Learning on the job: Librarians keeping up to date with emerging technologies

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Certificate of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma at Charles Sturt University or any other educational institution, except where due acknowledgement is made in the thesis. Any contribution made to the research by colleagues with whom I have worked at Charles Sturt University or elsewhere during my candidature is fully acknowledged.

I agree that this thesis be accessible for the purpose of study and research in accordance with the normal conditions established by the Executive Director, Division of Library Services or nominee, for the care, loan and reproduction of theses.

Signature: [Signature]

Helen Fried
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Ethics Approval

Charles Sturt University, Ethics in Human Research Committee, Ethics Approval number 300/2014/27
Publications associated with this research

Abstract

At a time of continuous technological change, academic library staff are required to be constantly learning to ensure they keep up to date with new and emerging technologies, both hardware and software. This learning is occurring regularly by both formal (workshops, training sessions), and informal (reading, problem-solving, exploring) means. Yet there has been little research into the complex area of workplace learning, in particular learning about emerging technologies, within the library and information studies field, and academic libraries in particular. Thus, this study explores the practice of academic library staff as they engage in learning about emerging technologies and identifies site specific influences shaping learning practices.

Through the use of a constructivist action research methodology, this study investigates the current practice of academic library staff learning about emerging technologies within three university libraries in a major city in Australia. A series of focus groups, participant journals and relevant workplace documents provide a rich source of data about current practices. Using the lens of the theory of practice architectures, the elements of practice (sayings, doings and relatings), and the practice architectures present, are examined. Thus providing a means of identifying ways to enable ongoing and improved practice.

What was revealed was current practice of ongoing learning about emerging technologies was focused on individual, often solitary, skill development. There was little evidence in participants' libraries of a common language or workplace conversations concerning emerging technologies in general, or the ongoing learning about these technologies. Results demonstrated a lack of agreement or understanding about how staff could or should undertake learning about technologies. There was also little comprehension about how learning should be integrated into individuals' work roles or indeed included in personal development plans. Lack of time, absence of clear direction
about what to learn, and lack of opportunities to share and build knowledge were all found to constrain ongoing practice of learning about technologies.

Identification of these constraints provides an opportunity for the researcher to highlight practice architectures that may enable the practice of ongoing learning. These include ongoing discussions about the role of technologies within the library and how best to incorporate ongoing learning into current roles. The provision of learning spaces that encourage staff to focus on learning and providing opportunities for staff to share their learning experiences with others may also provide supportive practice architectures. Library managers and staff working together to set clear directions, and the inclusion of learning about technologies in staff development plans, can also aid in the shaping of a work environment that contributes to the development of knowledge and skills of all staff.

The use of the theory of practice architectures as an analytical lens in this study demonstrates that this theory can provide significant insight into the sayings, doings, and relatings of library practice as well as the practice architectures supporting that practice. This insight can enable individual and organisational actors to better understand and improve practice.
Chapter 1

1 Introduction

Keeping up to date with new and emerging technologies is an important way of ensuring university libraries and their staff continue to meet the ever changing needs of their clients and institutions. The nature of work in the academic library is changing, brought on in part by advancements in technology. Innovations in the way universities conduct their business impacts on libraries’ services and reinforces the need for library staff to be continuously learning in a range of areas, including knowledge about emerging technologies (Bonn, 2014; Crowe & Jaguszewski, 2010; Delaney & Bates, 2015).

Change and the need for constant learning within the workplace as a result of the influence of emerging technologies is not new within the library environment. As libraries embrace the ability to collect and make available large amounts of global information as well as providing their current collections to more mobile users, library staff are impacted by new and emerging technologies on an ongoing basis (Walker, 2014, p. 85). Understanding how library staff undertake the practice of keeping up to date and continually learning about emerging technologies has however not been widely studied.

The exact nature of what comprises emerging technologies isn’t always straightforward (Rotolo, Hicks, & Martin, 2015, p. 1829). Definitions and descriptions of new and emerging technologies vary across a number of disciplines including economics, science and technology, management, and education. Despite some differences, all definitions encompass an implication of emerging as becoming. Descriptions of emerging technologies range from focusing on characteristics of the technology itself to those that describe emerging technologies within the field of context. Some definitions incorporate only hardware (computers, mechanical equipment) as emerging
technologies, whereas others include both systems and applications software (programs used to direct the operation of a computer or perform a particular role). An exploration of how librarians working within a university library understand and describe emerging technologies forms part of this study.

Research focusing on the workplace learning experience presents evidence of the wide variety of ways in which people learn within their work environment (Eraut, 2004; Gerber, 2006). Methods of learning are categorised in a number of ways including the use of terms such as formal, informal, self-directed, experiential, tacit, and transformational (Marsick & Watkins, 2001, p. 26). Alternatively learning methods are described as being on a continuum between formal learning and informal learning (A. Rogers, 2004). Researchers argue that the majority of an individual’s learning (between 70% - 90%) can be classified as informal learning, using learning methods such as on the job problem solving with colleagues, observation, personal reading and experimentation (Marsick & Watkins, 1990).

Understanding what methods of learning library staff are currently using is an important component to better understanding their practice of ongoing learning about emerging technologies. While there has been some LIS research into ongoing staff development in the area of emerging technologies over the past two decades, there has been limited focus on how this workplace learning is being undertaken and the variety of influences impacting the learning experiences of library staff (Auster & Chan, 2004; Hallam, 2009; I. Smith, 2002; Varlejs, 1999). With increased understanding of the nature of workplace learning about emerging technologies, individuals and library management will be better informed as to how best to support library staff to develop sustainable ongoing learning practices.

This study explores how library staff are currently undertaking ongoing learning about new and emerging technologies to add to the understanding of workplace learning in this area. A range of environmental impacts enabling and constraining individual’s learning practices will be identified. Approaching
this study from a practice perspective provides a different frame of reference for describing and understanding workplace learning compared with previous research. Through identification of the site specific influences shaping the practice of workplace learning, greater insight may be gained into how best to support and sustain the practice of ongoing learning. Greater awareness about the practice will result in ongoing benefits for both individuals enacting the practice, their libraries and the institutions they serve.

It is essential that academic libraries and library staff themselves continue to adapt and develop the knowledge and skills needed to meet the changing needs of their clients in order to ensure their continued value to their institutions. Understanding and supporting the ongoing learning of knowledge and skills of staff, particularly in the area of emerging technologies, is one way for libraries to remain relevant in a changing world. This study will provide evidence based research on how library staff are currently undertaking workplace learning about emerging technologies and identify ways to better support that learning into the future.

1.1 Background to this study

Ongoing staff development is an important component of ensuring library staff are able to meet the changing service requirements of the users of today’s academic libraries (Cossham & Fields, 2006, p. 235; Decker, 2017, p. 286; Guha, 2006, p. 12). Changes in the way libraries provide services, and the services themselves, emphasise the need for library staff to continue to learn about new and emerging technologies throughout their working life. Academic libraries are focused on a range of different areas including increasing access to their collections and information sources via mobile devices as well as expanding support for researchers through data management and storage of, and access to, scholarly communication. Changes in the services offered, the ways in which access is provided, and new library roles, for example, data management and scholarly publishing, have resulted in an emphasis on the need of ongoing updating of technology skills for staff (Bonn, 2014; Crowe & Jaguszewski, 2010; Delaney & Bates,
Research into the dynamic nature of job advertisements within LIS field has identified an increase in the demand for technological knowledge and skills being sought for existing library roles. Research has also identified an increase in advertisements for new roles such as research librarians and data management librarians all calling for high levels of technological skills and experience (Bonn, 2014; Jaguszewski & Williams, 2013; Sewell & Kingsley, 2017). Library users are also altering the ways in which they access and interact with information. The increasing use of digital devices and social media means that library staff need to be able to understand and use these technologies as well as assist with troubleshooting technological problems experienced by students or academics accessing library material through these avenues (Gwyer, 2015, p. 282; Inskip, 2016, p. 62).

Library managers are being asked to provide greater digital access to existing collections and services as well as providing new technology based services at a time when they are often faced with decreasing staffing budgets. Continual learning by existing staff is thus necessary to meet the challenges of changing services, driving individuals and library managers to seek greater understanding and assistance on how best to meet this challenge of providing ongoing learning (Cossham, Fields, & Oliver, 2005, p. 256; Robinson & Bawden, 2010, p. 648; Weingand, 1999). Reviewing the current research literature in the area of workplace learning provides an understanding of how individuals and groups of staff currently learn within their workplace and in so doing informs this study.

As briefly mentioned, workplace learning occurs though a variety of means, often depicted on a continuum from formal to informal. Formal learning, such as attendance at a training event, is considered to be highly intentional learning, directed by others and often held away from the workplace (Watkins, Marsick, & Álava, 2014, p. 61). This differs from informal learning which is considered part of daily workplace tasks and involves activities such
as problem solving, talking with colleagues, observation, and individual
exploration through reading or experimental use of applications software
(Zurcher, 2010, p. 4).

There are a variety of terms used to categorising informal learning, including
self-directed learning. Self-directed learning differs from other types of
informal learning by emphasising the control the learner has over their learning
experience, including the content and method of learning (Van Noy, James,
& Bedley, 2016, p. 42). Self-directed learning is initiated by the individual, but
often relies on others within the workplace to assist with, and validate, the
knowledge gained (Garrison, 1997, p. 19).

Over time a range of self-directed learning theories have been developed,
varying in emphasis and complexity. Candy (1991), an early researcher in
the self-directed learning field, presented a process driven theory involving
an individual identifying their own learning needs, then planning, undertaking,
self-evaluating and identifying further learning needs. Other researchers
have focused more on the personal motivation, control and responsibility
dimensions of self-directed learning (Garrison, 1997) or the internal and
external environmental conditions that are impacting on the learning process
(Straka, 2000). These later models of workplace learning confirm the
importance of recognising that individual learning does not take place in a
vacuum. Learning can be influenced by an individual's level of motivation,
their autonomy within their work role, and their current competences as well
as the social environment in which the learning is occurring. These
workplace learning theories point to a consideration of both individual and
social factors influencing learning.

Looking specifically at ongoing learning about emerging technologies within
the LIS field, there have been a range of programs developed to assist
library staff to keep up to date with such technologies. These programs have
used a variety of methods to encourage ongoing learning. These methods
have included specific workshops being offered focusing on individual
technologies, the provision of, and access to, a list of technologies to learn
(e.g. 23 things program) and programs encouraging participants to spend time learning each day (Blowers, 2008; Pegrum & Kiel, 2011; Quinney, Smith, & Galbraith, 2010; Stephens, 2013). All these programs have reported varying levels of success in their aim to encourage ongoing learning about emerging technologies but none have explored the question of sustainable learning. Social factors enabling the success of these programs have included managerial engagement in the program and positive feedback being provided to participants by managers. Factors identified as hindering program participation were lack of time and lack of organisational support (Stephens, 2013).

The emphasis on social factors impacting on the success of ongoing learning programs identified by these studies points to a need for greater understanding of how individuals learn about new and emerging technologies within the confines of their workplaces. Exploring ongoing workplace learning from a practice perspective provides the means to gain a greater understanding of the complex nature of learning practice, from both an individual’s point of view as well as the social setting within which the individual is undertaking their learning.

1.2 Theoretical and research approach

Practice theory provides a means of describing an activity not only from an observational viewpoint, but by those enacting the practice (Schatzki, 2012, p. 16). In stepping beyond the individual/social dichotomy, practice theory acknowledges that individuals do not work in isolation. All individuals undertake actions within a social environment and are impacted by both other individuals and non-human objects within that environment.

Schatzki’s theory of practice describes practices in terms of the language used (sayings) and the activities undertaken (doings) (Schatzki, 2012, p. 12). Kemmis and colleagues, building on Schatzki’s practice theory, emphasise that practices are also shaped by the relationships present within the site (Kemmis & Grootenboer, 2008, p. 48). Practices are not just the sayings and doings of an individual, they also include the social connections or relatings
between the individual and others and the individual and non-human objects (Kemmis & Grootenboer, 2008, p. 51). Kemmis and colleagues named their theory, the theory of practice architectures. The theory of practice architectures argues that a combination of sayings, doings and relatings of a particular practice come together to form that practice and are subject to the conditions that exist within a site (Kemmis, Edwards-Groves, Wilkinson, & Hardy, 2012, p. 34). Through the theory of practice architectures, Kemmis and colleagues assert that practices take place within a semantic, material and social space which is shaped by arrangements called practice architectures (Kemmis, Wilkinson, et al., 2014, p. 34). These arrangements, described as cultural-discursive, material-economic and social-political, not only shape the practice being undertaken but are also, in turn, shaped by that practice. Examples of practice architectures present within an academic library would include the language used to describe various roles within the library such as circulation staff, reference librarian and data management librarian (cultural-discursive arrangements) and the provision of equipment such as barcode readers and self-checkout machines (material-economic arrangements). The social-political arrangements within an academic library may be the policies that explain and direct services e.g. the lending policy or the implicit interactions between library staff and the students using the library space.

Practice traditions develop over time and are those arrangements that sustain and support a practice. It is through changes to the practice architectures within the workplace that individuals have the ability to shape how a particular practice is enacted into the future and the traditions that are developed (Kemmis, Wilkinson, et al., 2014, p. 32). Using the theory of practice architectures as a lens to analyse the complex practice of librarians’ ongoing learning provides a means of identifying changes that could be made for a better and more sustainable practice. The theoretical practice basis for this study led to the decision to undertake an action research approach which has strong links with the study of practice.
1.3 What this study is about

As technological changes continue to influence libraries, library staff need to embrace ongoing learning to ensure they have the knowledge and skills to meet the information needs of their stakeholders (Corcoran & McGuinness, 2014, p. 175). Workplace learning should be acknowledged for the part it plays in the ongoing learning practice of library staff (Broady-Preston, 2009, p. 275). A review of the extensive workplace learning research and in particular self-directed learning has found that prior to work, learning usually occurs within a formal education setting. Then, on entering the workforce, learning occurs through both formal and informal means (Eraut, 2004, p. 247; Gerber, 2006, p. 38). Research about how library staff in particular undertake ongoing learning about emerging technologies is a small but growing area, with an emphasis to date on identifying the amount of informal learning being undertaken and the success and value of specific programs to encourage ongoing learning about technologies (Fenwick, 2014; Stephens & Cheetham, 2011; Varlejs, 1999).

By using the theory of practice architectures as a theoretical lens, this study examines the complex practice of ongoing learning about emerging technologies by library staff. The following questions guide this research:

1. How is the practice of workplace learning about emerging technologies currently enacted by library staff in academic libraries?
2. What enables and/or constrains library staff’s ongoing learning about emerging technologies within the academic library setting?
3. How might conditions enabling the practice be further supported and those constraining the practice be changed to enhance the practice?

In answering these research questions, this study identifies the language practitioners use to describe the practice to themselves and others, the actions undertaken to learn about emerging technologies and the relationships present including the planning for, prompts to and evaluation of
participants’ learning experiences. Previous research has identified the actions (doings) by which practitioners are enacting their practice by counting incidents of learning, and identifying methods used to learn about technologies (Varlejs, 1999). This study, by examining the experience through the theory of practice architectures lens, explores in more depth how individuals and groups of individuals describe, action and relate to the practice of ongoing learning.

In addition to establishing the characteristics of the practice, this study examines the practice architectures that are shaping and being shaped by the practice, through identification of the language used in the workplace about the practice, the resources needed to undertake the practice, and the relationships that exist within the workplace impacting ongoing learning. Being able to develop a clear picture of these arrangements and the ways in which they shape the practice may provide the means to establish how the site within which the practices are being enacted can be shaped to support sustainable ongoing learning about emerging technologies.

1.4 The significance of this study

In acknowledging the impact that continuous technological change has on the need for library staff to be continually learning about new and emerging technologies, this study explores workplace learning from a practice perspective. Using the theory of practice architectures will help identify the elements of practice and the practice architectures shaping the current practice of librarians as they learn about emerging technologies, contributing to a broader theoretical understanding of workplace learning. This use of a practice or practices as the unit of study generates possibilities for considering where this approach could also be used to research other areas of LIS research in the future.

This study extends research into how practitioners are undertaking the current practice of ongoing learning about emerging technologies by highlighting the language used and relationships that exist within the workplace site. Through examination of the elements of practice and the
practice architectures of the sites, this study provides recommendations that will enable libraries and practitioners to improve and sustain ongoing learning. In a time of competing priorities and budgetary constraints identifying ways to support ongoing development of staff ensures libraries continue to meet the information needs of clients in the light of continuously changing technologies.

1.5 Methodology

This study uses an action research methodology involving librarians working at three metropolitan universities. Action research is the study of human activity within a particular context and focuses on the social interactions of individuals to understand and change practices (Checkland, 1981, p. 152; Kemmis, McTaggart, & Nixon, 2014, p. 5). Action research’s emphasis on the social nature of the workplace as a process for improving practice provides a strong means by which to address this study’s research questions.

To research the practice of library staff as they learn about emerging technologies as part of their work in academic libraries, it must be recognised that individuals undertake this practice within a social site. Whilst individuals undertake learning often by themselves, they are influenced by their environment. Individuals make sense of their own reality through their ability to in turn influence their environment (Bryman, 2016, p. 29).

Knowledge develops from individuals sharing their understandings with others, and through shared experiences, collective knowledge emerges (Tuli, 2011, p. 100). This constructivist approach to knowledge development encourages individuals to be self-directed learners, seeking out their own understanding but also working within the social setting to develop collective knowledge (Kumar, 2006, p. 248).

To study practices it is important to understand both the individual’s perspective of their own practice, and the collective understanding of the practice. Individuals make sense of their practice through the intersubjective
space where they interact with others and their environment. The intersubjective space is where collective understanding and knowledge development occurs. One method of researching individual realities, and the gathering of collective knowledge, is through the use of an action research methodology. Action research emphasises the sharing of understanding between participants in order to encourage both knowledge development and action (Lincoln, 2006, p. 126). This method of research invites the participants and the researcher to work together to improve practice by following a series of planning, action, observation and reflection cycles (Kemmis, McTaggart, et al., 2014, p. 18). The function of the researcher in this type of research is extensive, and can include roles as a facilitator, observer, supplier of knowledge, participant as well as the coordinator and sharer of the research outcomes (Johnsen & Normann, 2004, p. 226). Whilst often the researcher in an action research project is also one of the participants, in this study, the researcher gathered a group of interested participants to undertake the action research cycles while the researcher shared theoretical information, facilitated discussion and coordinated and shared the outcomes.

Action research, whilst sometime ignored as a research methodology due to perceived inadequacies in design and execution, aims to link research with practice (Williamson, 2018a, p. 210). The emphasis of action research on plan, action, evaluation and change cycles as well as being reflective and educative in nature have made it a useful methodology for improving teaching and learning practices (Williamson, 2018a, p. 210). These same features have seen the methodology used within the LIS field to investigate improvements in information literacy programs (Hill, 2000; Vezzosi, 2006). It is intended that this study will add to the research literature using this methodology within the LIS field and in doing so continue the collaboration between academic researchers and practitioners for the benefit of organisations, individuals and theory development.
1.6 An outline of this thesis

This chapter has introduced the study undertaken and given a brief overview of the background and previous research in the area of ongoing learning about emerging technologies. The broad aims of the study and the methodology being used have been outlined. This chapter serves as an introduction to the following chapters that will discuss in detail the background literature (Chapter Two), the methodology used (Chapter Three), the findings (Chapter Four), an analysis of the findings (Chapter Five) and how these particular findings relate to the known research within the field of workplace learning practice, in particular the learning about emerging technologies (Chapter Six). Chapter Seven examines the contribution of this study and concludes this thesis.

Chapter Two reviews the research and theoretical literature relevant to this study, outlining the developments occurring within libraries and the changing knowledge and skills required by library staff as a result of advancements in technologies. Practice theory and in particular the theory of practice architectures are discussed as well as the range of workplace learning theories, in particular self-directed learning theories and how these are informing this study. The results and conclusions from the research and professional literature examining how librarians are currently undertaking workplace learning are outlined. Chapter Two not only provides the background for this current study, but also highlights the gap in the current literature that this study examines. The research questions this study aims to explore are presented.

The methodology and research design chapter, Chapter Three, explains in detail the ontological and epistemological assumptions that underpin this study as well as the choice of action research methodology as a means of addressing the research questions. How data was collected and analysed is discussed as well as the ethical considerations and limitations of the action research methodology. Chapter Four, the Findings chapter, presents the findings from the focus groups, participants’ journals and documents that
were collected as part of the data collection phase of this study. Chapter Five, the Analysis chapter, examines how this study’s participants were undertaking the practice of learning about emerging technologies as well as the range of site specific influences that were enabling and constraining their practice.

The Discussion chapter, Chapter Six, evaluates the findings and analysis in light of the previous research and theory with a view to answering the research questions. This chapter also identifies ways in which the practice and practice architectures might be shaped to assist with sustaining the practice of ongoing learning. Chapter Seven concludes the thesis addressing the implications for both future practice and research as well as this researcher’s specific contribution to knowledge in the area. Limitations of the current research and the implications for further possible research are discussed.

The reader of this thesis will follow a path leading through understanding why the researcher believes this study is important, the perceived limitation in current research knowledge, the method used to engage with the practice of ongoing learning, the findings and what they mean, and finally implications for future research. Ensuring library staff have the knowledge and skills to meet the challenges of the future, shaped in part by technological change, is vital to the ongoing viability of the library profession. Understanding how to best encourage and support this ongoing skills development requires exploring the practice and practice architectures present in the site. This study provides both theoretical and practical evidence to support improved practice in ongoing learning by academic library staff.
Chapter 2

2 Literature Review

Technology has always impacted the way in which libraries operate. The constant and seemingly unrelenting impact of technology not only influences the way in which traditional library services are provided but also continues to shape new opportunities for library provision within the university environment (Brundy, 2015, p. 23). The conventional focus of the academic library of managing and providing access to a physical collection is changing. Supporting the changing needs of the teaching, learning and research activities occurring within universities has meant libraries are now providing access to information and resources in digital formats more than traditional print materials (Raju, 2014, p. 164). Academic libraries are embracing opportunities to provide support to clients through digital means such as subject portals and virtual spaces and through new technologies such as social media, open access, electronic publishing and digitization (Raju, 2014, p. 164).

Technology drives changes in academic libraries in increasingly frequent bursts and library staff have to continuously update their knowledge and skills to meet these new demands and take advantage of opportunities (Lehner, 2010, p. 32). To keep updating knowledge and skills, library staff need to be continuously learning on the job. By recognising and taking advantage of a variety of learning opportunities, library staff are able to increase their skills and knowledge resulting in a range of benefits. Knowledgeable staff not only advance their own careers but also continue to provide a relevant information service to library clients and minimize the risk of the library becoming extraneous to the business of their host institutions (Pamment, 2008, p. 663).

Library management in Australian academic and research libraries have responsibility for, and have shown a commitment to, ensuring the relevance of the library and its services to its stakeholders and supporting the
development of their staff despite changes in funding and the pressure of contracting budgets (Decker, 2017; McNair, 2016; Pamment, 2008, p. 664). The search for cost effective and relevant learning approaches to ensure that library staff have the skills and knowledge to deliver value adding services in a constantly changing technology based environment is paramount (Nicholson, 2013, p. 264; I. Smith, 2002, p. 8). Only through supporting and extending the mission of its host institution can university libraries remain relevant into the future (Dillon, 2008, p. 3). Through the ongoing learning by library staff the academic library will continue to be able to effectively support staff and students in the university it serves in this increasingly digital based world.

This chapter examines the theoretical, research and professional literature in relation to how academic library staff are currently undertaking workplace learning in order to meet the changing skill requirements of their role. In reviewing workplace learning, relevant theories and research are discussed and a review of how library staff are currently undertaking ongoing learning, in particular of new and emerging technologies, examined. This study approaches workplace learning about emerging technologies from a practice perspective, in particular using the theory of practice architectures to examine and discuss the topic. A review of practice theory and in particular the theory of practice architectures assists in explaining why this perspective was chosen. The range of definitions and understandings of the term emerging technology is explored to gain a better understanding the ongoing practice of workplace learning about these technologies.

An examination of the research and professional literature researching ongoing workplace learning about technologies within the LIS field has identified limited research in this area. Whilst there are a number of curriculum based learning programs that encourage and support library staff to undertake ongoing learning about emerging technologies, there is little research into identifying how the practice of ongoing learning is currently being enacted and how practice architectures are shaping that practice. This
study, by focusing on the research questions discussed at the end of this chapter makes a contribution to the limited research in this area.

2.1 The ever changing landscape of academic libraries

Technological change has been a major driver affecting university libraries particularly in recent years (Bonn, 2014; Crowe & Jaguszewski, 2010; Delaney & Bates, 2015; Dillon, 2008; James et al., 2015; Lynch & Smith, 2001). Traditional roles within the library such as the reference librarian and the liaison librarian are being significantly transformed by changes in technologies, and new roles, such as digital librarian or research support librarian, are being introduced (Bonn, 2014; Jaguszewski & Williams, 2013; Sewell & Kingsley, 2017).

A library’s primary purpose is to serve its clients’ and institution’s information needs. Library staff need to keep up with technological changes and develop skills to be able to both lead and assist library clients as these clients increasingly rely on technology to access a range of information sources (Cooke, 2012, p. 2; Inskip, 2016, p. 61). Trends in the information seeking behaviour of academic library users has seen a growth in the use of social media and mobile technology as well as the remote accessing of digital resources (Gwyer, 2015, p. 278). This changing behaviour means, for example, that library staff are now regularly required to communicate with their clients through social media, and collaborate with academics to provide online learning tools via a range of digital means in addition to more traditional ways (Gwyer, 2015, p. 282; Inskip, 2016, p. 62).

As well as changes in the way library clients access library services, new technologies have also led to developments within the research area of universities. The emergence of digital repositories, open access for the sharing of publications and open science for the sharing of data, library or university hosted open access electronic journals, and other increasingly digital scholarly communication options have opened up new opportunities for the library to support and collaborate with researchers. These new services require library staff to develop knowledge and confidence in
research data management, general data literacy, repository management, networking communication and digital media and formats (Bonn, 2014, p. 134; Delaney & Bates, 2015, p. 31; Sewell & Kingsley, 2017). This knowledge and confidence development comes through ongoing workplace learning, in addition to more formal education and training, about the technologies driving these services (Delaney & Bates, 2015, p. 41).

The increasingly online nature of the work of an academic library’s clients is not the only technological changes library staff need to keep up with. New technologies are now driving changes in the way libraries collect, store and provide information (Bonn, 2014, p. 134; Long & Applegate, 2008, p. 172; Neal, 2010, p. v; Pamment, 2008, p. 663). The traditional roles of the technical services and systems librarians are also becoming increasingly digital in nature (Ratledge & Sproles, 2017, p. 304). The rise in digital collections, digital repositories and the provision of electronic access to resources means these roles include tasks such as the creation and management of digital resources and advising on the most effective way to store and provide access to these resources (Park & Tosaka, 2017, p. 22; Ratledge & Sproles, 2017, p. 306). Technical services and systems staff are also being increasingly required to assist with the user experience, in particularly providing easy, single point access to multiple resources. For example, the single search box screen that can access the library’s catalogue and multiple journal databases with the same search, is now an expected feature of a library catalogue. Both desktop and mobile computing support, in some libraries, have now been incorporated into the technical services librarians’ role (Ratledge & Sproles, 2017, p. 308).

Relying on skills learnt in early career library education is not enough to sustain a library worker throughout a long career (Cossham et al., 2005, p. 256; Robinson & Bawden, 2010, p. 648; Weingand, 1999). Courses offered by tertiary education institutions in the LIS field respond to the needs of the industry at the time. Nonetheless in such a rapidly changing environment no single course can provide all the knowledge and skills needed by a graduate as they enter the workforce (Robinson & Bawden, 2010, p. 648). This is not a
new concern for LIS educators as they aim to respond to an ever changing workplace for graduates. Lifelong learning, in particular within the workplace setting, is necessary for library staff to be able to assist their clients in a rapidly changing technological environment (Cossham & Fields, 2006, p. 235; Decker, 2017, p. 286; Guha, 2006, p. 2). In particular, within the Australian academic and research library sphere, a personal commitment to lifelong learning has been highlighted as one of a number of personal attributes and skills needed by an academic research librarian (Leong & Woods, 2017, p. 5).

The Australian Library and Information Association (ALIA) emphasises the professional body’s commitment to ongoing learning for library staff through ensuring accredited courses promote “a commitment to lifelong learning and professional development” (ALIA, 2009). ALIA also provides members the opportunity to recognise ongoing learning through their Professional Development Scheme “which enables skilled personnel with a commitment to ongoing learning to demonstrate their value to employers and the broader community” (ALIA, 2017b). Similar professional organisations in the United Kingdom and New Zealand also provide professional registration to recognise ongoing professional development by library staff (CILIP, 2018; LIANZA, 2017). Each of these professional organisations acknowledges the need for ongoing professional development for those working in libraries and related fields, in part, due to the ongoing impact of new and emerging technologies in the sector.

In recognising the impact technology is having on library services and staff, it is necessary to consider the repercussions this is then having on library staff. Consideration needs to be given to what changing knowledge and skills are required and how these might be gained by staff during their working lives post formal education, whether in their workplaces and elsewhere.

2.2 Changing knowledge and skills required by academic library staff

As the information and technological landscape of the academic library changes and new roles and responsibilities are taken on by library staff there
is a need to learn new, or extend existing, knowledge and skills of staff. Despite the research literature providing a range of definitions of both knowledge and skills, for the purpose of this study, definitions have been sourced from the workplace learning and information science literature.

The term *knowledge* refers to the facts or principles of a particular subject and in past research has been considered the purview of the education process. More recent definitions of knowledge advocate that knowledge is the creation, processing or use of information within the mind of an individual and is influenced by the experiences, attitudes and context of the work being undertaken by that individual (Mårtensson, 2000, p. 208). Duffy (2000, p. 65) describes two types of knowledge, explicit and tacit. Explicit knowledge is the documented and public knowledge known by an individual; it is structured and conscious. Tacit knowledge is that known by an individual which is context specific, undocumented and dynamically created. For the study of a practice within the workplace, understanding that new knowledge is created through the interaction of both explicit and tacit knowledge is important (Mårtensson, 2000, p. 209). Explicit knowledge provides individuals with an understanding of how practices should be enacted within workplaces. Tacit knowledge, that is the actions of the practice within a given context, often leads to new explicit knowledge evolving and being documented within a particular workplace (Johannessen, 2018, p. 6; Venkitachalam & Busch, 2012, p. 357). Knowledge is different from information in that only through the processing of information within a particular context does information become knowledge. Information processed as knowledge has its highest value when applied to making decisions or resulting in actions (Bawden & Robinson, 2012, p. 73; Mårtensson, 2000, p. 208). Complementing knowledge creation is skill development.

Skills are assets that are acquired through learning activities within the workplace (Toner, 2011, p. 11). Having a particular skill means that a worker has the ability to perform certain tasks well (De Bruecker, Van den Bergh, Beliën, & Demeulemeester, 2015, p. 2). Within the workplace learning literature, the definition of skills not only describes the ability to undertake a
particular task well but also to be able to transfer this task to particular workplace situations (Nägele & Stalder, 2017, p. 739).

Research in the LIS field has employed a variety of methods to identify the dynamic knowledge and skill requirements needed to meet the changing and ongoing needs of the industry. These methods include reviewing job advertisements for the changes in requested and required skills, analysing the changes in job titles in the field over time and working with current library management and staff to identify their changing skill needs and possible future skill requirements (Bonn, 2014; Chawner & Oliver, 2013; Haddow, 2012; Kennan, Willard, & Wilson, 2006; Partridge, Lee, & Munro, 2010; Shahbazi, Fahimnia, & Khoshemehr, 2016; Wang, Tang, & Knight, 2010; Wise, Henninger, & Kennan, 2011). Each of these methods provide an insight into the knowledge and skills needed both now and into the future.

Research into job advertisements as an indicator of the knowledge, skills and competencies being sought in the library sector highlights the importance for employers of current technology skills (Wang et al., 2010; Wise et al., 2011). Studies from both Australia and the United States of America have found that generic information technology (IT) skills are among the most commonly requested skills in advertisements for library positions, in particular reference librarians (Kennan et al., 2006; Wang et al., 2010; Wise et al., 2011). The increase in positions with titles such as IT librarian, digital services librarian, metadata librarian, research data manager, scholarly communication librarian and digital archivist also point to the increasing importance of staff having IT skills within the library environment (Bonn, 2014, p. 134; Shahbazi et al., 2016, p. 71).

University libraries in particular, are continuing to move resource collections away from physical items towards digital formats as well as being challenged to increase support to university researchers, in the form of data management and storage, and scholarly communication (Bonn, 2014, p. 134; Delaney & Bates, 2015, p. 31; Ratledge & Sproles, 2017, p. 305). With this increased use of technology to provide traditional and new library
services comes the need for knowledge and skill development for current staff. Interviews with practitioners have identified their increased use of technology and its perceived importance for future work (Chawner & Oliver, 2013, p. 35; James et al., 2015, p. 252; Raju, 2014, pp. 164, 169). These practitioners identified technical skills such as software and hardware troubleshooting, web design, programming, social media, teaching and assisting users with the use of software programs, and digital resource acquisition and management as all skills required in the future to ensure they as library staff they continue to meet user needs (Chawner & Oliver, 2013, p. 35; Haddow, 2012, p. 246; James et al., 2015, p. 252; Maceli & Burke, 2016, p. 52).

As well as reviewing changes in job requirements over time and interviewing current staff working in libraries about their changing skill requirements, another way of identifying what skills library staff may need in the future is through a technique known as envisioning. Envisioning is imagining what services libraries might provide in the future and what knowledge and skills staff will need to provide these services. Partridge and colleagues (2010) from the Queensland University of Technology undertook a study aiming to predict the knowledge and skills Australian library workers would need in the future. Eighty one library and information professionals from around Australia joined focus groups to discuss the skills, knowledge and attributes of current and future library professionals. The discussions highlighted the constantly changing environment faced by library workers and the importance of focusing on the changing needs of people using the library service. As the library clients’ information needs change, library workers must be prepared to make changes and learn new skills to meet these needs.

The professionals consulted in the Partridge study perceived that the changes occurring in libraries didn’t alter the core role of libraries. Instead they focused on the changes in technologies used to undertake library and information work and the changes for library clients in accessing and using information for their studies and research. When asked to identify the skills required for a successful librarian in the future, participants outlined
personality traits in preference to specific skills including the ability to be an “active learner”, a person with a willingness to continue learning and to use new technologies and tools to provide better services (Partridge, Menzies, Lee, & Munro, 2010, p. 270). Successful librarians in the future will be required to have a fundamental understanding of emerging technologies, in terms of what is available, what they can offer now and how these technologies may be used to enhance library services in the future (Partridge, Lee, et al., 2010, p. 326). The study concludes that library staff in the future need to recognise that change is ongoing and that they are obligated to be actively learning about new and emerging technologies to meet these changes (Partridge, Lee, et al., 2010, p. 331). The focus on ongoing professional development in the area of emerging technologies is seen as a "survival of the fittest" scenario and without the personal mindset to embrace this requirement, it is predicted that some library staff will be left without a job (Partridge, Lee, et al., 2010, p. 330).

Although this study is now nine years old, the emphasis on the changing nature of the profession due to the impact of technologies and the need for library staff to be able to focus on their own ongoing education, embrace ongoing learning and be willing to share knowledge with colleagues has not changed (Partridge, Lee, et al., 2010, p. 326). A more recent study of the profession undertaken in Finland found that technological competence was a significant part of a librarian’s role (Huvila, Holmberg, Kronqvist-Berg, Nivakoski, & Widén, 2013, p. 203). Terms such as “internet competent”, “up to date”, “virtual” and “internet minded” featured in the top ten words practitioners used to describe a librarian of the future (Huvila et al., 2013, p. 203).

Changes in the technology skills and expectations of academic library users also influences the skills required by academic library staff. Growth in the number of students studying away from campus and the increasing variety of digital methods for offering education through organisations such as Open Universities Australia or MOOCs (massive open online courses) means libraries need to provide services in an online environment previously only
offered face to face (Lukasiewicz, 2007, p. 822). Library clients are also requesting technological help to access information from a variety of online sources, expecting library staff to have the knowledge and skills to assist them in this (Kaur & Singh, 2011, p. 744).

The increasing use of mobile applications also provides a challenge for library staff with smartphones, e-readers, and tablets all being used by library users with the expectation that library services will be provided and supported via these technologies (Kaur & Singh, 2011, p. 744). Research suggests that libraries may lack the necessary knowledge and skills among current staff to select, develop and provide services through a range of mobile devices as well as the skills to teach and support the use of mobile technologies (Liu & Briggs, 2015, p. 144; Potnis, Regenstreif-Harms, Deosthali, Cortez, & Allard, 2016, p. 188). To combat this gap, collaboration with IT education areas of the university might be one way to expand the necessary knowledge and skills base among the library staff (Potnis et al., 2016, p. 195).

E-research is another area gaining prominence in universities. E-research is a scientific paradigm involving more collaborative, more computational and more data intensive research than ever before (Tenopir, Sandusky, Allard, & Birch, 2014, p. 84). Driven by the opportunities offered by emerging technologies, e-research is increasingly involving enterprises in data management, collection and analysis and an emphasis on using collaborative technologies for research and teaching (Thomas, 2011, p. 44). Academic libraries are expected to both support and add value to the research efforts of their universities. Yet, research suggests that across academic libraries there seems to be varying degrees of readiness to support the use of technologies in the e-research area (Tenopir et al., 2014, p. 89; Thomas, 2011, p. 37). Limited budgets, unclear roles and insufficient skills among current staff are cited as reasons for the limited service offering by libraries, in the e-research area (Cox, Kennan, Lyon, & Pinfield, 2017, pp. 2193–2194). To ensure libraries are able to offer future services in this growing area developing the knowledge and skills of staff is a necessity.
Attendance at workshops and presentations, on the job training and self-directed learning are all suggested as ways to achieve the required knowledge and skill development (Corrall, Kennan, & Afzal, 2013, p. 659, 661; Cox et al., 2017, p. 2192; T. A. Peters & Bell, 2013, p. 15; Tenopir et al., 2014, p. 89).

