Professionals’ experiences of work and learning in complex adaptive organisations

Amanda Louise Lizier

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Certificate of Original Authorship

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as part of the collaborative doctoral degree and/or fully acknowledged within the text.

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Abstract

Globalisation and innovations in technology have increased complexity in work and workplaces, placing demands on professionals to learn and adapt as part of an increasingly uncertain and unstable workforce. A greater degree of theoretical complexity is required to fully understand the ways professionals and organisations are adapting their learning practices to suit emerging contexts of change and uncertainty. Situated within the field of work and learning, this study adopts a complex adaptive systems approach as the basis to investigate professionals’ experiences of work and learning using a newly developed framework.

An adapted phenomenographic approach and a specifically developed framework, the complex adaptive organisations conceptual framework, were used to analyse the data from semi-structured interviews with fourteen professionals, from a variety of organisations and industry sectors within Australia. The data analysis produced four categories of description. The first category described professionals’ experiences of learning as being primarily through work. The second category described how organisational complexity shapes the conditions of work, influenced by varying degrees of emergence, adaptation, complex social networks, and agency. The second category highlighted that work in complex adaptive organisations is best described as fluid work. The third category described how the greater the degree of work fluidity, the greater the need for professionals to learn through work. This study provided empirical evidence that fluid work and learning are interrelated in complex adaptive organisations. The fourth category highlighted how organisations have been slow to adapt to the influence of organisational complexity in continuing to emphasise structured learning.
This study makes two original and significant contributions to knowledge in the field of work and learning. First, it uses the *complex adaptive organisations conceptual framework* to examine how organisational complexity influences professionals’ experiences of work and learning. Second, this empirical study indicates that work and learning are interrelated in complex adaptive organisations and should be investigated concurrently. The adapted phenomenographic methodology was key to enabling work and learning to be analysed as a composite. The findings of this study suggest that the focus for understanding learning and development systems and practices in complex adaptive organisations needs to shift away from structures and individual learning, towards approaches that consider the interplay of organisational complexity, fluidity of work, and experiences of learning primarily through work.
Publications from this research


N.B. This conference paper was peer-reviewed.
Chapter 1 Introduction and background to the study

Shifts in developed economies from agriculture and manufacturing to the “knowledge economy” have produced corresponding changes in experiences of work and learning (Billett & Choy, 2013; Farrell & Fenwick, 2007). Change is now a pervasive feature of working life and shifts in the structure and nature of work have been influenced by increasing globalisation and greater use of technology (Billett & Choy, 2013; Dicken, 2015; Hislop, Bosley, Coombs, & Holland, 2014; Hodgson, 2016; Walton, 2016). These changes have brought about increased demands on professionals to learn and adapt to the increasingly complex nature of work in contemporary organisations. To better understand such organisational complexity, more complex theorisations of organisations are required (Tsoukas, 2017). Taking up Tsoukas’ challenge, this empirical study used a theoretical approach, focusing on complexity in contemporary organisations.

Professionals’ experiences of work and learning across a range of organisations and industry sectors were investigated, and conceptualised and analysed using a complex adaptive systems approach. Findings from this study have been accepted for publication and a copy of the journal article is included as Appendix 1. Semi-structured interviews were conducted with fourteen professionals who worked across a variety of organisational levels (e.g., managers, technical staff) as well as across a variety of professional and organisational contexts. Overall, the professionals worked within nine different organisations, representing sectors engaged in professional services, member services (peak professional body), banking, retail, radio and television production, aviation, scientific research, and pharmaceuticals. The interview transcripts were then analysed using an adapted phenomenographic approach. To conceptualise the study, the complex adaptive organisations conceptual framework (CAOCF) was developed,
drawing on the complex adaptive systems literature as well as the literature of work and learning. To a lesser extent, the framework draws upon literature from organisation studies, organisational learning, educational research, and management studies.

This chapter provides the background to the study showing the development of the research aims and the research question. The methodological approach and research design are also outlined, before a discussion of the key concepts used in the study. The significance of the research is then discussed before concluding with an overview of the organisation of the chapters.

Background to the study

The nature of work and organisations has undergone significant, and increasingly rapid, changes over the course of the 20th and early 21st centuries in response to broader changes in the global economy (Billett & Choy, 2013; Dicken, 2015; Hodgson, 2016; Walton, 2016). The following stories are used in this study to illustrate the impact of these changes on three individuals as they worked and learnt over the course of the 20th and early 21st centuries. Through their stories, key impacts on the changes to work and learning are highlighted.

**Story 1: The pre- and post-war period**

My grandfather was born in 1922 and began his working life at 13 years of age, during the Great Depression, after little formal education. His career trajectory exemplifies many of the changes that have occurred in work and learning over the course of the 20th century. Beginning as a farm hand on a small farm, he moved to a large metropolitan city at the age of 16 to work in a factory. Four years later, on
returning from army service in World War II, he found a “job for life” in the
government department responsible for postage, telegraph, and, increasingly,
telephone communications. When he joined the organisation in the late 1940s his
learning was exclusively through work and from more experienced colleagues. Forty
years later, he retired as Principal of the organisation’s training college which
provided recognised training to apprentice electricians and technicians. At the time
of his retirement in 1982, my grandfather had been part of the increasing drive to
promote qualifications and industry recognised training in many parts of the
workforce (James, Guile, & Unwin, 2013).

Story 2: Latter half of the 20th century

My father’s story, a generation later, reflects the beginnings of the shift away from
manufacturing towards more “knowledge work” in the economy (Farrell & Fenwick,
2007; Fuller & Unwin, 2010; Lee, 2014). On completing school at the age of 16 he
went to work as a teller for a large Australian bank in the late 1960s. Over his 28-
year career in one bank, he worked his way through the established hierarchy,
taking up job opportunities and promotions, to eventually become a senior
manager. He also attended many training courses over the years – all provided by
the bank in purpose-built classroom facilities. My father’s career with the bank came
to an end during the recession of the late 1980s and early 1990s when terms such as
“downsizing” and “restructuring” entered the family dinner conversation. No longer
did one have a “job for life”. He was a “victim” of the changes to work and learning,
influenced by global economic changes and neoliberal policies about work (Harteis, Rausch, & Seifried, 2014; Walton, 2016).

**Story 3: The 21st century**

The first two illustrative stories highlighted how the nature of work has changed using the examples of my grandfather’s and father’s careers and how work has evolved from the 1930s to the early 21st century. The conclusion of this narrative is found in the story of my career (to date). Where my father and grandfather had few formal qualifications, I attended university and began my working life after graduation with a casual job in a recruitment company. I did not start my first “traditional”, full-time job until almost a year after graduating from my undergraduate degree, at age 21, having already embarked on post-graduate study. My work as a learning professional within large organisations changed little over the sixteen years that I have spent working within them. When I started in 2001, I was writing face-to-face courses and hard-copy technical manuals for staff emphasising the static nature of the jobs for which people were being trained. By the time I was head of a learning and development department, several years later, business discourses had shifted to working “smarter not harder” and being “flexible and agile” but our learning practices had not evolved to match these discourses. After spending around ten years working full-time for large corporations, my job was restructured and I embarked on a career change, moving into what has been referred to as “portfolio work” (Fenwick, 2004). In practice this meant taking on
parallel or sequential fixed-term contracts to complete specified projects for various organisations. These projects required me to develop structured learning and development strategies, frameworks, and initiatives, favouring face-to-face and online courses. This period also coincided with the beginning of post-graduate research, university teaching, and consulting work as a self-employed contractor – concurrently. My experiences as both a learning professional and as a worker in these contexts are highly illustrative of the large-scale changes in the nature of work, from stable and often predictable, to fluid and flexible.

These stories illustrate changes across the workforce influenced by the evolution of the global economy (Billett & Choy, 2013; Dicken, 2015; Hodgson, 2016; Walton, 2016) and significant changes in technology and its applications at work (Fenwick & Edwards, 2016; Susskind & Susskind, 2015). Today’s professional is more likely to work for several organisations over the course of their career. Their jobs would be organised across multiple project teams, including virtual teams with members scattered across time zones and cultures. The promise of a “job for life” is no longer. Issues such as work-life balance have become a greater concern due to the encroachment of work into leisure hours via digital technologies. There are fewer opportunities for career advancement within organisations, and there is an increasing emphasis on personal responsibility for one’s learning (Baruch & Bozionelos, 2011). Organisations are also evolving to meet the demands of increasing rates of change and complexity by moving towards more flexible organisational forms (Schreyögg & Sydow, 2010). These organisations have been conceptualised as “boundaryless” organisations (Ashkenas,
Ulrich, Jick, & Kerr, 2002), virtual organisations (Davidow & Malone, 1992), project-based organisations (Miterev, Mancini, & Turner, 2017; Whitley, 2006), and holacracy (Robertson, 2016). These organisational concepts share common assumptions that contemporary organisations require speed and adaptability in their structure, processes, and practices and a reduction in hierarchy to succeed in contexts of broad societal, technological, and economic change (Schreyögg & Sydow, 2010).

Increasing pressures in the workplace from advances in technology and the impact of globalisation, and government responses to these, mean that change is now firmly acknowledged as an ever-present feature of organisational life (Hislop et al., 2014). This highly networked and changeable context is placing new and unprecedented demands on individuals’ abilities to learn and adapt quickly and efficiently. Furthermore, large-scale changes in the composition of the global economy and increased competition for jobs have created an imperative to maintain employability and stay abreast of the latest skills and knowledge throughout one’s career (Billett & Choy, 2013). These changes raise significant questions about how professionals experience the changes in work and organisations described above and, consequently, how professionals are “doing” and experiencing learning in these contexts.

With the ongoing shift into the “knowledge-based economy”, employees are increasingly described as “knowledge workers” (Farrell & Fenwick, 2007; Fuller & Unwin, 2010; Lee, 2014). The proportion of knowledge workers in the Australian economy is calculated by the Bureau of Statistics by combining the job classifications of Managers and Administrators, Professionals, and Associate Professionals. In 2004, this represented 39.2% of the workforce (Australian Bureau of Statistics, 2007). The
most recently available census data (from 2011) shows that the equivalent job
classifications now constitute 48.9% of the Australian workforce (Australian Bureau of
Statistics, 2012) an increase of nearly 10% from the previous census. The shift from a
manufacturing to a more service-based knowledge economy, in developed economies
like Australia, has seen professional education and lifelong learning promoted as being
of critical importance to both individuals and organisations (Illeris, 2003). This context
demands an “unparalleled learning response from organisations” (Bartell, 2001, p. 354)
and from individuals. As Farrell and Fenwick (2007) asked: “What is involved, and
what is at stake, in educating a global workforce for a knowledge-based economy?” (p.
13). Within the knowledge-based economy the emphasis has shifted from the training of
technical skills to “soft skills” associated with areas such as communication, problem-
solving, and skills in integrating new knowledge (Farrell & Fenwick, 2007).

My experiences as a learning and development manager within a large, multi-national
organisation reflected changes from stability to flexibility in work, with an increasing
emphasis on providing courses and reference materials on topics such as negotiation
skills, time management, communication skills, and leadership over technical skills for
specific jobs. Over time, I came to question whether the structured learning approaches
that we were designing and implementing were still suitable for rapidly changing work
contexts. Changes in the nature of work require, now more than ever, ongoing
development (Billett, 2009) and a greater degree of flexibility. However, the learning
frameworks and initiatives being used within my organisation, and those of my
colleagues in similar organisations, had changed relatively little over the years, with
much of the focus still on structured classroom-based and online programs. Continuing
to emphasise structured learning seemed to fail to recognise the increasing complexity
of work and organisations and raised questions for me about how work and learning are theorised and enacted in contemporary organisations.

**Adopting a complex adaptive systems perspective**

With the increasing complexity of work in contemporary organisations (Schreyögg & Sydow, 2010; Walton, 2016) described above, this study required a way of conceptualising organisations within contexts of change wherein complexity was emphasised. Tsoukas (2017) has argued that, to understand organisational complexity, we must “complexify” theory rather than attempt to simplify theoretical approaches (Bettis, Gambardella, Helfat, & Mitchell, 2014). Complexity approaches have been identified within the organisation studies literature as being an effective theoretical and conceptual framework for understanding organisations within contexts of rapid change and uncertainty (see Stacey & Griffin, 2005; Tsoukas & Dooley, 2011; Uhl-Bien & Arena, 2017; Yolles, 2006). In addition, the work and learning literature has also adopted complexity approaches as having potential for offering new understandings of learning and practice at work within changing and challenging contexts (see C. Davis, 2012; Fenwick, 2012a; Fenwick & Dahlgren, 2015; Johnsson & Boud, 2010; Lancaster, 2012; Reich & Hager, 2014). This literature largely adopts the more generic terms of complexity theory or complexity approaches (see Desai, 2010; Fenwick, 2010b, 2012a; Fenwick & Dahlgren, 2015; Fenwick, Edwards, & Sawchuk, 2011; Johnsson & Boud, 2010) with relatively few studies adopting the more specific concept of complex adaptive systems adopted for this study (see Chiva, Ghauri, & Alegre, 2014; Chiva, Grandio, & Alegre, 2010; Chiva-Gomez, 2003; Jacobson, Kapur, & Reimann, 2016; Jones & Corner, 2012; Palmberg, 2009). The use of complexity approaches, both in the organisation studies and work and learning literatures, provides this study with a useful
way to rethink work and learning in contemporary, complex organisations, following Tsoukas’ (2017) exhortation to complexify organisational theory. Adopting complexity concepts to underpin this study moves away from traditional approaches to understanding work and organisations, simplifying organisational phenomena, and assumed “logical, causal relationships among a set of concepts” (Bettis et al., 2014, p. 1411).

In taking a complex adaptive systems approach, this study brings together current threads in the work and learning and, to a lesser extent, organisation studies and organisational learning literatures. Adopting a complex adaptive systems approach as the basis for this study takes up current discourses around the changing nature of work due to rapid change influenced by globalisation, technology, and neoliberal policies (Harteis et al., 2014; Walton, 2016). In doing this, the study also takes up recent theoretical shifts in the work and learning literature towards practice (Hager, 2014) or complexity approaches (Fenwick et al., 2011), reflecting a growing recognition of the changes in contexts of work and learning in developed economies.

Complexity theory is a broad term used to describe the variety of ways specific types of systems, in particular, complex systems, are studied. A complex system is a network of components interacting to bring about complex collective behaviours that are not completely ordered or completely disordered (Mitchell, 2009). Adopting a complexity approach emerged as a highly suitable choice to frame this study of work and learning in contemporary organisations because of the insights it offers into unpredictable and emergent contexts. Complexity approaches originated in the natural sciences but have been taken up within the social sciences by researchers and theorists such as Sawyer
A more detailed discussion of complexity approaches is outlined in Chapter 2. This study adopted a specific sub-set of complex systems approaches referred to as complex adaptive systems (Holland, 1995, 2006) as the basis for the conceptual framework of this study. Complex adaptive systems are described as systems containing agents that have a drive toward adaptation; where the agents adapt their strategies for operating within the system to increase their chances of success (Holland, 1995). Adaptation within complex adaptive systems is usually achieved through learning processes (Holland, 1995) and it was the connection between adaptation and learning within complex adaptive systems that was a key reason for selecting a complex adaptive systems approach to frame this study.

Work and learning research has taken up many different theoretical approaches over time, including a current shift towards complexity approaches by some researchers. As Hager (2011) has suggested, in his work tracing the historical development of theoretical perspectives in work and learning, there have been three main approaches – psychological, socio-cultural, and what he calls postmodern. This final tranche of theories has been referred to in various ways however, such as post-Cartesian (Green, 2009), practice approaches (Hopwood 2016), or socio-material approaches (Fenwick et al., 2011; Fenwick, Nerland, & Jensen, 2012). These more recent approaches to work and learning “offer a basis for disrupting many features of conventional approaches to researching professional work and learning” (Hopwood, 2016, p. 60). Complexity approaches, as stated earlier, have been adopted in work and learning (see C. Davis, 2012; Fenwick, 2012a; Fenwick & Dahlgren, 2015; Johnsson & Boud, 2010; Lancaster, 2012; Reich & Hager, 2014) and “complexity theory had an influence on the growing attention to practice, especially when the concept of complex responsive processes
arrived in the debate on practices and sociomaterialities (Fenwick, 2012b)” (cited in Gherardi, 2016, p. 682).

However, complexity approaches have been taken up by various researchers across many different fields of study. For example, as noted by Gherardi (2016), there are variations in key ideas about complexity, such as in the meaning and usage of emergence. For example, Stacey (2003) adopts a socio-cultural focus to complexity and argues that learning emerges through human interactions and power relations and “is the activity of interdependent people” (p. 325). Further, he suggests that organisations are the result of the patterns of human interaction. In contrast, researchers such as Fenwick et al. (2011) use complexity approaches as adding to a socio-material perspective of work and learning where, “in (complex adaptive) systems, phenomena, events and actors are mutually dependent, mutually constitutive, and actually emerge together in dynamic structures” (authors’ emphasis, p. 21). From this perspective, the emphasis is on the interconnectedness and interactions of human and non-human elements of a system. Through interactions the overall nature of the system emerges (Fenwick et al., 2011). Socio-material perspectives differ from Stacey’s (2001, 2003) approach, emphasising instead the interconnectedness of the humans within systems, through which the system emerges.

This study follows Stacey (2001, 2003) in understanding that organisations are the result of patterns of human interaction. As Gherardi (2016) notes:

for Stacey, interaction is self-organizing and has an intrinsic capacity to produce an emergent coherence, while in most practice theory (as in activity theory or
actor-network theory), agency and knowing are embedded in knowledge/power
relations, so that the meaning of “emergent” is quite different. (p. 682).

While not dismissing the material elements of complex adaptive systems, this research
focuses on human interactions within the organisational system, emphasising
professionals’ experiences of work and learning within these contexts. This study
therefore takes both a socio-cultural approach to work and learning in the organisations
studied, in terms of focusing on the interactions of the professionals, while also taking
up more recent shifts in work and learning theories towards complexity approaches as
the primary conceptual framework. The study primarily adopts a complex adaptive
systems approach as the basis for the conceptual framework to meet Fenwick’s (2012a)
challenge that complexity concepts need to be used rigorously rather than
metaphorically to unlock their potential for explanation. A socio-cultural approach was
taken primarily to differentiate this study from other studies using complexity which
tend to use socio-material approaches (Fenwick, et al., 2011). It is important to note that
this is not a socio-cultural study in terms of methodology and method. This is discussed
further in chapter 4.

This study of work and learning focuses on the lived experiences of individual
professionals within contemporary organisations. Foregrounding the experiences of
individual professionals responds to gaps identified in the literature (discussed in
Chapter 2) highlighting that, while organisations have been studied as complex and
complex adaptive systems (e.g., Chiva et al., 2014; Chiva et al., 2010; Palmberg, 2009;
Uhl-Bien & Arena, 2017), there has been less research into the experiences of
individuals within such systems. Investigating the learning experiences of individuals,
here referred to as professionals, within complex organisations will add to current understandings of work and learning within the “fluid, ever-shifting contexts” (Hopwood, 2016, p. 75) in which professionals now work.

The conceptual framework developed specifically for this study of work and learning in dynamic contemporary organisations is named the complex adaptive organisations conceptual framework (CAOCF) (outlined in Chapter 3). Previous conceptual frameworks have focused on complex adaptive systems within different contexts (e.g., see Jacobson et al. (2016) in education and Chiva et al. (2014); Chiva et al. (2010) in organisational learning). Although these frameworks use complex adaptive systems approaches they have not been developed specifically for investigating work and learning. Frameworks that have adopted complex adaptive systems approaches (Chiva et al., 2014; Chiva et al., 2010; Jacobson et al., 2016) were helpful in developing a suitable framework for this study, as was the Working as Learning Framework (Felstead, Fuller, Jewson, & Unwin, 2009). The CAOCF provided a more nuanced conceptual framework, explaining organisations as complex adaptive organisations and positions organisational complexity as key to understanding work and learning in contemporary organisations in the context of the global, knowledge-economy (Farrell & Fenwick, 2007; Harteis et al., 2014). The CAOCF also enables a more rigorous exploration of professionals’ experiences of work and learning in complex adaptive organisations emphasising the importance of emergence, networks, learning, and adaptation within complex adaptive organisations.

A key reason for adopting a complex adaptive systems approach to frame the study, rather than adopting the broader, and more widely used, concept of complexity, is that a
complex adaptive systems approach emphasises adaptation and learning on the part of individuals within organisations while also considering the influence of broader, system-level complexity. The focus on the experience of professionals is an important part of this study. To date, much of the literature adopting complex adaptive systems approaches within work and learning (e.g., Jones & Corner, 2012; Palmberg, 2009) and organisational learning (e.g., Chiva et al., 2014; Chiva et al., 2010; Uhl-Bien & Arena, 2017) has examined learning from the perspective of the organisation or, in complex adaptive systems parlance, at the system level. There are few studies that examine individual learning and working within such contexts, a gap this research seeks to address. By adding to the understanding of individual experiences of work and learning, and how the broader organisational system influences these experiences, this study provides a fuller picture of how work and learning are experienced within complex adaptive organisations. Adopting a complex adaptive systems approach also offers insights into how individual professionals experience learning given the changing nature of work and organisations described at the beginning of this chapter by emphasising the complexity of contemporary organisations and investigating the impact of that complexity on how professionals work and learn. Through focusing on professionals’ experiences of work and learning, this study builds on earlier work and learning research that has positioned participation as central to learning at work (e.g., Billett, 2004b, 2016; Eraut, 2011). Taking up complex adaptive systems also contributes to recent trends within work and learning that are beginning to examine emergence, a key aspect of complex adaptive systems (Holland, 1995), and its role in work and learning (e.g., Dahlgren, Fenwick, & Hopwood, 2016; Reich & Hager, 2014), as discussed in the following section.
Complex adaptive organisations

Complex adaptive organisations, is a term used in this study to refer to the organisations studied. A review of the literature revealed that this term was first used by Longo (2007) to describe the organisations involved in a study of change processes in primary health care in Italy. However, a detailed definition of what constituted a complex adaptive organisation was not included in that study. As a concept, the complex adaptive organisation does not appear to have been adopted within work and learning research. The concept is used in this study in two ways. First and foremost, it is a key part of the conceptual framework and describes the organisations that form part of the study. Second, the term complex adaptive organisations, is used to differentiate the organisations in this study from other examples of complex adaptive systems found in nature such as flocks of birds, computer networks, and the like (Mitchell, 2009). Four core concepts of complex adaptive organisations were identified from the literature to usefully conceptualise and analyse the organisations studied (Barabási & Albert, 1999; Holland, 1995; Kauffman, 1995; Mitchell, 2009; Watts & Strogatz, 1998). The core concepts are emergence, adaptation, complex social networks, and agency and they are discussed in detail in Chapter 3.

Work and learning in the context of this study

As previously noted, this study is located within the emerging field of work and learning (Fenwick, 2006). Despite a growing interest in the field, there is still little agreement on what work and learning are or how they should be defined (Manuti, Pastore, Scardigno, Giancaspro, & Morciano, 2015), and the cross-disciplinary nature of
the field has resulted in a wide array of models and terminology (Candy & Matthews, 1998).

In her work questioning the use of terms in work and learning research, Fenwick (2006) highlights that the key terms used in the field – work, learning, and workplace – are complex and contested. In particular, this study takes up Fenwick’s (2006) assertion that the very term workplace is problematic in a context where there is often not a specific place of work and where locations of work can vary widely (Cole, Oliver, & Blaviesciunaite, 2014). While acknowledging that it is difficult to move away from such a deeply embedded term as “workplace learning”, this study instead refers to, alternately, work and learning or learning through work to separate conceptions of learning from a specific time or place. Further, the use of work and learning aims to bring discussions of work and its role in learning to greater prominence. Importantly, this study is not situated within organisational learning discourses although it does draw on some aspects of the literature. Within this study, the term “organisational learning” is used in two ways. First, it is used to refer to the organisational learning literature where it is necessary to highlight some aspect of research that has adopted a complexity, or complex adaptive systems approaches, and is relevant to this study. Second, it is used to refer to approaches to learning by organisations. Organisational approaches to learning are discussed in Chapter 7, where the implications of the findings of this study for learning and development systems and practices\(^1\) are discussed. The term learning and

\(^1\) The phrase “learning and development systems and practices” has been adopted in this study to broadly describe structured organisational approaches to learning. Within organisations, learning and development generally refers to the team generally responsible for learning within organisations (usually part of the Human Resources Department) as well as the processes and practices which surround learning. This discussion takes up learning and development systems and practices in the sense of frameworks, processes, and learning initiatives which scaffold learning within organisations.
development systems and practices is used in this study to refer to the systems, frameworks, policies, processes, and practices enacting learning within the organisations studied.

**Defining “work”**

Fenwick (2010b) has pointed out that “conceptions of ‘work’ are multiple and resist synthesis” (p. 106). It is challenging to define a concept such as work which may be paid or unpaid, visible or invisible, fixed in time and space, mobile, or virtual (Fenwick, 2006, 2010b). Of relevance to this study is the concept of “knowledge work” (Farrell & Fenwick, 2007; Fuller & Unwin, 2010). As Fuller and Unwin (2010) have noted, knowledge work and knowledge worker are contested terms. Knowledge work is commonly defined as work that creates and produces new knowledge (Fuller & Unwin, 2010) and is generally theoretical and scientific (Guile, 2006). Knowledge workers are “released from the burden of physical labour to solve problems and innovate, autonomous in their organisations and mobile at their own initiative across corporations and geographical boundaries” (Farrell & Fenwick, 2007, p. 21). Although most of the professionals who participated in this study arguably undertook knowledge work in terms of the types of work they undertook, their autonomy in completing that work, and the contexts in which they worked, the term “knowledge worker” was not used to define the nature of work for the purposes of this study for three key reasons. First, one of the aims of this study was to investigate the nature of work in complex adaptive organisations. To label the professionals as knowledge workers and the work they undertake as knowledge work would be to pre-empt the findings of the study and introduce potentially restrictive assumptions into the analysis. Second, debate about the
term makes it challenging to adopt, particularly critiques such as argued by Brint (2001), that the term knowledge worker is “being used increasingly as a badge conferring prestige rather than an accurate description of the work people do” (Fuller & Unwin, 2010, p. 205). Third, not all of the professionals interviewed for this research can be strictly defined as knowledge workers. In particular, it was challenging to determine whether the two administration assistants and a finance analyst (who primarily tracked expenditure against budget projections) were primarily engaged in knowledge work. The individuals who participated in this study were referred to by the broader term “professionals” to acknowledge that their work took place within an office context and included elements of knowledge work.

Work, in this study, refers to daily activities undertaken by professionals in pursuit of earning an income which may be planned or unplanned. These activities may be part of a professional’s job within one organisation, as defined through their job description or other organisational documents, or part of ‘portfolio work’ (Fenwick, 2004) where a professional works across multiple contexts. Work activities may therefore not always be immediately remunerated but may be completed in preparation for, or in the hope of, future work such as what Keuhn and Corrigan (2013) have referred to as ‘hope work’, for example, building professional networks or creating social media content. Within a single organisation, work activities may also be completed outside of a professional’s job description such as taking on additional projects elsewhere in the organisation or ‘acting up’ in a higher job (Johnsson, Boud & Solomon, 2012). A more detailed discussion of the nature of work in complex adaptive organisations is found in Chapters 6 and 7. Given the complex adaptive systems approach adopted for this study, it is also important to foreground both experiences of work and learning and how they may be
influenced by organisational complexity. Referring to work and learning as discrete but linked phenomena allows for a broadened discussion of learning within the context of work, particularly within the changeable and networked context of contemporary organisations.

**Shifts in approaches to work and learning in the literature**

In work and learning research there have been shifts in approaches to work and learning (as described by Hager, 2011), as well as descriptions of metaphors of learning, beginning with dominant metaphors of acquisition and transfer (Sfard, 1998) moving through to metaphors of participation and becoming (Hager & Hodkinson, 2009). More recently, there has been an increasing shift towards describing learning in terms of metaphors of emergence (Hopwood, 2016), echoing key aspects of complex adaptive systems approaches. In adopting complex adaptive systems to frame the study, emergence is used as both a metaphor for learning and a critical meta-phenomenon influencing work and learning. Emergence has therefore been included as the core component of the CAOCF. Indeed, it influences and responds to all aspects of complex adaptive organisations. Equally, in investigating experiences of both work and learning, this study also takes up learning through participation as both a metaphor and the primary means of learning at work (Billett, 2004a; Boud & Hager, 2012; Eraut, 2007, 2011). As discussed earlier, this study approaches work and learning from a socio-cultural perspective while also taking up recent shifts in work and learning theories towards complexity approaches.

There are the two key under-researched areas identified in the literature that this study aims to focus on. First, adopting complex adaptive systems to frame the study takes up
Fenwick’s (2012a) challenge to use complexity concepts rigorously rather than metaphorically. Although complexity concepts are useful as metaphors, their adoption as key explanatory and descriptive features of organisations makes a more rigorous contribution to understanding work and learning. As Hood (2014) proposes, writing within social work, research should “take a closer look at complexity as a phenomenon in its own right, rather than just a convenient metaphor of difficulty” (p. 28). The CAOCF was developed to enable a closer examination of how organisational complexity influences experiences of work and learning for individual professionals.

The second under-researched area identified in the work and learning literature is linking individual and organisational perspectives of learning. Existing research adopting complex adaptive systems approaches (e.g., Chiva et al., 2014; Chiva et al., 2010) focuses on the organisation rather than on individuals. Focusing on individual professionals’ experiences of work and learning in this study, and how they are influenced by organisational complexity, helps to understand this aspect of how work and learning are experienced within the context of contemporary organisations. Framing this study using a complex adaptive systems approach provides a new basis to investigate professionals’ experiences of work and learning within broader organisational contexts.

**Research aims and the research question**

To address the under researched areas identified above – taking up a complex adaptive systems approach and focusing on individuals rather than systems – this study investigated individual experiences of work and learning within complex adaptive organisations. The widespread changes in the nature of work discussed at the start of this chapter require new ways to analyse organisations that consider both the order and
the uncertainty found in contemporary contexts. Morgan (2006) has used metaphors such as “flux and transformation” and “organisations as brains” to highlight the same issues, identifying organisations as complex adaptive organisations influenced by emergence and three key concepts (adaptation, agency, and complex social networks, as outlined in Chapter 3), allowing for a more rigorous analysis of work and learning in these contexts.

The primary aim of this study was therefore to gain an understanding of how individual professionals experience work and learning within complex adaptive organisations. Further, the study aimed to question theories of work and learning that have placed participation as central to experiences of learning at work (Hager, 2011) but have tended to focus primarily on learning (Tynjälä, 2013) rather than also examining experiences of work. One of the issues with earlier psychological theories of work and learning that Hager (2011) identifies is that these theories often position learning as a product independent of the context within which it occurs. This study aimed to provide insights into the nexus of work and learning and to investigate the ways that the nature of work influences experiences of learning. As Billett (2017) has noted, work and learning may be considered as a duality; “two entities which are richly interlinked and linked to each other. Dualities are helpful in seeking to explain how individuals learn through working life” (p. 71). In addressing these aims and the gaps in the literature discussed above (and detailed in Chapter 2) the primary research question was:

**How do professionals experience work and learning in complex adaptive organisations?**
As discussed earlier in this chapter, the focus of this study is on individual professionals and how they experience work and learning within the broader context of organisations framed by complex adaptive systems approaches. The research question incorporates these key elements. The question focuses the study on individual professionals, highlighting that individuals within the organisational system are the unit of study. Furthermore, using the term professional best describes the nature of the work undertaken rather than using the often contested term “knowledge worker” (Farrell & Fenwick, 2007). Participants in the study were referred to as professionals to foreground their agency and, importantly, to differentiate them from the non-human agents also forming a part of the organisation. Human agency is critical in setting complex adaptive organisations apart from other examples of complex adaptive systems such as flocks of birds, colonies of ants, or computers in a network. Incorporating agency as a key element of complex adaptive organisations requires revision of the standard terms used for parts of complex adaptive systems, specifically the term “agents” (Mitchell, 2009), the term most commonly used to denote the individual elements of a complex adaptive system.

Referring to the study participants as professionals further helps to describe the nature of their work, which took place primarily within office-based environments and was non-manual, without adopting the contested term “knowledge workers” (Brint, 2001; Farrell & Fenwick, 2007; Fuller & Unwin, 2010). From the literature relating to the study of organisations and complexity has, so far, focused on organisations where the staff primarily works in an office-based context (see Chiva, et al., 2010; Chiva, et al., 2014; Jones and Corner, 2012; Palmberg, 2009) as this study has done. Complex adaptive organisations, within this study, are therefore places where the professionals
work primarily in office-based contexts as opposed to other contexts such as field work. Although the term professional traditionally denoted an individual who worked within a profession (e.g., law, medicine, architecture) the term has broadened over time to denote office workers more generally. In Australian universities, for example, administrative, allied, general, and non-academic staff are most often referred to by the term “professional staff” (Szekeres, 2011). Professional is used therefore used in the context of this study to refer to the office-workers who were interviewed for this study who worked across a range of job areas.

There are two key parts to the research question. First, the research question includes the concept of complex adaptive organisations. Complex adaptive organisations form a key part of the research question and the concept incorporates complex adaptive systems approaches into the study. A complex adaptive organisation is an organisation which is an example of a complex adaptive system and shows evidence of emergence and the three key elements identified from the literature – adaptation, complex social networks, and agency. Such organisations are comprised of individual professionals who learn and adapt, act with agency, and interact through complex social networks as part of their everyday work. Chapter 3 provides a detailed definition of complex adaptive organisations through the CAOCF. Chapter 5 uses data from the study to demonstrate in what ways the organisations in the study are complex adaptive organisations.

Second, the research question focuses the study on professionals’ experiences of work and learning. As discussed earlier in this chapter, this study foregrounds the lived experiences of individuals, to seek insights into the micro-level of complex adaptive
organisations, as distinct to the greater research emphasis given to the macro aspects of the system-level of organisations (e.g., Chiva et al., 2014; Chiva et al., 2010; Desai, 2010). Investigating the work and learning experiences of individuals expands understandings of how individuals may already be adapting their work and learning practices in response to organisational complexity. Chapter 6 describes the outcomes from an adapted phenomenographic analysis of the interview data and the four categories of description that describe aspects of professionals’ experiences of work and learning in complex adaptive organisations.

**Methodological approach**

The study’s focus on professionals’ experiences of work and learning in complex adaptive organisations required a methodology that could gather data on the lived work and learning experiences of professionals in such contexts. Phenomenography, an empirical methodological approach (Marton & Booth, 1997), seeks to identify the different ways individuals experience aspects of their world. Phenomenography was chosen as the most suitable research approach for this study based on this focus on the lived experiences of individuals (Marton, 1994). The products of a phenomenographic analysis are the *categories of description*, which offer insights into how a phenomenon is experienced, and the *outcome space*, which summarises the categories and highlights their inter-relationships (Marton & Booth, 1997). These terms have been used uniformly throughout the study to maintain consistency.

Phenomenography was also selected because it is a flexible methodology (Tight, 2016). As a research approach it has been used in areas such as school education (Aprea, 2015; Kalvaitis & Monhardt, 2011; Pang & Marton, 2013), vocational education (Bliuc,
Casey, Bachfischer, Goodyear, & Ellis, 2012; Sappa & Aprea, 2014), higher education (Entwistle & Karagiannopoulou, 2013; Woollacott, Booth, & Cameron, 2014), medical and nursing education (Dupin, Larsson, Dariel, Debout, & Rothan-Tondeur, 2015; Sjöström & Dahlgren, 2002; Wilhelmsson et al., 2010), and workplace and professional learning (Abdi, Partridge, & Bruce, 2013; Bailey, 2015; Paloniemi, 2006; Slotte, Tynjälä, & Hytönen, 2004). Chapter 4 provides a more detailed discussion of phenomenography as a methodological approach.

Phenomenographic studies generally focus on the lived experiences of a single phenomenon, most often learning (e.g., Bliuc et al., 2012; Felix, 2009; Wilhelmsson et al., 2010). This study differs in that the research question focuses on experiences of two phenomena that appear to be interrelated – work and learning. Flexibility in the phenomenographic approach (Tight, 2016) was therefore important in this study to investigate work and learning together. Investigating two phenomena as part of a phenomenographic study has been done before. Bailey (2015), in her study of the experiences of professional development of Human Resource Development (HRD) practitioners and their use of non-formal learning in their development, conducted separate analyses for her two phenomena resulting in two sets of categories of description and two outcome spaces. This study differs in that work and learning are positioned as inter-related phenomena to be studied together to recognise the influence they have on one another. It has long become accepted within the work and learning literature that learning at work occurs through participation in that work (Billett, 2004a; Boud & Hager, 2012; Eraut, 2007, 2011). This study integrates the acceptance of participation as central to understanding work and learning in investigating the two phenomena concurrently. In order to examine two phenomena as part of one analysis,
the phenomenographic approach was adapted and one analysis was conducted of the data for both phenomena. This study has one set of categories of description and one outcome space describing experiences of both work and learning. The categories of description and the outcome space are described in detail, supported by evidence from the study, in Chapter 6.

A further adaptation was made to the phenomenographic methodology in the analysis process to account for framing the study using a complex adaptive systems approach. The analysis of this study did not adopt the usual assumption that experiences of a phenomenon may be organised into a hierarchy, building until the highest category describes the “most advanced or developed way of experiencing the phenomena” (Tight, 2016, p. 320). Using a complex adaptive systems approach made such assumptions problematic. The dynamic and emergent nature of complex adaptive organisations made the development of clear hierarchies from the outset challenging to define and, potentially, counterproductive given the highly networked nature of such organisations. Approaching the analysis looking for hierarchies would have set parameters around the findings and constrained them in a way antithetical to a complex adaptive systems approach. Rejecting assumptions that the categories of description should form a clear hierarchy also responds to some of the criticisms of the phenomenographic approach, namely Webb’s (1997) criticism that the hierarchical arrangement of categories of description is problematic because it assumes that the most highly developed category is somehow “correct”. Similarly, Kember (1997) has also raised concerns that there are no established procedures for determining the hierarchy of categories of description. Although the phenomenographic methodology has been adapted to answer the research question posed here, this study is nonetheless still
recognisable as a phenomenographic study. As Tight (2016) has noted, “it has become more and more obvious that there are considerable variations in practice among phenomenographers” (p. 325) and this study forms a part of the ongoing exploration of phenomenography as a methodological approach.

The adapted phenomenographic analysis was conducted using data from the transcripts of semi-structured interviews with fourteen professionals across nine organisations. These organisations represented sectors engaged in professional services, member services (peak professional body), banking, retail, radio and television production, aviation, scientific research, and pharmaceuticals. These included publicly listed, not-for-profit and government organisations where the professionals worked as executives, senior managers, managers, technical professionals, and administration professionals. The interviews used a combination of direct questions and critical incident questions (Butterfield, Borgen, Amundson, & Maglio, 2005) and were digitally recorded before being transcribed. The interviews produced around sixteen hours of interview recordings, transcribed verbatim into 225 pages of data.

The analysis of the data, using an adapted phenomenographic methodology and the CAOCF produced four categories of description offering insights into the work and learning experiences of professionals within complex adaptive organisations. The descriptive categories emerging from this study are outlined in Chapter 6. The data analysis also produced evidence that the organisations studied are complex adaptive organisations, as detailed in Chapter 5.
Contributions of the research

This study contributes to the emerging field of work and learning (Fenwick, 2006) through an empirical study of the work and learning experiences of professionals representing a variety of organisations and industry sectors within Australia. This offers insights into learning within contemporary organisations and provides a framework for analysing and conceptualising this using the CAOCF developed specifically for this study.

This research also demonstrates the utility of the complex adaptive systems approach in investigating and explaining aspects of work and learning. Furthermore, the study highlights the benefits of considering work and learning from the perspective of the individual professionals as the constituent parts of a complex organisational system. Complexity approaches more generally have been used theoretically and methodologically to explore work and learning, and professional learning (e.g., Fenwick, 2012a; Johnsson & Boud, 2010; Reich & Hager, 2014; Tsoukas & Dooley, 2011). Within this body of work, the voices and experiences of individuals have often been neglected. Since complex adaptive systems emerge from the interactions of the actors, and their interactions with the context (Holland, 1995), a failure to unite these perspectives leaves a gap in our understanding of work and learning in these contexts. Significantly, this research provides a more complete view of learning in contemporary organisations by focusing on the work and learning experiences of professionals within the broader context of complex adaptive organisations. Framing the study in this way allows for an investigation of the impact of organisational complexity on the day-to-day experiences of work and learning within contexts of rapid and continual change.
Organisation of the thesis

This introductory chapter, Chapter 1, has outlined the background to the study and provided an overview of the study’s aims and the research question, the methodology and research design, definitions of key concepts, and the contributions of the study.

Chapter 2 locates the study within the current literature regarding the areas that are most relevant to this study, namely complex adaptive systems, work and learning debates, and a review of organisation theory relevant to the study. This literature review positions the study within the field of work and learning, a field increasingly adopting complexity approaches to investigate and understand learning at work (Fenwick, 2008b). The chapter opens with a discussion of the different ways work and learning has been conceptualised over time using the three areas described by Hager (2011) – psychological, socio-cultural, and postmodern theories (or what others call complexity approaches (Fenwick, 2010a, 2010b, 2012b; Fenwick et al., 2011)) – as a framework. The shifting metaphors of learning associated with these key theoretical shifts are also explored. An overview of the key tenets of the complex adaptive systems approach is provided for context, followed by a more detailed discussion of how these approaches have been adopted to frame studies of organisations and, most importantly, work and learning.

Chapter 3 outlines the conceptual and theoretical framework developed for use in this study. The CAOCF, based on complex adaptive systems approaches, provides a way to use these concepts specifically for research in work and learning. The chapter opens with a discussion of current debates concerning the use of complexity approaches in organisation studies building on the historical debates discussed in Chapter 2. The
The remainder of the chapter outlines the CAOCF, the role of emergence in complex adaptive organisations, and the key elements of complex adaptive organisations: adaptation, agency, and complex social networks.

Chapter 4 describes the adapted phenomenographic methodology used for this study. The chapter reviews current debates in phenomenography and outlines the rationale for its selection for this study. Epistemological concerns are discussed along with the differences between phenomenology and phenomenography to further highlight the rationale for the selection of this methodological approach. The chapter then outlines the research design and how the phenomenographic method was adapted to meet the aims of the study. The final sections of the chapter outline the methods used for sampling, data collection, and data analysis. The CAOCF is used to analyse data to establish whether the organisations studied are complex adaptive organisations (outlined in Chapter 5) and an adapted phenomenographic analysis is used to particularly analyse the data to examine professionals’ experiences of work and learning supported by the CAOCF. The chapter concludes with a discussion of ethical concerns raised as part of the study and their mitigation strategies.

The findings of the study are presented across Chapters 5 and 6. Chapter 5 focuses on the organisations in the study, using evidence drawn from the interviews and desktop research to demonstrate how each of the organisations in the study is a complex adaptive organisation using emergence and the three key elements of the CAOCF. The focus of Chapter 6 is on the descriptive categories emerging from the data. Chapter 6 discusses the categories of description in detail, supported by evidence from the interviews in the form of selected excerpts from the transcripts and by longer vignettes,
providing a more detailed view of how work and learning are experienced day-to-day within complex adaptive organisations. A discussion of the outcome space of the study, describing professionals’ experiences of the phenomena, closes the chapter.

Chapter 7 discusses the key findings of the study within the context of key trends in work and learning research occurring globally and positions these findings in relation to the literature and considering the implications for learning and development systems and practices. The chapter is divided into two related parts. The first part highlights four key themes that emerged from the categories of description and discusses these in the context of the literature and broader changes to work and organisations in the globalised economy. The second part discusses the implications of the findings for work and learning, theory and practices, in organisations.

The final chapter, Chapter 8, weaves together the threads of the study to demonstrate the impact of the study and its original contribution to work and learning research. The focus of this chapter is on the fresh insights that this study has provided into the nature of work in complex adaptive organisations and the impact on experiences of learning for individuals. The chapter concludes by outlining opportunities for further research to build on these findings.

**Concluding comments**

This study of professionals’ experiences of work and learning within complex adaptive organisations offers insights into the nature of work and learning within contemporary organisational contexts of change. It also provides an innovative conceptual framework for understanding work and learning in these contexts by outlining the CAOCF, the importance of emergence and its key elements: adaptation, agency, and complex social
networks. Furthermore, this research highlights how individuals are experiencing work and learning within dynamic contexts and how individuals and organisations are adapting to the demands of organisational complexity. The next chapter provides a critical discussion of the literatures relevant to this study, namely: work and learning, complex adaptive systems, and the organisation theory literature of relevance to this study.
Chapter 2 Locating the study within the literature: A critical review

This study is located within the “emerging” and multidisciplinary field of work and learning (Fenwick, 2008b) which exists at the intersection of a number of fields including: organisation and management studies, organisational learning, human resource development, adult education, and vocational education research (Fenwick, 2008a). While located as part of the body of research in work and learning, this study also engages with some related literature in organisational studies and organisational learning. This chapter pulls together these various threads to critically review key literature, identify the research gaps and articulate the research question for this study.

The chapter opens with a discussion of the different ways in which researchers have conceptualised work and learning over time using Hager’s (2011) categories of work and learning theories – psychological, socio-cultural, and postmodern theories (discussed in this study as the shift towards complexity). A discussion of the increasing adoption of complexity concepts in the field of work and learning follows. A brief overview of complexity approaches, and their adoption into organisational studies, is provided for context. The chapter concludes with a discussion of the use of complexity concepts in work and learning research. These discussions lead to an outline of the research gaps addressed by this study and the research question.

Shifts in theoretical approaches to work and learning

Work and learning, to the extent that it is defined, has been referred to in various ways. As a multi-disciplinary field (Fenwick, 2006; Sawchuk, 2010), work and learning faces challenges in terms of clear and accepted definitions when faced with researchers across
numerous disciplines (Sawchuk, 2010) resulting in “blurrings” in terms of how these terms are defined (Fenwick, 2006, p. 266).