Studies of job advertisements, interviews with current library staff and research into growth areas in library services have all shown that knowledge and skills in the use of a range of technologies continues to be important in the LIS field. The constant introduction of new and emerging technologies means library staff are required to be constantly learning in order to support mobile technologies, research data curation and scholarly communication. To meet the needs of their clients and to provide the best possible service, library staff need to continuously extend their knowledge and skills as they seek out, evaluate and use emerging technologies. Library management and individual staff must understand how best to undertake and support ongoing learning in this area as technological change is the norm (Partridge, Lee, et al., 2010). One aspect of this understanding can come through a greater appreciation of the place workplace learning has in supporting ongoing learning.

2.3 Workplace learning

The research literature discussed so far in this chapter has highlighted the changing landscape of academic libraries, the influence of technologies on the types of services and resources offered by libraries and the ways in which libraries deliver these to their clients. The need for library staff within academic libraries to be continuously learning during their working life has been identified. One approach to encouraging and developing such learning is through ongoing workplace learning.

Research in the area of workplace learning includes a number of concepts and theories that need to be identified and understood in order to ground further discussion. These include the difference between education, training and learning, and the distinction between formal and informal methods of
learning within the workplace.

2.3.1 Education, training and learning

In the literature the words education, training, and learning are often used interchangeably, even though they are different concepts. It is important to distinguish between them. The majority of university library staff have undertaken some sort of formal education either prior to, or as part of, their library career. Education is undertaken at a formal place of learning such as a university and focuses on the general skills and knowledge for a particular discipline or field. As the exact nature of the environment that students will work in is not known, education is often general in nature (Garavan, 1997, p. 41; Rothwell, 2002, p. 7; Tuijnman & Boström, 2002, p. 95). Education, whilst occurring through a range of learning opportunities, can also be viewed as being driven by external sources who identify the means and amount of learning that can occur (Jarvis, 2010, p. 39).

Training in contrast, or possibly complimentarily, is described in terms of the development of practical skills in order to be able to undertake particular activities within a profession (Garavan, 1997, p. 40). It is instructor-led and context based. Training may occur in an educational institution such as a Technical and Further Education (TAFE) institute or in the workplace. Training is grounded in the knowledge and skills required for a particular workplace or type of work (Garavan, 1997, p. 40; Masadeh, 2012, p. 64).

Defining learning is difficult as various theoretical viewpoints describe it differently. When compared with formal education or training, learning is considered more behavioural in nature. Learning has been described as a relatively permanent change in behaviour through experience, instruction or study (Clifford & Thorpe, 2007, p. 7; Garavan, 1997, p. 41). While training emphasises the pushing of information and skills to a person, learning is about the person pulling on experience to perform better (Rothwell, 2002, p. 8). Learning is an intrinsic part of life. As humans encounter and make sense of different experiences and social situations they are being changed, that is learning from the experience (Jarvis, 2010, p. 39). The ways in which
humans learn has been described as occurring along a continuum; through formal activities (education) at one end of the continuum to informal means (e.g. discussion with colleagues) at the other (Unwin, Felstead, & Fuller, 2007, p. 1).

Beyond the definition of education as general skills, there has been an introduction in to the literature of the terms lifelong education and lifelong learning (Jarvis, 2010, p. 44; Tuijnman & Boström, 2002, p. 95). Lifelong learning is described as a process rather than a discrete skill or knowledge acquisition and is considered to be developed across the life-span of individuals who are able to control their own learning and adjust to change (Andersson, Fejes, & Sandberg, 2013, p. 406; Tuijnman & Boström, 2002, p. 95).

For adult learners, education and training are two methods of promoting learning either through formal programs attended prior to gaining employment (e.g. a university qualification) or as part of ongoing employment (e.g. training session for a new library software program) (Clifford & Thorpe, 2007, p. 8). Learning, that is the change in behaviour as the result of experience, may be the result of attending a training program and then being able to apply that training within the workplace or through sharing the new knowledge with colleagues. It is the use and transfer of knowledge and the generation of further knowledge rather than simply the attendance at a training event that provides the learning experience (Chan & Auster, 2002, p. 113).

Learning focuses on outcomes and has in the past been considered an individual process (Rothwell, 2002, p. 8). More recently, there is a growing research interest in the social nature of learning, in particular in workplaces, where individuals either on their own or in cooperation with colleagues undertake learning (Unwin et al., 2007, p. 2). In acknowledging the impact of environmental factors on workplace learning, a number of influences have been identified as affecting participation in workplace learning. These include the extent workplaces provide opportunities for learning, the extent
individuals choose to engage as well as number of staff, expertise, use of IT, culture, support from management, individual motivation, time and IT skills (Sambrook, 2005, p. 113; Tynjälä, 2008, p. 141). Workplace learning is a complex area of research including the individual and social nature of learning, available facilities and management attitudes, as well as the types of learning being undertaken within the workplace.

2.3.2 Formal, informal and self-directed learning in the workplace

To study how librarians can best engage with ongoing learning about emerging technologies in their workplace it is necessary to consider the nature and types of learning occurring within the workplace. There is a shift in workplace research from an individualistic view of learning, to the learner being a part of a workplace, gaining skills and knowledge through participation in work tasks and social interactions (Hager, 2011, p. 17). Views of workplace learning have varied across differing disciplines, ideologies and organisational viewpoints, suggesting three broad perspectives. These are 1) the workplace as a site of learning, 2) the workplace as a provider of a learning environment, and 3) working and learning as being inextricably linked (Manuti, Pastore, Scardigno, Giancaspro, & Morciano, 2015, p. 3).

The first of these perspectives separates work from learning with learning taking place away from the everyday tasks of a particular job. Learning may take the form of attendance at a training day, conference or workshop. The second perspective designates that learning occurs within the workspace suggesting learning events are planned, such as specific skill development in the use of a piece of equipment or software program. The third perspective advocates continuous learning occurs on the job with the workplace being structured in such a way to support and encourage ongoing learning by employees (Manuti et al., 2015, p. 3). This third perspective recognises that learning occurs through participation within a workplace and that through structuring a workplace in such a way as to encourage learning opportunities, employees continue to learn skills and gain knowledge through the social participation in the workplace. This final perspective, one of active participation within a site aligns with the practice perspective being
undertaken in this study as will be discussed shortly.

Over the past decades researchers have attempted to categorise workplace learning in a number of ways including using terms such as formal, informal, self-directed, experiential, tacit and transformational (Marsick & Watkins, 2001, p. 26). In the 1990s Marsick and Watkins were considered the first to define workplace learning in terms of informal and incidental learning. Informal and incidental learning were considered different to formal learning which typically takes place within a highly structured, classroom based setting (Marsick & Watkins, 1990, p. 12). Informal learning, of which incidental learning is a subset, sees the control of learning shift from the teacher to the learner. Whilst usually intentional in nature, informal learning is not as structured as formal learning. Informal learning may be in the form of networking, mentoring, or performance planning (Marsick & Watkins, 2001, p. 25). Other definitions of informal learning have included those learning activities initiated by workers in the workplace; a set of processes with specific workplace contexts that result in acquired knowledge and skills; or where learning is not the primary purpose of the activity, but occurs as the result of problem solving a situation (Manuti et al., 2015, p. 5).

Marsick and Watkins and other cognitive researchers such as Eraut have focused their models of workplace learning on the level of information processing involved in the task (Sawchuk, 2011, p. 168). Formal learning is conscious and goal directed in nature, involving the learning of explicit knowledge. In contrast informal learning is unconscious, with no intention to learn and no awareness that learning has taken place (Eraut, 2000, p. 115). The focus on the individual and their control over their learning has resulted in a number of models of the formal/informal learning continuum being proposed.

Rogers (2004) provides a relatively simple continuum model based on the social context and agency of learners (Figure 2.1). Formal education at one end of the continuum involves closed groups with the curriculum not changing when new participants join the group e.g. university courses. Non-
formal and participative education are highly contextualized and participatory activities with individuals gaining more agency over their learning. Informal learning is considered to encompass all the unstructured, incidental learning that is a part of everyday life (A. Rogers, 2004). Rohs proposed a more detailed workplace learning continuum which includes factors of intention, learning support, control, content, consciousness and learning result (Figure 2.2) (Zurcher, 2010, p. 4). Whilst this provides a more detailed framework for discussion, the attempt to split such factors as intention or learning results is difficult when both ends of the spectrum may be involved in the same learning experience (Zurcher, 2010, p. 4). These two continuums are only examples of the many continuum models proposed by researchers.

![Figure 2:1 Roger's education/learning continuum.](Adapted from “Looking again at non-formal and informal education – towards a new paradigm” by A. Rogers, 2004. (www.infed.org/biblio/non_formal_paradigm.htm)).

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<tr>
<td>other-directed</td>
<td>Control self-determined</td>
</tr>
<tr>
<td>focused</td>
<td>Content holistic</td>
</tr>
<tr>
<td>conscious learning</td>
<td>Consciousness partially unconscious learning</td>
</tr>
<tr>
<td>theoretical knowledge</td>
<td>Learning results experiential knowledge</td>
</tr>
</tbody>
</table>

![Figure 2:2 Rohs' continuum of learning.](Adapted from “Teaching-learning processes between informality and formalization” by R. Zurcher, 2010. (www.infed.org/informal_education/informality_and_formalization.htm)).

It is challenging to synthesize the variety of definitions of workplace learning into one theory or model, however there appears to be three main features common to many models, 1. the location of the learning, 2. the degree of
planning and 3. the role of any trainer or facilitator (Manuti et al., 2015, p. 10). When individuals learn they make a series of decisions. Depending on their workplace learning environment; learners may have the opportunity to decide what, where and how they wish to learn; incorporating organisation-led, formal learning experiences (often in the form of training programs) and informal self-directed learning experiences (the individual choosing, planning and enacting their learning experience) (Follman, Hall, & Omotade, 2012, p. 7).

In workplaces, emphasis is often placed on the need for formal learning opportunities, which provide employees with the knowledge and skills required for a general place of work e.g. academic libraries. Formal learning opportunities, such as attending training courses or conferences, can be included in performance management schemes for staff as they are concrete, measurable events that can be used as a key performance indicator or objective. These courses and conferences have been popular because they are based on measureable inputs; it is possible to record and report on the number of hours and the number of people who have engaged in this type of learning opportunity (Clarke, 2004, p. 143). In contrast, informal learning is primarily unplanned and often not directly testable so there is a move away from the learning-performance paradigm to consider the process of learning and the environment in which the learning is occurring (Clarke, 2004, p. 143).

As perspectives in this area move from learning as an acquisition of knowledge to a focus on the learning process as a means of gaining skills and knowledge, understanding this learning process increases in importance. In Rohs’ continuum (Figure 2.2), the component of learner control over the learning experience is described by the dichotomy of other directed/self-directed. At one end of the continuum, other directed describes formal training programs where the content and learning method is set by another. Self-directed learning occurs when the learner has control over the content and method of learning. Unlike a training program, self-directed learning is often problem centred and is self-evaluated as to its effectiveness.
Self-directed learning provides a perspective where the individual takes responsibility for constructing meaning but also includes individuals seeking to confirm and validate this new knowledge through others in the workplace (Garrison, 1997, p. 19). Comprehending the individual’s approach to their workplace learning, through their own self-directed learning experiences, provides a means of understanding how individuals are currently learning about emerging technologies.

2.3.3 Self-directed learning

Definitions of self-directed learning vary among researchers, with some considering self-directed learning to be a process, while others have focused on the individual as having a self-directed personality attribute (Song & Hill, 2007, p. 28). The self-directed learning process focuses on the degree to which a learner can control their learning experience and in doing so plan, monitor, and evaluate their own learning (Robertson, 2011, p. 1629; Song & Hill, 2007, p. 32). In contrast, self-directed learning as a personality attribute determines a learner’s motivation and capability for taking responsibility for their own learning (Song & Hill, 2007, p. 28). Both have a place in understanding self-directed learning.

Candy, one of the earliest researchers in the field of self-directed learning, outlined what he saw as the four distinct definitions of self-directed learning coming from the literature at the time he was writing and researching:

1. Self-direction as a personal attribute (personal autonomy).
2. Self-direction as the willingness and capacity to conduct one’s own education (self-management).
3. Self-direction as a mode of organizing instruction in formal settings (learner control).

A review of some of the self-directed learning models proposed over the past three decades shows a changing perspective on the role the individual and
the social setting have in influencing self-directed learning. Candy’s model focuses on the individual driving their own self-directed learning (Figure 2.3). Individuals undertake an ongoing circular learning process involving six steps;

- determining what should be learned,
- identifying one’s own learning needs,
- developing learning objectives,
- identifying a learning plan,
- successfully implementing the learning plan, and

Figure 2:3. Candy's model of self-directed learning.

Candy’s model focuses on the process of learning and does not consider any external influences on the learner, nor any motivational or other personality factors that might impact the learning process. Since Candy’s work in the field of self-directed learning, a number of other models have been proposed. These have focused on the role that internal and external factors have in influencing learning (Garrison, 1997; Straka, 2000). Garrison (1997) argues that learning is a result of an individual constructing meaning within their
environment, influenced by their own motivation to initiate the learning experience. An individual’s perceived value and anticipated success of achieving the desired outcomes from a learning experience impacts the motivation to begin learning, which can also be influenced by external conditions and internal states (Garrison, 1997, pp. 26, 29).

Straka (2000), in proposing a two shell model of self-directed learning (Figure 2.4) proposed that for self-directed learning to occur the learner begins with an interest in the subject, then develops strategies on how to learn more. Learning is then undertaken and, finally, evaluation occurs. While the internal circle of Straka’s model involves the self-directed learning process similar to that identified by Candy (1991), this model also incorporates factors individual to the learners such as prior knowledge, belief in their abilities and skills, their interest and motives for undertaking the learning.

Figure 2.4. Two-shell model of motivated self-directed learning.

By including the context within which the learning is occurring, Straka’s model aligns with the identification of environmental and personal factors that can influence learning experiences. Straka argues that factors such as autonomy, competence and social connectedness all impact on the learning experience (Straka, 2000, p. 245).

These models provide a view which sees learning as an individual acquisition event, influenced by internal and external conditions. They do not, however, take into account learning and knowledge development generated through social interaction and workplace participation (Fenwick, 2006, p. 288). Self-directed learning models may provide an opportunity to discuss learning from an individual’s perspective, yet still have some limitations as researchers move to understanding learning more as a social process.

In more recent years researchers have considered the social aspect of self-directed learning. From extensive research and writing on adult education, Merriam and colleagues (2007, p. 107) outline three clear goals of becoming a self-directed learner. The first is to help learners be able to plan, undertake and evaluate their own learning. This is reflected in Candy’s model. The second goal is to become critically aware of one’s own learning and the reasoning behind why and what an individual wants to learn. This awareness of motivations is reflecting in models proposed by Garrison (1997) and Straka (2000). The third goal of self-directed learning is to promote emancipatory learning and social action (Merriam et al., 2007, p. 108). This third goal of self-directed learning emphasises the social aspect of learning, working with others to build a cooperative learning climate and analysing and critically reflecting on the social, economic and political contexts in which learning is occurring (Merriam et al., 2007, p. 119). The emphasis on the context in which learning is happening, aligns with the importance of the site in practice theory, as will be discussed in section 2.4 of this chapter.

2.3.4 Communities of practice

Whilst self-directed learning models provide insight into adult learning, they focus on the individual. Knowledge and skill development occurs within the
individual and while the environment influences the behaviour, knowledge is considered as an acquisition by the individual (Sawchuk, 2011, p. 169). Self-directed learning theories have an important place in understanding workplace learning, but looking to the concept of knowledge development as a social process suggests that other models of workplace learning might be relevant. Lave and Wenger propose that learning is social in nature and arises from engagement in communities of practice (M. K. Smith, 2009).

Lave and Wenger, looking beyond the acquisition of knowledge in terms of the cognitive processes involved, were interested in how individuals engage in structures that are present in the workplace (M. K. Smith, 2009, p. 3). Introducing the concept of communities of practice provides researchers with a means of studying the environment or situation in which learning is occurring, acknowledging the power, control and conflict that occurs within workplaces (Sawchuk, 2011, p. 171). Communities of practice are not just groups of people, there are certain conditions that make them an entity. These conditions include a shared area of interest and engaging in joint activities and discussions, and sharing information around that shared topic of interest (Wenger, 2011, p. 2). Members of a community of practice also share resources, in the form of experiences, ways of work, tools and stories (Wenger, 2011, p. 3).

Using the concept of communities of practice as a means of researching workplace learning makes it possible to consider the social structures that are impacting on learning. Workplaces can be studied in terms of their nature as a learning environment (Fuller & Unwin, 2011, p. 51). Characteristics of the workplace provide either an expansive or restrictive learning environment. For example, workplaces where individuals are provided with time for reflection and deeper learning, those with a recognition of and support for workers as learners and have managers who actively facilitate workplace learning are considered expansive learning environments (Fuller & Unwin, 2011, p. 52). Workplaces displaying the opposite of these features would be considered restrictive learning environments. These structures are shaping the practice of the individuals within that environment.
Whilst Lave and Wenger include the individual as a learner within a community of practice, they implicitly consider a newcomer to a community comes as a blank slate, ready to learn within that community (Fuller, Hodkinson, Hodkinson, & Unwin, 2005, p. 66). In entering a community of practice individuals choose to adapt and modify their behaviour in order to belong in a new community (Fuller et al., 2005, p. 66). This view does not take into consideration that all learners enter a community with their own prior learning and work and life experiences.

It is in reconciling the individual as a learner, with their own motivations and goals, with the importance of the workplace as a community shaping the learning of individuals, that leads to the consideration of practice theory, and in particular the theory of practice architectures as a basis for researching workplace learning. Individuals within the workplace are not separate from their learning experiences, they are changed by the experiences they encounter. The workplace is also not a stable entity, with structures and processes changing due to the actions of the individuals within it. The individual is able to shape their workplace, whilst also being shaped by that environment as they learn (Hager & Hodkinson, 2009, p. 631).

2.4 Practice theories and the theory of practice architectures

Workplace learning theories have focused either on the individual as a subject of study, or on the community or workplace in which the learner is undertaking learning. Practice theory perspectives on workplace learning aim to encompass both the individual as a learner and the complexity of the changing and relational nature of the workplace (Reich & Hager, 2014, p. 428). In exploring practice theories and the theory of practice architectures further, it is possible to see how the practice perspective can add to the discussion of workplace learning, in particular the ongoing learning about emerging technologies.

The impact of technological change upon the work of library staff, in this case those working within academic libraries, has been discussed. This impact
underscores the importance of ongoing learning about new and emerging technologies for library work, and the work of staff and their managers. Only through ongoing learning will library staff continue to be able to deliver relevant services to their clients. Framing the discussion of this ongoing learning within a practice theory framework, enables the researcher to study both the context within which a practice is occurring as well as attributing meaning to the actions being undertaken by individuals within that context (Cox, 2012, p. 182).

The term practice is often used to express the domain of human activity e.g. vocational practice, educational practice, political practice or workplace practice (Reich & Hager, 2014, p. 419; Schatzki, 2002, p. 70). There is not one practice theory; yet for all practice theories there are a number of aspects that differentiate them from other views of the social world. Practice theories do not place the individual at the centre of the theory interacting with the world, nor do they view the world from the social aspect acting upon individuals without their input. Instead practice theories share an understanding that in trying to describe the world, it is through human activities in the form of “meaning-making, identity-forming and order-producing” that are important (Nicolini, 2012, p. 7). Practices are the means through which actions and language acquire meaning, individuals’ identities are formed and the social order is constituted through stabilizing patterns of relationships (Nicolini, 2009, p. 1394). The different practice theories proposed over the past forty years have not built on each other to develop a single practice theory, instead different language and definitions about what is a practice have been advanced and similarities and differences between theories provide an opportunity to enrich our understanding of practice (Nicolini, 2012, p. 10).

Across the landscape of practice theories, there are three important features that define a practice. Practices are: 1) a social phenomenon embracing a number of people; 2) organised activities being undertaken by multiple people; and, 3) manifested by actions that are “non-propositional bodily abilities” (Schatzki, 2012, p. 14). These non-propositional abilities are difficult
to articulate and have been described as “know-how” (Ryle), “habits/schemas” (Merleau-Ponty), “habitus” (Bourdieu) and “practical consciousness” (Giddens) (Schatzki, 2012, p. 14).

In identifying this new idea that practices are the central component to social life, “first generation” practice theorists such as Bourdieu, Giddens and Lave built on the philosophical work of Wittgenstein and Heidegger (Hui, Schatzki, & Shove, 2016, p. 1). These early practice theorists focused on debating the individualism/holism dichotomy; the explaining of social phenomena as based on the individual versus the idea that society is more than a collection of individuals (Ritzer & Gindoff, 2014, p. 13). Following Bourdieu, Giddens and Lave are a “second generation” of practice theorists, including Schatzki, Gherardi, Reckwitz and Kemmis (Hui et al., 2016, p. 1). These later practice theorists focused on contesting the material/cultural dichotomy; that is the distinction between the reality of society and individuals’ ideas about that reality.

Schatzki, in writing about what constituted social life, argues that social life is grounded in the social site; that is the context in which humans exist and are part of (Schatzki, 2002, pp. xi, 147). Individuals come together in the social site and coexist within the site, describing this as site ontology, in contrast to individualist and socialist ontologies (Schatzki, 2002, p. 138). Site ontology is more than just the context within which practices occur but instead the argument that the site can impact the actions of individuals in the same way the actions of individuals influences the site. Any practice can only be studied within the site in which it is occurring (Schatzki, 2003, p. 176). Practices take form within particular sites, and in doing so interact with other practices present in the site. For example, the larger practice of librarianship takes place within the site of a library, and from that same site, other practices also emerge such as user education practices, information literacy education practices, management practices, archival practices and more.

Theories of workplace learning as discussed previously have either focused on the individual as the focus of learning practice, gaining skills and
knowledge from their environment, or on the social group (communities of practice) as a means of learning. Practice theory, in looking beyond the individual/holism dichotomy to suggest that individuals influence their environment which in turn influences them, provides another view through which to discuss the practice of workplace learning.

Site ontology, as defined by Schatzki, is powerful because it stresses the importance of seeing and therefore studying beyond a static view of the context in which something is happening. By studying a site and understanding the range of rules, materials, and language that exist within that site researchers gain greater insight into what, within that site, is shaping the practices (Kemmis, Wilkinson, et al., 2014, p. 34; Lloyd, 2009, p. 416). Within the LIS field, practice based research has shown the importance of the site in such areas as information literacy, where it is the site that shapes how information is perceived, used and acted upon collectively by the individuals within the site to generate knowledge (Lloyd, 2009, p. 413).

In Schatzki’s view, a practice is represented through a bundle of the actions required to undertake a particular activity (doings) and the language that both describes the activities and also provides the means for connecting the actions with the social context (sayings) (Schatzki, 2002, p. 73). These bundles are always bound with material articles that people manipulate to direct, prefigure, enable or constrain the practice and are essential for the enacting of any practice (Schatzki, 2012, p. 16).

Defining practices as a set of doings and sayings, Schatzki argues that practices are both regular doings and sayings but can also be constantly changing doings and sayings (Schatzki, 2002, p. 74). Schatzki (2002, p. 88) emphasizes the social element of the site as both directing and changing the sayings and doings that constitute a practice. Sayings are considered to be a subset of doings. The sayings element of the practice emphasises the importance of a particular context or site, as meanings of words are often dependent on the circumstances within which they are used, or who is speaking or writing them (Schatzki, 2002, p. 61). An example of this is the
jargon of any profession. Within libraries the use of words like holdings, citation, microfilm and interlibrary loan have been found to be very context specific. Those individuals undertaking the practice of working in a library have a better understanding of the meaning of these words than those not undertaking that practice, for example students (Chaudhry & Choo, 2001, p. 345). This is the same for any profession and only through participation within a particular site can increased knowledge of the sayings and doings happen.

Schatzki’s theory also states that practices are more than just the sayings and doings at a basic level but also are contained in teleological hierarchies; that is the reasons why people act as they do, the outcomes that are the result of the doings and sayings (Schatzki, 2012, p. 15). Practices are sets of actions that are organized by understanding how to do things, the rules that govern the doings and the reasons why the actions are taken (teleological hierarchies) (Schatzki, 2005, p. 471). An example of Schatzki’s theory within the LIS field is the practice of providing access to a library collection for a student. The doings include removing books from the shelves and entering loans in a database, sayings include words such as loan and return date. Examples of rules for loaning items may include the length of loan allowed for certain student types or the number of items a student may borrow at any one time. Finally the teleological hierarchy, the reason why an individual might undertake a practice may include rationale such as wanting to facilitate students’ access to information, fulfilling professional expectations or just doing their job. The importance of the site within this practice is seen in the understanding that these doings and sayings mean little if they were not being actioned within the space of a library, and in particular an academic library.

In considering the practice of ongoing learning about technologies as the focus for this study, the sayings and doings can be seen through the use of language such as formal and informal learning, and the language describing the methods individuals use to learn e.g. individual exploration and attending workshops. The practice of ongoing learning is contained within rules in each
workplace such as access to particular equipment or the approved use of the equipment for particular learning such as technologies directly related to library work and not those for personal use beyond work. The reasons for learning are also dependent on the site, including being able to provide relevant services to clients or to develop an individual’s own knowledge and skills.

Schatzki, in defining practice as comprising of doings and sayings within a particular site, implies that there is also relationships that exist between individuals and the site (Edwards-Groves & Grootenboer, 2015, p. 152; Kemmis, Wilkinson, et al., 2014, p. 30). To make these relationships more explicit Kemmis and colleagues (2014, p. 30) developed the theory of practice architectures, giving this relationship dimension equal importance alongside the doings and sayings of the practice.

The theory of practice architectures considers both the nature of practices and also the arrangements occurring within a site that are constraining and enabling practice. Kemmis and colleagues (2014, p. 31) provide an explanation of practices that focuses on the interplay between the language of the practice (sayings), the activities that characterise the practice (doings) and the relationships between people and objects that are part of the practice (relatings). These three components together form a "distinctive project".

The project of a practice refers to the intentions of those involved, those things that are taken for granted as being part of the practice, as well as the intersubjective spaces in which individuals and groups of individuals encounter each other (Kemmis, Wilkinson, et al., 2014, p. 14). Intersubjective spaces are described as the semantic space, the physical space-time and the social space. Individuals encounter each other “in language in the semantic space; in activities and work in the material world of physical space-time; and in relationships of power and solidarity in social space” (Kemmis, Wilkinson, et al., 2014, p. 14).
While Schatzki emphasised the importance of the site as the conditions in which practices occur, the theory of practice architectures seeks to explore the role of the site as an influencing factor on practices. The theory of practice architectures highlights the enabling and constraining dimensions of the site, referring to these dimensions as practice architectures (Kemmis, Wilkinson, et al., 2014, p. 34).

Practice architectures take the form of cultural-discursive, material-economic and social-political arrangements. The cultural-discursive arrangements are the resources that make possible the sayings that characterise the practice. For example, the specialist language used within a library site enables the sayings individuals use to describe ongoing learning. The material-economic arrangements are the resources that make possible the doings that characterise the practice. In the case of ongoing learning the equipment available to undertake learning is one material-economic arrangement. The social-political arrangements are the resources that make possible the relationships between people within a site and between people and non-human objects that enable the practice. Shared understandings about the role technologies have in enabling library work, the rules present about appropriate use of library equipment and the solidarity or sense of belonging between individuals to undertake ongoing learning are examples of the social-political arrangements that may be influencing the ongoing learning practice of individuals within the site (Kemmis, Wilkinson, et al., 2014, p. 32).

Kemmis and colleagues in establishing the theory of practice architectures developed it as a means of better understanding and studying practices within organisations such as schools but it can also be applied to a range of other workplaces, including in this case libraries (Kemmis, Wilkinson, et al., 2014, p. 37; Lloyd, 2014). Through the identification and description of the existing conditions within a site as cultural-discursive, material-economic and social-political arrangements, researchers are able to gain insights into distinctive aspects of practices rather than just considering the social site as a whole (Edwards-Groves & Grootenboer, 2015, p. 154). It is an important premise of this theory that even through identification of these various
elements of practice and the arrangements that shape practices, no single element or arrangements can describe a practice and its site on its own. It is the interconnectedness of these elements and arrangements that brings the wealth of understanding of how arrangements both shape practice and are also shaped by practice (Edwards-Groves & Grootenboer, 2015, p. 154). This richness of description and its potential for enabling greater understanding are the reason why the theory of practice architectures has been chosen as the framework for this study. The various aspects of the theory will now be considered in more detail. Figure 2.5 provides an overview of the theory of practice architectures and demonstrates the interconnection between the practice and the practice architectures.

<table>
<thead>
<tr>
<th>Practices are intertextually secured in</th>
<th>Intersubjective space/medium</th>
<th>Practices architectures (arrangements and set-ups) enable and constrain interaction via</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practitioners’ characteristic ‘sayings’ - and thinking (the ‘cognitive’)</td>
<td>Cultural-discursive arrangements found in or brought to a site (e.g., language, ideas)</td>
<td></td>
</tr>
<tr>
<td>Practitioners’ characteristic ‘doings’ (the ‘psychomotor’)</td>
<td>Material-economic arrangements found in or brought to a site (e.g., objects, spatial arrangements)</td>
<td></td>
</tr>
<tr>
<td>Practitioners’ characteristic ‘relatings’ (the ‘affective’)</td>
<td>Social-political arrangements found in or brought to a site (e.g., relationships between people)</td>
<td></td>
</tr>
</tbody>
</table>

which are handled together in the projects (tele-affective structures) of practices, and the dispositions (habitus) of practitioners.

which are handled together in characteristic ways in practice landscapes and practice traditions.

Figure 2.5. Theory of practice architectures.


In Figure 2.5, Kemmis and colleagues graphically represent practices as being composed of sayings, doings and relatings, encompassed by the practitioner as they enact the practice. Sayings are the language and discourse used to describe the practice, doings are that which is done in
order to undertake the practice and relatings are the connections between people and objects located in the site (Kemmis, Wilkinson, et al., 2014, p. 36; Lloyd, 2011, p. 278). Bringing together the motivations of the practice, the actions to conduct the practice and the results that the practice aims to achieve form projects. Although individuals contribute different sayings, doings and relatings to the project, there is a shared understanding between members of a site as to the purpose that comes through the practice (Mahon, Kemmis, Francisco, & Lloyd, 2017, p. 8; Rönnerman, Grootenboer, & Edwards-Groves, 2017, p. 6).

Within the site of the practice the cultural-discursive arrangements are specific language and ideas that are used to describe the practice and action the practice (Kemmis, Wilkinson, et al., 2014, p. 32). These cultural-discursive arrangements enable the practice by providing a language that those participating in the practice understand, binding the practice through language and discourse. The example of the practice of ensuring the physical collection of a library is serving the needs of its customers can provide an illustration of these arrangements. Words such as *weeding* or *discarding* used to describe the practice within the workplace are understood by those undertaking the practice but might not necessarily be understood by others. As a new person enters into the practice within the site, they not only bring their own sayings but also develop an understanding of the language that is appropriate within the current site. Language used for this practice at a particular site forms the cultural-discursive arrangements which are realised within the semantic space, as shown in Figure 2.5 (Edwards-Groves & Grootenboer, 2015, p. 152)

Material-economic arrangements are the resources that make the practice possible and are realised within a physical space (Kemmis, Wilkinson, et al., 2014, p. 32). The use of trolleys, portable barcode scanners and portable recycling bins are all part of the material-economic arrangements that enable the practice of weeding or discarding of material from the physical collection of a library. The lack of such items would constrain the practice. Material-economic arrangements shape how the practice is undertaken.

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Finally social-political arrangements are the resources that support the power and relationships between people and objects that occur in the practice and are realised in the social space (Kemmis, Wilkinson, et al., 2014, p. 32). These arrangements enable or constrain the relatings of a practice. Using the example of discarding materials from a physical collection, these arrangements may include the relationship between library staff and policies such as the collection development policy or the shared understanding among librarians about the purpose of the physical collection. The presence of a collection development policy that clearly directs what is kept or discarded from a collection would enable the practice of discarding material whereas a lack of clear understanding by staff as to the purpose of the collection could be seen to constrain the practice.

Together the cultural-discursive, material-economic and social-political arrangements form the practice architectures that enable or constrain the sayings, doings and relatings of a particular practice as they are realised within the intersubjective dimension (the semantic, physical and social spaces) of the practice. This is not a one way relationship. The sayings, doings and relatings undertaken by individuals working collectively can shape practice architectures bringing change to the site (Kemmis, Wilkinson, et al., 2014, p. 33). As a new practitioner enters a particular site they draw from the prefigured, or currently present practice architectures in order to understand how a particular practice is undertaken within the site. At the same time they also bring with them previous knowledge and ideas and are able to impact on those practice architectures, changing them as the practice moves forward in time (Kemmis, Wilkinson, et al., 2014, p. 38). The constant interaction between individuals and the site is represented by the infinity symbol used in Figure 2.5 (Mahon et al., 2017, p. 14).

Using the previous example of the weeding of a physical collection, a new graduate may have learnt about collection development during their LIS education and so understand the language, actions and rules associated with this practice. As they enter their new workplace they need to learn and
understand both the sayings, doings and relatings as practiced within this specific workplace, and the practice architectures that enable or constrain the practice within this particular site. It is the collection development policy, the budget, the resources and the language and discourses used within a graduate’s workplace that shape their practice going forward, while the knowledge and experience they bring from their education may be able to shape the practice architectures by bringing new understandings or examples of practice from outside the site. As a graduate actively participates within a site’s practices they learn the sayings, doings and relatings often through on-site training events or via informal and social means and begin to construct their own understanding and bring their own influence upon a particular practice (Cox, 2012, p. 181).

To develop a new practice the tasks required to undertake the practice must be identified, a common language and understanding shared, including possibly rules and policies, and individuals trained in how to undertake the tasks required (Schatzki, 2012, p. 23). To then make a practice ongoing or sustainable it not only needs to make sense and be able to be done by those undertaking it, it must not be so constrictive that it doesn’t allow for development or adaption over time (Kemmis, 2009b, p. 35). Resources need to continue to be available and financially sustainable, and the ongoing practice should not result in hardship or suffering for those undertaking the practice (Kemmis, 2009b, p. 35). Through the experience of undertaking a particular practice the individuals within a site assist with sustaining that practice (Shove, Pantzar, & Watson, 2012, p. 67). Practices continue to change and adapt when individuals make changes to the way they enact the practice (Shove et al., 2012, p. 68). Using the example of weeding physical collections, if the practice does not allow for the adaption of new technologies or if storage availability changes, then the practice is not sustainable in its current configuration and must adapt in order to continue.

Most practices continue to be perpetuated by the individuals undertaking them, as through commitment to the practice, individuals develop identity, as they see their role through their practices. For example, whereas in the past
circulation staff have considered loaning books, renewing items and processing fines as some of their core practices, with the implementation of self-checkout machines, online renewals and automated fine payments circulation staff are having to reconsider their view of their role within the library and change their practices accordingly (Su, 2008, p. 78).

In order to make sustainable changes to a particular practice it is necessary to undertake a collective change in how a practice is enacted. This can only happen through changing individual practices (Kemmis, 2009b, p. 27; Schatzki, 2012, p. 22; Shove et al., 2012, p. 70). Changing individuals’ ways of thinking about, talking about and doing a particular practice are not enough, there must also be a collective change to the way individuals relate to each other and their environment for sustainable change to occur (Kemmis, 2009b, p. 27). Change can come from either a group of individuals changing their practice or the changing of the practice architectures that enable and constrain the practice. Changes in the practice architectures, such as resources available through budgets and staffing levels, or policies and procedures, may have a significant impact on the practices undertaken within a particular library, with some practices no longer undertaken or others significantly altered in the way they are performed. Technological advancement are one influence on the way certain practices are undertaken.

2.5 Workplace learning and practice theory

Approaching workplace learning from a practice perspective provides researchers and practitioners the opportunity to consider the synergy between practice and learning. Workplace learning is about learning how to undertake the practices required within the site of work; that is taking the knowledge and skills learned during library education courses and adapting and developing these to suit the workplace (Reich & Hager, 2014, p. 422).

Viewing knowledge as more than just a possession to be gained, but as an activity situated in practice, leads to considering what is learning and how does that relate to knowledge. Learning can be studied from an individual, group or organisational level and researchers have approached it from these various
viewpoints (Van den Bossche, Gijselaeers, & Milter, 2013, p. vii). Viewed from a practice perspective, learning is the practice which moves individual knowledge into applicable knowledge through a process of interaction and knowledge sharing within a social site (Grohnert, Carbonell, Dailey-Hebert, & Segers, 2013, p. 88). Learning is the practice that an individual participates in, in order to be a competent member of a community and knowledge is acquired through interacting with other people, and also through experiencing thoughts, sensory experiences and aesthetics (Gherardi, 2009, p. 354).

Ongoing learning within the workplace is an important part of being professional, of undertaking good practice (Hopwood, 2016, p. 94). The ongoing learning and knowledge development about emerging technologies has an important role to play in being a staff member in an academic library (Leong & Woods, 2017, p. 6). Through approaching workplace learning from a practice perspective, learning is more than just the acquiring of information, it is being able to use interactions within the workplace in such a way as to bring about change (Hopwood, 2016, p. 97). By understanding how the practice of workplace learning is occurring and the site specific practice architectures shaping the practice it is possible to extend perceptions beyond the individualism/holism dichotomy of current workplace learning research. To gain this understanding, it is necessary to consider how the theory of practice architectures has been used to undertake research to date.