Jacobs and Parks (2009), for example, from a human resource development perspective, define work and learning as “the process used by individuals when engaged in training programs, education and development courses, or some type of experiential learning activity for the purpose of acquiring the competence necessary to meet current and future work requirements” (p. 134). Such a definition focuses on a more psychological approach to the individual acquisition of skills to perform a job whereas other definitions take on more socio-cultural elements of learning. Billett (2001, 2004a), for example, argues that learning at work occurs through participation in work and in social practices whereas Sambrook (2005), who adopts the term “work-related learning”, defines it as “learning in and at work” (p. 101). More recent considerations of work and learning have expanded to include the socio-material, challenging the tendency to human centrality evident within earlier research in work and learning (Fenwick et al., 2011). These differing definitions highlight a key issue for the field of work and learning research. As Fenwick (2006, 2008b) has pointed out, there is a lack of consistent definitions of key terms such as work, learning, and workplace. There are also multiple terms adopted throughout the literature such as workplace learning, work and learning, work-related learning, and learning through work. As outlined in Chapter 1, this study adopts the term work and learning rather than the more commonly used workplace learning (Hager, 2011).

While it is beyond the scope of this study to resolve the terminological and definitional “blurrings” in the field (Fenwick, 2006), the following section offers a historical view of
conceptions of work and learning. This discussion is structured using Hager’s (2011) three categories of work and learning theories: psychological, socio-cultural, and postmodern, the latter considered here as representing the shift towards complexity.

**Focus on individual learners: Psychological approaches**

Early research considering work and learning focused, as with much of learning theory, on the psychological theories of behaviourism and cognitivism (Hager, 2011). This foregrounded the individual acquisition of skills and knowledge within the context of doing a particular job (Fenwick & Tennant, 2007). Psychological theories consider work and learning as a transfer of skills of knowledge to an individual learner whose mind has been likened to a “container for knowledge” needing to be filled (Bereiter, 2002). Behaviourism, in the context of work and learning theories, emphasised learning as demonstrable and observable behaviours and resulted in jobs being defined as a series of skills, or competencies, that one was trained in and then performed to establish competence (Reich, Rooney, Gardner, et al., 2015). This ignores, or at least minimises, the role of what cannot be observed, including knowledge and understanding (Hager, 2011; Kalantzis & Cope, 2012).

An increasing realisation that most work is not observable led researchers to look towards cognitivism as a way in which to incorporate unobservable mental processes in definitions of learning (Kalantzis & Cope, 2012). In the area of organisational learning, for example, Argyris and Schön (1996) proposed the concepts of single- and double-loop learning as a way in which to incorporate cognitive processes. Single-loop learning, as the process by which learners react to circumstances, is drawn from a behaviourist perspective favouring a reactive approach by learners to stimuli (Argyris &
Schön, 1996). Double-loop learning, on the other hand, takes a cognitive perspective involving reflecting on one’s experiences to react to current circumstances (Argyris & Schön, 1996). Bandura’s (1986, 1988) social-cognitive learning theory also emphasised the idea of learning being a cognitive process while incorporating social and contextual elements of learning. He described learning as occurring via a process of triadic reciprocity, proposing that “behaviour, cognitive and other personal factors, and environmental influences all operate interactively as determinants of each other” (Bandura, 1986, p. 23).

The increasing shift towards considering social and contextual factors as part of learning at work, as did Bandura (1986, 2002), still did not deal effectively with what Hager (2011) identified as the key limitations of psychological theories of learning: the focus on the individual as the unit of analysis, learning as a product, and a lack of consideration of context in learning.

**Socio-cultural learning theories**

Socio-cultural theories of work and learning (e.g., Billett, 2001, 2004a, 2004b; Eraut, 2007, 2011) responded to critiques of psychological theories by expanding definitions of learning to include collective learning through social mechanisms. Such theories consider context as a key part of understanding work and learning (Bound & Rushbrook, 2015). Socio-cultural theories also position learning at work as an ongoing process which occurs through participation in work, where the learning is shaped by the context in which the learner is located (Hager, 2011). A key feature of such theories is foregrounding participation in work as a key learning mechanism (Billett, 2004a; Eraut, 2007, 2011) where learning occurs through the process of working through any
problems or new tasks that arise day-to-day (Boud & Hager, 2012). For Billett (2004b), “learning and participation in work are inseparable” (p. 315). He proposes that work and learning is a product of the ongoing interactions between the affordances of the social networks and the agency of the individual actors. The day-to-day work activities, the context and direct and indirect social interactions are the key sources of learning at work (Billett, 1999). The opportunities to learn are seen as what is afforded to the actors in terms of social, cultural and structural support for learning within a given workplace (Billett, 2001). Broad acceptance of learning through participation in work has seen the focus of work and learning research expand include additional areas of investigation such as the role of learning through work in employee innovation practices (R. Smith, 2017). In addition, there is a well-established literature which examines the role of gender and power relations in learning at work in terms of how gender shapes learning environments to the benefit or detriment of privileged or non-privileged groups (e.g. Beck, Fuller & Unwin, 2006; Doyle, Findlay & Young, 2012; Fuller, Turbin & Johnston, 2013; Gustavsson & Eriksson, 2010; Johnansson & Abrahamsson, 2017; Silvennoinen & Nori, 2017).

Another key focus of socio-cultural theories is debate around conceptions of formal, informal, and incidental learning (Billett, 2002; Boud & Middleton, 2003; Cameron & Harrison, 2012; Eraut, 2011; Malcolm et al., 2003; Marsick, 2009; Marsick & Watkins, 2001; Marsick et al., 2017). Formal, informal, and incidental learning are concepts that arise frequently in work and learning research, particularly within socio-cultural perspectives. Informal learning in particular has become a consistent part of ongoing conversations about work and learning globally (Sawchuk, 2008) and it is most often defined in opposition to the concept of formal learning (Marsick, 2009). Informal
learning has been defined in the work and learning literature as learning that does not take place within a classroom or other organised or guided learning activity. It is defined as unstructured and experiential, and is often defined as incidental (Marsick & Volpe, 1999) although, in more recent work, Marsick et al. (2017) have noted that informal learning requires a degree of reflection which suggests that it is perhaps not completely incidental. Incidental learning has been defined by Marsick et al. (2017) as a sub-set of informal learning, where learning occurs as part of other activities and may not be recognised as learning. In workplaces, it is a part of the individuals’ daily work tasks, occurring spontaneously and “just in time”, as they face a new task or a problem in their role (Marsick & Volpe, 1999).

It is often argued that what is commonly referred to as informal learning is responsible for anywhere up to 80% of learning at work (Eraut, 2010) and that the majority of learning at work occurs outside of guided learning facilitated by others (Billett, 2014). The commonly applied 70:20:10 framework (Lombardo & Eichinger, 1996; McCall et al., 1988; Tough, 1979) often used to structure learning in organisations, is an example of how this concept has been adopted by management consultants and implemented in many corporate sector organisations. This framework proposes that 70% of learning is through work experiences, 20% through interactions with others (e.g., coaching or mentoring), and the remaining 10% through formal learning such as face-to-face and online courses (Kajewski & Madsen, 2013).

Informal learning has, in many ways, become synonymous with work and learning, a conflation which Billett (2002) rejects arguing that this type of definition restricts understandings of learning through work. In his critique of definitions of informal
learning, Billett (2002) argues that learning opportunities which might be termed formal or informal are instead different examples of social practices through which learning happens through participation in work. From this perspective, learning at work is structured and so “formal” in that sense (Billett & Choy 2013) making the formal/informal dichotomy an inaccurate distinction. Similarly, Malcolm et al. (2003) argue that the terms formal and informal learning are redundant and they instead propose a continuum of formality and informality in work and learning. From this perspective, there are elements of formal and informal learning in most learning experiences and so it is difficult to define these terms separately (Malcolm et al., 2003).

Marsick et al. (2017) recently re-evaluated the Marsick and Watkins (1990) model of informal and incidental learning using socio-cultural and complexity approaches. In terms of complexity, Marsick et al. (2017) draw on the work of Snowden and Boone (2007). They note that informal learning is a better fit in contexts which are complicated but not necessarily complex, whereas incidental learning is more effective in complex contexts characterised by unpredictability and emergence which support spontaneous learning (Marsick et al., 2017). In considering organisations as complex adaptive organisations, this study positions organisations as being complex contexts rather than complicated using Snowden and Boone’s (2007) framework. However, this study has not adopted the contested terms of incidental, informal, or formal learning to describe learning in complex adaptive organisations. Rather, this study uses the terms learning through work and structured learning to differentiate between learning through participation in work and the learning opportunities provided via the learning and development systems and practices of organisations. The reasons for this are two-fold. First, the research question for this study is focused on examining experiences of
learning and working; labelling learning using established terms such as informal, incidental, or formal learning from the outset may bias the findings. Second, this study has incorporated the Malcolm et al. (2003) critique of informal and formal learning as being a continuum rather than opposing concepts and so different terms have been used to reflect this.

A key shift from psychological to socio-cultural theories of work and learning has been the incorporation of social and collective learning; learning through others has been a topic of interest in work and learning for many years. Communities of practice, for example, have been a key concept which considers both social interaction and participation as a key to learning (Lave & Wenger, 1991; Wenger, 2000, 2004, 2009). Within communities of practice, learning “is an interplay between social competence and personal experience. It is a dynamic, two-way relationship between people and the social learning systems in which they participate” (Wenger, 2000, p. 227). Fenwick et al. (2012) argue, however, that communities of practice fail to adequately account for the power relations within communities which may enable or inhibit practices. These authors also note that communities of practice are presented as a “localised and bounded field of practice” wherein practice is understood only within those boundaries. They also argue that communities of practice fail to account for “the material and epistemic aspects of work and learning, or transformations in knowledge over time” (Fenwick et al., 2012, p. 5).

In contrast to psychological theories of learning, socio-cultural theories are characterised by learning as participation rather than as being solely within the minds of individuals suggesting that collective learning is a possibility (Hager, 2011). The
embeddedness of learning within work contexts is a key part of socio-cultural
perspectives of work and learning with an increasing recognition that phenomena such
as knowledge and learning are deeply affected by the socio-cultural practices within
which they are enacted (Carlile et al., 2013). Hager (2011) argues that much of the work
in this area has focused on theorising work and learning so that consistent conditions to
enhance learning can be implemented. More recent theories of work and learning
question such assumptions of predictability and consistency within contemporary
workplace contexts (Hager, 2011).

**The shift towards complexity**

The shift towards complexity in the work and learning literature is a broad body of work
which encompasses a number of approaches including socio-material approaches
(Fenwick et al., 2012), cultural-historical activity theory (CHAT), actor-network theory
(ANT), and complexity approaches (Fenwick, 2010a, 2010b, 2012b; Fenwick et al.,
2011) as well as practice approaches (Hager et al., 2012a). In his framework, Hager
(2011) refers to this shift as being towards postmodern theories of learning within which
he includes theories which position learning as an ongoing process that is not
necessarily specifiable in advance. In doing this, he focuses on emergence as a key
concept which sets these so-called postmodern theories apart from earlier theories.
Complexity approaches then position learning as inherently unpredictable and emerging
from changing and complex contexts.

Emergence is increasingly used as a metaphor and as a concept to understand and
contextualise work and learning (e.g., Fenwick, 2012a; Hopwood, 2014, 2016; Johnsson
& Boud, 2010; Manidis & Scheeres, 2013; Reich & Hager, 2014). From a complexity
perspective, emergence refers to the patterns that arise from the interactions of the actors but which are not able to be predicted or directed (Holland, 1995; Kauffman, 1995) and it describes how novel structures, patterns, properties and behaviours arise during the process of self-organisation (Goldstein, 1999). Emergence in an organisational context can be understood as “events and actors (that) are mutually dependent, mutually constitutive and actually emerge together in dynamic structures” (Fenwick, 2012b, p. 71).

Within the current work and learning literature, emergence is often described in terms of the production of spaces, artefacts and practices both socially and materially (Hopwood, 2014). Practices “emerge” from social relations and from interactions with the physical, cultural, and political context. Learning is also described as “emerging” from practices; for example, Manidis and Scheeres (2013) note that learning and knowing are emergent within the emergency departments that they studied. The Purser and Montuori (1994) research of jazz ensembles similarly argues that learning emerges through the ensemble’s interactions with each other and their context. Johnsson and Boud (2010) also adopt emergence to look at how practices emerge from individual interactions in a context of unpredictability where “learning develops as a collective generative endeavour from changing patterns of interactional understandings with others” (Johnsson & Boud, 2010, p. 360). Emergence has particularly been taken up in practice approaches to work and learning where practices are considered “emergent, in the sense that the ways that they change and evolve are not fully specifiable in advance” (Reich & Hager, 2014, p. 426). The shift towards complexity has recognised that learning, as a phenomenon, cannot be fully defined or determined in advance but that it emerges (Dahlgren et al., 2016).
Part of the shift towards complexity has been an increasing recognition that phenomena such as knowledge and learning are deeply affected by the socio-material practices within which they are enacted (Carlile et al., 2013). This socio-materiality of practices is identified by Reich and Hager (2014) as one of the six key threads within the practice literature and they point out that practices must be understood as both undertaken by human actors but also influenced by objects and artefacts. From this perspective, learning within organisations is a socio-material practice that “involves the material world (including the human body) as much as it involves the mind” (Carlile et al., 2013, p. 2). Knowledge is also seen as something that is embodied (Gherardi, 2006). Learning and knowledge are therefore both embodied as well as embedded within the material context within which they occur (Hopwood, 2014). Increasingly, there is widespread recognition that learning does not occur in a vacuum but within the organisational context of the actors (Snoeren et al., 2015), a perspective taken up by both socio-cultural and complexity approaches. Seely Brown et al. (1989), for example, saw knowledge, and learning, as being situated within the activities, culture and context within which they occur. Communities of practice also use the concept of situated cognition where the context and tools available to the learner shape their learning as tasks are performed (Lave & Wenger, 1991). Billett (2004b) notes that workplaces “provide interactions with human partners and non-human artefacts that contribute to individuals’ capacity to perform and to the learning that arises from their performance” (p. 316). Illeris (2004) too has suggested that learning in the workplace occurs through the interaction of the actors with the environment but necessarily, through their own internal learning processes. These trends also inform the shift towards complexity in acknowledging the inter-related nature of people, things, and contexts within
workplaces. Discussing researchers such as Billett (2004b), Lave and Wenger (1991), and Illeris (2004) in this section also highlights the overlap between socio-cultural and complexity approaches to work and learning theory which is reflected in this study.

Space also plays an important role in understanding learning in the workplace within socio-material and practice approaches. Learning and spaces have been considered in the research literature for the past twenty years. Over that time, perceptions of learning spaces as fixed, physical locations have evolved to also incorporate spaces where informal learning may occur at work, digital and virtual spaces, or combinations of these (Kersh & Evans, 2017). Conceptions of “space” in terms of learning have now shifted away from understandings of space as geometry or organisation towards the construction of space through social interactions (Brooks, Fuller, & Waters, 2012). Social spaces have been identified as important for learning (Solomon et al., 2006) and the overlap with other spaces such as work spaces and virtual spaces makes it challenging to make definite distinctions between learning, work, and social spaces in contemporary workplaces. Interactions and learning opportunities can be found anywhere, not only within designated work spaces, but also in the “in-between spaces” such as the cafeteria, smoking shed or even the local café (Solomon, Boud, & Rooney, 2003). These spaces are often where the professionals can come together informally. In addition, the increasing prevalence of digital and virtual spaces for both work and learning provides increasing opportunities for learning in through work and social interactions. Studies of learning within healthcare contexts (e.g., hospital emergency departments, family health units), for example, have shown that spaces are an important part of workplace practices (Gregory et al., 2014; Hopwood, 2014; Manidis & Scheeres, 2013). In this context, the different spaces that form the workplace facilitate social
interactions between the actors that allow them to share important information about their patients (Hopwood, 2014). Varieties of learning spaces in contemporary organisations have resulted in new places and spaces of work both inside and outside of traditional places of work. These transitions have provided opportunities for individuals to shape their personal spaces and individualise the ways in which they engage in work and learning (Felstead & Jewson, 2012).

Complexity approaches have been adopted by a number of educational and organisational learning researchers (see Chiva et al., 2010; B. Davis & Sumara, 2006; Jacobson et al., 2016), and particularly in organisational studies (Fulmer & Ostroff, 2015; Goldspink & Kay, 2003; Stacey, 2003; Tsoukas, 2005; Tsoukas & Chia, 2002). Their contributions are discussed in detail in the later section Complexity in organisations, work, and learning when discussing how complexity concepts have been used in work and learning research, and when outlining other learning frameworks and typologies specifically adopting a complex adaptive systems approach, in Chapter 3. Prior to this discussion of the use of complexity concepts in organisational and work and learning research, the next section discusses progressive shifts in metaphors of learning over time.

**Shifts in metaphors of learning**

It is useful, at this point, to discuss how metaphors of learning have developed through the different theories of work and learning outlined in the previous section. Several researchers have pointed out the ubiquity of metaphors when discussing learning (Hager, 2008; Hager & Hodkinson, 2009; Sfard, 1998). In particular, the prevalent metaphors of acquisition and transfer which focus on learning as something which is
undertaken by individuals and which is then applied as needed to situations (Boud & Hager, 2012). Metaphors of acquisition and transfer are used to describe psychological theories of work and learning which place the individual and their cognitions and behaviours at the centre of the learning process. More recent work and learning theories, such as socio-cultural and complexity approaches, shift towards metaphors of participation and becoming (Boud & Hager, 2012). These shifts see learning move from being a product which is acquired and transferred, through the participation metaphor embraced by socio-cultural theories of learning before more recently taking up metaphors of learning as becoming (Boud & Hager, 2012; Hager & Hodkinson, 2009).

More recently, emergence, as a metaphor, has become prominent in recent theories of work and learning (Hopwood, 2016). In socio-material and practice approaches, for example, “emergence is taken up as a key metaphor of learning rather than participation, or acquisition and transfer” (Hopwood, 2016, p. 74). Hager (2011) bases his third category of work and learning theories around the metaphor of emergence or becoming, or as Hopwood (2016) has described, is “related to ideas of becoming, practice, and temporal dimensions in fluid, ever-shifting contexts” (pp. 74–75).

This study takes up the shift towards learning as emergent and becoming but continues to adopt socio-cultural metaphors of participation. Metaphors of becoming “imply active involvement in practice and greater agency and change on the part of the professional” (Boud & Hager, 2012, p. 26) while metaphors of participation acknowledge that a great deal of learning at work occurs through participation in that work. In adopting a complex adaptive systems approach to underpin the conceptual and analytical framework for this study, learning is considered as a key part of the operation
of the organisational system where learning is participatory as well as part of emergence within the system. Within complex adaptive organisations it is argued that learning does not occur in the sense that it is a fixed product or event at a fixed point in time, such as described by metaphors of acquisition and transfer; rather it is a process of individual and organisational emergence which occurs through participation. Learning and work are defined further in the context of complex adaptive organisations in the next chapter which outlines the complex adaptive organisations conceptual framework.

**Considering “work” in the context of work and learning**

The literature of work and learning includes many contributions that have investigated how work and workplaces influence learning (Billett, 2001, 2004a, 2004b; Felstead et al., 2009; Fuller & Unwin, 2003, 2004, 2008, 2010; Harteis et al., 2015; Skule, 2004; Skule & Reichborn, 2002, 2007). This section discusses a selection of three influential frameworks from the literature to locate this study of work and learning within the discourses of how workplace contexts influence learning. These are: learning-conducive work (Skule, 2004; Skule & Reichborn, 2002, 2007), workplace affordances (Billett, 2001, 2004a, 2004b), and the expansive restrictive framework (Fuller & Unwin, 2003, 2004, 2008, 2010).

Skule (2004) proposed a framework to measure informal learning at work that used a dependent variable measuring the “learning intensity of work” (p. 11), which was then used to classify jobs. Three dimensions were used to determine the learning intensity of a given job in relation to other jobs, these being: a subjective judgement on the part of the individual participants as to the learning intensity of the job, the length of time required to master the skills and knowledge required for the job, and the durability of
those skills in terms of how long it would take out of the job for skills and knowledge to become outdated. Jobs which scored higher on this scale were considered “learning intensive jobs” and those scoring lower were “learning deprived jobs” (Skule, 2004, p. 11). Skule (2004) found that learning intensive jobs tended to be in more highly skilled, higher status, and more highly paid professional jobs, mainly in the banking, oil, insurance and commercial services industries. Lower status areas, such as retail and hospitality, had the highest proportion of learning-deprived jobs. Learning-intensive jobs were found to have several common characteristics, of which the top two were, first, a “high degree of exposure to changes” and, second, a “high degree of exposure to demands” (Skule, 2004, p. 14). Recently, Harteis et al. (2015) studied the impact of age, gender, and occupation on work and learning. Their study also found that individuals in so-called lower status occupations had a lower level of perceived learning support in the workplace whereas higher status occupations, which included managers and supervisors, were offered a “more learning-conducive workplace environment than lower-status occupations” (Harteis et al., 2015, p. 74).

Billett (2001, 2004b) has also considered the role of job status on learning as part of his conceptualisation of workplace affordances. Workplace affordances describe “how the workplace supports or inhibits individuals’ engagement in work activities and access to both the direct and indirect guidance” (Billett, 2001, p. 210). Billett (2001) argues that these affordances are not evenly distributed between people and that they are a part of the ongoing contestation of workplaces. Furthermore, elements such as one’s employment status (i.e., full-time, part-time, or casual employee), race, gender, workplace affiliations, and duration of service in that workplace can have an effect on what is afforded to an individual for their learning at work.
Fuller and Unwin (2003, 2004, 2008, 2010) have taken a broader view, focusing on the contexts of work and workplaces, and the impact of these on learning, through their expansive–restrictive framework, which they have proposed as a continuum with which to categorise learning environments. The expansive–restrictive framework provides a way in which to explore the characteristics of workplaces in terms of the extent to which a given workplace provides opportunities for learning or presents barriers to learning (Fuller & Unwin, 2010). The framework presents a series of continua which outline expansive (supportive) and restrictive (inhibiting) practices within workplaces. For example, “Participation in multiple communities of practice inside and outside the workplace/restricted participation in multiple communities of practice” (Fuller & Unwin, 2003, p. 411). The expansive–restrictive framework was originally proposed in the context of trade apprentices (Fuller & Unwin, 2003) and was later also used to examine “knowledge workers” (Fuller & Unwin, 2010), again, in the context of the apprenticeship model of learning. In exploring the applicability of apprenticeship models to the professional development of knowledge workers, Fuller and Unwin investigated the learning environments of software engineers and university academics. Fuller and Unwin’s (2010) research shares with this study, a concern for investigating the impact of pressured and globalised work on the learning of professionals. However, the focus of the research differs in that Fuller and Unwin emphasise the impact of the learning environments on learning at work whereas this study emphasises both the learning environment (complex adaptive organisations) and, importantly, what this means for day-to-day work tasks and how this influences learning.

What the frameworks and concepts of Skule (2004), Billett (2001, 2004a, 2004b), and Fuller and Unwin (2003, 2004, 2008) have in common, is that each of them focuses
primarily on the work environment and the ways in which it shapes learning. Skule’s (2004) study, for example, aimed to “identify the factors most conducive to informal learning at work, and to develop an empirically derived, generalised conceptualisation of the learning environment of the workplace” (author’s emphasis, p. 10). Similarly, Fuller and Unwin (2010) proposed the expansive–restrictive framework as a way in which to consider learning environments at work and their influence on learning. Billett (2001, 2004a, 2004b) proposed “workplace affordances” as a way in which to examine the interplay of how opportunities for learning are afforded to individuals and how those individuals engage with those activities. These frameworks are underpinned by the now widely accepted perspective that learning at work is through participation (Hager, 2011). The frameworks have offered significant insights into understandings of work and learning in terms of the work and workplace contexts which best support learning through participation. An under-theorised area in this literature is the influence of day-to-day work tasks on learning through participation in terms of the ways in which such tasks might encourage or inhibit learning. Although Skule (2004) and Skule and Reichborn (2002, 2007) introduced and developed the concept of learning-conducive work, this construct focuses on the time taken to learn the job and the currency of those skills rather than investigating other aspects of the nature of the work. In considering professionals’ experiences of work and learning, this study aims to contribute to a more nuanced theorisation of the nature of work in the context of contemporary, complex organisations. An important contribution is a more nuanced theorisation of the nature of work tasks particularly focusing on complexity using a complex adaptive systems approach.
The next section of this chapter outlines the concept of complex adaptive systems and how it has been adopted in organisational and work and learning research. Providing an overview of complexity and complex adaptive systems serves two purposes. First, it provides the background for the conceptual framework of this study and second, it provides an overview for readers who are not familiar with complex adaptive systems.

**An overview of complexity and complex adaptive systems**

Complexity theories are a broad category referring to a number of different areas of scientific and social science research, such as chaos theory, the study of fractals, the study of cultures, neurons, atoms, or organisations (Mason, 2008). Complexity also refers to the theoretical and analytical tools used to investigate specific types of systems called complex systems. A complex system is one where there is a network of components with little or no central control and simple operational rules which bring about complex collective behaviours (Mitchell, 2009). The components of a complex system are generally referred to in the literature as “agents” where an agent may be a bird in a flock, a computer linked in to the internet, or a person in an organisation (Mitchell, 2009). The collective actions of the agents produce complex, difficult to predict, patterns of behaviour (Baets, 2006; Mitchell, 2009). In this study, the human agents within organisations are referred to as professionals, as indicated in Chapter 1.

A key assumption of complexity approaches is that complex systems adapt. Both the agents and the system change their behaviours to increase their chances of success or survival, usually through learning or adaptation (Holland, 1995). When a complex system contains agents that seek to adapt, these are called complex adaptive systems (Axelrod & Cohen, 1999; Holland, 1995, 2006). Complex adaptive systems contain
agents that respond to external and internal inputs by adapting, forming and changing their strategies for working within systems (Holland, 1995; Waldrop, 1992). From this perspective, it is assumed that these systems learn. It is the adaptive nature of complex adaptive systems that is of interest in framing this study and it forms the basis of the complex adaptive organisations conceptual framework. The following section outlines how complexity and complex adaptive systems approaches have been adopted in organisational theory, work and learning, and organisational learning research.

**Complexity in organisations, work, and learning**

**Conceptualising organisations: Historical trends**

Debates in management and organisation studies about how to best conceptualise organisations have been ongoing since the early 20th century. In more recent times, Morgan’s (2006) seminal work, proposing eight metaphors describing how organisations have been understood by different theorists, has been used extensively. It is again used here to frame a brief discussion of the development of organisation theory over time to show the journey towards using complexity approaches within the field.

Morgan (2006) proposed eight metaphors which explore “the art and understanding of organizational life” and which explore the “nature of organization” (p. 4). These metaphors offer a way in which to trace the development of how researchers and theorists have explored and conceptualised organisations. Although the metaphors are contested by some (see Örtenblad et al., 2016), they provide a useful summary of key

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2 There are more recent discussions in the literature regarding metaphors for conceptualising organisations (e.g., McCabe, 2016; Morgan, 2016; Örtenblad et al.; Oswick & Grant, 2016; Schoeneborn et al., 2016). These are discussed in the first section of Chapter 3 to illustrate recent shifts in the literature towards adopting complexity approaches.
debates in organisation theory over the past hundred years. In summary, the eight metaphors are: organisation as machine, organism, brain, culture, political system, psychic prison, flux and transformation, and instrument of domination (Morgan, 2006). Of particular interest for this study, is the movement from mechanistic and reductionist conceptualisations of organisations towards systems approaches, which incorporate complexity. In terms of Morgan’s (2006) metaphors this discussion concentrates on organisation as machine, organisation as brain, and organisation as flux and transformation.

Early research on organisations within organisation and management studies reflected the prevailing metaphor of the organisation as a machine, where the focus was the process of production rather than the workers (Morgan, 2006). Among the concepts that Taylor (1911), and his contemporaries such as Fayol (1919), contributed to the study of organisations, the mechanistic conceptualisation of organisations shifted discourses towards considering organisations as entities in their own right; separate from the people who constituted them. However, this view was limited in that it overlooked that organisations are constituted by people who often do not act in supposedly rational ways like the cogs in a machine, or work towards common organisational objectives (Morgan, 1997).

As the 20th century progressed, researchers began to take a greater interest in workers and how organisations interacted with the social environment in which they were embedded. This research, collectively known as the human relations school, yielded information about the way in which the workers interacted, conflicted and cooperated within organisations (e.g., Dalton, 1959; Roethlisberger & Dickson, 1939). Despite the
growing interest in people, as well as the work of the organisation, there was little research into the organisation as an entity in and of itself and organisations were primarily viewed as places where work was undertaken rather than as social systems (W. R. Scott, 2004). This reflects the prevailing mechanistic, reductionist, and deterministic scientific paradigm of the time within which organisations were seen to be hierarchical and bureaucratic.

Around the mid-20th century, a parallel stream of research opened which began to consider organisations as systems. Numerous researchers began to build on the use of systems approaches in the physical sciences and apply it to the study of organisations (Sawyer, 2005). Overall, systems approaches examined common features between biological, natural, and social systems (von Bertalanffy, 1950). The shifts from metaphors of machines to more networked ideas of brains and flux mirrored changes to the nature of work and organisations occurring over the course of the 20th century, and were discussed in Chapter 1. In response to changes in the economy, organisational structures became flatter and less hierarchical. Increasingly, organisations were seen as heterarchies with multiple reporting lines and cross-functional teams deemed to be more flexible to the needs of an ever-changing world (Weick, 2001). The metaphor of organisations as machines was no longer found to be as useful by many at the dawn of the 21st century and so new ways were needed to conceptualise organisations (Clegg & Baumeler, 2010).

A further key development in the study of organisations in recent decades was the shift to considering organisations as webs of social structures and practices. Schatzki (2006), for example, takes the view that “an organisation, like any social phenomenon, is a
bundle of practices and material arrangements” (p. 1863). An organisation therefore “happens” when its constituent actions are performed. In this view, organisations occur in real time and are therefore in a constant process of development (Schatzki, 2006). This mirrors trends in the work and learning literature towards metaphors of becoming and emergence, discussed earlier in this chapter. This “practice turn” in social theory has emerged over the last 15 years (Schatzki, Knorr-Cetina, & Savigny., 2001) and considering organisations and learning through the practice lens has become increasingly widespread in the study of organisations and learning (Nicolini, 2013). The practice approach, in some ways, also recognises that the contemporary context is characterised by constant change and inter-connectedness (Nicolini, 2013).

In terms of Morgan’s (2006) metaphors, the increasingly prevalent conceptualisation of organisations as social webs or social systems reflects a shift to conceptualising “organisations as brains” (focusing on learning), or organisations as “flux and transformation” (emphasising complexity and emergence) as opposed to earlier metaphors of organisation as machines. “Organisation as brain” is a metaphor which focuses “on the cognitive features of organizations and encompasses learning theories and cybernetics” (Örtenblad et al., 2016, p. 877). As part of this metaphor, Morgan (2006) discusses single- and double-loop learning (Argyris & Schön, 1996) as well as the concept of “learning organisations” (Senge, 1990). Conceptualising “organisations as brains” brings ideas of networks and plasticity into debates about organisations. The metaphor of “organisation as flux and transformation” builds on the metaphor of “organisations as brains” in recognising changes in the context within which organisations operate in more recent times. The metaphor of “flux and transformation”
“emphasizes processes, self-reference and unpredictability through embracing theories of autopoesis, chaos and complexity” (Örtenblad et al., 2016, p. 877).

Complexity approaches to organisational theory recognise the role of change and the interconnected nature of contemporary organisations. There is a growing body of literature which adopts complexity approaches to provide insights into increasingly fluid and changeable organisational contexts (e.g., Palmberg, 2009; Tsoukas, 2017; Tsoukas & Dooley, 2011; Uhl-Bien & Arena, 2017; Uhl-Bien & Marion, 2009). This discussion reflects the increasing use of complexity theory to understand organisations.

**Using complexity to conceptualise organisations: Key debates**

In the organisation studies, and, to a lesser extent, work and learning literature, organisations are being described in terms of complex systems and complex adaptive systems (Boal & Schultz, 2007). These concepts have been explored by numerous researchers in organisation and management studies and applied to areas such as organisational change (Styhre, 2002; Tsoukas & Chia, 2002; Zimmerman, 1999), leadership (Uhl-Bien & Arena, 2017; Uhl-Bien & Marion, 2009; Uhl-Bien, Marion, & McKelvey, 2007), management (Palmberg, 2009), knowledge management (McElroy, 2000; Moss, 2001), mentoring (Jones & Corner, 2012), innovation and creativity (Leeuwis & Aarts, 2011; Stacey, 1996), organisational and process design (Brodbeck, 2002), and collaboration and team work (Porter-O’Grady, 2015; Saoud & Mark, 2007).

Within the organisation and management studies literature, organisations are characterised as complex systems or complex adaptive systems. For example, Morel and Ramanujam (1999) suggest that organisations are made up of individuals, teams, departments, and divisions which interact with each other by way of feedback
mechanisms. B. Davis and Sumara (2001), approaching organisations from an educational research perspective, suggest that these relationships and networks are nested one inside the other. The authors further argue that interpreting organisations, in their case schools, as complex systems is really “more a matter of redescription than of restructuring. People have always organized themselves into small groups within larger groups” (B. Davis & Sumara, 2001, p. 91). Tsoukas (2017) has proposed that adopting a complexity approach to theorise organisations provides an opportunity to complexify theory which is necessary in a context where organisations are themselves complex.

The non-linearity of complex adaptive systems has been taken up within some areas of the organisation and management studies literature in discussions of organisational “becoming” (e.g., Clegg, Kornberger, & Rhodes, 2005; Tsoukas & Chia, 2002), echoing recent metaphors of learning as becoming (Boud & Hager, 2012). These views position organisations as being constantly formed and reformed through the interactions of the individuals and groups within them. Organisations are no longer considered as complete, static entities but rather as undertaking a process of “organising” (Feldman & Orlikowski, 2011). This study takes up the concept of “organising” and organisations as “becoming” in arguing for a reconsideration of contemporary organisations as examples of complex adaptive systems rather than simply “complex” in terms of their constituent elements.

There has been some criticism of adopting complexity approaches to conceptualise organisations. There are those, such as Chia (1998) and Stacey (2003), who suggest that complex systems and complex adaptive systems approaches fail to address subjectivity, meaning, and language within organisations. Although Stacey has adopted complexity
approaches to describe and investigate organisations, learning, and knowledge creation, he argues that complexity is a source of “analogies with human action”, and using complexity in this way, he argues that “learning is an activity of interdependent people” (Stacey, 2003, p. 326). Stacey’s (2001) approach stops short of describing organisations as complex or complex adaptive systems, instead adopting the concept of “complex responsive processes” to describe how people in organisations relate to one another, learn, and create knowledge. Complex responsive processes in organisations focus on understanding the interactions between people within organisations rather than on the contexts within which they work and learn. As described in Chapter 1, this is a key difference between the way in which complexity concepts are used in this study compared to Stacey’s (2001, 2003) concepts. Stacey argues that complex adaptive systems approaches are only useful as a source of metaphors or analogies for understanding organisations. While both this study and the work of Stacey are based on socio-cultural theories of learning, this study has adopted a complex adaptive systems approach as the basis for the conceptual framework of the study rather than solely as a source of metaphors or analogies as has Stacey (2001, 2003).

Criticisms raised by researchers such as Chia (1998) and Stacey (2003) question whether the genesis of complexity approaches in the physical sciences means that the concepts are unsuited to considering systems with human agents because they are too reductive (Lancaster, 2012). Baskin (2008) asks whether it is legitimate to apply complexity principles to the study of human social systems, such as organisations. He argues that the ability of humans to act with agency, “to tell stories, to imagine new futures, act on those stories and change the world so that they can realize such futures” (p. 2). Baskin argues that the concept of “storied spaces” should be substituted for
complex adaptive systems. This perspective suggests that social structures are “an intricate nested network of spaces … in which membership depends on the acceptance of negotiated stories by which each grouping defines the nature of the world and how people in the world must respond to prosper” (Baskin, 2008, p. 1). Baskin has taken a selective approach to the use of complex adaptive systems concepts. In particular, he has taken up aspects of complex social networks (Barabási & Albert, 1999; Watts & Strogatz, 1998) and the criticality of interactions (Baets, 2006) but has not explored key areas of complex adaptive systems such as emergence and adaptation (Holland, 1995; Mitchell, 2009) which have the potential to offer the greatest insights into work and learning.

Lancaster (2012), whose work is situated within the work and learning literature, acknowledges the utility of complexity approaches in studying learning in organisations but argues that these concepts alone are insufficient for understanding learning and practice. In response to her criticisms, Lancaster (2012) adds Dewey’s concept of transactions (Dewey & Bentley, 1989) and defines learning as affective functioning where experience is internalised and given meaning through social interactions. Stacey (2001) similarly argues that human agency makes the direct application of complexity concepts difficult, if not impossible. Stacey, Griffin, and Shaw (2000), as with Baskin (2008) and Lancaster (2012), adopt the networked characteristics of complex adaptive systems but add the work of others to propose a “complex responsive processes theory of organisations” (Stacey, 2003, p. 330).

Criticisms of adopting complexity approaches for work and learning research (Baskin, 2008; Lancaster, 2012; Stacey, 2001, 2003) tend to focus on its genesis in the physical
sciences in which the human elements of systems are seen to be relegated to a lower status or not considered at all. As seen in the criticisms outlined above, these are often expressed as a failure of complexity, and complex adaptive systems approaches, to deal adequately with the role of human agency within the system. Agency has been acknowledged within complexity approaches as a key feature of systems where the elements are human (Giddens, 1984). The criticisms articulated above fail to take into account the ways in which complexity approaches have been used for a number of years to examine human social systems (e.g., Kasthuriratna, Harre, & Piraveenan, 2015; Sawyer, 2005) and various facets of organisations (e.g., Axelrod & Cohen, 1999; Chia, 1998; Tsoukas & Dooley, 2011). The position taken in this study is that much of the previous research adopting complexity approaches has not been sufficiently specific in the usage of such approaches and that adopting a complex adaptive systems approach provides an additional layer of specificity to this study of work and learning. To address the criticisms outlined above, agency has been included as part of the CAOCF outlined in Chapter 3.

One major commonality in the research adopting broad complexity approaches to study organisations, work, and learning, is that it takes a system-level perspective. Using complexity approaches and complex adaptive systems perspectives in research within organisation studies, organisational learning, and work and learning research adds to understandings of organisations; however, there is little research looking specifically at the individual professionals within such organisations. Previous studies using organisations as complex adaptive systems (see Chiva et al., 2014; Chiva et al., 2010; Jones & Corner, 2012; Palmberg, 2009; Uhl-Bien & Marion, 2009; Uhl-Bien et al., 2007), have tended to focus on organisational systems rather than also investigating the
work and learning experiences of individuals. Complex adaptive systems are formed by the dynamic interplay of systemic and individual elements (Mitchell, 2009) making it crucial to investigate the interplay of organisational complexity and the professionals. This study examines this question, focusing on professionals’ experiences of work and learning in complex adaptive organisations. This study contributes significantly to furthering understandings of work and learning in contemporary organisations by investigating the work and learning experiences of individual professionals within organisations characterised as complex adaptive systems.

**Complex adaptive systems in work and learning research**

It is notable that there are relatively few work and learning theories or studies which refer directly to complex adaptive systems (see Chiva-Gomez, 2003; Chiva et al., 2014; Chiva et al., 2010; Jones & Corner, 2012; Palmberg, 2009). The trend appears to be towards adopting the more generic, broader terms of complexity theory or complexity approaches (see Desai, 2010; Fenwick, 2010b, 2012a; Fenwick & Dahlgren, 2015; Fenwick et al., 2011; Johnsson & Boud, 2010) rather than embracing the specific concept of complex adaptive systems. There are two main ways in which complexity approaches have been adopted within the work and learning literature.

Emergence is the complexity concept most commonly applied to understanding work and learning either on its own or as part of a broader complexity approach. Studies such as those of Dahlgren et al. (2016) and Manidis and Scheeres (2013), and the more theoretical work of Reich and Hager (2014), illustrate the overlapping usages of the concept of emergence within contemporary theories of work and learning such as practice approaches, socio-material approaches, and complexity approaches.
Within the work and learning literature, researchers have tended to adopt complexity concepts to understand work and learning but not necessarily applying a specific complex adaptive systems approach. The most commonly used complexity concept within the work and learning literature is emergence (e.g., Buckley & Monks, 2008; Chiva et al., 2010; Hopwood, 2014; Manidis & Scheeres, 2013). For example, Johnsson and Boud (2010) propose that adopting a complexity approach is a useful way in which to consider learning at work. In their study of managers “acting up” in more senior roles within an organisation, Johnsson and Boud (2010) outline an emergent model of learning which “suggests that learning develops as a collective generative endeavour from changing patterns of interactional understandings with others” (p. 359) recognising the non-deterministic characteristics of contemporary workplaces.

Desai (2010) also incorporates ideas around the co-creation of learning at work but instead uses the concept of complex adaptive systems rather than a broader complexity approach. She argues that existing learning theories are insufficient to understand such phenomena instead proposing complex adaptive systems approaches as having better explanatory power. Desai (2010) argues that interactive technologies have changed the ways in which people work, interact, and learn within contemporary organisations which are now better understood in terms of “value-networks” (Allee, 2003) and the co-creation of learning within them.

Working in the field of organisational learning, Chiva et al. (2010) have used complex adaptive systems as part of their adaptive/generative learning typology. Rather than considering the organisation as a complex adaptive system, Chiva et al. (2010) have instead built on earlier work by Argyris & Schön (1996) which differentiates between
adaptive and generative learning. While Chiva et al.’s (2010) adaptive/generative learning typology is based on complexity approaches, it positions learning as either occurring via adaptive or generative processes. Rather than conceptualising organisations as single complex adaptive systems, Chiva et al. (2010) argue that learning in organisations occurs within either complex adaptive systems which produce iterative learning based on logical reasoning, or complex generative systems which produce so-called double loop learning (Argyris & Schön, 1996) via dialogue and inquiry. The adaptive/generative typology is examined in greater detail in the next chapter as one of the frameworks that adopts complex adaptive systems which may be useful to frame this study.

Jones and Corner (2012) have also used a complex adaptive systems approach to examine the specific area of mentoring within organisations. They argue that a complex adaptive systems approach offers a useful way in which to understand mentoring relationships where the mentoring relationships themselves are examples of complex adaptive systems reflecting changes in contemporary contexts of work in addition to offering practical options for improving mentoring practices. Jones and Corner’s (2012) usage of a complex adaptive systems approach to examine mentoring relationships differs from much of the work and learning research which adopts a complex adaptive systems approach. Similarly, work in the area of leadership has also adopted complex adaptive systems concepts to re-theorise leadership which “frames leadership as a complex interactive dynamic from which adaptive outcomes (e.g., learning, innovation, and adaptability) emerge” (Uhl-Bien et al., 2007, p. 298). Complexity leadership has been positioned as ‘an overarching framework for understanding and practicing leadership in a complex world” (Uhl-Bien & Arena, 2017, p. 9). Leaders therefore need
to enable adaptive responses in their employees by creating “adaptive space” which enables interconnectivity with the organisation (Uhl-Bien & Arena, 2017).

In a similar vein, Palmberg (2009) has adopted a complex adaptive systems approach as a metaphor for understanding organisational management. Unlike work and learning research which conceptualises organisations as complex adaptive systems (see Chiva-Gomez, 2003; Chiva et al., 2014; Chiva et al., 2010; Chiva & Habib, 2015; Desai, 2010), Palmberg’s (2009) approach uses complex adaptive systems concepts metaphorically and uses the concepts to recommend ways of managing contemporary organisations in terms of the most appropriate management practices. Similarly, Buckley and Monks (2008) have also used a complex adaptive systems approach to consider management education in discussing the contexts within which managers now work as being at the “edge of chaos” (Langton, 1990).

The work and learning, and to a lesser extent organisational learning, literature which adopt complex adaptive systems approaches share common themes. The first of these is that the research commonly emphasises the organisation as the unit of study (Chiva et al., 2014; Chiva et al., 2010; Chiva & Habib, 2015), or a phenomenon with an organisation such as management (Palmberg, 2009) or mentoring (Jones & Corner, 2012). There is a lack of research considering the impact of organisational complexity on individual workers/learners within organisations. This is important within the context of complex adaptive organisations which are formed through the interactions of the professionals and the system of which they are a part (Holland, 1995). A second common theme in the literature is that it is commonly conceptual or theoretical with little empirical research undertaken investigating work and learning within
organisations as complex adaptive systems. Researchers such as Jones and Corner (2012) and Desai (2010), for example, have proposed theories or conceptual frameworks which adopt complex adaptive systems approaches but have not undertaken empirical research to investigate the applicability of the theories. Reviewing the work and learning literature which adopts complex adaptive systems approaches highlights that there are still great opportunities for research in this area which this study takes up.

**A study of professionals’ experiences of learning in complex adaptive organisations**

This chapter has so far traced the development of work and learning theories and research from the earliest psychological theories, through socio-cultural theories, to the more recent focus on complexity. An important part of this theoretical journey has been shifting metaphors of learning, beginning with metaphors of acquisition and transfer (Sfard, 1998) focusing on psychological theories of learning, to shifts towards metaphors of participation and becoming (Boud & Hager, 2012; Hager, 2008). More recent approaches to work and learning, such as complexity, socio-material, and practice approaches, have particularly taken up metaphors of emergence and becoming (Boud & Hager, 2012; Hopwood, 2016). Reflecting, and building on, these recent metaphorical shifts, this study adopts a complex adaptive systems approach where emergence is used, not solely as a metaphor, but also as a key element of the organisational system which has significant implications for work and learning within this context. This study investigates the work and learning experiences of professionals in these complex adaptive systems.
The focus on professionals is a key differentiating factor for this study compared with other studies reviewed above, using complexity approaches in organisation studies, organisational learning, and work and learning. Although there has been increasing adoption of complexity approaches in work and learning research, it has tended to focus on the system within which the learning takes place. For example, the adaptive/generative learning typology (Chiva et al., 2010) focuses on the organisational systems. While this is useful conceptual work for understanding work and learning in contemporary organisations, it neglects a key component of the system: the individual professionals who learn and work within it. The organisational system is shaped by their interactions, and it is their interactions with each other and within the context of the complex adaptive system, which co-create the system.

**Locating the study: The research “gap”**

From the above discussion of the relevant literature, two key under-researched areas are identified and addressed by this study. First, adopting complex adaptive systems to frame the study and second, investigating individual experiences of work and learning within organisations characterised as complex adaptive systems. These under-researched areas are discussed in the following sections.