2.6 Researching practices and workplace learning

Research into practice has developed a range of views and approaches, depending on what aspect of practice is emphasised (Kemmis, 2009b, p. 19). Kemmis and McTaggart (2005, p. 573) in reviewing practice research distinguish five different research perspectives. They are research about;

- the individual behaviour of those actioning the practice as viewed by an observer,
- the social conditions which constitute the practice as seen by an observer,
- the patterns of social interaction and conditions that make up the practice, intentions and meanings as seen by those actioning the
practice,

- the language and traditions of a practice viewed by those undertaking the practice, and,
- the change and evolution of practice over time (Kemmis & McTaggart, 2005, p. 573).

No one perspective is the correct or best way to study practices; whether it be as an observer or participant, an individual or a member of a community or a combination of all of these. All together these perspectives represent the study of practice (Kemmis, 2009b, p. 28). The theory of practice architectures offers a way of understanding individual behaviour as well as the social conditions.

By considering practices through the lens of this theory researchers are able to not only describe a practice but are also provided with the means to discuss how a practice can be improved through the changing of either the individuals sayings, doings or relatings or considering the cultural-discursive, material-economic and social-political arrangements that shape practice (Kemmis, 2009b, p. 24). The theory of practice architectures provides both a theoretical and analytical means of researching practice. Theoretically through the comprehensive language used to describe and interpret the social world, and analytically through identification of connections between the practice and the practice architectures of the site within which the practice is occurring (Mahon et al., 2017, p. 19).

In identifying the various elements of practice and practice architectures it is important to remember it is only through the interconnections between these elements and arrangements that researchers are able to truly understand a practice (Shove et al., 2012, p. 32). To give an example of the importance of the connections between the individual and arrangements, the use of the word *weeding* on its own means different things to different individuals and does not result in an outcome unless it is combined with the physical actions of removing items from a collection (doing) and the connection between the library and the physical or digital collection (relatings). Each of these actions
take place within the site, shaping and being shaped by the arrangements relating to the weeding of the collection. Any time individuals come together to work collectively they bring together language and discourses, actions, power and understanding of how they work together to undertake a practice. Individuals are the carriers of a practice but do so within a particular social site (Shove et al., 2012, p. 42).

Researching practices requires the capturing of information about the practice. This may be undertaken through focus groups, individual interviews, direct observation or recording of practices (Schatzki, 2012, p. 25; Shove et al., 2012, p. 103). It is also possible to identify those cultural-discursive, material-economic and social-political arrangements that are enabling and constraining the practice through these methods (Kemmis, Wilkinson, et al., 2014, p. 225). Studying practices isn’t always easy as there are issues in identifying where one particular practice ends and another begins when so many of the practices undertaken within a workplace are integrated with each other (Cox, 2012, p. 183). Through understanding the project, (the meaning, actions and ends of the practice), it is possible to establish some boundaries of the practice for the purpose of researching it. Researchers must also consider that any observation of a practice relate to a single moment in time. The evidence collected about a practice is relevant to that moment in time. Understanding the practice also relies on the judgement of the researchers as to the connection between what is being observed and what may have happened prior to that moment and what is happening at the site at the time is based on that moment in time (Kemmis, Wilkinson, et al., 2014, p. 227).

Practice theories, as a means for framing understanding of practice, have been used recently in the LIS field, in particular for considering a different perspective of information practices and behaviour (Byström & Lloyd, 2012; Huizing & Cavanagh, 2011; Lloyd, 2009, 2010a, 2013; Schreiber, 2014). There have also been a number of researchers who have theorised about, or examined the role of practice theory in general and the theory of practice architectures in the LIS field (Cox, 2012, 2013; Lloyd, 2010a, 2011; Moring &
Lloyd, 2013; Pilerot, Hammarfelt, & Moring, 2017). Studies and theoretical papers within the LIS field have focused primarily on the concept of information practice, a term sometimes used interchangeably with information behaviour (Pilerot et al., 2017, p. 1; Savolainen, 2007, p. 109). There is a growing debate within LIS practice based research between considering information seeking behaviour as an individual activity; a skill to be developed or identifying it as a social problem solving activity (Cox, 2012, p. 184; Lloyd, 2007, p. 1, 2009, p. 397). The evolution of practice based theories, and their relevance to understanding information seeking behaviour, will provide opportunities for continued research into the importance of context based information practice (Cox, 2012, p. 186; Lloyd, 2009, p. 417).

The use of practice theory and viewing of information activities as a social activity is explored in the work of Lloyd (2010b, 2011, 2012, 2013) who has undertaken focused research on the practice of information literacy. Lloyd argues that by taking a broader view of information literacy as more than a set of skills, to consider how learning occurs within the intersubjective spaces of a particular site, a better understanding of information behaviour is possible (Lloyd, 2012, p. 781).

This study, in researching a practice other than information literacy aims to broaden the use of practice theory, and in particular the theory of practice architectures within the LIS field. Taking both an objective and subjective perspective, and investigating both individual practice and the social relationships and connections present, this study recognises the interconnectedness of practice within sites. To understand how the perspective of this study differs from previous research in this area, this literature review will now examine research into workplace learning in libraries, and in particular ongoing learning about emerging technologies.

2.7 Workplace learning and libraries

The provision of ongoing development opportunities for staff ensures they are able to keep current within their changing environment, and providing
these opportunities has been found to increase the motivation of employees (Shupe & Pung, 2011, p. 411). Other researched benefits of ongoing development include greater acceptance of workplace change and challenges, more flexible attitudes to work and decreased stress related to changing user expectations and the demands made by new technologies (Crawley-Low, 2013, p. 72; Shupe & Pung, 2011, p. 411).

Academic library managers have shown a commitment to ensuring staff have the required skills to do their job, recognising that through staff development both individual and organization goals and the provision of quality services to clients are achieved (McBain, Culshaw, & Hall, 2013, p. 456; I. Smith, 2002, p. 13). The process of providing these opportunities within the workplace is usually referred to as staff development or continuing professional development. Many Australian libraries have professional development budgets, staff development managers or staff development committees to assist with encouraging and supporting opportunities for staff to undertake learning activities, yet less than a third of libraries surveyed by Hallam (2009, p. 79) had an actual staff development plan. This same study found that 75% of academic libraries had a staff development policy, which outlined the formalized support of development and obligations of staff members receiving this support (Hallam, 2009, p. 77). This would suggest the focus of academic libraries is on the allocation and spending of staff development funds with less attention to the ways in which ongoing development can be executed and supported.

The need to provide ongoing development opportunities has been recognised and responded to by Australian libraries and the Australian Library and Information Association (ALIA) through their Professional Development Scheme. Future skill development of library staff has been identified as a major strategic goal and priority for Australian libraries yet results from the neXus2 study suggests that isn’t necessarily translated into staff development plans (Hallam, 2009; Ritchie et al., 2010, p. 295; Saunders, 2015, p. 286).
Whilst recognising the strategic importance of ongoing learning, especially in the area of emerging technologies, libraries are still faced with issues of allocating time for learning and associated budgetary constraints (Blakiston, 2011, p. 728). In light of these constraints it is necessary to understand how libraries and their staff are currently undertaking workplace learning in order to identify possible areas for improvement.

Any professional development activity undertaken in any organisation, including libraries, needs to be both strategic and sustainable. The diminishing resources available for staff development, the greater pressures on staff time, and the changing nature of the academic library’s environment all require library management to balance the cost of staff development with the changing expectations of users and institutions (Blakiston, 2011, p. 278; Hallam, 2009, p. 75; Le, 2015, p. 312). The need to manage this balance has been recognised across the globe with responses ranging from the creation of staff development programs in Australian academic libraries to the establishment of compulsory continuing professional development schemes in New Zealand and the United Kingdom. Ongoing staff development requires planning and time but without it “an academic library’s other work may very well become more difficult or even irrelevant” (Zauha & Potter, 2009, p. 559). A review of the success of the compulsory professional registration program in New Zealand and the gradual introduction of the same in the United Kingdom conclude that these schemes contributed to individual self-esteem and motivation by requiring professionals to undertake and reflect on their learning and update their skills and knowledge on an ongoing basis (Broady-Preston & Cossham, 2011, p. 36). ALIA has introduced a voluntary professional development registration scheme to support professional practice and promote ongoing learning within the field. All three organisations, in describing their schemes focus on the individual benefits of ongoing development and professional registration, with no mention of the benefit to an individual’s organisation (ALIA, 2017b; CILIP, 2018; LIANZA, 2017).
In researching ongoing professional development in libraries, few studies have researched the role of informal learning methods in such development (Attebury, 2017, p. 232). The studies that have been done have found that the number of informal activities being undertaken by staff has outnumbered the number of formal professional development activities attended (Auster & Chan, 2004, p. 61; D. A. Smith & Oliva, 2010, p. 133). Formal professional activities included courses, workshops and attending conferences, in contrast to more informal activities such as reading professional journals, working with colleagues, watching YouTube instructional videos and postings on e-mail discussion lists (Auster & Chan, 2004, p. 61; Corcoran & McGuinness, 2014, p. 179; D. A. Smith & Oliva, 2010, p. 133).

Research into ongoing professional development by librarians has used both surveys and interviews as data collection methods, and relied on individual reflection and self-reporting. Respondents from larger libraries, as designated by larger staff numbers, were found to have significantly higher participation rates in formal professional development activities and that this was the preferred method of keeping up to date with changes (Corcoran & McGuinness, 2014, p. 186; D. A. Smith & Oliva, 2010, p. 133). Barriers identified to attending formal professional development activities were high cost, lack of interest by individuals, lack of opportunities available and a lack of staff to cover an individual’s library shifts, particularly for smaller libraries (Auster & Chan, 2004, p. 63; D. A. Smith & Oliva, 2010, p. 133).

Auster and Chan (2004, p. 61) in analysing their survey results developed an “updating climate” construct, that is contextual features of the library that had an effect on participation in professional development activities. Measures included availability of time, up to date equipment, financial support and information sharing between colleagues. While barriers such as lack of quality professional development, location of courses and lack of information about opportunities for development significantly affected participation in formal development, information sharing, as an “updating climate” measure was predictive of informal development activity levels (Auster & Chan, 2004, p. 64). With increased information sharing between colleagues, librarians did
not see the need to consciously undertake formal professional development activities, believing that they were keeping up to date through this sharing activity. No empirical evidence was found that lack of time was a significant deterrent to participation in professional development activities by Auster and Chan (2004, p. 65) despite it having been highlighted in other studies as a barrier to ongoing professional development (Corcoran & McGuinness, 2014, p. 192).

Auster and Chan’s (2004) study also recognised the difficulties of self-reporting of informal learning participation because within a freely sharing environment, staff didn’t identify the knowledge gained through these informal learning events as learning. Individuals are used to linking learning with a distinct activity such as attending a workshop or when they are concentrating on learning a new skill. Knowledge and skills learnt seemingly unconsciously from others in the workplace were not always recognised as a learning activity despite outcomes showing that learning had occurred. Retrospective recognition that new knowledge and skills development has occurred is difficult (Livingstone, 1999, p. 2). For researchers, and for individual learners, the question of how to recognise and report on something that is happening unconsciously remains a constant complication to greater acknowledgement of informal learning as an important part of workplace learning. The current study, by capturing learning experiences close to the time they take place, encourages participants to reflect more consciously on the formal and informal learning being undertaken.

It is important for workplaces to facilitate and nurture an environment that fosters informal learning through such means as valuing informal learning, developing learning networks, time allocation for learning and establishment of communities of practice (Leong, Phillips, Giddens, & Dickson, 2014, p. 9). Libraries need to consider capitalizing on the enthusiasm of learning-motivated library staff and focus on developing in-house informal learning opportunities that encourage autonomy and lifelong learning that benefit both the individual and the organisation. While wanting future library staff to be innovative, flexible and active learners, it is incumbent upon library
management to provide the environment that support staff to use and share these skills (Partridge, Menzies, et al., 2010, p. 270).

It is not enough to just talk about supporting ongoing workplace learning in policies; a practice of ongoing workplace learning must also be supported through the provision of support structures such as procedures, time release and infrastructure provision for practitioners to reflect upon and try out new ideas. This is also sustained through strategic professional/social relationships which foster a practice of shared reflection and inquiry and go on to create the conditions which enable a practice of ongoing workplace learning. Libraries are sites that aim to support the lifelong learning of the communities they serve, therefore it is imperative that these sites and their managers are supportive of, and provide meaningful opportunities to, their own library staff to engage in workplace learning (Moreton & Salisbury, 2000). Little research to date has investigated how best to provide this environment. This study contributes to this discussion.

Ongoing learning is not just the responsibility of library management; individual’s must also take responsibility for their own learning (Leong et al., 2014, p. 9). Individual traits like self-directedness, ability to set goals, experimentation, experience, self-evaluation and motivation in developing self-directed learning skills have been found to have significant impact on ongoing learning (Francom, 2010, p. 32; Leong et al., 2014, p. 12; Raelin, 1997, p. 573). Consideration of ongoing learning practice must keep in mind both the individual as they undertake the practice as well as the site specific arrangements present in shaping the practice. The studies referenced to date in this review have focused on professional development activities in general, including keeping up with advances within the LIS field and related professional skills as well as the use of technology. Consideration of the research into ongoing learning about emerging technologies specifically, found that a range of curriculum based learning programs have been specifically designed to aid ongoing learning by library staff.
2.8 Understanding the term emerging technology

Before looking particularly at the informal and self-directed learning about emerging technologies by librarians it is important to understand what is meant by the term *emerging technologies*. Definitions and descriptions of emerging technologies are used across a number of fields including economics, science and technology, management and education and focus on technology as being in a state of *becoming*. The exact nature of emerging technologies isn’t always clear (Rotolo et al., 2015, p. 1829).

The word *technology* is derived from two Greek words, *techne* indicating an art or skill and *logia* indicating a body of knowledge implying that technology is knowledge about making things (Spector, 2013, p. 4). The Oxford Dictionary (2019) defines technology as both “the branch of knowledge dealing with engineering or applied sciences” and “machinery and equipment developed from the application of scientific knowledge”. As equipment, or hardware, becomes more complex, the use of technological processes such as applications software is needed to use the hardware to achieve knowledge (Isman, 2012, p. 209). Terms such as technology, and as will be discussed, emerging technology, are both difficult to define and now permeate much of the human experience (Isman, 2012, p. 210).

In light of the growing interest in emerging technologies from a number of perspectives, including policy making, Rotolo, Hicks and Martin (2015) conducted a review of the literature to examine definitions of emerging technology. In doing so they provided a comprehensive timeline of the changing usage of the phrase (Rotolo et al., 2015). In 1995 the phrase emerging technology encompassed the notion of a technology of a generic nature that yielded a benefit for a wide range of sectors of the economy and/or society. Through the 2000s definitions ranged from technologies that enabled discontinuous novel innovations to those which were an extension of an existing technology and the outcome of a more evolutionary process. Through a textual content analysis of what they saw as the 12 core innovation studies dealing with definitional issues of technological
emergence, Rotolo and colleagues extracted what they called attributes of an emerging technology and used these to construct their own, comprehensive definition (Rotolo et al., 2015). Emerging technologies:

- are radical novelties i.e. something that destroys the established order,
- are relatively fast growth,
- have coherency (persisting over time),
- will have prominent impact on socio-economic domains in the future, and
- are in a phase of uncertainty and ambiguity (Rotolo et al., 2015).

Rotolo and colleagues assert that through this framework of attributes, emerging technologies can be defined and measured. The range of examples given in the studies of Rotolo and colleagues (2015, p. 1831) include fields such as DNA sequencing technologies, molecular biology, and wireless communications technology, which are making impacts on organisations, industries and societies. They also include such technological developments as the smartphone as an emerging technology, even though the technology as such was not new, it was integrated in a new way to provide an innovative product (Rotolo et al., 2015, p. 1832). Other research has also included the high cost of emerging technology as a defining characteristic (Halaweh, 2013). These examples and the attributes discussed, focus entirely on the technologies with little acknowledgement of the context in which emerging technologies are used.

In contrast, research that has sought practitioner understandings of emerging technologies has resulted in more context based definitions (Gachago et al., 2013; Veletsianos, 2010). Working within the education field and seeking a definition based on the understanding of colleagues, Veletsianos (2010, p. 20) found that emerging technologies were considered to include innovations, tools, concepts, ideas, knowledge and both hardware and software technologies. In contrast to Rotolo and colleagues’ research (2015), Veletsianos’ (2010) study led him to define emerging technologies in
terms of what he called characteristics, which reflect more how people view a technology that is emerging rather than focusing only on the particular attributes of the technology. Veletsianos defines emerging technologies as technologies which:

1. may or may not be a new technology, older technology employed in a new way can still be seen as an emerging technology,
2. may be coming into being or be an evolving technology, implying that the technology is still in a state of development or refinement,
3. may cause people to experience a cycle of euphoria, adoption, activity and use, maturity, impact and enthusiasm with some becoming part of the business (acceptance), while others fade into the background (rejection),
4. may not yet be fully understood or researched and questions of their impact and usefulness are yet to be answered, and
5. have the potential to be disruptive, mostly unfulfilled at the time of emergence (Veletsianos, 2010, p. 24).

Veletsianos (2010) did discuss the concept of context within his understanding of emerging technologies, giving the example that in the field of education, interactive whiteboards can be both emerging or established technologies, depending on the context of the user. What is an emerging technology for one context, might not be so for another. The examples given by Veletsianos’ (2010) research also differ considerably from Rotolo and colleagues’ (2015) research. Veletsianos describes the emergence of Twitter as an example of an emerging technology coming into being, and social networking as an example of a not yet fully understood technology as educators develop an understanding of how social media can be used to sustain learners engagement online (Veletsianos, 2010, pp. 22, 23).

Veletsianos’ (2010) definition is supported by research done in universities in South Africa. Along with the five characteristics reported by Veletsianos, two more characteristics were added to expand the definition. Emerging technologies are also:

6. frequently used first by specific people, those with a personal interest
or risk takers, and also initially by small numbers of people, and
7. provide personalized learning opportunities by enabling more flexible,
autonomous, creative and personalized use of technologies, thus
increasing personal ownership of learning (Gachago et al., 2013, p.
98).

Within the education field at least, definitions of emerging technologies can
be seen to be highly context-specific.

Rogers, a preeminent theorist in the field of technology diffusion and
adoption, whilst not using the term emerging technology, discusses
innovation with regard to new technologies (E. M. Rogers, 2003, p. 12;
Sahin, 2006, p. 14; Straub, 2009, p. 626). An emerging technology may be
considered an example of an innovation. Rogers' definition of innovation was
“an idea, practice or project that is perceived as new by an individual” (E. M.
Rogers, 2003, p. 12). Often using the terms technology and innovation
synonymously, Rogers’ argues that although a technology or innovation may
have been invented some years before, it is the individual's perception of
something as new that makes it an innovation. The individual perception of
innovation in Rogers' definition adds to a diverse range of definitions of new
or emerging technologies.

Within the LIS field, focusing on technological innovation, a single issue of
Library Technology Reports aimed to define the term innovation and in
particular technological innovation (Vaughan, 2013b). A survey of library
directors, a review of job advertisements and analysis of a range of American
library committees supported the inclusion of both characteristics of the
technology and the perception of the user in describing technological
innovation. Technological innovation trends in the LIS profession were found
to involve a shift to mobile environments, services accessible via mobile
devices, application development, open source software programs and social
media (Vaughan, 2013b, p. 16). The importance of the perception of the user
is evident when library directors were asked to indicate what makes a
particular technology innovative. Answers included the newness of the
technological innovation, how it was being applied uniquely or differently in the library setting, whether it was an incremental or fundamental change and the rate of adoption among other libraries (Vaughan, 2013a, p. 67).

The survey by Vaughan (2013b) defining technological innovation is one of the few studies in the LIS research literature seeking to define emerging technologies. Most papers prefer to use definitions developed within the education field such as Veletsianos’ characteristics of evolving technologies discussed previously (Hayman & Smith, 2015). Studies using the definition offered by Veletsianos (2010) and Gachago and colleagues (2013) as the basis for their research have also included not only tools such as library management software but also social media, Google Apps and MOOCs within their examples of emerging technologies (Hayman & Smith, 2015, pp. 8, 10; Oladokun, 2015, p. 25).

Rather than seeking to define the term emerging technology, the LIS literature assumes a common understanding and focuses on the challenges and trends arising as a result of emerging technologies such as delivering content via new mobile technologies, or the increasing expectation of the use of technologies to provide a single point of access to a large range of third party information sources (Hayman & Smith, 2015). Li (2009, p. 9) defines emerging technologies and evolving technologies as experimental products, with a high technical risk, high financial cost, high potential impact and an unconfirmed outlook. Li gives the example of speech recognition software as an emerging technology. She compares speech recognition software to other data input devices such as the keyboard and the mouse. The software is not 100% perfect, is still relatively expensive, has not yet reached its full potential and it is still uncertain whether it will provide access for users with speech or vision impairments (Li, 2009, p. 13), yet it has the potential to make a huge difference for user experience. Li’s characteristics of emerging technologies align more with Rotolo and colleagues’ (2015) attributes as they do not consider the context within which the technology is emerging. An example is where libraries which have supported vision impaired clients and which have used speech recognition software for some time may no longer regard such
software as experimental or high risk but instead as a technology that needs continuous improvement to enhance its features.

Conversely Cervone (2013, p. 240), in his discussion about how emerging technologies are viewed within the LIS field, suggests that librarians tend to use the phrase emerging technologies colloquially to refer to “something we haven’t done before”. This usage, Cervone argues, is actually referring to innovation which he sees as a relative term, and different to a definition of an emerging technology (Cervone, 2013, p. 240). Cervone (2013, p. 239) contends that there is no official definition of emerging technologies within the LIS field but that within the institutions that libraries serve, the rule of thumb definition is couched within a percentage adoption rate (being less that 30 percent) and that emerging technologies still have a certain amount of risk and uncertainty associated with them. Cervone argues that while emerging technologies should be defined by their technological features, as by Rotolo and colleagues (2015) and Li (2009), practitioners were more likely to refer to these technologies in relative terms, or in context as suggested by more recent researchers such as Veletsianos (2010), Gachago and colleagues (2013) and Vaughan (2013b).

Thus we see in the literature that the focus of the term emerging technologies began with describing the technology itself. For example emerging technologies are seen to have particular characteristics such as being experimental, not fully developed, novel, or fast growing. In recent research and practice, people often refer to emerging technologies which do not have all these technological characteristics, but may simply be technologies which are new to them, or in their field, or their workplace, providing a chance to offer services differently or in more ways (Cervone, 2013; Gachago et al., 2013; Halaweh, 2013; Hayman & Smith, 2015; Oladokun, 2015; Veletsianos, 2010).

Rogers in his work on innovation diffusion includes both hardware and software in his definition of technology, hardware being the tool that embodies the technology, i.e. a physical object and software as the
Rogers’ work in defining and researching innovation has resulted in his theory of innovation diffusion and subsequent research into how and why different populations adopt technologies in different ways over different time periods (E. M. Rogers, 2003). While focusing on the adoption of innovations by a population, Rogers’ theory acknowledges that a population is made up of individuals all making decisions about whether to adopt or reject a particular innovation (Straub, 2009, p. 630). The process of adopting an innovation is one of a series of choices and actions over time beginning with first gaining awareness or knowledge about a particular innovation. This initial awareness can be a passive process where others bring the innovation to the attention of an individual, or active, with a person seeking out information about innovations (E. M. Rogers, 2003, p. 171; Straub, 2009, p. 630). At this stage an individual chooses whether a particular innovation is relevant to them, then moving to the persuasion stage, at which time a decision on the favourability of the innovation is made. The individual is developing an attitude towards a particular innovation, making personal decisions based on the knowledge learnt (E. M. Rogers, 2003, p. 175; Straub, 2009, p. 630). At the decision phase of adoption the individual makes the decision to adopt or reject the innovation based on their knowledge and attitude towards that innovation. Rejection can take the form of active rejection; a conscious decision not to adopt the innovation, or passive rejection where the individual really had no intention of adopting the technology but had been just following a process to this point (E. M. Rogers, 2003, p. 178). If adoption is chosen the implementation stage begins, whilst there is still some uncertainty, individuals work to overcome these. Also during this stage some redesigning of the innovation may occur to fit local or changing conditions (E. M. Rogers, 2003, p. 185). Finally there is a confirmation stage where a review of decisions made to date is undertaken and the final decision made on the continuance of using a particular innovation is made (E. M. Rogers, 2003, p. 189; Straub, 2009, p. 630).

From Rogers’ work, theories of technology acceptance and use have developed, attempting to identify what personal characteristics could predict
usage outcomes. Personal characteristics such as perceived usefulness, ease of use, peer or organisational support, personal interest, training events provided, social pressures and physical resource support have all been found to be useful in predicting an individual’s likelihood of adopting technology (Sahin 2006, p.20; Straub 2009, p.640). Research in this area has tended to focus on current attitudes to technology or evaluating the best ways of introducing technologies to a workplace. Little research has been done on the voluntary uptake of technologies (Straub, 2009, p. 640). This study researched the voluntary process of adopting technological innovations, or emerging technologies within the workplace.

2.9 Learning about emerging technologies in libraries

In response to the second generation development of the Internet, termed Web 2.0, involving greater user collaboration and social networking, a number of curriculum based learning programs have been developed specifically for libraries. Web 2.0 online technologies have moved the Internet from a series of static websites where users read and downloaded content, to websites that encourage user interaction, content sharing and collaboration (Rouse, 2015). To assist library staff with learning about these new Web 2.0 technologies a series of programs have been developed. These Web. 2.0 programs range in nature from those that have a set curriculum to courses such as the 23 things program (Blowers, 2008; Lindsay, 2016; Stephens, 2013), based on a more informal method of learning. The range of programs available will be discussed in terms of their contribution to supporting practitioners to undertake ongoing learning practice.

Beginning in 2008, the University of Western Australia Library offered a program to library staff called initially E-learning and later renamed Emergent Technologies in Education (Pegrum & Kiel, 2011, p. 583). This program aimed to give participants knowledge and skills in developing e-learning material, in particular focusing on the pedagogical approach to e-learning. This program was subsequently run in 2009 and 2010 and feedback from participants suggests that the course did result in individual knowledge and
skills development and an attitude shift and the beginning of some organisational learning. Pegrum and Kiel (2011, p. 595) report positive individual results but also recommend that ongoing support was needed for participants to continue their learning. The value of the program in developing knowledge and confidence about new and emerging technologies was reported when the same program was conducted at Victoria University in Melbourne in 2011, 2013 and 2015 (O’Neil & Pegrum, 2018, p. 6). Limitations of the course, as with any training activity, was the need for the right environment and the ongoing assistance to share their knowledge and be able to put the knowledge gained into practice (O’Neil & Pegrum, 2018, p. 4; Pegrum & Kiel, 2011, p. 595).

A series of less formal, but still organisation-led programs have also been developed. Programs such as 23 things (Blowers, 2006) and Learning 2.0 (Forsyth, Joseph, & Perry, 2009) have been designed to encourage library staff to undertake learning about emerging technologies. These programs have been described as informal learning programs because, whilst giving some direction as to the tasks that must be completed, it is up to the individual learner to decide how and when they will learn. These programs developed from a recognised demand that currently employed library staff needed to be aware of, and able to trial and evaluate, new and emerging technologies (Forsyth et al., 2009, p. 172). These programs are designed to direct learners through a range of tasks at their own pace in the nature of self-directed learning and to offer some social network and mentoring opportunities to promote learning (Stephens, 2013, p. 131; Stephens & Cheetham, 2012, p. 9).

Blowers, who developed the internationally successful 23 things program, said she developed the program out of frustration. In three months of providing traditional face-to-face training sessions on emerging technologies she had only managed to present her training session to 60 of the 540 staff within her organisation (Blowers & Reed, 2007, p. 12). She concluded that it was necessary to move away from instructor-led training sessions and develop a self-directed learning program that could be completed by
individuals in the workplace. Blowers stresses that the greatest outcome of the program is not the learning of the technology *per se* but that a person’s learning is self-directed. Setting up an environment that allows employees to reflect on what they were learning is important and staff are encouraged as part of the *23 things* program to articulate, through the use of blogs, the changes that are occurring in their own workplace due to emerging technologies. Blowers concludes by stating, “These Web 2.0 technologies are new to almost everyone and at the rate they keep emerging, it’s important to just encourage staff to play and explore” (Blowers, 2007).

Subsequent research into the individual benefits of the *23 things* program have found improved confidence and a willingness to continue to explore emerging technologies. For the workplace, benefits of better sharing among staff and overall communication in the workplace have also been noted (Stephens, 2013; Stephens & Cheetham, 2011). Some of the roadblocks or barriers to the program’s success as nominated by the respondents include lack of time; lack of access to the appropriate technology and the lack of organisational participation following the program that meant that the sharing and collaboration that had started during the program stopped at the completion of the program (Stephens & Cheetham, 2011, p. 55). An online survey of Australian library and information employees across a range of libraries, found that for employees working in academic libraries specifically, 25% (17 of 66 responses) did not complete the program with “no time” reported by eight of the ten who answered this question as to the reason why they didn’t complete (Stephens & Cheetham, 2011, p. 42). Providing time, reducing distractions and involving all staff in the program have all been identified as means of increasing the benefits of this program (Stephens, 2013, p. 135).

Stephens and Cheetham, in undertaking their research, refer to the *23 things* program as being self-directed learning. Once the program was completed the reported evidence of a lack of ongoing sharing and collaboration would suggest that the organizations where this program has been implemented may have failed to provide suitable practice architectures to sustain ongoing...
practice. These architectures could have included time provision, access to appropriate technology or explicit ongoing organisational support to promote and support the ongoing learning begun during the program.

In considering these types of programs, there is evidence of a less than ideal completion rate for some workplaces. For example, a 12 week Learning 2.0 program, based on the 23 things program was begun by 893 public library staff in NSW. There was a reported completion rate of 25% (226 staff). Sixty-one participants (27%) who completed the course said they would have liked more help, more detailed instructions or more support from within their workplaces (Forsyth et al., 2009, p. 182). The low participation rate (37% of possible participants began the program) and very low completion rate (only 25% of those that began the program actually completed it) point to these programs not being as successful as library management might have hoped.

Evaluation of the Learning 2.0 programs continues (Stephens, 2013; Stephens & Cheetham, 2012). Whilst remaining positive about the benefits of this type of program with increased awareness of the range of emerging technologies, completion of the program and ongoing learning remain around the 30% mark (Stephens & Cheetham, 2012, p. 14). For a program that the researching authors believe is of great benefit for promoting the learning about emerging technologies, the low completion rates must be a concern and may be due to the organization failing to provide suitable practice architectures such as time allocation and ongoing managerial support to facilitate the best possible outcome for individual staff and the organisation. Further research into the reasons why participants didn’t complete and whether this lessens the impact of the program may suggest whether sustainable ongoing learning and organisational change is still occurring.

Another approach to learning about technologies is based on the understanding that adults prefer to choose what and how they learn. The Brigham Young Library program aims to be different from the Learning 2.0 programs by encouraging participants to choose what they wanted to learn and to do so in a manner that would be habit forming (i.e. daily learning)
(Quinney et al., 2010, p. 206). As a guide, participants were given a range of tasks or challenges that they could undertake, whilst leaving scope for participants to explore other technologies that may be of interest. Rewards was given based on a range of challenges completed and more importantly for time spent on learning tasks. 54% of the 175 staff of Brigham Young Library engaged with the six-month program, with a completion rate of 55% for those that started the program (Quinney et al., 2010, p. 206). A more positive completion rate than the results reported for the 23 things program. The participants used an online tool to track time spent and tasks undertaken and the library provided a range of training sessions throughout the program.

These Web 2.0 programs encourage individuals to develop an understanding of why they are learning something, to take responsibility for their own self-directed learning and to be concerned with their own ongoing employability in an ever changing technological environment (Popp, 2013, p. 180). There appears to be mixed results with regarding the success of the programs both during and following their implementation. Low completion rates and lack of ongoing learning following the programs suggests that individuals undertaking these programs were involved at a practical level (that is completing of tasks) but were not developing the ability to reflect on their learning nor working in an environment that encouraged and supported ongoing learning.

Organisation-led informal programs, such as the Learning 2.0 programs address a moment-in-time learning need for library staff but do not appear to encourage sustainable, ongoing learning practice. Due to the recent introduction of these programs, (within the last ten years), there has thus far not been the opportunity to undertake follow-up or longer-term longitudinal studies. It is the researcher’s personal experience of managing a workplace in which the 23 things program had been promoted and supported which led her to wanting to study how ongoing learning about emerging technologies could be better facilitated for sustainable learning. The researcher’s experience mirrored that of the reported research; while some staff enjoyed and completed the program, others did not complete the variety of tasks despite management
support in the form of time allocation and encouragement. The researcher also observed that while a few staff members continued to explore and learn about emerging technologies, there were some, having completed the program who chose not to continue learning.

Research into self-directed programs encouraging ongoing learning of emerging technologies has focused primarily on the experiences of those participants who completed the program. The reasons given by participants for non-engagement or non-completion highlight a range of organisational factors such as lack of organisational support, time constraints within an already busy workload and difficulty with IT support (Stephens & Cheetham, 2011, p. 55). Factors that are likely to exist in any workplace into the future. Even those who have completed the 23 things program and were positive about learning about new technologies conceded that any lasting change was more of a personal change than institutional change (Stephens & Cheetham, 2011, p. 53). Whilst increased confidence and willingness to explore new technologies were seen as personal gains from the program, participants did not believe that their libraries was any more open to sharing and encouraging new initiatives in the form of emerging technologies (Stephens & Cheetham, 2011, p. 53).

In attempting to list exemplary practice for ensuring program success Stephens and Cheetham (2011, p. 56) highlight a range of possible measures that could be introduced into a workplace including:

- allowing staff time to work on the program,
- breaking down barriers with IT departments to allow suitable access to technology, committing to ongoing communication about learning after the completion of the program,
- recognising that personal benefits will come before organisational benefits, and
- using the program to promote the library and its services to other departments within the organisation.
The popularity of *Learning 2.0* programs in libraries around the world, and the various adaptations of the programs such as *23 mobile things* and *23 research things* suggests there is an identified need for some means of assisting library staff to continue learning about emerging technologies. Whilst the research into the outcome and effectiveness of these programs highlights issues of time allocation, organisational support, and access to appropriate technology as some of the enabling and constraining factors, there has been limited research that investigates how library staff are undertaking learning about technologies outside designated programs.

In light of the range of definitions used to describe emerging technologies within the literature, it is noted that in each of the programs described in this section, no definition of emerging technologies was offered. A distinguishing aspect of this study was the decision to allow participants to identify for themselves what they considered to be emerging technologies and to explore the language they used to define these technologies.

This study fills a gap both in identifying how the practice of learning about emerging technologies is currently being enacted within the academic library workplace and identifying the practice architectures that are enabling and constraining the practice. By asking participants to reflect whilst engaged in the actual learning experiences and through sharing these reflections, this study contributes to the research into how academic library staff undertake the practice of learning about emerging technologies.

### 2.10 Bringing together theory and practice

This chapter has discussed research and practice literature across a number of subjects highlighting the complex and changing perspectives on knowledge development, workplace learning, and practice theory as a framework for improved practice. Consideration of the theory of practice architectures as a framework for investigating workplace learning and a perceived gap in the practice literature of learning about emerging technologies leads to the research questions proposed by this study.
There is an imperative for library staff to continue learning about emerging technologies to ensure the continued relevance of the library within its host organisation and, from a purely personal standpoint, so that library staff have the knowledge and skills needed to enhance their career prospects (Cox et al., 2017, p. 2193; Haddow, 2012, p. 246; James et al., 2015, p. 252; Maceli & Burke, 2016, p. 52; Potnis et al., 2016, p. 195). How this ongoing learning can occur lies within the domain of workplace learning theory and research.

This review of the theory and research of workplace learning outlines the unfolding understanding of knowledge development from knowledge as a product that is transferred from one person to another, to a more social perspective of knowledge as something that is created through interaction with others (M. K. Smith, 2009). Workplace learning research has also evolved from an understanding that learning occurs within an individual, to learning being a social process, individuals coming together to share their own understanding and to confirm and validate their experiences (Hager & Hodkinson, 2009, p. 631). This shift to a social process view of workplace learning aligns with the theory of practice architectures in its understanding that the practice of workplace learning is undertaken by individuals that both impact and are impacted by the site arrangements. The environment, or workplace within which learning is occurring is no longer seen as a backdrop for learning but as a significant part of the practice, one that can be manipulated in order to improve practice.

In examining practice theories and in particular the theory of practice architectures the interdependence between the individual and their site of practice is highlighted, providing the framework with which to explore the practice of ongoing learning (Reich & Hager, 2014, p. 428). Through understanding the practice and practice architectures present within a site, support or change can occur with the goal of improved practice (Kemmis, 2009b, p. 27; Schatzki, 2012, p. 22).

Research into how librarians are undertaking workplace learning, and in particular informal and self-directed learning, has generally involved
reflecting upon, and recall of, events that have happened in the past (Auster & Chan, 2004; Corcoran & McGuinness, 2014; D. A. Smith & Oliva, 2010). Whilst a number of research studies have focused on the completion and impact of programs specifically designed as self-directed learning programs, there has been a focus on completion rates and perceived effects on individuals and organisations (Forsyth et al., 2009; O’Neil & Pegrum, 2018; Pegrum & Kiel, 2011; Stephens, 2013; Stephens & Cheetham, 2011). The researcher has been unable to find any studies examining how library staff are learning about emerging technologies from a practice perspective.

Investigating how the practice of learning about new or emerging technologies is currently being undertaken (doings), a number of studies that investigate the popular Learning 2.0 programs have been evaluated. Whilst these programs provide a means for staff to continue to undertake learning, their role in encouraging and supporting ongoing learning experiences has been found to be limited. Research into the success of these Learning 2.0 programs also identifies the variety of practice architectures that could impact on the practice of learning about emerging technologies, but does not explore them in any depth.

This review of the literature has identified the potential usefulness of the theory of practice architectures as a lens for studying the practice of current library staff continuing to learn about emerging technologies. The highlighted need for library staff to continue to update their skills in a number of areas, including the technologies area, indicates that understanding how librarians currently undertake the practice and what practice architectures are enabling and constraining that practice is significant. This study examines how the practice can be nurtured within academic libraries for the benefit of both individuals and organisations, through the exploration of the following questions:

1. How is the practice of workplace learning about emerging technologies currently enacted by library staff in academic libraries?
2. What enables and/or constrains library staff’s ongoing learning about emerging technologies within the academic library setting?
3. How might conditions enabling the practice be further supported and those constraining the practice be changed to enhance the practice?

Researching the answers to these questions and gaining a better understanding of how the practice is enacted, assists in identifying enabling and constraining conditions providing both individuals and organisations increased knowledge and skills to discuss and action ongoing learning about technologies. Budgetary and time constraints, along with competing priorities have been found to impact ongoing learning so it is necessary to identify ways in which ongoing practice and support can address these barriers. Changes in technologies are a constant influence on the ways in which libraries and their staff offer services and meet their clients’ information needs. Understanding ongoing workplace learning about technologies is imperative to ensure libraries remain relevant.

This study also adds to the body of knowledge about practice within the LIS field through the use of the theory of practice architectures as a framework for understanding workplace learning practice. Looking beyond just the workplace learning actions of the individual to include the language and relatings that make up practice, extends outcomes identified by the research undertaken to date which has focused primarily on the methods by which learning is occurring. Through considering practice as it shapes and is shaped by the site, this research will also extend knowledge about the context of learning to explore how this context is both enabling and constraining practice. The use of the theory of practice architectures as a framework for analysing and discussing the results of this research provides insight into the means by which this theory can inform ongoing research within the practice domain.

2.11 Conclusion

Technological change is having a significant impact on both the academic library environment and the knowledge and skills required by library staff to
serve their clients (Crowe & Jaguszewski, 2010; Kaur & Singh, 2011; Lukasiewicz, 2007). In order to ensure staff have the knowledge and skills to continue to provide quality service to clients, ongoing learning within the workplace is imperative.

Current research into how academic library staff undertake ongoing learning about emerging technologies has been based on the study of Learning 2.0 programs. Research into workplace learning practice in general within the LIS field has relied on surveys and interviews focusing on the experiences of individual staff. This study uses the real time recording of learning experiences to develop greater understanding of learning experiences about emerging technologies. The researcher working with practitioners employed in academic libraries investigates how the practice is currently being enacted, what practice architectures are shaping the current practice and probe what opportunities may arise to improve practice. An action research methodology has been chosen to aid this exploration. Why this methodology was chosen and implemented form the basis of Chapter Three.
Chapter 3

3 Methodology and Research Design

3.1 Introduction

The main aim of this study is to examine how the practice of workplace learning about emerging technologies is currently being enacted by library staff in academic libraries. As part of this examination, the study intends to identify enablers and constraints of this practice and possible means to further support or change these conditions with a view to improved skill development and employability of staff and a learning organisation equipped to meet future demands.

Developed and used by a small number of researchers within the education field, the theory of practice architectures provides a framework within which to consider individual action within the social site. From the individual’s perspective, identifying the sayings, doings and relatings of a practice helps provide a detailed understanding of the practice and an insight into how a practice may be improved. Using the example from the Literature Review of the practice of discarding items from the library collection, an individual in considering their own practice can identify the language used such as “I’m weeding the collection”, and the actions necessary, such as removing books from the shelves, scanning them, disposing of them. This language is relevant only in so far as it is being used as part of the practice and within the particular site. The term weeding would have a different meaning for those not undertaking the practice of discarding items from a library collection.

The arrangements identified through the lens of the theory of practice architectures acknowledge the site specific influences on a practice. In the case of discarding items from the library collection, this practice will be influenced by such arrangements as the equipment available to complete the tasks, the collection development policy and the language used by managers.
to direct the activity. All these arrangements will be specific to a particular site.

Identifying the elements of practice and the practice architectures present in any activity is a complex task. This chapter outlines how this study researched the practice of learning about emerging technologies in academic libraries, including the methodological choices made for the study which underpin the research method. The data collection and analysis process is outlined, as is the way in which the theory of practice architectures is used to present and discuss the data.

Previous research about workplace learning by librarians surveyed participants asking them to recall workplace learning experiences. These studies identified that they were not always successful in capturing all experiences of informal and self-directed learning (Auster & Chan, 2004; Varlejs, 1999). This study planned to capture learning close to the time it was happening rather than relying on participants’ recall of their learning experiences. In this way it was hoped to overcome some of the challenges to successful data capture found in the earlier studies.

To successfully undertake this form of data capture, it was necessary to use a methodology that involved participants actively engaging in identifying their practice as it was happening, and in recording their experiences close to the time of the learning experience. Requiring participants to record learning experiences in this way prompts participants to be more aware of their learning experiences and to develop reflective practice in identifying the value of the experience and the influences occurring at the time.

Through active participation in, and reflection on, the practice, this study endeavours to understand how library staff are engaging in learning about emerging technologies and identify the enabling and constraining practice architectures. Action research creates the opportunity for practitioners to understand and reflect upon their practices within the site specific conditions that shapes the practice (Kemmis, McTaggart, et al., 2014, p. 5). Using the
action research approach, the researcher worked with the participants through a series of action cycles which lead participants through a self-reflection process capturing and reflecting on their learning as part of their social group (Kemmis, McTaggart, et al., 2014, p. 18). The assumptions underlying the study and a critique of the action research method are now explored.

3.2 Methodological Choice

A research methodology is the framework that informs a particular research project and consists of the rationale for the choice of research paradigm, the methods used to collect and analyse data and the tools used to investigate a research question (Williamson, 2018c, p. 5). The research paradigm reflects the ontological and epistemological premises and informs the choices of methods used and the analysis and interpretation of the data collected with the purpose of making claims of new knowledge (Cecez-Kecmanovic & Kennan, 2018, p. 132).

Looking firstly to ontology, or the perceived nature of social reality. There are two opposing views of the nature of social reality, and many nuances within this dichotomy. The first is often referred to as an objectivist or realist ontology. Research conducted in this paradigm views reality as a concrete structure, external to the actors’ views of their social reality (L. Cohen, Manion, & Morrison, 2011, p. 5). As such, reality can be researched and reported as a series of facts. With this ontological view researchers are mere reporters and remain detached observers of the research subject (Tuli, 2011, p. 101). Research, using an objectivist ontological view, is often undertaken in the natural sciences area, where empirical evidence and hypothesis testing are used to determine facts and knowledge.

As an alternative to this concept of reality, a constructivist or nominalist ontology takes the view that people are able to make sense of reality from their own perspective and are able to influence and change that reality (Bryman, 2016, p. 29). No two individuals’ social realities will be exactly the same, as reality is experienced by individuals rather than existing prior to
being experienced. Social reality is experienced through a lens of interpretations and subjectiveness (Williamson, 2018c, p. 5). Social constructivism is one category of constructivist ontology.

Social constructivists consider a person’s social reality and an individual’s learning develops through interactions with others (Williamson, 2018c, p. 12). For social constructivists, the site acts as a backdrop against which understandings of reality are created and refined (Williamson, 2018c, p. 12). In contrast, practice theorists argue that social reality is made up of practices that are present within a specific site, and as such each site has its own distinct social ontological view (Feldman & Orlikowski, 2011, p. 1241). Schatzki, in writing about a new type of social ontology, called it ‘site ontology’, arguing that social reality is inherently connected to the context in which it occurs (Schatzki, 2003, p. 176). In choosing to use the theory of practice architectures as the lens of analysis, this study acknowledges the importance of practices in developing, reproducing and changing social reality and the relevance of the site in shaping those practices, that is, a site ontological view (Nicolini, 2012, p. 13).

While ontology describes the social reality, epistemology provides assumptions about the nature of knowledge, how it is acquired, and how it is communicated to others (L. Cohen et al., 2011, p. 6). The epistemological basis of any research provides the foundation for methods of data gathering and analysis as well as the interpretation and conclusions drawn from that data (Connaway, Radford, & Powell, 2016, p. 48).

A positivist framed epistemological approach aligns with an objectivist ontology and researchers using this approach argue that only those things that can be objectively observed can generate knowledge (Bryman, 2016, p. 24). Knowledge is based on direct observation, the gathering and testing of empirical facts and enables individuals to control events (Cecez-Kecmanovic & Kennan, 2018, p. 137; Tuli, 2011, p. 100). The positivist view of knowledge has been influential in research in the LIS field. Budd (1995, p. 300) in a review of the epistemological foundations of LIS research, argues that the
determination of researchers within the LIS field to be recognised as having the same rigorous attributes as research within the natural sciences had promoted the use of positivist research methods. Examples of positivist epistemological research involve examining what a librarian does within the library, the number of loans, the type of reference questions answered, and the number of staff development events attended. This type of research provides observable, quantifiable measures stemming from a positivist research view of knowledge (A. L. Dick, 1999, p. 308).

In contrast, researchers adopting a constructivist perspective contend that individuals influence their environments and generate knowledge through their interactions and experiences with each other and the social world (Tuli, 2011, p. 100). This epistemological view goes beyond generating knowledge from facts and observations to comprehending the world through the reported experiences and understandings of those individuals within it. Building from a social ontological view of social reality, social epistemology is about understanding how individuals’ acquisition of knowledge takes place within a social context (Fallis, 2006, p. 482).

By approaching this study from a social constructivist ontological and social epistemological viewpoint, it is assumed that the participants in the study have the ability to interact with, influence and change their social reality and that knowledge is developed within a social setting through negotiation (Fallis, 2006, p. 485). Knowledge is both specific to a particular site and is the result of individuals working together as they engage with others and objects in the site (Lloyd, 2010a, p. 246).

Using the theory of practice architectures as a lens for analysing practices emphasises the importance of the site in shaping the practices of individuals and of individuals shaping the site through their practices. Whilst each individual will have a different experience of learning within their workplace it is through reflection and discussion with others that they are able to fully develop knowledge that is relevant for the site. Thus data collection for this study needed to explore an individual’s practice, the collective understanding
of the practice within the site, and the participants’ views of the practice architectures enabling and constraining their practice. To do this it was necessary to choose a research method that involved participants in gathering data and in reflecting on their learning as it was occurring. This led to the decision to use an action research method for collecting data.

3.3 Action research

Action researchers, in differentiating their methodology from others, argue that action research alone provides the conditions for practitioners to, both individually and collectively, understand and transform their own practices (Kemmis, McTaggart, et al., 2014, p. 5). By its nature, action research is an inquiry into human activity within a particular context undertaken with a view to solving a problem (Checkland, 1981, p. 152). It provides a flexible, context specific methodology that employs a structure of plan, act, observe and reflect cycles (Stringer, 2007, p. 8). Action research enables practitioners and researchers to ask the question: How do I improve practice? This method of research also encourages self-reflection as well as sharing experiences and working with others to inform further learning (Kemmis, McTaggart, et al., 2014, p. 7; J. M. Peters, Taylor, & Doi, 2009, p. 27). Whilst the action research method can be used to research an individual’s own actions, its emphasis on groups of people using this method to understand and develop practices within a social site acknowledges that reality and knowledge development are social processes (Kemmis, McTaggart, et al., 2014, p. 19). As the action research process as used in this study is explained in this chapter, it can be seen that even though the participants came together to discuss their practice as a group, they remained individuals exploring their own practice, rather than the exploration of a group practice.

Kurt Lewin is customarily credited with developing the term *action research* and developing the action research cycle of planning, acting, observing and reflecting (Klein, 2012, p. 1). Working in the United States of America in the late 1930s, Lewin worked with disadvantaged groups of people in factories and neighbourhoods to demonstrate that gains in productivity and law and order were greater through increased democratic participation than through
autocratic coercion (Adelman, 1993, p. 7). Lewin developed his action research cycle through social studies. His research involved groups discussing problems, making decisions on how to proceed, carrying out those decisions and then monitoring and reviewing the progress that followed before using that information to make further decisions and develop further action plans (Adelman, 1993, p. 9). The active involvement of participants in directing the research is one of the key features of action research that distinguishes it from other methods of research. Lewin’s main intention for using action research was that it needed to include both action and research. Action to bring about a change within the context of the study and research to increase the understanding about the issue for both the researcher and the participants in the study (B. Dick, 1993, p. 6).

Over subsequent years, a number of researchers have added to Lewin’s original cycle of plan, act, observe and reflect and have developed a variety of action research approaches. Carr and Kemmis (1983) outline three such approaches to action research; technical, practical and emancipatory. Primarily the difference between these styles is the instigator of the research. In the technical style the research is developed by outsiders and is designed to inform further research; in the emancipatory style the participants take responsibility for developing the research to inform and improve their own practice (Carr & Kemmis, 1983, pp. 202–203). This study is using the practical action research style where an outside researcher works with participants to undertake a research project (Carr & Kemmis, 1983, p. 203).

No matter what action research approach is undertaken there are similar characteristics in all forms. The four basic characteristics for all action research are that the research is situational, collaborative, participatory and self-evaluative (Burns, 1997, p. 347). Action research is situational in that it needs to take place in a natural setting; this is not research that can be done in a laboratory type setting and the results and recommendations are based on and only directly relevant to the site of the research. The researcher has a collaborative relationship with the participants and because the researcher is involved in the process it is important that they identify, and where possible,
eliminate, their own biases when conducting and reporting the research (Craig, 2009, p. 7). Those people involved in the study have a much greater participatory role than in other types of research, and it is expected that they will assist with driving the research process. Finally, data collection within an action research study can take the form of both quantitative and qualitative data and is often rich in nature due to its descriptive quality. The results, conclusions and recommendations of the research should be self-evaluating, that is derived from the data only, and be used to inform participants’ practice in the future (Craig, 2009, p. 7).

3.3.1 The role of the researcher in action research

The role of the researcher differs in action research in comparison with other research methods such as case studies, surveys, ethnographic or bibliometric research (Charles & Neil, 2007, p. 7). The researcher, who is an observer in other research methods can, in action research, be one of the participants in the study, although this isn’t always the case. Having a commensurate relationship with the participants, the researcher both facilitates and often contributes their own expertise on the subject of the research (Berg, 2004, p. 202; Burns, 1997, p. 358). The researcher is the person who typically initiates the research, identifying the aims of the project and then becomes the facilitator who works with the participants to bring about the research (Stringer, 2007, p. 24; Swantz, Reason, & Bradbury, 2008, p. 42). The researcher remains in control of the research but does so with the participation and agreement of those involved (Schein, 2006, p. 270).

In the present study the researcher was not one of the participants and was not a colleague of any of the participants at the time of the research. Although the researcher was an outsider, she had worked in similar positions (reference librarian, liaison librarian) and a similar context (academic libraries) as the participants. The researcher, by sharing her academic library experience upon meeting participants, aimed to develop a feeling of compatibility with the participants, to address the issue of being seen as an equal member of the group. Through initial discussions of her career
experiences and the sharing of her knowledge on the topic being studied, the researcher was able to contribute to the group knowledge and establish her credentials to manage the research process effectively.

Joahnsen and Normann (2004, p. 226) identified a number of separate roles the researcher assumes when undertaking action research. These roles are described as facilitator, observer, supplier, participant, bridge-builder, and service provider. The researcher in this study undertook each of these roles throughout the research process. Table 3.1 outlines in detail how each of the researcher roles manifested in this study.

Table 3:1

Details of the roles undertaken by the researcher in action research

<table>
<thead>
<tr>
<th>Role of Researcher</th>
<th>Relevance to this study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facilitator</td>
<td>Brought together the participants and provided the opportunity and setting for research and learning to occur</td>
</tr>
<tr>
<td>Observer</td>
<td>Collected, analysed and reflected on the data so those involved and others could learn from the research</td>
</tr>
<tr>
<td>Supplier</td>
<td>Provided relevant contextual knowledge and knowledge of the process of research with the participants to allow the research to proceed</td>
</tr>
<tr>
<td>Participant</td>
<td>Became involved and in a small way invested in sharing and developing the learning experiences of the participants</td>
</tr>
<tr>
<td>Bridge builder</td>
<td>Shared knowledge from research literature relevant to the research with participants to increase their knowledge of practice theory and self-directed learning theory</td>
</tr>
<tr>
<td>Service provider</td>
<td>Contributed to the development, management and completion of the research</td>
</tr>
</tbody>
</table>

Note: Adapted from Johnsen and Normann (2004, p. 226).

In the role of facilitator, the researcher brought together the participants in a manner that would allow the research to occur. As a bridge-builder, the
researcher was able to share knowledge from the research literature about workplace learning research that other participants may not have had. In the role of service provider, the researcher was in a position to ensure that the research was managed and completed. It is important for the researcher to acknowledge and understand the variety of roles they play within the process.

Acknowledging the complex role of the researcher and the possibility that the researcher was also a workplace peer to the participants, there are a number of ethical issues to consider when undertaking action research. These issues include researcher bias, the working relationship between the researcher and participants and where the benefits of the research outcomes lie, that is with the researcher and/or the participants. These issues will be considered later in this chapter (section 3.7) along with other ethical considerations that arose from this research. The following section of this chapter will outline in detail the action research process as it follows a quite specific approach.

3.3.2 The action research process

Herr and Anderson (2005, p. 69) describe the process of undertaking an action research based dissertation as “designing the plane while flying it” and this quote captures both the opportunities and challenges of undertaking this type of research. The nature of action research provides the researcher the opportunity to respond to the observations and feedback of the participants during the process enabling participants the opportunity to validate findings or discuss further. Challenges include being able and confident to adjust the research plan during the action research process.

The action research process generally follows a number of steps and forms a cyclical process (Kemmis, McTaggart, et al., 2014, p. 18). There are a number of different methods for undertaking action research that vary in approach and in the number of steps in each cycle, depending on the research environment (Berg, 2004, p. 197). This study adopted the steps recommended by Lewin; plan, act, observe and reflect (Figure 3.1). An
explanation of each of Lewin’s steps in his action research cycle and how it was undertaken in this study follows.

3.3.2.1 Pre-stage (reflect)

Before the research begins a pre-stage is undertaken and through a review of the research literature and personal observations an issue or problem to be investigated is defined. To complete this stage in this study the researcher undertook a review the literature and then invited interested staff at each site to attend an information session as part of their introduction of the study. During this information session the researcher discussed the topic of learning about emerging technologies, why she felt it was important and the questions to be addressed by the study. At each site, following this introduction, staff were then invited to take part in the study. Not all those who attended the information sessions went on to participate in the study.

Figure 3:1 Action research process.
3.3.2.2 Plan

This part of the action research cycle involves clearly stating the problem or issue to be researched and outlining the basis on which the action is being planned and undertaken. The researcher must be clear about the theoretical foundations for the project and how to involve the participants. The researcher also needs to be able to explain the importance of the research, and specifically how they believe it will result in improved practice and new knowledge (Craig, 2009, p. 93). During the planning phase questions or general statements can be formulated that clarify the problem to be studied. These initial questions are often designed to establish the boundaries of the research and aim to pose a problem for investigation rather than aiming to prove or disprove a statement (Beck & Manuel, 2008, p. 206). These questions may also change over the time of the research due to the interactive nature of the action research process (Beck & Manuel, 2008, p. 206).

In the current study, the Plan part of the cycle involved the first focus group session, designated as the Initial Focus Group. This focus group session was held at each site, and the agenda for this and subsequent focus groups sessions is available in Appendix A. Details of how these focus groups were formed is discussed as part of the sample and recruitment section of this chapter (section 3.4).

During the Initial Focus Group the researcher reiterated the requirements for participation and requested that each participant read the information sheet provided and complete a consent form (Appendix B). The researcher then asked a series of questions about the participants’ practice of learning about emerging technologies. The researcher then questioned the group about what practice architectures they saw as enabling or constraining their practice. This was followed by discussion on how the learning practice might be recorded and a suggested participant journal template was provided. Discussion followed about whether the participants believed this participant journal template would be adequate or if changes might be necessary. These
changes were then made if agreed to by the group. An example of the participant journal template and a completed journal entry are available in Appendix C. Participants were then asked to choose a four week period within the following six to eight weeks to record their learning experiences. The option of which four week period was left to individuals to fit within their own work schedules.

3.3.2.3 Action

In this part of the action research cycle plans are put into action. Following the Initial Focus Group, participants were asked to record their experiences about their learning practice. This recording phase aimed to capture participants’ learning experiences as they were occurring, allowing initial reflection by participants.

3.3.2.4 Observe

This phase of the action research cycle involves the collection of a range of data; through observation, interviews, focus groups, participants’ journals, and document analysis. The range of data collection methods can include both qualitative and quantitative methods depending on the needs of the research (Burns, 1997, p. 350). In this study the researcher was able to gather a range of data through recording and transcribing focus group sessions and interviews over the two action research cycles and through the participants’ journals which were completed as part of the action phase of each cycle. The researcher also sought further data from workplace documents pertaining to staff development at each of the sites. Details of the data collected are discussed as part of section 3.5 of this chapter.

3.3.2.5 Reflect

This part of the action process cycle is about examining the data, attempting to determine the outcomes of the process and identifying what has been learnt that can then inform both the next action research cycle and participants’ practice. In this study, these reflections were shared through a second focus groups session, designated as the Mid Study Focus Group. This session was held following the first four week recording period, with participants sharing and discussing their experiences of recording their
learning events. Participants also noted what they had observed in terms of prompts for learning events, how successful they believed their learning experiences had been and what practice architectures were present during the experience that were enabling or constraining the practice. As part of the Mid Study Focus Group, the researcher presented information about self-directed learning theory and the theory of practice architectures and participants were invited to discuss how these theories might be relevant to their practice of learning about emerging technologies. Written information about these topics and references were provided to participants if they wished to learn more (Appendix D).

3.3.2.6 Second action research cycle

Observations and analysis from the previous cycle then form the basis for the next cycle of plan, act, observe and reflect. The decision was made to undertake two cycles as part of this study. This provided the researcher the opportunity to share research about workplace learning and the theory of practice architectures with participants as part of the Mid Study Focus Group. Undertaking two action research cycles also afforded participants the opportunity to build knowledge through shared conversations before undertaking further action.

This second cycle followed the same phases of plan, act, observe and reflect, with the reflection phase of the first cycle informing the planning for action of the second cycle. The action phase again consisted of recording in a participant journal learning experiences. This was followed by the final focus group of the study, designated as the Final Focus Group. As part of the Final Focus Group session, participants reflected on their learning practice and again discussed their experiences and understanding of the practice architectures that were enabling or constraining their practice. They also considered whether there was any evidence of them incorporating the self-directed theory knowledge shared in the Mid Study Focus Group into their learning practice. The ongoing commitment of participants to the practice of ongoing learning; and what changes within their workplace might support
their ongoing practice were also discussed as part of this focus group session. Participants were then thanked for their participation in the study.

In reality, action research isn’t always as clear and neat as outlined in Lewin’s cycles. Phases overlap, and the process is open and responsive to the feedback and needs of the participants (Kemmis, McTaggart, et al., 2014, p. 18). For the current study, although attempts were made to implement the cycles as described by Lewin it wasn’t always possible. In one case a participant moved from one of the participating libraries to another during cycle one and wanted to continue to be part of the study so this needed to be accommodated. It also wasn’t always possible to find appropriate times for all participants within a particular site to meet at the same time. This necessitated a few instances where individual interviews were undertaken in place of focus groups.

At two of the participating libraries, only one individual interview was required. At a third, four individual interviews were conducted, however no single participant required more than one interview, and so all participants were involved in focus groups on at least two occasions. Interviews do not provide the same opportunity for discussion and reflection generated through the social interaction of the focus groups (Acocella, 2012, p. 1129). Combining focus groups and interviews did however present the opportunity to explore slightly different views of the topic of interest, from exploring opinions and beliefs through focus groups, to deeper exploration of personal experiences through interviews (Lambert & Loiselle, 2008, p. 230). In this study as the interviews were conducted after the particular focus groups session, usually within a few days, they granted the researcher an opportunity to verify or discuss findings raised during the focus group. Interviewees were then able to either offer a supporting example from their own experience or elicited a disagreement regarding their experience of the practice. While the combining of interviews and focus groups as a data source can provide the opportunity for systematically identifying individual and contextual characteristics of a particular phenomenon, and convergence of the characteristics, the use of interviews in this study was not widespread.
or targeted enough to compare the data provided by each method (Lambert & Loiselle, 2008, p. 235). These examples go to show the fluid nature of the action research process completed over time and some of the variations that may need to be accommodated and considered.

The action research methodology has not been used extensively in the LIS field. The study of information literacy is however one area that has seen a few studies use this methodology. The University of Queensland Library successfully used the action research methodology to assess and improve the information skills program provided to first year engineering students (Hill, 2000, p. 140) and the same approach was taken with environmental science students at the University of Parma in Italy (Vezzosi, 2006, p. 293). The action research methodology was chosen for these studies as it aims for knowledge generation and change, looking beyond simply studying and understanding current situations (Vezzosi, 2006, p. 290). The use of an action research methodology within a practice framework, in particular the theory of practice architectures, has been more prevalent in research within the education field (Casey, 2012; Green, Hibbins, Houghton, & Ruutz, 2013; Kemmis, 2008, 2009a; Wilkinson, Olin, Lund, Ahlberg, & Nyvaller, 2010). Action research methodology fits well with the theory of practice architectures framework as it aims to make changes in practitioner’s practice through the understanding of these practices and the environment in which they occur (Kemmis, 2009a, p. 463).

This study, through the use of action research to study ongoing learning practices, contributes to discussion of the use of this methodology within the LIS field. Having outlined the action research process used for this study the next part of this chapter will detail how the participants were recruited and selected.

3.4 Research sample and recruitment process

University libraries have been identified as being significantly impacted by ongoing technological change and as such the researcher chose to focus on this sector of the library community (Bonn, 2014; Crowe & Jaguszewski,
2010; Delaney & Bates, 2015; Dillon, 2008; James et al., 2015; Lynch & Smith, 2001). Although librarians in all sectors of the LIS field are being impacted by ongoing technological change, librarians within the university sector are often at the forefront of responding to technological change and as such the researcher chose to focus on this sector in particular (Kumbhar, 2014, p. 477).

3.4.1 Selection of the university libraries

Initially, University Librarians were approached by email at three Australian metropolitan academic libraries, outlining the aims of the study and a request for permission to approach staff to be part of the study. In considering possible universities, thought was given to obtaining a sample large enough for suitable focus groups encompassing library staff from a range of areas within the library. It is acknowledged that many of university libraries in Australia would have been suitable sites for the research, the libraries initially approached were selected for their staff size. Libraries with more staff are more likely to have enough staff who would be interested in volunteering to be participants to meet the need for good size focus groups. The other major consideration was proximity to, and access for, the researcher given that the research approached necessitated ongoing contact between participants and the researcher over a period of six months. The University Librarians from each of the sites gave in-principle agreement for the researcher to approach staff within their organisations. A fourth University Librarian was approached when a lack of numbers from interested staff meant that one of the first three universities approached was unsuitable.

For ethical reasons, including anonymity of the participants, the names of the universities cannot be used. Rather than referring to each of the sites by numbers e.g. One, Two etc, for ease of readability the researcher has assigned each university a name according to the following schema: colonial Australian explorers. No meaning should be attached to the names used as they were randomly assigned by the researcher. The four sites approached were designated as Lindsay, Kennard, Davidson and Forrest Universities. All
four libraries offer support for teaching, learning and research to students, staff and other stakeholders within their Universities.

3.4.2 Sampling of participants

There are two types of sampling methods used by researchers; probability and non-probability sampling. This study undertook purposive sampling, a type of non-probability sampling, as it did not involve the random selection of participants from a given population (Williamson, 2018b, p. 362). The sample was purposively chosen from library staff working in the selected academic libraries. Participants were invited to participate on a voluntary basis and it was anticipated that participants who had an interest in the area of learning about emerging technologies would be more likely to self-select, bringing the positives of their knowledge and strong interest to the study. The success of action research, and the resulting outcomes credibility and validity, in part relies on participants having an interest and willingness to explore the topic under investigation. Voluntary selection was preferred over compulsory participation or asking managers to select appropriate participants (White, Suchowierska, & Campbell, 2004, p. S4). Sample sizes for qualitative research such as this study are often by their nature small due to the extensive data generated through focus groups and interviews and the time commitment required of their participants (Williamson, 2018b, p. 371).

Focus group sessions were chosen as one of the data generation methods so it was important to recruit a suitable number of participants at each site to make such sessions work to best advantage. The researcher planned to have at least eight participants from three sites. Focus groups typically number between six to ten people however can vary from these numbers (Beck & Manuel, 2008, p. 87). As one of the strengths of focus groups and action research is the exchange of thoughts and ideas between participants to generate ideas and reflection it is better not to have too small a sample size (Efron & Ravid, 2013, p. 106). Further discussion about the strengths and limitations of focus groups will be covered shortly (section 3.5.1).
Ethical approval to undertake the research was obtained from Charles Sturt University before approaching library staff at the first three universities; Lindsay, Kennard and Davidson. At each of these three universities, the University Librarian forwarded an email from the researcher to staff outlining the study and asking for interested staff to make contact with the researcher. At Davidson Library, only one member of staff expressed an interest in being part of the study. As only one participant from a particular site would not provide the opportunity for discussions through focus groups as part of the data gathering phase of the study, the decision was made to approach a fourth university, Forrest University as a substitute site for Davidson Library. The researcher approached the University Librarian of Forrest University and again gained permission to approach staff requesting interested participants.

Table 3.2 outlines the recruitment process undertaken at each of the four libraries. At Lindsay Library, following the initial email, four participants expressed an interest in being part of the study. An information session was arranged, attended by these four participants and a fifth interested person who then agreed to be part of the study.

A participant, who had been working at Forrest University and attended the information session and the Initial Focus Group session there, transferred to Lindsay University library and asked to continue the study at her new library. In all, six participants undertook the majority of the data collection stage of the study at Lindsay Library.

At Kennard University, only two participants expressed an interest in being involved with the study following the initial email. In consultation with the Staff Development Manager at this university library, the researcher presented a lunchtime seminar about her research topic and the study for any interested staff. This was an opportunity to discuss the research topic and ask questions with those that attended. Approximately 35 staff attended this session, and following the conclusion of the seminar, a further six more participants offered to participate in the study. In total eight participants were involved from Kennard University.
Table 3:2

Recruitment methods and final participant numbers for each site

<table>
<thead>
<tr>
<th>Recruitment method</th>
<th>Lindsay</th>
<th>Kennard</th>
<th>Davidson</th>
<th>Forrest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial email invitation to participant sent from the University librarian on behalf of the researcher</td>
<td>Initial email invitation to participant sent from the University librarian on behalf of the researcher</td>
<td>Initial email invitation to participant sent from the University librarian on behalf of the researcher</td>
<td>Initial email invitation to participant sent from the University librarian on behalf of the researcher</td>
<td></td>
</tr>
<tr>
<td>Result of initial email</td>
<td>Four participants expressed an interest in being involved</td>
<td>Two participants expressed an interest in being involved</td>
<td>One participant expressed interest in being involved</td>
<td>Four participants expressed an interest in being involved</td>
</tr>
<tr>
<td>Extra recruitment</td>
<td>An extra participant joined following the information session. The last participant, having moved jobs, completed the information session and Initial Focus group at Forrest Library before continuing at Lindsay Library</td>
<td>An information session was held for interested staff to explain the research, discuss the literature and the research aims. From this six more participants agree to be involved</td>
<td>No further recruitment undertaken</td>
<td>One participant moved to Lindsay Library following the Initial Focus Group. After the data collection process had begun, the researcher was approached by another staff member wanting to participate. The decision was made to start a new group, so another email was sent inviting staff to participate and a second group of three was begun.</td>
</tr>
<tr>
<td>Final numbers involved at each site</td>
<td>Six participants</td>
<td>Eight participants</td>
<td>Did not participate in the study</td>
<td>Six participants</td>
</tr>
</tbody>
</table>

Different response times and having to set up appropriate times to undertake information sessions at each of the library meant that the success of a general lunchtime session as undertaken at Kennard University could not be
repeated at other sites. The information session at Kennard University was run after focus group sessions had started at the other two sites.

At Forrest University, the initial email resulted in four interested participants, one of whom subsequently obtained a position at Lindsay University, continuing the study there. The data collection process at Forrest was begun with just three participants. Following the start of the action research process with these three participants, the researcher was approached by another interested staff member. Following discussion with her supervisor, the researcher arranged for a further email to be sent to all library staff to see if there was any further interest. The approach from the interested staff member and follow up email resulted in another group of three participants being convened and the action research process was followed with this group. In all, six participants, working in two groups, were involved from Forrest University.

### 3.4.3 Participants

To ensure anonymity the researcher assigned pseudonyms to each participant. These pseudonyms were drawn from the fifty most popular baby names for 2015. The gender assignment of pseudonyms was congruent with participants’ gender.

Participants were employed in a variety of library roles at the time of the data collection. As can be seen from Table 3.3, the majority of participants at each site were employed in a reference or liaison role; that is working on the library’s reference desk, undertaking liaison duties with various academic departments, taking information literacy classes, and performing collection development activities.

At Forrest Library, two participants (Naomi and Tanya) were front desk staff undertaking circulation duties such as loaning and returning items, reshelving items and basic library and IT assistance. Naomi, while primarily a front desk staff member, also had some rostered shifts working on the reference desk. Angela worked within the information management department of the library.
receiving and processing new items such as periodicals and completing some basic cataloguing duties. At Lindsay Library Jacinta worked as a cataloguer in the information management department and Alice, was a manager, but did not manage any library staff directly. At Kennard Library, Vanessa undertook a front desk role involving circulation duties. Each of the participants involved in this study took part voluntarily, sharing their thoughts and engaging in discussion as part of the focus groups sessions.

Table 3:3

Participants and their library role at the time of the data collection

<table>
<thead>
<tr>
<th>Site, participant pseudonym and role at time of the research</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Site</strong></td>
</tr>
<tr>
<td>Linda Liaison</td>
</tr>
<tr>
<td>Phillip Liaison</td>
</tr>
<tr>
<td>Jacinta Information management</td>
</tr>
<tr>
<td>Alice Manager</td>
</tr>
<tr>
<td>Beth Liaison</td>
</tr>
<tr>
<td>Zoe Reference</td>
</tr>
<tr>
<td>Simona Reference</td>
</tr>
<tr>
<td>Jacob Reference</td>
</tr>
</tbody>
</table>

*Beth withdrew from the study following the Mid Study Focus Group Session
* Zoe changed jobs from Forrest Library to Lindsay Library following the Initial Focus Group. She completed the rest of the data collection activities at Lindsay Library

At the information session held at each site, the research process was discussed in detail with the requirements for participation outlined. The researcher also shared what she believed each participant might gain from being part of the study. Participants were given the opportunity to ask questions, and withdraw from the research at any time. This open discussion provided the opportunity for the researcher to build a rapport with the
participants and to acknowledge that although the ownership and benefits of the study belonged to the researcher, there were still perceived benefits for the participants. The researcher also explained that she acknowledged the participants as the experts in understanding their own practice and that not only were they sharing their experiences, as a group they were providing valuable information about the site in which the practice was being actioned (Acocella, 2012, p. 1129). Only one participant withdrew during the data collection phase, (citing time commitments as the reason) and the researcher felt that all other participants engaged fully, sharing experiences and completing journals as asked.

3.5 Data collection

Data is generated at a number of points in the action research cycle; during the planning phase, the action phase and the reflection phase. In this study, focus group sessions provided participants with the opportunity to discuss their own experiences of and thoughts about their ongoing learning about emerging technologies and also to hear and comment on others’ experiences. Focus groups were also conducted during the reflection phase of each cycle to share and confirm experiences as well as for participants to be exposed to new knowledge and discuss changes that may be actioned as part of a second cycle to incorporate this new knowledge in their practice. During the action phase of each cycle participants completed journals recording their learning experiences. These were discussed as part of the reflection phase and provided a rich source of individual data for the researcher. The final source of data was the collection of any written policies or other documents pertaining specifically to staff development within each of the libraries. These organisational documents were collected to supplement information about the site in which the practice was taking place.

Action research takes place over time, and for this study, approximately six months elapsed between the Initial Focus Group session, through two cycles of plan, action and reflection to a Final Focus Group session held at each site. Whilst the aim was for participants to attend each of the three focus groups session, this was not always possible due to work commitments,
annual leave and illness. The researcher therefore conducted interviews if a participant was unable to attend a particular focus group session following the same agenda. Focus groups and interviews each have their advantages which will be discussed in section 3.5.1. A complete outline of the data collection schedule can be found in Appendix E.

3.5.1 Focus groups and Interviews

The researcher chose to convene focus groups as one of the primary data collection methods as collective sharing, planning and reflection by participants is the cornerstone of the action research methodology as well as the social epistemology underlying this study. Research into focus groups as a data collection method has found that they provide a faster data collection method than interviews, provide a collective view on a topic from a group, increase responses as participants respond to others’ ideas, and are a way of collecting social data within a social environment (Gill, Stewart, Treasure, & Chadwick, 2008, p. 293; Onwuegbuzie, Leech, & Collins, 2010, p. 711). By encouraging participants to interact, focus groups generate both data on individual views about a topic as well as information on consensus and disagreements between individuals (Onwuegbuzie et al., 2010, p. 713). There are disadvantages to the focus group method such as the possibility of “group think” when listening to others’ views might prevent some participants from disagreeing or where participants may agree just to be seen to be supporting others’ ideas (Lederman, 1990, p. 119).