**Adopting complex adaptive systems to frame the study**

As Fenwick (2008b) notes, the adoption of complexity approaches is a key trend within the field of work and learning; however, in order to access the useful insights offered by complexity approaches a rigorous rather than metaphorical use is needed so as to fully exploit its potential for explanation (Fenwick, 2012a). This study takes up this trend and takes up Fenwick’s challenge to use it rigorously rather than metaphorically. As a way
of applying a complex adaptive systems approach to this study, the CAOCF was
developed. The complex adaptive organisations conceptual framework allows complex
adaptive systems to be applied to the investigation of work and learning in organisations
by providing a conceptual framework through which to view the organisations in the
study. The CAOCF has been specifically developed to frame and analyse this study
enabling a more rigorous application of complex adaptive systems concepts to the
analysis of interview data from this study, also providing a way to conceptualise how
organisational system characteristics influence the experience of work and learning for
individual professionals. The framework focuses on complex adaptive systems as the
key concept rather than the general usages of complexity approaches which are more
commonly used in work and learning research as discussed earlier. Using complex
adaptive systems as the foundation concept for this study emphasises the adaptive
nature of organisations and the criticality of learning, while also ensuring that
adaptation and learning are key elements in the analysis of the study. This framework
has been developed to investigate the under-researched areas identified within the work
and learning literature with a level of specificity for work and learning research.

Adopting a complex adaptive systems approach is a way in which to disrupt and
challenge current theory and practice in work and learning, and “offer a basis for
disrupting many features of conventional approaches to researching professional work
and learning” (Hopwood, 2016, p. 60). Similarly, Johnsson and Boud (2010) propose
that a complexity view of learning challenges existing theories of work and learning.
This research study, aims to challenge existing theories of work and learning through
the use of the CAOCF, providing a way to examine experiences of work and learning in
the “fluid, every-shifting contexts” (Hopwood, 2016, p. 75) in contemporary
organisations. As Farrell and Fenwick (2007) have pointed out, in the global,
knowledge-based economy in which contemporary organisations operate, there are
questions around what so-called “knowledge workers” need to learn, know, and do.
Taking a complex adaptive systems approach to frame investigations of work and
learning in this context, provides new insights into work and learning as part of a highly
networked and emergent system using a conceptual and analytical framework specific
to work and learning.

Adopting a complex adaptive systems approach to frame this study also provides an
opportunity to expand on emergence as a metaphor for learning and incorporate it as a
core meta-phenomenon of complex adaptive organisations. Emergence is key to a
complex adaptive systems approach and it has been taken up widely within the current
discourses in work and learning research (e.g., Fenwick, 2012a; Hopwood, 2014, 2016;
Johnsson & Boud, 2010; Manidis & Scheeres, 2013; Reich & Hager, 2014). This study
contributes to these discourses and expands on them to show how emergence is a meta-
phenomenon influencing and influenced by complex adaptive organisations which plays
an important role in shaping learning.

**Focusing on individual experiences of work and learning**

This study further expands current work and learning research in adopting complexity
approaches and emergence by focusing on the work and learning experiences of
professionals rather than focusing primarily on the organisations as the unit of study. A
focus on organisations has been a key feature of earlier research which has adopted
complexity and complex adaptive systems approaches (e.g., Chiva et al., 2014; Chiva et
al., 2010; Palmberg, 2009). Rather, in focusing on professionals’ experiences of work
and learning, and how they are influenced by organisational complexity, this study provides a fuller picture of how work and learning are experienced within the context of complex adaptive organisations.

This study also considers both work and learning concurrently rather than focusing on learning as the primary unit of study which has previously been the case within a great deal of work and learning research (Tynjälä, 2013). Investigating work and learning together as inter-related phenomena also contributes to an under-theorised area of work and learning research which has focused on work contexts (see Billett, 2001, 2004a, 2004b; Fuller & Unwin, 2003, 2004; Skule, 2004; Skule & Reichborn, 2002, 2007) and their influence on learning but not necessarily the nature of the work itself. Investigating experience of both work and learning within complex adaptive organisations is also an important acknowledgement of the dynamic inter-relatedness and inter-connectedness of complex adaptive systems. Considering work and learning separately would be contrary to both a complex adaptive systems approach as well as to the large body of work and learning research now widely accepting participation in work as the key mechanism for learning at work (Hager, 2011).

This study builds on earlier research (e.g., Billett, 2001, 2004a, 2004b, 2014, 2016; Eraut, 2011) examining learning through participation in the practices of work. If, as Hager (2011) concludes, work and learning research is now at a point where it is accepted that learning occurs whenever someone performs a task, then considering the nature of work and learning together is critical in order to gain a full understanding of learning at and through work. This study investigates work and learning within the context of both current work and learning discourses as well as through the lens of
complex adaptive systems within which the elements of the system are enmeshed in entwined relationships. In addition, this study focuses on the nature of work in terms of day-to-day tasks, as well as the broader work context and how these influence learning.

**Research question**

To address the research gaps identified above, this study investigates the experience of work and learning for individual professionals within organisations characterised as complex adaptive systems. The concept of complex adaptive organisations has been developed to more clearly articulate such organisations and the study is framed by the complex adaptive systems conceptual framework. The research question is framed as:

**How do professionals experience work and learning in complex adaptive organisations?**

As outlined in Chapter 1, there are two key elements to this research question. First, the research question introduces the concept of complex adaptive organisations. To investigate the research question, it is therefore important to first define a complex adaptive organisation, which is the focus of the next chapter as part of the complex adaptive organisations conceptual framework. It is also necessary to determine if the organisations studied can be considered as complex adaptive organisations. Data from the interviews and desktop research, supported by the CAOCF, are used in Chapter 5 to provide evidence that the organisations in the study are complex adaptive systems. The second key element of the research question asks about professionals' experiences of work and learning. Professionals' experiences are examined using an adapted phenomenographic analysis (discussed in Chapter 4) from which the categories of description (outlined in Chapter 6) emerged.
Concluding comments

Work and learning is an emerging field, increasingly adopting complexity concepts to investigate and understand learning at work. This study contributes to, and extends, this field. First, by taking up the specific approach of complex adaptive systems as the basis for the study rather than the more commonly adopted, broader complexity approaches. To rigorously use a complex adaptive systems approach specifically for this study of work and learning, the CAOCF was developed. Second, this empirical study focused on investigating the experiences of professionals within broader, complex organisational contexts whereas earlier works have tended to describe one or the other with an emphasis on the organisation over the individual.

A review of the work and learning literature showed that work and learning are contested terms. The work and learning theories were traced developmentally from individually focused psychological theories of learning, through the incorporation of social and contextual factors foregrounding participation in work as the key to learning, and then on to current trends to the adoption of complexity concepts, socio-material, and practice approaches. This review also tracks a shift in metaphors of learning from metaphors of acquisition and transfer, through metaphors of participation, to the more recent metaphors of becoming and emergence. This study takes up the latter metaphors of becoming and emergence (Boud & Hager, 2012) and further considers emergence as a key element of complex adaptive organisations shaping professionals’ experiences of work and learning. Emergence is a key element of the CAOCF described in the next chapter.
Chapter 3 The complex adaptive organisations conceptual framework

A complex adaptive systems approach was used to frame this study in recognition of the growing complexity of contemporary organisational contexts and changes in the nature of work and organisations, as outlined in Chapters 1 and 2. The literature review in the preceding chapter discussed the most common concepts used in complex adaptive systems approaches. As discussed in Chapter 2, complexity, as an interdisciplinary field (Waldrop, 1992), and complex adaptive systems approaches more specifically, are “broad churches” which encompass a range of definitions and emphasise different concepts (Mitchell, 2009).

This chapter outlines the complex adaptive organisations conceptual framework (CAOCF) which frames the study as well as being used as part of the analysis. It begins with examining the debates around conceptualising organisations using complexity approaches more generally, before discussing the suitability of alternative learning frameworks which have adopted complex adaptive systems approaches. The second half of the chapter outlines the CAOCF and discusses emergence and the three key elements which shape complex adaptive organisations.

The CAOCF sets out the ways in which complex adaptive systems approaches have been adopted and customised specifically for this study of professionals’ work and learning experiences within contemporary organisations. Developing a conceptual framework based on complex adaptive systems, and specific to the field of work and learning, was important to frame this study as no suitable work and learning frameworks based on complex adaptive systems were found within the literature. The framework
became a key tool in understanding the organisations studied. The CAOCF offers a way in which to understand organisations as complex adaptive systems using emergence and the three key elements of complex adaptive organisations – complex social networks, adaptation, and agency. These elements offer insights into the interplay of organisations and the professionals within them.

The preceding chapter discussed the ways in which complex adaptive systems approaches have been used in work and learning research and highlighted the small amount of work and learning research that has adopted complex adaptive systems approaches (see Jones & Corner, 2012; Palmberg, 2009). The development of the CAOCF was also a way to use complexity approaches within work and learning research more rigorously rather than metaphorically or as an adjective to describe context. As Hood (2014), writing within the field of social work proposes, researchers need to “take a closer look at complexity as a phenomenon in its own right, rather than just as a convenient metaphor of difficulty” (p. 28).

**Complexity and organisations – recent shifts**

In Chapter 2, a brief overview of research in organisation and management studies was provided to show the journey from earlier, reductionist metaphors of organisations as machines towards systems-based metaphors of organisations as brains and organisations as flux and transformation (Morgan, 2006). The ways in which complexity and complex adaptive systems approaches have been adopted within organisation theory were also discussed (Stacey, 2001; Stacey & Griffin, 2005; Tsoukas, 2017; Tsoukas & Chia, 2002), organisational learning (Chiva et al., 2014; Chiva et al., 2010; Chiva & Habib, 2015; Stacey, 2001, 2003; Tsoukas, 2005), and work and learning (C. Davis, 2012;
Fenwick, 2012a; Jones & Corner, 2012; Lancaster, 2012). In this chapter, the discussion turns to recent shifts within organisation theory in terms of continuing the discussion of Morgan’s (2006) metaphors and to position the complex adaptive organisations conceptual framework (CAOCF) within these discourses.

Morgan’s (2006) metaphor of organisation as flux and transformation is particularly pertinent to this study, primarily because the metaphor of flux and transformation “invites scholars to understand organizations in paradoxical ways …. by drawing a relation between the objectified notion of organization (an entity) and a process (a non-entity)” (Schoeneborn et al., 2016, p. 916). Addressing the “process-entity paradox” is important in recognising the dynamic nature of organisations (p. 917). Schoeneborn et al. (2016) outline three streams of current organisational research which expand on Morgan’s (2006) metaphor of flux and transformation. These are: organisations as becoming (Clegg et al., 2005; Tsoukas & Chia, 2002), organisations as practice (Nicolini, 2013; Schatzki, 2006), and organisations as communication (Cooren, Kuhn, Cornelissen, & Clark, 2011; Luhmann, 2003).

Proponents of organisations as becoming argue that organisations are not static entities but are made up of unstable and unfolding processes and relations (Schoeneborn et al., 2016). Conceptualisations of organisations as becoming are also aligned with recent shifts in work and learning theories which position becoming as a metaphor for learning in contemporary contexts (Boud & Hager, 2012; Hager, 2008; Hager & Hodkinson, 2009). Linked to organisations, and learning, being understood by a metaphor of “becoming” are conceptualisations of organisations as practice, which reflects the “practice turn” in the social sciences (Schatzki et al., 2001) and in work and learning
(e.g., Gherardi, 2012, 2016; Hager, Lee, & Reich, 2012b; Reich, Rooney, & Boud, 2015). Research considering organisations as practice highlights “the situated, embodied, and unfolding character of social phenomena” (Schoeneborn et al., 2016, p. 926). Organisation as communication also views organisations as dynamic and in states of flux in theorising that organisations are constituted by communication (Kuhn, 2012; Putnam & Nicotera, 2009). What these metaphors have in common is a recognition that organisations are dynamic entities as well as constituted of dynamic processes and practices which require new conceptualisations of organisation that reject traditional mechanistic approaches. Morgan (2016) has recently suggested two additional metaphors which build on these dynamic theories and metaphors of organisation to deal with “the multidimensional complexity we now face” (p. 1029) in contemporary organisational contexts. In conversation with Oswick and Grant (2016), Morgan proposed the metaphor, the global brain, recognising the increasing role of big data in organisations, and the metaphor of organisation as media, referring to “the digital revolution and the shift into electronically-mediated, multi-sensory modes of understanding to a degree that we’ve never experienced before” (p. 340). While acknowledging the importance of such changes to work and learning in contemporary organisations, this study has not used the metaphors of the global brain or organisations as media specifically. As discussed in Chapter 1, this study incorporates shifts in technology and its influence on work through considering shifts in the structure (Fenwick, 2004; Walton, 2016) and nature of work (Billett & Choy, 2013; Dicken, 2015; Hodgson, 2016) influenced by global economic changes and neoliberal policies about work (Harteis et al., 2014; Walton, 2016) and greater use of technology (Billett & Choy, 2013).
Complexity approaches are a part of the overall shift towards metaphors of organisations as dynamic, in flux and transformation (Morgan, 2006), and *becoming* (Clegg et al., 2005; Tsoukas & Chia, 2002) discussed above. Complex adaptive systems are balanced at the “edge of chaos” with elements of both order and disorder (Holland, 1995; Kauffman, 1995; Langton, 1990). Complexity approaches provide ways to consider organisations from the perspective of both the system and the individuals constituting it, while still recognising that there are elements of both order and disorder present. In addition, complexity approaches have more to offer than solely metaphorical lenses for understanding organisations. They provide concepts and frameworks which are useful in rethinking new understandings of organisations and reframing the ways in which they are researched.

Recently, criticisms of Morgan’s (2006) original metaphors have been raised which argue that the metaphors continue to assume rationality despite appearing to embrace more systemic and dynamic approaches to organisation (McCabe, 2016). Morgan’s (2006) original metaphors are grounded in rationality and suggest that, even in cases of irrationality or unpredictability, organisations may be managed and ordered (McCabe, 2016). In response, McCabe (2016) proposes the metaphor of “Wonderland”, based on Lewis Carroll’s book *Alice in Wonderland*, which recognises that “absurdity, irrationality, uncertainty and disorder are part of the everyday experience for many” (p. 946). The metaphor of Wonderland moves away from emphases on stability and manageability in organisations which, McCabe argues, neglect a large amount of organisational life. However, considering organisations as sites of disorder and uncertainty is an argument better situated within discourses of chaotic systems which are not ordered (Lorenz, 1993) rather than complex adaptive systems which contain
elements of both order and disorder (Mitchell, 2009). Organisations today, while being dynamic and subject to high degrees of uncertainty and flux, still contain ordered elements such as management processes, hierarchies, and procedures. These elements of seeming order exist in concert with elements of disorder in organisations and a complex adaptive systems approach offers a way in which to understand and investigate organisations which recognises this duality.

**Considering alternative frameworks**

In seeking a suitable conceptual framework for this study, two learning approaches with complex adaptive systems as their basis were considered; the adaptive/generative learning typology of Chiva et al. (2010) for analysing organisational learning, and the Complex Systems Conceptual Framework of Learning (CSCFL) of Jacobson et al. (2016). It is notable that neither of these are situated within the work and learning literature but are instead an organisational learning and school education framework, respectively. Complexity and complex adaptive systems approaches have been taken up less often in work and learning research (see Jones & Corner, 2012; Lancaster, 2012, 2013; Palmberg, 2009) and a framework specific to work and learning research has yet to be developed – a key reason for developing the CAOCF to frame this study.

In their organisational learning typology, Chiva et al. (2010) have built on earlier typologies using adaptive and generative learning (e.g., Argyris & Schön, 1996) to elaborate how these terms work within organisational contexts, specifically by adopting what they term “complexity theories” (p. 114). The adaptive/generative learning typology differentiates between two different types of systems, complex adaptive systems and complex generative systems. In the typology of Chiva et al. (2010),
adaptive learning occurs within complex adaptive systems through a process of self-organisation. Self-organisation is defined as “a self-referential process characterised by logical deductive reasoning, concentration, discussion and improvement” (p. 114). It is used in the adaptive/generative typology in the context of adaptive learning, taking up work by complex systems researchers such as Gell-Mann (1994) and Kauffman (1995) who argue that complex adaptive systems adapt through self-organising processes.

Adaptive learning in organisations is then focused on improvement based on the need to adapt to an environment (Chiva et al., 2010). On the other hand, generative learning occurs within what Chiva et al. (2010) call complex generative systems, learning through processes of self-transcendence where generative learning occurs at the “edge of chaos” (Langton, 1990). Such learning may occur through individual or social processes, “through intuition, attention, dialogue and inquiry” (Chiva et al., 2010, p. 116), the implication, from an organisational learning perspective, being that generative learning is of greater significance to organisations because it is more likely to generate innovation and new ways of working and organising. Indeed, Chiva et al. (2014) explored adaptive and generative learning further in a later study analysing two case studies from firms in the clothing sector, using their adaptive/generative typology, in which they argued that there is a reciprocal relationship between organisational learning and innovation and that generative learning is key to “radical innovation”.

In adopting the adaptive/generative learning typology of Chiva et al. (2010), a key challenge is that it examines learning from the perspective of the organisation more so than the individuals. The focus on the organisation limits its usefulness for this study, focusing as it does on investigating professionals’ experiences of work and learning experiences within complex organisational contexts. Chiva et al. (2010) also emphasise
two different types of learning – adaptive and generative. In theorising two different types of learning, Chiva et al. (2010) propose multiple systems operating within organisations which facilitate that learning, namely complex adaptive systems and complex generative systems of which complex generative systems appear to be preferred for their superior learning capabilities. The present study investigated professionals’ experiences of work and learning, without assuming that there are “better” or “worse” forms of learning from the outset, as Chiva et al. (2010) do, which is unhelpful in answering the research question of this study. Taking up complex adaptive systems to investigate professionals’ experiences of learning within organisational contexts, rather than focusing on learning at an organisational level, also acknowledges the inter-related nature of the individual and organisation and, as discussed in the previous chapter, meets a need for research which examines professionals’ working and learning within complex adaptive organisations.

In comparison, Jacobson et al. (2016), researching school education, proposed the Complex Systems Conceptual Framework of Learning (CSCFL) which they argue offers a way to unite cognitive learning theories focusing on the micro-level, and situative learning theories that focus on the macro-level of an educational system (Jacobson et al., 2016). This study investigated the work and learning experiences of professionals within organisations conceptualised as complex adaptive systems by considering the influences of organisational complexity and how they may affect professionals’ experiences of work and learning. However, using the CSCFL is challenging in this context as it is designed to frame investigations of student learning and pedagogical processes within school contexts, subject to a higher degree of regulatory frameworks (e.g., the curriculum, child protection legislation, teacher quality ...
frameworks, quality frameworks) and less diversity in terms of the types of work and learning that the students undertake compared to business-related organisations in the knowledge economy. Jacobson et al. (2016) offer support for their framework based on research of problem-solving teams in school classrooms whereas this study investigates experiences of work and learning across a wide variety of organisational contexts and a diversity of work types undertaken by the professionals. Having school work based on a standardised curriculum is a very different context to learning at work which has more variance in terms of the types of work undertaken and the learning requirements of that work.

Importantly, the CSCFL uses both complex systems and complex adaptive systems as a basis for the framework and relies on elements from both as necessary (Jacobson et al., 2016). In comparison, this study purposely adopts a complex adaptive systems approach in order to emphasise the adaptive nature of such systems and the criticality of learning and adaptation within them. Jacobson et al. (2016) propose that complex systems approaches foreground “complex collective behaviour” whereas complex adaptive systems foreground how the individual elements of a system learn and adapt (p. 212). For the purposes of the present study Holland’s (2006) definition of complex adaptive systems is more relevant in specifying that complex adaptive systems are “systems that involve many components that adapt or learn as they interact” (p. 1).

Although a conceptual framework based on complex adaptive systems was not found within the work and learning literature, Felstead et al. (2009) have proposed the Working as Learning Framework which shares some elements with the CAOCF. The Working as Learning Framework draws attention to complexity approaches as a way to
understand contemporary contexts of work and learning, although it does not adopt a complexity approach overall; a key reason for not using the Working as Learning Framework for this study.

Felstead et al. (2009) developed the Working as Learning Framework to explore the concept of “context” in work and learning, focusing on three theoretical concepts drawn from the social sciences literature, namely productive systems (from economic theory), discretion and trust (from sociology of work), and learning environments (from work and learning). Through these three, interrelated concepts, Felstead et al. (2009) contend that “in order to understand learning at work, researchers need to examine how work is organized and how, in turn, this is influenced by wider forces” (p. 35). Felstead et al. (2009) refer to complexity approaches as part of the discussion of their framework, highlighting the ways in which the Working as Learning Framework acknowledges “a high degree of complexity and indeterminacy in the contexts of workplace learning” (p. 33) and how such systems are dynamic and constantly evolving. Furthermore, the Working as Learning Framework, like the CAOCF, is based on the necessity to understand both structural and individual perspectives to gain a more complete understanding of work and learning. However, the two frameworks diverge in the centrality of complexity concepts underpinning the framework. In the case of the Working as Learning Framework, the framework draws on economics, the sociology of work, and work and learning literatures to form the theoretical basis of the framework, while drawing on complexity concepts to explain structural elements of workplaces, particularly in terms of social networks and emergence (Felstead et al., 2009). In contrast, the CAOCF is underpinned by a complex adaptive systems approach drawing strongly on complex adaptive systems approaches as well as the work and learning
literature. The CAOCF also considers the interrelationship between work and learning, specifically, how organisational complexity influences work, and how work then influences learning providing a suitably specific framework to investigate the research question of this study: How do professionals experience work and learning in complex adaptive organisations?

Although the alternative frameworks discussed here – the adaptive/generative learning typology (Chiva et al., 2014; Chiva et al., 2010), the Complex Systems Conceptual Framework for Learning (Jacobson et al., 2016), and the Working as Learning Framework (Felstead et al., 2009) – were helpful in developing a suitable framework for this study, the CAOCF provided a more nuanced conceptual framework which more strongly explained organisations as complex adaptive organisations. The CAOCF was developed primarily from the complex adaptive systems literature (Barabási & Albert, 1999; Holland, 1995, 2006; Langton, 1990; Mitchell, 2009; Strogatz, 2008; Watts & Strogatz, 1998), and the three frameworks outlined above provided examples as to how a complex adaptive systems approach could be used in work and educational contexts. The CAOCF foregrounds the complexity of organisations and positions this organisational complexity as key to understanding work and learning in contemporary organisations in the context of changes in the nature and structure of work due to shifts in the global economy and technology (Harteis et al., 2014).

**Complex adaptive organisations**

As outlined in Chapter 1, the term complex adaptive organisation (CAO) has been used in this study in two ways: to describe the organisations in this study and to differentiate these organisations from other examples of complex adaptive systems found in nature.
The concept of CAO used in this study has a number of key elements which have been identified from the literature of complex adaptive systems, and work and learning, and which constitute the CAOCF.

In the interdisciplinary field of complexity, there is no single theory of complex adaptive systems; rather the field is emerging and changing according to the latest research and the discipline (or disciplines) approaching each problem (Mathews, White, & Long, 1999). Despite this, key theorists propose several common properties of such systems which include: adaptation, emergence, complex networks, sensitivity to initial conditions, and self-organisation (Barabási & Albert, 1999; Holland, 1995; Kauffman, 1995; Mitchell, 2009; Watts & Strogatz, 1998).

Core to the concept of the CAO is emergence, which influences all aspects of the organisation as well as individual experiences of work and learning. In addition, three key elements of CAO were identified from the literature, these are:

- Adaptation,
- Complex social networks, and,
- Agency.

Emergence and the three key elements were selected as having the greatest potential for offering insights into work and learning within contemporary organisations. The core concepts of CAO do not include sensitivity to initial conditions or self-organisation. The following section discusses why these have not been included as separate concepts when describing complex adaptive organisations but have instead been incorporated as part of emergence.
Selection of the core concepts of CAO

Although there is a range of definitions and emphases within complex adaptive systems approaches (Mitchell, 2009), key theorists (as highlighted above) have proposed a number common properties of complex adaptive systems. Three of these properties have been adopted as part of the CAOCF – emergence, adaptation, and complex networks (here referred to as complex social networks). These concepts will be discussed in greater detail shortly.

Self-organisation is the tendency of the agents within complex adaptive systems to produce complex, difficult to predict patterns of behaviour through a network of interconnected agents that follow basic rules with little or no central control (Baets, 2006; Mitchell, 2009). Emergence and self-organisation are often described synonymously (B. Davis & Sumara, 2006). However, although both refer to the ways in which the actions of the agents in a system interact to produce order, the key difference between the two concepts is whether that order becomes apparent over time (self-organisation) or whether order becomes apparent with the increasing size of the system (emergence) (Sayama, 2015). Emergence refers to situations where larger scale views of a system (e.g., a whole organisation or work team) yield greater descriptive power for properties of complex adaptive systems which are not predictable from observing the interactions of the individual agents (Sayama, 2015; Shalizi, Shalizi, & Haslinger, 2004). For example, organisational culture cannot necessarily be easily articulated by observing the behaviours of individual employees, but observing the whole organisation, or work teams, may produce insights into the culture as a collective phenomenon. Self-organisation, on the other hand, is a dynamic process whereby a
system spontaneously orders over time with little or no central control (Sayama, 2015). An increase in order within the system over time and the lack of central control are the two key features of self-organisation (Polani, 2008; Shalizi et al., 2004).

While other complex adaptive systems-based learning approaches have included self-organisation in their frameworks and typologies (see Chiva et al., 2010; Jacobson et al., 2016), self-organisation has not been included as a key element of the CAOCF, as the organisations studied all had a degree of central control in terms of management processes, learning and development systems and practices, procedures, and policies. Moreover, self-organisation, which describes the development of order over time, was not appropriate to this study as the data gathered from the research interviews described the organisations at a single point in time. Emergence, on the other hand, does not focus on time but instead emphasises the dynamic development of order within complex adaptive organisations through the interactions of the professionals and their context. In this study, emergence is examined through its influence on the work of professionals in complex adaptive organisations and how work influences professionals’ experiences of learning.

Sensitivity to initial conditions is a key feature of chaotic systems (Mendenhall, Macomber, & Cutright, 2000) referring to the impact of small inputs into a chaotic system which amplify over time. In the case of complex adaptive systems, however, it is not as clear cut. Small inputs into a complex adaptive system can, but will not necessarily, amplify over time (Mitchell, 2009). The debates as to the general applicability of sensitivity to initial conditions as a key element of complex adaptive systems (Mitchell, 2009), as opposed to chaotic systems, questions its usefulness as part
of the CAOCF. Consequently, sensitivity to initial conditions was not included as one of the key elements of complex adaptive organisations. Furthermore, the inherent novelty and unpredictability within complex adaptive organisations, as a consequence of sensitivity to initial conditions (Parker & Stacey, 1994), is accounted for by using the concept of emergence. Emergence accounts for much of the novelty, unpredictability and non-linearity of complex adaptive organisations. Based on the nature of the study and the fact that sensitivity to initial conditions is more often considered in the context of chaotic systems, it was decided that including sensitivity to initial conditions as part of the CAOCF added little to the overall framework in terms of the explanatory power of work and learning.

**The role of context**

As discussed in Chapter 2, an important aspect of complex adaptive systems is the interactions of the individuals and their context, and how context, in turn, shapes interactions. This section discusses the role of context in complex adaptive organisations before outlining emergence and the three key elements of complex adaptive organisations in the next section. Context may include professionals’ networks (discussed later in this chapter as part of complex social networks), the organisational culture(s), and the physical environments in which they work which includes such elements as the workspace, office layout, and technology.

The role of context has been debated within the work and learning literature (e.g., see Felstead et al., 2009; Unwin et al., 2007). Felstead et al. (2009) focus on the importance of context in their Working as Learning Framework which they describe as “a general model of what is meant by ‘context’” (p. 17). The Working as Learning Framework,
through the concepts of productive systems, work organisation, and learning environments, attempts to “specify the contexts of learning” (authors’ emphasis) (Felstead et al., 2009, p. 36). Through the Working as Learning Framework, Felstead et al. (2009) consider context in the sense of the ways in which learning is influenced by “the multiple interconnected social relationships and processes that constitute the world of work” (p. 17). The CAOCF similarly foregrounds the importance of relationships through the element of complex social networks.

In complex adaptive organisations, discussions of “context” take up Edwards’ (2006) work which argues that context needs to be understood in relational terms. This is important in the context of complex adaptive organisations as they are, like all complex adaptive systems, relationally constructed (Holland, 1995, 2006; Mitchell, 2009). Edwards (2006) argues that a more useful way to consider context is through the idea of contextualisation, a process through which context emerges, which may be in many forms. Context, within the CAOCF, is considered as an emergent property of complex adaptive organisations. Considering context as emergent reflects the ways in which organisations may have quite different contexts but similar underlying key elements, as is proposed through the core concepts of complex adaptive organisations which are discussed next.

**Emergence**

Emergence is commonly defined as a characteristic of complex and complex adaptive systems, describing how the interactions of individuals within the system contribute to patterns at the macro-level that are not able to be completely predicted from observing the actions and interactions of the individuals and their context (Axelrod & Cohen,
1999; Jacobson & Wilensky, 2006; Sawyer, 2005). These macro-level, emergent properties may have different characteristics to those of the individual agents (human and non-human) and cannot be fully predicted or directed (Lancaster, 2012).

Goldspink and Kay (2010) propose a continuum of emergence bounded by non-reflexive emergence at one extreme and reflexive emergence at the other. Reflexive emergence is of greatest use in this study due to the research focus on professionals’ experiences of work and learning as it represents systems “where the agents (actors) in the system under study are self-aware and linguistically capable” (Goldspink & Kay, 2010, p. 48). The cognitive and linguistic capacity of humans allows them to become self-aware and reflexive in turn influencing emergence within the system through the unique feedback loops which emergence creates (Goldspink & Kay, 2010). The concept “reflexive emergence” has been incorporated into the CAOCF to account for the human element of organisations along with the key element of agency. Recognising and incorporating the human element of complex adaptive organisations responds to criticisms of adopting complexity approaches to study organisations. These criticisms have questioned whether an approach with its genesis in the physical sciences may be adopted in the social sciences, as it fails to adequately account for the human actors (Baskin, 2008; Lancaster, 2012).

Reflexive emergence, while useful, is insufficient to describe emergence within CAO. Within the literature which investigates organisations using a complexity approach (for example Chiva, et al., 2010, 2014), emergence has largely been referred to as unpredictable properties of organisations, however this fails to account for the “radical novelty” of emergent properties which are “features not previously observed in the
complex system under observation” (Goldstein, 1999, pp. 50). Emergent properties are then not merely unpredictable but are also novel.

In summary, within complex adaptive organisations, emergence is the process by which professionals interact reflexively and linguistically, in ways which contribute to novel patterns within the organisation which are not able to be completely predicted or directed. Emergence is not a key element of the CAOCF, but a meta-phenomenon which encompasses the organisational system and permeates interactions within it.

**The three key elements of CAO**

**Adaptation**

Emergence presents constant opportunities for adaptation for the professionals within complex adaptive organisations as they encounter the novel and unpredictable patterns which emerge through their interactions. Adaptation is a common feature of educational complexity approaches (see B. Davis & Sumara, 2006; Jacobson et al., 2016) and organisational learning typologies (see Chiva et al., 2014; Chiva et al., 2010; Chiva & Habib, 2015) which adopt a complex adaptive systems approach.

Learning and adaptation are critical parts of complex adaptive organisations which have important implications for the ways in which professionals learn and work within them. Within complex adaptive systems approaches, learning and adaptation are often considered to be synonymous. For example, in their complexity framework for education, B. Davis and Sumara (2006) argue that the adoption of complexity approaches for education requires entirely ‘new principles of adaptation – that is, *learning*” (p. 12). Learning is usually defined within complex adaptive systems
approaches as the process whereby individual elements within systems adapt to the demands of their context, and to emergence, with reference to their relationships to the other elements of complex adaptive systems (Holland, 2006; Mitchell, 2009).

Learning and adaptation are considered within the CAOCF as interdependent processes where learning is the key enabler of adaptation. Within complex adaptive organisations, adaptation is understood as the capacity to adjust to one’s environment, incrementally or transformatively, depending on the emerging requirements of the context. The complexities of work and learning in contemporary organisations suggest, however, that adaptation alone is perhaps a too simplistic way of defining learning in this context and so learning and adaptation are defined in relation to one another.

As discussed in Chapter 2, historical definitions of learning range from behaviourist and cognitivist psychological approaches through to more socio-cultural and socio-material definitions (Hager, 2011). Moreover, defining learning at work is also problematic. As Fenwick (2008b) notes, learning at work can ‘refer to skill acquisition, personal transformation, collective empowerment, or a host of other phenomena” (p. 18).

Drawing on the literature discussed in Chapter 2, learning within complex adaptive organisations is understood within this study as a continual process whereby the professionals develop expertise and networks built on relationships to adapt to emergence within the organisation. Within complex adaptive organisations, learning is then a key influence on the ability of professionals to respond and adapt to emergence.

**Complex social networks**

In the literature of complex adaptive systems, complex networks are defined as specific types of networks which are described as being neither completely regular nor
completely random (Newman, 2010). In the CAOCF, the focus is on a further sub-set of complex networks referred to as small-world networks (Milgram, 1967; Watts & Strogatz, 1998). Such networks generally have a greater number of connections between immediate agents with a lower but significant number of connections outside of their immediate cluster (Barabási & Albert, 1999; Watts & Strogatz, 1998). In complex adaptive organisations, the implication is that most connections in a work network are among immediate colleagues with fewer connections to other parts of the organisation or professional networks outside of the organisation. Professionals therefore work within interlocking networks which are highly interconnected despite any imposed organisational structure or hierarchy. These networks may be self-organised but are often influenced by management or organisation structure. For example, the constitution of work teams and departmental structures in organisations is generally centrally defined by management or the human resources department and is not self-organised in the way in which it might be understood in complex adaptive systems terms.

Professional networks within and outside of organisations, on the other hand, are much more likely to be self-organised in the sense of the professionals exercising their agency in developing such relationships, influenced by the demands of their context.

The importance of networks within organisations has been considered within both the academic literature (e.g., Borgatti & Cross, 2003; Borgatti & Halgin, 2011; Borgatti, Mahra, Brass, & Labianca, 2009; Uhl-Bien & Arena, 2017; Uhl-Bien & Marion, 2009; Uhl-Bien et al., 2007) and industry literature (e.g., Christakis & Fowler, 2011; Cross & Parker, 2004; Rainie & Wellman, 2014). Uhl-Bien and Marion (2009), for example, in writing about complexity leadership, propose that dynamic interaction (emergent and therefore unpredictable ways of interacting) and interdependence between professionals
are both part of the enabling conditions necessary for the operation of complex adaptive systems. In her analysis of 209 articles from peer reviewed journals over a five year period, Fenwick (2008a) noted that around nine percent of the articles positioned learning as being through networks.

**Agency**

The fourth element of complex adaptive organisations is not derived from the literature of complex adaptive systems, but from the literature of work and learning. Within the literature of work and learning, agency is exercised in order to make sense of the social experiences of work and to respond to those experiences (Billett & Smith, 2010). Further, agency is constructed in the workplace through interactions between the individual, spatial, and organisational dimensions of the learning space (Kersh, 2015). Including agency as part of this framework also addresses the criticisms (such as Chiva et al., 2010; Fenwick, 2012a; Stacey, 2003), raised in Chapter 2, arguing that complexity approaches fail to adequately consider human agency. Agency is increasingly incorporated into research and theories of work and learning (Billett, 2006, 2011; Eteläpelto, Vähäsantanen, Hökkä, & Paloniemi, 2013; Vähäsantanen, Paloniemi, Hökkä, & Eteläpelto, 2017).

Agency, in the sense of professional agency, has most commonly been conceptualised as “various kinds of choices and intentional actions, participation in social relationships, and the influence on work-related matters” (Vähäsantanen et al., 2017, p. 3) which incorporates assumptions that professionals are active participants and responsible for their own actions within the workplace (Vähäsantanen et al., 2017). Discretion is an alternative concept which Felstead et al. (2009) have adopted from the sociology of
work literature and they define it as “the degree of autonomy and responsibility exercised by workers in the labour processes in which they are engaged” (p. 24).

Within the work and learning literature, agency and learning at work have been positioned as being intertwined (Billett, 2011; Eteläpelto et al., 2013; Harteis & Goller, 2014; Tynjälä, 2013; Vähäsantanen et al., 2017). As it is an increasingly important concept in the research on work and learning, agency has been included as a key element of the CAOCF for the following reasons. First, the inclusion of agency forms a part of broader discussions in the literature of work and learning about the importance of agency in work and learning dynamics (see Billett, 2006, 2011; Eteläpelto et al., 2013; Vähäsantanen et al., 2017). Second, agency places the emphasis on the human actors, the professionals, in complex adaptive organisations. As discussed earlier, in adopting a complex adaptive systems approach it is crucial to differentiate systems that include both human and non-human elements, such as organisations, from those systems which incorporate only non-human elements, such as flocks of birds. This echoes the use of reflexive emergence (Goldspink & Kay, 2010) in the definition of emergence used earlier, specifically referring to the human element of organisations.

Importantly, adopting agency continues to respond to the criticisms raised earlier in this chapter, and in detail in Chapter 2, that the use of complexity approaches to understand organisations fails to adequately account for human agency. Stacey (2001), for example, has argued that human agency makes the direct application of complexity concepts from the physical sciences extremely challenging. It has also been suggested that complexity approaches do not adequately address subjectivity, meaning, and language within organisations (Chia, 1998; Stacey, 2003). Including agency as a key element of the
CAOCF is therefore important to address such concerns over the use of complexity approaches to understand organisations.

To overcome these criticisms of the use of a theory from the physical sciences in the social sciences, the CAOCF used in this study incorporates a definition of agency from evolutionary sociology, an approach which applies social systems theory. Dietz and Burns (1992) define agency as “effective, intentional, unconstrained, and reflexive action by individual or collective actors” (p. 187). Agency is considered as a continuum, with all actors having a degree of agency but no single individual or group having unconstrained agency (Dietz & Burns, 1992). This is a useful concept when examining organisations through the lens of complex adaptive systems as these types of systems are bounded by rules and structures which guide behaviour (Mitchell, 2009) where unconstrained agency is not a feature of the system. Dietz and Burns (1992) propose four criteria which determine whether an actor has agency. First, an actor must have a degree of power to change things to meet their needs. Second, actions must be intentional. Third, agency depends on there being a choice for the actor in terms of actions that might be taken. Finally, there must be a degree of reflexivity where the actors have enough information and self-awareness to adapt their choices and behaviour according to present needs. Within the CAOCF, agency is defined as a continuum along which empowered and self-aware professionals have a greater or lesser number of opportunities to make decisions and take intentional actions to learn and adapt to the present needs of their work and work context.

Including agency as a key element of the CAOCF places a greater emphasis on the professionals in the organisational system and their ability to act within the boundaries
of the complex adaptive organisation and the ways in which professionals are “responsible and active actors in work contexts” (Vähäsantanen et al., 2017, p. 2). The actions of the professionals are then both shaped by organisational complexity while also influencing it, making agency a critical part of feedback loops within complex adaptive organisations which are discussed in the next section.

**Bringing the elements together: Conceptualising complex adaptive organisations**

The complex adaptive organisations conceptual framework (CAOCF) developed for this study is a way in which to research contemporary organisations that considers changes in the nature and structure of work which are influenced by unprecedented innovations in technology, and globalisation (Billett & Choy, 2013; Cairns & Malloch, 2011; Walton, 2016). As discussed throughout this chapter, the CAOCF draws on the literature of complex adaptive systems and the element of agency from the literature of work and learning, to outline the core concepts shaping complex adaptive organisations. Emergence is a critical part of complex adaptive systems (Goldspink & Kay, 2010; Mitchell, 2009) as well as being considered as a metaphor for learning (Hager, 2011; Hopwood, 2016) and as an explanatory concept in work and learning research (e.g., Dahlgren et al., 2016; Manidis & Scheeres, 2013; Reich & Hager, 2014). Emergence has also been included in other frameworks and typologies which adopt a complex adaptive systems perspective (Chiva et al., 2014; Chiva et al., 2010; Chiva & Habib, 2015; Jacobson et al., 2016). Adaptation has also been included as a key aspect of complex adaptive systems (Holland, 1995, 2006) as well as being critical to learning (B. Davis & Sumara, 2006). The inclusion of complex social networks continues and contributes to work and learning research which has shown the importance of social
elements (Bandura, 1986; Billett, 2014; Lave & Wenger, 1991) and social networks in learning in addition to recognising that complex social networks are a key element of complex adaptive systems (Barabási & Albert, 1999; Watts & Strogatz, 1998). The inclusion of agency ensures that the decisions and actions of the professionals in the organisation are accounted for, which is important in differentiating complex adaptive organisations from other examples of complex adaptive systems such as flocks of birds or ant colonies which do not include human actors. Furthermore, the inclusion of agency reflects current trends towards considering the role of agency in work and learning (see Billett, 2006, 2011; Eteläpelto et al., 2013; Vähäsantanen et al., 2017).

Figure 3.1 provides a visual representation of how the core concepts come together to shape complex adaptive organisations. Visually representing complex adaptive organisations in a two-dimensional figure is challenging due to the dynamic interlinkages between the elements. Figure 3.1 indicates the inter-relationships between the core concepts, the organisation, and the professionals which shape complex adaptive organisations.
Complex adaptive organisations are influenced by emergence and made up of individual professionals who learn and adapt, act with agency and interact through complex social networks as part of their work (as shown in the centre of Figure 3.1). Within the organisation these interactions occur through complex social networks where there are numerous local connections within their network with fewer, but still significant, longer connections elsewhere in the organisation or to other organisations (Barabási & Albert, 1999; Watts & Strogatz, 1998). The organisational system is shaped by the emergence and the three key elements of complex adaptive organisations. Emergence is therefore shown as encompassing the whole CAO in Figure 3.1 while the three key elements are shown positioned around the work annulus to indicate the influence of organisational complexity on every-day work. The key way in which professionals experience the influence of organisational complexity is through their day-to-day work. Emergence makes work challenging to predict or direct due to increased novelty and unpredictability, requiring adaptation and the exercise of agency by the professionals who also leverage their networks to complete their work.

Importantly, the influence of the core concepts of complex adaptive organisations is not one-way. As the professionals interact and make decisions through the course of their work, the organisation is also shaped by the actions of the professionals. Figure 3.1 shows these influences by nesting work and professionals’ responses to work within emergence and the three key elements of adaptation, agency, and complex social networks. The three points highlighted in the centre of Figure 3.1 describe how professionals within complex adaptive organisations respond to organisational complexity by: learning and adapting, acting with agency, and utilising their complex social networks. The emergence and the three key elements of complex adaptive
organisations therefore not only shape the organisation as a complex adaptive system but also form part of the way in which individuals respond to organisational complexity which, in turn, further shapes the organisation forming feedback loops.

Feedback loops commonly feature in complex adaptive systems (Langton, 1990). Research in complex adaptive systems indicates that complex adaptive systems with feedback experience an adaptation to the edge of chaos (Langton, 1990; Wotherspoon & Hubler, 2009). The term “edge of chaos” is an important concept for understanding how complex adaptive organisations come together. It denotes a transition space of dynamic interplay between order and disorder within a system which is both the product of, and drives, adaptation within the system (Langton, 1990). Complex adaptive systems, and the agents within them, are only able to learn and adapt when there is a sufficient degree of complexity present and the system is balanced between order and disorder (Gell-Mann, 1994). Complex adaptive organisations are constantly changing and adapting to fit their context as is the case for all complex adaptive systems (Strogatz, 2008) through the dynamic interplay of emergence and the three key elements of complex adaptive organisations and professionals’ responses to these in terms of how they learn and adapt, act with agency, and utilise their networks. In the CAOCF, this interplay occurs through feedback loops, where organisational complexity (through emergence and the three key elements) shapes work which, in turn, influences professionals’ learning and adaptation responses. These responses then further shape the properties of the complex adaptive organisation, thus completing the feedback loops.
Concluding comments

Although complex systems and complex adaptive systems approaches have been used in organisation theory, organisational learning, and school education contexts, the frameworks for use in these contexts were found to be insufficiently specific for use in researching work and learning in contemporary organisations. The CAOCF was therefore developed specifically for this study and is based around emergence and three key elements of complex adaptive organisations: adaptation, complex social networks, and agency. Professionals within complex adaptive organisations primarily experience the effects of organisational complexity through their work and respond to it by learning and adapting, using their agency, and utilising complex social networks. These actions then feed back into the organisation, further shaping the organisation in feedback loops. Emergence and the three key elements of complex adaptive organisations were first used to analyse the organisations studied and demonstrate that they are complex adaptive organisations (discussed in Chapter 5) and second, to analyse the interview data (discussed in Chapter 6), framing the discussion (Chapter 7). The next chapter outlines the methodological approach, research design, and the adapted phenomenographic analysis used in this study to answer the research question – How do individual professionals experience work and learning in complex adaptive organisations?.
Chapter 4 Methodology and research design

This chapter outlines the methodology and research design employed to investigate the research question identified at the end of Chapter 2 – How do individual professionals experience work and learning in complex adaptive organisations? The chapter opens with a discussion of the epistemological basis of the study leading to the rationale for selecting an adapted phenomenographic approach as the methodology. A detailed overview of the research design and methods follows, concluding with a section on the data analysis approach adopted for the study.

A dilemma that the discussion in this chapter explores is finding a suitable methodological approach meeting the dual foci of the study – a focus on the individual professionals’ experiences of learning, and a focus on complex adaptive systems – in this study of complex adaptive organisations. Many studies using a complex adaptive systems approach, particularly those in the physical sciences, have traditionally adopted quantitative methodologies (e.g., Mitchell, 1998; Oka & Ikegami, 2013; Rodewald et al., 2015; Stramaglia et al., 2012), as have some studies in the social sciences such as research using computer simulations (see Epstein & Axtell, 1996; Jacobson & Wilensky, 2006; Will, 2016). However, these quantitative approaches are not designed to consider questions of the subjective experiences of individuals – a focus of this study. A qualitative methodology would more commonly be used to investigate the individual experiences of actors – in this study, professionals’ learning. Some researchers have adopted a qualitative research approach within a complexity framework. Goldman, Plack, Roche, Smith, and Turley (2009), for example, used qualitative interviews supported by a thematic data analysis within a complex systems framework in their
study of learning within a hospital emergency department. The chapter pursues this discussion through outlining the epistemological assumptions of this study and argues that an adapted phenomenography was the most appropriate methodology. A discussion of phenomenography follows.