The researcher, being aware of both the advantages of gaining agreement from others as to a particular event or idea and the disadvantage of group think, employed techniques designed to address these issues. During the focus group discussions, when there were nods, or agreement from others on an idea expressed, the researcher chose to either speak directly to the person agreeing to ask them to express further their agreement, or rephrased the question to confirm agreement. The researcher also chose to specifically ask each person within the focus group their opinion on a topic if they hadn’t contributed to the general discussion. The researcher was also aware that by choosing to call upon individuals for their opinions, she was
not only offering participants the opportunity to share their thoughts, but also possibly raising fears for participants about being judged negatively for their responses (Acocella, 2012, p. 1133). Singling out individuals to share their thoughts didn’t always result in new responses and it is possible that the focus group setting influenced participants to express only statements that agree with others (Acocella, 2012, p. 1135).

It was evident across the time spent with each of the participant groups there was one participant at Kennard Library who appeared to agree with much of the conversation, rarely offering her own opinion unless to concur what had already been said. However, having observed this participant’s tendency to agree with others, there were one or two moments, in particular with regard to the influence of management support on her experiences, that she felt able to clearly share her thoughts in disagreement of others. In each of the focus groups, whilst there were a mix of participants in terms of role and place in their organisational structure, there was no situation of a direct manager/staff member relationship. At Lindsay Library, there was one manager present, however as her role was not a line management role, it is believed that her presence did not have an effect on the conversation or thoughts shared within that focus group.

Building trust within a focus group between the facilitator and the participants is very important. The facilitator undertakes to develop relations both between herself and the group and also between the group members (Acocella, 2012, p. 1129). The facilitator in this study considered it crucial for her to begin the topic for discussion and then leave the participants to discuss and interact around the topic (Acocella, 2012, p. 1129). Yet, it was also important for the researcher to develop a relationship with the participants that allowed them the space and trust to share experiences. The researcher will always approach a focus group with some assumptions about their own position relative to the group (Bourke, 2014, p. 3). In this study, as part of the Information Sessions, the researcher shared her interest in the topic of ongoing learning including her experience as a manager in a university library. In sharing that experience, it was hoped that the researcher
would be seen as having knowledge and understanding of academic libraries. Issues may have arisen if participants, having heard the researcher’s experience, were unsure or unwilling to disagree with her. In acknowledging this possibility, the researcher aimed to acknowledge equally all experiences and reflections shared by the participants, without judgement. The researcher also did not share any expectations about the outcomes she may have expected to see given her knowledge and experience. The researcher hoped that doing this would allow participants to feel comfortable sharing all experiences and thoughts without feeling they were disagreeing with the researcher, or not providing the perceived required answers.

Focus groups were conducted in a semi structured way. A particular set of questions were used to begin a conversation between participants and the researcher was able to probe further and to gauge group agreement of an opinion expressed (Onwuegbuzie et al., 2010, p. 712). The researcher was also able to further encourage discussion by reflecting back ideas and opinions raised at the previous focus group sessions as well as findings from focus groups at other sites, which served to again increase discussion (Gill et al., 2008, p. 293). Focus group discussions were audio recorded and later transcribed by a commercial company and then checked for final accuracy by the researcher.

Discussions during the focus groups sessions were generally free flowing, with nearly all participants sharing their ideas and experiences. At Forrest Library, each of the participants had worked together for some time. This seemed to promote, rather than hinder discussion. Each participant appeared to have a clear understanding of the role of the others in the focus group. At Lindsay Library, participants didn’t work together as closely as those at Forrest Library, as it was a larger library, with more staff, and a greater number of departments within the library organisation. The Kennard Library focus group brought together a number of people who not only hadn’t worked together but in some cases were not known to each other. In the researcher’s opinion this lack of familiarity within the group at Kennard
Library did not appear to prevent participants sharing their experiences or ideas freely.

3.5.2 Participant journals

The aim of participant journals was to document the learning experience close to the time it occurred rather than relying on a participant’s memory to recall information after the event. Participants were given a template of questions to complete for each learning experience and offered the opportunity to make changes to the template as part of the focus group discussions prior to the first recording period.

As part of the action research process, participants were given the opportunity to discuss what they considered was the best method for recording their learning experiences. The researcher provided a simple first draft of the participant journal initially to Lindsay Library participants, as the first site to convene an Initial Focus Group session. The first draft of the participant journal was quite basic and not very prescriptive asking only four broad questions:

1. What did you learn and how did you learn it?
2. What type of activity was it?
3. How long did you spend?
4. Was it an effective learning experience?

During the Initial Focus Group session at Lindsay Library participants decided it would be useful to add two further questions:

5. Why did you decide to learn this particular technology?
6. What helped or hindered the learning?

Based on this feedback and following discussions with the researcher’s supervisors the second iteration of the template asked more specific questions, focusing the attention of the participant specifically to comment on motivation, the materials used, feelings about the experience, to identify enabling or constraining factors, and to reflect on the overall learning experience. Participants were given the option to complete the journal
electronically or in hard copy. This more detailed participant journal was then used at all sites and during all recording periods. A copy of the participant journal is presented in Appendix C. Discussions about how to complete the journal were conducted during the Initial Focus Group and each participant was also given a supporting document to assist with completing the journal, developed by the researcher at the request of participants which gave brief examples of the types of answers and comments that may be included.

The participant journals aimed to provide data collected in real time, to serve as a reflection tool for participants, and provide a memory aid for further discussion within the focus groups. The journals provided specific examples of the technologies participants considered to be emerging technologies. They also provided evidence of the range, types and frequency with which participants encountered emerging technologies and how they were choosing to undertake these learning experiences.

Participant journals, by their nature require a commitment and motivation on the part of the participant to complete them. Yet, as was the case in this study, they may also provide the only way in which to capture the data that is sought (Pickard, 2012, p. 241). As the intention was to gain information about learning experiences as close as possible in time to the learning event, participant journals were considered to be a suitable data collection method. In including participants in the design and questions included for each learning experience it was intended that this would assist with motivating and helping participants to complete them (Pickard, 2012, p. 236). The level of detail provided in the journals differed between participants with some including considered reflections on their learning experiences, while others recorded just basic information about what and why they were learning.

The participant journals provided a means to identify specifically the human and non-human objects within the participants’ sites that were enabling or constraining their everyday practice in a way that complimented the focus group discussions. The journals also provided a prompt for individuals to use when discussing their practice during the focus group sessions.
3.5.3 Organisational Documents

The decision to collect organisational documents relevant to staff development at each site was made to provide evidence of the official context within which the practice of learning was occurring and to corroborate, expand or challenge other sources of data (Bowen, 2009, p. 29). Documents collected as data can be examined in two ways, firstly for their content alone or consideration can also be taken of their use and function within an organisation (Delamont, 2012, p. 428). Documents can provide a way of triangulating data to corroborate findings from other data sources and increase the credibility of findings (Bowen, 2009, p. 28).

Documents sought for this study included any official library documents pertaining to ongoing staff development within the organisation. These documents were collected from each site. A summary of the documents collected is presented in Table 3.4. From the Table it can be seen the range of titles used and years of coverage for each of the documents.

Table 3:4

<table>
<thead>
<tr>
<th>Site</th>
<th>Documents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lindsay Library</td>
<td>Staff Development Plan 2013 – 2015</td>
</tr>
<tr>
<td>Forrest Library</td>
<td>Training Plan</td>
</tr>
</tbody>
</table>

From Lindsay Library, a copy of the Staff Development Plan 2013 – 2015 was obtained. This plan outlined the priorities, resource allocation, targets and administrative procedures to be undertaken to access staff development. This plan was available to all staff and the wider university network.

From Kennard Library, two documents were collected: Library Plan 2014 – 2015 and the Training and Development plan 2014 – 2015. The first of these
documents outlined the vision for the library, the related university documents, and the external environment of the library. It also identified capability gaps and a set of activities to address these gaps. The development of a Training plan was one of those activities identified. The Training Plan document outlined specific areas of training required in the following areas: learning and teaching, research and publishing, web training, building organisational capabilities, compliance, OH&S, customer service, IT, and leadership.

From Forrest Library, a copy of the Training Plan for the previous year was obtained. This plan provided a list of goals including providing opportunities for development, compliance training, IT skills, conferences and workshops to be attended, and professional skills development opportunities.

These documents were gathered to provide a means of gauging the commitment of the organisation to ongoing staff development and priorities with regard to the learning of technologies, in particular emerging technologies. These documents are part of the social-political arrangement of the participants’ sites and so are an important resource in providing context for participants’ experiences or highlighting differences between the organisation’s policies and the perceived reality.

3.6 Data analysis

The analysis of research data aims to organise and explain the range of data gathered in order to improve understanding and outcomes of the research (L. Cohen et al., 2011, p. 537). Data analysis must ensure the integrity of the data is not lost while reducing the amount of data to a manageable level (L. Cohen et al., 2011, p. 559). Qualitative research methods as applied in this study resulted in the gathering of non-numeric and often extensive data which required managing and understanding (Bazeley & Jackson, 2014, p. 3). The data collected for this study was examined through the lens of the theory of practice architectures which afforded the researcher a framework by which to analyse and discuss the raw data. By presenting the data schematically, as will be discussed in section 3.7.2, the complex interplay
between the practitioners’ practice and the site of the practice can be highlighted. The table of analysis used also focuses attention on the purpose of the practice, the landscape and traditions, and the relations between all aspects of the practice and the site as practice unfolds through time (Kemmis, Wilkinson, et al., 2014, p. 227).

The data analysis software (NVivo) was used to assist with the management and analysis of the data. Such software programs allow the management of a range of different data files, in this case, focus group transcripts, participant journals and organisational documents. It also supports the researcher to electronically organise and quickly access conceptual knowledge generated through analysis of the data (Bazeley & Jackson, 2014, p. 3). This knowledge generation and organisation through annotating and bringing together similar concepts can be done through the use of codes (Bazeley & Jackson, 2014, p. 8). Coding provide a means of structuring the data and is undertaken by reading and rereading the data looking for patterns, consistencies and inconsistencies and relationships between the codes (L. Cohen et al., 2011, p. 560). Using coding software such as NVivo facilitates analysis across the different datasets (Bringer, Johnston, & Brackenridge, 2006, p. 252). The software program enables the researcher to look at similarities and differences across all participants’ responses and also group the participants so a single worksite result can be examined in a more succinct manner than attempting this same process using hard copy transcripts (Bringer et al., 2006, p. 254).

3.6.1 Data preparation and analysis:

Whilst analysis of the data was informed by the theory of practice architectures and the research questions, it was important not to discount or ignore any comments or entries that may not at first appear relevant. The first reading of each item, whether focus group or interview transcript, participant journal or university document, involved identifying the major concepts and topics that the speaker or writer was discussing. Codes were allocated and named in a way that was meaningful to the researcher and a coding book was developed to provide the name and description of the
codes to assist the researcher to use codes consistently (Bazeley & Jackson, 2014, p. 78).

Initial codes included such topics as “example of emerging technology”, “definition of emerging technology” and identification of specific concepts that were classified as impacting their learning experiences such as “influence of time” or “impact of manager”. This type of coding aimed to identify the intent of what was being talked about at the time rather than the use of specific words or language. The researcher was interpreting what was being said and then coding it accordingly in an effort to identify the practice and practice architectures present. Table 3.5 gives examples of the how the initial coding was used.

Table 3:5

*Examples of the use of initial codes to analyse the data*

<table>
<thead>
<tr>
<th>Transcript</th>
<th>Coding</th>
</tr>
</thead>
<tbody>
<tr>
<td>From Focus group: ‘it’s very difficult to define. I think it probably depends on your perspective and in some ways your plan, your point of seeing whether you need to use the technology or not’ (Jacinta, Lindsay)</td>
<td>Definition of emerging technology</td>
</tr>
<tr>
<td>From Journal: (my manager) initially showed me through the steps to access my google calendar. Sitting beside me and stepping me through it. (Zoe, Lindsay)</td>
<td>Impact of manager</td>
</tr>
<tr>
<td>From Focus group: ‘I get very overwhelmed by how many things I’ve got on my list to learn in my own time. I get overwhelmed by it. There’s just not enough hours in the day or in the week and it’s a bit tiring and then I just think ‘well that’s a lot I’ll just watch TV now’. (Angela, Forrest)</td>
<td>Feelings about emerging technology</td>
</tr>
<tr>
<td>From Journal: ‘Having a knowledgeable colleague to go to for helped.’ (Jacinta, Lindsay)</td>
<td>Support for learning</td>
</tr>
</tbody>
</table>
It can be seen that coding can identify a section of text, a single sentence, or part of a sentence. The codes were designed to group together quotes, journal entries and document text about the same concept. Codes were initially broad in nature e.g. “impact of manager” capturing entries mentioning or relating to interactions with the participant’s manager. This then provided the option of further coding subsets within this set such as “manager support” and “lack of manager support” during further analysis.

The second reading of each item was specifically related to ensuring identification of how the practice of learning about emerging technologies was occurring. This resulted in identifying coding such as “how learning is done”, “how much to learn”, “how often is learning done” and “language used to talk about emerging technologies”. Some examples of these codes are given in Table 3.6.

This reading also focused on identifying the types of arrangements that were enabling and constraining the learning practice. In both the focus groups and the participant journals, participants were asked specifically what aspects of their environment and personal experience did they think were impacting on their learning experiences at the time of its occurrence. In the focus groups this involved participants considering what they felt impacted on their learning, whereas the journals provided quite specific examples of what enabled or constrained the experience. Impacts and subsequent coding included aspects such as lack of time, competing priorities and what the researcher identified as a separation of work and learning.

Many sentences and passages within the text were coded with more than one code, for example the following quote from Zoe when she was at Forrest Library, was coded as “example of emerging technologies’, ‘prompts for learning’ and ‘competing priorities’:

In my studies I've just taught myself a bit of Camtasia. So there's something about - like it's a long time since we did 23 things and I was just thinking to myself the other day I might do that 23 mobile things
after the fact because there's probably a whole lot of skills that I haven't picked up on because I was busy last year. [Zoe, Forrest]

Each of the codes was then reviewed individually to see if coding had been used consistently and whether subsets were needed to better refine and understand the topic (Bazeley & Jackson, 2014, p. 118). Broad codes of ‘supports for learning' and ‘barriers to learning' were also used to capture an overall view of those impacts identified by participants as supporting or providing barriers to learning. This was also a chance to see the various topics within the data begin to emerge.

Table 3:6

**Further examples of the use of codes to analyse the data**

<table>
<thead>
<tr>
<th>Transcript</th>
<th>Coding</th>
</tr>
</thead>
<tbody>
<tr>
<td>From Documents: ‘23 Research Things’ (Document, Kennard)</td>
<td>How learning was done</td>
</tr>
<tr>
<td>From Focus group: ‘I reckon I do about three hours a week of personal development, of which might average half an hour being related to technology’ (Julia, Lindsay)</td>
<td>How often is learning done</td>
</tr>
<tr>
<td>From Journal: ‘the fact that I came back to a mountain of work and email and preparation for classes’. (Linda, Lindsay)</td>
<td>Competing priorities</td>
</tr>
<tr>
<td>From Focus group: ‘It must come as a secondary activity to completing required tasks but it is also very important in enabling productivity and quality of output as an employee. Consequently, I complete all necessary work and then undertake additional projects during quiet times. Some development activities are necessary for core activities so these take precedence if they directly affect core activities.’ (Vanessa, Kennard)</td>
<td>Work/Learning Disconnect</td>
</tr>
</tbody>
</table>
Coding does not complete the data analysis, providing instead the means to draw together data from a range of items on the same topic. Through being able to review the focus group quotes, journal entries and extracts from documents about a single topic, the researcher was able to begin to generate a picture of the experiences on that topic. From here, addressing the research question can begin.

3.6.2 Practice table

Kemmis and colleagues developed a “Table of invention for analysing practices” (Table 3.7) as a means of both presenting and exploring how the theory of practice architectures could be used to understand and discuss practices (Kemmis, Wilkinson, et al., 2014, p. 224). As well as identification of the practice elements and the arrangements shaping the practice, the table also features identification of the purpose of the practice (project) and the interactions between the practitioners and the environment (practice landscape). The knowledge, skills and values being developed and exhibited by the practitioners (dispositions) are described and the practice traditions and history within the site are recorded. This table for analysing practices reflects the theory of practice architectures as shown in Figure 2.5 in the Literature Review Chapter (p. 42) and provides the means to present and aid discussion of the findings of this study.

The concept of a table of invention, arising from the notion of arranging topics in order to develop arguments, has been used in a variety of research settings. These include tracking changes over time in an action research project, organizing researcher’s thoughts, and as means of structuring and presenting findings when studying practices (Buch & Andersen, 2015, p. 30; Howden, 1998, p. 46; Kemmis, McTaggart, et al., 2014, p. 58; Mahon & Galloway, 2017; Schroyen, 2001).
Table 3:7

Table for analysing practices

<table>
<thead>
<tr>
<th><strong>Elements of practices</strong></th>
<th><strong>Practice architectures in the site</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Project</td>
<td>Practice landscape</td>
</tr>
<tr>
<td>(the purpose of the practice)</td>
<td>(how people and objects are enmeshed in the interactions of the practice)</td>
</tr>
<tr>
<td>Sayings</td>
<td>Cultural-discursive arrangements</td>
</tr>
<tr>
<td>Doings</td>
<td>Material-economic arrangements</td>
</tr>
<tr>
<td>Relating</td>
<td>Social-Political arrangements</td>
</tr>
<tr>
<td>Dispositions</td>
<td>Practice traditions</td>
</tr>
<tr>
<td>(The knowledge, skills and values that makes it possible to enact the practice within the site)</td>
<td>(The history and traditions that have reproduced or transformed the practice)</td>
</tr>
</tbody>
</table>

Note. This table is adapted from ‘Table of invention’ for analysing practice (Kemmis, Wilkinson, et al., 2014, p. 226)

Practices are a complex concept to both describe and analyse. The use of the table of analysis presented provides a means of both viewing and analysing the connections and interdependencies between the practice and the practice architectures and between various elements of the practice and the site (Kemmis, Wilkinson, et al., 2014, p. 277). The theory of practice architectures provides a means for both understanding the practice that is being undertaken as well as a means of discussing how the conditions in which the practice is occurring are both enabling and constraining the practice (Mahon et al., 2017, p. 2). Yet beyond identification of the elements of practice and the practice architectures holding these practices within the
site, the theory of practice architectures also assists in illustrating ways in which practices might be improved or changed for the better for both individuals and the site within which they are being enacted (Mahon et al., 2017, p. 2). By highlighting those aspects of the social site that are either creating or contributing to unsustainable or unreasonable practices, the theory of practice architectures provides the framework to consider changes for the better (Mahon et al., 2017, p. 20).

Previous sections have outlined in detail the methodological process, the sample selection, and the methods of data collection and analysis being used in this study. It is also necessary to consider a range of ethical considerations impacting on this research as well as the means by which trustworthiness of the research has been achieved.

3.7 Ethical Considerations

This section of the chapter will outline some of the important ethical considerations that were acknowledged and addressed as part of this study, including participant consent, anonymity, and confidentiality. The role of the researcher within the action research methodology and the secure handling of data during and after the study is also considered. Research with human participants often involves seeking personal and at times sensitive information as well as the presence of a relationship of trust and respect that is built up between the researcher and the individual participants (Gorman & Clayton, 2005, p. 43). For this reason, and as a university requirement for all research, ethical issues need to be considered throughout and following the research process. This study was carried out with ethics approval from Human Research Ethics Committee at Charles Sturt University.

3.7.1 Participant Consent

Participation in this study was voluntary and written informed consent was obtained from all participants prior to the collection of any data. During the Information Session the aims of the research and the commitment required was explained to participants verbally. The researcher also outlined how the data collected would be used, the level of anonymity that could be expected
and confidentiality requirements. Participants were then given the opportunity to ask questions and the option to continue as part of the study. Following verbal agreements to be part of the study, participants were asked to read and sign a consent form indicating they understood the information explained by the researcher. A copy of the consent form is available in Appendix B.

3.7.2 Anonymity

The anonymity of research participants when subsequently reporting findings is one means of putting participants at ease to enable sharing of both positive and negative aspects of their workplace and experiences. There was no concern expressed by any of the participants about responses collected throughout the study being shared with their organisation. Even so, the researcher was clear that any comments or outcomes shared or published would not identify the source of those comments directly. The focus group sessions did not produce many negative comments about the participants’ organisations. In one case at Lindsay Library, having identified an action that a participant felt her library’s management team should act on as part of focus group discussions, she took it upon herself to raise the issue directly with her manager. As mentioned earlier in this chapter, (section 3.4.3), participants were all identified by a pseudonym. Each participant’s role was included as part of their identification as sometimes the role, or department within the organisation had an impact on their experiences.

Anonymity of the sites is more difficult as some of the findings related to the size or organisational structure of a particular site. Although the three sites were all metropolitan academic libraries, they differed in size and staff numbers. When discussing implications for library management as part of the discussion section of this paper it is necessary to consider the size of the organisation and its subsequent ability to provide certain opportunities for staff.

3.7.3 Confidentiality

The importance of the confidentiality of focus group discussions was explained as part of the Information Session with participants. Although the
researcher was able to guarantee that the participants' journals would not be seen by anyone besides herself, confidentiality of discussions within focus groups was not as easy to assure. Participants were reminded that comments shared during the focus groups were not to be discussed outside the group or shared with other colleagues. The participants seemed accepting of both this requirement and the lack of a guarantee of confidentiality.

3.7.4 Researcher involvement

Although the aim is for the researcher to work in partnership with the participants in an action research study, this is not always the case. At times when the researcher is also one of the participants, or from within the organisation, issues can arise. Issues such as the role the researcher may have within the organisation e.g. as a line manager or in senior management of the organisation, could produce a power dynamic that needs to be considered when conducting and discussing the research process and results (Zeni, 2009, p. 257). In the case of this study, the researcher was someone from outside each site and only participated within discussions to initiate topics, clarify understanding of comments and provide expert knowledge in the area of the methodology and research literature on the subject. Participants were aware that the study was supported by the management of their library, and in particular their University Librarian. Although the researcher did not have power within the organisation as an employee, there may have been concern that the researcher had the power to share personal comments and experiences with senior management.

While it was intended that the participants saw the role of the researcher as a peer it is acknowledged that as the participants were assisting with the researcher's doctoral study rather than a particular project developed for themselves, the researcher had a greater investment in the outcome of this study than the individual participants. The participatory nature of action research is designed to engage participants in the process and the outcome of the research for their own benefits. To this end as part of the initial explanation and discussion with each group of participants the researcher
shared what she believed to be the benefits for the participants, beyond just providing data for her study. Benefits such as increased awareness of their own practice, the sharing of experiences with others to improve collective practice, the sharing of research literature by the researcher, and being able to consider how the experience of being part of the study may impact their own and collective practice were all discussed. It was envisaged that these personal and collective benefits would be seen by participants as worthwhile in order to elicit their engagement with the study.

Whilst aiming to minimize the possible impact of the power role the researcher may have it is also important for the researcher to be aware of their own biases both with regard to the participants themselves as well as their expectation for the research outcome. As the researcher in this case directed the research more than the participants, and began the focus group conversations with a particular project in mind, it is important that the researcher remains conscious of their own biases (McNiff & Whitehead, 2010, p. 75). In this study the researcher was cognizant to acknowledge all contributions to the discussion and to seek input from all participants, being mindful not to discount or overly emphasise one particular opinion over others. Participants were specifically asked to share their own experiences even if they differed from others within the group. The researcher was also conscious of not leading the conversation in order to gain validation of her own desired outcomes. For example, having shared research literature on self-directed learning and its possible use to direct and evaluate learning experiences, the researcher was conscious not to enforce the use of the theory to influence subsequent learning experiences of the participants. The researcher was also careful to share all preliminary findings back with the participants throughout the process, not just those findings that supported the researcher’s focus.

Involvement in the action research project did have an impact on the behaviour of the participants. The process of recording and reflecting on the experience raised the awareness of the participants of their learning experiences in a way that probably would not have occurred if the
experience was not part of this study. Some participants did raise concern that during the journal recording phases of the research, they may not undertake or experience any learning episodes. It was important for the research that this be acknowledged and for participants not to feel they had somehow failed if this was the case. The possibility of no learning experiences being undertaken was discussed within the focus groups before the journal recording phases and participants were assured that the aim of the study was not to create learning experiences but to record the personal experiences as they occurred during every day work.

3.7.5 Security of data

Focus group recordings, transcripts and identifiable participants' journals all formed part of the data generated by this study. It remains the responsibility of the researcher to store this data securely. All electronic data has been stored in a form requiring password access on secure servers. Hard copy documents of the focus group transcripts and the participants' journals, following conversion to electronic format will be shredded five years after final publication of this thesis. It is an important part of the research process to ensure responsible research data management as recommended by the Australian Code for Responsible Conduct of Research (National Health and Medical Research Council, 2018).

3.8 Trustworthiness of research

Qualitative researchers aim to apply rigour to their research methods to ensure the trustworthiness of their results. Whilst quality in quantitative research requires validity, reliability, objectivity, and generalisability, qualitative researchers aim for trustworthiness as a means of ensuring quality (Chowdhury, 2015, p. 143). Guba (1981, p. 83), in proposing four criteria for assessing trustworthiness, intended to address criticism from quantitative researchers about the validity and reliability of qualitative research (Shenton, 2004, p. 63). The four criteria for trustworthiness are credibility, transferability, dependability and confirmability (Guba, 1981, p. 83) The following paragraphs will discuss in detail these various criteria, addressing how they were actioned in this study.
3.8.1 Credibility

Credibility ensures that the multiple realities of the participants is reflected in the findings and analysis of the data (Williamson, 2018c, p. 15). The credibility of this study can be demonstrated through the use of an appropriate and recognised research methodology and methods and developing an atmosphere of honest and open sharing between participants and with the researcher (Chowdhury, 2015, p. 150).

Triangulation works to support the credibility of the data by confirming any findings from a number of sources (Burns, 1997, p. 360). For example, if a participant reported that they had experienced a particular incident in a focus group, and that was also able to be confirmed through a participant’s journal and through the observation of the researcher, then this would increase the credibility of the experience having taken place. The use of focus groups, participant journals and organisational documents is one way of gaining credibility in this study. The use of three different workplaces also provides a means of triangulation across sites, noting commonalities and differences between them (Shenton, 2004, p. 66).

3.8.2 Transferability

Transferability in action research is a validity test different to that of other research methods where generalisation across contexts or groups is an outcome of the research (Stringer, 2007, p. 59). In interpretive research, qualitative studies, and some kinds of action research, with outcomes being site and participant specific, transferability is about providing a detailed description of the context and the process of the research. This detail then allows readers to make judgments about whether their particular situation is similar enough to the research context to make the results applicable to them (Chowdhury, 2015, p. 150). It is not for the researcher to argue transferability but for the reader of the outcomes to determine the extent of transferability to their particular site. In this case, the researcher has provided details of the boundaries of the study including details of who participated, the data collection methods used, and when and how the data was collected and
analysed as a means of allowing the reader to compare their own specific circumstance and site to the research case.

3.8.3 Dependability

Dependability is based on the need for a detailed description of the process so others can judge whether the process undertaken for the research is trustworthy (Mertler, 2012, p. 131). It is not possible, as happens within positivist research, to replicate the research in order to test the validity of results (Shenton, 2004, p. 71). The changing nature of action research means that the exact situation cannot be replicated. In this study a detailed description of the planning and conduct of this study has been given in this chapter to support the dependability of the research.

3.8.4 Confirmability

Finally, the confirmability of the study is the ability for others to substantiate that the procedures described and the data collection did actually take place through evidence of an audit trail (Stringer, 2007, p. 59). Details of the focus groups and interviews conducted including which participants attended has been provided in Appendix E to provide an audit trail of this study. Confirmability can also be shown through the recognition of the limitations of both the methods used and the possible impact on the results. The detailed review of the research methods used and their limitations covered in this chapter assists with providing confirmability of this study (Chowdhury, 2015, p. 150)

3.9 Limitations of the data collection phase

Having discussed the steps undertaken in pursuit of quality research it is also necessary to identify the limitations of the research. One clear limitation of this study was the small sample sizes at each of the sites, with only Kennard Library yielding an ideal number of participants for a robust focus group discussion. Lindsay and Forrest Libraries yielded below expected numbers, which also limited the range of library roles represented by the participants.

As has been noted, the participants all self-selected to be part of the research, so it is possible that this group of participants had a greater interest
in ongoing learning about emerging technologies than their colleagues. Other factors such as perceived time available, willingness to engage in a research process or lack of interest in the topic may all have impacted on individuals’ willingness to participate. The reasons for participating were briefly discussed with participants as part of the Information Session and focused on individual interest in the subject being researched. There was also some interest by participants in improving their own practice. As well as being self-selecting, the majority of participants (15 of the 20) were working in a liaison or reference position. This did not provide a cross-section of the range of positions within an academic library and so may have provided a narrow view of the range of emerging technologies these participants were encountering as part of their roles.

3.10 Summary of the methodology

This chapter has outlined the methodological choice, the sample for the study, and the data collection and analysis method that were chosen to investigate the research questions. The choice of the action research method aimed specifically to allow participants the opportunity to capture and reflect on the practice of learning about emerging technologies while it was happening over a period of time.

The action research methodology involved a series of cycles of planning, action, observation, and reflection including participation in focus groups and the chance for participants to record and reflect on their practice over two, four week periods, of recording learning experiences. This method of recording and reflecting at the time of the learning event is unusual among the research literature on workplace learning and provides an opportunity to gather experiences in real time with the intention to provide more reliable reflections than retrospective recording of events. Whilst small in number, the participants had ample opportunity to consider, discuss and share their experiences, the knowledge they had gained and the insights they gathered into their practice of learning about emerging technologies.
The use of the theory of practice architectures, and the table of invention as a means of presenting and analysing the data, helps ensure that not only the elements of practice or the practice architectures are considered, but that the complexity of the site, within which the practice is being enacted, is captured and given prominence in analysis of the data. The visual representation, as seen in the practice table being used, prompts the acknowledgement of the interactivity between practice and practice architectures within the site. The Findings chapter (Chapter Four) and Analysis chapter (Chapter Five) will explore the experiences of the participants who took part in the research. This is followed by the Discussion chapter (Chapter Six) exploring this study’s findings with respect to the research and practice literature.
Chapter 4

4 Findings

4.1 Introduction

Chapter Three detailed the methodology and research design that was chosen to explore the current practice of librarians learning about emerging technologies within an academic library site. This chapter reports the key findings of the research by presenting the experiences of the participants as they discussed and undertook the practice of learning about technologies. As discussed in section 3.6.2, a Practice Table will be used to present and aid discussion of the findings of this study. This chapter is therefore structured to mirror the practice table, presenting first the purpose of the practice, then the elements of the practice (the sayings, doings and relatings of the practice). Following this the findings pertaining to the site, and then the cultural-discursive, material-economic and social-political arrangements will be reported.

4.2 Why learn about emerging technologies?

During the Initial Focus group participants were asked whether they believed it was important to continue learning about emerging technologies and if so why. As expected from this self-selected group of participants, the answer was that it was definitely important to be continually learning about new and emerging technologies. Reasons as to why included, to be seen as professional, to ensure they were able to do their job, and to continue to deliver relevant and effective library services.

Participants identified that an important reason for continuing to learn about emerging technologies was so that the library, the profession, and individual staff were seen to be up to date with the latest technologies. Professional standing in terms of expert knowledge and the importance of the library being viewed as relevant within its host organisation were cited, for example:

there is immense pressure on libraries to justify their existence right now and so keeping up with information and being able to
demonstrate value to the academic community and to the student community is really, really key. I think it's a really critical thing for all librarians. So it's very concerning when we talk about people who say I don't have time or if they don't really seem motivated to learn. I think this is actually hurting everybody. The attitude more than anything [Sean, Kennard].

Without a commitment from everyone within the library to continue to learn about emerging technologies, this respondent felt that the entire library was at risk of being seen to be irrelevant. This idea was also expressed in the need to keep learning to meet the challenges brought on by changes in both the use of technology to deliver library services and the use of technology in the daily lives of the library’s clients.

Ongoing changes in technology are a pivotal driver of changes in the way library services are delivered to those that use academic libraries. For this reason participants believed it was important library staff not only understood how to use the variety of technologies through which library services were being delivered, but also to be able to assist users in accessing these services. At each site, participants agreed that having at least a basic knowledge of technologies was required in order to help students during a rostered shift on a library service desk. The following comments illustrate this point:

I felt that I did not have strong enough knowledge to assist patrons to the best of my ability so I followed up by learning more to ensure that I would not be caught out in the future’ [Vanessa, Kennard].

‘we’re working with technologies all the time and now changing and new technologies are coming along and we have to know about them and you have to apply them a lot of the time in your work … you’re going to assist students and staff and colleagues. So I think it’s part of everybody’s work whether you’re new or you’ve been in a job for 20 years, now I think that there’s constant learning and development that you need to consider and be mindful of [Jacinta, Lindsay].

Jacinta, as quoted above, reported both the need for ongoing learning to be a part of everyone’s professional role as library staff as well as being able to assist students and staff with their use of new technologies.
The growth of mobile devices as the preferred method for accessing services is having a considerable impact on the way libraries deliver their services and the skills library staff need to support students to access such services as seen in this quote from Sara:

The interaction with the students, you need to understand where the students are at. I think it's that generational shift and the mobile generation. You have to really understand what they're into, even if you don't agree with it or whatever. It's really important. It's sort of an unwritten part of the job but you've got to be savvy in this profession [Sara, Forrest].

The externally driven purpose of ensuring staff keep up with technology to provide good quality service to clients was also matched with more personal reasons such as one's own skill development and to improve the way routine work was done. Technologies provide the opportunity to work smarter or more effectively both as an individual and within the social work group, for example:

I think there's got to be pull factors in any new skill in a technology and the pull factors can be to do with making your job easier or somehow making your working life socially easier or better. How many of either your social group at work or social groups outside of work who also use this technology in some way. That's got to be a pull factor in a way. So A. either make your job easier or B. social benefit [Angela, Forrest].

The ongoing process of learning as a means of ensuring individuals remain professionally skilled was also an influential reason for the ongoing learning about technologies. Having the skills to apply for jobs in the future, or for general career development were strong motivators for ongoing learning:

So we need to know more about what is available so that we can explore more in the library area because we really need to update our skill in that area, otherwise I'm not sure how many jobs will be left for us' [Naomi, Forrest].

So it's a very personal sort of question in a way and you know, sometimes that age thing you kind of go, oh I need to learn because of all these people coming up behind me now and if I want to move forward in career kind of terms, how on top of this stuff do I need to be? Because these people are coming up behind and they're just taking it on board as – you know, that's the assumption, it's not
necessarily a reality, it’s the assumption is that they’ve already got half of that stuff on board already [Zoe, Forrest].

The imperative to take personal responsibility for ongoing learning in order to continue to be skilled in the profession was emphasised by participants from one site that has just undertaken a restructure within the library. During interviews for positions within the new structure staff were specifically asked what steps they were taking to keep up to date with technologies in their own profession and beyond. Comments from participants at this site in particular reflected the significance that staff placed on continuing to learn about technologies:

but there's not as many jobs or anything anymore, so you feel pressured, I've got to keep up to date and you hear what other people are talking about and you want to find out what it is.' [Olivia, Kennard].

‘potentially your job is always on the line, so if you can’t justify your position here and one of the ways to do it is say “I am up with the current stuff”, and you know, the people you might be competing for a job with or against might not be, and that’s a huge advantage for you personally [Sean, Kennard].

Being professional and job capable, as well as ensuring job security were strong incentives for ongoing learning as was wanting to keep one’s job interesting and varied, as seen in the following quotes:

Learning that stretches you a bit for your brain isn’t it? It’s like gym for your brain. And it makes the job more interesting.’ [Sara, Forrest]

‘But on the whole I think we want to remain interested, so if we’re going to keep ourselves interested we are going to want to keep learning. Because I know I have those sort of static days where you just can’t get out of your own way, but then the best way of getting out of that static day is to learn something new’ [Tamara, Forrest].

‘Because it’s interesting and it’s fun, and even if you crash and burn, you still – you know, you learn something and you take it to the next job or endeavour [Olivia, Kennard].

Identification of the purpose of the practice provides an insight into why individuals are undertaking the practice. The next section reports on how participants defined emerging technologies and described the practice of learning about these technologies.
4.3 The sayings of the practice

Practices are actioned and shared through language. To explore the sayings of the practice of learning about emerging technologies, participants were asked to define emerging technologies and described how they went about learning about these technologies.

4.3.1 What is an emerging technology?

A major finding of this study was that the participants used of the terms emerging technologies, new technologies and technologies interchangeably and as umbrella terms for hardware, applications software and social media. For this reason, unless specifically addressing the use of the term emerging technologies, the practice being discussed from this point will be that of the ongoing learning about technologies more generally. The basis for this decision will be discussed further as the findings are presented, analysed and discussed.

Succinctly defining what is meant by the term emerging technology initially proved difficult for the participants. Participants described their understanding of the term in a relational manner, and in the majority of cases, this relationship was with their own knowledge of technologies. Emerging technologies were considered to be those that were new to the individuals on a personal level. Participants reported that what one person considered an emerging technology was not necessarily the same for another person who may already have considerable knowledge of the same technology. This understanding showed a very individual-centric view in defining emerging technologies and can be seen in the following responses to the question ‘what do you understand by the term emerging technology?’:

emerging for me but maybe the rest of the world they would know about it quite well [Jacinta, Lindsay].

emerging technology … (are)… all the things that I haven’t heard of yet that my family is going to very shortly start using [Brooke, Forrest].

to me it was emerging because I didn't know about it [Sean, Kennard].
The other definition shared by participants was to describe emerging technologies in relation to their novelty within their own library site. For example an emerging technology was one that had not been used within the participant’s workplace before:

not stuff that's been around for years being used, it’s new and it’s on the horizon, and stuff we could look at and consider utilising, things we aren’t using currently [Richard, Kennard].

This view characterised emerging technology as emerging in *our space* as opposed to *out there*.

### 4.3.1.1 Emerging technology definitions beyond the library setting

Some participants discussed looking beyond the library to external sources to guide their understanding of what was an emerging technology. Blogs and magazines provided Phillip [Lindsay] and Sean [Kennard] with some ideas as to what technologies were emerging beyond the library environment. Alice [Lindsay] specifically referred to the *NMC Horizon Report: 2017 Higher Education Edition* (2017) and *NMC Horizon Report: 2017 Library Edition* (2017) as her guide to what were the emerging technologies in education in general and particularly within the library environment.

I also am influenced by the Horizon list which you may or may not have seen because it specifically says these are the emerging technologies, and so it's probably using emerging in the sense of this is going to be big soon [Alice, Lindsay]

### 4.3.1.2 Emerging technologies in relation to work or role

Another way that emerging technologies were described was in relation to the effect that they could or would have on an individual’s work or role. Emerging technologies were described as those technologies that were new tools to increase work efficiency or the scope of the work a library could offer or a librarian was able to perform. For example an emerging technology would be technology new to the participant enabling them to work “smarter or quicker” [Naomi, Forrest], or it may be any new tool that increased the range of services a library or individual staff member was able to provide.

The definitions described so far have focused on linking emerging technologies with the individual librarian, or the library space. On further
consideration though, some participants also focused more on the technology itself in terms of the lifetime of the technology or how widespread the use of the technology was. For example:

you can look at the terms new or emerging and say, okay it’s recent, maybe you know, last year or two or emerging in that people are just starting to use it in this way [Philip, Lindsay].

cutting edge stuff that no one had heard of before and not many people were using [Sean, Kennard].

Sean [Kennard] described emerging technologies as being on a spectrum based on the number of people with knowledge of them and the uptake of individuals using it. Sean was not able to quantify when the use of a technology was considered widespread enough to no longer be classified as an emerging technology.

4.3.1.3 Hardware as an emerging technology
In describing examples of emerging technologies participants separated technologies into hardware products such as the “game changing” mobile devices e.g. the iPhone or iPad [Melanie, Kennard] and the larger technology space of software applications for use on the hardware products. 3D printers, drones and Google glasses were all identified by participants as emerging technologies that had in some cases the potential to have a significant impact on the services provided by the library. Despite describing these examples of technological hardware as emerging technologies, participants acknowledged that for others within the university this hardware was no longer considered emerging. Zoe [Forrest] described her engagement with design academics, referring to the academics as being “streets ahead” of her in their knowledge and use of 3D printers. She felt more knowledgeable and able to assist these same academics with using social media to connect and share their research with others in their field.

Participants reported little interaction with new hardware technologies during the course of this study. Interactive pens and video conferencing hardware were both described as new hardware by participants. The focus group at Lindsay Library was held in a room where new video conferencing equipment had just been installed, so during the discussion, Jacinta pointed
to the hardware with the comment “we probably have to learn how to use this”. While hardware such as the Google glasses and Virtual Reality headsets had been seen at conferences attended by some of the participants, there was no mention of these being introduced in any of the three libraries. Olivia [Kennard] having seen Virtual Reality headsets being demonstrated at the ALIA Information Online conference, discovered that a department of her university had a pair and organised for herself and a colleague to “try them out”. Yet on sharing this discovery with her manager and showing an interest in the possibilities of this technology for use within her library, her manager told her that she had wasted her time learning about this technology. Olivia expressed disappointment both from the perspective of a possible technology opportunity being dismissed by her manager but also what she saw as a clear lack of direction and support for any exploration of new technologies by staff. Her final comment on this experience was:

So I think it’s that thing, you want to play, but as well we’ve got a lot of other responsibilities, you have to reign it in a bit [Olivia, Kennard].

4.3.1.4 Applications software as an emerging technology

It was found through analysis of the participant journal entries in particular, that participants were describing learning about features of application software programs new to them or building on knowledge of software programs that were already being used or for which new versions or applications were being introduced. Applications software recorded in the participant journals spanned a range of types from social media (Facebook, Twitter, Linkedin, Yammer), learning software (Captivate, Jing, Camtasia, Prezzie), reference management software (Mendeley, Zotero, Papers), online conferencing software and Adobe Connect, advanced Google and Microsoft Excel features, library management system software (ALMA), authority file software (Orcid), digital repository and digitalising software (Equella), software for ebook readers and software for citation impact and apps (iDoneThis, Trello).
The lack of a clear definition of emerging technologies, and the range of different technologies considered within this definition was an interesting finding and will be discussed further in Chapter Five (section 5.4.1).

4.3.2 Describing the practice of ongoing learning about technologies

Language provides a means for people to communicate using a common body of words. Participants used a variety of words to define emerging technologies and to describe the experience of learning about technologies.

4.3.2.1 Describing the learning experience

Learning was just one word participants used to described how they went about learning about technologies, others included words often associated with the curiosity of learning such as exploring, trialling, experimenting and trying. Interestingly participants also used the word playing when describing the learning experience, a word not usually associated with adult learning.

Experimenting, learning, following up on, and attempting to repair/resolve problems, professional development [Vanessa, Kennard].

Yeah learning, definitely use the word learning [Tanya, Forrest].

the learning process, trial and error [Jacob, Kennard]

Two participants also described the learning experiences as having an outcome. For example:

I’d say trialling, because then to put it in a context of how it can be applied so that the manager knows that you’re not just there to play around with new technology just for the hell of it, but because you can see some ways that it can be applied to your job. Or if not specifically to yours, then it might help a colleague or so and so [Jacinta, Lindsay].

Whether anything comes out of it there’s certainly the support to explore and experiment with a lot of technologies and seeing how they could be applied [Jacinta, Lindsay]

The use of the term play to describe the learning experience produced a mixed response and highlighted the different ways staff interpret the use of this term. The term play was used to describe how participants actioned the practice of learning about technologies. For example:
My first preference is to play and then ask someone who knows better if I'm desperate [Alice, Lindsay].

you might have an initial poke and a play with something because you think, "Oh, well, maybe that will help me with X." [Melanie, Kennard]

And then I’ll go and spend half an hour, an hour, reading about it or looking up YouTube clips just so I can learn it. And then an hour or two probably playing in a lot of stuff I do with Google Graphic Data [Sara, Forrest].

This was in contrast with other comments that showed concern with the use of the word play to describe something that either occurred at work or was used for describing learning experiences. The 23 things program which was explicitly designed to encourage library staff to play with technology was cited specifically by participants when discussing the word play.

I wouldn’t use the word playing. If I wanted to be allowed time to do something I wouldn’t use the word playing [Brooke, Forrest].

I never minded the ‘23 things’ when we did it and I thought that that gave a lot of staff who didn’t otherwise have the opportunity to learn, the permission to play around [Tamara, Forrest].

I kind of think you identified a lot of the problems with the 23 things and why it didn’t work is because it appealed to people who are already out there and already playing with technology, and it didn’t appeal to people who sit back and wait, and without that pressure, this is your job you must do it, the whole play aspect doesn’t appeal to the people who aren’t out there [Sean, Kennard].

A variety of words were an important means of quantifying the level of knowledge a person has in terms of the participants’ current knowledge of technologies, and also comparing their experience of learning about technologies with others. For example:

So we need to have a bit of a base or some knowledge base using the technology so we can adapt to different technologies [Jacinta, Lindsay].

you need to know a little bit about it so I just had to go in and start learning about applications and things that really don’t have that much relevance to my work – using the applications doesn’t have relevance to my work but knowing about them and where to find out… [Jacinta, Lindsay].
It was interesting that the participants who self-selected for this study, whilst having an interest in, and ongoing commitment to, learning about technologies, did not see themselves as being at the forefront of having knowledge in this area in comparison to their colleagues. Instead many of the participants described themselves as waiting for others to give direction as to what technologies they should be learning.

I’m not the trailblazer, I wait for someone to have done the work and then I follow if I think it’s useful [Linda, Lindsay]

I sometimes worry that I might seem a little bit retrograde because <colleague> jumps into every new little thing and I’m the sort who will sort of look at all those new little things and think now, are they going to last longer than five minutes, I actually have to sit back a little bit and wait and see, like, for another five minutes and see if it’s actually going to last [Tamara, Forrest].

Yeah, you’ve got the people who are sort of out there and really would pursue it far more, and then there’s sort of people who, - I think I put myself within this band a bit, interested and will take things on board but are not really up with the vanguard of exploration. I’m not an early adopter [Zoe, Lindsay].

Through the use of phrases such as “base knowledge” and “know a little bit” participants were indicating that they saw it as part of their role to have a broad scope of knowledge about a range of technologies that they might encounter as part of their daily job. Yet these staff were still looking to others, be it the members of staff who were considered "early adopters" or possibly their managers to give clear direction about the particular technologies or types of technologies they should be learning about as part of their development.

4.4 The doings of the practice

As expected, participants undertook the learning about technologies in a number of ways from informal methods such as individual exploration and asking colleagues, to more formal means such as attending workshops and presentations. Individuals used a mix of methods to learn, often depending on what technology they were learning or why they were learning it.
4.4.1 Learning through individual exploration

In nearly every case, individual participants shared that when first encountering a technology that was new to them, or when needing to learn a new feature of a software program they were already using, their preference was to learn by individual exploration. Comments such as “have a go myself” [Brooke, Forrest; Linda, Lindsay; Sean, Kennard] or “jump straight in and have a play” [Jacinta, Lindsay] confirmed the informal nature of these learning experiences. These actions of individuals also highlight the solo nature of many of the learning experiences as discussed or documented by participants. Initial individual exploration was also supplemented by searching online for assistance such as cheat sheets, quick help guides or YouTube videos. For example:

I tend to download it (new software) and do it myself. I guess I always try to stumble through it on my own and see what I can find and then if there's something that I'm trying to do that I can't work out I'll typically google the answer and then lo and behold there's 15 forums postings [Sean, Kennard].

Used the help options in the software [Brooke, Forrest]

Watched online video on it [Alice, Lindsay]

A number of participants equated the time spent trying to work out the features of and how to use a technology on their own with the best way to learn.

You sort of wanted to work it out for yourself because in some ways sometimes no pain no gain, if you don’t have that painful experience of trying to learn it, it doesn’t stick. I find that [Sara, Forrest].

4.4.2 Learning from colleagues

Whilst acknowledging that individual exploration as a means of learning has its benefits, one participant also recognised that learning this way also has its limitations.

I tend to like try and use the help and find out myself and then it’s sort of like a half-life of, okay this is not effective searching, I should ask someone. Sometimes even making the time to talk to someone about
it, because it’s still going to be quicker than trying to learn myself [Angela, Forrest].

Angela, in speaking of asking someone else for help, highlighted another informal method of learning about technologies; that of learning from colleagues. In recognising the skills of colleagues, participants deliberately sought out particular colleagues that they believed had greater knowledge of a particular technology and who would be willing to share that knowledge.

Because I know there are so many experts here, you know the minute I’m stuck I go and ask and they always answer straightaway, then I can move on to the next step [Linda, Lindsay].

My colleagues’ knowledge and experience were invaluable with this. The help menu could not answer institution specific protocol/workflow questions [Angela, Forrest].

Colleagues, as Angela pointed out in the above quote, have the advantage of being able to provide site specific knowledge that cannot be found as part of online videos or other sources of online help. Superior knowledge, close proximity, and the need to learn things in a hurry were all reasons that colleagues were consulted as a source of learning.

Sometimes it was easier to just ask someone else who knew more about that area than muck around with it for hours [Angela, Forrest].

Because it’s easier and the person to ask is sitting three desks away so you can just get up and walk over [Zoe, Lindsay].

if there is a crisis at work I will ask someone or try to work it out, otherwise I tend to leave it for later on because I know that I learn better when I find out myself rather than – or being shown slowly and I can redo the steps. But if I have to watch someone doing it it’s not good enough, I need to do it to remember it [Linda, Lindsay].

Whilst colleagues can provide a quick source of knowledge, especially in open plan offices (the environment worked in by nearly all participants), learning from others wasn’t always seen as the best way to ensure long term retention of knowledge. Linda [Lindsay] as quoted above recognised this as did Tamara [Forrest]:

I do find that I muck around with things and I spend ages and ages – it takes me ages to work things out, but once I’ve worked it out I’ve
remembered it. Whereas if somebody shows me in five minutes it’s just out of my head [Tamara, Forrest].

Open plan offices provide easy access to colleagues, and at both Forrest and Lindsay Libraries, Tamara and Jacinta specifically identified the open plan offices and collegiate atmosphere that had developed in the past few years, as assisting with their learning about technologies. Yet approaching colleagues for help wasn’t always as easy as the collegiate atmosphere might suggest.

when you ask a colleague then you’re just asking something that they know like the back of their hand but you’re taking up their time for them to tell you [Sara, Forrest].

4.4.3 Learning by attending workshops or presentations

Personal exploration and asking colleagues for help were both used extensively by participants as means by which to learn about technologies. The third method of learning identified was to attend workshops or organised sessions provided by either the participant’s library or the university. These sessions were organised by library management or offered to interested staff by sections of the university. The range of sessions reported by the participants included formal training sessions offered by software vendors from outside the organisation, training sessions provided by library staff for the benefit of other library staff, and informal lunchtime sessions where library staff were able to meet with other department staff, try out a new technology and share information and learning. At Lindsay Library in particular, there were a number of sessions that were of one hour’s duration and presented by members of the library liaison team, on a range of library relevant topics including new technologies and customer service. The participants from Lindsay Library talked of a recent training event run by a member of the liaison library staff on Google Docs and Google Drive and how useful that had been in providing an overall understanding of the range of features and usability of these two technologies. Linda [Lindsay] used this particular session as a starting point in her learning journey before then spending time herself further exploring Google Docs as was recorded in her participant journal.
These training sessions were offered as a means of introducing a range of technologies to staff, to discuss the technologies’ relevance to the liaison role and for staff to gain hands on experience in using the technologies. Also offered at Lindsay Library were presentations, again by library staff, to introduce a range of technologies that staff may not have heard of, or considered, in terms of their implications for the library. Alice described these presentations as follows:

they might not be necessary for people to do their work or use those technologies but you still gain something from them and for those people that aren’t self-motivated naturally to learn, there are easy things for them to go along to [Alice, Lindsay].

These two types of sessions, the workshops and presentations, were viewed positively by the staff at Lindsay Library. They were identified by participants as providing a means for staff who may not choose to initiate their own learning about technologies, to gain at least some knowledge of new technologies that were available and their relevance within the library environment. Participants at Lindsay Library, whilst endorsing the workshops and presentations as a means for staff who otherwise might not be motivated to spend time independently learning to gain awareness of such technologies, also recognised that this may provide the only learning about technologies undertaken by some staff. The University Librarian, as reported in a discussion by Alice, also raised the role these workshops and presentations played in individuals’ learning experiences and their perceived benefits in supporting ongoing learning. Alice described her conversation:

Well, the workshops and the presentations do support learning but one of the things that the university librarian wondered to me was whether this – trying to get people to take responsibility for their own learning and not be waiting to be spoon-fed things, whether the workshops and stuff will kind of push against that in a way because we’ve got so much in terms of the learning opportunities presented to us here, if we don’t take any initiative but just go along, we’re still going to learn. It was just an interesting – he wasn’t saying, “Don’t do them” but he was just wondering whether, because we have so many well-structured learning opportunities that people don’t feel the need to take responsibility as much. I think that’s only a small number of people myself [Alice, Lindsay].
Alice’s comment raises an interesting question about who, within the workplace, has responsibility for ensuring that staff keep up to date with technologies. This will be discussed later in the next chapter as part of the section on the language used in the training documents (section 4.8).

The value of workshops offered by the library or the university was raised by a participant who described himself as being less than confident with technology, in particularly learning about new technologies. Jacob [Kennard], whilst recognising that for his ongoing career development he needed to keep on learning about technologies, noted his preference was to attend workshops and presentations as a means of undertaking this ongoing learning. Preferring in his words, to be “taught” rather than having to “earn” [Jacob, Kennard]. Jacob was referring primarily to software programs that his library had purchased, such as a new journal articles database, a Microsoft product such as Microsoft Excel or the library management system, rather than freely available software programs. Jacob felt that there was an increased reliance on someone within the library learning a new technology first and then requiring them to share that knowledge with others. This contrasted with his experience of learning technologies in the past when formal training sessions, often provided by software suppliers, was delivered by what he termed an “expert” [Jacob, Kennard]. Jacob’s language in describing his preference in how he would like to learn about technologies suggests he is more comfortable learning in a way similar to school or university, where a teacher, or perceived expert, imparts knowledge to students, who then demonstrate what they have learnt through using the technology. In this workplace the focus appeared to be more on the individual as the instigator and director of their own learning, through exploration, consultation with expert sources and talking to colleagues rather than through a teacher/learner arrangement.

At Forrest and Kennard Libraries, staff described informal sessions that focused on learning more about new and emerging technologies that were coordinated from within the library department. These sessions were open to any interested library staff to attend. At Forrest Library, one of these informal
sessions discussing the usefulness of a range of software programs being used by different sections of the library department was held over a lunchtime. All library staff were invited to attend and not only were the features of a variety of software applications discussed but also their usefulness in helping staff to work smarter or more collaboratively with others. An example of one of the applications that was discussed was Trello, a group planning tool being used by a particular workgroup within the library. Tanya [Forrest] found one of these informal sessions particularly useful when she listened to a presentation on Jing, a video capturing and sharing software. The session provided her with an understanding of the potential of the software program and helped her take her first steps in exploring and using the software program. Since this informal session and following her own exploration, Tanya went on to develop instructions for her work area using Jing as well as instructions for other staff on how to use this particular software program.

The role workshops and presentations have in initiating further learning experiences was highlighted through the range of sessions attended by the participants during the time they kept a record of their learning experiences in the participant journals. These sessions covered a range of applications software and included both face to face sessions and online sessions. Zoe [Lindsay] attended a training session on LibGuides2 before then continuing her learning through personal exploration. Jacinta [Lindsay] attended a webinar on Primo, the discovery layer of her Library Management System. Sara [Forrest] attended a session offered by her library colleagues on the Wiki software used within her University, and Tamara [Forrest] attended a training session offered by another department of her university on an online curation tool called Scoop.it. At Kennard Library, there were a number of training sessions on offer as noted in the participant journals from this site. Oliva attended a training session offered by an external company on their new research benchmarking tool Incites, Sean attended a session on a new sign creation software called Upto and Vanessa attended sessions on Endnote, Microsoft Excel and client management software. In some cases these sessions were attended to gain an understanding of potential of the
software program. Other sessions were attended in order to learn how to use the program for a specific task, such as Vanessa needing knowledge of how to use the CMS matrix software, to undertake part of her role.

4.4.4 Learning by presenting workshops on technologies

Not only was attending workshops on new technologies a valuable way participants went about learning about technologies, but, when asked to present a workshop sharing experiences of a particular technology, this too provided a learning experience. At Kennard Library there had been in the past an Emerging Technologies group that was tasked with investigating new technologies and presenting sessions to share their findings with the wider library staff. Olivia [Kennard] described the value in being asked to present one of these informal sessions, seeing this as an opportunity to increase and then share her knowledge of a particular technology, for the benefit of herself and others. Olivia considered the sharing sessions as providing an opportunity to explore a particular emerging technology that she had previously been unfamiliar with, and then through shared questioning during the session discuss with colleagues the value of the technology for both individual library staff and for their workplace in general. The benefits of sharing knowledge through these sessions was confirmed by Richard, also from Kennard Library, who commented that as he was encouraged more and more by academics to share new technologies and their usefulness with students, having the chance to share first with library colleagues had the additional benefit of improving his later presentations to students.

4.5 The relatings of the practice

In discussing self-directed learning as part of the Mid Study Focus Group session, participants were asked about prompts for learning and how they planned and evaluated their learning as a means of further understanding the relationships between individuals, the practice and the site. As participants talked, a strong dichotomy emerged between participants about how learning intersected with their work tasks. For some participants, learning was definitely just another work task, for others, it was a separate
task, to be done after work tasks were completed. They also shared a range of emotions they associated with the learning practice.

4.5.1 Is learning part of the work role or not?

The connections between the sayings and relatings of a practice were realised in an interesting way when participants discussed how learning at work, in particular learning about technologies, related to their work role. The participants not only described how they related to the practice they also talked about how they believed their colleagues related to ongoing learning during work time. Taking into account that participants self-selected for this study, showing an interest in ongoing learning about technologies, they interestingly shared a range of views about the role workplace learning plays within a person’s work tasks. Whilst some participants, agreed that learning was an important part of their role as a library staff member, there were others that weren’t sure what that meant when it came to spending time learning at work. There were a few clear statements that placed learning as an integral part of the work role; for example:

I need to stay up to date with this and I need to know what everything means and I need to know how stuff works. So it’s just ongoing [Angela, Forrest].

I feel like it's kind of a natural part of my role, just because partially because I've started like a new role this year, so a lot of it's been trying to get up to speed with different tools [Olivia, Kennard].

Because learning is becoming a huge percent of what we need to do to survive now, much higher than people recognise [Alice, Lindsay].

None the less there were also far more comments that described learning as an extra activity that was only done when core work was completed or as an added task beyond their work tasks. For example:

It must come as a secondary activity to completing required tasks but it is also very important in enabling productivity and quality of output as an employee. Consequently, I complete all necessary work and then undertake additional projects during quiet times. Some development activities are necessary for core activities so these take precedence if they directly affect core activities [Vanessa, Kennard].
it's just sort of somehow for a lot of people it's seen as an added extra rather than an integrated part of your ongoing professional development and work [Beth, Lindsay]

Participants shared their feelings of guilt when taking time from work tasks to learn about technologies, or had concerns that learning technologies was associated with playing, which was perceived as inappropriate during work hours. As the final quote below from Vanessa shows, feelings of guilt could be overcome by considering that any learning was providing the staff member with greater skills to provide a better service and therefore a part of a person’s workplace responsibilities.

so I always have this guilty feeling that I should get on with my work [Linda, Lindsay]

So because there was an element of play it was perhaps incongruous of their concepts of what constituted work activities [Angela, Forrest]

You do feel like you’re stealing time and you do feel sometimes guilty about spending time learning stuff [Sara, Forrest]

However, I think the long-term outcome is demonstrated through my quality as an employee so I allow any guilty feelings to pass. I also ensure that all core activities are completed before undertaking any extra learning [Vanessa, Kennard]

Vanessa’s comment above also raised an issue shared by a number of participants; that of the benefit of ongoing learning to both the individual and the organisation. Ongoing learning provides the individual with increased skills, and so for some participants, this meant that as they personally were the beneficiaries of their learning, any learning about technologies should be done in their own time. The complexity of the role of learning within the workplace, and the struggles that individuals had with understanding and reconciling their ongoing learning can be clearly seen in the views participants shared:

People who really want to learn, they don’t think that way, they think okay this is what I’m gaining out of it. So it’s an advantage. But it’s not like I want someone to pay for that, because it’s learning. So I’m learning; I’m getting something out of it. People might think in another way as well, this is an extra thing for me to do and why should I do it? I’m not paid for that so why should I spend time on that? I think it's learning, so if you are getting something out of it, if you are learning
something, it's a gain, you're not losing anything. You are given a time for that, so you are spending your time which is in your workplace [Naomi, Forrest].

I think ultimately we're responsible for our development individually but it's support – it's a good environment if your organisation sees it as it can only benefit the organisation if everyone is allowed to be a bit challenged by new things and try things [Angela, Forrest].

4.5.2 Emotions associated with learning about technologies

Words such as “guilt”, “play”, “core activities”, “stealing time”, “not working” all help shape how individuals relate to their learning experiences, as does how they feel about the practice. It was interesting that as participants described their learning, they also described feelings of being overwhelmed, lacking in confidence, doubt in their own ability, frustration, and the expectations of others as influencing their learning practice. This range of emotions can be seen in the following quotes:

So that's the kind of problem I've had. I never know how to diagnose the problem, is it coming from me or the machine or the program or whatever it is. This is one of the biggest things to find out [Linda, Lindsay]

... because I think there's a lot of fear around learning. There's a lot of fear about getting it wrong, there's a lot of fear about making mistakes. I think it's getting better. I think there's a cultural shift away from it, but I think, you know, there's still aspects of it there [Angela, Forrest].

I get very overwhelmed by how many things I’ve got on my list to learn in my own time. I get overwhelmed by it. There’s just not enough hours in the day or in the week [Zoe, Forrest]

I sometimes worry that I might seem a little bit retrograde because <colleague> jumps into every new little thing and I’m the sort who will sort of look at all those new little things and think now, are they going to last longer than five minutes? [Tamara, Forrest].

Tamara, quoted above, raised the issue about the large number of new technologies available to learn as did others:

I don’t tend to feel overwhelmed but I love the new and shiny. My problem is in fact sort of not being the magpie that goes after every next thing when I perhaps don’t quite need to [Melanie, Kennard]
it's so disrupting. It's like being a bee in a flower garden or something, you’re just constantly distracted by the latest new thing and think, whoops do I – okay I'll have a quick look at that, oo I'll have a look at that, oo that thing over there, shiny thing, shiny thing… And you think I really need to actually spend some time or decide priority list of what – you know, is this something I need to know? [Sara, Forrest].

Olivia [Kennard] as discussed previously (section 4.4.4) reported that constantly emerging technologies offered her the opportunity to learn new things and to share these with her colleagues. She identified the benefits for both herself and others. Ongoing learning was also a source of both confidence building and motivation. The following quotes were from participant journals as they reflected on their learning experience:

- Went really well, increased my confidence [Naomi, Forrest]
- An increasing confidence that I can master basic functions of technology [Linda, Lindsay]
- Interested, motivated, excited to be learning about technology and culture – a heady combo! [Sean, Kennard]

This will be discussed further in the Evaluation section (section 4.5.5).

Motivation and attitude have both been highlighted as important factors in driving self-directed learning (Garrison, 1997). Whilst identifying their own motivations or purpose for learning as discussed earlier in this chapter (section 4.2), participants also reported that they did have colleagues that they believed had no interest in, and didn’t want to know about, new technologies unless they absolutely had to as part of their work tasks. Several participants shared surprise and frustration at what they perceived to be a lack of motivation of their colleagues to undertake ongoing learning and concern as to the impact this lack of motivation might have on these colleagues' careers. Comments included:

- If there’s a chance for job progression, career progression, then people might be more motivated if they see “Oh, if I learn about this application there’s a chance that I might move on in my career and get to do something with that” [Olivia, Kennard].

- I think it's a really critical thing for all librarians. So it's very concerning when we talk about people who say I don't have time or if they don’t
really seem motivated to learn. I think this is actually hurting everybody. The attitude more than anything [Sean, Kennard].

### 4.5.3 Prompts for learning about technologies

Prompts for learning about technologies identified by the participants ranged from personal motivation to improve their own knowledge or skills to external influences such as needing to learn to respond to a client’s request. Being in a new role, or undertaking new duties, often meant that a period of learning new technologies was necessary. This was also the case when new technologies were introduced into the workplace, such as a new library system or particular hardware.

Participants cited professionalism as part of being a librarian as not only the reason they went about learning about technologies but as direct prompts for their learning experiences. This professionalism was considered as firstly having the skills required by a member of the library profession in order to continue to provide relevant services to the library’s clients as well as workplace professionalism that was characterised by the parity of their work with that of the academics and others within the university. For a few of the participants it appeared important that not only they, but also their colleagues and the library as an entity, were seen as professional within the university setting. Comments included:

- it's a really critical thing for all librarians [Sean, Kennard]
- Keeping up to date with changing needs of the faculty [Sara, Forrest]
- As a librarian, it is my job to know how to use it and be confident enough to teach it [Tamara, Forrest]

Being able to interact and work with academic staff within the university was also a strong prompt for why participants learnt particular technologies. For example:

- If someone said right, you’re doing this project with six other people, we’re using Popplet, end of story, you have to use it, off you go [Sara, Forrest].
I was motivated to find out about the uses for this application and how if there is a role for the library to provide support to academic staff who are using it and/or advise on the best methods for using this application [Phillip, Lindsay].

The importance of an individual’s sense of their own ongoing professional development as well as their status as a librarian, was a strong impetus for driving learning about technologies. Being able to not only use a particular technology but having the responsibility for identifying and testing technologies that may assist the delivery of services to students prompted several participants to read technology blogs and subscribe to relevant email lists, and to also be trialling and evaluating technologies. Richard [Kennard] explained his prompt for learning technologies was to see if something could be useful for his students, and would explore and learn about a particular technology with that in mind. Sara [Forrest] also explained that any technology she spent time learning was with a view to its relevance within the workplace: “was it going to be useful”, what was the “return on investment, why would I learn this” [Sara, Forrest]. The return for time and effort invested in a learning experience was also discussed by Phillip [Lindsay] who acknowledged he was more likely to be focused on a learning experience if he was able to identify how he could apply a particular technology to his work.

Participants, were also conscious that having a limited time to spend on learning meant that learning the right technologies was important. Participants looked to others within their workplace for direction as to what was worth spending time on, especially when considering learning technologies as yet untested in the current workplace. Brooke [Forrest] identified a particular colleague who she followed on Twitter and when this colleague posted a tweet about new technologies, she then tried to spend some time learning a bit more about them. Jacob [Kennard], also agreed that there were certain colleagues whose recommendations were prompts for his own learning experiences, because he respected their judgement. Jacob believed that if these particular colleagues were recommending that a certain technology might be worth learning, then it was worth him investing time
exploring the technology for himself. Looking to others as “early adopters”, as described by Rogers (2003, p. 22) not only provided prompts for learning but also gave validity to a technology’s possible value within the workplace, therefore satisfying one criteria for spending the time learning it.

Colleagues provide the opportunity to hear about something you might not have heard about before or would not have thought to look at [Phillip, Lindsay]

Another librarian mentioned they used Zeetings to do a poll in a class. I was a bit frustrated as it didn’t work the way I thought it would and I didn’t have a lot of time to get it working! But it was fun learning something new [Olivia, Kennard].

Closely linked with wanting to appear professional or competent to other academic staff, taking on a new role, or new responsibilities also prompted staff to focus on spending time learning about technologies. Vanessa [Kennard] commented:

another trigger <for learning> is the requirements of my job which change and evolve according to need which is precipitated by structural changes and staff losses which require someone to pick up extra work in an area previously dealt with by someone else [Vanessa, Kennard].

Zoe [Lindsay] and Melanie [Kennard], both having recently started work in their current workplaces, agreed that being in a new role meant there was an increased need to undertake learning to understand and be able to competently use the technologies presently being used in a particular workplace.

Contrasting slightly with both the impetus to learn as part of the professional identity of being a librarian and also as part of a new role, is the learning prompted by the organisational requirements of a person’s job. Technologies are a vital tool used for the work done by librarians, and staff are required to have a working knowledge of particular technologies in order to undertake their work roles. Simone explained this in the following way:

what I've learnt I've learnt because I need to do it for my job at that particular point [Simone Kennard].
Examples of the types of technologies learnt as part of the organisational requirements of a person’s job was given by Angela [Forrest] who learnt how to use the document sharing software Dropbox to increase efficiency within the workplace, and Tanya [Forrest] who learnt how to use Jing, a screen capturing software that provided her the means to include visuals in an online training program she was asked to develop for colleagues. Jacob [Kennard] learnt the app Readings having been told by his manager to do so to undertake required work, and Jacinta [Kennard] participated in an online webinar on a new feature of the library management system because it was “required as part of my job”.

The nature of librarians’ work also influenced participants to undertake learning. As with much on-the-job learning experiences, answering an immediate question, or solving a particular problem often prompts learning. Client questions and improving the efficiency of doing a particular task were both cited as prompts for learning experiences:

you get reference questions that’s a bit meaty or nutty, you sort of use that as an opportunity to learn something [Sara, Forrest].

both needed to know because needed to do my work and made life easier at work [Angela, Forrest].

The final prompt for learning discussed by participants was when the opportunity arose within the workplace to attend a workshop or presentation about a particular technology. This technology may or may not be directly relevant to a participant’s current work role, yet these sessions were still seen as a good opportunity to learn further about a particular technology, and form a judgement on whether it would be relevant to learn more as well as be useful for career development.

you might not necessarily think, “Oh yes, I need to learn that.” You go along and suddenly you learn something you hadn’t realised [Phillip, Lindsay].

Given the range of prompts for learning, and the feeling by some participants that they were reacting to the needs of their library environment and clients
when it came to learning new technologies, this examination turns now to how these participants went about planning for learning.

4.5.4 Planning for learning

Planning is an important component of self-directed learning (Boud, 2012, p. 5; Candy, 1991; Kicken, Brand-Gruwel, Van Merriënboer, & Slot, 2009, p. 457; Knowles, 1975, p. 18). Having seen from the previous section in this chapter (section 4.5.3) that learning about technologies was prompted by both personal and external influences, it was interesting to discover how the participants went about planning their learning about technologies.

When discussing what planning went into learning about technologies, the overwhelming initial response from participants was that it was not possible to plan their learning. Participants argued that so much of their learning about technologies emerged from the need to answer a client’s immediate question or was in response to an external opportunity such as a workshop offered by the university or library department, and so planning was not feasible.

I’d be surprised to see anyone having a planned learning regime around emerging tech, mine is just adhoc [Sean, Kennard].

I’m not just thinking what am I going to learn today? [Tamara, Forrest].

I think it depends what’s being offered around the university, like that’s what I – you know, someone is teaching Echo 360, yes I’ll go. So it wasn’t like a planned thing, it just popped up in my e-mail and I’ll take advantage of that [Simone, Kennard].

Following this initial response, further discussion raised the issue about learning being seen as more effective if what was learnt was either used straight away or was in response to an identified need.

But I think that’s one of the things about modern life, is that you learn things when you need them, you don’t learn them – like just in case learning has taken a backseat to just in time learning [Sean, Kennard]

However “just in time” learning can also be seen as stressful. Olivia [Kennard] reported that much of her new role meant being asked to learn about a particular technology just before she was to teach it to others so she
often felt stressed about how much she had to learn within a short time frame.

I just need to do this thing. You know, I'm not thinking. Hey, I'm going to learn this new technology today. How fun. I've got heaps of time to do that. It's, like, Boom, got to do this. Aaagghh [Olivia, Kennard].

Olivia’s colleagues agreed that learning was often done under pressure due to an immediate need and this type of learning did not always lend itself to being planned.

The participants believed that one of the reasons why it was not possible to plan learning about technologies was because the learning was foremost, although not always, in response to external influences, prompted by responding to others’ needs.

So reflecting on keeping track of learning of the technology hasn’t necessarily been an active experience … it has been more of a - just gradually taking things on board and working towards a certain objective with a task [Beth, Lindsay].

It’s the ad hoc nature of stuff, of our workflow that is just, I think, the problem isn’t it? [Sara, Forrest].

Learning was seen as responding to what they needed to know at the time, or triggered by reading or hearing about a technology from blogs or colleagues.

One of the ways that organisations promote ongoing learning for staff is through professional development plans and so participants were asked if learning about technologies was something that was or could be incorporated into their annual professional development plans. Angela [Forrest] articulated that it would be difficult to include learning about technologies within an annual plan because she didn’t really know what she would need to learn in the coming year or what might be available to learn within the landscape of constantly changing technology. Unlike a staff member who can identify that they wish to undertake customer service training program, or attend a management training session, as part of their annual development plan, being able to name specific technologies to learn
within the next 12 month period wasn't as easy. Several participants suggested that identifying a number of new applications or software programs to learn might be a better way of including learning about technologies in their professional development plans. As Angela suggested, a goal for inclusion in the development plan might be:

in the next year you need to learn three new applications [Angela, Forrest].

Participants then discussed a number of possible solutions to how they could plan better for ongoing learning. Tamara [Forrest] reported setting aside time on a Friday afternoon to undertake learning, and to scan the technological horizons, and even had her manager’s permission to spend this time learning, but still found that:

other things, immediate requests got in the way [Tamara, Forrest].

Setting aside time to focus on learning about technologies was also identified by Richard [Kennard], who suggested that whilst setting aside a specific time for learning about technologies was a good idea in theory, putting this into practice was more difficult.

you would get overrun by local demands where something is on fire that needs to be put out, or a student’s at the desk and needs help [Richard, Kennard].

Participants identified that including learning about technologies as part of their development plans was not an issue that most of them had discussed with their managers, or even considered themselves. The participants did however, following this discussion, indicate that they could see the benefits of having a conversation about setting time aside for learning, or identifying a number of technologies to learn, when they were next due to set development goals with their managers.

As a result of being more conscious of their learning experiences through keeping participant journals and focus groups discussions, the participants themselves identified the difficulty with planning learning was difficult. This difficulty arose as learning was so often prompted by the need to solve an
immediate problem for a client, or was in response to an opportunity offered by their library department or university.

4.5.5 Evaluation of learning experiences

Through the previous sections of this chapter the participants’ view of what was prompting their learning and planning for learning about technologies have been explored. Turning now to the evaluation of learning. Evaluation, like planning, has been identified as an important component of the self-directed learning process (Boud, 2012, p. 8; Candy, 1991; Straka, 2000), yet is not always a conscious part of the relatings of the practice when learning is actioned in the workplace. As part of process of self-directed learning, identifying whether participants were evaluating their learning experiences, and if so by what means they were undertaking that evaluation, was critical. To this end, participants were asked to evaluate their learning experiences as they occurred through their participant journals. Whilst developing the journal tool, the participants made a collective decision to use the heading was the learning experience effective? as a prompt of capturing their evaluation of their learning experience. Each participant was able to interpret the meaning of the word effective when they recorded their experiences.