Epistemological bases of this study

Complex adaptive systems are described by key complexity researchers as emerging through the interactions of the actors with one another and their context (Holland, 1995; Mitchell, 2009). It is argued that, in taking up a complex adaptive systems approach to frame this study, the study is positioned epistemologically within the constructivist paradigm, specifically complex constructivism. It was discussed in chapter one that this study has taken a socio-cultural approach. There have been debates in the literature as to whether constructivist and socio-cultural approaches are dichotomous or complementary (see Packer & Goicoechea, 2000, Jacobsen, et al., 2016) and this study has adopted the position that

sociocultural and constructivist perspectives are not two halves of a whole, but that the constructivist perspective attends to epistemological structures and processes that the sociocultural perspective can and must place in a broader historical and cultural context (Packer & Goicoechea, 2000, pp. 228).

This study incorporates social constructivism (via complex constructivism, discussed shortly) as part of the phenomenographic methodology while socio-cultural perspectives form part of the conceptual framework.
Complex constructivism

Social constructivism is an interpretive research approach which investigates individuals’ “understanding of the world in which they live and work” and its goal is to “rely as much as possible on the participants’ views of the situation” (Creswell, 2013, pp. 24–25) – a key goal of this study in investigating the subjective work and learning experiences of professionals within the organisations studied. Social constructivism is an appropriate epistemological approach for this study to consider the ways in which professionals engage with and experience organisational complexity and how they experience and make sense of this through work and learning.

Within the social constructivist paradigm, Doolittle (2014) has combined both social constructivism and complexity approaches, and proposed a model which unites these two approaches, naming it “complex constructivism”. Complex constructivism positions learning as the “active construction and adaptation of one’s internal models of reality based on the interaction between oneself and one’s environment (including other persons), such that the functioning of one’s internal models exceeds the sum of the models’ components” (Doolittle, 2014, p. 485). Epistemologically, knowledge is actively constructed through processes of self-organisation and adaptation which occur through the interactions of the agents. Complex constructivism is a very appropriate philosophical and theoretical fit for this study. In adopting complex constructivism as an epistemological approach, this study is able to unite the two powerful perspectives of complexity and constructivism, as anticipated by Doolittle (2014).

This study is then epistemologically based on complex constructivism which unites complexity approaches with social constructivism, characterising the organisations
studied as complex adaptive systems which are socially constructed. This position is framed by the CAOCF. This study adopts a qualitative approach to investigate the subjective experiences of individual professionals as they work and learn within the broader context of complex adaptive organisations.

Based on the epistemological assumptions outlined above, a methodology was required which allowed for the investigation of professionals’ subjective experiences of work and learning within their organisational reality. Two possible methodological approaches that emerged for this purpose were phenomenology and phenomenography due to their common focus on subjective experiences of phenomena (Crotty, 1998). As previously stated, this study has adopted a phenomenographic research approach. Phenomenography takes a non-dualistic epistemological perspective where experience is “an internal relationship between human beings and the world” (Pang, 2003, p. 145). From an epistemological standpoint, phenomenography views knowledge of the world as being gained through this relationship between the ways in which individuals experience the world and their internal reflections and cognitions on these experiences (Marton & Booth, 1997). Knowledge is “constituted through internal relations between people and the world” (Yates et al., 2012, p. 98). Again, this aligns with the complex constructivist epistemological position of this study which assumes learning to be an active construction between the individual and their interactions with their context and other individuals (Doolittle, 2014).

The next section outlines phenomenography and why it was selected over phenomenology.
Phenomenography as the methodology for this study

Phenomenography has been variously referred to as an empirical research paradigm (Pang & Ki, 2016), a research approach (Bailey, 2015; Limberg, 2008; Marton, 1986; Yates et al., 2012), and an innovative research design (Tight, 2016). This study adopts phenomenography as a research approach which informs the design of the study and the data analysis.

Phenomenography is “the empirical study of the limited number of qualitatively different ways in which various phenomena in, and aspects of, the world around us are experienced, conceptualised, understood, perceived and apprehended” (Marton, 1994, p. 4424). It seeks to identify the different ways that individuals experience aspects of their world, such as teaching or learning (Ashworth & Lucas, 2000). Historically, phenomenography has been concerned primarily with questions of how people experience learning within particular contexts (Marton & Booth, 1997; Svensson, 1997). It emerged from educational research in Sweden in the 1960s and 1970s that sought to understand the world from the perspective of the students (Ashworth & Lucas, 2000). The goal of phenomenographic research is to produce categories of description which offer insights into the experiences of students or teachers (Ashworth & Lucas, 2000). These categories are then summarised in the outcome space (Marton, 1981, 1986, 1994; Marton & Booth, 1997). The process of developing the outcome space is discussed as part of the data analysis section at the end of this chapter.

Key to phenomenography is the adoption of a “second order” perspective where “the researcher is oriented towards describing people’s ways of seeing, understanding and experiencing the world around them” (Yates et al., 2012, p. 99). Marton (1981)
differentiates between first and second order perspectives. First order perspectives approach research from “the outside” in describing various phenomena. Second order perspectives research from “the inside” in describing people’s experiences of phenomena. Marton (1981) argues that this is a particular strength of phenomenography, contrasting with traditional scientific approaches taking only a first order perspective. Marton and Booth (1997) propose that first and second order perspectives are, in fact, investigating different objects of research. Taking both a first and second order perspective in phenomenography influences how research questions are expressed. Questions are asked about “how” and “what” is experienced instead of “why” (Yates et al., 2012). This study follows Marton and Booth’s (1997) first and second order approach which is reflected in the research question for this study asking how work and learning are experienced by professionals within complex adaptive organisations.

A key strength of phenomenography is that it offers a rigorous approach to qualitative research, offering both a methodological approach, as well as guidance on how to carry out the research (Tight, 2016). Despite having a significant body of literature describing how to use phenomenography, there is nevertheless flexibility and differences in how the approach is used. This flexibility, and these differences within phenomenographic approaches, can be seen in the large number of studies which have adapted the phenomenographic approach to suit their particular research question (Tight, 2016). This has included, for example, investigating multiple phenomena (Bailey, 2015), the approach taken in this study, as well as using data from sources other than semi-structured interviews, such as observation and organisational documentation (Borup, 2015; Slotte et al., 2004). As Marton and Booth (1997) have noted:
Phenomenography is not a method in itself, although there are methodical elements associated with it, nor is it a theory of experience, although there are theoretical elements to be derived from it …. Phenomenography is rather a way of – an approach to – identifying, formulating and tackling certain sorts of research questions. (p. 111).

This study uses phenomenography to investigate the “how” questions of professionals’ experiences of learning and to inform the methodology, research design, and methods of the study.

**Rationale for selecting phenomenography as the methodology**

At the beginning of this chapter, it was noted that phenomenology could also have been a suitable methodology for this study given its emphasis on the subjective experiences of individuals (Crotty, 1998). Phenomenography and phenomenology share a common epistemological and ontological basis (Cibangu & Hepworth, 2016; Larsson & Holmström, 2007). Although both approaches share a concern with immediate experiences of phenomena (Crotty, 1998), a key difference between the two methodologies is that phenomenology has a strong philosophical emphasis (Creswell, 2013) whereas phenomenography is positioned as an empirical research approach (Marton, 1994; Marton & Booth, 1997). Table 4.1 summarises the key differences in these approaches.
Table 4.1 highlights that both phenomenography and phenomenology are based on a constructivist epistemology and consider intentionality as part of the epistemology, although with a slightly different focus. They also share a common non-dualistic ontology as well as an interpretive theoretical perspective. However, there are significant differences. A key difference between phenomenography and phenomenology, as highlighted in Table 4.1, is that phenomenology is both a philosophical method (Marton, 1994) and a research approach (Crotty, 1998) whereas phenomenography is an empirical research approach (Marton, 1994). Also important to note, is the difference in the research aims for each approach. Phenomenology aims to clarify meaning and structure in a phenomenon (Giorgi in Larsson & Holmström, 2007) while phenomenography aims to describe how individuals experience a phenomenon (Marton, 1981). This is a critical consideration in terms of this study which is an
empirical investigation of professionals’ experiences of work and learning in complex adaptive organisations. Phenomenography is therefore far better aligned to the goals and research question of this study than phenomenology.

Phenomenology and phenomenography also differ in terms of the unit of study. Phenomenography investigates the experiences of individuals. Through the process of phenomenographic analysis, categories of description emerge which describe collective variations in individual experiences (Marton, 1981, 1986; Marton & Booth, 1997). Phenomenology, in contrast, emphasises the subjective experience of individuals and what they have in common (Creswell, 2013). The difference in emphasis between the individual and the collective is important in the context of this study for two reasons. First, the research question examines the work and learning experiences of professionals as a collective group within complex adaptive organisations. Second, as noted earlier in this chapter, phenomenography provides a way in which to analyse individual accounts of how work and learning are experienced within complex adaptive organisations before analysing the data to gain a collective perspective through the categories of description.

In summary, there are three key reasons for adopting phenomenography as the methodology for this study. First, the non-dualistic epistemological and ontological assumptions of phenomenography are aligned with the complex constructivist approach and non-dualistic ontology of this study making it a good philosophical and theoretical match. Second, phenomenography is an empirical research method that describes how individuals experience a phenomenon and provides a robust but still sufficiently flexible methodological framework through which to investigate this research question. As an empirical approach, phenomenography allows for the categorisation of qualitative data
and has been specifically designed to investigate lived experience. Phenomenography offers this opportunity through the process of reviewing the data to establish categories of description which are then reviewed and refined as part of the analysis process to create the outcome space. Third, phenomenography is the most appropriate methodology for analysing data from individuals to form a collective perspective of professionals’ experiences of work and learning. Phenomenographic analysis is therefore very applicable to a complex adaptive systems approach where the inter-relatedness of the system requires both an individual and collective perspective.

Despite its overall suitability, some adaptations to the phenomenographic approach were required to best investigate work and learning together. Previous studies in work and learning have made adaptations to the phenomenographic methodology to better respond to the specific requirements of each study. The specific ways in which the phenomenographic approach has been adapted for this study are outlined in the next section.

**How is phenomenography used in work and learning research?**

Phenomenography originated as a methodology for investigating student experiences of learning (Yates et al., 2012) and has generally continued to explore how individuals learn and consider knowledge within certain contexts (Marton & Booth, 1997; Svensson, 1997). It has been used widely to look at the experience of learning in a variety of contexts such as higher education (Entwistle, 1997; Tight, 2016), teacher education (S. Booth & Anderberg, 2005), learning a second language (Felix, 2009; Polat, 2012), nursing education (Borup, 2015; Sjöström & Dahlgren, 2002), and, work and professional learning (Bailey, 2015; Paloniemi, 2006; Slotte et al., 2004).
Studies in the field of work and professional learning have tended to adapt the phenomenographic approach to better examine their research questions and work contexts. In a recent study, for example, Bailey (2015) used a phenomenographic approach to investigate the ways in which human resource practitioners “describe, experience, understand and analyse their professional development and the use of non-formal learning in that development” through semi-structured interviews and a phenomenographic analysis (p. 220). An earlier study in the human resource development field used phenomenography to investigate how human resource development practitioners described learning at work (Slotte et al., 2004). Slotte et al’s (2004) study is notable in that, while semi-structured interviews are the most common method used in phenomenography (Ornek, 2008), Slotte et al’s study applied a phenomenographic analysis to messages posted to an online discussion forum. Using messages from a discussion board rather than interview data demonstrates some of the flexibility in the phenomenographic approach, where researchers have used the central tenets of phenomenography but adapted it to suit the phenomena or context they are investigating. This study has also adapted the phenomenographic methodology in investigating work and learning concurrently instead of the more usual approach of focusing on a single phenomenon such as learning.

**Adapting the phenomenographic approach for this study**

Although phenomenography was chosen as the most appropriate research approach for this study, the focus of this study in investigating two interrelated phenomena – work and learning – made it necessary to include adaptations to the phenomenographic approach. Traditionally phenomenographic research has tended to look at only one
phenomenon, such as learning (Äkerlind, 2017), however this study investigates professionals’ experiences of both work and learning. As this study is investigating two phenomena – work and learning – an adapted phenomenographic research approach was utilised and the research design adopted is therefore something of a “hybrid” incorporating key elements of the phenomenographic approach (Bailey, 2015). Other researchers have made similar adaptations, for example, Bailey (2015) used phenomenography in her study of human resources professionals when investigating two phenomena – professional development and the use of non-formal learning in professional development. She completed two analyses of the data, one for each phenomenon. Because this present study is based on a definition of work and learning as interrelated phenomena it was determined that it was not possible or desirable to conduct separate analyses of these phenomena. In agreement with much of the work and learning literature which has adopted the notion that when people are working they are learning (Hager, 2011), work and learning are considered together for the purposes of analysis in this study to capture the dual phenomena required by the adaption of the phenomenographic approach. The categories of description and the outcome space then capture experiences of both work and learning within complex adaptive organisations.

In addition, the analysis of this study did not adopt the usual assumption of the phenomenographic approach, namely that experiences of a phenomenon may be organised into a hierarchy that builds until the highest category describes the “most advanced or developed way of experiencing the phenomena” (Tight, 2016, p. 320). This approach is problematic when using the CAOCF as the dynamic and systemic nature of a complex adaptive organisation makes clear that hierarchies are extremely challenging, and perhaps counterproductive, to define. In completing the analysis with the aim of
developing hierarchical categories from the outset this sets parameters around the findings and constrains them in a way antithetical to a complex adaptive systems approach. The analysis was therefore conducted with a more open frame of mind, as proposed by Åkerlind (2005), which looked for categories of description following the traditional analysis approach of phenomenography but without specifically looking for a hierarchy within those categories.

**Limitations of phenomenography**

One of the criticisms of phenomenography is in relation to the categories of description which emerge from the analysis (Tight, 2016). Such criticisms raise questions about the accuracy of the categories, how many there should be, and concerns about how the categories are demarcated (Kember, 1997). Meyer and Shanahan (2002) shared Kember’s (1997) concerns regarding the categories of description and attempted to qualitatively replicate the categories from an earlier study with little success. To increase the validity of the study reported here, and address some of the concerns around the validity of the categories of description, a post-hoc analysis of the categories was conducted as part of this study, after the core phenomenographic analysis, with a view to assessing the extent to which the data supported the categories which emerged.

Although identified as a limitation, this sort of flexibility in the phenomenographic approach, as outlined in Chapter 1, can be considered a strength in this study. As outlined at the beginning of this chapter, complex adaptive systems approaches do not have a strong tradition of using qualitative methodologies. In approaching the study of work and learning from the perspective of professionals within complex adaptive organisations, a more flexible approach was needed to allow sufficient latitude to
investigate a range of possibilities. Phenomenography, as a methodological approach, offered an empirical research methodology with sufficient flexibility to be adapted to investigating work and learning using a complex adaptive systems approach.

A further limitation of the phenomenographic approach which is relevant to this study is Säljö’s (1996) concern that, although data is produced via individuals, it is analysed collectively, a process which he sees as ignoring the individual (Tight, 2016). Säljö (1996) argues that this makes it difficult to then relate the categories back to “living people” (p. 20). In the same way as the issues discussed above regarding the categories of description, this potential limitation does not affect this study in the same way as it might for other studies given the conceptual framework is based on a complex adaptive systems approach. Taking a complex adaptive systems approach necessitates taking both an individual and a collective view of the system as they are interrelated. Phenomenography, in this sense, offers a unique way in which to take individual accounts of how work and learning are experienced in complex adaptive organisations before moving to a collective view in the categories of description. The categories of description are the outcome of a phenomenographic analysis and they describe individuals’ experiences of the phenomenon being investigated while the outcome space draws together the categories of description to describe the overall and collective experience of a phenomenon. (Marton & Booth, 1997)

**Research design**

Adopting phenomenography as the methodology provides a clear pathway for the research design in terms of the methods selected. It also determines the analytical approach taken. The research question being asked in this study is: How do individual
professionals experience work and learning in complex adaptive organisations? To answer this question, the focus of the research design was professionals rather than organisations. The unit of study was therefore individual professionals at work, emphasising the subjective experience of professionals while also positioning that experience within a broader social and cultural context. Although some data was gathered to learn more about the nature of the organisations within which the participants worked, the organisations themselves were not the focus of the investigation. It is important to note that, while this research is likely to gather data from individual professionals on their work context, the focus of this study is on gathering data about professionals’ experiences of work and learning. Further research investigating the workplaces and organisations of the professionals would be required to fully investigate relationships between context, agency, and individual experience more broadly.

The remainder of this chapter outlines the overall research design utilised for this study. It details the participant selection, interview design, data collection, and data analysis processes as well as outlining the ethical considerations of the research.

**Participants**

**Participant selection**

Participants were identified using existing professional networks of the researcher and a convenience sample (Saumure & Given, 2008) was then taken from across a range of industries, organisation types, and hierarchical levels based primarily on access to participants and their willingness to participate. The participants were, where possible, selected from different levels of organisational hierarchies with the goal of having as
even a representation as possible from all levels of professionals including individual contributors (no management responsibilities), managers, and executives. Participants were selected using a purposive sampling approach (Palys, 2008). A purposive sampling approach signifies that the sampling process, as described above, involved a series of strategic choices about the participants and how their selection might further the aims of the research (Palys, 2008). Purposive sampling is common in phenomenography (Yates et al., 2012) and participant selection in phenomenographic studies is generally not random as the characteristics of the participants are influenced by the phenomenon being investigated (Åkerlind, 2005; S. Booth, 1997; Marton, 1986).

The organisations where the professionals worked were not purposively selected. The professionals were identified first and their suitability considered in terms of the nature of their work. Following an initial examination of the professionals’ work and accessibility for interviews, their organisations were then examined against the CAOCF to establish if they were suitable to consider as complex adaptive organisations. This process, and the outcomes, are documented in chapter 5.

Using a purposive sampling approach, fourteen participants were interviewed for the study, which is in line with the usual phenomenographic practice of having around fifteen to twenty interviews in order to reach a saturation of categories (Dunkin, 2000). In a phenomenographic study it is important to interview enough participants to ensure that there is sufficient variation across the sample but this must be balanced with interviewing a manageable number of participants (Bowden, 2005). Bowden notes that 20 to 30 participants generally have both sufficient variety as well as being a manageable number for a group research project. However, this study is not a group...
research project and, as such, Trigwell’s (2000) suggested minimum number of ten to fifteen participants was adopted instead to ensure a reasonable change of variation as well as to ensure a manageable number of interviews for a sole researcher. The final number of fourteen participants was arrived at by aiming for the minimum suggested number of ten to fifteen participants and finding fourteen willing to participate who created the most effective sample given the criteria outlined earlier.

**Participant profile**

As discussed above, participants were purposively selected (Palys, 2008) for their participation in jobs from a range of job levels, ages, organisation types, and industries within Australia. The professionals interviewed were evenly split along gender lines with seven women and seven men interviewed. Further, reflecting the Australian workforce demographics (Workplace Gender Equality Agency, 2014), there were fewer women in leadership positions who participated in the study than men. Within this sample, there were more women found in administration/support and technical positions and more men found in management and executive positions. There were no men interviewed in administration/support positions and no women in manager positions, although there were women interviewed at senior manager and executive level (see Figure 4.1).
Overall there was an even representation from across all occupational levels (see Figure 4.2) except for administration/support professionals of whom there were only two. The professionals also came from a range of ages, with the ages ranging from 27 to 54 years old. This age range included early, mid- and late-career age groups.

The participants were employed in a range of industry types (see Figure 4.3) as well as from across Government, for-profit and not-for-profit sectors (see Table 4.4).
This diversity of participants in relation to the types of organisations, hierarchical levels within those organisations, industry sectors, and gender ensured that the categories of description were as broadly applicable as possible, and met the recommended number of participants for a phenomenographic research approach (Trigwell, 2000).

**Data collection**

The overall research design for this study was a series of semi-structured interviews with professionals within organisations which were characterised as complex adaptive organisations using the CAOCF. In phenomenographic research, the preferred method is the semi-structured interview (Ornek, 2008) and this was the primary method of data collection used in the present study. In addition, desktop research using organisational websites was conducted to learn more about the organisations in terms of their organisational goals, structures, and learning and development systems and practices.
The interview data, supported by data from the desktop research, provided support for determining that the organisations studied were complex adaptive organisations using emergence and the three key elements of the CAOCF.

The semi-structured interviews used a combination of direct questions and critical incident questions (Butterfield et al., 2005) to encourage participants to reflect on specific learning situations and describe their experiences of them. The interview guide (see Appendix 3) shows how the interview was established by asking general questions about the organisation and the professional’s role within it before moving through to direct questions about their learning at work. The opening questions of the interview were more structured to gather information about the organisation, the professional’s work context, and their job responsibilities. The critical incident questions were used in the second half of the interview and were designed to make it easier for the participants to access their reflections rather than relying solely on direct questions about the nature of their work and learning experiences. The critical incident questions asked the professionals to reflect on a situation where they felt learning had occurred in their job and to identify which part of that experience they felt constituted learning. Professionals were also asked how they “learned the ropes” when they first started in their job and to describe the process of their learning at a time when they needed to learn something new for their role (see Appendix 3 for details). As Ashworth and Lucas (2000) suggest, a style of interview with open-ended questions and with an empathetic interviewer, is the most appropriate research method for phenomenographic research and this recommendation was taken up in conducting the interviews in this study. This interview design, focusing mainly on open-ended, critical incident questions (Butterfield et al., 2005), aligns with Marton’s (1994) recommendation that interviews, as much as
possible, follow what the participant says in order to investigate the phenomenon as it is experienced and to enable a thorough exploration.

The interview questions were developed by referring to both the research question and the CAOCF. An initial group of questions was developed with the aim of gathering data about the professionals’ experiences of learning. These questions were refined and consolidated to form the first draft of the interview guide. The interview questions and technique were piloted with professionals from a not-for-profit organisation which was determined to be a complex adaptive organisation. These professionals were strategically selected from the professional networks of the researcher as experienced practitioners in the field of work and learning and who were trusted to provide robust feedback from the point of view of both a participant and a learning professional. The pilot of the interview questions allowed for a review of the interviewer structure, the questions being asked, and how prompts and follow-up questions were being handled (Ashworth & Lucas, 2000). Two key changes were made to the interview guide based on the pilot. First, a few questions were changed to make them more open-ended as the trial participants had noted that some of the questions appeared to be leading questions in that it seemed the interviewer may have been “looking for something in particular”. Second, the more structured questions regarding the organisation and the participant’s job were moved to the start of the interview. This was partly to help build rapport by asking the participant to talk about themselves and describe their job rather than starting with direct questions about learning. Moving the more structured questions also had the benefit of focusing the participants to think about their current job and their place within the broader organisational structure (see Appendix 3 for the interview template).
In terms of process, the pilot interview also provided the opportunity to trial the process and structure of the interview meeting itself, in addition to the questions asked. A script was added to the first page of the interview guide to ensure consistency of explanation of the study for all participants and each interview progressed according to the order of questions in the interview guide. On first contact, via email, participants were provided with an overview of the study in the form of a Participant Information Sheet (see Appendix 1). Once participants had agreed to participate they were then sent a copy of the Participant Consent Form (see Appendix 2) via email to read in advance. The second email also confirmed the details of the interview in terms of time and place. At the beginning of the interview meeting, participants were asked if they had any questions arising from the Participant Consent Form or Information Sheet and, once any questions were answered, the participant was asked to sign the consent form. These forms were scanned electronically and stored on a secure server separately from the interview transcripts to ensure the anonymity of the participants and confidentiality of their responses. The interview then proceeded using the interview template as a guide.

The duration of the interviews was, on average, forty-five minutes. All fourteen interviews were digitally recorded producing around sixteen hours of interview recordings. These recordings were then transcribed verbatim, with all the participants de-identified using numeric codes, producing 225 pages of transcripts which were then stored on a password protected, secure server. Some handwritten notes were taken by the interviewer during each interview, mainly encompassing brief notes on the topic areas discussed for each question. These notes were then used as a complement to the transcripts and a memory prompt as required when transcribing. The whole transcripts
were then subjected to the adapted phenomenographic analysis to produce categories of description and the outcome space, which are both discussed in Chapter 6.

**Ethics**

This study gained ethics approval through the Human Research Ethics Committee of the University of Technology Sydney with the approval number HREC2010-349A.

The following table (Table 4.5) describes the potential ethical risks to the study. Each of these risks was rated according to its likelihood and impact. Mitigation strategies were developed for any risks that have been identified as high or medium in any category and these are discussed briefly below.

<table>
<thead>
<tr>
<th>Potential Risk</th>
<th>Likelihood (High, Medium, Low)</th>
<th>Impact if Triggered (High, Medium, Low)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privacy/De-identification of participants and organisations</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>Commercial sensitivity</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Data storage (recordings and transcripts)</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>Confidentiality (transcription)</td>
<td>Low</td>
<td>High</td>
</tr>
</tbody>
</table>

*Table 4.3 Potential ethical risks*

**Privacy/De-identification of participants**

All participants were allocated a unique identifying number. In case further discussions were required with a participant to clarify data, a password protected document was retained containing both names and identifying numbers. This was stored separately from the interview recordings and transcripts on a secure server.
Commercial sensitivity

All commercial-in-confidence restrictions of the organisations were respected and adhered to and organisations were de-identified. Organisations were referred to only by their industry sector (e.g., banking, retail, pharmaceutical).

Data storage

Interviews were digitally recorded in MP3 format and then transcribed into electronic file format (MS Word). Both these file types are only identified by the unique numeric code assigned to each participant and a broad description of the industry sector (e.g., banking or pharmaceuticals). These files were stored on a secure server for the duration of the data collection and analysis which was password protected and backed up daily. After the study concluded, these files were stored on University of Technology Sydney servers for the required length of time (five years from the submission of the dissertation) as required by the Australian Code for the Responsible Conduct of Research (National Health and Medical Research Council, 2007).

Confidentiality

Individual participants were de-identified using a numeric code and are referred to only by their job title in written works. Organisations have been similarly de-identified and are referred to only by their industry sector. All interviews were confidential in line with university ethics policies (University of Technology Sydney, 2014).

Adapted phenomenographic data analysis

In phenomenographic research the term conception is often used to describe individual’s ways of experiencing an aspect of reality (Sandbergh, 1997). When
analysing the data, conceptions are usually presented as *categories of description* which are then summarised in the *outcome space* (Marton, 1981, 1986, 1994; Marton & Booth, 1997). The overall goal of the research is to identify and describe individual’s experiences, or conceptions, as faithfully as possible.

There is no single data analysis technique within phenomenography (Yates et al., 2012). Researchers have different approaches to the analysis of the interviews in order to formulate their categories of description (Walsh, 2000). Although common practices exist, they are somewhat underreported in the literature (Ãkerlind, 2005). The first of these common practices, as described by Ãkerlind (2005), is the importance of maintaining an open mind in approaching the analysis with a view to reducing the influence of predetermined views and the researcher being willing to “constantly adjust her/his thinking in the light of reflection, discussion and new perspectives” (p. 323). The need to maintain an open mind when analysing the data, raises the issue of “bracketing”, a term originating in phenomenology. Bracketing refers to the need for the researcher to, as far as possible, put aside his or her own assumptions in order to focus on the participant’s point of view (Ashworth, 1999). Any presuppositions derived from theories and prior research must be acknowledged and put aside, in addition to any assumptions on the part of the researcher. In terms of this study, the CAOCF formed a key part of the process of bracketing by enabling theoretical presuppositions to be clearly defined from the outset and then used as part of the final stage of analysis.

A second common analytical practice in phenomenography described by Ãkerlind (2005) is maintaining that “a focus on the transcripts and the emerging categories of description as a set, rather than on individual transcripts and categories, is also essential
in order to maintain focus on the collective experience” (p. 323). Phenomenographic analysis is a strong iterative approach, as the transcripts initially, and later the categories of description, are reviewed and refined, grouped and regrouped, to arrive at the final categories. This study adopted this iterative approach, first by analysing the whole transcripts, and then revising the emerging categories of description over a period of around twelve months.

Walsh (2000) notes that phenomenographic analysis “focuses on the relationship between the interviewee and the phenomenon as the transcripts reveal it” (p. 20) but questions whether phenomenographic analysis is a process of construction or discovery. This is an important question, as the answer helps determine the method of data analysis. Taking a construction view, the researcher “draws on his or her particular perspective to describe the relationship the interviewee has to the phenomenon: the researcher’s perspective influences the categories ‘in’ the data” (Walsh, 2000, p. 20). The discovery perspective assumes that categories are discovered in the data independently of the researcher or their method of analysis (Walsh, 2000). This study takes a construction stand-point, in line with the epistemological assumptions of the study, when it comes to data analysis. Framing the study using the CAOCF brackets the study from the outset and guides the analysis which, in turn, influences the categories emerging from the data.

Generally, phenomenographic studies focus on lived experiences of a single phenomenon, often learning (e.g., Bliuc et al., 2012; Felix, 2009; Wilhelmsson et al., 2010). As previously outlined, this study, taking an adapted phenomenographic research approach to investigate professionals’ experiences of the interrelated phenomena of
work and learning, differs from other phenomenographic studies in that there are two phenomena under investigation. As discussed earlier, this in itself is not new, as Bailey’s (2015) study of the professional development of human resources practitioners also investigated two phenomena – professional development and non-formal learning. Bailey (2015), however, conducted two analyses, one for each phenomenon, which resulted in two sets of categories of description and two outcome spaces. The difference between the present study, and Bailey’s (2015) study, is that the present study considers work and learning as interrelated phenomena which it is argued cannot, and should not, be considered separately. As such, only one analysis was conducted of the data producing one set of categories of description and one outcome space describing experiences of both phenomena.

Phenomenographic studies also assume that the categories of description should be organised into a hierarchy in which the highest category describes the “most advanced” way of experiencing a phenomenon (Tight, 2016, p. 320). As outlined earlier in this chapter, this is problematic within the dynamic and highly networked contexts of complex adaptive organisations. Approaching the analysis with the goals of creating a hierarchy of categories of description also sets parameters around the findings, and challenges the researcher’s ability to conduct the analysis with an open mind, as proposed by Åkerlind (2005). The adapted phenomenographic analysis for this study looked for categories of description following the traditional iterative approach of phenomenography but without specifically looking for a hierarchy within those categories.
As outlined in Chapter 1, there were two parts to the research question which required different analyses of the data. The first part of the research question concerned the concept of complex adaptive organisations and so the data was analysed using the CAOCF to determine that the organisations studied were complex adaptive organisations. To operationalise the conceptual framework, the core concepts of the complex adaptive organisations conceptual framework were distilled into a series of questions (shown in Table 4.5), and were then used to analyse the interview data and determine whether the organisations studied were complex adaptive organisations. The outcomes of this analysis are discussed in Chapter 5.

| Emergence                                | • Do the professionals engage in work that changes day-to-day?  
                                           | • Is change a constant feature of their organisational life?  |
|------------------------------------------|---------------------------------------------------------------|
| Adaptation                               | • Do professionals need to adapt to changing circumstances?  
                                           | • Is learning described as a continual process?              |
| Complex social networks                  | • Do the professionals work across structures such as virtual teams, matrix teams, cross-functional teams?  
                                           | • Do professionals identify belonging to a professional or organisational network of colleagues?  |
| Agency                                   | • Do the professionals have the power to change things to meet their needs?  
                                           | • Do the professionals intentionally plan and complete their own work and work goals?  |

*Table 4.4 – Analysis questions based on core concepts of the conceptual framework*

The second part of the research question examined professionals’ experiences of work and learning in complex adaptive organisations. The analysis process for this part of the study was taken from the phenomenographic process described by Patrick (2000) and Dunkin (2000). First, the interviews were transcribed verbatim before two further reviews of the full transcripts were conducted to gain a thorough overview of the data. This yielded a lengthy list of themes, which was sorted and refined into high-level themes and sub-themes based on the research question. Next, this list was refined to
develop a coding framework, which was then used to code the transcripts using the qualitative research software Dedoose (www.dedoose.com). To do this, the transcripts were uploaded to Dedoose along with “descriptors” for each which tracked organisational information such as organisational type (e.g., private, public) and industry sector, as well as non-identifying information for individual participants such as age, gender, and organisational level (e.g., manager, executive). The coding framework was also created in Dedoose and used to code each transcript by highlighting excerpts and assigning codes to them (see Appendix 4 for the coding framework). In many cases, each excerpt had multiple codes attached. Each transcript was reviewed twice in this manner. The coded excerpts were then analysed using the Dedoose analytic tools, and key themes identified overall and for the research question. These key themes formed the starting point for the categories of description refined through further reviews of both the whole transcripts and the coded excerpts. This process of iterating the categories of description took around one year, often with a significant lapse of time of some months between iterations. Overall, there were around ten iterations of the categories of description over this time.

It is usual in the analysis stage of a phenomenographic study to have both a researcher and a challenger in order to ensure inter-judge reliability (Sandbergh, 1997). Phenomenographic researchers have traditionally looked to inter-judge agreement to address the issue of recognising conceptions in the categories developed (Marton, 1986). Inter-judge agreement, or reliability, is sometimes “characterised as a measurement of the communicability of the findings produced within phenomenography” (Sandbergh, 1997, p. 205). Inter-judge reliability requires more than one researcher to read the same data as the original researcher and categorise it using
the initial categories that the original researcher has developed. The use of multiple researchers to review the categories of description was not possible in this study as it was conducted by a sole researcher. Patrick (2000) discussed how she chose not to re-categorise her research material saying that it was a large task to be undertaken as part of a PhD project and that, as Sandbergh (1997) argued persuasively, inter-judge reliability was not required. Like Patrick (2000), this study has been completed as a PhD process and it is therefore not practical to have additional reviewers for the categories. In order to address issues of reliability, this study adopts Sandbergh’s (1997) interpretive guidelines, as did Patrick (2000).

Sandbergh (1997) argues that because of the “epistemology of intentionality” underlying phenomenography it is more important to establish the reliability of the researcher’s interpretation – “reliability of results relating to objective reality falls outside the domain of interest” (p. 209) – rather than inter-judge reliability. This means that researchers must recognise and deal with their subjectivity throughout the research process. It is possible to achieve this using phenomenological reduction (Sandbergh, 1994). Marton and Booth (1997) hold that:

At every stage of the phenomenographic project the researcher has to step back consciously from her own experience of the phenomenon and use it only to illuminate the ways in which others are talking of it, handling it, experiencing it, and understanding it. (p. 121).

Sandbergh (1997) subsequently offers a number of guidelines that Patrick (2000) adapted for the purposes of her research. It was Patrick’s (2000) steps that were used to guide the analysis for this study, as outlined below:
• An orientation towards the phenomenon and how it appears throughout the research process;
• Seeking to describe the experience under investigation, rather than trying to explain it;
• Horizontalizing the material being analysed—treating everything which is said as being of equal importance;
• Seeking structural features in the experience under investigation;
• Using intentionality as a correlational rule (looking at what is focused on and how it is represented). (p. 131)

As with both Patrick (2000) and Dunkin (2000), the whole of each transcript was used in this study rather than parts thereof. Phenomenographers differ on the issue of whether transcripts should be used as a whole (Trigwell, 1994) or may be dealt with as sections or fragments (Marton & Booth, 1997). Dunkin (2000) describes how, in her PhD project, she adopted the more cautious approach of using the whole case and this was the approach used in this study, particularly given a lack of inter-judge reliability. This process also guards against the additional bias that could arise in selecting sections of the transcripts that are useful.

Dunkin (2000) also offers a useful approach to help ensure an appropriate distance is maintained from the work of categorisation. In keeping with her recommendations, there was a minimum one-week gap, often longer, between iterations of the categories of description. This allowed an examination of the transcripts “with new eyes to a satisfactory level of rigour” (Dunkin, 2000, p. 131).
Reliability was also assessed by working backwards from the final categories and re-
coding the data in a post-hoc analysis to determine if there was direct support for the
categories. While this is not traditionally part of the phenomenographic approach, it
provided an opportunity to verify that the categories of description were supported by
the data. This final analysis provided the excerpts which are used in Chapter 6 to
support of the categories of description.

**Strengths and limitations of the study**

Two main strengths were identified in this study: the indicative sample and the adapted
phenomenographic methodology. Two main limitations of the study were also
identified: the focus on professionals and time constraints on the interviews.

A strength of this study was that the sample was taken from a range of industry sectors,
organisations, job types, and job levels representing a diversity of perspectives in the
data and the categories of description. In terms of the conceptual framework, the range
of organisations included in the study provided a sufficient sample to assess the
suitability of the framework for investigating experiences of work and learning.

Although the CAOCF was developed specifically for this study, it was always hoped
that it might form the basis of future research in the field. This is discussed further in the
next chapter.

In terms of the limitations of the study, focusing of the study on professionals within
Australia limited the immediate applicability of the study to these contexts. Limiting the
study to professionals within Australia was a conscious choice in terms of marking the
boundaries of the research and ensuring that a suitable sample could be gathered and
analysed within the time available. In utilising the professional networks of the
researcher to gather a convenience sample, it was possible to interview a sufficient number of participants across a variety of organisations and industries.

The use of professionals who were based primarily in office contexts also presented challenges in terms of the duration of interviews. While participants had initially agreed to an interview of up to one hour in duration (see Appendix 1 for the participant letter), it was found in practice that this was not always possible. Since the interviews largely took place within the workplace and within work hours there were necessarily constraints on time and interruptions, requiring a flexible approach to the interviews. In some cases, this meant that the interviews were not as long as had been hoped but, fortunately, all the key aspects were still addressed even if the responses were succinct.

A lesson from the interview process was that those interviews conducted away from the workplace, for example in a nearby café, enabled a greater depth of discussion despite presenting challenges for audio quality in the recordings. However, it was not always possible to leave the workplace completely and so allowances were made as needed to accommodate the needs of the busy professionals interviewed.

**Concluding comments**

This qualitative study uses phenomenography as a research approach to examine individual’s experiences of learning in complex adaptive organisations.

Epistemologically, this study takes a complex constructivist perspective (Doolittle, 2014) which unites social constructivism and complexity. Aligned with the complex constructivism approach, this study emphasises the active construction of knowledge and the adaptive nature of knowledge construction as part of individuals’ interactions with one another and with their environment (Doolittle, 2014). Phenomenography, as a
research approach, aligns well with these philosophical assumptions as it is specifically
designed to examine individuals’ experiences of phenomena within a non-dualistic
philosophy.

The phenomenographic approach has been adapted for this study to investigate work
and learning in concert with the CAOCF, which has influenced the underpinning
assumptions of the research as well as providing a framework for the analysis. Two
adaptations were made to the phenomenographic research process for this study. The
first adaptation was to consider dual phenomena – work and learning – rather than the
usual single phenomenon. The second adaptation was to reject the assumption that the
categories of description should form a hierarchy with the highest category representing
the most advanced experience of the phenomenon. Transcripts from fourteen semi-
structured interviews were analysed using this adapted phenomenographic approach to
produce the categories of description and outcome space which are discussed in Chapter
6. The next chapter describes the organisations studied and draws on the interview data
to show that the organisations in the study are complex adaptive organisations.
Chapter 5 Complex adaptive organisations: Evidence from the study

An important concept underpinning the research question for this study was complex adaptive organisations. A complex adaptive organisation is one which demonstrates emergence and the three key elements of the complex adaptive organisations conceptual framework (CAOCF) outlined in Chapter 3 – adaptation, emergence, complex social networks, and agency. This chapter presents an analysis of the interview data, supported by desktop research, which shows that the organisations studied were complex adaptive organisations. In the earlier chapters, two parts of the research question were identified – complex adaptive organisations, and professionals’ experiences of work and learning. This chapter focuses on the former aspect of the research question while Chapter 6 outlines the categories of description which describe professionals’ experiences of work and learning in complex adaptive organisations.

Identifying complex adaptive organisations

As outlined previously, complexity approaches have been taken up to describe the workings of organisations within the literature of organisational learning (Chiva et al., 2014; Chiva et al., 2010; Desai, 2010), organisation studies (Tsoukas, 2005; Tsoukas & Dooley, 2011), and, increasingly, the literature of work and professional learning (Fenwick, 2010b, 2012a; Fenwick & Dahlgren, 2015; Jones & Corner, 2012). Within this body of research, discussed in Chapter 2, complex adaptive systems are proposed as increasingly useful to describe organisations, and to understand learning in organisations. A feature of these approaches has been to “understand organizations and groups as complex adaptive systems” (Jones & Corner, 2012, p. 392). For example, in
her work using complex adaptive systems to frame organisational management, Palmberg (2009) describes the features of complex adaptive systems which she has identified in the literature before using a complex adaptive systems approach to define the organisations in her study. An underlying assumption of complex adaptive systems approaches is that organisations are complex adaptive systems and insights may be gained by studying them as such (Axelrod & Cohen, 1999; Gell-Mann, 1994).

Following these researchers using complex adaptive systems approaches to study organisations, this study focuses on organisations understood as complex adaptive organisations. In asking how professionals experience work and learning in complex adaptive organisations, it is important to establish whether the organisations in this study may be characterised as such. As outlined in this chapter, the interview data was analysed to establish if the organisations in this study were complex adaptive organisations. Further data was collected through desktop research, including reviewing company websites and organisational documents that some of the professionals shared during their interviews to highlight aspects of matters discussed. These documents are unable to be referenced directly as some of the documents were commercial-in-confidence. Furthermore, to reference the documents would also identify the organisations. The analysis used emergence and the three key elements of the CAOCF outlined in Chapter 3. Using the conceptual framework as the basis of the analysis, the central ideas of emergence and the three key elements of complex adaptive organisations were distilled into questions which were used to analyse the data and determine whether an organisation may be considered a complex adaptive organisation. Table 5.1, below, outlines these questions.
### Table 5.1 – Analysis questions based on the core concepts of the conceptual framework

| Emergence | • Do the professionals engage in work that changes day-to-day?  
| Adaptation | • Is change a constant feature of their organisational life?  
| Complex social networks | • Do professionals need to adapt to changing circumstances?  
| • Is learning described as a continual process?  
| • Do the professionals work across structures such as virtual teams, matrix teams, cross-functional teams?  
| • Do professionals identify belonging to a professional or organisational network of colleagues?  
| Agency | • Do the professionals have the power to change things to meet their needs?  
| • Do the professionals intentionally plan and complete their own work and work goals?  

Considering the interview data and organisational documents in the context of the complex adaptive organisations conceptual framework, this chapter evaluates the elements indicating that the organisations are complex adaptive organisations. Part of this analysis reflects the individual professionals’ experiences of work and learning, connecting to the broader organisation through the influences shaping the professionals’ experiences, such as organisational change. A brief description is given of each organisation before discussing how the data indicates that each organisation studied is a complex adaptive organisation. Organisations are identified only by their industry and all efforts have been made to de-identify the organisations. The professionals have also been de-identified and are referred to by indicative job titles.

**Studied organisations as complex adaptive organisations**

**Banking**

One professional was interviewed from the Human Resources function of a major Australian bank who worked as a “learning projects manager”. The bank is one of the largest in Australia with offices around the country as well as internationally with numerous inter-related functional areas operating across all aspects of retail, investment
and commercial banking, employing around 32,600 people. Matrix, virtual, and cross-functional teams were key features of the organisational structure.

Within the bank, the professionals engaged in non-routine work within the head office context which changed frequently according to business needs. For example, the organisation moved headquarters to a new, custom-built space as well as having undergone several organisational restructures over recent years. The learning projects manager interviewed described her learning as a continual process and outlined how learning was strongly promoted by the organisation. The bank provided structured learning and development opportunities for employees incorporating face-to-face courses, online courses and reference materials, experiential learning programs, and coaching programs. The learning projects manager described how:

we provide online and face to face courses, we also provide access to research and information and that is in a number of different ways so we provide support to be part of a sort of industry body or organisation ... we provide study assistance – from full fee support and additional leave to attend .... We also have processes where employees recognised as top tier talent will undertake initiatives from sort of one-off course type initiatives to longer periods where they’re seconded to work on projects or they’re job shadowing or otherwise. Some of them are in sort of more formal blended programs of nine to 12 months that involve a range of jobs.

3 To preserve the anonymity of the professionals interviewed, the gender pronoun used for of each professional have been randomised. The first professional is referred to as “her” and the remainder of the professionals alternate between male and female personal pronouns.
In terms of the questions listed earlier in Table 5.1, the bank may be considered a complex adaptive organisation in terms of its structure as well as the nature of the work and interactions of the employees, as described by the learning projects manager interviewed. The questions relating to emergence, focused primarily on change as a more visible manifestation of emergence within a system. Within the bank, the learning projects manager described her work as changing day-to-day as well as requiring adaptation to a changing business, particularly in banking post-global financial crisis. Change was described as a constant feature of organisational life requiring a continuous process of learning and adaptation on the part of the professionals. From an organisational perspective, a large amount of resources was devoted to what was termed “learning and development initiatives”. The bank had dedicated learning staff, such as the interviewee, as well as an elaborate structure of courses and other learning resources which employees were encouraged to include in their “annual development plan”, a document which all staff completed outlining their “learning goals” for the year. In this process, as with much of their roles, the professionals within the organisation took an active part in planning and completing their own work and setting work goals.

Structurally, the professionals worked within virtual teams across Australia and internationally with numerous cross-functional teams working on projects within the Australian head office. Indeed, the learning projects manager described how participating in such projects was an important part of her learning and was recognised as such by the organisation. She outlined how she had included cross-functional project work in her annual development plan for the year to gain experience across the organisation and expand her networks. Overall the structure of the organisation was described by the learning projects manager as:
increasingly more networked but it is still very much a pyramid structure.

The organisation had many functional areas which served to demarcate work across the organisation but, increasingly, the professionals needed, and were encouraged, to work across functional lines to avoid duplication of work and be more strategic with a whole of organisation approach to business goals. Professionally, the learning projects manager identified strongly as a “learning and development professional” with strong links to professional networks in this field outside of the bank in which she worked. She described these links to professional networks as important to her own career development and, importantly, learning and growing in her chosen profession. She also described how she saw these networks operating in that:

there is an element of managing and maintaining a network of people and not sort of in a self-promotion networking sense. But being in touch with what is happening with the industry .... and maintaining some close contacts in the vendor community and trying to be across what they’re delivering not just for organisations like ours but for other organisations. I’m (also) involved in a group called Learning Cafe .... a sharing thing and there are conferences that are run; a few a year.

Analysing the interview data against emergence and the three key elements of the CAOCF indicated that the bank is a complex adaptive organisation. The learning projects manager interviewed described a work context in which change was ever present, requiring ongoing adaptation and learning. The professional further described the importance of working across organisational and professional networks outside of
the organisation as well as how agency was exercised in planning and completing her day-to-day work.

**Professional services**

A professional, identified as a “knowledge manager”, was interviewed from the Australian-based business of an international consulting firm with offices in all major Australian cities and operating as a partnership network of organisations globally. The organisation provided accounting consulting services as well as, increasingly, management consulting services. The organisation was structured using matrix, virtual, and cross-functional teams where professionals frequently worked on-site within client organisations and needed to respond flexibly to the needs of their immediate project. This professional’s work was subject to change according to both business and client needs and the knowledge manager was largely self-directed in his work.