In the majority of cases, participants evaluated their experiences positively.

- Using the sandbox gave me the opportunity to test my knowledge and to play with possible new ideas without fear of damaging the real user interface [Jacinta, Lindsay].
- Went really well, increased my confidence, was able to concentrate on learning because I was interested in the topic [Naomi, Forrest].
- Solved the problem but it did not enhance my knowledge of the software beyond that [Elise, Kennard].

In many cases, having identified the learning experiences as effective, participants were also able to share that the learning experience had, in turn raised the possibility of future learning experiences.

- Yes, it was effective, but I think I need to do a lot more reading/research to get up to speed with this topic [Olivia, Kennard].
I feel like I still need to follow up and learn more about how all of Google Drive, Sites, Google Docs, Forms all fits together, and how to integrate it in my working day more efficiently and effectively [Zoe, Lindsay]

Ultimately yes, it is an effective learning experience, but I’m looking for ways to improve it in future. I think that it reinforces the maxim that there are no short cuts – learning is frustrating, and makes me feel lost, but the only way out is through [Sean, Kennard].

In reflecting on the learning experiences, participants were also able to identify some of the constraints that impacted upon their learning practice. The frustration of not having enough time as impacting on the effectiveness of learning experiences was raised by several participants. Sara [Forrest] cited “not enough time” to achieve the desired outcome when learning how to export records from a database to Microsoft Excel. Simone [Kennard] also experienced frustration with Zotero, a reference management software, citing a “need to allocate more time and attend a proper class” for why her learning experience wasn’t completed effectively. Simone [Kennard] also recorded the following entry in her journal when she tried to learn how to integrate Google forms into the learning management system she was using:

I would say it was a 50 per cent positive experience. I did successfully construct a quiz in the LMS using Google Forms, but I still do not know how to get any meaningful stats or analytics out of it. I have not had enough time to go back and look into this further [Simone, Kennard].

One particular measure of the effectiveness of the learning experiences was in the personal experience of gaining confidence not only in the use of a particular software program but in the use and exploration of technology in general.

<learning Windows Movie Maker> went really well, increased my confidence [Naomi, Forrest]

every small victory with technology brings me a step nearer to being more adventurous [Linda, Lindsay].

<attending a training session on the new library circulation program> provided the confidence that I could learn what was needed [Vanessa, Kennard].
The networking opportunities afforded by attending workshops or presentations of technologies added to the effectiveness of the learning experience for some participants. Not only were participants able to learn details about a particular technology, they were also able to discuss the value of the technology within the workplace and hear views and experiences from others which increased the effectiveness and value of the learning experience.

Yes it was effective overall: it was good attending the presentation with others in my team as they asked questions that I would not have thought of [Olivia, Kennard].

It was an effective learning experience and it helped me to forge connections with librarians and managers [Vanessa, Kennard]

The time-sensitive nature of the learning experiences was also highlighted by one participant when discussing effective learning. Philip [Lindsay] argued that it was important to not only learn more or explore the features of a particular technology, but that it should also then be used or revisited again within a reasonable time frame, to reinforce or build on the learning experience in order to ensure the new knowledge wasn’t forgotten.

To answer the question when you would do that evaluation, if you do it straight away you go, ‘Oh yeah I learnt a lot.’ Do it a month or two later and say, ‘I totally forgot about that!’ If you don’t touch it for a couple of months you’ll actually start to realise what you’ve forgotten about how to use something like Captivate, something particularly if you hadn’t used it in between when you were working on that. But I think we do tend to do our valuations straight after [Phillip, Lindsay].

Participants highlighted the value of sharing the outcomes of learning experiences as a means of increasing the effectiveness of learning. This was seen as particularly important following attendance at workshops or presentations in contrast to the more individual exploration learning experiences.

I think that there would be a part of those people who are attending, getting something out of it by evaluating it themselves individually but also by reporting on it to the wider organisation. It has benefits not only to the person presenting it because then they reinforce what they’ve learnt, but then the rest of the organisation gets to hear about it as well [Jacinta, Lindsay].
Participants used the evaluation of their learning to identify the next possible learning step, to acknowledge their increased confidence in using or exploring technologies, and to reflect on how they might increase the effectiveness of their learning through sharing what they had learnt with others.

4.6 The elements of the practice of learning about technologies

The previous sections of this chapter have outlined the elements of the practice of learning about technologies through the identification of the sayings, doings and relatings of the practice (sections 4.3, 4.4 and 4.5). Together these elements provide a picture of the learning experiences of these participants as they undertake learning about technologies within their workplace. Yet practices are not enacted within a void, the practice architectures present within the three sites studied, shaping and being shaped by the practice are a vital part of any discussion about practices. The next section of this chapter will now present the practice landscape and cultural-discursive, material-economic and social-political arrangements as presented by the participants.

4.7 The setting of the practice

All participants worked in small groups, and for all but two participants, in open plan offices of various sizes ranging from an office of four to an office containing up to 24 staff. One of the participants worked in her own office, but was being moved to an open plan area shortly after the data collection phase of this study. Two participants (Naomi, Forrest and Vanessa, Kennard) were part of teams providing circulation or front desk services so their work days were regulated by allocated desk shifts and other required duties. All other participants, except the manager, were either reference and liaison staff with limited desk shift allocations or worked in the information management areas of the library and were able to regulate their own work day to complete their required tasks. The participants who had a high level of autonomy over their work tasks and how they allocated their time during work hours, identified this as an important consideration when discussing how they engaged with the practice of learning about technologies. Melanie
and Elise from Kennard Library explained how they saw having control over their own time, gave them some flexibility with regard to spending time learning:

It depends a bit on your - on your job design. I mean, because I'm a backroom sort of person I've got a lot of flexibility with just how I structure [my] day so, I don't tend to have to block things out as much. [Melanie, Kennard].

I'm expected to do stuff, but our time is kind of our own as long as we're keeping up with everything [Elise, Kennard].

In contrast Naomi [Forrest] highlighted her perceived lack of control over her time when it is regulated by desk shifts and required tasks:

Whenever I’m in lending service area, they have their roster so when you’re on service desk you can't do anything. So if two hours a day you are in lending services desk, then one hour you are as a backup. So three hours gone like this and then your reserve work. And even though if you got a time and you want to do some learning – we can’t. There’s a lot of people in my team asking ‘why is she not going to do shelving, why can’t she just go and shelf reading, you know?’ So there’s always something [Naomi, Forrest].

Each participant had access to their own allocated personal computer. IT staff, employed by the university, were available to support the use and maintenance of the equipment. Participants had limited ability to load new applications software onto their allocated computers, often requiring their IT department to use administrative passwords to download new software. At Lindsay Library, the new liaison librarian was allocated an iPad for use in the role. At Kennard Library, Olivia brought her personal MAC laptop into work when she required access to a different platform as she tested various technologies as part of her role.

4.8 Cultural-discursive arrangements present in the site

The first clear finding of this study when considering the cultural-discursive arrangement of the practice was the apparent limited discussions reported as being held with both managers and colleagues on why and how to go about learning technologies. From the participants’ perspective only a few reported that they had explicit conversations with their manager about their ongoing learning practice. Other participants described implied but unspoken
understanding from their managers either supporting their learning, or in contrast, a lack of support for ongoing learning, for example:

I've been able to make a conscious decision because I've had that explicit understanding from my manager that it's actually expected that I spend my time in that way, at least some of my time in that way [Phillip, Lindsay].

I think people are happy for me to learn whatever I want to learn. Like my boss has kind of acknowledged, my manager's, acknowledged that that's one of my strengths. She says I'm like a sponge and I like - because I do - it's obvious, you know, I really like it and I'll try and sign up for any training I can go to [Olivia, Kennard].

People read things into their situation and they don't necessarily – we're always making assumptions, aren't we, about what our manager thinks and we haven't necessarily even checked [Zoe, Lindsay]

The lack of conversations held within the workplace may have been connected to the range of understandings that the participants had of the position that learning had within their own work role, as previously discussed in section 4.5.1. Whilst some of the participants considered their ongoing learning as an important part of their role, others saw any learning as personal development, to be done either after all core work was completed, or in their own time. The lack of a discourse around learning within these particular sites seems to have help foster the confusion.

it's that sort of thing that whether it's a formal or an informal understanding with your manager that you need that understanding before you can feel comfortable doing it outside of your everyday work. You know, sometimes you have projects or training that you have to do in the technology so that's your understanding with your manager to do it. But if you don't have it you're like, 'Hmm, maybe it is something I have to do…' in your own time instead [Phillip, Lindsay].

Whilst investigating the collective language within the sites shaping the practice, it was found that at each site there were formal training plans that clearly outlined the support that the library organisation had for ongoing development of staff. Extracts from the plans illustrate this support:

Provide opportunities for all staff to undertake professional development activities and share their experiences' and 'IT Skills: Provide opportunities for all staff to develop their skills in the IT area [Training Plan, Forrest].
maintaining and extending skills, developing necessary knowledge of new products and keeping staff current with new technology, library policies and procedures, and customer service strategies [Training Plan, Lindsay].

In the training plans of each site, the importance of ongoing development of library staff was explicitly stated. For example at Kennard Library the vision of the library is:

To develop a highly skilled, sustainable Library workforce that proves its value to the University by supporting student learning, community engagement, and by enhancing research productivity, teaching practices and institutional reputation [Training Plan, Kennard].

A number of external environmental impacts on the library and its staff were also identified as part of the plan including:

New digital technologies enable information collaboration and sharing via social media and they are changing the information environment. Staff will need to be flexible in their work roles to allow for changes to the physical environment, client expectations and technological developments [Training Plan, Kennard].

During all the discussions with participants at the three sites, neither the training plans, nor acknowledgement that the organisation had made a commitment to the ongoing development of staff was raised.

While the written training plans seem to be supporting the ongoing learning about technologies, amongst other development areas, the conversations between participants did not reflect this organisational commitment. What the written plans did highlight, and was also reflected in the conversations of the participants, was the mixed messages with regard to where the responsibility lies in terms of ensuring ongoing development of staff. Whilst Forrest Library’s plan stated that it was the manager or supervisor’s responsibility to work with individual staff to ensure ongoing development, in Lindsay Library’s plan reference was made to staff members having responsibility for the maintenance and enhancement of their own personal knowledge and expertise by undertaking to:
actively engage in learning opportunities provided, to initiate our own learning, to seek help as needed, and to share knowledge and expertise with others [Training Plan, Lindsay].

The support of managers was highlighted as a “key role” in supporting learning. Alice, as part of her role at Lindsay Library, raised the importance of managers having a crucial role in discussing and supporting ongoing learning.

the idea being getting the managers to really encourage staff to think about learning more broadly than going to a course but how much take-up and how much they follow through, I can’t tell. So that’s certainly something that would be good. I don’t quite know how to address that but we need the managers to be encouraging staff to think of their learning broadly and setting themselves learning targets and things and projects that don’t necessarily mean I’ve finished a Lynda.com but, you know, even myself I don’t do it well enough but I try to stretch myself by saying, “Okay, I’m going to do this Lynda.com and then I’m going to report to my boss and talk about the implications of…” so that I get the feedback element so that – I don’t do enough of it but did that at least, so that kind of concept [Alice, Lindsay].

Whilst participants declared the belief they were working within a supportive learning environment, they were unable to share evidence of organisational conversations about the ongoing learning of technologies. Although the library organisations had written explicit support for ongoing learning at each of the sites, this did not then appear to enable appropriate discourse and common understanding on what ongoing learning might look like in everyday practice. Moving from the semantic space, where these cultural-discursive arrangements shape the sayings of the practice, the findings from the physical space where the material-economic arrangements shape the doings will now be explored.

4.9 Material-economic arrangements present in the site

The material-economic arrangements shaping practice refer to those influences within the physical space and time the practice is being undertaken. Participants raised a number of physical issues that were influencing their practice of learning about technologies including their workspaces, the equipment available to them to undertake the practice and the time involved in both undertaking the practice and as a component of their
busy work day. Each of these issues will be discussed in terms of how they were perceived by the participants.

4.9.1 Physical workspace

The participants identified that they often approached colleagues to assist with their ongoing learning about technologies so it was of interest how the physical environment, in particular the setup of work desks was considered to impact on the learning experience. For all but two of the participants, the daily work space consisted of a nominated desk in an open plan office. The participants identified that the open plan office setup was both enabling and constraining their practice. While easy physical access to colleagues in order to quickly ask questions or gain help was seen as a positive consequence of open plan offices, the difficulty of being able to concentrate without interruption and within a potentially noisy work space was viewed negatively by participants.

The concern raised most frequently about the open plan workspace in terms of its influence on ongoing learning was the frustration of not being able to concentrate without interruptions. The participants argued that in an office you could close the door and concentrate for an extended period of time, whereas in an open plan office, there was not the same opportunity for uninterrupted time. Interruptions from colleagues in the form of others’ conversations or being asked questions by colleagues, were still an issue even when staff deliberately used headphones to block out noise or as a way of signalling to others to not interrupt. Zoe [Lindsay] explained the issue of working in an open plan office this way:

it's very hard both to concentrate on something of your own for an hour and a half without being interrupted … it's all work interruptions and it's all legitimate. But I find it very hard to concentrate on something unless I put headphones on which is a sign that I'm focusing on something and what have you. But even so people still interrupt you [Zoe, Lindsay].

While some participants were able to continue to concentrate with the noise of others talking, others identified this as a problem when it came to undertaking any learning that requiring sustained concentration.
I find too that I can – if there’s noise around and I’ve got to concentrate on something I just block it out. The place could crash down around me and I won’t know [Tamara, Forrest].

A good headset which was provided in my work space made viewing these in an open plan office more comfortable [Jacinta, Lindsay].

I can’t remember what was the thing I was trying to learn, and I went to my manager and I said, you know I’m constantly being interrupted. I need time off my desk … she was very understanding and gave me two hours a week to go into a little seminar room [Linda, Lindsay].

Despite Linda removing herself from the open plan office, this didn’t seem to solve the entire problem as she went on to say:

But then I found I was very lonely and the place had no natural light or anything. In the end I preferred to actually put some things in my ears and work at my desk [Linda, Lindsay].

Another identified issue with staff being in an open plan office was the feeling of being judged by colleagues. Participants spoke of colleagues, when walking past a participant’s work desk and looking at their screen, might assume they were not focusing on work, if they were watching a video, looked to be on social media, or viewing other, not directly apparent work related websites. The concern about being judged by others was not directly caused by the physical workspace. The workspace was shaping how individuals perceived their own ongoing learning within their work environment.

we feel sort of uncomfortable if we focus that amount of time on something that people don’t immediately see as related to your work perhaps [Zoe, Lindsay].

here’s this idea that you’ve got work to do and you need to be doing it and stuff like that but also, … everyone that walks past sees your screen and should you have work on it instead of a YouTube clip of something [Phillip, Lindsay].

When participants were asked specifically if they felt their open plan offices were an issue when it came to ongoing learning, some did identify that there were benefits of working in open plan offices. In particular, when you were learning something new, that others might know more about than they do.
Being able to turn around and ask a group of colleagues if they knew how to do something, or knew about a particular software program was seen as a quick and easy way to learn. Olivia felt that:

> it's okay if it's something - like one of my learnings was Zeetings … I was just doing a poll in there and someone else had said, “that is Zeetings. And it was really easy; you just kind of sign in and then you're creating a survey” [Olivia, Kennard].

Olivia went on to say that while the open plan office had been fine when learning Zeetings this was not the case with other software programs:

> however for something like Endnote, part of the reason why I did it at home is because I just didn’t have that quiet headspace to really figure out some of the more difficult features [Olivia, Kennard].

At Lindsay Library, participants were in the process of being moved from small offices of four work stations into a large open plan office space. As the issue of work space, and the difficulty of concentrating within a large open plan space were discussed, participants at this site identified a few possible solutions to concerns about being interrupted or not being able to concentrate. The main solution suggested was the provision of what was described as a “play room” or an office that could be booked and used for sanctioned learning time. It was suggested that staff would be able to book the room, not be disturbed by others, and spend time on learning about technologies, whether it was by watching videos, undertaking online learning modules, or exploring and using new software programs or mobile apps.

> that we had a little pod somewhere where we can isolate ourselves and we can book it … and we concentrate on what we have to do. That would be so helpful and I don't think any of the managers have thought of that and this is something we need to bring to their attention, we really do [Linda, Lindsay].

Participants believed that the availability of a separate space, where staff could concentrate alone, would not only provide staff with the ability to concentrate without interruption, it would also clearly signal that spending time learning was sanctioned by library management, and an important part of a staff member’s development.
4.9.2 Time

Time, and in particular the lack of available time to spend undertaking learning, was an important theme when the participants talked about constraints on their practice. The consideration of time as a practice architecture is being discussed within the material-economic arrangement section of this chapter, however, the importance of language in describing the impact of time was also evident. Participants described time as if it was physical resource which could be allocated to a variety of tasks, including learning. When asked what the biggest constraint on their ongoing learning was, participants’ initial response was “not enough time”. Exploring this initial reaction further resulted in the identification of a number of themes of how time was impacting the participants’ learning experiences, including not having enough time to learn, wanting to spend what limited time was available wisely, actively making time to learn, the pressure of deadlines on learning, and needing to spend time learning away from work.

4.9.2.1 Not having enough time and spending time effectively when learning

Decreasing budgets, staff cuts and increased workloads were some of the reasons participants gave for not having time to spend learning. Olivia [Kennard] summed it up when she cited feelings of being overworked, under time pressure to complete tasks, and not have time to “muck around with extra stuff”. Olivia believed that when there had been a greater number of staff working in the library in the past it had been easier to have “spare time to learn”. This feeling of being overworked and lacking time was confirmed by others:

we all have too much work and therefore we haven’t got time to learn [Alice, Lindsay]
I just don’t have time <to spend learning> [Tanya, Forrest].
I think that’s the core of it really, we don’t have time [Vanessa, Kennard].
I have been resentful of not having enough time at work and having to learn at home [Linda, Lindsay]
In recognising the limited amount of time available for learning of any kind, and about technologies in particular, participants indicated that making good use of any time spent learning was important. Participants shared that spending time on learning should not only be focused on something that is relevant and work related, but they also had concerns about the speed with which they learnt and not wanting to waste time by taking too long to learn something. Thoughts shared were:

you are so inundated with technologies and videos and how to’s. You’ve only got so much time to spend on that so you really want to make sure it is focused and relevant [Jacinta, Lindsay].

The only barrier, I suppose it just comes under the same category as time, thinking what’s the shelf life of this thing I’m investing my time into? Is it just going to - like so many other things, just kind of fly by and not be needed anymore? That’s a real worry [Sara, Forrest].

I still feel like I should be learning it quicker but I don’t know if that’s actually something that they’re putting on me or just my own thoughts [Zoe, Forrest]

This concern about spending too much time learning seems to link to the lack of clear understanding by participants about the role learning has within their work role, and how much time, if any, they should be spending learning about technologies at work. The role a manager plays in setting direction for learning also influenced time, and will be discussed shortly when considering the influence of managers on learning (section 4.10.1).

4.9.2.2 Actively making time to learn

Some participants were more positive about time availability with the recognition that unless they made time or that they consciously allocated time to learn, that time wasn’t going to just become available. There was recognition that at certain times in a day or week there were short periods of time that were available for learning quick things; be it watching a short video or having a quick look at a new technology. Jacinta identified that:

most of the training videos were very short (roughly five to ten minutes) which made them easy to watch between other pieces of work, when there was only ten minutes to kill before a meeting or home time, etc. This short playing time made it easier to accommodate viewing the material [Jacinta, Lindsay]
Specifically setting aside time each week was seen as one way of ensuring time was spent undertaking learning about technologies.

when I moved into my new role, I blocked out blocks of my calendar for learning. I’m starting a new formal training this month and I’ve already put aside <time> [Phillip, Lindsay],

But every now and then I do get that time on a Friday afternoon where I can just scan the horizons, have a look at what’s out there, see what I need to do, maybe make some plans for myself and then it all sort of falls in a heap the next week. But that is the idea [Tamara, Forrest]

I allow myself about an hour every morning to sort through my emails, this includes email lists, setting aside this time ensures I read through most emails received from these lists [Jacinta, Lindsay].

Whilst Jacinta’s reading of email lists would not be considered active learning, by setting aside time each morning she was able to identify any new or emerging technologies that might be worth exploring at a later date.

Some participants talked of the need to be realistic and set aside time to undertake learning. Phillip [Lindsay] argued that if managers instructed staff to spend two hours a week learning then this would encourage everyone to spend time learning, and developing their skills and knowledge. Participants saw actively making time for learning as important to ensure that staff continued to learn about technologies.

If you waited until you’d finished all your other work, you’d never do it [Alice, Lindsay].

you can’t find time … you either make it or you don’t [Sean, Kennard]

Sean [Kennard] strongly believed that ongoing learning was very important but that individuals needed to be realistic about and responsible for their own development, setting aside time specifically in their work calendars, and actively discussing ongoing learning with managers to ensure all staff kept up with new technologies.

4.9.2.3 Pressure of deadlines on learning

This study found that the pressure of work deadlines and limited time frames for completing work tasks had a constraining influence on the time
participants were able to spend learning about technologies. Several participants described having to learn a particular software program quickly to deliver on a request e.g. development of a video for a class; and not having time to learn enough about a program to be as helpful as possible to a client. Sara [Forrest] detailed having to quickly learn new features of *Endnote* and her university’s research database to be able to respond to a request from an academic staff member. She expressed her concern about feeling she had not completed the learning she needed due to the deadline imposed by the academic.

Not enough time. I couldn’t get to the finished product, but passed the info on to the project officer and checked back with her, she was ok with it. I would have liked to sit with her to see how she got to the very end of the process but that wasn’t practical or feasible [Sara, Forrest].

With applications software often having many layers of complexity and features, participants felt that they only had time to learn the bare minimum of requirements of the software to complete the task. With more time, the participants believed they would have been able to explore further the capability of a particular software program and therefore possibly provide better service to the client. This raises the distinction between having the skills and knowledge to solve a current problem, in this case, answer the question of a client, and having more time to explore the features of a software program to be able to either help further in the future, or to improve a library service.

4.9.2.4 *Learning away from work*

With perceived limitations on what learning could be undertaken at work, the alternative option for participants was to spend time outside work hours to learn what was needed both for their role, and as a professional librarian. Linda [Lindsay] and Olivia [Kennard] both shared that they did some of their learning at home because they did not have time at work. When talking about their learning experiences Linda and Olivia explained:

Most of the things were done off work because I just don’t have time at work, everything is done at home on my own time [Linda, Lindsay].
So if I want to do something, like, learn something new often just the reality is that I end up doing it in my own time. It's not because I'm guilty or don't think I should be doing it at work. I just don't have time [Olivia, Kennard].

Participants also discussed the issue of whether time spent learning about technologies at work was benefiting the organisation or the individual. Sara [Forrest] was conflicted between wanting to spend more time learning Endnote during work hours, as she had volunteered to assist with Endnote enquiries as an extra to her work role, while at the same time she was increasing her own skills and so thought maybe she should be learning in her own time.

Time is a very important influence on the practice of learning about technologies. For many staff it was seen as a strong constraint on their ability to undertake learning at work. For others, recognition that learning is an important part of their role gave them permission to actively set aside time to spend focusing on their learning practice. In order to improve the practice, time is one practice architecture that needs to be discussed in order to try and change it from being a constraint to an enabler. This will be explored further in the Analysis (section 5.5.2) and Discussion (section 6.9) chapters of this thesis.

4.9.3 Equipment

Similar to the influence physical space and time have on the ability of individuals to undertake the practice of ongoing learning, having access to appropriate equipment and applications software was also identified as crucial in enabling the practice. Participants indicated that generally they had access to the equipment they needed in order to learn about technologies. Yet there were a few times during discussions and as part of the participant journals that feelings of frustration were noted with the lack of reliable equipment or IT issues, in particular software issues. Participants agreed that their managers acknowledged the importance of having a good set of noise cancelling headphones, particularly for those working within an open plan environment, and headphones were supplied for individuals at each site, as required.
Zoe [Lindsay] on arriving at her new job was given her own iPad and told that this would assist her in her job. Zoe recognised that working in a library environment, and sharing devices such as iPads between colleagues, was difficult and appreciated that this had been addressed at her new site with individual devices. This gave Zoe the option of loading the software programs she needed onto her own device. New equipment wasn’t always greeted positively though:

New equipment is tossed at us with the instruction to get IT to teach you. I guess I’ll have to use IT more and more as we don’t seem to have in-house support at a reasonable level [Alice, Lindsay].

When new video conference equipment was installed in one of the meeting rooms at the Lindsay Library, that particular group of participants commented that this would be yet another technology they would have to learn, in order to assist any staff or students using the equipment as part of their room booking.

Having access to both PC and Mac computers was highlighted as one area that could be improved as library staff often had to assist clients who were accessing services or library supplied applications software through a variety of devices. At each site, there was a one computer per staff member policy. If a library staff member wanted to learn how particular software programs functioned on another type of computer or test a particular software program on a different device, this was not always possible. Participants identified that this could be solved by ensuring library staff within each site had access to a range of computer types (PC or Mac) and devices (tablets).

Conversations about hardware referred primarily to requirements to complete everyday library tasks, and any new hardware the participants had to learn was because their library had purchased it for users and other stakeholders to use. Participants didn’t identify wanting access to new hardware such as virtual reality headsets or 3D printers that they had encountered at library conferences. Nor did they identify how access to a variety of new hardware
might extend their knowledge and skills in the use of technologies other areas of their university or their users might be using.

Identifying the material-economic arrangements of a site highlighted that both physical items such as particular equipment was needed to undertake learning about technologies, as well as resources such as a time allocation, or an office in which to undertake concentrated learning shaped learning practice. Turning to the third arrangement outlined in the theory of practice architectures, the social-political arrangement, the importance of managers and colleagues in shaping the learning experience is explored.

4.10 Social-political arrangements present at the site

The social-political arrangements of a site are realised within the social intersubjective space. These arrangements shape and are shaped by the relatins of a practice. For this study, these social-political arrangements included the relationships between the individual participants and their managers; relationships with colleagues, and the influence of a person’s work role on their practice.

4.10.1 Influence of the manager on learning about technologies

A person’s manager was identified as having the ability to assist with both enabling and constraining a staff member’s ongoing practice. Managers were identified as enabling learning by helping staff to identify their future professional development needs, developing and supporting a learning culture, supporting attendance at workshops or seminars, and explicitly supporting time spent learning technologies.

The role of the manager in identifying individual’s development needs was clearly expressed in the training plans of both Forrest and Lindsay Libraries. Participants noted that when a manager initiated a conversation with them about future professional development needs they felt strongly supported to undertake ongoing learning of any kind.

I know even just from conversations with my manager about what my role entails and what my work entails, a portion of my time should be
spent on development stuff so I would definitely be expected to continue learning and figuring out at least new ways of doing things [Phillip, Lindsay].

I’ve always had supervisors who are quite keen to encourage ongoing learning. So it might be something that I spot or could have even been something that the supervisor will send through and say, are you interested in this? [Melanie, Kennard]

Participants identified that it was often individual managers who had the ability to create an environment that was strongly supportive of ongoing learning. This supportive environment was explained in terms of explicit directives that had come from these managers supporting staff to seek out opportunities for learning, or to share their learning experiences with others.

We got a new supervisor, and he was very supportive of new ideas whether they were stupid or not and he was also like, “Okay, if you’ve got time to work on that, then do it. Have a go at it and we’ll come back and we’ll try a workshop and we’ll try and work it out.” If anyone mentions anything, he never shoots it down and says we can’t do it or “Don’t do it” or “It’s not part of your work, your role.” It’s like, “Keep doing whatever your main role is but if you’ve got time to do this, then explore it and yeah, let’s have a go. Let’s try it out.” So very supportive of that [Jacinta, Lindsay].

I mean number one the managers here are really, really keen to promote learning and are really supportive of any learning and development opportunities. So there’s an awful lot of encouragement to go out and learn more and develop more. I think that’s probably a factor of working in a higher education environment is people naturally believe in that [Sean, Kennard].

The managers in these examples acknowledged explicitly their support for ongoing learning and these open conversations about what was acceptable seemed to resonate positively with participants:

That sounds like the important thing to say to the managers, if you don’t voice it that it’s all right, then staff will likely imply that it isn’t [Zoe, Lindsay].

Managers have a strong role to play in not only identifying future development needs of staff, but on a practical level, enabling staff to attend workshops or training events through supplying funding or time release. The manager is also in a position to support staff to attend workshops and to
insist staff attend workshops that will extend personal knowledge about technologies.

‘My supervisor helped me by directing me to consider extending my knowledge and attend the training and by modifying the roster to enable me to attend the training’ [Vanessa, Kennard].

Participants described colleagues who they felt needed to be pushed by managers to attend training events to extend their learning about new and emerging technologies.

not just in this workplace but a lot of places I’ve been to where there are staff that literally have to be told by their manager they have to attend something like that because if it’s not directly related to their work, they won’t give up the time to go to it [Phillip, Lindsay].

In contrast, Naomi [Forrest] found the lack of support from her manager greatly constrained her ongoing learning because she was unable to attend training sessions or workshops that were not for skills directly related to her current work role. Naomi noted in discussion with her liaison staff colleagues that:

in my case would be totally different from you guys because it is required for your job, so you’re going but for me because it’s not required from my job, what I’m in Lending Services, they don’t take it seriously. Yeah I really wanted to go but it was a busy time and I didn’t get the support from my management, so I couldn’t attend [Naomi, Forrest]

The final identified area of managers’ influence on learning was in the manager’s support for the time needed as part of the work day to undertake learning.

We’ve got so much busy work to do that I don’t think we give ourselves enough permission to have that time, to set that time aside and my manager spoke with me about that when she first started. She said, “when you plan your week I’d really like you to plan say on Friday afternoons or when you first get in, in the morning, for your first half hour, just scan your environment, have a look at what’s out there, get your head around things and give yourself permission to do those things” [Tamara, Forrest].

I can’t remember what I was trying to learn, and I went to my manager and I said, you know I’m constantly being interrupted. I need time off
my desk to - and she was very understanding and gave me two hours a week to go into a little seminar room [Linda, Lindsay]

The importance of the support from managers appeared to be most evident when it wasn’t there. At Forrest Library, where the 23 things program had top level management approval and expectation that staff would be given time to complete it, there were still staff who felt that their direct supervisors complained they were spending too much time on the program. Linda [Lindsay] accepted that although management support for ongoing learning about technologies was present at her library in theory, sometimes the practical side of the support was lacking. Managers were identified as performing a very important role in the enabling and supporting of ongoing learning about technologies by individual staff members.

4.10.2 Influence of colleagues on ongoing learning about technologies

As part of the discussions participants identified that not only did managers have an important relationship with the way individuals undertake ongoing learning, but colleagues did as well. This study found that how individuals interact with colleagues (whether through conversations or physical presence) can shape how they go about their practice. Colleagues assisted in enabling the practice through their own willingness to continue learning, their verbal encouragement and engagement in ongoing learning, through sharing experiences, and as a source of identifying new opportunities for learning. In contrast, the language and expectations of colleagues could constrain the practice, as well as being a source of distraction and discouragement.

Exploring further the enabling influence of colleagues, participants referred often to the knowledge or experience of others as a source of knowledge when they needed to ask someone informally about a technology or how to complete a task using a particular technology. Colleagues were described as being “approachable”, “knowledgeable” and “experienced”, and through presenting workshops and sharing their own learning in a range of formal and informal ways, helped to develop and foster an environment that supported ongoing learning.
<colleague> took us through a demo, hands on practicing [Tamara, Forrest],

there’s also people who are willing to put their hand up and teach us so it’s great [Linda, Lindsay]

basically someone learns it and then …teaches everybody else and that’s how it works [Olivia, Kennard].

Whilst hearing about the technologies others are learning about may not be a learning experiences as such, participants identified that these conversations enabled a foster a learning space and collegial acceptance that ongoing learning was an important part of a library staff member’s role to develop.

we’re a very conversational group as well, people want to learn and share about that. And both you want to tell someone that you’ve found this really great thing because you want to share it and engage them. But also they’re curious to know what you’re doing [Beth, Lindsay].

Colleague had been enthusiastic about it, so I thought I’d learn more about it [Linda, Lindsay]

Jacinta [Lindsay] expressed her comfort in spending work time learning about a particular new technology because she had attended a workshop with her manager and a colleague and “knowing that others were doing it helped”. Simone [Kennard] also recorded in her participant journal when noting what helped her learning experience “a colleague who was also playing around with it”.

Whilst colleagues through their positive learning experiences and sharing contribute to a social space that both supports and encourages ongoing learning by individuals, colleagues were also found to contribute to an environment that discouraged learning and an atmosphere of disapproval for those that spend time learning. Phillip [Lindsay] observed the different impact colleagues could have on a culture of learning in his workplace. Phillip reported a positive experience of having colleagues encourage him to attend workshops to develop his skills versus feeling judged by his colleagues as either wasting time or spending time inappropriately when he was the only one leaving his desk to attend a workshop.
Participants discussed the perceived unspoken judgement of others when they spent time learning. Naomi [Forrest] felt the judgement of others who would look at her screen, and she believed, silently questioned what she was doing watching *YouTube* videos or being on *Twitter* when there was shelving or shelf reading that needed to be done. Tamara [Forrest] who felt the need to justify to a colleague, who saw she was using the *Facebook* app, as to how this related to her work saying “I feel a bit judged sometimes”. Sean [Kennard] felt that his colleagues, in not taking the time to keep up with technologies, were actually “hurting the profession as a whole” and that it was critical for library staff to keep learning and be seen to be up to date. Sean extended this statement to argue that any lack of motivation or staff arguing that they didn’t have time to learn was detrimental to all staff by association.

This perceived judgement of how others spend time at work, especially when considering workplace learning, was also evident in comments participants made about others within their workplace. Tamara and Beth both admitted to silently judging others that they saw as “playing around” with new applications or keeping up with the latest technologies with thoughts such as:

> it’s all very well for them but I’ve got a lot of work to do while they play
> [Tamara, Forrest]

> I know someone who religiously sets aside four hours a week to do their professional learning and I think, how can you do that? [Beth, Lindsay]

Whilst none of the participants talked of ever having had a colleague make a negative comment on their learning, there was still evidence of feelings of being negatively judged. It can be seen from the comments and participant journal entries, the behaviours and attitudes of colleagues, can have either an enabling or constraining influence on someone’s willingness or ability to keep up to date with technologies, and to be receptive to ongoing learning experiences.
Two unexpected themes arose in this study as influencing and shaping the ongoing learning practice of staff. These were the library position of the individual, and when a staff member was beginning a new role. The participants clearly delineated the perceived differing value of ongoing learning about technologies to certain positions within the library, such as liaison librarian or lending services librarian. Participants also identified that when an individual was new to any role within the library that learning about technologies was an important part of their work tasks at this time.

Two participants held roles within the Lending Services areas of their libraries. Both these participants, Naomi from Forrest Library and Vanessa from Kennard Library, shared their experiences on the varying expectations of their managers and colleagues within regard to ongoing learning about technologies.

Naomi [Forrest] had a dual role of liaison librarian and lending services librarian, working half the week in each role. Naomi felt strongly that whilst she was undertaking her lending services role she was actively discouraged from spending time learning. This feeling arose from the behaviour of her manager, who denied her permission to attend training sessions or workshops discussing new or emerging technologies, as these sessions were seen as irrelevant to her lending services role. Naomi further reported that she believed her lending services colleagues also felt she was wasting time or “playing” if she was taking time to learn about emerging technologies. When comparing the environments present for her two roles, Naomi described her liaison environment as “a really good environment… people are willing to help and share” compared with when she was working in her lending services role “it's a different environment with the technology acceptance and with the people who want to stick with the traditional way” [Naomi, Forrest].
Vanessa [Kennard] also expressed her negative interpretation of how ongoing learning about technologies was perceived in her role as a lending services staff member with the following comments:

I’m just a service desk person so I don’t get to do the more sophisticated things [Vanessa, Kennard].

I almost think they don’t want people at my level to progress. It’s in their interest to keep me at this level basically [Vanessa, Kennard].

When Naomi [Forrest] shared during the focus group session of her experience of the different environments in which she worked, others in the group wondered why the environments between the two roles were different given that they believed it was important for all staff to continue learning about technologies. The participants suggested that the cause of the difference included that reference and liaison staff have greater autonomy over the work day; that the work of reference staff often involves learning technologies in order to answer client questions; and that the range of technologies needed to undertake the liaison role was greater and more complex. The influence of different managers, which has already been discussed was also identified as a factor.

The other interesting influence on ongoing learning of technologies was perceived to be the length of time a person had been within a position. At certain times within a person’s position it was considered to be more acceptable to spend time learning during work time. While not documented within any of the sites’ policies, participants felt that there was general acceptance by managers and colleagues alike, that when a person was new to the organisation, or had taken on a new role within the organisation, that a certain period of increased learning was required and acceptable. This learning would be centred on understanding the technologies and processes unique to a particular site or new role. Phillip [Lindsay] reported taking on a new role and feeling that his manager and colleagues expected that he would spend a fair amount of time learning about the new technologies he needed in his new role. Melanie [Kennard] and Zoe [Lindsay], both new to
their respective organisations, acknowledged that their colleagues and managers accepted the need for time spent learning. Zoe explained it as:

I think there’s certainly been <an> expectation initially of you’re learning the role a bit more … than if I had been here a while [Zoe, Lindsay].