The knowledge manager described his need to work across multiple client sites and projects, as did most of the professionals in the organisation, providing layers of complexity within the networks of the organisation in terms of the work undertaken. For example:

> there are always multiple stakeholders when you’re trying to do anything internally. And there is, especially with big decisions, there’s lots of backroom negotiating and just because an order is issued from the top doesn’t mean that it will stick.

Even though he worked within the head office in Sydney, his work included providing services to, and collaborating with, remotely located employees as well as those in head
office. The knowledge manager described a great deal of agency in organising his own work and had flexibility to work on cross-functional projects which interested him and which were encouraged by the organisation.

The organisation has remained relatively stable in terms of structure over recent years but has found a need to adjust to changes in client requirements and the global economy. As primarily an accounting consultancy, the global financial crisis of 2008 had a significant impact on the business and the broader economy, to which the organisation needed to adapt. In talking about complexity in the organisation, the knowledge manager noted that a significant amount of complexity within the organisation arose from:

the speed of change that is impacting its sector, so there’s a lot of regulatory change that’s coming down around things like audit rotation out of Europe. And then there’s things like how you deliver professional services. Up until 10 years ago it was relatively stable; the last 10 years it’s started to change with increasing amounts of outsourcing. So outsourcing professional services, especially to India and The Philippines. The use of digital channels that might suddenly change a service to a product and various other things as well ... So there’s a whole bunch of things that add to complexity, to turbulence; more moving parts in the system.

The knowledge manager described his learning as being continuous, self-directed, and informal. A philosophy of continuous learning and professional development was promoted by the organisation through the messaging from managers around the learning and development systems and practices as well as the provision of learning
opportunities which were described as predominantly structured. Structured learning opportunities were available across the organisation but tended to favour accounting professionals who needed to maintain their annual professional development requirements. Organisatonally, learning was structured around the 70:20:10 framework (Lombardo & Eichinger, 1996; McCall et al., 1988; Tough, 1979) with more emphasis placed, and recognition given, for the “20” (learning from others – here mainly through coaching and mentoring programs) and “10” (face-to-face and online courses).

The highly-networked structure of the organisation, the agency of the professional in how he approached his work, the constant change within the professional services industry as well as the organisation itself, and the adaptation this required from the knowledge manager indicates that this professional services organisation is a complex adaptive organisation.

**Member organisation**

Three professionals were interviewed from a member organisation⁴: a “state sales manager”, an “executive assistant”, and a “systems analyst”. The member organisation provided specialist educational programs to members and to the public as well as professional education and networking events for members only. The organisation also provided advocacy services for issues of concern to members at a State and Federal government level within Australia and New Zealand and was increasingly providing services into international markets, particularly in Asia and the Pacific. The organisation

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⁴ “Member organisation” refers to a peak professional body which represents the interests of a specific professional group. The organisation is made up of employees as well as paying members for whom the organisation provides professional advice, education, advocacy, and professional development and networking opportunities.
was a medium-sized enterprise with around 250 employees across Australia and was growing rapidly at the time of the interviews.

The organisation has undergone a continual process of change and renewal from January 2012 when a new strategy and subsequent organisational structure were adopted. These changes were followed by a change in Chief Executive Officer. As a consequence of a considerable change in structure and direction for the organisation, it began to position itself as an international organisation, particularly across Asia and the Pacific, rather than solely serving members in Australia and New Zealand as had previously been the case. Structurally, most of the staff were based in Sydney with satellite offices in each state capital around Australia and an office in New Zealand. Cross-functional project teams and the services of contractors were used a great deal within the organisation for flexibility in resourcing as well as employees participating in advisory committees and projects outside of the organisation. This work was subject to change according to business and member needs, with professionals being largely self-directed in their work. The state sales manager described how the constantly changing context required:

*Listening and being able to work autonomously and be able to be adaptable to change because there’s a lot of things that happen on a daily basis that, whilst you could be the most organised person in the world, you need to be able to adapt and change if things don’t go according to that plan. It’s a very turbulent environment at times.*

The professionals interviewed mainly described setting their own goals and tasks within broad strategic objectives and initiatives. The executive assistant could set her own
work goals to a lesser extent than her colleagues as her job was structured around reacting primarily to the needs of others, although she exercised a high degree of agency in determining her day-to-day work. She was, however, encouraged to participate in projects outside of her immediate job both within her department and across the organisation and she enthusiastically took up these opportunities to develop new skills and meet people from across the organisation.

Among the three professionals interviewed from the member organisation there were differing opinions about how greatly the organisation valued learning since there was only a nascent learning and development offering within the organisation at the time of the interviews. All professionals interviewed described learning and adaptation as being a core requirement of their job as well as a continuous process, however there was little in the way of structured learning available within the organisation specifically for employees. All the professionals interviewed did, however, describe support from their managers in undertaking professional development. For example, the systems analyst described how:

my team is quite good at encouraging us to go to as many [networking events and meetings] as we can …. just give us an idea of not only what is going on in these meetings but …. who are the people there like that sort of stuff. So it’s very encouraging, that’s an excellent ... I guess venue for learning. In regards to other opportunities I think, there is; it’s kind of more up to you in a sense, like if you decide, you know, I really want to learn how to do this one skill, it’s more of an approach to your Manager, they have training budgets and discuss what you’re interested in. And as I mentioned,
my team is quite good, so I would feel very comfortable and have gone up
and said, I’d like more teaching in this, can you put some budget towards
maybe me as an individual going to this more specific and that kind of thing.

The courses provided for members were also used to provide development for
employees, however this was not always effective since the courses did not reflect the
day-to-day jobs of the professionals. At the time of the interviews, the organisation was
in the process of implementing a learning framework for all staff based on the 70:20:10
framework and had hired a learning manager to develop and implement an organisation-wide learning strategy.

This smaller organisation demonstrated the characteristics of complex adaptive
organisations perhaps to an even greater extent than the larger organisations which
formed part of the study. Having fewer employees spread across the same number of
functional areas as the larger organisations, more opportunities were available to
professionals to work on cross-functional teams. The smaller size of the member
organisation also provided increased opportunities for the professionals to create
networks across the organisation and outside of the organisation.

**Retail**

From a retail organisation one professional, a “buying executive” based in Hong Kong,
was interviewed. His job was to source products and liaise with manufacturers in Asia
on behalf of this large Australian retail organisation as well as lead a team of buyers
who were local employees in Hong Kong (the professional interviewed was an
expatriate Australian).
The organisation was a large retailer in Australia with around 180,000 employees in over a thousand locations across the country as well as expanding international operations, mainly across Asia and New Zealand. The business context for this retailer has been turbulent with a series of restructures dating back to 2004 and another about to commence at the time of the interview. Publicly, this retailer had released statements about changing the way in which they work and do business to cope with the changing demands of consumers and to deal with significant financial losses in recent years. Matrix, virtual, and cross-functional teams were all key features of the organisational structure within head office. This contrasts with the structure found within the stores which had a more traditional hierarchical structure with a clear demarcation of work between each layer of managers, supervisors, and general staff. The head office context is the focus of this study, where the professional interviewed engaged in largely self-directed work, changing constantly in line with shifting business and market needs in Australia and for the suppliers across Asia. The buying executive described setting his own goals and tasks within broad strategic objectives and initiatives and needing to work largely alone since he was working in a location remote from the head office in Sydney. This also affected his learning in that:

*it’s more experiential learning … so a lot of our work is based out in, like, China. A lot of it needs to be done out in the field kind of thing. You actually need to go and visit the factory and look at it and see what it is like and, you know, it’s more practical.*

The buying executive described his personal learning as a continual process and referred to an expectation he felt came from the organisation that employees would continually
learn and develop in their jobs in line with organisational needs. The organisation itself had a long tradition of providing structured learning opportunities for its staff as well as a structured experiential learning program particularly targeted at staff in stores but with some aspects also used for those in head office roles.

Analysing the data collected for this retail organisation using the questions derived from the CAOCF highlights how this organisation may be characterised as a complex adaptive organisation. Being a large organisation, there were numerous functional areas with many employees, most of whom worked outside of head office in Sydney. In comparison to the member organisation previously discussed, the retail organisation offers a different perspective on how complexity manifests within organisations. Emergence, and the requirement to adapt, appears constant between the organisations, as does the need to work with a high degree of agency. The differing structures highlight the various ways in which complex social networks operate within different-sized organisations. These networks operate in the same way in each context and mainly vary in terms of scale. In the member organisation, for example, the smaller overall size of the organisation allowed for most professionals within the organisations to get to know each other (a high number of local connections) with fewer but still significant connections outside of the organisation. The retail organisation similarly shows a high number of local connections but differs in that there appear to be fewer longer connections outside of immediate work teams across the organisation due to its far larger size. From the data, it appears that most of these inter-connections are found through cross-functional teams and virtual teams.
The highly changeable and emergent context of the retail organisation, requiring adaptation and the exercise of agency from the buying executive, indicates that the retail organisation is a complex adaptive organisation. Focusing on head office, the professional described a complex, international structure where she worked in Hong Kong but reported to managers within Australia. Working at a physical and temporal distance from head office in Australia required the buying executive to be proactive in determining her own work goals and day-to-day work.

**Aviation**

A “training and compliance manager” was interviewed from an airline employing around 26,600 people in operations in Australia and in other partner hubs around the world. The airline operated within a dynamic industry which had seen a great deal of change in recent years. There was a heavy reliance on contracted and sub-contracted employees, with employees and contractors working across multiple sites and cross-functional project teams. The environment for this airline in the broader global economy and airline industry has been challenging in recent years with a great deal of change both in terms of the structure of the organisation (many jobs have been made redundant or sent offshore) and in terms of service offerings to meet changing customer demographics and demands.

Within the Head Office, the focus of this study, the training and compliance manager engaged in work which changed constantly according to business and market needs. She described setting her own goals and tasks within broad strategic objectives and initiatives. Day-to-day there was little oversight or guidance from her manager on what to do or how to do it.
The training and compliance manager described herself as a keen learner who was continually learning both through what she described as “formal” and experiential learning. However, she felt that there was an organisational focus on structured learning and qualifications over experiential learning opportunities.

[Airline] is very much traditional and only really understands formal [learning]. We’re trying to develop clear definitions of 70:20:10 but we’re going to have to force the issue with that. But it’s mainly because of the traditionalist approach within [Airline] – if you’re not in the classroom, you’re not doing training. So the building you’re sitting in at the moment used to be an apprentice training centre so a lot of people who’ve worked with [Airline], been here [for a long time], they started here in a classroom, learned their business, then went off and did it.

The training and compliance manager described how continuous learning played an important role at the airline since they took great pride in their pilot training program and air steward training program for which there were purpose built facilities and a flight simulator. General staff were also expected to maintain their skills but this tended to be qualification driven although there was little money to pay for external courses resulting in a large apparatus for providing training programs in-house. This resulted in a great deal of training for technical and customer-facing roles and a self-paced approach for those in support roles (generally based in an office context).

The data indicates that emergence was a key influence on the operation of the airline in that the work of the training and compliance manager was not specifiable in advance and was subject to frequent changes. Change, as an ever-present and notable feature of
organisational life for the training and compliance manager, required ongoing learning and adaptation to keep up with changes to jobs and the requirements of the aviation industry. Learning was critical to success within the organisation and structured learning frameworks were important to skill and knowledge development. In adapting to changing contexts, the professional exercised a high degree of agency within the boundaries of her job description. While complex social networks did not emerge as strongly through the interview with the training and compliance manager as with the other organisations discussed to this point, networks were still important in terms of the distributed structure of the airline across numerous Australian and international sites with a diverse workforce. In the same way as the retailer, there appeared to be a much higher number of local connections with fewer longer network connections outside of work groups at each work site. Further, in the same way as the professional from a bank, the training and compliance manager identified strongly as a “learning and development practitioner” and cited her professional networks outside of the airline as being an important part of his work and learning. The data indicated that the airline was a complex adaptive organisation with the professional describing an environment of constant change requiring adaptation, learning, and the exercise of agency across complex social networks within, and outside of, the organisation.

**Television and radio production**

A “radio network manager” was interviewed from a television and radio production organisation located primarily in a head office in Sydney but with correspondents and production crews around the country and with partnerships globally. There was a large reliance on external organisations, as well as contract and sub-contracted employees, to
produce television and radio content. Employees were also expected to increasingly collaborate with the other broadcasters and production companies to develop content and share resources to minimise spending. As indicated in organisational documents, in 2011 the organisation embarked on a process of defining the capabilities required for all jobs and developing a learning framework to support the development of the identified capabilities with both structured learning programs as well as opportunities to learn through work. The capability design project aimed to allow greater mobility within the organisation and clarity as to the skills and knowledge required for each job so that employees would know what was expected of them as well as having better tools to plan their career progression. In addition, the organisation was also changing structurally. Where the organisation had previously been split into platforms (e.g., radio, television news, television drama, online content) there was a move towards greater integration (e.g., having all news departments working together across radio, television, and online) as well as a move to a matrix organisation. As the radio network manager explained:

So structurally ... at the moment, it’s split up into platforms. There are various divisions and they are technology, content, news, sport, radio, so these big kind of chunks of divisions, and we’re just about to move to a more matrix structure which is starting to deal with what they call “the vertical” and this is heading towards the multiplatform, much more contemporary way of working. So we’re looking at those who are working in food and those who are working in feature films and that sort of stuff, but we’re going to approach that in a matrix way.
Within the head office context, the radio network manager’s day-to-day work changed frequently according to business and market needs and according to the technical requirements of his job. He was largely self-directed in his work with minimal direction from management, who often did not fully understand what he did in his job. For example, the radio network manager, who worked mainly on radio programming in languages other than English, commented that:

you don’t speak the languages that you’re working in half the time. It’s quite ridiculous.

The radio network manager described setting his own goals and tasks within broad strategic objectives and initiatives. Day-to-day there was little oversight or guidance from his manager on what to do or how to do it. Since the environment was highly changeable in terms of the requirements of each radio show and the broader changes within the organisation, with tight deadlines unable to be moved (i.e., program times are fixed), he needed to be able to act as the situation demanded working quickly and flexibly without needing to refer to others for approval or guidance.

Using networks as a key part of learning and working emerged strongly from the interview with the radio network manager. He noted that this was one of the main ways in which he had learned throughout his career within the television and radio industry and continued to learn in his current role. He also passed this experience of the importance of building and maintaining professional networks on to new professionals in giving advice such as:

So, I’m saying to the twenty-year-olds you’ve got to understand this [their university degree] is not valued, so go in there. Find the people you need to
speak to. Be a good bloke. Go out there and find the right people. Get them to like you. Ask to hold the camera. Tell them what you can do.

The importance of adaptability to change and complex social networks were strong themes within the interview with the radio network manager. Change was a strong feature of organisational life where adaptation was a continual process driven mainly by learning through work and learning from others. It was noted more than once in the interview that, until very recently, professionals “worked your way up” and learned on the job with few opportunities, or indeed need, for formal qualifications.

The data indicates that the television and radio production organisation is a complex adaptive organisation. Given the pace of change and the need to adapt there was a high degree of agency required from the radio network manager with many decisions needing to be made quickly about how work was done without reference to higher level managers. As previously discussed, networks were critical to operating and succeeding both within this organisation as well as within the media and broadcasting industry more broadly.

**Scientific research**

Three professionals were interviewed from an Australian Government scientific research organisation with around 5,200 employees across scientific, management, and support roles. The three professionals interviewed were: an “early career scientist”, a “scientific manager”, and a “financial analyst”. The organisation had a matrix structure organised according to key project areas which were based on identified national areas of need (e.g., climate change and agricultural development) rather than scientific disciplines. Projects were all managed in cross-functional and virtual teams and there
was a high level of collaboration by scientists with colleagues external to the organisation in Australia and globally.

All three professionals interviewed described an emphasis on learning within the organisation, particularly the two scientists. The scientists both described how the nature of their work at the “edge of knowledge” required them to constantly learn and adapt in a self-directed way to keep up with the demands of their research and keep up-to-date with their field. The financial analyst was primarily focused on continuing professional development and maintaining her accounting qualifications.

Over the past decade, this organisation has been undergoing a series of restructures which has resulted in the development of a highly complex and complicated matrix organisation with cross-functional and multiple reporting lines across projects and research areas and an increased emphasis on external funding. These complex structures have generated some significant changes and challenges to the ways in which the professionals work. In discussing these issues, and how work is allocated within the matrix structure, the scientific manager explained that:

\begin{quote}
So, there are all these kinds of challenges — finding a place in that matrix and making that fit for everybody. Because, of course, we’re not just here to find places for people. We’re actually here to deliver those projects ... and to develop our capabilities such that we can meet challenges in the future as well. But, in order to do that, you need to have staff (laughs) and the staff need to be in a way where they can be achieving those multiple goals, so short-term goals and long-term goals.
\end{quote}
The two scientists and the financial analyst engaged in work which was not always predictable and which changed according to the needs of the various research and commercialisation projects that they may be working on at any given time as well as, in the case of the scientists, their own research interests and career development. The professionals within this organisation determined their own goals and daily work tasks to a very high degree, particularly the scientists who pursued their own research agendas in tandem with their project work. As the early career scientist noted:

*You need to be able to cope with uncertainty, in that you can’t come to work and expect someone to tell you “here’s what you’re going to do today and here’s a list from 1 to 10”, that’s not going to happen.*

Similarly, the financial analyst also noted that:

*there are no written rules, no written procedures, or no set base of doing things, so I have been given say a temporary assignment and I always have an objective in mind that, yes, I need to achieve this by this time, so basically I discuss the strategies. Some background is obviously provided to me by my manager and then if I have any questions in terms of how am I going to approach this, I discuss those with my teammates if they have any information on the matter or my manager and then go from there. So basically it’s on the job learning and just learning as the circumstances come up and talking to various people involved a lot of communication, so if I have to get one answer I’ll have to talk to various people and get one conclusion and so it’s kind of like that.*
The complicated matrix structure of the organisation made networks a critical part of learning and working within the organisation, as alluded to by the excerpt from the financial analyst above. By necessity, the professionals were compelled to maintain their networks across the multiple cross-functional project teams of which they were members. The professionals then had network connections within their own work team but also a strong, at times even stronger, network across various other parts of the organisation and other organisations and external funding bodies.

The organisation provided a range of learning programs through its Learning and Organisational Development function which were open to all employees and targeted at various levels. The scientific manager, as someone with responsibility for managing both people and projects, noted that he was “put on training” for management and project management skills according to the organisation’s capability framework. The early career scientist referred more to the need to complete compliance modules dealing with legal requirements such as research ethics and workplace behaviour which were largely dismissed as being something that had to be grudgingly undertaken. The financial analyst was more positive in her description of learning within the organisation especially when describing her accounting qualifications, which the organisation supported in terms of providing time to complete the education as well as paying for it.

The scientific research organisation’s complicated matrix structure combined with shifting work requirements, the need to adapt, and a high degree of agency indicated that this organisation is a complex adaptive organisation. Of all the organisations discussed so far, the scientific research organisation is the most structurally complicated, which has a significant impact on the ways in which the professionals
work and learn, especially the importance of working across networks within and outside of the organisation. Each of the three professionals referred to the complicated matrix structure of the organisation and the way in which it impacted the lack of predictability in their work and how it complicated their tasks and interactions. Unlike the other organisations in this study, which had matrix and cross-functional teams alongside a more traditional organisational structure, the scientific research organisation was structured primarily around matrix and cross-functional teams.

**Pharmaceutical 1**

Two professionals were interviewed from Pharmaceutical 1; an “executive assistant” and a “regional remuneration and benefits director”. This organisation was a large multinational pharmaceutical company with multiple divisions organised along functional lines (e.g. human health, animal health, oncology) and a mobile and self-directed sales force spread across Australia. The reporting lines were off-shore to offices outside of Australia and all the functional business entities reported to different regions and head offices in different countries despite being co-located within one office in Sydney. In Australia, the company has around 1200 employees based across the country. Matrix, virtual, and cross-functional teams were all features of the organisational structure, as well as virtual teams across regions. For example, the Human Resources department was managed across north and south Asia from a central hub in Singapore supported by a team based in countries across the region, who seldom met in person.

This organisation has been undergoing significant transformation over the past decade due to changes in the pharmaceutical market and the patent for the most profitable
medicines expiring resulting in significant decreases in revenue. The organisation has
been restructured from a largely self-governing national organisation into separate,
smaller organisations based on functional areas (e.g., nutrition and oncology) which
report off-shore into various countries outside of Australia. For example, the four
business areas in Australia reported to head offices in London, Singapore, and New
York while still being co-located in one office in Sydney. These business areas shared
support functions (e.g., Human Resources, Information Technology and Finance) which
also reported separately to managers based in Singapore. At the time of the interviews
the manufacturing plant based in Sydney was also being closed and production moved
to Singapore.

The shifting and changing context meant that the professionals engaged primarily in
work which was not always specifiable in advance and changed rapidly according to
business and market needs and the demands of multiple stakeholders within the many
different head offices for each business area. The professionals described being largely
self-directed in their work with little detailed direction from their managers who, in the
case of the regional remuneration and benefits director, was based in another country.
Both professionals described setting their own goals and tasks within broad strategic
objectives and initiatives. This was particularly the case with the regional remuneration
and benefits director whose manager was based in New York and, the work was
challenging and often delayed due to the time difference between New York and
Sydney. These challenges also affected the way in which work was completed in terms
of negotiating with many remotely-based stakeholders. As the regional remuneration
and benefits director explained:
there’s not one stakeholder at a country level, and of course we are a matrix
organisation, to get buy-in from the business can be difficult because you’ll
have five or six stakeholders at a country level who all have a say. Then
from an HR perspective because you’ve got support at a country level,
support at a business level, a lot of stakeholders there to keep informed and
get consensus from. Sometimes it’s hard to know just who you should be
consulting with because it’s just such an interwoven support structure.

The executive assistant interviewed had many of the same issues with negotiating
networks, however his work needed to be more responsive to the needs of his direct
manager and to the department he supported. He did, however, exercise a high degree of
agency with regards to how and when he completed the work and how he used his time.

Both professionals described the emphasis placed on continual learning within the
evolving organisation and described the new “online learning portal” as particular
evidence of the shift towards continual and self-paced learning by the organisation. The
regional remuneration and benefits director remarked that:

So we’ve got a portal that is fantastic …. You can go on to that portal, look
at the competencies and there’ll be training that will link to that competency.

“I want to develop my business acumen so what can I do as a formal
learning to develop business acumen?” So there are modules linked to that,
mentoring – I can find a mentor and the mentors nominate their area of
expertise. So if I’m looking for someone to mentor me in business acumen, I
can go on to the portal and seek out someone who’s knowledgeable and who
wants to mentor someone.
The learning portal was structured around the 70:20:10 framework and was centrally managed by global head office in New York with some input regionally (Asia/Pacific region, with the office based in Singapore). A restructure in late 2009 removed the local learning function and professionals were expected to be self-directed in their learning with most the learning opportunities provided through the online portal. Face-to-face courses were minimal and tended to focus on leadership level positions as the programs were run out of each head office (i.e., London, New York, or Singapore) and the expense of sending local Australian or New Zealand professionals was too great to send more than a select few.

Pharmaceutical 1 may be characterised as a complex adaptive organisation when the data is analysed using emergence and the three key elements of the CAOCF. As a multinational organisation with a virtual and matrix structure, Pharmaceutical 1 was structurally very complicated and both interviewees discussed, at length, the need to negotiate multi-faceted networks to do their jobs. The complicated structure of the organisation coupled with a high degree of change also required the professionals to learn and adapt constantly, which was supported by the organisation through a self-paced, online learning portal. The matrix structure also required a high degree of agency from the professionals since often their manager and colleagues worked in a different office either within Australia or, often, in another country, resulting in a high degree of autonomy in completing one’s work and decision-making.

**Pharmaceutical 2**

A “remuneration manager” was interviewed from Pharmaceutical 2. Like Pharmaceutical 1, Pharmaceutical 2 was a multinational pharmaceutical company with
multiple divisions organised along functional lines (e.g., human health, animal health, wellbeing) with a mobile and self-directed sales force. The remuneration manager in Pharmaceutical 2 worked in a very flexible way utilising technology to connect to others in the organisation from a variety of work locations, including working from home which was actively encouraged. The organisation saw working in more flexible and less traditional ways, according to the remuneration manager, as a way in which to break down rigid hierarchies and encourage collaboration across the organisation. Matrix, virtual, and cross-functional teams were all features of the organisational structure both within Australia and across countries. As the remuneration manager noted:

_We are a matrix organisation. So, for example, HR [Human Resources] reports offshore. All of your support functions report offshore but the sales and marketing functions report to the managing director [based within Australia]._

Pharmaceutical 2 undertook a local restructure through 2013 and 2014 which drastically changed the ways in which work was conducted and the physical work space was significantly altered to facilitate this. Professionals were subsequently encouraged to work more flexibly using activity-based work principles (Wyllie, Greene, Nagrath, & Town, 2012) supported by technology such as laptops, smart phones, VOIP phones (which work over an internet connection rather than phone lines), and online

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“Activity-based working” refers to both a workplace design strategy and way of working. The basis of the concept is that people have a choice of settings in which to complete their work based on the type of work they need to complete. For example, quiet spaces for individual work requiring concentration, informal meeting spaces, and so on (Wyllie, Greene, Nagrath, & Town, 2012).
collaboration tools. The remuneration manager engaged primarily in work with a low level of predictability, changing according to business and market needs and needing to be self-managed. Indeed, autonomy and flexibility in approaches to work were actively encouraged as part of the organisation’s shift towards activity-based work, and an emphasis on work-life balance through working from home and working more flexible work schedules.

The remuneration manager outlined a culture of continuous learning focused not only on professional but also on personal development. Professionals were encouraged by the organisation to set quarterly goals for their learning as well as personal development. For example, the remuneration manager was working towards a professional accreditation and included training for a marathon as part of his personal development for the quarter. One of his colleagues had included piano practice as one of her personal learning goals for that quarter which was then discussed at the Human Resources team meeting. The remuneration manager articulated this in terms of a push for greater balance between work and home life as a response to the complications and stresses of daily work:

\[
\text{my development plan is probably more of a holistic plan in terms of it's not just structured around work it's around work-life balance as well. ... Making sure that I still keep time for exercise, time with family, and those sorts of things so that work doesn't become all-encompassing when I'm working on something that's got a big pressure point.}
\]

Pharmaceutical 2 had also, at the time of the interview, recently launched their own organisational “university” which was centrally managed by head office in the USA and
based around an online portal. This portal was, like Pharmaceutical 1, based on the
70:20:10 framework with a greater emphasis on self-paced learning. The learning and
development systems and practices of the organisation were focused on transitioning the
ways in which people worked and collaborated through their move to activity-based and
virtual working.

In terms of the CAOCF, Pharmaceutical 2 may also be characterised as a complex
adaptive organisation. In a similar way to Pharmaceutical 1, Pharmaceutical 2 had a
matrix structure with many reporting lines from Australia to other countries which had
an impact on how work was conducted. Complex social networks were a feature of
Pharmaceutical 2 in terms of a high number of local connections with a smaller but
significant number of longer links (links outside of immediate work teams) to other
parts of the organisation or to professional networks outside of the organisation. For
example, the remuneration manager discussed how he used his peer networks for
learning:

*My predecessor had left in the October and I started in March so there was
quite a big gap .... There was a regional person I could go back to but they
were overseeing so many other markets so sometimes getting share of voice
with that person wasn’t always high on their list of priorities because this is
just one other market. The other people I would sometimes go to were peer
networks so if I wasn’t sure about something I might ring [former colleague]
and I might say look, without sharing any competitive information I’ve got to
do this so can you give me a few pointers or what do you think about that?*
Although the professionals already exercised a high degree of agency in their jobs, this was actively encouraged further within Pharmaceutical 2 with the shift to activity-based working and an emphasis on work flexibility. Although less pronounced than in Pharmaceutical 1, change was nonetheless an ever-present feature at Pharmaceutical 2 requiring ongoing learning and adaptation by the remuneration manager. At the time of the interview this was, again, focused on the large shift towards new ways of working which required not only new skills in terms of using technology but a shift in mindset for managers and their staff as to how work was completed and measured.

The data analysis indicates that Pharmaceutical 2 is a complex adaptive organisation. Pharmaceutical 2 was structurally complex, although less-so than Pharmaceutical 1, and the shift towards more flexible ways of working that were less tied to a single head office location created a need for the remuneration manager to negotiate complicated, multi-faceted networks to do his job. The complexities of, and high degree of change in, the work context required the remuneration manager to constantly learn and adapt, supported by the organisation’s university online portal.

**Concluding comments**

The data analysed from the interviews, and organisational documents, using the CAOCF, indicated that the organisations in this study are complex adaptive organisations using analysis questions based on emergence and the three key elements of the CAOCF – adaptation, complex social networks, and agency. Determining that the organisations studied were complex adaptive organisations responds to one of the two parts identified in the research question. Using the data to indicate that the organisations studied are complex adaptive organisations allows for the next analysis of the data.
which examines the second part of the research question, the work and learning experiences of professionals in complex adaptive organisations, using the adapted phenomenographic analysis outlined in Chapter 4. The next chapter presents the four categories of description and the outcome space that were the product of the adapted phenomenographic analysis and which describe professionals’ experiences of work and learning in complex adaptive organisations.
Chapter 6 Professionals’ experiences of work and learning in complex adaptive organisations

This chapter presents the categories of description and the outcome space which emerged from the adapted phenomenographic analysis. The four categories are supported by selected excerpts from the interview transcripts, and further illustrated using vignettes, based on individual transcripts. The vignettes present a more complete picture of the experience of work and learning for the professionals in these diverse and complex organisations by presenting a more nuanced and contextualised view of the experience of work and learning. As outlined in Chapter 4, categories of description provide insights into the ways in which a phenomenon is experienced (Åkerlind, 2012). In this study, two phenomena have been investigated – work and learning – so the categories describe professionals’ experiences of both work and learning in complex adaptive organisations. The categories of description are known collectively as the outcome space (Marton & Booth, 1997) which summarises the categories and highlights the relationships between different ways of experiencing phenomena (Åkerlind, 2012).

In the preceding chapter, the organisations studied were analysed using the CAOCF, which indicated that each organisation was a complex adaptive organisation. Chapter 5 focused on using the data to indicate that the concept of complex adaptive organisations was applicable to this study in indicating that the organisations studied were complex adaptive organisations. This chapter presents the outcomes of the adapted phenomenographic analysis which investigated the second part of the research question, professionals’ experiences of work and learning within complex adaptive organisations.
Four categories of description emerged from the analysis:

1. Learning is experienced by professionals as being through work;
2. Work is experienced by professionals as being fluid and shaped by varying degrees of emergence, agency, complex social networks, and adaptation;
3. Professionals’ experiences of learning are influenced by the degree of fluidity encountered in their work;
4. Professionals experience an organisational emphasis on structured learning.

**Category 1: Learning through work**

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<th>Learning is experienced through work</th>
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A strong thread through all the interviews was that the professionals experienced learning as being predominantly through work, and part of getting their work done. For example, a state sales manager from the member organisation referred to:

> the things I’m learning are very much on the job, on the instant, on the fly anyway to some degree.

Similarly, the radio network manager from a public broadcaster noted that,

> my learning has been a lot from being involved and being allowed to be involved.

Overall, 71 excerpts (of the 268 which described learning) described situations of “learning through work” directly while 24 excerpts instanced “informal learning”, and a further 53 excerpts referred to learning being “self-directed”. A finance analyst from a government scientific organisation summarised it as:
basically it’s on the job learning and just learning as the circumstances come up.

The following excerpt provides greater insight into how professionals experience learning in complex adaptive organisations. The excerpt is taken from the same interview with a female finance analyst from a government scientific organisation as the excerpt above and describes how she learns the skills and knowledge needed to complete a new work task.

I just analyse what my predecessors have done previously so like I have got access to previous reports that they had produced, so I analyse those reports and saw what sort of commands they have used, what sort of features in Excel they might have used that I was new to and then I noted that information from that and then had a go myself looking in Google and looking at some online short sessions and learn from there and then when I was able to apply those skills into the piece of work that I was doing and I was able to get the results then I could really prove that yes I can do this.

Two key findings from this study are highlighted within the excerpt above. First, the professional’s learning process starts with her looking for completed work examples or other resources within the workplace or on the internet. Such an approach was common among the professionals interviewed with Google specifically referred to five times throughout the interviews as a learning tool and a further eight mentions of using the internet to source the required skills and knowledge. The finance analyst goes on to say that she applies her new skills and knowledge to the task at hand. Many of the
professionals interviewed described the same sort of approach with 67 excerpts (from 268) describing learning as being through “trial and error/learn and apply”. The data indicates how learning was consistently experienced as part of the process of work rather than as a stand-alone activity.

These findings provide empirical evidence that supports existing research, which found that, in the context of work, much of the learning occurs through work (Billett, 2004b; Boud & Hager, 2012; Eraut, 2007; Seely Brown et al., 1989). Evidence from this study shows that professionals describe their own experiences of learning as being primarily through participation in work, forming a part of how they do their job. Workplace experiences help to develop proficiency over the course of one’s life and these experiences are embedded in daily practice (Paloniemi, 2006). In the same way reported by the professionals in this study, learning has been described in the literature as occurring through the process of working through any problems or new tasks that arise day-to-day (Boud & Hager, 2012). Furthermore, “learning and participation in work are inseparable” (Billett, 2004b, p. 315). The day-to-day work activities, the context, and direct and indirect social interactions are the main sources of learning at work (Billett, 1999).

When directly questioned about how they learned at work, the professionals were far more likely to nominate structured learning activities as their primary learning experience over learning through work. However, when asked critical incident questions (Butterfield et al., 2005) to describe how they learned something for their job in a specific situation, they described their learning as being primarily an ongoing process of problem-solving to get their job done. In contrast, when describing how they learned at
work in response to direct questions the professionals referred to the structured learning activities provided by their organisations such as face-to-face courses, online courses and reference materials, and coaching and mentoring programs. This highlights the disparity, previously noted by Boud and Middleton (2003), between how participants experience learning through work but continue to name their learning as being structured. As a state sales manager within the member organisation described it,

*I would take the course so I have something to show for it, something to say yes, I do actually have those skills.*

As Boud and Solomon (2003) also found, the professionals in this present study did not necessarily identify themselves as learners unless the context demanded it. The participants reported “getting on with the job” but did not name what they were engaged in day-to-day as learning. However, when undertaking a course, it was considered more acceptable to be termed a learner. “Learner” was often an externally imposed definition, and the label of learner was not something that most participants consciously applied to themselves. The study by Boud and Solomon (2003) found that individuals were often reluctant to identify themselves as learners. They found that, on the one hand it was perceived as good for the individual and for the organisation for a professional to be a “learner”. On the other hand, being identified as a learner, in many contexts, was tantamount to being identified as a novice – a much less desirable position that questioned one’s competence (Boud & Solomon, 2003).

The findings of this study highlight the important role of informality in day-to-day learning for professionals within complex adaptive organisations. As discussed in the literature review in Chapter 2, informal learning and work have become consistent parts
of the ongoing conversations about work and learning globally (Sawchuk, 2008) and it
is most often defined in opposition to the concept of formal learning (Marsick, 2009).
This study also found that the professionals in the complex adaptive organisations
studied, tended to juxtapose what they termed “informal learning”, which was referred
to as learning that was unstructured, experiential, and often incidental (Marsick &
Volpe, 1999), with “formal” or “structured learning” through face-to-face courses and
structured online programs.

It is often argued that the majority of learning at work occurs as part of work processes
(Billett, 2014) and that learning through work is responsible for anywhere up to 80% of
learning in the workplace (Eraut, 2010). The 70:20:10 framework used to structure
learning and development systems and practices in many organisations around the
world, was referred to numerous times by the professionals interviewed in this study.
The regional remuneration and benefits director in Pharmaceutical 1 stated:

   so we’ve got the “official” learning model, if you like, which is the
   70:20:10.

The knowledge manager in the professional services firm recognised:

   There is the ever present, 70:20:10 rule.

The framework proposes that 70% of learning is a result of work experiences, 20%
through interactions with others (e.g., coaching or mentoring), and the remaining 10%
through formal learning such as courses (Kajewski & Madsen, 2013).

Interestingly, given the currency of the 70:20:10 framework within organisations, this
study found that less formal learning is not often recognised as learning by either the
learners or the organisation (Boud & Middleton, 2003). This may be because learning through work is viewed as just a part of performing a job, which makes the learning invisible (Boud & Middleton, 2003). Learning through work is also difficult to measure and to link to outcomes, which makes it less attractive within many organisational management processes based around performance outcomes (Marsick, 2009).

While it is now common to say that people learn at work informally or through work, and do not necessarily name these experiences as learning, the difference in this study is the suggestion that informal learning through work is the primary mode of learning even within structured learning settings. Malcolm et al. (2003) have written about the continuum of formality and informality in work and learning as an opposing viewpoint to the more usual dichotomy of formal versus informal learning. The continuum argument is supported by the findings of this study. It was found that even learning experiences that are ostensibly formal (e.g., face-to-face courses) had significant elements of informality that both attracted the professionals to the experience as well as shaped their learning from the experience. For example, the professionals in this study reported viewing face-to-face courses as an opportunity for building and developing social networks and to learn from other people. As the remuneration manager from Pharmaceutical 2 noted:

*My preference would probably be face-to-face in some sort of workshop because you get the benefit of hearing other people’s stories and experiences. Sometimes that provides you with a light bulb moment where you can go “oh I hadn’t thought about that” and you might not always get that through self-paced learning.*
This excerpt highlights how elements of formality and informality may be found across all learning experiences (Malcolm et al., 2003) that form a core part of the experience of learning in complex adaptive organisations.

Vignette 1 is compiled from an interview with an early career scientist in a government scientific organisation. It illustrates the first category of description by highlighting how a professional learns through work within a complex adaptive organisation.

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<th>Vignette 1 – ‘You’re really on your own to a large degree’</th>
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| I’m a research scientist for a federal government agency at the moment. I work mainly with people within my own team but also a lot of collaboration with people external to the company on different research programs that I have set up with them myself using my networks. As a scientist, a lot of learning is kind of self-directed. You’re working on a particular research project and you have a problem, so you can talk to other people about that and see if they’ve got any ideas that can help or show you a technique or point you in the right direction to something that might help. You can start searching the web as well. You just try a few key words that describe your problem and read up in journal articles or presentations or whatever. It’s all very self-directed. Even if you get other people involved to help you are really on your own to a large degree.

Obviously, there’s some formal stuff as well. You might take some face-to-face courses to learn some soft skills like presentation skills or grant writing or things like that apart from all the mandatory things the company wants you to do like health and safety. It’s really hard to capture the learning I’m really doing anyway because it’s so unstructured.

For example, I needed to use a particular mathematical technique for a project I was working on that I hadn’t used before. The first thing I did was chat to a colleague who knows a lot about this sort of technique to get an overview, then basically, once I knew what I was looking for, I just Googled it, read a few background pieces and got started. That’s pretty typical of the way I learn. I like to have a simple conceptual framework in my head before starting to read too much about it because that helps me target the bits I need to fill in. I particularly like talking to people first to get a bit of an overview and then they could point out some things to read and I can ask some questions as well. Learning happens very much on the fly.

This vignette highlights how the early career researcher learns through the course of her work. The scientist describes the process of self-paced learning which she relies on in her job. As a scientist, she often finds herself facing problems which she needs to solve
to move her work forward and looks to reference materials (mainly found online) as well as to her professional networks to get ideas about how to progress. Interestingly, the scientist describes her approach as “a sort of personal needs analysis”, first identifying what exactly it is that she needs to focus on then moving on to a locating the required information or expertise. The scientist’s somewhat dismissive description of the structured learning opportunities provided by the organisation is also interesting to note in the vignette. This theme is taken up again in Category 4 in looking at organisational emphases on structured learning. Vignette 1 also provides a glimpse of the fluid nature of work experienced by the professionals interviewed.

**Category 2: The nature of work is fluid**

| Work is experienced as being fluid and shaped by varying degrees of emergence, agency, complex social networks, and adaptation |

The second category shifts the focus from the experience of learning to the experience of work. The term “fluid” is used to describe the experience of work that emerged from the data, taking up shifts in the broader organisational, and work and learning, literature towards adopting terminology such as “becoming”, or “organising” suggesting fluid processes rather than static features of workplaces and learning (Clegg et al., 2005; Gherardi, 2009; Hager, 2008; Hopwood, 2016; Schatzki, 2006). Fluid, in the sense used here, is juxtaposed with the idea of work being structured and planned. The professionals in this study described their work as being changeable and often unpredictable, requiring rapid and flexible learning and adaptation to problem-solve and get their jobs done. Fluid work refers to the nature of the day-to-day tasks encountered by the professionals in this study. This differs from recent usages of the term “fluid work” in the literature which have focused on describing work contexts (see Allard &
Bleakley, 2016; González-Martínez, Bangerter, Lê Van, & Navarro, 2016; Holmberg, Larsson, & Bäckström, 2016; N. Smith & McDonald, 2015; Xinwei, Lorne, & Jingbing, 2016). The data from this study emphasised the day-to-day work tasks as part of a complex organisational context which required a different usage of the term fluid work to capture the emphasis on work tasks specific to each professional’s job. The following excerpt from the executive assistant at the member organisation illustrates the fluidity of one such job:

*it’s like okay when I left yesterday afternoon the diary was perfect. I get in this morning and there’s you know, all these emails and it’s like uh, what’s happened and then you got to like change everything.*

The excerpt above exemplifies a common picture presented by the professionals interviewed who reported regularly making work plans only to have the requirements or priorities change.

Interview data from the professionals in this study suggests that the degree of work fluidity is shaped by emergence and the three key elements of complex adaptive organisations: agency, adaptation, and complex social networks, as outlined in Chapter 3. Considering work and learning in terms of these four elements helped to contextualise professionals’ experiences by examining the impact of organisational complexity (via the core concepts of the CAOCF) on individual experiences of work and, subsequently, learning.

The following sub-sections consider emergence and each of the three key elements of complex adaptive organisations illustrated by selected excerpts from the interview transcripts, which helps to understand how professionals experience work as fluid. The
analysis provides insights as to the ways in which emergence and the three key elements of CAO influence the degree of work fluidity.

**Emergence**

Throughout the interviews, the professionals identified that their work was highly changeable, time pressured, and required constant adaptation to the emerging requirements of their work. The scientific manager from the government scientific organisation described this in noting that he was always learning:

‘...you apply for a promotion, you don’t get it, you learn about it. Every new process that you have to implement that you learn about, every new initiative that comes along that either you wanted to do as an initiative or the organisation wants to do as an initiative, you have to think about how that should be rolled out or what the best way of doing some procedure is. You’re always learning.’

The scientific manager quoted above is describing both the emergent nature of his day-to-day work as well as the ways in which this influences his learning through work.

Emergence was defined in Chapter 3 as the process by which professionals interact reflexively and linguistically, in ways that contribute to novel patterns within complex adaptive organisations. These patterns are novel, unexpected, and unpredictable from the interactions or characteristics of individual professionals (Mitchell, 2009).

Emergence is strongly related to adaptation and plays an important part in the fluidity of work and subsequent experiences of learning. Emergence is not completely random and
yet it cannot be predicted or directed, a situation requiring a high degree of adaptation from professionals (Lancaster, 2012).

As discussed in Chapter 5, the professionals identified their work and their organisational contexts as being highly changeable, time pressured, and uncertain, requiring them to adapt to the emerging requirements of their work and their organisations. For example, the radio network manager from the television and radio production organisation outlined the major restructures which his organisation had been undergoing over the past few years, and were continuing at the time of the interview. These changes impacted the ways in which people worked in their jobs as well as how they worked with their immediate team members and other teams within the organisation. For the professionals in this study, learning was experienced as a continuous process of adaptation to the demands of emergence supported by their networks and achieved through the exercise of their agency. For example, the executive assistant to a general manager in the member organisation described her job as one of day-to-day uncertainty requiring a dynamic and adaptive approach to both work and learning. Emergence plays a central part in the fluidity of work and professionals’ subsequent experiences of learning primarily through work.

The success of contemporary organisations is contingent on their ability to learn and adapt (Za, Spagnoletti, & North-Samardzic, 2014) and emergence was a key influence shaping fluid work. This importance of adaptation in learning at work has been noted across multiple workplace contexts including, for example, musicians where the music of jazz ensembles emerges through the interactions of the musicians and how they react to the playing of others, changes in tempo, and the like (Purser & Montuori, 1994). In a
study focusing specifically on change and learning, Tyler, Choy, Smith, and Dymock (2014) found that, for the workers in their study, there was a “requirement to accommodate emerging transformations in occupations” (p. 164), and outlined how the participants in their study described an “increasing intensification of work” (p. 166) influenced by technology, organisation restructuring, and changing legislative and regulatory requirements. Emergence is most evident when change, novelty, and unpredictability is occurring within complex adaptive organisations, a key influence on professionals’ experiences of work and learn in those organisations.

Adaptation

In this study, the professionals described their experiences of work in complex adaptive organisations as requiring ongoing learning and adaptation using a variety of approaches driven by what emerged through the course of their day-to-day work. The professionals described highly changeable and unpredictable work which required a high degree of adaptation including learning new skills and knowledge, and developing relationships. As a systems analyst at a member organisation commented:

> Everything changes now. You kind of just go bend with everything and go with the flow with whatever’s happening, you know. You can plan your day to look like something but it never pans out that way.

As outlined in Chapter 3, this study defined learning as being an enabler of adaptation and the professionals described needing to constantly learn and adapt. Within the CAOCF, learning and adaptation are considered as interdependent processes where learning is an enabler of adaptation. Adaptation is the ability for professionals to adjust incrementally and transformatively, as required, to the demands of complex adaptive
organisations. The professionals in this study described “adapting” to the needs of their work. The state sales manager from the member organisation noted that the most important skill for him at work was to:

> be able to be adaptable to change because there’s a lot of things that happen on a daily basis that, whilst you could be the most organised person in the world, you need to be able to adapt and change if things don’t go according to that plan. It’s a very turbulent environment at times.

Within the organisational learning literature, the term “adaptive learning” has been used for some time, generally as part of a typology of adaptive versus generative learning (Argyris & Schön, 1996; Chiva et al., 2010; Senge, 1990). While the dual concepts of adaptive and generative learning have been used to describe organisational learning, this study, however, found that it was not a useful dichotomy when looking at individual experiences of work and learning. In taking a complex adaptive systems approach to organisational learning, Chiva et al. (2010) use their definitions of learning to define two different types of systems. On the one hand, they see adaptive learning arising from complex adaptive systems. Adaptive learning is “a self-organizational process that might happen when individuals and groups within organisations mainly exercise logic, reasoning, concentrate, discuss and focus on improving any mental model, knowledge, process” and the like (Chiva et al., 2010, p. 123). Adaptive learning differs from Chiva et al.’s (2010) concept of complex generative systems where generative learning ‘implies being able to see beyond the situation and questioning operating norms’ and it occurs ‘individually or socially at the edge of chaos’ (p. 116). Generative learning, in the sense used by Chiva et al. (2010) describes the use of intuition and dialogue to
question the established practices and to innovate. In contrast adaptive learning is based more on reasoning “implies the ability to detect and correct errors in certain operating procedures” (p. 116).

The data from this study indicates that although professionals describe the need to adapt to their context, that this adaptation is not necessarily an incremental process as described by Chiva et al. (2010). For example, the remuneration and benefits director from Pharmaceutical 1 described how large-scale changes across the Asia region required her to adapt to new assumptions about how employees were remunerated and develop new frameworks and policies to support these changes. In adapting to the demands of the complex adaptive organisation, the remuneration and benefits director needed to innovate and implement significant changes across a disparate geographical, linguistic, and cultural region.

Complex social networks

Complex, inter-related, social networks were consistently identified by the professionals in this study as a key element of both working and learning. The radio network manager from a television and radio production organisation, for example, discussed the importance of building his networks through nurturing relationships to influence others so that they would assist him:

> it's those relationships that you're developing with others and how you're able to influence others in regards to say, assisting you with the job or getting information from them so you can hone your job in that way.
Complex social networks are a specific category of social networks. As outlined in Chapter 3, social networks are defined by patterns of interactions between people or groups of people (J. Scott, 2000; Wasserman & Faust, 1994). The people within complex social networks have greater interactions with their nearest neighbours (e.g., within teams or work groups) but also some long distance connections between people in other parts of the organisation (Mitchell, 2009; Watts & Strogatz, 1998). Network “clustering” (e.g., through work teams or social cliques) is a term used to describe how every person is more or less connected to people in the rest of the network through a surprisingly small number of connections (B. Davis & Sumara, 2006), often referred to as a “small-world network” (Milgram, 1967). For example, once one or two people from each work team are connected then the rest of the people in the team are also connected through varying “degrees of separation” (Milgram, 1967; Mitchell, 2009).

Networks are increasingly important in a globalised world and, as described in Chapter 5, many of the professionals and organisations in this study utilise and are influenced by global networks.

Within the studied complex adaptive organisations, professionals were found to be highly clustered in their social networks, having a greater number of connections within their immediate work teams (even when work teams were scattered geographically) and with others doing similar work, also supported by a lower number of links to outside of their team and the organisation. The professionals interviewed consistently described seeking out colleagues within their team to learn from, or turning to their networks to seek introductions to people with more specific expertise. Although, as noted in Chapter 5, some professionals (particularly the two scientists, the remuneration and benefits director from Pharmaceutical 1, and the remuneration manager from Pharmaceutical 2)
described seeking advice from outside of their work teams and even from outside their organisation. Learning through work was reported as being not only through doing the work itself but also as a social and collaborative experience, with 100 excerpts (from the 268 mentioning learning) referring to activities such as asking colleagues questions and building relationships as important components of work and learning in complex adaptive organisations. The executive assistant from Pharmaceutical 1 gave a detailed account of nurturing a network of colleagues in similar roles from which he could learn as required,

you’re not skilled in everything all of the time so I may not do PowerPoint now for six months or 12 months but you know, then a presentation comes back and you have to do it. That’s where you’ve got to be resourceful and go to someone who does use it all the time, day in and day out that you can go to them and that’s what I find our Business Support Group so helpful with because we’ve got this network of people that you can email and it doesn’t make you feel like you should know it in this role but you’ve got people you can go to say “I’ve got to do this mail merge, haven’t done one for six months” and you’ve got people to help you do that.

Within complex adaptive organisations, building and maintaining social networks is critical for learning and adaptation. It is a process where the professionals actively engaged in building networks to meet their own work and learning needs as well as to learn to navigate and utilise existing structures. Professionals in this study consistently reported that their networks inside and outside of the organisation were key to their
success in terms of learning as well as in their work more generally. Learning then becomes less a matter of know-what than know-who (Borgatti & Cross, 2003). Several professionals in this study related instances where they had used their networks to get started on a new task or to solve a problem. In one such example, the systems analyst from the member organisation described how her learning was prompted by changes to her job within a new and growing department.

_I guess time went on, the role got busier. We got more responsibilities as a department and I really had to use relationships within the organisation to get things done, to get processes and to learn the ropes. Because there was no one there to teach me how to do this, so I would have to go to each division and learn something from each division. So I would have to put on a meeting with IT to learn how to use this and I’d have to put a meeting with Finance to teach me how to invoice. And then I’d have to have a meeting with someone in [another State], so they could teach the invoicing._

In these complex adaptive organisations, an environment was created where the professionals both needed and wanted to build networks. The professionals’ networks were both to build a professional identity and keep up-to-date with one’s field, as well as to have people to go to within the organisation when one had a question. The scientists surveyed were a particularly good example of how networks were an important part of their work and learning. Building and maintaining social networks was a critical part of the scientists’ work in terms of their success in their research area as well as their ability to perform their work. They reported assiduously nurturing their relationships with like-minded researchers around the world, which provided them with
networks of colleagues with which to discuss ideas, to collaborate, and to learn new information and techniques. Furthermore, it enabled them to keep abreast of developments in their field, a very important consideration for scientists working across considerable distances of time and space in Australia away from other centres of scientific knowledge production. This also had practical pay-offs in making the scientists aware of possible funding opportunities and jobs locally and abroad.

The administration and support professionals who were interviewed also provided an excellent example of engaging in complex social networks in practice. They realised, perhaps more than the other professionals interviewed, that their ability to complete their work and learn what they needed to do was enabled largely by their networks. These networks were mainly informal networks although the two administration professionals, from different organisations, had both been involved with the development of what they referred to as “communities of practice” (Lave & Wenger, 1991) for the executive assistants across their organisation (those supporting executives and the CEO of the organisation). The administration assistant used the term communities of practice to refer to a more formalised network arrangement with regularly scheduled meetings and documented procedures in contrast to how communities of practice are discussed within the work and learning literature (see Lave & Wenger, 1991; Wenger, 2000, 2004, 2009).

Within complex adaptive organisations, it is the interactions of the professionals through complex social networks which creates and sustains the system and the strength of the system is directly related to the quality of the interactions between people (Baets, 2006). These interactions through networks act as an important learning and adaptive
tool for professionals to learn and adapt to the constantly emerging needs of the system.

An important contribution to professionals’ interacting effectively within complex social networks is their ability to act with agency within the boundaries of the organisation and their job.

Agency

Agency was defined in Chapter 3 as a continuum along which empowered and self-aware professionals have a greater or lesser number of opportunities to make decisions and take intentional actions to learn and adapt to the present needs of their work and work context (Billett, 2011; Dietz & Burns, 1992; Eteläpelto et al., 2013; Vähäsantanen et al., 2017). The analysis conducted for the present study indicated that all the professionals interviewed exercised a high degree of agency within their job, with the flexibility to determine their daily activities and longer term goals within the boundaries of their area of responsibility. The two scientists interviewed, for example, exercised extremely high degrees of agency in their work and were almost completely self-directed whereas the two executive assistants had jobs more narrowly bound by formal job descriptions, though offering a degree of agency in terms of how their work was carried out as well as taking up additional work outside of their defined job description. The scientists and administration professionals sit at different points on the agentic continuum but both exercise a degree of agency in their day-to-day jobs.

The degree of agency which the professionals could exercise contributed in a significant way to the fluidity they experienced in their jobs with multiple, often competing, demands placed on them. As demonstrated in the following excerpt from an interview with the executive assistant to the general manager of a busy marketing department
within a member organisation. Although her role was ostensibly to support her manager, the job had grown and changed as the needs of the business and the team had changed, and she found herself often operating outside of her original job description.

*I'm almost like an all-in-one shampoo, conditioner and body wash .... I report directly to the GM [General Manager]. I look after him. I also support the team. We have a team administrator as well who, I kind of help her along with stuff as well .... And then I sit on lots of projects and I also look after a program that we run .... and then I help support administration on a digital project that we have as well.*

In using the metaphor of being “an all-in-one shampoo, conditioner and body wash” she encapsulates not only the fluidity of her job generally in being “all things to all people” but also her agency in negotiating how her work was carried out. The excerpt from the administration assistant also highlights the paradox of fluid work that even as the professionals exercise a high degree of agency they nevertheless use terms such as “reactive”, “overwhelmed”, and “out of control” when referring to their day-to-day work. The transcripts generate a sense of a constant and somewhat erratic stream of work to which the professionals felt they needed to constantly react and adapt with little opportunity for consideration or reflection, further demonstrating the impact of emergence on experiences of work through the creation of dynamic contexts of change and uncertainty. As the systems analyst, also from the member organisation, put it:

*There was a person in the role before me, had left a month before I began.*

*So there was no handover, there was nothing. there was kind of, this is kind of a new department, we kind of don’t have a hand over, we kind of don’t*
know what this role is. It’s going to be changing, get in there and do it. So, the first couple of weeks was actually quite slow in the sense that I didn’t have that many responsibilities on that work, this is your role. Because it was still kind of, we don’t know what your role is. So, I took it upon myself to kind of see what we have in our folders, what streamlining kind of created basic processes for the team, that we follow in regards to say, admin and invoicing and that type of stuff.

Incorporating the CAOCF into the adapted phenomenographic analysis of the data from the study has provided insights into the nature of work in complex adaptive organisations. Using emergence and the three key elements of complex adaptive organisations – adaptation, complex social networks, and agency – to further analyse the second category of description indicated that work is strongly influenced by organisational complexity and is best described as fluid. The professionals described their work as being highly changeable, novel, and unpredictable (emergence) requiring a high degree of agency to make speedy decisions and the ability to utilise complex social networks. Professionals reported needing to constantly adapt to the changing and unpredictable demands of both their day-to-day work and their work context.

Vignette 2 is compiled from an interview with the executive assistant from the member organisation. It illustrates the second category of description by highlighting how a professional experiences their work as fluid within a complex adaptive organisation.

**Vignette 2: ‘I need to be all things to all people’**

My job title is Executive Assistant. We recently had a restructure in our department. Originally it was just marketing so I was just looking after them but now we’ve become part of a new department called Member Marketing Services which means we’ve got the membership teams on board with us and we now have 24 people in the team. I would say that it takes a good 12 months or so to get up to speed
with this department and the broader organisation because of the degree of complexity involved. Once you get the hang of it though it's not too bad.

On any given day I need to be all things to all people in this team. On paper I report directly to the GM [General Manager] and I look after him. I also support the team. We have a team administrator as well who ... I kind of help her along with stuff as well, and I also support the GM with whatever’s needed. Then I also sit on lots of projects and I also look after programs that we run, and then I help support administration on a digital project that we have as well. Oh, and I work on individual projects as well that are going on around the organisation. It’s not all exactly in my job description but I enjoy doing different things even if it is a massive workload.

The skill that’s most important for my role is flexibility. Everything changes now. You just kind of bend with everything – go with the flow. You can plan your day to look like something but it never pans out that way. It’s quite a reactive role, all the time. One thing after another and generally based on what the other members of the team need because of my role as an assistant. That’s despite me being involved in a number of projects in my own right and, often, off my own bat. I actually quite like it because for me to do the same mundane thing day in, day out would really bore me. I do many of the same tasks everyday but they’re always different because they’re done for a different reason.

A key phrase within Vignette 2 is “being all things to all people”. This executive assistant, although in many ways reactive to the needs of others in his job, has a high degree of agency in how that job is carried out and the ability to take up additional opportunities to expand his work responsibilities. The fluidity of his job comes in part from these shifting responsibilities, but also in the flexibility required to perform his job. He describes a constantly changing context where he needs to “go with the flow” and “bend with everything”. The idea of “bending” expressed by the executive assistant is an apt metaphor for fluid work; work which requires constant flexibility, learning, and adaptation.
Category 3: Influence of fluid work on learning

Professionals’ experiences of learning are influenced by the degree of fluidity encountered in their work

In the previous two categories of description, the analysis of the study’s data indicated how work is experienced as being primarily through work, and that the nature of work is fluid and shaped by organisational complexity. As described in the first category of description, learning within complex adaptive organisations is experienced as being through work and as a part of getting one’s work done. The data indicated that the greater the degree of work fluidity in one’s job, the greater the impetus towards learning through work. In other words, when professionals were presented with work that demanded that they learn and adapt quickly, work across and within networks, and exercise agency in doing so, then learning through work was the most commonly used form of learning to meet the speed of learning and adaptation required to successfully complete that work. The following excerpt from the interview of the knowledge manager from the professional services organisation gives some insight into how he experienced fluid work day-to-day.

*I’m involved in a sort of futures-oriented project here which is looking at what are the mega trends over the next 10 years that will impact our clients and will impact us. So, as part of that, and this is mainly focused on financial services at the moment, banks, etc. So ... we had a discussion with a few people and said how about we run a workshop for representatives from our clients around the future of Australian banking. How about we do that as a scenario planning activity? So basically, I hadn’t done that before, so I said “I’ll do that” because nobody else was going to do it. So I went off*
and did it. That’s pretty much how the learning occurred. I read a few books, I talked to a few people, I actually used the (so about 18 months ago we signed a contract with Jive, who are an enterprise social networking provider) so I put out a few questions on the Jive platform and got a few useful responses back from people from elsewhere. Then I just went off and did it.

The excerpt above highlights both work fluidity, in terms of adapting to project requirements and opportunities as they present themselves, as well as how these changing work requirements then impacted his experiences of learning. The knowledge manager was also asked to participate in a project outside his day-to-day job as a knowledge management expert. The project was not originally part of his job description and it presented new opportunities for learning and professional development which he took up enthusiastically. The learning projects manager from the bank had a similar experience as the knowledge manager, where she described:

I was tapped on the shoulder by the head of our team and offered the opportunity to do it [a more senior role that he had expressed an interest in]. And that was pretty much it. I said yes and it was mine and any gap between what I was currently able to do and what I needed to be doing the role was … I am sure I probably could have asked for more but, at the time, it very much felt like I guess I better learn how to do this myself.

In a similar way to the knowledge manager, the learning projects manager was required to respond to the emerging requirements of her work and of the organisation. Her journey of learning and adaptation was through the course of learning her new job.
Overall, the connection between fluid work and learning was best illustrated through the accounts of two categories of professionals: scientists (two interviewed) and administrative staff (two interviewed). These professionals, for different reasons, described their learning as being primarily through work when asked directly about how they learned at work. Neither the scientists nor the administration professionals identified face-to-face courses as being “for them”. The administrative professionals reported that their work was highly reactive to the needs of others and so often required quick adaptation and learning to changing contexts. For the scientists, a greater impetus to learn through work was the result of there being few other ways for them to learn given the highly specific knowledge and skills required for their work. Talking about a lack of structured learning options, an early career scientist from a government scientific organisation noted:

\[\text{the biggest thing day to day is just trying to solve the problems in your research that you encounter day to day and they're not really things that you can plan for in advance and put it in a development plan.}\]

Vignette 3 is compiled from the transcript of an interview with the radio network manager from a television and radio production organisation. His interview described the fluid nature of work and the impact that this had on his learning in his current job and his career in the media.

\[\text{Vignette 3 – ‘You can’t really prepare in advance for a lot of what we do here’}\]

At the moment I’m the network manager for radio but I’ve spent most of my career in television up until this point. The role is very complex since we produce programs in a number of languages, none of which I speak. It can be quite ridiculous really but it makes it a very interesting place to work. I need to be very adaptable. For example, generally when you hire people you have some expectation of a certain level of education or some awareness of what they might have studied in media at an Australian university. Here though, I have people working for me who escaped the Pol Pot regime in Cambodia.
who have no education and refugees from the Middle East so we’re not even starting from the same base and I need to help these language experts learn about working in radio which is a large part of my role. In terms of my own learning and career, I’ve always built on my experience and I’ve managed to take that into an advisory capacity in my current role. I started in television drama and worked on the Sydney Olympics in 2000 and now I bring those experiences to producing radio.

I think in this workplace, like any workplace really, there’s an awful lot of training on the ground and people don’t realise that they’re learning. There’s an awful lot of mentoring in this industry where someone with a few skills and maybe a little bit of study under their belt might sit with someone more experienced for six months or so to learn and move on to progressively harder programs. That’s how I learned and now that’s how I train others. You can’t really prepare in advance for a lot of what we do here because every program is different. There are some core technical skills but overall we need to be very flexible and adaptable and really learn how to apply those skills to new situations all the time. Learning for me is about having problem solving skills.

Vignette 3 typifies the nature of fluid work and the impact of fluid work on learning. The radio network manager describes how his work is highly changeable and unpredictable to which he says “I need to be very adaptable”. The radio network manager describes how, for him, learning is about generic problem-solving skills which are required to respond to his unpredictable context. Much of his learning throughout his career was via experience and being mentored by more experienced colleagues.

Within Vignette 3, the key elements of complex adaptive organisations are represented. The radio network manager describes dealing with the change and unpredictability of emergence within his job, and the organisation, to which he needs to adapt. In addition, he maintains, and works within, complex social networks which are also an important part of his learning. Finally, there is a high degree of agency in his role in determining what gets done and how, much of it being through a process of problem solving.

Vignette 3 raises the question: what is the role of structured learning and development systems and practices in learning within complex adaptive organisations? The fourth and final category, outlined next, offers some insights into this question.
Category 4: Emphasis on structured learning

The professionals in this study experienced learning as primarily through work and as a key part of their jobs, however they also reported that there was an organisational emphasis on structured learning, as discussed in Chapter 5. Such learning and development systems and practices within organisations were summarised by the training and compliance manager from the surveyed airline as:

if you’re not in the classroom, you’re not doing training.

This quote highlights a disconnection between how the professionals interviewed experienced learning, compared to the learning opportunities provided and supported by their organisations. From the perspective of the professionals, the organisations most valued learning which occurred via structured learning initiatives. For example, several professionals related accounts of picking face-to-face courses just to write on their development plans and show their managers that they were “doing something” about their learning. As the buying executive interviewed from the retail organisation related,

we have annual performance agreements that, you know, contain some element of training and development and typically that’s guided towards more formal things ... you might find a course on something you want to do that you put in there.

Recognition of learning was an important factor for professionals with the state sales manager from the member organisation describing how:
I would take the course so I have something to show for it, something to say yes, I do actually have those skills. Because I know that looking for future employment for example, well they want to see qualifications which sometimes, although not always correctly, the qualifications are written down on the CV speaks louder than the experience you have.

The excerpt above highlights not only an organisational emphasis on structured learning, but also a broader system of continuing professional recognition in the workforce. Continuing professional recognition has traditionally been driven by competency and capability frameworks which “largely exist independent of the contexts in which practitioners operate” (Reich, Rooney, & Boud, 2015, p. 139).

For individual organisations, the readiness of an organisation to “afford opportunities and support for learning” (Billett, 2001, p. 210) is a critical factor in effective learning at work. For example, some data from the interviews indicated that poor relationships with managers could hinder the learning of the professionals who reported to them, who then went around the manager to meet their learning needs. Indeed, the training and compliance manager at the airline noted that she did not trust her manager and would not have her manager involved in her development. She had instead sought out a mentor for her ongoing professional development for whom she had a lot of respect. When asked about barriers to her learning she noted that:

I guess my manager is a bit of a barrier. Really, I think it’s great if you’ve got a really good manager who supports you in your development. Like I’m very conscious that my four guys are getting as much development as I can throw at them, whatever that might look like, whether we have to construct
or create it, try and look for a freebie, whatever. But I think I’m really conscious that people have that opportunity for development. My boss just doesn’t seek that for anybody. She’s a bit of a status person and prefers to see status. So for example, my staff member who was in here meeting with me [prior to the interview], she’s [the manager] trying everything to get that person seen and maybe picked up by the powers that be as this great talent and she’ll take credit for it. But really she hasn’t done anything about the development.

Fortunately, most of the professionals reported positive relationships with their managers who were very supportive of their learning and worked to ensure access to learning opportunities for their staff. The professionals reported that their managers used a combination of the internal learning and development systems and practices centrally managed by the Human Resources department, such as development plans, a menu of learning options available, and mandatory compliance training as well as seeking networking and learning opportunities outside of the organisation. In most cases, organisational learning and development systems and practices were underpinned by competency frameworks and were often reported as following the 70:20:10 learning framework embraced by many organisations (Kajewski & Madsen, 2013), as noted in Chapter 5. As noted by the knowledge manager at a professional services firm:

There is the, ever present, 70:20:10 rule.

And, as noted by the Human Resources professional at the bank:

so we’ve got the “official” learning model, if you like, which is the 70:20:10.
While the 70:20:10 framework has been criticised for lacking empirical support (Jefferson & Pollock, 2014; Kajewski & Madsen, 2013), it was widely adopted as the basis of the learning and development systems and practices of the organisations studied in this research. From the nine organisations in this study, there was data which indicated that eight had implemented, or were in the process of implementing, the 70:20:10 framework. Four of the fourteen professionals interviewed described the basis of their organisation’s learning and development systems and practices as the 70:20:10 framework. These professionals worked for the professional services firm, Pharmaceutical 1 and 2, and the airline, respectively. In addition, desktop research showed that the member organisation was in the process of implementing the 70:20:10 concept as the basis for their learning and development systems and practices while the bank and the retail organisation also used the framework in this way.

The learning and development systems and practices experienced by the professionals were largely structured in the form of face-to-face or online courses rather than the less formal learning favoured in the 70:20:10 framework. An example of a structured learning and development initiative was outlined by the remuneration manager from Pharmaceutical 2:

*we have a thing called Pharma University ... it is a corporate thing but I think that’s going to be more driven out of a talent approach, so if you’re identified as key talent these are the sort of programs that will work for you through [Company name] University.*
The learning opportunities available in the complex adaptive organisations studied were often contingent on the creation of a personal development plan agreed with the professional’s manager. According to the organisation’s learning and development systems and practices, personal development plans were intended to be a collaborative effort between employee and manager but often these were completed by the employee before being “signed-off” by the manager (if they were completed at all). As the early career scientist from a government scientific organisation noted in relation to the creation of her personal development plan that “it’s pretty clear what’s going in there and you just alter it based on what you are going to be doing anyway” before the manager “rubber stamped it”.

The personal development plans often, but not always, formed a part of the performance appraisal processes and so were nominally linked to personal and organisational goals for the year. Personal development plans were created once to fulfil an obligation and then seldom, if ever, referred to again. Professionals reported struggling with the formal processes of learning imposed by their organisations in terms of how to interpret them into something meaningful for their job and career. The regional remuneration and benefits director from Pharmaceutical 1, who worked in a virtual team across south-east Asia, commented that:

6 Within the organisations studied it was a widespread practice to have an annual planning process for learning, centrally managed by the Human Resources Department. In this study, the process and the resulting documentation are referred to as “personal development plans” to reflect the terminology used in the literature (e.g., Beausaert, Segers, Fouarge, & Gijselaers, 2013; Beausaert, Segers, & Gijselaers, 2011; Greenan, 2016). Personal development plans are “a strategic development tool used by Human Resources Departments to stimulate employees’ formal (e.g., training) and informal (e.g., reading a book, peer feedback discussions) learning which in turn is assumed to improve performance” (Beausaert et al., 2011, p. 232).
I struggle to do my [personal] development plan and identify my learning ....

I’m struggling with what to put in it since I don’t know what my next role is.

I don’t even know what I put in it! I’m just ticking boxes.

While the internal learning frameworks contained elements of informality, such as rhetoric around self-responsibility for learning, and attempts to promote learning through work, the way in which learning was measured and recognised ensured that the professionals experienced learning in more structured terms, usually through face-to-face courses, professional development seminars, or qualifications that were more easily tracked through learning and development systems. Even where organisations used the 70:20:10 framework, and therefore appeared to support less structured modes of learning, there was an emphasis in these organisations on structured learning. The learning projects manager from the bank noted that:

I would say where we have some of the less formal arrangements, I think we kind of put structures around them that really tip them back into being a formal arrangement. So, for example, we know that a lot of coaching takes place, but we also know that really only takes place when we are putting some structure around it. So it’s not sort of an organic coaching process where a manager might set up regular sessions with their direct reports or even people that aren’t people’s managers being assigned to people as a coach. It really works when we track it and measure it and then for me that kind of tips into a formal arrangement.

Even within organisationally endorsed, structured learning events, professionals found less structured learning opportunities with professionals describing their desire to attend
courses to learn from the other participants. The opportunity to interact with other professionals, not necessarily from their immediate work team, was a powerful drawcard to attend face-to-face learning events for those interviewed. Within such events (e.g., courses, seminars, or professional networking events), participants reported that they considered the discussions with other professionals a rich source of learning. This was a space where professionals from different areas and backgrounds could come together, share their experiences, and learn from one another. As the radio network manager from the television and radio production organisation related:

*I was just remembering an example that you might be interested in where I did one of those AIM courses in dealing with people and [laughs] it was a fascinating day and I will remember it forever. We had one of those things where you had to tick the box ... So, here’s the example of the situation. Your person at work may not be coming in every Monday and there’s a problem, so do you do A, B, C or D? You tick off one then you go to answer four or ten or whatever. And we did this by ourselves, in a class, in a group, then we go together and shared our .... And of course, this person was saying, “No, I just sacked him.” “Yeah, I sacked him too.” I look at these guys and go, “But didn’t you guys notice that he had a drug-dependent son?” It was the first time .... I know it was silly, but it was the first time I realized that people think differently to the way I do. So sometimes the value is going out from what is normal to ideas and different experiences and understanding that there’s so many differences, so that was a big day for me.*
Vignette 4 is compiled from an interview with the knowledge manager in the large professional services organisation. His interview shows how the learning opportunities in his organisation are structured, but that his own learning is self-directed and through work.

**Vignette 4 – ‘There is the ever present 70:20:10 rule...’**

I work as a Knowledge Manager for a large professional services firm. My role is primarily internal in that I provide a service to internal “clients” within the organisation itself. In some ways, it’s a clearly defined role and in others that means I create my own role as I go based on where my skills and knowledge might be a good fit, like on a project team or something. There’s a little bit of customer stuff that I do but primarily my role is to help make the complexity of the organisation more comprehensible for other employees. The organisation has a lot of formal knowledge management processes and platforms in place, but a lot of the management of knowledge happens informally through networks. Ours is definitely a relationship-based business. My role then becomes facilitating those networks and relationships. A lot of my role is brokering relationships with people so that people will come up to me and say “who knows about this?” and I’ll say “funny you should mention that; these are the people you should be talking to”. So, my role is around, I suppose, brokering and managing those networks more effectively.

Individual professional learning in this organisation tends to be very structured. There are formal training courses and compliance modules. There is the ever present 70:20:10 rule and, I think, like most organisations, if you look at what the learning group does and where it invests its money, it’s not 70:20:10. There’s a lot of time spent on that 10. But in terms of how the organisation functions and how people learn on the job, a lot of it is in that 70:20 space and it’s done informally. I have a development plan at the moment. They are taken semi-seriously and it’s referred to once or twice a year. For some roles, it’s quite structured, like for a junior accountant because there is a clear learning and career pathway for them. For me personally, learning is a kind of choose your own adventure really. You make it up as you go along. A difficulty for me is that I have quite a lot of experience already and stuff that I find myself doing in this organisation is stuff I’ve done before so my constant challenge is that I would like to do things I haven’t done before. Keeping my professional skills and knowledge up-to-date is largely off my own bat and not really recognised here.

The main way that I learn at work is really through just doing since there aren’t really many courses that I’m interested in or need. I put my hand up for projects that will take me out of my comfort zone and I do a lot of self-paced learning where I do some research, try something out, and then review how it went. At this point, there’s not much recognition of that type of learning in [organisation name] so it’s more about my own career development and keeping myself challenged and marketable. I learn through having a lot of coffees with people. Negotiation and bartering. I’m not just going off and learning, I’m trying to build relationships for the future. You want to learn from other people but you also want to bring something yourself. Is there anything that you can give them in exchange?
Notable in the vignette, is the juxtaposition between the structured learning provided by the organisation and the way in which the knowledge manager’s primarily experiences learning through work. The knowledge manager stated that his organisation has adopted the 70:20:10 framework, as have many of the other organisations in this study. The knowledge manager also notes that he doesn’t experience the 70:20:10 framework in the way in which it was intended, with the organisation spending a disproportionate amount of time and money on the “10” – or structured learning activities such as face-to-face courses, online courses, and online reference tools. Learning is experienced by the knowledge manager as being self-paced and in response to the needs of his job rather than via the learning and development systems and practices of his organisation. The tension between the learning opportunities afforded by the organisation and the way in which learning is experienced through work has implications for practice which are discussed in the next chapter.

**Outcome space: Professionals’ experiences of work and learning in complex adaptive organisations**

In phenomenographic research, the categories of description are referred to collectively as the “outcome space” (Marton, 1981). The outcome space shows how the categories are logically structured and internally related (Marton & Booth, 1997). Marton (2000b) states that the outcome space is “tantamount to the phenomenon, to the object as it is experienced in different possible ways” (p. 108). The outcome space for this study is shown in Figure 6.1. It diagrammatically represents the relationship between the categories of description and how they come together to describe the phenomena – professionals’ experiences of work and learning in complex adaptive organisations.
Experiences of work and learning within complex adaptive organisations are shaped by emergence and the three key elements of complex adaptive organisations which influence both work and learning as may be seen in Figure 6.1. Although both work and learning are influenced by organisational complexity, it is fluid work which is the most tangible manifestation of complexity for professionals. Professionals then need to learn and adapt to meet the demands of fluid work. Complex adaptive organisations are contexts where professionals experience learning as being primarily through work, influenced by the need for flexible and timely learning within an unpredictable and novel emergent context.

There is an increasing discussion in the work and learning literature of “engagement in work activities that offer rich learning experiences” (Billett & Choy, 2013, p. 264). The data from this study supports the centrality of participation to learning at work and expands on earlier research by using the CAOCF to understand the influence of organisational complexity on work and learning. The framework highlights how the non-linearity of complex adaptive organisations creates contexts which are largely unpredictable, novel, and emergent, generating the conditions for fluid work which
require professionals to learn and adapt within the workflow. Further, the need to adapt to a constantly changing context necessitates flexibility in learning over structure.

Billett and Choy (2013) have noted that, “workplace learning experiences are becoming increasingly legitimized, in demand and seen as being able to address a range of learning related purposes, they are also subject to clear limitations” (p. 265). This perhaps offers some explanation as to the seemingly contradictory experiences of learning within complex adaptive organisations. As the categories of description indicate, there is variability in how learning is experienced day-to-day compared to how structured learning is emphasised by organisations. The first category describes the centrality of learning through work to experiences of learning whereas the fourth category describes the organisational emphasis on structured learning.

Concluding comments

This chapter reported the findings from this empirical study of professionals from a range of organisations, industries, and hierarchical levels. From an adapted phenomenographic analysis of the interview transcripts, four categories of description emerged: learning through work, fluid work, relationship of work and learning, and structured learning. The categories collectively show that learning is experienced by professionals primarily as being through work and that the degree of work fluidity influences how learning is experienced. The impact of emergence and the three key elements of complex adaptive organisations – agency, adaptation, and complex social networks – influences the degree of work fluidity and in turn, influences the learning responses of professionals. The professionals reported that their experiences of learning
were largely embedded in everyday practices but that organisations still offered, and recognised, primarily structured learning and development systems and practices.

This study extends existing research which has shown that learning at work is predominantly through the work itself (Billett, 2004b, 2014; Boud & Hager, 2012; Eraut, 2007; Paloniemi, 2006; Seely Brown et al., 1989) by using the adapted phenomenographic approach and the CAOCF. By adapting the phenomenographic approach to incorporate an analysis of two phenomena – work and learning – the data analysis of this study has indicated the interrelated nature of work and learning. Using the CAOCF, brought together the individual and organisational perspectives on work and learning by highlighting the ways in which organisational complexity shapes fluid work, subsequently influencing learning.

The following chapter discusses the key themes emerging from the findings and locates the findings within the work and learning literature. The implications of the findings for learning and development systems and practices, and learning design, in complex adaptive organisations are also discussed.
Chapter 7 Key themes emerging from the study and their implications for theory and practice

In the opening chapter, I related the stories of my own, my father’s, and my grandfather’s, careers as examples of the changes to the nature and structure of work over the course of the 20th and early 21st centuries, where work in developed economies has gradually moved from a focus on agriculture and manufacturing to what is often termed “knowledge work” (Billett & Choy, 2013; Farrell & Fenwick, 2007; Hajkowicz et al., 2016; Lee, 2014). Over the closing decades of the 20th century and the opening decades of the 21st century, shifts in the structure and requirements of work have continued at an increasing pace (Cairns & Malloch, 2011; Lee, 2014). Changes in work have been most directly felt by individuals in organisations because of the significant impact on work practice (Tyler et al., 2014). Work in the 21st century has seen an increase in instability, with a shift away from the notion of a “job for life” and a decline in the centrality of work towards people becoming “work nomads” with periods of unemployment becoming more common and less stigmatised (Cairns & Malloch, 2011). Technology has been recognised as a driver of such changes, resulting in a rapidly changing environment which requires people to be far more flexible and adaptable than previously (Cairns & Malloch, 2011; Hiniker & Putnam, 2009). Within these discourses, work is positioned as flexible in terms of the nature of the work tasks as well as the structure of work. “Portfolio work” and “portfolio professionals” (Fenwick, 2004; Hajkowicz et al., 2016), for example, are used to describe professionals who may contract their services to a number of employers on a temporary basis.

Organisations are also adapting and evolving in the face of such changes. As discussed in Chapter 3, metaphors of organisations have shifted from reductionist metaphors, or
organisations as machines, towards metaphors of flux and transformation (Morgan, 2006, 2016). These changes are reflected in increasingly flatter structures in organisations in order to “offer more teamwork, less bureaucracy, better communications” and faster decision making processes with greater autonomy and ability to exercise agency for professionals (Hajkowicz et al., 2016, p. 37).

Contemporary organisations are not static but are “becoming” (Clegg et al., 2005; Schoeneborn et al., 2016; Tsoukas & Chia, 2002) through unstable and unfolding processes and relations (Schoeneborn et al., 2016). Such contexts have seen calls for the complexification of theory in order to understand organisational complexity (Tsoukas, 2017) and researchers have taken up complexity approaches to frame their investigations of organisations (see Baskin, 2008; Stacey & Griffin, 2005; Tsoukas, 2017; Tsoukas & Chia, 2002; Tsoukas & Dooley, 2011).

This increasing complexity of work and organisations has raised significant questions about how learning is experienced within these contexts, which have guided the aims and research question of this study and influenced the selection of a complex adaptive systems approach to frame the study. Influenced by these issues, this study has examined professionals’ experiences of work and learning within the changing contexts of work by investigating the research question: How do professionals experience work and learning within complex adaptive organisations? Adopting a complex adaptive systems approach to frame this study (using the CAOCF) provided a theoretical and analytical basis for investigating the work and learning experiences of professionals within increasingly complex contexts of change and uncertainty. This approach provided a different way of understanding how work and learning are intimately connected to each other and to the systems within each organisation and beyond.
This chapter locates the findings discussed in Chapters 5 and 6 within broader debates in the work and learning literature and discourses around changes in the nature of work.

In the first part of the chapter, four key themes which emerged from the findings of the study are discussed. The second part of the chapter discusses the implications of these findings for learning and development systems and practices within organisations and the implications for learning design in terms of the ways in which learning and development systems and practices could evolve to better respond to the demands of contexts of fluid work in complex adaptive organisations.

**Key themes emerging from the findings**

From the outcome space of this study (discussed in Chapter 6) four key, interrelated themes emerged. The first theme is the impact of emergence on experiences of work and learning in complex adaptive organisations (outlined in Chapter 5) and its importance to the understanding of individual experiences of work and learning (outlined in Chapter 6). The second, related, theme is how fluid work, shaped by organisational complexity, influences experiences of learning. The third theme, is that work and learning are interrelated phenomena and need to be considered as such to fully understand work and learning in complex adaptive organisations. The fourth, and final, theme highlighted in this study is a disconnection between learning and development systems and practices and the day-to-day work and learning experiences of

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7 As noted in Chapter 1, the phrase “learning and development systems and practices” has been adopted in this study to broadly describe organisational approaches to learning. Within organisations, learning and development systems and practices generally refers to both the team generally responsible for learning (usually part of the Human Resources department) as well as the processes which surround learning. This discussion takes up learning and development systems and practices in the sense of frameworks, processes, and learning initiatives which scaffold learning in organisations.
professionals, having implications for practice. These are examined in detail in the following sections.

**Impact of emergence on work and learning**

Feedback loops within complex adaptive organisations between organisational complexity and the interactions and agency of the professionals reinforces emergence as a key element of work and learning in complex adaptive organisations. Emergence is an important factor in producing the dynamic balance between order and disorder at the “edge of chaos” (Langton, 1990) within complex adaptive organisations. This drives the need to learn and adapt on the part of the professionals and plays a central part in shaping the nature of work as fluid.

Emergence was defined in the context of this study as the process whereby professionals interact reflexively and linguistically, contributing to novel patterns within the organisation that are not able to be completely predicted or directed. Novel patterns of emergence in complex adaptive organisations are often more evident in times of organisational change and uncertainty creating novel and unpredictable outcomes (Mitchell, 2009). In this study, emergence was found to play a central role in the fluidity of work and subsequent experiences of learning. Emergence in complex adaptive systems is the result of change in the system (Prigogine, 1997). The system develops through non-linear dynamics where it is constantly selecting alternatives based on the context and interactions between agents. After a choice is made, the system changes and new alternatives are then available (Prigogine, 1997). Each decision point is a phase change for the system which provides the necessary instability required for new patterns and alternatives to emerge (Lancaster, 2012). Based on the findings of this study,
system changes prompting decisions about alternatives also occurs in complex adaptive organisations, where the day-to-day tasks and challenges faced by professionals presented choices, continually creating new alternatives shaping the organisation, further driving learning and adaptation. Organisational complexity creates conditions that shape fluid work. Professionals’ responses to fluid work, in turn, influence unpredictable changes in the organisational system creating multiple feedback loops which further shape experiences of work and learning.

Data from the interviews and desktop research was analysed using emergence, adaptation, complex social networks, and agency. This analysis showed that the organisations studied were complex adaptive organisations (see Chapter 5). Two questions based on the framework were used to analyse the extent of emergence within the organisations studied: (1) Do the professionals engage in work that changes day-to-day? and (2) is change a constant feature of organisational life? This analysis highlighted the strong impact of emergence on all the organisations in the study in terms of change, novelty, and unpredictability. For example, the learning projects manager interviewed from the large Australian bank noted that change was a constant feature of organisational life at the bank which required ongoing learning and adaptation from the professionals. The CAOCF was also used as part of the adapted phenomenographic analysis (see Chapter 6) to analyse the nature of work in complex adaptive organisations finding that work is fluid influenced by emergence, adaptation, complex social networks, and agency.

Much has been written about the current context of work being highly changeable and increasingly fast paced (see Billett, 2009; Gunz, Mayrhofer, & Tolbert, 2011; Hodgson,
The effects of technology and globalisation – and government, social, and business responses to these changes – has resulted in change now being considered a constant feature of organisational life (Hislop et al., 2014). Moreover, in contemporary contexts of change and uncertainty, it is imperative to stay abreast of the latest skills and knowledge throughout one’s career (Billett & Choy, 2013). Relying on what is learned at the start of one’s career is now unlikely to be sufficient throughout a career due to these rapidly changing job requirements and evolving job structures (Billett & Choy, 2013). The requirements of what needs to be learned have also shifted incorporating “complex, higher order and strategic kinds of learning” rather than the mechanics of doing a job, with the increasing use of technology as a catalyst (Billett & Choy, 2013, p. 265). Earlier work by Fuller, Unwin, Felstead, Jewson, and Kakavelakis (2007) and Unwin et al. (2007) has also noted a greater need to investigate the increasingly dynamic contexts within which learning at work occurs.

This study found that learning did not only emerge from the interactions of the professionals, but it was also a critical part of the broader complex adaptive organisation where professionals’ interactions through complex social networks influenced change and uncertainty within the organisation. As outlined in Chapter 3, complex adaptive organisations exhibit feedback loops between organisational complexity (via emergence, agency, complex social networks, and agency) shaping fluid work. Professionals then respond to the demands of that fluid work (in terms of their learning and adaptation, utilising networks, and exercising agency), influencing in turn the organisational system. The feedback loops influence the interplay of order and disorder generating emergence within the system (see Figure 7.1 below). This study found the
relational quality of phenomena, such as work and learning, emerge through interactions within complex adaptive organisations.

![Figure 7.1: Complex adaptive organisations incl. fluid work (author's adaptation)](image)

In Chapter 2, the increasing use of the concept of emergence within work and learning research was discussed. In particular, there has been an increasing use of emergence as a metaphor for learning (Hopwood, 2016), evolving from earlier work and learning metaphors relating to acquisition and transfer, and participation (Boud & Hager, 2012; Hager, 2011; Hager & Hodkinson, 2009). In this study, the inclusion of emergence as a central influence on complex adaptive organisations, as well as a metaphor for learning, has provided significant explanatory power for professionals’ experiences of work and learning. Using the CAOCF incorporates emergence as the central influence on complex adaptive organisations that drives experiences of work and learning through fluid work. Using emergence in this way made it possible to consider the novel, unpredictable and dynamic nature of emergence within complex adaptive organisations and the impact this had on individual experiences of work and learning, particularly in terms of fluid work.
This study has taken up complex adaptive systems approaches from within a socio-cultural approach to learning, as outlined in Chapter 1. This is in contrast to socio-material approaches within which Fenwick et al. (2011) have included complexity approaches. This study has found that participation is still part of understanding work and learning in that the professionals in this study all learned predominantly through work and expanded this work to show the importance of also considering emergence as both a metaphor for learning and as an explanatory concept for work and learning in complex adaptive organisations. In considering complexity, and emergence, through a socio-cultural lens, this study has shown how emergence within complex adaptive organisations influences the nature of work through which professionals learn via participation. The emergent, fluid nature of work then influences learning through participation within complex adaptive organisations.

**Fluid work and its influence on experiences of learning**

Describing the nature of work as fluid offers a way to clarify some of the definitional issues around work (Fenwick, 2006) and provides a way to investigate experiences of work and learning for individual professionals rather than making generalised assumptions about the nature of work for a discrete workplace or profession. The second category of description which emerged from this study described experiences of work as fluid and being strongly influenced by emergence, agency, adaptation, and complex social networks. In Chapter 3, the CAOCF was discussed and illustrated using a diagram which reflected the relationship of work and learning in complex adaptive organisations. Incorporating the findings of this study, the diagram was updated (see preceding Figure 7.1) to incorporate a description of work as being fluid.
When discussing the categories of description, the term “fluid” was adopted to describe the nature of work in complex adaptive organisations based on the findings of this study. The professionals described their work as being highly changeable, requiring rapid and flexible learning and adaptation to problem-solving to get their jobs done. For example, the systems analyst for the same member organisation described the changes in her job, and more broadly within her department and the organisation, which were driving her learning through work. She was left on her own to learn her new role, in a newly formed department, through her own initiative.

Fluid work, as discussed in Chapter 6, refers to the nature of the work in terms of the day-to-day tasks of the professionals in this study whereas recent usages of the term “fluid work” in the literature have focused on describing the work context (see Allard & Bleakley, 2016; González-Martínez et al., 2016; Holmberg et al., 2016; N. Smith & McDonald, 2015; Xinwei et al., 2016). Describing work as fluid also takes up broader shifts within the organisational studies and work and learning literatures where terms are being adopted, such as “learning”, “becoming”, or “organising” suggesting fluid processes rather than static features of workplaces and learning (Clegg et al., 2005; Gherardi, 2009; Schatzki, 2006).

The nature of work in the 21st century is of increasing interest for both researchers (e.g., Boell, Cecez-Kecmanovic, & Campbell, 2016; Skule, 2004) and within the industry literature (e.g., Gratton, 2015; Susskind & Susskind, 2015). This study challenges research which has focused on the relative status of a job as the basis for examining learning (see Harteis et al., 2015; Skule, 2004). In this study, considering the nature of work without specific regard for the relative status of a job was found to be an important
part of understanding experiences of learning in complex adaptive organisations. Occupational status emerged as an important consideration in this study, more than gender or age, and so occupational status is foregrounded here. It was not within the scope of this study to explore the connections (Johansson & Abrahamsson, 2017) between gender and learning at work within complex adaptive organisations.

Importantly, the description of work as being fluid that provides the greatest insight into how organisational complexity shapes the nature of work and, in turn, how this work influences learning. Earlier research has discussed jobs as being “learning intensive” (Skule, 2004) and “learning conducive” (Skule & Reichborn, 2002, 2007). Skule (2004) found that learning-intensive jobs had several common characteristics, of which the two most important were, first, a “high degree of exposure to changes” and, second, a “high degree of exposure to demands” (p. 14). Learning-intensive jobs tended to be found in more highly skilled, higher status, and more highly paid professions, mainly in the banking, oil, insurance and commercial services industries. Lower status areas, such as retail and hospitality, had the highest proportion of learning deprived jobs (Skule, 2004). The present study provides a different perspective by demonstrating that the nature of work in complex adaptive organisations is fluid. Furthermore, this study provides an understanding of jobs unconnected from the perceived status of the job within the organisational hierarchy. The study reported here also challenges Skule’s (2004) position that so-called lower status jobs are often learning-deprived. Importantly, the present study has shown that work fluidity has a stronger influence on experiences of learning in complex adaptive organisations than the relative status of a job.
For example, the data from the administrative assistants interviewed showed that they described the learning support provided by their respective organisations was “more for managers” and that they closely identified their learning as primarily occurring through work. A recent study by Cho and Kim (2016) also found a high level of informal learning through work among administrative assistants, influenced by their perceived job efficacy; what Skule (2004) might call learning-conducive work. However, the study reported here demonstrated that administrative assistants experienced work as fluid; work that was emergent and affected by organisational emergence, dependent on complex social networks, and in which the administrative professionals possessed a high degree of agency. The two scientists interviewed also reported that they experienced fluid and dynamic work in addition to a high degree of agency in their jobs, emphasising learning through work. The findings of this study found a different emphasis than earlier work (see Harteis et al., 2015; Skule, 2004) suggesting that the fluidity of the work tasks influences experiences of learning irrespective of job title or perceived status. Understanding work as fluid highlights the impact of emergence on work and the degree to which a given job requires that professionals adapt, utilise complex social networks, and exercise agency.

Understanding the nature of work as fluid shares some characteristics with the learning-conducive work of Skule (2004) and Skule and Reichborn (2002, 2007) insofar as learning-conducive work focuses on learning through work and the contextual conditions that shape learning through work. However, the concept of fluid work in this study offers a more detailed analysis of work and learning in complex adaptive organisations. Fluid work indicates how organisational complexity shapes the nature of work, how that work is experienced by professionals, and, importantly, how fluid work
then shapes experiences of learning. While fluid work may, in some sense, be considered learning-conducive work (Skule, 2004; Skule & Reichborn, 2002, 2007), in that it provides the conditions of challenge and change required for learning, describing work as fluid provides a way in which to understand professionals’ experiences of work and the subsequent influence that this has on their experiences of learning in complex adaptive organisations.

Earlier research has also investigated the role of context in work and learning (see Billett, 2001; Fuller & Unwin, 2003; Gijbels, Raemdonck, Vervecken, & Van Herck, 2012; Kyndt, Dochy, & Nijs, 2009; Unwin et al., 2007) but has tended to focus on how the context encourages or restricts learning. Whereas the emphasis of such research “lies on conditions, possibilities or occasions created to make workplace learning possible” (Kyndt et al., 2009, p. 370), the present study has shown the importance of considering the nature of the work itself in understanding work and learning in contemporary organisations. Research by Gijbels et al. (2012), for example, has highlighted the importance of examining job characteristics in terms of work and learning. However, their research has focused on how job demands and control positively or negatively influence interpersonal variables such as stress or well-being, also finding a positive correlation between job demands and job control with “work-related learning behaviour” (p. 425). They have noted, however, that additional qualitative research is needed to further investigate these findings. The study reported here has undertaken such research, finding that experiences of work as fluid are central to understanding how professionals’ experience learning in complex adaptive organisations.
This study further expands on earlier research in indicating that it is the degree of fluidity in work which determines experiences of learning for professionals. Earlier work, such as the expansive-restrictive framework (Fuller & Unwin, 2003, 2004, 2008) and learning-conducive/learning-intensive work (Skule, 2004; Skule & Reichborn, 2002, 2007) have tended to indicate that there are more, and less effective, workplace practices in terms of encouraging and supporting learning. In contrast, this present study has shown that it is insufficient to examine work and learning in terms of what the organisation or context provides or does not provide which supports or inhibits learning. Furthermore, data from this study has indicated that the organisations studied were providing opportunities for learning in the sense of learning and development systems and practices. However, these examples of structured learning contrasted with the learning experiences of the professionals as being through work. This study found that, although the affordances of the workplace are important in creating supportive conditions for learning at work, it is in understanding the nature of fluid work that reveals how professionals learn through work. The professionals reported that their organisations were largely supportive of their learning and provided numerous opportunities for learning through the learning and development systems and practices of the organisation, indicating that most of the organisations studied might be considered as affording learning (Billett, 2001, 2004a, 2004b) or being expansive in their learning practices (Fuller & Unwin, 2003, 2004, 2008, 2010). However, the data from this study indicates that examining learning and development systems and practices alone, no matter how supportive of learning they might be, does not provide a comprehensive understanding of work and learning in complex adaptive organisations where learning is primarily through participation in fluid work.
**Fluid work and learning are interrelated**

The two previous sections have discussed how emergence is a critical factor in work and learning, creating the conditions for fluid work. Fluid work, in turn, influences the experience of learning for professionals and the ways in which they approach learning by adapting to emergence using complex social networks and exercising their agency.

The executive assistant to the general manager in the member organisation noted that she tended to learn on the job because her job was busy and changeable, and “regular courses” were largely useless to her – she was too busy to attend them at any rate. This section builds on these key findings by discussing how this study has indicated the way in which fluid work and learning are interrelated and how they need to be considered together to fully understand how professionals experience learning in complex adaptive organisations. This study found that the nature of fluid work is critical to understanding learning in the context of contemporary workplaces; learning which takes place primarily through work. Considering both work and learning as the phenomena in the adapted phenomenographic analysis gave a fuller picture of professionals’ experiences of work and learning in complex adaptive organisations by highlighting the ways in which organisational complexity shapes fluid work and, in turn, how fluid work influences learning. Although a phenomenographic approach traditionally investigates only one phenomenon, investigating two phenomena using one analysis provided a rich source of data on the experience of work and learning within complex adaptive organisations. The inclusion of the CAOCF in the analysis then provided a means to conceptualise and understand the interrelationships of these experiences of work and learning in indicating that fluid work drives learning responses for professionals.
In showing the ways in which fluid work and learning are interrelated, this study provides an innovative way to approach studies of work and learning in complex adaptive organisations, foregrounding both work and learning as the phenomena under investigation. Moreover, this study has expanded prior research showing that learning at work is primarily via participation (Billett, 2001, 2004a, 2004b; Eraut, 2007, 2011; Hager, 2011) and research focusing on the influence of work contexts on learning (Billett, 2001; Felstead et al., 2009; Fuller & Unwin, 2003, 2004, 2008, 2010; Skule, 2004; Skule & Reichborn, 2002, 2007), offering insights into the nature of fluid work for individual jobs influences learning responses for professionals.

As outlined in Chapter 1, the phrase work and learning was used in this study rather than the more commonplace, but contested, workplace learning (Fenwick, 2006). This was a deliberate choice to better reflect that learning occurs through the process of working through any problems or new tasks that arise day-to-day (Boud & Hager, 2012). Using these terms as a composite also separates work and learning from a distinctive “place”, recognising the evolution of work practices in the 21st century away from the notion of the “workplace” as a single physical and temporal location (Fenwick, 2006). This study has shown how fluid work, influences learning and adaptation by professionals as they complete their day-to-day job tasks. Fluid work strongly influences the nature of the tasks and the contexts in which they must be carried out. The nature of fluid work is intrinsically entwined with learning in that it drives professionals’ learning responses towards learning via participation. Data from the professionals’ interviews showed that the professionals learned primarily through work, specifically, through solving problems related to their work. For example, the regional remuneration and benefits director from Pharmaceutical 1 described how:
I guess that a lot of my learning is self-led, so I might seek out some new information, I might do something new in my job and I have to learn how to do that as a result. I did that just last year. Something I’ve never done before and just figured it out for myself and thought “OK, I can tick that box”.

The boundaries of work, social networks, and the organisation shape the context within which learning occurs and, therefore, also shape professionals’ learning approaches (Billett & Choy, 2013). Further, a critical part of learning at work is the intertwinemement of work and learning goals (Stenström & Tynjälä, 2009) because learning in the workplace is integrated with work tasks (Billett, 2004b). The findings of this study have further illustrated how a focus in the literature on learning as the primary phenomenon being investigated rather than focusing on the nature of work (Tynjälä, 2013) has important methodological implications. The professionals reported that they were “always learning” and “learning on the fly”, however they also rarely identified this as learning, rather as “just doing my job”. The professionals in this study rarely identified what they were doing as learning or identified themselves as learners in the first instance.

Organisational emphasis on structured learning

This study has shown that learning and development systems and practices in organisations are frequently at odds with the day-to-day work and learning experiences of professionals. In the interview transcripts, the professionals all referred to various forms of organisational learning structures. Most of the professionals interviewed referred to some sort of learning plan for the year, variously referred to as a “development plan”, “individual development plan”, “personal development plan”, or
an “annual performance agreement” which incorporated learning goals. These types of processes focus on the measurement of outcomes and are often seen as a means through which to implement broader strategic initiatives within organisations for competitive advantage (Greenan, 2016). The executive assistant from Pharmaceutical 1 described how the online learning “portal” provided by her organisation was a central feature of her personal development plan, further highlighting the link between how learning is measured and the structured emphasis on learning. She described how all the learning opportunities afforded to her by the organisation were funneled through to the online portal, centrally managed from the organisation’s head office in New York, USA, and needed to be noted within one’s personal development plan. In contrast, however, the executive assistant described her learning at work as primarily happening through work and through her social networks within the organisation.

The professionals in this study described experiences of a context where structure in learning was privileged even as their managers and learning professionals in their organisation, espoused the benefits of informality in learning through the widespread adoption of the 70:20:10 framework. Eraut (2011) found, through two research projects that “informal workplace activities provided between 70-90% of the learning; but that informal learning was treated as only an occasional by-product. Hence most discussions of learning dealt only with formal, organised events” (Eraut, 2011, p. 12). This was also consistent with the experiences of the professionals in this study, contrasting with a focus on setting measurable learning goals with one’s manager as part of a personal development plan, as described by the professionals in this study. The professionals reported that, although organisations espoused a commitment to more informal learning practices, this was not borne out in their individual experiences of “putting courses in
their personal development plan”. It is apparent from the findings of this study that professionals are learning and adapting in ways which meet the demands of fluid work, but that learning and development systems and practices have yet to recognise this sufficiently and consistently.

Despite the efforts of organisations to promote the inclusion of less structured, through work, learning activities in personal development plans, the professionals in this study reported that it was easier to track participation in structured learning activities such as face-to-face and online courses. For example, several of the professionals interviewed noted that their organisations were encouraging what they described as “informal learning” opportunities such as the opportunity to learn through completing specific projects or to participate in a coaching or mentoring program. However, as the learning projects manager from the bank noted, such programs and initiatives tended to be formalised by his organisation, with the initiatives being structured via a proscribed number of meetings with one’s mentor, for example, or forms to complete to demonstrate learning. In terms of tracking learning, several organisations used learning management systems (LMS) in addition to reporting to the Human Resources department via the completion and submission of personal development plans. In terms of structures around learning, the professionals interviewed also referred to competencies and competency models, learning management systems, online learning portals, and corporate universities being common structured learning activities. As the training compliance manager from the airline described, the airline had in place, a “learning framework, measurement and evaluation, quality checks of learning before it goes out, reporting, and the like”.
This study found that, despite most of the organisations adopting the 70:20:10 framework, proposing 70% of learning in the workplace should be via experience, the organisations primarily promoted and privileged the 10% (structured learning) and, to a lesser extent, the 20% of learning through others by using coaching programs and structured learning networks. This is a common trend in contemporary organisations where structured learning is built into business processes such as quality frameworks (Hiniker & Putnam, 2009). Frameworks such as the ISO9000, QS 9000, or ISO14000 standards, for example, all require “a formal training plan and a disciplined approach to training” as part of the criteria for organisations to be awarded these certifications (Hiniker & Putnam, 2009, p. 207). Structured learning is also emphasised within continuing professional education frameworks as well as by “organisations that employ professionals” (Reich, Rooney, & Boud, 2015, p. 131), basing learning and development systems and practices on outdated assumptions about learning where work and learning is considered a psychological process of acquisition and transfer (Reich, Rooney, & Boud, 2015). This argument provides an explanation for organisational emphases on structured learning in the organisations studied by suggesting that the assumptions underlying learning and development systems and practices remain underpinned, perhaps unconsciously, by assumptions of learning and work as processes of knowledge and skill transfer that may be measured and assessed using tools such as personal development plans and learning management systems.

While the professionals in the study described learning and adapting through engaging in fluid work, the learning and development systems and practices described (e.g., training calendars, personal development plans, learning portals) appear to sustain assumptions about learning as a product to be acquired and transferred, highlighting
psychological assumptions about learning at work (Hager & Hodkinson, 2009). Adopting a complex adaptive systems approach to frame this study has not only highlighted the tendency of learning and development systems and practices towards structured learning, but has also shown that more recent shifts towards socio-cultural and postmodern (Hager, 2011), or complex, theories of work and learning, are now far more appropriate to meet the demands to understand organisational complexity and work as fluid. Berg and Chyung (2008) have also noted that what they call informal learning is often invisible within organisations and that formal, or structured, learning is privileged. The findings of this study support Berg and Chyung (2008) but expand on their argument by demonstrating how learning at work is indeed experienced as being through work but that this experience is very often at odds with learning and development systems and practices focusing on more on structured learning.

Importantly, this study also indicates that in the organisational commitment to the 70:20:10 framework, the emphasis of learning and development systems and practices has been disproportionately placed on structured learning (the 10%) rather than learning through work.

Considering work and learning through the lens of the CAOCF has shown that the organisations studied are complex adaptive organisations where organisational complexity is central to shaping fluid work and thus influences learning. In adopting the 70:20:10 framework, the organisations studied have made insufficient changes in their learning and development systems and practices to respond effectively to the challenges presented to work and learning in contexts shaped by emergence, complex social networks, adaptation, and agency.
Fuller and Unwin’s (2003) expansive restrictive framework is useful here to understand the impact of learning and development systems and practices failing to adapt to increasing organisational complexity. The expansive-restrictive framework proposes that expansive practices create a richer learning environment than restrictive practices and that such expansive practices include access to a wide range of formal and informal learning experiences, organisational recognition of workers as learners, and providing opportunities for reflection (Fuller & Unwin, 2003). Despite providing a range of structured learning experiences and varying degrees of less formal learning experiences, the organisations in this study did not appear to recognise professionals as learners unless they were engaged in a formal learning activity, such as a face-to-face or online course which, according to the expansive-restrictive framework (Fuller & Unwin, 2010), presents a less expansive context for learning. Nor did the professionals recognise themselves as learners and thus also a part of expansive learning processes (Fuller & Unwin, 2003). Further, there were limited opportunities for reflection on the increasing demands of fluid work, and reflection was not noted by the professionals as being encouraged by the organisation despite being identified as an expansive learning practice (Fuller & Unwin, 2003). There was little practical acknowledgement of the fluidity of work in complex adaptive organisations or the flexibility required on the part of both organisations and professionals to effectively adapt to these requirements. These findings were consistent regardless of the degree of fluidity of work experienced by the professionals and there was no evidence that this influenced the emphasis on structured learning at work. Despite the organisations surveyed, being quite different from one another, the professionals interviewed experienced the same structured learning initiatives.
As described in Chapter 6, learning through work in complex adaptive organisations was predominantly seen by the professionals as “doing my job” and problem solving rather than learning, whereas structured learning such as face-to-face or online courses is “real”, measurable learning and, therefore, favoured by the organisations studied. Unstructured, or less structured, ways of learning are then more embedded in everyday work and so become invisible and taken for granted (Berg & Chyung, 2008). Naming oneself as a learner is context-dependent and to do so is a complex act ‘which opens up issues related to position, recognition and power in any given group” (Boud & Solomon, 2003, p.326). The professionals in this study did not necessarily identify themselves as learners unless the context demanded it. The professionals reported “getting on with the job” but not necessarily being a learner as part of this process. However, when the professionals described undertaking a course, they were more likely to refer to themselves as learners. These findings have significant implications for the effectiveness of current learning and development systems and practices within complex adaptive organisations, as discussed in the next part of this chapter.

Working and learning in complex adaptive organisations

Throughout this study, the changing nature of work in contemporary organisations has been discussed. The nature of work has fundamentally changed within this rapidly changing context shaped by innovations in technology and shifts “towards a sector of high-quality services within highly developed economies”, questioning assumptions about stability (Harteis et al., 2014, p. 2). Evidence from this study has shown that fluid work now dominates the day-to-day working lives of professionals within complex adaptive organisations, which has a significant influence on the ways in which professionals experience learning. Fluid work, as a way of considering the nature of
work, raises significant questions for learning and development systems and practices within organisations. This study has investigated how professionals are already experiencing their learning in this context and outlined how learning and development systems and practices within organisations appear to be slow in adapting to these changes in the nature of work. The remainder of the chapter explores how the findings of this study challenge current learning and development systems and practices and the underlying assumptions about learning theory apparently underpinning them. First, considering organisations as complex adaptive organisations has significant implications for the appropriate degree of structure in learning and development systems and practices within dynamic contexts of flux and emergence. Second, the findings raise questions about the underlying psychological assumptions about work and learning on which learning and development systems and practices appear to be based. Organisations need to continue progress towards socio-cultural approaches to learning while also adopting complexity approaches to work and learning to underpin their learning and development systems and practices.

**Balancing prescription and fluidity in complex adaptive organisations**

Providing evidence that the organisations in this study were complex adaptive organisations (outlined in Chapter 5) takes up earlier work in organisation studies describing organisations as “becoming” (Clegg et al., 2005) and recent trends within work and learning research using metaphors of “emerging” (Hopwood, 2016) or “becoming” (Boud & Hager, 2012; Hager, 2008) to describe learning in contemporary work contexts. Complex adaptive organisations are, like all complex adaptive systems, dynamic and nonlinear, not completely ordered or disordered (Holland, 1995). Complex
adaptive organisations are strongly influenced by emergence and are, therefore, not static but in a constant state of becoming as the system balances on the “edge of chaos” (Kauffman, 1995; Langton, 1990) through feedback loops between the four elements of complex adaptive organisations and professionals’ responses to these. Emergence has been shown in this study as an important factor in work and learning within complex adaptive organisations, driving both experiences of fluid work and the subsequent learning and adaptation responses of professionals. This raises some key questions. First, given the unpredictability and dynamic nature of complex adaptive organisations, how is it possible to formulate constructive personal and organisational learning responses? Second, how might organisations and learning practitioners negotiate learning and development systems and practices in contexts of emergence and fluid work?

The findings of this study indicate significant challenges for complex adaptive organisations in terms of learning and development systems and practices that are predominantly structured. This study has shown that there is a disconnection between structured learning and development systems and practices and how professionals experience learning through fluid work, suggesting that large-scale shifts in learning and development systems and practices are needed to move away from structure towards emergence and flexibility in learning. In emphasising structured learning, the organisations studied are failing to adapt their learning and development systems and practices to better align with professionals’ experiences of work and learning in complex adaptive organisations through work, and strongly shaped by emergence, adaptation, complex social networks, and agency.
Adopting the CAOCF to investigate and understand work and learning in contemporary organisations also raises significant questions about the optimal degree of structure in learning and development systems and practices. The professionals in this study described their experiences of learning as being primarily through participation. However, it is too simplistic to argue that all learning at work can occur through participation as there are skills and knowledge that need to be taught and are not amenable, for safety or other reasons, to learning through work (Billett & Choy, 2013). Work requirements are becoming increasingly reliant on conceptual and symbolic knowledge requiring specific learning interventions to ensure that this knowledge is learned effectively (Billett, 2009). A key indication from this study is that learning and development systems and practices within complex adaptive organisations need to be flexible to be useful to professionals negotiating contexts of fluid work. This does not preclude structured learning and development systems or learning initiatives such as courses, but instead indicates that structured learning approaches should be used where applicable rather than as the primary learning opportunities afforded by the organisation. Moreover, such structured learning and development systems and practices also need to be adapted to suit the context of each complex adaptive organisation and, most importantly, the requirements of specific jobs considering the degree of fluidity which impacts each job.

**Shifting theoretical assumptions about work and learning**

Challenging psychological assumptions of learning and instead taking up more socio-cultural and complexity-based assumptions is important for organisations to move forward and change their learning and development systems and practices to better
negotiate the emerging demands of fluid work in complex adaptive organisations. As noted in the previous section, learning in complex adaptive organisations cannot be completely structured nor prescriptive due to emergence within the system, yet prescriptive approaches to learning were the basis of the learning and development systems and practices of the organisations studied. For complex adaptive organisations to adopt more flexible and less prescriptive approaches to learning, organisations need to progress from assumptions that learning at work is a psychological process of acquisition and transfer (Hager, 2011; Hager & Hodkinson, 2009). Earlier in this chapter, when discussing the key findings, it was argued that the emphasis on structured learning approaches by the organisations studied reflected, as Reich, Rooney, and Boud (2015) have noted, outdated assumptions about work and learning based on psychological theories of learning. These assumptions fail to account for the well-recognised body of work and learning research acknowledging the primacy of learning through work over structured learning (Eraut, 2012; Hager, 2011). It is argued that finding an emphasis on structured learning indicates that the organisations studied have based their learning and development systems and practices on assumptions about psychological processes of acquisition and transfer in work and learning (Hager, 2011; Hager & Hodkinson, 2009). Further, emphases on structured learning by the organisations studied neglected to address organisational complexity through their learning and development systems and practices, thereby failing to effectively support the flexible learning through work most needed by professionals as they negotiate contexts of fluid work.

In Chapter 2, historical shifts in theorising about work and learning were discussed, organised around Hager’s (2011) classifications which traced the development of three
overlapping tranches of work and learning theories; from psychological, through to socio-cultural approaches, and finally to more recent approaches which have been referred to in this study as the shift towards complexity. In arguing that learning and development systems and practices are embedded in psychological theories of learning, it is further proposed that the emphasis on structured learning experienced by the professionals in the organisations studied reflects stagnant assumptions about learning as a process of acquisition and transfer (Hager, 2011; Hager & Hodkinson, 2009) and a limited exploration of socio-cultural perspectives on learning. The widespread adoption of the 70:20:10 framework by the organisations studied indicated a nascent shift towards socio-cultural assumptions about learning at work through increased opportunities for experiential and social learning within existing learning frameworks. However, this progress appears to be limited and, ultimately, learning and development systems and practices in the organisations studied were still mostly structured.

Although the organisations studied have taken up some practices associated with socio-cultural approaches to learning, such as encouraging physical and virtual learning networks (e.g., the “community of practice” described by the executive assistant from Pharmaceutical 1), the focus on face-to-face and online courses indicates underlying assumptions about learning as a measurable “product” (Hager, 2011) able to be transferred from facilitator to learner before being used to increase work productivity. This is problematic within complex adaptive organisations shaped by emergence, adaptation, complex social networks, and agency. If individual professionals are learning through work, and that work is fluid and only partially predictable, what are the learning “products” or systems which would best assist them in their job? The next section discusses the implications of the findings of this study for learning and
development systems and practices, and for the design of learning initiatives within complex adaptive organisations.

**Implications of the findings for learning and development**

**Implications for learning and development systems and practices**

The professionals interviewed in this study provided examples of learning and development systems and practices such as personal development plans, training calendars, and online learning portals. The adoption of such structured systems and practices is challenged by the findings of this study, firstly through the implications of considering the organisations studied as complex adaptive organisations, and second, by demonstrating that fluid work and learning are interrelated. This section discusses the implications of the four key findings discussed earlier in this chapter for learning and development systems and practices in complex adaptive organisations.

As discussed in the preceding section, identifying the organisations studied as complex adaptive organisations has significant implications for the ways in which work and learning are conceptualised. Emergence and the three key elements of complex adaptive organisations – adaptation, agency, and complex social networks – shape professionals’ experiences of both work and learning in a context where learning is predominantly through fluid work. This is juxtaposed with evidence that the organisations in this study continue to privilege structured learning which is centrally managed by the Human Resources Department. Understanding organisations as complex adaptive organisations provides a way in which to rethink such structured approaches to learning in organisations by reconsidering how organisational complexity shapes both work and learning through emergence and the three key elements of complex adaptive
organisations. Considering organisations as complex adaptive organisations requires learning and development systems and practices that assist professionals in learning and adapting to the emerging requirements of fluid work through complex social networks and the exercise of agency. Furthermore, this requires organisations to place a greater emphasis on individual experiences of work and learning rather than more broadly targeted learning and development systems and practices.

The findings of this study have shown how the organisations studied, despite many adopting the 70:20:10 framework, appear to have largely failed to act on the past twenty years of work and learning research which has consistently found that learning at work is through participation in that work (Billett, 2004a, 2014; Eraut, 2004, 2010; Hager, 2011). As discussed earlier, learning and development systems and practices now need to continue their nascent transition from assumptions of learning as acquisition and transfer (Sfard, 1998) and through participation (Hager, 2011; Hager & Hodkinson, 2009) towards incorporating assumptions about work and learning being interrelated and emergent within complex adaptive organisations.

Considering work and learning as interrelated within complex adaptive organisations indicates, as argued in the earlier section on fluid work, that there are far greater benefits to learning in considering the nature of fluid work for each job and the unique challenges this may bring for a professional’s learning. This takes up current discourses in the organisational learning and professional literatures around personalised learning (Basham, Hall, Carter, & Stahl, 2016; Feldstein & Hill, 2016). Emerging from school and higher education, personalised learning aims to address the specific needs of students and is often strongly linked to the use of technology in education (Basham et
al., 2016; Feldstein & Hill, 2016). It has potential as a way in which to embed learning within the context of work using technology and based on the needs of individual jobs.

Evidence of the interrelatedness of fluid work and learning, further suggests that learning and development systems and practices need, as much as possible, to be located at the site of work and at the time of completing a task. This requires more flexible learning and reference tools to be available to professionals than those emerging from the organisations studied. The professionals in this study were already widely using the Google search engine, for example, to answer questions and learn new skills and knowledge required for tasks. The professionals also commonly described seeking assistance from their professional networks within, and occasionally from outside, the organisation. These findings indicate that learning initiatives which facilitate the development and strengthening of complex social networks within work teams and across organisations would also be beneficial within the context of complex adaptive organisations. This has implications for professionals who are new to an organisation and who are still in the process of developing these critical networks.

It is important to be cautious in such approaches however, particularly within the uncertain and emergent context of complex adaptive organisations. As Boud, Rooney, and Solomon (2009) found in a study of public-sector workers, “interventions in the name of fostering informal learning may well be hindering what they seek to promote” (p. 323). Their research investigated the implementation of three interventions in a local government context (a city council) which attempted to promote learning through co-opting existing social practices within the organisation. The findings of the Boud et al. (2009) study are important for the implications of considering work and learning as...
interrelated in terms of how organisations may facilitate a less structured approach to learning. The findings from this study, and from Boud et al. (2009), suggest that interventions seeking to mimic or build on existing learning or networking may be potentially far less effective than anticipated through the simple act of trying to structure opportunities for learning through work. Workplace interventions must consider the situatedness of such interventions within the socio-political context of the workplace (Elkjaer & Nickelsen, 2016). Even though organisations or individual managers may make intentional interventions in the workplace, the outcomes of these interventions “may be unreliable and may undergo transformations, as they are attempted to be realised” (Elkjaer & Nickelsen, 2016, p. 276). As discussed earlier when considering the balance of structured learning and learning through work in complex adaptive organisations, learning and development systems and practices need to negotiate a fine line between structure and being responsive to the requirements of fluid work. This also has implications for how learning initiatives are designed within complex adaptive organisations.

**Implications for learning design**

The findings of this study highlight the ways in which learning practices need to be flexible and timely; available at the point where they are needed within the workflow. Further, this also suggests that structured learning activities are now less relevant to the requirements of fluid work in complex adaptive organisations. This does not, however, imply that workplace learning initiatives should be completely unstructured and through work. A variety of pedagogical approaches are needed that consider participation and emergence as core mechanisms for learning but also provide sufficient structured
learning opportunities to allow professionals to learn skills and knowledge that are not able to be gained through work. As the findings of this study show, professionals may learn primarily through work but they describe their learning in terms of structured learning opportunities provided by the organisation, suggesting that there is still a role for structured learning activities in contemporary work contexts. On-job experiences of learning at work are subject to limitations in terms of learning conceptual and symbolic knowledge not immediately available through participation in work (Billett & Choy, 2013).

The findings of this study suggest that, when learning practitioners are designing learning initiatives, those situated within work are of greatest use to professionals within complex adaptive organisations, as well as opportunities for social learning within and across networks. Learning with and from other people at work has long been a feature of the work and learning literature (e.g., Eraut, 2007; Lave & Wenger, 1991) and “social learning” has also been recently increasing in popularity within the industry literature (e.g., Hart, 2014) with numerous recommendations for how to leverage social media technologies for learning at work. For example, Littlejohn, Milligan, and Margaryan (2012) have proposed a process they call “charting” which aims to support individual professionals, through web-based tools, to map and manage their own perspective on collective knowledge within an organisation. This type of personal knowledge management (Razmerita, Kirchner, & Sudzina, 2009) aims to facilitate social and self-directed learning by linking professionals who have similar learning needs to create a supportive network for work and learning (Littlejohn et al., 2012). Based on their research, Kyndt et al. (2009) also suggest that creating opportunities to provide feedback and opportunities to acquire knowledge for professionals are central to
learning practices in organisations. They propose that this would take the form of working in teams, peer feedback, new work assignments, and project debriefings (Kyndt et al., 2009) – all being described as part of daily work by the professionals interviewed in this study.

In addition to work-based learning initiatives, learning methodologies from school and higher education, such as flipped learning (Nederveld & Berge, 2015), are also starting to be adopted into workplace contexts and offer further opportunities to change learning practices in terms of how structured learning is designed and implemented. Flipped learning, for example, provides an opportunity to incorporate greater flexibility to structured learning experiences. Using this approach generally sees the content of a structured learning experience delivered in a self-directed way via an online learning platform with subsequent face-to-face sessions focusing instead on the application of skills and knowledge to work-based scenarios (Nederveld & Berge, 2015). Such methods are also aligned with the learning needs of professionals within complex adaptive organisations who primarily learn through work. Furthermore, these approaches answer some of the criticisms of Billett and Choy (2013) in providing structured learning opportunities to learn skills and knowledge that are not amenable to being learned through work while also focusing on practical application of skills to “real-world” scenarios.

Linked to learning through work, and the importance of considering work and learning as interrelated, is helping professionals develop their skills as “reflective practitioners” (Schön, 1995) in order to realise their learning through work experiences. Self-reflection has been recognised as central to the development of expertise (Margaryan,
Littlejohn, & Milligan, 2013) and reflexivity is a key part of effective lifelong learning (Edwards, Ranson, & Strain, 2002), shifting the locus of learning away from acquisition of skills and qualifications. This is aligned with shifts in metaphors of learning which have been discussed throughout this thesis and the shift away from metaphors of acquisition and transfer towards participation, emergence, and becoming (Boud & Hager, 2012; Hopwood, 2016). In addition to being important for individual professionals, reflection is also an important consideration for work teams (Schley & van Woerkom, 2014).

Reflection for both teams and individuals is important to consider in the context of complex social networks within complex adaptive organisations. The concept of “reflexive emergence” (Goldspink & Kay, 2010) was specifically incorporated into the definition of the key element of emergence in the CAOCF. Reflexive emergence acknowledges that professionals in complex adaptive organisations “are self-aware and linguistically capable” (Goldspink & Kay, 2010, p. 48). In the context of complex adaptive organisations, reflection on the part of professionals would create feedback loops for their individual learning (Argyris & Schön, 1996; Schön, 1995). This would also have an impact on emergence within their work teams and the organisation by creating larger scale feedback loops (Goldspink & Kay, 2010).

Although reflection in the workplace is a contested concept (Siebert & Walsh, 2013), it is nevertheless recognised as an important element of learning through work (Boud, 2010; Schley & van Woerkom, 2014). In the context of complex adaptive organisations, an increased emphasis on effective reflection has potential for better facilitating learning
through fluid work in contemporary workplaces, while also acknowledging the role of emergence in fluid work and the entwinement of work and learning.

Reflection is a valuable part of work and learning, creating a “reinforcing cycle between self-efficacy and reflection” supported in the workplace by such tools as reflective journals, learning portfolios, or reflection sessions guided by a facilitator or coach (Hetzner, Heid, & Gruber, 2015, p. 46). Work conditions may be facilitated that support and recognise reflection through promotion and performance management systems (Hetzner et al., 2015). In terms of learning design and practice in complex adaptive organisations, professionals “may realise greater benefits from reflection when they believe in their own capabilities, take initiative and operate within a safe and supportive work environment that values and reinforces reflection” (Hetzner et al., 2015, p. 46). This suggests that professionals in complex adaptive organisations need to continuously assess their learning needs and develop strategies to address these (Goldman et al., 2009) through processes of reflection. Evidence from this study indicated that professionals are already continuously assessing their learning needs and developing strategies to address them through the process of problem-solving in their jobs.

Encouraging and facilitating reflection within complex adaptive organisations would help to close the feedback loop for professionals to recognise and leverage their experiences of fluid work as learning opportunities. In their study of self-regulatory learning strategies and learning goals in the workplace, Margaryan et al. (2013) found that there was a “lack of explicit focus on reflection on learning in the workplace across all experience levels within the sample” (p. 254). Insights from studies of professional reflection (Hetzner et al., 2015; Margaryan et al., 2013) highlight opportunities for learning design and practices to encourage reflection. Educating professionals in
complex adaptive organisations about the importance of reflection and ways to reflect on their fluid work experiences would more effectively realise their learning through work. This study has shown that professionals learn primarily through work and that this work is best described as fluid; however, this study has also shown that professionals do not generally recognise their experiences as learning. Encouraging reflection may help professionals to acknowledge the importance of their work experiences as an important part of learning at work and provide them with the skills to more consciously access this learning. Reflection, in supporting effective learning through work, also offers a flexible and adaptable way in which to negotiate learning through fluid work in complex adaptive organisations where the context is frequently shifting and often unpredictable. In complex contexts where structured learning initiatives are ill-equipped to adapt quickly to the requirements of the moment, the ability to reflect on one’s experiences in the flow of work offers a considerable degree more flexibility than a face-to-face or online course.

Productive reflection (Cressey, Boud, & Docherty, 2006), which is offered in response to changes in work in the late 20th and early 21st centuries, offers a useful way to re-conceptualise reflection in complex adaptive organisations. Productive reflection arose in response to a realisation that workers in contemporary organisations are increasingly time-poor and feeling frantic in both their work and personal lives (Cressey et al., 2006). Productive reflection, unlike earlier approaches to reflection, situates reflective practice within the context of work and, importantly, acknowledges that “reflection in such settings cannot be an individual act if it is to influence work that takes place with others” (Boud, 2010, p. 32). The focus on context and working with others is critical in complex adaptive organisations where organisational complexity shapes experiences of
work with a central part of fluid work and learning being complex social networks.

Moreover, productive reflection takes up several areas that are important in the context of working and learning in complex adaptive organisations. First, as already mentioned, productive reflection has a collective orientation rather than focusing on individuals (Boud, 2010; Cressey et al., 2006). This is important in terms of recognising and leveraging the complex social networks of complex adaptive organisations for learning. Moreover, it is also important in terms of considering complex adaptive organisations as systems shaped by feedback loops between organisational complexity and professionals’ responses to that complexity in their work and learning. Second, productive reflection “connects work and learning and operates in the space between the two” (Boud, 2010, p. 32). Connecting work and learning is critical in the context of complex adaptive organisations where this study has demonstrated that fluid work and learning are interrelated. Finally, productive reflection is dynamic and unpredictable (Boud, 2010; Cressey et al., 2006) in the same way as complex adaptive organisations. Educating and supporting professionals in adopting productive reflection offers a way to support professionals in learning through their work within complex adaptive organisations while accounting for the dynamic and fluid nature of work. Reflection is also an under-theorised area of work and learning research with little empirical evidence to support claims of its efficacy (Boud, Cressey, & Docherty, 2006; Schley & van Woerkom, 2014). This is elaborated in the final chapter as an area of further research.

**Concluding comments**

The findings of this study show that the experience of work and learning for professionals in complex adaptive organisations is shaped by emergence and the three key elements of complex adaptive organisations – adaptation, complex social networks,
and agency. Fluid work is the most tangible manifestation of this organisational complexity whereby individual professionals respond by learning and adapting, utilising complex social networks, and exercising their agency. Experiencing work as fluid influences professionals’ learning through work based on the often unpredictable and novel tasks and challenges which emerge day-to-day. Emergence was also shown to be an important factor in fluid work and, consequently learning, within complex adaptive organisations. Moreover, this study has indicated that fluid work and learning are interrelated and therefore need be examined together to gain effective insights into work and learning. Critical to indicating that work and learning are interrelated is demonstrating how organisational complexity shapes the nature of work. Considering work as fluid within complex adaptive organisations was shown to be important in understanding professionals’ experiences of learning, particularly in indicating that the demands of fluid work influences professionals to learn primarily through work. The findings of this study have supported earlier research which has found that learning at work is primarily through participation (Billett, 2001, 2014; Eraut, 2011; Hager, 2011) and expanded on it by offering insights into the ways the nature of fluid work influences learning through participation. Furthermore, this study has expanded on earlier work which has focused on the influence of work contexts on learning (Billett, 2001, 2004a, 2004b; Fuller & Unwin, 2003, 2004, 2008; Skule, 2004; Skule & Reichborn, 2002, 2007). Considering organisations as complex adaptive organisations means that emergence and nonlinearity are important parts of the system. However, the dynamic nature of such organisations is at odds with traditional, structured approaches to learning and development systems and practices. Related to this is a need for complex adaptive organisations to move away from psychological assumptions to socio-cultural
assumptions about work and learning also, embracing complexity approaches to work and learning.

The findings of this study have practical implications for how learning is negotiated within complex adaptive organisations in terms of how learning and development systems and practices, and specific learning initiatives, are designed. Learning and development systems and practices need to support learning through work for professionals by moving away from structured learning as the default towards a greater emphasis on learning through work and from others in complex social networks. Central to re-developing learning and development systems and practices is exploring new ways of designing learning initiatives that are more embedded in practice and place a greater emphasis on “productive reflection” (Cressey et al., 2006).

The next chapter concludes by discussing the key contributions of this study and the original contributions to knowledge that it makes within the field of work and learning.
Chapter 8 Conclusion: Significance and contribution of the study

This thesis began with a discussion of how the nature of work has changed using the examples of my grandfather’s, my father’s, and my own careers and how work has evolved from the 1930s to the early 21st century. As detailed throughout this thesis, the study examined professionals’ experiences of work and learning within complex adaptive organisations, situated in the dynamic and fluid contexts of the globalised and technologically enabled economy. The data from this study has indicated that, within complex adaptive organisations, professionals learn through participation in fluid work. Yet much of the current work and learning research has focused instead on learning as the object of study (Tynjälä, 2013), largely neglecting detailed examinations of the nature of work tasks and their influence on professionals’ experiences of learning, particularly from a complex adaptive systems approach (Holland, 1995; Mitchell, 2009). Research has been conducted using concepts such as learning-conducive work (Skule, 2004), expansive and restrictive practices (Fuller & Unwin, 2010), and workplace affordances (Billett, 2001), which has investigated the role of learning environments on work and learning. This study expands on this earlier research by investigating learning environments as complex adaptive organisations in addition to examining the nature of day-to-day work tasks and how they are influenced by organisational complexity. This study has examined the nexus of work and learning as interrelated phenomena and how each influences the other within the changeable and uncertain contexts of complex adaptive organisations. These new insights into workplace learning were gained by using a complex adaptive systems approach to
consider the influence of organisational complexity on professionals’ experiences of work and learning.

The chapter begins by revisiting the research question in light of the findings outlined in Chapter 6 and the discussion in Chapter 7. Next, the chapter highlights the original and significant contributions that this study makes to both conceptual and empirical work and learning research and to learning and development systems and practices within organisations. The key conceptual contribution of this study highlights the explanatory and analytical power of complex adaptive systems approaches for investigations of work and learning in contemporary organisations. The empirical contribution of this study is as an empirical study of professionals’ experiences of work and learning in complex adaptive organisations. An important part of this contribution is the development of an adapted form of phenomenography as the methodological approach. The chapter concludes with a discussion of the limitations of the research, and future research opportunities which show how the findings of this study may be expanded.

**Revisiting the research question**

This study posed the question: How do professionals experience work and learning within complex adaptive organisations? The main aim of the study, identified in Chapter 1, was to gain an understanding of how professionals experience work and learning within broader contexts of organisations considered as complex adaptive systems. The research question was framed within the broader societal and organisational changes to the structure and nature of work in the knowledge economy and how this has impacted professionals’ experiences of learning, focusing on two key under-researched areas of the workplace learning literature. In the first instance, there
was little work and learning research identified as adopting complex adaptive systems approaches. The tendency within the literature has been towards the adoption of complexity approaches that did not emphasise adaptation in the same way as a complex adaptive systems approach (see Fenwick & Dahlgren, 2015; Fenwick et al., 2011; Johnsson & Boud, 2010). As detailed in Chapter 3, an organisational learning typology from Chiva et al. (2010) and a school education framework from Jacobson et al. (2016) were examined in terms of their usefulness for this study. It was found that these frameworks were not sufficiently specific to work and learning research for use in this study.

The second under-researched area identified from the work and learning literature was within the research that has adopted complexity and complex adaptive systems approaches, where there has been little investigation into individual’s experiences of work and learning within organisations but a greater focus on organisational systems (see Chiva et al., 2014; Chiva et al., 2010; Chiva & Habib, 2015). An organisational focus has been a key feature of previous research adopting complexity and complex adaptive systems approaches (e.g., Chiva et al., 2014; Chiva et al., 2010; Palmberg, 2009). The research question developed for this study addressed both these under-researched areas – by first, focusing on complex adaptive organisations, and second focusing on the individual professional experiences of learning in these organisations.

As outlined in Chapter 1, work and organisations have changed significantly over the course of the 20th and early 21st centuries. Contexts of work have moved from stability towards contexts of change and uncertainty with shifts in the broader economy influenced by globalisation, technological advances, and neoliberal economic policies
(Harteis et al., 2014; Walton, 2016). In response to contexts of increasing complexity and uncertainty, this study adopted a complex adaptive systems approach to frame the study. A new conceptual framework, the CAOCF, was specifically developed for use in this study.

Semi-structured interviews were conducted with fourteen professionals from a diverse range of industry sectors and organisations producing around sixteen hours of audio recordings which were transcribed into 225 pages of data which was analysed using an adapted phenomenographic approach. Two adaptations were made to the more common phenomenographic approach. The first adaptation was to analyse two phenomena concurrently – work and learning – rather than conducting a separate analysis for each phenomenon which is more common (see Bailey, 2015). The second adaptation to the phenomenographic approach was to reject more common assumptions that the categories of description should emerge as a hierarchy (Tight, 2016). These are discussed further in the contribution section below.

The categories of description and the outcome space which emerged from the adapted phenomenographic analysis provided insights into the research question, specifically that work in complex adaptive organisations is best considered as “fluid” and shaped by organisational complexity through emergence and the three key elements of complex adaptive organisations – complex social networks, agency, and adaptation. Fluid work, in turn, influences professionals’ experiences of learning as being primarily through work. Four interrelated categories of description, outlined in Chapter 6, provided insights into professionals’ experiences of both work and learning as interrelated phenomena within complex adaptive organisations. The categories of description are:
1. Learning is experienced by professionals as being through work;
2. Work is experienced by professionals as fluid and shaped by varying degrees of emergence, agency, complex social networks, and adaptation;
3. Professionals’ experiences of learning are influenced by the degree of fluidity experienced in their work; and;
4. Professionals experience an organisational emphasis on structured learning.

The outcome space of this study was portrayed in Chapter 6, Figure 6.1, showing that professionals in complex adaptive organisations experience work and learning as interrelated phenomena which strongly influence one another. Learning at work is experienced primarily through participation in that work. The four categories of description which form the outcome space of this study indicated that work and learning are not only interrelated, but entwined with organisational complexity (see Figure 8.1). Emergence and the three key elements of complex adaptive organisations are central to shaping organisational complexity. Organisational complexity then shapes the nature of fluid work to which professionals must adapt through learning quickly and flexibly, exercise agency, and exploit complex social networks.

In contrast to professionals describing how they primarily learned through fluid work which was changeable and unpredictable, professionals reported that their organisations emphasised structured learning through their learning and development systems and practices. The data indicated that the learning and development systems and practices of the organisations studied were underpinned by competency frameworks and eight out of the nine organisations studied had adopted the 70:20:10 learning framework, as noted in Chapters 5 and 6. While the organisations’ documents espoused that their learning and development systems and practices adopted a less formal approach to learning and a
focus on learning through experience, the ways learning was measured and recognised emphasised structured learning via face-to-face and online courses, qualifications, and professional development events.

The findings of this study have shown that professionals in complex adaptive organisations experience work as fluid, shaped by the four elements of complex adaptive organisations. Fluid work, in turn, influences professionals’ experiences of learning as being primarily through work, from others in their networks, and, to a lesser extent, via structured learning provided by their organisation.

**Unique and significant contribution of the research**

This study makes both a significant conceptual and empirical contribution to the field of work and learning research.

**Conceptual contribution**

This study adopted a complex adaptive systems approach as the basis for an innovative conceptual and analytical framework. The *complex adaptive organisations conceptual framework* (CAOCF), developed for this study, proved to be a very useful tool for conceptualising and analysing data from this study. Emergence and the three key elements of the CAOCF were used to analyse the interview data and organisational documents to determine that the organisations studied were indeed complex adaptive organisations. These core concepts of the CAOCF were also used as part of the adapted phenomenographic analysis to examine the nature of work within complex adaptive organisations, providing a way in which to examine the influence of organisational complexity on professionals’ experiences of work. The analysis presented in Chapter 5
showed how the organisations in this study were complex adaptive organisations, based on emergence and the three key elements of the framework, and the categories of description in Chapter 6 provided evidence of how work and learning were experienced in complex adaptive organisations.

The CAOCP contributes to the research by means of other conceptual frameworks using complex adaptive systems approaches. As discussed in Chapter 3, other frameworks focused on learning in different contexts; as for example, school education (Jacobson et al., 2016) and organisational learning (Chiva et al., 2014; Chiva et al., 2010). Despite adopting elements of complex adaptive systems approaches, neither the Complex Systems Conceptual Framework for Learning (CSCFL) (Jacobson et al., 2016) or the adaptive/generative learning typology (Chiva et al., 2014; Chiva et al., 2010) were found to be suitable for this study. In the case of the CSCFL this was primarily because of its focus on school education, differing significantly from contexts of work and possessing less diversity in terms of the types of work and learning which students undertake compared to professionals. In addition, the CSCFL used elements from both complex systems and complex adaptive systems whereas this study emphasised the adaptive nature of complex adaptive systems and the critical role of learning and adaptation within them. The adaptive/generative typology (Chiva et al., 2014; Chiva et al., 2010) was also unsuitable for this study as it focussed on learning from the perspective of organisations rather than individuals. Further, the adaptive/generative typology emphasised two different types of learning – adaptive and generative – proposing that each type of learning was facilitated by either complex adaptive systems or complex generative systems, of which complex generative systems were preferred for their superior learning capabilities. Assuming certain types of learning were “better” or
“worse” from the outset of the study would have been unhelpful in investigating professionals’ experiences of work in complex adaptive organisations with an open-mind (Åkerlind, 2012).

As an appropriate and existing framework, based on complex adaptive systems approaches, was not found within the work and learning literature, a conceptual framework specific to this study of work and learning was developed. The CAOCF provided a conceptual and analytical framework to apply complex adaptive systems concepts specifically to an investigation of work and learning. Using the framework as part of the analysis, the nature of work in complex adaptive organisations was found to be best described as fluid, providing significant explanatory power for experiences of work and learning in complex adaptive organisations.

Developing a framework specifically for analysing work and learning concurrently in complex adaptive organisations has opened opportunities to understand in new ways, the complexity of professionals’ experiences of learning in work. Foregrounding emergence and the key elements of complex adaptive organisations and their interconnections has provided a way of studying the professionals’ experiences of learning in detail.

Using the CAOCF has also contributed to debates about metaphors of work and learning (Hager, 2008; Hager & Hodkinson, 2009). It has provided a different understanding of emergence, showing that emergence is not only a more appropriate metaphor to describe learning in contemporary contexts than participation alone, but that it plays a crucial part in shaping fluid work as a characteristic of complex adaptive organisations which then influences learning. Finding that learning at work occurs via
participation, as well as being influenced by emergence, contributes to discussions of shifting metaphors of learning (Hager, 2008; Hager & Hodkinson, 2009) by demonstrating the importance of emergence in work and learning, particularly in shaping fluid work.

This study shows how individual professionals experience systemic complexity in the context of their work and learning. Using the CAOCF as part of the analysis provided a fuller understanding of work and learning within complex adaptive organisations from both the organisations’ and professionals’ perspectives. Focusing on professionals’ experiences of work and learning, and the influence of the organisational complexity on these experiences, provided valuable insights into work and learning, particularly in highlighting the nature of work as fluid and the influence of fluid work on experiences of learning.

**Empirical study of work and learning as interrelated phenomena**

The key empirical contribution of this study to the field of work and learning is a study of professionals’ experiences of learning in complex adaptive organisations. This empirical study contributed five main advances to knowledge in the field of work and learning: rich descriptions of the professionals’ experiences of learning in complex adaptive organisations; empirically linking work and learning in a study of professionals’ learning in complex adaptive organisations; expanding understandings of learning as participation in work by empirically identifying fluid work as central to influencing learning via participation; empirically indicating the disconnection between learning occurring primarily through work and organisations’ emphasis on structured
training; and using an adapted phenomenographic approach to investigate work and learning as interrelated phenomena.

First, the study provides rich descriptions of day-to-day work and learning experiences of professionals within complex adaptive organisations who were employed in a range of jobs (including scientists, administrators, journalists, and managers) and a variety of organisations (large multinational companies, member organisations, government organisations). Their experiences of learning were found to be strongly interlinked with the nature of their daily work and the effects of the complex adaptive organisations in which they worked. Other studies (e.g., Chiva et al., 2014; Chiva et al., 2010; Chiva & Habib, 2015; Johnsson & Boud, 2010; Jones & Corner, 2012) lack the focus on individual professionals’ experiences of learning and do not focus on these experiences within complex adaptive systems. The rich descriptions from this study provided in-depth data on professionals’ experiences and situated them within broader contexts of work fluidity and organisational complexity.

Second, empirically investigating work and learning together makes a key contribution to research in the field of work and learning. Although a great deal of earlier research shows that participation in work is the primary way in which learning at work occurs (e.g., Billett, 2004b; Eraut, 2004, 2011), a lesser amount of research considers the nature of that work and its influence on learning from a complex adaptive systems approach. As Tynjälä (2013) suggests, the focus of research has tended to be on learning as the object of study rather than work, or both work and learning together. An important empirical contribution of this study is indicating the importance of investigating both
work and learning concurrently in terms of understanding professionals’ experiences of learning through work.

Third, the study has empirically demonstrated that the degree of fluidity of work is a key influence on the professionals’ experiences of learning. Fluid work was revealed in this study as the most appropriate way in which to describe the demands of work in complex adaptive organisations. Furthermore, fluid work was found to be central to experiences of learning through work within complex adaptive organisations, expanding on earlier research which focused on the role of work environments in learning. This study expands on earlier work in finding that a key influence on learning through work is the degree of fluidity in work. Such findings support existing work and learning literature which has long accepted that participation is the primary means of learning at work both as a means of learning and as a metaphor for learning. Current debates within the work and learning literature argue that metaphors of becoming and emergence are more relevant in contemporary contexts of work than metaphors of participation. In adopting a complex adaptive systems approach, this study expands knowledge in the work and learning field about participation as the primary means of learning at work by empirically indicating that both participation and emergence are appropriate metaphors for learning in complex adaptive organisations. Fluid work, influenced by emergence, adaptation, complex social networks, and agency, requires the flexibility and speed offered to professionals by learning through work. Learning in complex adaptive organisations may be considered as emerging from participation in fluid work and influenced by emergence, adaptation, complex social networks, and agency as part of a complex adaptive organisation.
Fourth, the study empirically indicated the disconnection between ways in which professionals primarily learnt through work and the organisational emphasis on structured learning. The professionals in the study experienced learning through participation in fluid work, from others in their networks and, to a lesser extent, by taking up structured learning opportunities offered by their organisations. In contrast, as this study indicated, organisations continue to emphasise structured learning. The study provided empirical data which highlighted the ways in which structured learning and development systems and practices were emphasised by the organisations studied through personal development plans, face-to-face and online courses, and self-paced online learning “portals”. The findings of this study suggest that the focus for understanding learning and development systems and practices in complex adaptive organisations needs to shift away from structure and a focus on individual learning (i.e., psychological approaches to learning), towards approaches which consider the interplay of organisational complexity, fluidity of work, and experiences of learning primarily through work.

Fifth, the insights into work and learning as interrelated phenomena from this study were largely enabled by the adoption of an adapted phenomenographic research approach where both work and learning were analysed concurrently rather than separately, as was most common in previous studies using phenomenography (see Bailey, 2015). Adapting the phenomenographic approach to enable a unitary investigation of work and learning is a key contribution of this study. The changes made to the phenomenographic approach allowed for a combined analysis of work and learning as well as the flexibility to move beyond the frequently used phenomenographic practice of assuming a hierarchy of categories of description from
the outset of the analysis (Tight, 2016). Rejecting the assumption of a hierarchy of categories allowed for a broader analysis of the data which highlighted the tension between professionals’ experiences of learning through work in contrast to learning and development systems and practices emphasising structured learning. Further, the use of phenomenography to investigate professionals’ experiences of two phenomena, rather than experiences of learning alone, which is more common in phenomenography (e.g., Bliuc et al., 2012; Felix, 2009; Wilhelmsson et al., 2010), was central to indicating that fluid work and learning are interrelated as well as uncovering the ways in which fluid work influences the learning experiences of professionals. The adapted phenomenographic methodology used in this study contributes to the field of work and learning by providing a way to investigate work and learning together as interrelated phenomena.

**Limitations of the research**

As will all methodologies, the methodological approach adopted for this study – phenomenography – has its limitations. As discussed in Chapter 4, the main limitations of a phenomenographic study are the focus on investigating only one phenomenon, an assumed hierarchy of categories of description (Tight, 2016), and concern over conducting a collective analysis using individual data (Säljö, 1996). A further limitation identified in this study is using a complex adaptive systems approach to frame a qualitative study. These limitations, and their mitigation, are discussed in the sections below.
Critiques of phenomenography

Phenomenography was identified as the most appropriate methodology for this study based on its focus on empirically investigating the lived experiences of individuals (Marton & Booth, 1997) and an alignment between the ontological and epistemological assumptions of the study and the phenomenographic approach. Nevertheless, there are limitations in using a phenomenographic approach for this study, as discussed in the methodological discussion in Chapter 4. Three key limitations relevant to this study are: the focus on investigating experiences of a single phenomenon, the focus on hierarchies in the categories of description (Tight, 2016), and that data is gathered from individuals but analysed collectively (Säljö, 1996).

Although phenomenographic research has traditionally tended to focus on a single phenomenon (Åkerlind, 2017), it is a flexible research approach which has allowed for variation in phenomenographic practice (Tight, 2016). Phenomenography’s focus on a single phenomenon was a potential limitation for this study as the research question examined two, interrelated phenomena – work and learning. To overcome this limitation, this study adapted the phenomenographic analysis to include a concurrent analysis of both phenomena resulting in one set of categories of description and one outcome space, whereas earlier research examining two phenomena undertook a separate analysis of each phenomenon (see Bailey, 2015). In analysing the composite dual phenomena, this study could access the benefits of phenomenography as a research approach while investigating work and learning together.

A traditional assumption of the phenomenographic approach is to organise the categories of description hierarchically (Tight, 2016). In Chapter 4, this was identified
as a limitation of the approach for this study due to the use of a complex adaptive systems approach to frame the study. The unpredictable and systemic nature of complex adaptive organisations made hierarchies in the categories of description challenging to define from the outset and could have constrained the findings. To overcome this limitation, a further adaptation was made to the phenomenographic approach to conduct the analysis with a more open frame of mind (Åkerlind, 2012) and not to seek a hierarchy of categories from the outset, providing increased flexibility in the analysis.

The other limitation of the phenomenographic approach identified for this study was Säljö’s (1996) concern over conducting a collective analysis of individual data. In the context of this study, collective analysis was not identified as a limitation as it was a key reason for selecting phenomenography. Framing the study using a complex adaptive systems approach requires both individual and collective perspectives as the two are intertwined within complex adaptive organisations. Phenomenography offers a unique way in which to empirically investigate professionals’ individual experiences of work and learning before moving to a collective view of professionals’ experiences in the categories of description and the outcome space of the study.

**Framing a qualitative study using a complex adaptive systems approach**

Another key critique of using complexity approaches in the social sciences has centred on the origins of complexity approaches in the physical sciences, arguing that complexity approaches fail to recognise human agency and subjectivity (Baskin, 2008; Chia, 1998; Lancaster, 2012; Stacey, 2001, 2003). In response to these critiques, agency was included as a key element of complex adaptive organisations. Including agency in the CAOCF addressed both concerns with using complexity approaches in the social
sciences (Baskin, 2008; Chia, 1998; Lancaster, 2012; Stacey, 2001, 2003) and increasing interest in agency in work and learning research (see Billett, 2011; Eteläpelto et al., 2013; Vähäsantanen et al., 2017).

Further, adopting a complex adaptive systems approach to frame this qualitative study could be seen as a limitation. Research investigating complex adaptive systems has tended to be quantitative (e.g., Mitchell, 1998; Oka & Ikegami, 2013; Rodewald et al., 2015; Stramaglia et al., 2012), often using computer simulations (Wilensky, 1999). However, this has not precluded the investigation of human social systems (e.g., Axelrod & Cohen, 1999; Kasthurirathna et al., 2015) or the use of qualitative methodological approaches to complex adaptive systems studies (e.g., Chiva et al., 2014; Will, 2016). Although a focus on quantitative methods suggests a positivist approach underpinning complex adaptive systems research, the highly networked and emergent nature of complex adaptive systems also highlights how such systems are constructed through complex webs of interactions and so may be considered using a constructivist perspective. In Chapter 4, Doolittle’s (2014) complex constructivist approach was discussed as a suitable epistemological foundation for this study by uniting social constructivism and complexity approaches. Complex constructivism positions the construction of knowledge through processes of adaptation, occurring through the interactions of the agents (here professionals) within the system (Doolittle, 2014).

**Proposed future research**

This study has provided significant insights into professionals’ experiences of work and learning in complex adaptive organisations and four areas of research have been
identified which would expand the contributions of this study, these being: application of the CAOCF to other sites and non-professional workers; use of the adapted phenomenographic approach for other studies; further research into the applications of productive reflection (Boud, 2010; Cressey et al., 2006) in complex adaptive organisations; and, research examining improvements to learning and development systems and practices in light of the findings of this study.

**Broader application of the conceptual framework**

The CAOCF was developed specifically for this study but with the longer-term goal of assessing its broader applicability across a range of work settings. This study has demonstrated the usefulness of the framework for providing insights into professionals’ experiences of work and learning across nine industry sectors. It would be a further contribution to use the CAOCF to investigate work and learning in other work sectors as well as to explore experiences of work and learning outside of primarily office-based contexts.

Three groups are noted as being of particular interest for further research. The first is “portfolio workers” (Fenwick, 2004), people who work within organisations but often on very specific terms. These workers may work between multiple organisations or for short-term projects within a single organisation. Although affected by the dynamics of each organisation, these workers are also strongly affected by broader changes in the economy and needing to learn across multiple contexts. The second group is front-line staff with customer-facing jobs within organisations. The CAOCF includes complex social networks as being a key element of organisations but how is work and learning
experienced when these networks include stronger interactions with customers? The third group of interest is those in the skilled trades. These workers often have no fixed workplace and so their learning occurs within varying spatial, temporal, and knowledge contexts very different to that of office-based workers. Research in on-site contexts of work and learning would also provide a way to investigate whether smaller organisational structures may also be considered as complex adaptive organisations. Investigating front-line workers and those in the skilled trades would expand the usage of the CAOCF outside of office-based professionals.

**Use of an adapted phenomenographic research approach in other contexts**

A combined analysis of both work and learning was a key to the findings of this study, particularly in indicating the interrelatedness of work and learning. This presents a range of opportunities to extend the adapted phenomenographic research approach used in this study to further studies of the experiences of work and learning. In addition, the adapted phenomenographic methodology used for this study could be used to investigate other interrelated phenomena. An example of this could be experiences of learning and management that have been of continuing research interest (e.g., Hasson, Von Thiele Schwarz, Holmstrom, Karanika-Murray, & Tafvelin, 2016; Lans, Verhees, & Verstegen, 2016).

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8 “Customers” is used here to refer to those individuals who purchase goods or services from an organisation. The professionals within this study, while interacting with internal “customers” within their organisation, were not what is sometimes called “front line staff” in terms of dealing with customers directly via shop fronts, telephone enquiries, or online.
Productive and collective reflection in complex adaptive organisations

The findings of this study have implications for learning design in complex adaptive organisations, particularly the need for learning opportunities to embrace more flexibility and emphasise learning through fluid work over structured learning. Productive reflection (Boud, 2010; Cressey et al., 2006) was discussed in Chapter 7 as a useful concept to better facilitate learning through fluid work within complex adaptive organisations. The focus of productive reflection for both individuals and teams (Boud, 2010; Cressey et al., 2006) has the potential to provide a better scaffold for learning through work for individual professionals as well as considering the importance of complex social networks in complex adaptive organisations.

The contexts in which professionals work, and reflect, have fundamentally changed in recent years (Frost, 2010). Globalisation, increasing access to vast amounts of information, a highly networked society, and an increasing focus on compliance have implications for professionals’ critical reflection (Frost, 2010). Further research is needed to determine how productive reflection might be used within contexts of fluid work and within teams in complex adaptive organisations. Key to this line of inquiry is investigating how productive reflection could be used without a focus on structure and measurement by organisations. In addition, further investigation is needed as to the skills, knowledge, and support that professionals and work teams might need in order to use productive reflection effectively to learn through work.

A further line of inquiry is to investigate the usefulness of collective reflection (Cressey, 2006) in complex adaptive organisations. Reflection has traditionally been examined as an individual phenomenon, however there is increasing research investigating the social
embeddedness of reflection (Rantatalo & Karp, 2016). Adopting a complex adaptive systems approach to investigate work and learning, emphasises relationality and networks and their role in work and learning, and may be highly conducive to collective reflective processes. Collective reflection has already been investigated in such areas as police training (Rantatalo & Karp, 2016) and teachers’ professional learning (Ohlsson, 2013) and may offer opportunities for improved learning experiences for professionals working within complex social networks in complex adaptive organisations.

**Research into learning and development systems and practices**

This study highlighted how learning and development systems and practices continue to emphasise structured learning despite experiences of professionals learning primarily through work and the demands of complex organisational contexts. Further research to investigate how learning and development systems and practices could become more flexible and emphasise learning through work would expand on the findings of this study and consider how the findings could be practically applied. In indicating that fluid work and learning are interrelated, there is a need for further research investigating the ways in which both work and learning may be more effectively considered when designing learning and development systems and practices in terms of how they provide support for learning at work. Future research could investigate the ways in which learning and development systems and practices could be adapted to better support and recognise learning through work and to determine which approaches are the most effective. An important consideration in new approaches to supporting learning in organisations is productive and collective reflection, as discussed in the previous section. In addition, further lines of inquiry could investigate how organisations could
adopt more adaptive and flexible learning and development systems and practices and the cultural shifts required to effect such changes.

**Concluding comments**

Contemporary contexts of work and learning have significantly shifted from stability and predictability to a lack of predictability and frequent change, demanding flexible responses from professionals and organisations. These changes challenge how work and learning have traditionally been conceptualised and investigated. This study has demonstrated an innovative way to investigate experiences of work and learning in contemporary organisations using a complex adaptive systems approach that complexifies theory in response to increasing complexity in work and organisations (Tsoukas, 2017).

The data indicated that fluid work and learning are interrelated and, as such, need to be considered together to gain a full understanding of work and learning in contemporary organisations. Considering experiences of work as fluid and the ways in which fluid work influences experiences of learning makes a significant contribution to the understanding and practice of work and learning within increasingly complex organisational contexts. Further, identifying organisations as complex adaptive organisations has important implications for new ways to support learning for professionals and ways to improve learning and development systems and practices. The findings from this study suggest that, for professionals and organisations to best respond to increasing complexity, learning in complex adaptive organisations needs to be aligned with, and acknowledge, the interplay of organisational complexity, fluidity of work, and experiences of learning through participation.
Appendix 1 – Journal of Workplace Learning article

Investigating work and learning through complex adaptive organisations

Abstract

Purpose

This article outlines an empirical study of how professionals experience work and learning in complex adaptive organisations. The study uses a complex adaptive systems approach, which forms the basis of a specifically developed conceptual framework for explaining professionals’ experiences of work and learning.

Design/methodology/approach

Semi-structured interviews were conducted with fourteen professionals from a variety of organisations, industry sectors, and occupations in Sydney, Australia. The transcripts were subjected to an adapted phenomenographic analysis and an analysis using the complex adaptive organisations conceptual framework (CAOCF).

Findings

The findings indicated that professionals experienced learning mainly through work, where work was experienced as fluid and influenced by varying degrees of emergence, agency, complex social networks, and adaptation. Further, the greater the degree of work fluidity, the greater the impetus toward learning through work, empirically indicating that the experience of learning in contemporary organisations is entwined with work.

Originality/value

This study used the concept of complex adaptive organisations as a conceptual framework, coupled with an adapted phenomenographic methodology, to investigate individual professionals’ experiences of work and learning. The adoption of the concept of complex adaptive organisations provided a rigorous way in which to adopt complexity theory. In particular, the concept of emergence provides insights into how organisational complexity influences work and, subsequently, learning and adaptation.
Introduction

This article outlines an empirical study which investigated the question: How do professionals experience work and learning in complex adaptive organisations? A conceptual framework based on a complex adaptive systems approach (Holland, 1995) was developed for this study, introducing the concept of complex adaptive organisations. Complex adaptive organisations are used to describe the framework as well as to differentiate organisations as human social systems from other examples of complex adaptive systems found in nature (e.g. flocks of birds, computer networks). Individual participants in this study are referred to as “professionals” to differentiate them from non-human agents within complex adaptive organisations as well as to describe their work within primarily office-based contexts.

Adopting a complex adaptive systems approach as the basis for the conceptual framework gives recognition to shifts in workplace learning research towards the adoption of complexity approaches (Fenwick, Edwards, & Sawchuk, 2011). This article suggests that a rigorous use of complexity approaches, in particular the specific adoption of complex adaptive systems, offers new insights into work and learning.

The article begins with an overview of the literature on workplace learning and complex adaptive systems before outlining the gap in the literature addressed by this study. The study’s conceptual framework, the complex adaptive organisations conceptual framework (CAOCF), is then outlined, followed by the methodology, which uses an adapted phenomenographic approach. The article concludes by highlighting two key contributions of the study.
Complexity approaches and complex adaptive systems

Complexity approaches offer new understandings of learning and practice in the context of work (Fenwick, 2012; Fenwick & Dahlgren, 2015; Johnsson & Boud, 2010; Lancaster, 2012). Complexity approaches is a broad term given to a number of different areas of scientific and social science research (Mason, 2008) referring to investigations of specific types of systems called complex systems. Complex adaptive systems are specific types of complex systems containing agents which adapt their strategies for working within systems to increase their chances of success, usually through learning processes (Holland, 1995), emphasising learning and adaptation as critical aspects of the system.

Originating in the physical sciences, complexity approaches have been adopted by researchers in workplace learning (C. Davis, 2012; Fenwick, 2012; Lancaster, 2012), organisational theory (Tsoukas & Hatch, 2001), organisational learning (Chiva, Ghauri, & Alegre, 2014; Chiva, Gradío, & Alegre, 2010), and education (B. Davis & Sumara, 2006; Jacobson, Kapur, & Reimann, 2016). Complexity approaches offer a way in which to consider work and learning simultaneously from the perspective of collective behaviour (the organisation) as well as from the perspective of individuals who can learn and adapt (Jacobson et al., 2016).

This study takes up Fenwick’s (2012) challenge to use complexity concepts rigorously rather than metaphorically by using a complex adaptive systems approach to frame the study. This contributes to workplace learning research by empirically indicating the interrelated nature of work and learning in diverse workplaces and the influence of four
key elements of complex adaptive organisations – emergence, adaptation, complex social networks, and agency – on the experience of work and learning.

**Complex adaptive organisations conceptual framework (CAOCF)**

Central to the *complex adaptive organisations conceptual framework* (CAOCF) is the concept of complex adaptive organisations. A complex adaptive organisation is one that displays, and is shaped by, the four key elements, namely emergence, adaptation, complex social systems, and agency. These four elements were identified from the complex adaptive systems (Barabási & Albert, 1999; Holland, 1995; Mitchell, 2009; Strogatz, 2008; Watts & Strogatz, 1998) and workplace learning (Kersh, 2015; Vähäsantanen, Paloniemi, Hökka, & Eteläpelto, 2017) literature as having the greatest potential for insights into work and learning in contemporary organisations.

The first key element, *emergence*, describes how interactions within organisations contribute to patterns at the macro-level that may have very different characteristics to those of the individual elements (e.g. people, technology, spaces) and are unable to be fully predicted from their actions and interactions (Reich & Hager, 2014), creating an environment of near constant change lack of predictability. The second key element is *adaptation*, referring to the capacity of professionals to adjust to the emerging requirements of their context. The third key element is *complex social networks*, specific types of networks that are not completely regular and not completely random (Newman, 2010). In complex adaptive organisations, professionals operate within and across overlapping networks which are highly interconnected. The fourth and final key element of complex adaptive organisations included in the CAOCF is *agency*. Within complex adaptive organisations, agency is experienced as a continuum, with all
professionals having a degree of agency but no single individual or group having unconstrained agency (Dietz & Burns, 1992).

Figure 1 provides a visual representation of the inter-relationships between the four key elements and professionals, and how they shape complex adaptive organisations.

Complex adaptive organisations are made up of professionals who learn and adapt, act with agency, and utilise their networks in response to the influence of the four key elements, which professionals primarily experience through their impact on everyday work. The influence of the four key elements is bi-directional with the actions and interactions of the professionals influencing the four key elements of the organisation creating a feedback loop (Wotherspoon & Hubler, 2009). Figure 1 illustrates these relationships by representing complex adaptive organisations as nested with professionals’ responses at the centre surrounded by work and the four key elements.

The CAOCF was used as part of the data analysis for the study in two ways. First, to determine whether the organisations studied could be considered complex adaptive
organisations. Second, the CAOCF was used as part of the phenomenographic analysis to consider the nature of work given the assumed influence of organisational complexity.

**Methodology**

This study adopted an adapted phenomenographic approach which sought to identify the different ways in which people experience aspects of their world (Marton, 1994). Phenomenography’s positioning as an empirical research method (Marton & Booth, 1997) which describes individual experiences of phenomena provided a robust but still flexible methodological basis for the study. Traditionally, phenomenography focuses on a single phenomenon; however this study investigated experiences of both work and learning. This study therefore adopted a “hybrid”, or adapted, approach, incorporating core aspects of phenomenography (Bailey, 2015) but with one analysis for both phenomena. The methodology also rejected the assumption, commonly held in phenomenography (Tight, 2016), that the categories of description form a hierarchy to maintain a fluid approach, in keeping with the complex adaptive systems approach of the study.

Semi-structured interviews were conducted with fourteen professionals; a recommended sample size for this type of study (Trigwell, 2000). A convenience sample of participants was selected using a purposive sampling approach involving a series of strategic choices about the participants and how their selection would further the aims of the research (Palys, 2008), an approach common in phenomenography (Yates, Partridge, & Bruce, 2012). The participants were selected to provide data across a wide range of industries, job types, and occupational levels. Participants represented nine
organisations within Sydney, Australia and a range of occupational levels (i.e.
administration, technical, management, and executive). Participants were drawn from
organisations within sectors focused on professional services, professional education
and advocacy, banking, retail, radio and television, scientific research, aviation, and
pharmaceuticals, with an age range 27–54 years. The interviews used a combination of
direct and critical incident questions (Butterfield, Borgen, Amundson, & Maglio, 2005)
and were digitally recorded before being transcribed. The direct questions focused on
two main areas; organisational characteristics and experiences of learning as described
by the professionals. The critical incident questions helped participants describe how
they learned at work in greater detail by asking them to recall situations where they
needed to learn something new at work and to talk through the process of how they
went about this. The interviews produced over sixteen hours of audio recordings which
were transcribed verbatim into 225 pages of transcripts. The excerpts used in the next
section were selected from these transcripts to highlight the findings.

Findings

Using the adapted phenomenographic approach described above, and framed by the
CAOCF, the transcripts were analysed through an iterative process over the course of
one year to develop the categories of description. The CAOCF was used to “bracket”
(Ashworth, 1999) the analysis, enabling theoretical assumptions to be defined. Through
the analysis, it emerged that professionals in complex adaptive organisations
experienced work and learning in four interrelated ways:

(1) Learning is experienced by professionals through work;
(2) Work is experienced by professionals as fluid and influenced by varying degrees of emergence, agency, complex social networks, and adaptation;

(3) Professionals’ experiences of learning are influenced by the degree of fluidity encountered in their work; and; found

(4) Professionals experience an organisational emphasis on structured learning.

The outcome space (Marton & Booth, 1997) illustrating these findings is shown in Figure 2.

![Complex adaptive organisation](Figure 2 – The outcome space)

A general theme across all the categories of description was the interrelationship of work and learning experiences. As shown in Figure 2, the four elements of complex adaptive organisations influenced experiences of both work and learning, in particular work. Fluid work had a strong influence on learning in a context where learning through work was experienced as the primary mode of learning. The term “fluid” is used to describe the experience of work that emerged from the data and, in the sense used here, is juxtaposed with the idea of work being structured and clearly planned in advance.

The professionals described their work as being highly changeable and unpredictable. Fluid work is used in this study to refer to the nature of the work in terms of day-to-day tasks whereas recent usages of the term “fluid work” in the literature have focused
primarily on describing the work context (Allard & Bleakley, 2016; Smith & McDonald, 2015).

The first category of description which emerged from the data analysis described how learning was primarily experienced through work. A finance analyst from a government scientific organisation summarised it as:

basically it's on the job learning and just learning as the circumstances come up.

Similarly, a manager from a member services organisation referred to:

the things I’m learning are very much on the job, on the instant, on the fly.

These findings are aligned with existing research, which has found that much of the learning at work occurs through the practice of work (Billett, 1999, 2004; Boud & Hager, 2012; Eraut, 2007). Interestingly, when asked a direct question about their learning, the professionals tended to nominate structured learning activities such as face-to-face and online courses as their primary learning experiences. In contrast, the critical incident style questions (Butterfield et al., 2005) resulted in the professionals describing their learning as being a process of trial and error, often assisted by others or online resources, through the execution of their work. This highlights the disparity, previously noted by Boud and Middleton (2003), between how professionals experience learning through work yet often name their learning as being structured. This study differs in investigating experiences of both work and learning simultaneously which provides context, and potential explanations, for why learning is experienced primarily through work but often named as being structured.
The second category of description which emerged from the study was that work was experienced as fluid and influenced by varying degrees of emergence, agency, complex social networks, and adaptation. The CAOCF was used here to analyse the data relating to fluid work to examine how work was experienced within broader contexts of organisational complexity where adaptation and emergence featured as important elements of the experience of work. The professionals described work that was constantly changing and lacked predictability, requiring high levels of adaptation which required learning new skills and developing relationships. As a systems analyst from a member services organisation commented:

*Everything changes now. You kind of just go bend with everything and go with the flow with whatever it’s happening.*

Overall, the professionals interviewed identified their work as highly changeable, time pressured, and requiring constant adaptation to emerging requirements. A scientist/manager from a government scientific organisation described this well when he noted that he was always learning:

*You apply for a promotion, you don’t get it, you learn about it. Every new process that you have to implement that you learn about, every new initiative that comes along ... you’re always learning.*

Descriptions of learning as a continuous process of adaptation were common across the professionals. For example, an administrative assistant from a pharmaceutical company noted that:

*Things change all the time, so you’ve got to be able to adapt quickly and to be able to share that knowledge and skills too.*
This excerpt highlights the relationship which was found between change and unpredictability within the organisation (here described as *emergence*) and adaptation. Emergence and adaptation played key roles in the fluidity of work and subsequent experiences of learning.

Inter-related, *complex social networks* were also consistently identified by the professionals interviewed as an important aspect of both learning and getting one’s job done. A radio producer for a public broadcaster, for example, highlighted the necessity of nurturing relationships amongst her network to influence others so that they would assist her:

> it’s those relationships that you’re developing with others and how you’re able to influence others in regards to say, assisting you with the job or getting information from them so you can hone your job in that way.

The professionals consistently described seeking out colleagues within their team or professional networks to learn from, or to ask them for an introduction to, someone with more specific expertise. This highlighted the professionals’ experiences of work and learning as relational phenomena, supporting the broader “turn” within the workplace learning literature towards describing learning as relational (Gherardi, Nicolini, & Odella, 1998; Hopwood, 2016; Reich & Hager, 2014). A complex adaptive systems view of organisations highlights the importance of relationality by foregrounding the role of complex social networks within organisations.

The final key defining element of complex adaptive organisations is *agency*. All the professionals interviewed exercised agency within their work, with flexibility to determine their daily activities within the boundaries of their area of responsibility.
These boundaries influenced varying degrees of agency depending on the positioning of the job within the organisation. The degree of agency which the professionals could exercise contributed strongly to the fluidity they experienced in their work with multiple, and often competing, demands placed on them. As described by an executive assistant to the general manager of a busy marketing department:

*I'm almost like an all-in-one one shampoo, conditioner and body wash ... I report directly to the GM [General Manager]. I look after him. I also support the team. We have a team administrator as well ... I kind of help her along with stuff as well ... And then I sit on lots of projects and I also look after a program that we run ... and then I help support administration on a digital project that we have as well.*

This excerpt encapsulates not only the fluidity of the executive assistant’s work, but also her agency in negotiating how that work was carried out.

The *third category of description* described how professionals’ experiences of learning are influenced by the degree of fluidity experienced in their work. The data analysis indicated that the greater the degree of work fluidity, the greater the impetus towards learning through work. Learning through work appeared to be the most efficient way for professionals to learn and adapt at the speed required in their complex work context. To learn and adapt to emergence within organisations, the professionals needed to operate within and across networks, and exercise agency in doing so.

Overall, this connection between fluid work and learning was most vividly illustrated in the accounts of two categories of professionals: scientists (n = 2) and administration assistants (n = 2). These professionals, for different reasons, were unique in identifying
their learning as being primarily through their day-to-day work when asked directly about their learning at work. In particular, they did not identify face-to-face courses as being “for them”. Talking about learning through work, one scientist within a government scientific organisation noted:

*the biggest thing day to day is just trying to solve the problems in your research that you encounter … and they’re not really things that you can plan for in advance and put it in a development plan.*

Both of these groups reported high levels of agency in their jobs, particularly the scientists. Moreover, both groups also reported high levels of adaptation required for their work. For the administration assistants, this was that their jobs were highly reactive to the needs of others. For the scientists, it was the result of there being few other ways to learn being available to them, such was the specificity of the knowledge and skills required for their work. These two groups also nominated their professional networks as being central to successfully working in their job and within their respective organisations.

The fourth category of description described how professionals experienced an organisational emphasis on structured learning despite also experiencing learning as primarily through work. Such an emphasis was wryly summarised by a manager from an airline as:

*if you’re not in the classroom, you’re not doing training.*

While numerous professionals described learning and development systems and processes that attempted to promote learning through work, the way in which learning was measured through organisational performance processes ultimately ensured that the
professionals experienced learning in structured ways, such as face-to-face courses, which were more easily monitored by the organisation. As a human resources professional from a bank noted:

*I would say where we have some of the less formal arrangements. I think we kind of put structures around them that really tip them back into being a formal arrangement. So for example we know that a lot of coaching takes place, but we also know that really only takes place when we are putting some structure around it.*

This excerpt highlights a disconnection between how the professionals experienced learning and the learning opportunities that were supported by the organisations studied. Professionals reported that the prevailing learning and development systems and practices tended to privilege formality in learning over informality, either explicitly or implicitly, indicating opportunities for organisations to improve learning practices to better facilitate, and recognise, learning and adapting through fluid work.

**Discussion**

Collectively, the four categories of description discussed above indicate that learning by professionals in complex adaptive organisations was primarily experienced through work, and that learning was strongly shaped by the degree of work fluidity experienced. The degree of work fluidity was influenced by adaptation, emergence, complex social networks, and agency which, in turn, influenced more flexible learning responses from the professionals. Despite this, the professionals reported that organisations were still providing, and recognising, structured learning initiatives as the primary source of learning at work.
This study raises many interesting issues relevant to work and learning researchers, though within the space constraints of this article, two implications are pre-eminent. First, the importance of emergence in considering experiences of work and learning and, second, the influence of fluid work on experiences of learning in complex adaptive organisations.

**Emergence**

As previously discussed, emergence has been increasingly taken up in workplace learning research, particularly as a metaphor (Hopwood, 2016) juxtaposed with earlier learning metaphors of acquisition and transfer, and participation (Boud & Hager, 2012; Hager, 2011). In this study, using emergence as a defining element of complex adaptive organisations offered significant explanatory power for experiences of work and learning. This was achieved by defining emergence as a key element of complex adaptive organisations in addition to being a useful metaphor for learning. Through the data analysis, the unpredictability of emergence became apparent. Emergence was experienced by the professionals as producing the conditions for fluid work, requiring high levels of agency and adaptation, negotiation of complex social networks, and flexible learning approaches. Previous research has suggested that there is a greater need to look at the increasingly dynamic and unpredictable contexts where learning at work occurs (Fuller, Unwin, Felstead, Jewson, & Kakavelakis, 2007; Unwin et al., 2007). Understanding emergence as a key element of complex adaptive organisations, and an important influence on work and learning within them, provides a way to focus on these unpredictable contexts.
Fluid work

The second issue of interest to work and learning researchers, and strongly linked to emergence, is the concept of fluid work. By framing the study using the CAOCF, the concept of fluid work its influence on experiences of learning, emerged. It suggests that a more effective way to discuss learning at work is to examine the nature of work tasks and the work context specific to each professional.

Harteis, Billett, Goller, Rausch, and Seifried (2015) found in their study of the impact of age, gender, and occupation on workplace learning that occupational level was the only one of these factors where significant differences in learning affordances were found. Those in lower status occupations had a lower level of perceived learning support at work whereas higher status occupations, such as managers and supervisors, were offered a “more learning-conducive workplace environment than lower-status occupations” (Harteis et al., 2015). Interestingly, at first glance, this finding seems replicated in this study in terms of the administrative assistants identifying that the learning opportunities provided by the organisation were not applicable to them and they strongly identified that they learned mainly, and continuously, through their work. Recent work by Cho and Kim (2016) also reported a high level of informal learning on the part of administrative assistants, influenced by their perceived job efficacy. The study reported here, however, indicated that the work context of administrative assistants was one in which they possessed a high degree of agency within a complex environment of fluid work. This general context is one that researchers, such as Billett (2001) and Eraut (2004), have noted is important for affording learning at work. This is further supported by the scientists’ data, indicating that they also worked within contexts that were rich in interactions and fluid work coupled with a high degree of
agency requiring flexible learning approaches. Arguably, scientists are a higher status occupation than administrative assistants yet they described their experiences of work and learning in very similar terms.

Previous workplace learning research, such as Billett’s (2001) workplace affordances, Skule and Reichborn’s (2002, 2007) learning-conducive work, and Fuller and Unwin’s (2003) continuum of expansive and restrictive practices, has demonstrated the importance of participation as core to learning at work and how workplace practices support or restrict learning. This study, through the lens of the CAOCF, furthers this work by offering a framework to investigate both workplace affordances for learning from an organisational perspective as well as investigating how individual experiences of the work itself influence learning. The emphasis on structured learning by the organisations in this study particularly highlights that organisations appear to have been slow to adapt their learning and development systems and practices to the challenges of the emerging and fluid work experienced by their employees. This suggests that, just as more flexible learning approaches are needed from individuals, organisations also need more flexible and adaptable workplace learning practices.

**Conclusion**

This article reported an empirical study of the work and learning experiences of professionals that innovatively used a complex adaptive systems approach to conceptualise and analyse the interview data. The data analysis indicated that professionals in complex adaptive organisations experience learning primarily through work, strongly influenced by the fluidity of their day-to-day work. The experiences of
professional learning through participation contrasted with their experiences of the learning opportunities afforded by organisations, which were predominantly structured.

Two principal conceptual developments are highlighted by this study. First, is the usefulness of incorporating emergence as a key element of complex adaptive organisations. Second, and related to emergence, the CAOOF highlights the influence of fluid work on professionals’ experiences of learning, and how fluid work is shaped by the four key elements of emergence, adaptation, complex social networks, and agency.

The challenges faced by individuals and organisations in contemporary contexts, typified by the constantly shifting globalised economy, require a radical re-shaping of previous approaches to conceptualising work and learning. The study discussed here proposes an innovative way forward in considering the fluid nature of contemporary work and the ways in which this influences learning, as viewed through the lens of complex adaptive systems.

References


Appendix 2 – Participant Information Sheet

THEORY AND PRACTICE OF LEARNING WITHIN COMPLEX ORGANISATIONS:
THE LEARNER’S PERSPECTIVE

Who am I?

My name is Amanda Lizier and I am a PhD student at UTS. (My supervisor is Dr Tony Holland). I am a part of the Education Department and my research area is organisational learning.

What is this research about?

This research is to find out about the experience of learning within a complex organisation. The current business environment is characterised by constant change and an increased imperative to work across networks within and between organisations. In this rapidly changing environment, complex systems research offers a useful framework for looking at the operation of interconnected human social systems, of which organisations are an excellent example. The primary objective of the project is to establish how individuals experience learning within organisations as complex systems and determine how this might affect existing theories and practices of organisational learning. This incorporates how people learn and what they seek to learn.

Why have I been asked?

You work in an organisation that has been identified as a good example of a complex organisation. You are therefore in a good position to share your experiences of learning and working within this environment which is the purpose of my study.

If I say yes, what will it involve?

I will ask you to meet with me for a face-to-face interview. The interview will be at a time and location that is suitable for you and will take around 45 minutes and definitely no longer than 1 hour. In the interview I will ask you some questions about your learning experiences within the organisation. Your responses will not be identified and will be kept completely confidential. I will digitally record the interview and transcribe it verbatim for analysis.

I may need to speak with you briefly before we meet to get some background information to help me plan for our meeting. If this is the case I will call or email you for the information which should only take around 15-20 minutes of your time.

Following the study I will write up a brief report of my findings which I will share with you. You may also ask for a copy of your interview transcript at any time following the conclusion of the data analysis stage of the study.

Are there any risks?

There are very few if any risks because the research has been carefully designed. Your personal details will be stored separately to your survey/interview responses and kept confidential.

Do I have to say yes?

No, you don’t have to say yes.

What will happen if I say no?

Nothing. I will thank you for your time so far and won’t contact you about this research again.
If I say yes, can I change my mind later?

You can change your mind at any time and you don’t have to say why. I will thank you for your time so far and won’t contact you about this research again.

What if I have any concerns or a complaint?

If you have concerns about the research that you think I can help you with, please feel free to contact me at amanda.l.lizier@student.uts.edu.au.

If you would like to talk to someone who is not connected with the research, you may contact the Research Ethics Officer on (02) 9514 9772, and quote this number UTS HREC 2010-349A.
Appendix 3 – Participant Consent Form

PARTICIPANT CONSENT FORM

THEORY AND PRACTICE OF LEARNING WITHIN COMPLEX ORGANISATIONS: THE LEARNER’S PERSPECTIVE

UNIVERSITY OF TECHNOLOGY, SYDNEY

I _______________________ agree to participate in the research project Theory and Practice of Learning within Complex Organisations: The Learner’s Perspective (UTS HREC 2010-349A) being conducted by Amanda Lizier (UTS FASS PO Box 123 Broadway 2007, 0411 069 641) of the University of Technology, Sydney for her degree PhD.

I understand that the purpose of this study is to investigate the learning experiences of individuals within complex organisations.

I understand that my participation in this research will involve a face-to-face interview of no more than 1 hour duration and that this interview will be digitally recorded and later transcribed verbatim for analysis. I understand that my personal details will be stored separately to my responses and kept confidential at all times and that I may request a copy of my interview transcript by contacting the researcher.

I am aware that I can contact Amanda Lizier or her supervisor Dr. Tony Holland if I have any concerns about the research. I also understand that I am free to withdraw my participation from this research project at any time I wish, without consequences, and without giving a reason.

I agree that Amanda Lizier has answered all my questions fully and clearly.

I agree that the research data gathered from this project may be published in a form that does not identify me in any way.

________________________________________  ____/____/____
Signature (participant)

________________________________________  ____/____/____
Signature (researcher or delegate)

NOTE:

This study has been approved by the University of Technology, Sydney Human Research Ethics Committee. If you have any complaints or reservations about any aspect of your participation in this research which you cannot resolve with the researcher, you may contact the Ethics Committee through the Research Ethics Officer (ph: +61 2 9514 9772 Research.Ethics@uts.edu.au) and quote the UTS HREC reference number (UTS HREC 2010-349A). Any complaint you make will be treated in confidence and investigated fully and you will be informed of the outcome.
Appendix 4 – Interview Guide

Introduction

Ensure that the participant was sent a copy of the Participant Information Sheet and that they have read it before starting.

This research is to find out about the experience of learning within complex organisations. The primary objective of the project is to establish how individuals experience learning within organisations as complex systems and determine how this might affect existing theories and practices of organisational learning. You work in an organisation that has been identified as a good example of a complex organisation and you are therefore in a good position to share your experiences of learning and working within this environment which is the purpose of my study.

Your participation will consist of an interview of approximately 1 hour in duration and this interview will be digitally recorded and later transcribed for analysis. Your personal details will be stored separately from your responses and kept confidential at all times on a secure server. Only myself and my supervisor will have access to any personal information and data from this study. You may request a copy of the transcript at any time by contacting me.

You are free to withdraw your participation at any time, even during the interview. If you do this any data collected from you will be destroyed. If you have concerns about the research following this interview, please feel free to contact me at amanda.l.lizier@student.uts.edu.au. You can also contact my supervisor, Dr Tony Holland at tony.holland@uts.edu.au. If you would like to talk to someone who is not connected with the research, you may contact the Research Ethics Officer on (02) 9514 9772, and quote this number UTS HREC No. 2010-349A.

Do you have any questions for me before we start? If you give your consent to participate in this study please read and sign this Consent Form.
General Information

**GEN Gender**

M  F

**GEN Age range (circle)**

- 15 – 19
- 20 – 24
- 25 – 29
- 30 – 34
- 35 – 39
- 40 – 44
- 45 – 49
- 50 – 54
- 55 – 59
- Over 60

**GEN Role**

Job title

Level of role  • Administration/support
              • Technical
              • Manager
              • Senior Manager
              • Executive

**Areas/questions to cover (those marked with an asterix are most important)**

Tell me about your organisation (business model, structure, core business, etc.).

Do you think that your organisation is complex (geographic, communications, structure nature of the work, work environment)? In what ways?

Tell me about your role. Where does your role fit in the organisation?

How does learning take place in your workplace (e.g. courses, informal)? Which form predominates?

What skills and knowledge would you say are valued by your organisation?

What sorts of skills and knowledge are most important to you in your role?
• Do these align with what your organisation tells you are important?

What learning options and support are provided by your organisation (e.g. courses, financial support, e-learning, coaching or mentoring programs)?

• In what ways is your learning supported by your Manager?

What do you see as being your current development needs? Do these change over time or are they fairly consistent?

How do you keep your professional skills and knowledge up-to-date?

* Could you describe, in as much detail as possible, a situation in which learning occurred for you in your current role/organisation? (Kvale & Brinkmann, 2009)

* What part of that experience would you consider learning? (Kvale & Brinkmann, 2009)

* How did you “learn the ropes” in your current role?

* Think about a time when you needed to learn something new in your current role how did you go about it?

  • How did that come about?
  • What did you need to learn and how did you learn it?
  • Is that the way that you would normally approach it?

How do you prefer to learn at work in general?

To what extent would you say that you learn from other people at work? In what ways? Are there specific topics that you tend to approach learning in this way?

What, if any, are obstacles to your learning at the moment?
Appendix 5 – Coding Framework

The following coding framework is taken from the Dedoose software where the analysis started.

Initial codes

How do people learn?

- Reflection-on-action
- Formal learning
  - Face-to-face course
  - Online course
  - Professional events
- Informal learning
- Experiential learning
- Self-directed learning
  - Online research
- Social learning
  - Communities of practice
  - Asking questions
  - Networking
  - Modelling
  - Social media

Experience of learning

- Learning networks/programs
- Collaborative working
- Continual process
- Credentialism
- Barriers/obstacles
  - Manager
  - Distance from main office
  - Lack of appropriate opportunities
  - Lack of challenge
  - Lack of expertise in organisation or team
  - Boredom
  - Motivation/self-discipline
  - Not prioritising learning
  - Organisational obstacles
  - Time limited
- Supportive manager
- Tension between profession and organisation
- Trial and error/learn and apply
Organisational characteristics

- Perceived complexity
- Networks
- Complex adaptive systems (CAS)
- Structures to support learning

What do people seek to learn?

- Professional development/identity
  - Industry knowledge and trends
  - Keeping up-to-date
  - Networking
- Role-specific learning
  - Technical skills
  - Influencing/consulting
  - “Soft skills”
  - Compliance/mandatory
  - Leadership
  - Relationship skills
- Organisational citizenship
  - Culture
  - Behaviours
  - Collaboration/teams
  - Adaptability
  - Values

Codes for post-hoc analysis

- Learning through work
- Fluid work
- Organisational emphasis on structured learning
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