Managers, colleagues, a person’s position, and length of time in a position were all found to shape the ways in which individuals enacted their ongoing practice. These social-political arrangements, as well as the seeming lack of discourse within the workplace about ongoing learning, combined with issues of physical work space and time to learn, were all identified as shaping the practice of ongoing learning within the sites studied. By being able to consider the range of practice architectures present in a particular site a picture has emerged of the complexity of influences present when considering how library staff are enacting their practice.

4.11 Conclusion

This chapter has outlined in detail how academic library staff are currently undertaking the practice of learning about technologies within their work role. Both the language used to define emerging technologies and the actions of learning are focused around the individuals’ perspective. While individuals connect with colleagues in order to access learning, there is limited collective practice being undertaken. Managers were seen as having a strong influence on an individual’s practice as they support both the individual’s learning as well as promote a learning environment. The next chapter, Chapter Five, will present and analyse these findings from the perspective of the intersubjective spaces in which individuals encounter others and their environment.
Chapter 5

5 Analysis

5.1 Presenting and analysing the findings

This chapter analyses the findings presented in Chapter Four. The action research methodology undertaken as part of the data collection phase of this study provided a large amount of descriptive data that needs to be interpreted further in order to identify the nature of the practice within the sites studied. As part of this methodology, focus groups offered opportunities for participants to discuss their understanding of their practice of learning about emerging technologies. These focus groups were held before, during and after two periods of recording actual learning experiences. The two recording periods offered participants the means to consciously record and reflect on their learning experiences to provide real time data and inform further discussion. The researcher was also able to reflect back to participants (during the focus group meetings) previous discussions to prompt further debate in the light of their learning experiences. This data has been presented in the previous chapter, firstly from the individual's perspective (their sayings, doings, and relatings). This was then followed by the participants' view of the site arrangements influencing their practice (the cultural-discursive, material-economic, social-political arrangements). This analysis of the data will discuss the reasons for the practice, connections between the practice elements and site arrangements, as well as the practice landscape and traditions present at the time of the study.

The purpose of using the theory of practice architectures as a framework for discussing the data in this study was to gain greater insight into learning practices through the identification of the practice architectures enabling and constraining them (Kemmis, Wilkinson, et al., 2014, p. 223). Kemmis and colleagues (2014, p. 226) suggest a table of invention or table of practice as one method for both presenting and discussing practices and practice architectures. Thus Table 5.1 presents the findings of this study graphically. By calling attention to the relationships between parts of the practice and the
practice architectures, the table of practice assists researchers to find connections and interdependencies within the site. Identifying these connections and interdependencies provides a richer understanding of the semantic, physical and social spaces (the intersubjective space) within which practices take place (Kemmis, Wilkinson, et al., 2014, p. 227). This understanding should lead to a better appreciation of how learning practices are enabled and constrained in a particular site and means by which they can be transformed into the future.

Included in Table 5.1 is the intersubjective spaces (semantic, physical and social) in which the practice is realised as a reminder of the significance of these spaces as the medium of practice. As individuals bring their sayings, doings and relatongs into a particular site, they encounter the arrangements present in these spaces (Kemmis, Wilkinson, et al., 2014, p. 4). For example, the sayings of individuals shape and are shaped by the cultural-discursive arrangements of the site, and are evident within the semantic space.

Similarly, the doings of a practice shape and are shaped by the material-economic arrangements and are evident in the physical space. Within the social space, the relatongs of a practice shape and are shaped by the social-political arrangements. In accepting the interdependence of practice and site, the intersubjective spaces will be used to structure the analysis of the findings of this study. This Table aligns with the graphic depiction of the theory of practice architectures as shown in Figure 2.5 of this thesis (p. 42).

Table 5:1

<table>
<thead>
<tr>
<th>Elements of practices</th>
<th>Practice architectures in the site</th>
</tr>
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<tbody>
<tr>
<td><strong>Project (Findings 4.2)</strong></td>
<td><strong>Practice landscape (Findings 4.7)</strong></td>
</tr>
<tr>
<td>The aim of undertaking the practice is to:</td>
<td>The setting for the practice is a university library providing information services to its host university. Features of this setting include:</td>
</tr>
<tr>
<td>• maintain professional status within the university,</td>
<td>• a range of staff, undertaking various roles, engaged in a range of practices</td>
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<tr>
<td>• continue to provide relevant services to clients,</td>
<td>providing services to students, academic staff, and other library stakeholders,</td>
</tr>
<tr>
<td>• enable the Library to be seen as up to date and providing quality services,</td>
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and progress in their job, and
to keep one’s job interesting by learning
new things.

This is done through:
informal individual learning,
engaging with colleagues, and
formal learning opportunities

• an established history of meeting library
users’ information needs through the
provision of information services,
staff having access to their own PC and
there is university IT support available,
work roles requiring daily use of
technology and exposure to new and
emerging technology is a constant
feature of the work landscape, and
participants working in small teams
reporting to a manager, having different
degrees of autonomy over their work
days, and engaging in required desk
shifts in the library.

Sayings (Findings 4.3)
Participants:
use of variety of language to
describe the action of learning
e.g. learning, exploring, trialling,
experimenting, trying, playing,
have mixed reactions to the use
of the term play to describe
learning about technologies,
did not describe themselves as
early adopters, and
described needing to have at
least base level knowledge of a
range of technologies to do their
job.

Semantic
Space
(realised in the
medium of
language)

Cultural-discursive
arrangements (Findings 4.8)
Cultural discursive arrangements
included:
a lack of a common language
describing learning and
technologies,
 Few reported discussions with
managers and between
colleagues about ongoing
learning about technologies,
training plans that explicitly
supported ongoing staff
development
 training plans and comments
from participants reflected mixed
messages about who’s
responsibility it was to manage
ongoing learning, and
limited explicit support for
ongoing learning with some
support present expressed
through implicit means.

Doings (Findings 4.4)
Participants undertook learning by:
individual exploration e.g. trial
and error or using online help,
asking colleagues for help,
attending workshops or
presentations, and
presenting workshops to staff or
students.

Physical
space-time
(realised in the
medium of
activity and
work)

Material-economic
arrangements (Findings 4.9)
Material economic arrangements
included:
open plan offices that provided
easy access to colleagues,
noise and interruptions present
due to open plan offices making
it difficult to focus on learning,
feelings of being judged by
colleagues present when open
plan offices allow others to see
screens showing learning by for
example playing,
a need for space away from
others to facilitate concentrated
learning identified,
time as an important influence on
learning, including perceived lack
of time to learn, pressure of
deadlines, something that should
be used wisely when learning,
<table>
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<tr>
<th>Relatings (Findings 4.5)</th>
<th>Social-Political arrangements (Findings 4.10)</th>
</tr>
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<tbody>
<tr>
<td>Participants describe:</td>
<td>Social political arrangements included:</td>
</tr>
<tr>
<td>• different understandings of the place learning has as part of a person’s work role,</td>
<td>• line managers having a considerable influence on learning,</td>
</tr>
<tr>
<td>• feelings of being overwhelmed, lacking in confidence, frustration, and expectations of others influencing the learning experience,</td>
<td>• managers having the ability to facilitate a supportive, or less than supportive, environment for learning,</td>
</tr>
<tr>
<td>• being prompted to learn in order to appear professional when interacting with academic staff,</td>
<td>• managers being expected to provide direction on what technologies to learn as well as identifying future development needs of individuals,</td>
</tr>
<tr>
<td>• learning new technologies in order to answer requests from clients or provide new services,</td>
<td>• managers having the ability to facilitate access to workshops to support learning,</td>
</tr>
<tr>
<td>• seeing learning as their professional responsibility in order to identify, evaluate and share knowledge about new technologies with students and academic staff,</td>
<td>• managers having the ability to influence workloads and support time allocation for ongoing learning,</td>
</tr>
<tr>
<td>• learning particular new technologies was a requirement of the job,</td>
<td>• colleagues influencing learning through encouragement, engagement, and sharing experiences,</td>
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<tr>
<td>• learning is sometimes driven by opportunities presented by the university or library,</td>
<td>• colleagues perceived as judging others learning practice,</td>
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<tr>
<td>• learning as difficult to plan as it was often reactive,</td>
<td>• ongoing learning considered an important part of some work roles, and not for others, and</td>
</tr>
<tr>
<td>• how better use of professional development plans may assist ongoing learning,</td>
<td>• being new to a library or role was an accepted time for learning.</td>
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<tr>
<th>Social space (realised in the medium of power and solidarity)</th>
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<tbody>
<tr>
<td>Dispositions The knowledge, skills and values used or developed by participants included:</td>
</tr>
<tr>
<td>• knowledge acquired previously about how to use a PC and search online for</td>
</tr>
<tr>
<td>Practice traditions Traditions that supported the practice included:</td>
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<tr>
<td>• a history of ongoing learning being an individual pursuit, and the responsibility</td>
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<td>Information,</td>
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<tr>
<td>• knowledge and skills in the use of a range of software programs and the navigating of websites,</td>
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<tr>
<td>• individual confidence in learning new technologies as influenced by previous learning experiences</td>
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<tr>
<td>• individuals displaying various levels of motivation for learning,</td>
</tr>
<tr>
<td>• personal understanding of professionalism within the library profession as shown in the value placed on enacting the practice of ongoing learning, and</td>
</tr>
<tr>
<td>• personal language and understanding of how to facilitate their own learning.</td>
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**Note.** This table is adapted from ‘Table of invention’ for analysing practice (Kemmis, Wilkinson, et al., 2014, p. 226)

### 5.2 The project of the practice

In studying practices it is important not only to identify the elements that make up the practice but to also consider why a practice is being undertaken. The purpose, or project, of the practice explains why individuals undertake a particular set of actions and use the language they do to describe those actions (Kemmis, Wilkinson, et al., 2014, p. 14).

Individual language and individual actions on their own do not form a practice, yet when they are brought together in a social site they form projects (Kemmis, Wilkinson, et al., 2014, p. 32). When individual understanding and action combine with those of others' they form a distinct project, encompassing the intention, actions and aims of the practice (Mahon et al., 2017, p. 8). To discuss the practice of learning about technologies, it is necessary to understand the project; the purpose or reasons why individuals and groups of individuals are enacting the practice, and what they hope to achieve by it.

Participants described the purpose of continuing to learn about technologies as a means of improving the ability of the organisation to provide services through the use of technologies. The participants believed that through ongoing learning they were also able to improve their own personal skills to
deliver relevant services and therefore be viewed as professional by colleagues and the broader university community.

Having knowledge of the technologies currently being used to provide services to the library’s clients was also important, as was the need to keep up with the technologies that the students were using in everyday life. Students’ use of mobile devices and social media to access information in general impacts on how they expect to be able to access information from the library. Participants were aware that their libraries do not provide services within a vacuum. Consideration has to be given as to how students and academics are using technology to access services from other parts of the organisation and indeed other organisations and the impact this may have on how the library delivers its services.

When looking for the reasons why the practice of ongoing learning about technologies is being enacted, the evidence showed that there were both external and internal reasons. The ongoing provision of quality services, and the library and library professionals being able to justify their existence within the university, were compelling reasons why individual staff felt it was important for them and their colleagues to continue to learn about technologies as part of their workplace practice. Individuals were concerned about their own ability to maintain and develop the skills they needed to keep their jobs or progress their careers within the profession. Recognition that learning provides the opportunity to improve workplace practice as well as add interest to one’s job also drove ongoing learning.

The importance of continuing to learn about technologies was expressed in the language, actions and reasons participants gave for their practice. They reported requiring at least base level knowledge of a range of technologies, needing to continue learning to respond to client requests, and to develop their own skills and confidence. It is only when the sayings, doings and relatings that make up a practice come together for the purpose of achieving these goals, that practices are described as projects (Schatzki, 2002, p. 73). Understanding the project of a practice provides the means of bringing
together the motivation for the practice, the actions and the hoped outcome (Mahon et al., 2017, p. 25). This understanding provides individuals both the ability to continue to enact the practice and the power to adapt and transform the practice for the better in the future (Kemmis, Wilkinson, & Edwards-Groves, 2017, p. 248). Insight into the project of the practice also brings the acknowledgement that the practice is held in place by the current practice landscape.

5.3 The current practice landscape

It is the current practice landscape that provides the setting in which many practices come together and includes the people, practices and practice architectures that constitute the setting (Mahon et al., 2017, p. 25). Not everyone involved in a practice has the same degree of involvement or interaction with the objects that are present. It is necessary to consider who is involved, their level of involvement and what objects are present as part of the practice being studied (Kemmis, Wilkinson, et al., 2014, p. 39).

Participants had varying levels of interaction with students, academic staff and other library stakeholders such as senior managers of their host university. Those participants undertaking circulation, reference and liaison roles had a high level of interaction with students and academics. These interactions included often assisting these clients with the use of a variety of technologies to access the library’s collection or services, or to source information held elsewhere. The information management staff member, and the one middle manager in this study had less daily interaction with students and university staff; instead using technologies to provide a range of library services such as access to research databases or the library’s collections. Each of the participants used technologies on a daily basis to complete their job requirements.

In considering the practice landscape it is also necessary to consider the tensions and contradictions between practices that happen in a site (Mahon et al., 2017, p. 20). In this case, the practice of ongoing learning was occurring in the same time and place as other practices being undertaken by
groups of individuals. Library staff are required to undertake a range of practices such as the provision of lending or reference services to students, liaison with academic staff, and the administrative tasks that are part of the practice of being a staff member of the university. All these practices are undertaken by individuals as part of their engagement within their work site and compete for space and time within the practice landscape. Pressures from these competing practices can be seen in the participants’ concerns about managing priorities, lack of time to learn and an ambiguous understanding of the role of learning within the work role.

The practice landscape works to keep current practices as they are within the site, but will be changed if practices are transformed through modifications in the arrangements shaping a practice take place. Moving from the practice landscape to consideration of the intersubjective spaces, the next section explores the semantic space where the sayings and cultural-discursive arrangements shape practice.

5.4 The semantic space

In the semantic space language is the medium by which the sayings and cultural-discursive arrangements are realised. Language is an important component of social interactions, with practice theorists arguing that language is used to both describe and achieve action. Language and communication are needed to bring action into being (Nicolini, 2012, p. 190). It is necessary for a person to verbalise an action, even silently, such as I need help from a colleague before the action of rising out of a chair and going to talk to a colleague can occur. The importance of language as a means of bringing about action within practices is also emphasised by the constructivist epistemological basis of this study. It is through shared understanding and language that people within a site develop both the actions appropriate for, and the meaning of, their reality (Williamson, 2018c, p. 12).

Kemmis and Mahon (2017, p. 227), in exploring the development of the theory of practice architectures, discuss how within the semantic space,
individuals coordinate their own language with that of others as a way of developing a shared practice. Knowledge and meaning are developed through having a specific, common language, yet this study found little evidence of a common language either for understanding what emerging technologies were, or how to go about learning them in the workplace.

5.4.1 Defining emerging technologies

The decision was intentionally made in this study not to provide participants with a definition of emerging technologies because it was important to explore the language being used within the site rather than imposing a definition from outside. In making this decision, and providing participants the opportunity to share their own understanding, the research found individual participants did not have a clear collective understanding of the term emerging technologies. Each participant was able to share their own understanding of what emerging technologies were, while also acknowledging that their definition might not be the same as others’. In addition, as a collective there was a wide range of language used to describe emerging technologies and no evidence that the topic had previously been discussed. What was apparent was that for all participants, emerging technologies included examples of both hardware and applications software.

Whilst computer hardware is a constant part of a librarian’s work life, and participants were able to discuss a range of hardware that they had experience with, or knowledge of, it was of interest that there were few examples of encounters with new hardware technologies listed in the participants’ journals. Interactive pens, 3D printers, drones, video and audio conferencing hardware, Google glasses and Virtual Reality headsets were all reported during discussions of emerging technologies. Yet, in acknowledging all these examples, only one participant recorded learning about any of them in their participant journal. This suggests that whilst library staff know about or have heard of a range of new hardware technologies, these were not being used in these academic libraries or at least not in the areas of the library in which the participants were working. It might also be extrapolated from the absence of this learning experience that the introduction of new
hardware in the academic library setting happens less frequently than encounters with new or emerging software applications.

Whilst new hardware technologies have the potential to have a major effect on the way services are provided by the library, emerging technologies within the application software space were more commonplace in participants’ everyday work. Participants acknowledged that often the impact of new software was not as disruptive as with new hardware, despite happening more frequently. Emerging technologies in the applications software space were described by participants as being new programs or changes to existing software packages such as a new version of Microsoft Excel or upgrades to library management systems.

5.4.2 Developing a collective understanding of emerging technologies

Participants, through the process of discussing and reflecting on their practice, acknowledged that there did not appear to be a clear definition of the term emerging technologies, either for themselves individually, or as a group in their workplace. Before beginning the journal recording phase of this study participants at Lindsay Library asked whether using old technology in a new way or learning a new component of an existing software program could be regarded as learning about an emerging technology. The question was put to the group. The consensus at this site was that extending a person’s knowledge of existing software program or learning the features of a new version of that software program could be considered as learning about an emerging technology as these features were new to them personally and therefore an emerging technology. Whilst this was the consensus of the group at the time, and an example of the group generating knowledge about a particular practice through shared discourse, overall this definition remains an individual-centric one.

Whilst the participants in this study described emerging technologies as those that were new or emerging for them personally or within their own library environment, this differs to the definitions offered in the literature. This difference will be examined further in the Discussion Chapter including how a
site specific definition might be developed (section 6.2). Language is important in developing a shared understanding of what is meant by the term emerging technologies, and also provides the basis for driving action, in this case, the language associated with the act of learning.

5.4.3 The language of learning

The participants’ use of a range of language to describe their learning experiences and their level of knowledge of technologies points to how learning within the work environment is perceived. There was a dichotomy found between participants; on one hand, there were those who strongly identified learning as an important part of their work and role, and on the other those who identified learning as an activity separate from their work role. This dichotomy emphasises the importance of language in shaping both the doings and relatings of a practice and will be explored further when the relatings of the practice are discussed later in this chapter (section 5.6.1).

Differences were also found among participants with respect to the words used to describe their learning practice. Some participants clearly described any encounter with new technologies as a “learning” experience, while others used a range of words including “trialling”, “exploring” and “playing”. As playing was a word deliberately chosen to describe ongoing learning for the 23 things program, this was explored further by the researcher at each site. Play for some participants described actions of exploration and trialling, possibly offering the option to learn without fear of failure or not achieving a desired outcome. Participants reported developing technological confidence through playing with new technologies and playing implied a less threatening experience than other types of learning experience.

In contrast to the positive aspects of play as a means of learning and gaining confidence, the participants also identified using the term play to describe activities they believed were not seen as appropriate within a work context. For example, Olivia [Kennard] wanted to “play” with a particular software program but acknowledged that she had lots of other responsibilities that came first and that playing would need to wait until after her other work was
completed. Another participant worried about spending too much time playing, what she described further as “wasting time”, instead of working. Reasons for this concern about describing the action of learning as playing might include the possible trivialising of the activity, and play is by nature, not being directed towards a goal (Kurt, Kurt, & Medaille, 2010, p. 10).

Individuals bring to a site their own understanding and experiences of language, and these examples of different interpretations of the word play are evidence of this. The language used within a site gives individuals an understanding of what language is appropriate for use at that site and also what meaning is attached to particular phrases. Participants reported they had had few discussions either with their line managers, or between colleagues related to the ongoing learning about technologies. The lack of conversations about, or an agreed language to discuss, learning or emerging technologies within each site meant that each individual was relying on their own experiences and understanding to direct the language they used. Through discussion in the workplace, a common language and understanding about learning could develop; either as a means to obtain skills, or as a process of developing confidence, as well as skills. In trying to understand the common language of a practice, individuals often look to the written as well as spoken word, in this case, training or learning and development plans.

Training plans provide evidence of the written language and an understanding about how ongoing staff development is presumed to be enacted within a site. These training plans can also aid in embedding a practice within a site, whilst reinforcing the practice arrangements that are shaping the practice. An example of how a written document might be considered to hold a practice in place is evidenced in the Kennard Library training plan. This plan focused the practice of ongoing learning via attendance at training events such as workshops, and listed opportunities for staff to further their learning through attendance at three workshops provided by external providers. In so doing, staff were lead to understand that these were appropriate ways in which to enact the practice of ongoing learning. In
contrast, the training plan from Lindsay Library had a strong emphasis on the language of learning including phrases such as the “learning experience”, “learning opportunities” and individuals engaging in “planned learning”. While the Kennard Library training plan provided direction on one means by which to undertake knowledge and skill development, the Lindsay Library training plan encompassed the range of possible ways in which an individual might undertake learning. The value of engaging in a number of learning methods is explored further in the Discussion chapter (section 6.8). The difference between training and learning was discussed as part of the Literature Review chapter (section 2.3.1) and will be considered further when discussing training plans as part of the Discussion chapter (section 6.5.6). Between these two sites, the difference in emphasis between attending training events and seeking learning opportunities, highlights the ways in which different communities develop and sustain their practice and in turn develop the knowledge of individuals and their communities (Lloyd, 2010b, p. 152).

5.4.4 Enablers and constraints within the semantic space

In reviewing the participants’ practice as realised within the semantic space, the importance of language in shaping practice is evident. The lack of a common definition or understanding about what is an emerging technology, and perceived lack of discussion within the site about ongoing learning of technologies, means that individuals were relying on their own experience and understanding to drive their practice. Written documentation in the form of training or learning plans provided little guidance in appropriate language either. The cultural-discursive arrangements present at the three sites studied can be considered to be constraining the practice of ongoing learning by not being clear about what learning about emerging technologies involves and how the site will support it. Individuals’ language and understanding were sustained by their own personal experience and knowledge; their dispositions.

5.5 The physical space

Within the physical space the actions of groups of individuals are realised and shaped by the material-economic arrangements present. Doings can be
seen as the easiest aspect of practices to understand and articulate, as they are often evidence of the skills and capacity of an individual (Kemmis & Mahon, 2017, p. 230). In describing their own actions, participants described the ways in which they usually approach any new technologies on their own, using their previous knowledge and skills as a basis for learning something new. It was only following attempts to learn on their own and possibly not achieving the desired outcome that individuals then sought out colleagues, especially those that they believed had greater knowledge of the particular technology in question. This type of learning was unidirectional in nature, individuals asking questions of a colleagues in order to learn something.

Attendance at workshops and presentations about applications software that were being introduced into the workplace or that may be of interest were also cited as means of actioning learning. Participants reported that these types of sessions provided the opportunity for more formal learning as they listened to presentations by those more knowledgeable about a particular software program and were able to ask questions. Tamara [Forrest] explained that a “<colleague> did a demonstration [of Scoop.it] and we had some hands on practicing, so I just thought I could do this”. Following the session Tamara felt confident to explore the new technology further on her own.

In contrast to these unidirectional interactions where colleagues received information from an external source, there were some examples of more informal sessions aimed at discussing new software programs that were available. These informal sharing sessions were seen both by participants and presenters as very useful and provided the opportunity for colleagues to work together to build knowledge. The value of these sessions was seen in the opportunities they provided to gain insight into new technologies, build confidence in attendees to explore further and to share ideas about the value these technologies might have in the workplace. Despite being considered valuable by those who had attended, these sessions were not being offered on a regular basis at any of the sites.
Being able to share personal knowledge, validate learning experiences, and build site specific knowledge together is an important aspect of social learning. Lave and Wenger in studying communities of practice validated the role that colleagues can play in sharing knowledge and developing learning within an organisation (M. K. Smith, 2009). Through having opportunities to build social knowledge by way of discussions about new and emerging technologies, groups of individuals are also able to evaluate the role these technologies might have in improving services to clients of the library.

The material-economic arrangements shaping these learning actions included the access to colleagues as afforded by office arrangements as well as the time available to undertake the actions. Participants identified both enabling and constraining features of their physical environment as it impacted on their learning experiences.

5.5.1 Learning in an open plan office

Learning is often associated with individuals acquiring skills and knowledge, and the findings of this study emphasised the solitary nature of learning about technologies being undertaken by participants. Each of the participants acknowledged that when encountering a technology they hadn’t used before, or trying new features of a software program, their first instinct was to attempt to learn it on their own. As much of a person’s formal education is aimed at individual knowledge acquisition, this reaction was not unexpected.

The focus on individual learning was made difficult by the environment of the open plan offices in which most participants’ worked. Noise and interruptions were cited as making it difficult to concentrate when learning something new. Participants also reported feeling judged by colleagues when they were learning on their own and at times judged others negatively for spending time learning. Participants stressed that when they were attempting to concentrate on learning a particularly difficult software program, it would be preferable to have access to a space away from the noise and interruptions of the open plan office. Such a quiet space, with access to appropriate hardware and applications software, would enable more effective learning.
In apparent contradiction to open plan offices constraining the learning practice, at times when individuals were asking colleagues for help to learn about a particular technology, the office arrangement enabled quick and easy access to assistance. Being able to approach a colleague in the open plan office to ask a question, or seek help, empowered individuals to gain knowledge quickly. For example, Angela [Forrest], working in the Information Management department of her library, sought answers from colleagues so she was able to implement the library system software as required by the workflows of her particular site. This site specific type of help was not available through help screens or online videos. While the physical set up of the working environment had an influence on the actions of participants, time was cited most often as the major material-economic arrangement shaping ongoing learning.

5.5.2 Time as a resource needed to undertake learning

When considering the range of influences impacting their learning practice, participants consistently reported not having enough time as having the greatest impact on their ongoing learning. Time, or lack thereof, has been identified in previous studies of programs focusing on learning about emerging technologies as one of the major reasons these programs were not completed (Gross & Leslie, 2010, p. 661; Stephens & Cheetham, 2012, p. 12). Whilst this will be discussed further in the Discussion chapter (section 6.9), it is important to understand the participants’ experiences in more detail.

In exploring the idea of lack of time for ongoing learning further with participants, competing priorities, the pressure of deadlines, and concern about wasting too much time learning were all raised. Participants reported having to complete their core tasks before they had time to spend learning, and decreasing staffing levels meant that they were being asked to do more in less time. When time was spent learning to either answer a client’s question or in order to present a particular technology to others, participants felt they were often hampered from being able to learn enough due to externally imposed deadlines.
In acknowledging the limited time available, some participants shared concerns that with the large amount of new technologies available to learn they wanted to spend their limited time learning technologies that would be useful to them in their work. For this reason, participants often looked to others to direct their choice of technologies to learn, whether it be other staff members’ recommendations about relevant applications software or through reading blogs or e-lists for technologies that may be relevant to their work place.

Yet, for a few participants, the issue of time was not a consideration. These participants were comfortable allocating time during their work week to focus on learning about new and emerging technologies, with the aim of identifying technologies that may be of use to them or their students. These participants were also those that identified ongoing learning as an important part of their role and professional career, and were more likely to have had explicit conversations with their managers about their ongoing learning practice. Lack of time is often cited as a reason for not undertaking ongoing learning, yet it needs to be better understood as there are those within each of the three sites studied who were finding or making sufficient time for ongoing learning.

Lack of time wasn’t always an issue when considering workplace learning about technologies. Participants believed that spending time learning a new technology, or extending knowledge of a technology they currently used, was justifiable when it was directly related to answering a reference question or fulfilling a request from a library client. For example, in response to a request from a client for a particular report from the University’s research database, Sara [Forrest] had to learn how to use features of both the research database and Endnote to complete the request. Sara expressed no concerns about spending the time required to learn the features she needed to know to complete the request.
This type of learning, in response to a workplace problem, is a common reason for undertaking workplace learning. Deliberate in nature, this type of learning has a clear work based goal, and involves workers engaging consciously with a particular problem (Eraut, 2004, p. 250). Sara [Forrest] would not have considered *not having enough time* as an acceptable reason for not undertaking the learning needed to answer the client’s question. Instead, Sara expressed regret that it was the deadline for completing the request, which actually prevented her from spending more time learning beyond the basic skills she needed to complete the request.

Undertaking learning in response to a workplace problem, while removing concerns about committing time to such learning, also raises the issue that this goal orientated learning often results in exploring only the features of a technology required to complete a task. While the current learning needs are met, goal orientated learning does not always provide for further exploration and reflection on the potential of a technology to assist future requests (Eraut, 2004, p. 250). If an investment of time is required to explore particular features of a particular technology it can also be argued that further time and effort would be useful to ensure a person develops greater competency in understanding and using that technology (K. G. Brown, 2005, p. 466). Whilst acknowledging there were times within a person’s workday that it is appropriate to spend time learning about a new technology, in this case, when answering a client’s question, ideally there should also be the opportunity to spend further time exploring and reflecting in order to gain a wider knowledge of the potential of the technology for future use.

Whilst much of the learning undertaken within the education system is designed to produce an outcome, that is gaining an answer to a question, time spent exploring the wider features of a technology may not always result in a quantifiable outcome. Focusing on learning as a means of acquiring knowledge, means that individuals might only see the value of their learning when it is directly linked to a work related goal. In recognising the benefits of learning with no immediate work related outcome, learning in order to explore the possibilities of a particular technology, may require a shift in the
thinking within the site about the range of objectives for ongoing learning. Library staff attend conferences without necessarily having direct work related outcomes but instead to hear about and reflect on a range of possibilities with a view to their value to an individual’s workplace. By considering time spent exploring technology as a similar activity, the value of ongoing learning might not be immediately obvious but may result in an unforeseen benefit in the future. To shift the mindset of both individuals and the organisation to consider future benefits for ongoing learning will require conversations within the workplace on the place learning has, both in meeting immediate needs and also future possibilities. Once again, the value of language and discourse in shaping the practice of ongoing learning can be seen as they influence individuals on how to regard the use of time in shaping their practice.

5.5.3 Enablers and constraints within the physical space

At each of the three sites, participants were enabled in their ongoing learning practice through having access to their own PCs and when required, headphones to cancel out surrounding noise. The open plan office also provided quick access to colleagues who were often used as a source of site specific learning. For those participants who chose to allocate specific time to undertake learning, this action supported their learning practice. These same practice architectures (open plan office and time) were also perceived as constraints to the learning practice in the form of noise and interruptions and perceived lack of time available.

5.6 The social space

In considering the semantic and physical space so far, a number of practice architectures have been identified as shaping the practice of individuals. Yet, it is in the social space that one of the greatest influences on shaping the learning practice is realised; that being the impact of the behaviours of managers. The positive impact of manager behaviour was evident in their capacity to promote a supportive environment for learning, have explicit conversations about ongoing learning and to facilitate social learning among staff. Managers also help shape the language and conversations about
ongoing learning in the workplace as well as guiding staff on prioritising learning within their work roles. The social space was also where the relationship participants had with the learning experience within the greater practice of their work role emerged. The ways in which the relatings and social-political arrangements were realised in the social space gives support to this being an important aspect of the theory of practice architectures. As well as managers having an influence in this space, the learning/work dichotomy and the impact of colleagues were also identified as shaping practice. This next section considers the reported disconnect between learning and work described by some participants.

5.6.1 Learning as a part of working

In exploring what was prompting the learning experiences of the participants, it was found that there was a strong sense of professional identity that drives individuals to continue learning about technologies. Being able to continue to deliver relevant services to students, and work with academics using the same software programs were also important factors. Professional librarians were seen by these participants not only as being able to use the range of technologies that the students and academics were using, but were also able to identify and evaluate the usefulness of new technologies. This study also found an organisational demand to be able to use a range of technologies as a normal part of the library role and this necessitated ongoing learning of technologies by library staff. Yet, having identified the importance of ongoing learning about technologies within their work practices, participants weren’t always clear about the role their learning practice had in relation to their core work tasks.

While some participants understood that their learning practice was interwoven with their work practices, there were others that described learning as a separate and distinct practice. Olivia [Kennard] and Alice [Lindsay] clearly expressed their understanding that learning was an important part of their work practice and through ongoing learning within the workplace they were better able to undertake their work tasks. In contrast, learning was also described as a “secondary activity” [Vanessa, Kennard] or
an “added extra” [Beth, Lindsay] implying that for these participants learning was a separate practice to that of work. These varying viewpoints might stem from different understandings of the concept of learning. While Olivia and Alice considered learning as a process that involves interactions with both humans and objects within their workplace, Vanessa and Beth expressed an understanding more closely linked to learning and knowledge being something that is acquired in isolation and then transferred to the workplace. Alice, in particular, described discussing the role of learning as ongoing work with her managers and was clear about the organisation’s commitment to developing staff. Eraut in researching workplace learning also found that the majority of his respondents equated learning with formal education and training programs and that they saw “working and learning are two quite separate activities that never overlap” (Eraut, 2004, p. 249).

5.6.2 The influence managers have in enabling ongoing learning

Managers can have a strong influence on the learning environment of a particular team through their support of an environment that does not punish mistakes, and explicitly values sharing of new knowledge (J. Cohen, 2013, p. 514; MacNeil, 2004, p. 98). Although participants found it difficult to explain what exactly constituted a good learning environment, they were able to share examples of those managers who they believed were enabling a positive culture of learning, and who strongly supported the ongoing development of staff. Participants reported that supportive managers explicitly assisted ongoing learning by providing opportunities and encouragement to attend relevant workshops or events, altered desk shift rosters to facilitate individual’s attendance at workshops, and directly provided time to enable learning to occur during work hours. In describing a specific manager at the Lindsay Library, participants discussed the manager as never saying “we can’t do that” or “it’s not part of your work”, instead the manager was more likely to say “Keep doing whatever your main role is but if you’ve got time to do this, then explore it and yeah, let’s have a go. Let’s try it out”. Interestingly, despite the obvious support for ongoing learning, this manager still indicated through his language, that learning was something separate from a person’s main role and to be undertaken after the core tasks
were completed. This may be reinforcing the work/learning division that was discussed earlier in this section (section 5.6.1) and shows how easily the language used within a workplace can shape the practice within that workplace.

In discussing the explicit support of one particular manager at Lindsay Library, participants also shared a change that had been noticed in a particular team’s attitude to ongoing learning as a result of a change in their line manager. From the participants’ perspective, learning and sharing were no longer encouraged and the participants believed that this had resulted in a decrease in the individual team members’ willingness to undertake learning, both formally and informally, and had contributed to a decline in morale across this team.

Management engagement in the practice of ongoing learning as an enabling practice architecture does not appear to have been highlighted in other studies discussing the role of managers in supporting workplace learning. Participants in this study did, however, identify managers’ modelling ongoing learning practice as important. When managers were seen to attend training events or workshops, to be actively exploring new and emerging technologies, or to be engaging in conversations about technologies, participants described being more comfortable in engaging in ongoing learning themselves as part of their own daily work practice. Conversely, when managers did not actively engage in ongoing learning, participants reported that this influenced their own willingness to undertake ongoing learning. At the Forrest Library, where one of the senior managers was actively engaged in not only exploring but sharing her experiences with new and emerging technologies, staff felt this implicitly gave them permission to not only spend time exploring new technologies, but to also share their experiences with others in a public forum such as Twitter.

Positively, the few participants who did indicate that they had had explicit conversations with their managers about their future learning needs confirmed that they felt enabled to undertake ongoing learning of
technologies as part of their work role. In contrast, those who reported not having had definitive development conversations with their managers were not as certain as to whether learning was supported by their manager nor what particular technologies they should be learning as part of their role. This contrast highlights the different ways managers are enabling and constraining practice.

Participants looked to their line managers to provide direction on where to focus their individual learning efforts, particularly when relating new and emerging technologies to current work tasks or future library services. Three participants expressed a desire for direction by sharing examples of when that direction was not provided. Jacob [Kennard] expressed his frustration about the lack of clear direction given by his manager, when having spent time learning a new software program, he was told by his manager he had wasted his time as this program was not relevant to the library. Interestingly Jacob described this incident when discussing that self-directed learning or what he described as “the bottom up approach” to setting direction for learning about technology was employed, instead of library management providing direction on what to learn, a “top down approach”. Alice [Lindsay] expressed a need for clear direction regarding the adoption of technologies to prevent following the latest trend which could lead to time wasted focusing on technologies that was quickly replaced by a similar product or technologies not relevant to their particular workplace.

Olivia, [Kennard], also experienced disappointment when having investigated the potential of Oculus Rift glasses, was told by her manager that they had no future in their library, without opening up a discussion about the potential they may have. These were examples of staff taking the initiative to explore new technologies with a view to determining their relevance to the library and their own work. Having taken the initiative they were informed that the technology was not relevant to the direction the library was taking, or having learnt about a particular software program, was told that due to a newer technology, the previous technology knowledge was no longer needed. Participants saw this as a clear lack of direction by management as to which
technologies should be learnt or what the library’s technological future might require.

5.6.3 Colleagues too have a role in enabling learning

Whilst managers have the ability to help shape the learning environment through discussions and providing direction, it is also important to recognise and explore the impact colleagues have in shaping the practice of ongoing learning. Participants highlighted a number of ways in which they believed colleagues were shaping their practice, including providing site specific knowledge, and suggestions as to which particular technologies might be worth learning. Colleagues were also identified as a quick source of information due to their close physical proximity within the open plan office environment. Participants identified that asking a colleague for help with a particular technology was often quicker than researching it on their own. These findings support the research literature which has identified that colleagues can be a good resource to support learning (Eraut & Hirsch, 2007, p. 30; Gijbels, Raemdonck, & Vervecken, 2010, p. 242). Adding to this literature, this study goes further in identifying the role colleagues have in shaping the practice of learning about technologies.

Colleagues are an important source of site specific knowledge (Eraut & Hirsch, 2007, p. 5). Attending training sessions are one source of learning yet it was when learners were able to interact with colleagues in the workplace, and then use the information they had learnt within a particular site, that resulted in learning occurring (Eraut, 2011, p. 8). Angela [Forrest], who worked in the information management area of the library, observed that her colleagues were able to provide valuable site specific answers to her questions which she could not have learnt from using help screens within a particular software program. The same way that colleagues assist those new to a workplace understand the language of a particular site, they also provide assistance in learning how things are done within the site, including how specific technologies are configured and used. Learning from colleagues provides a means of ensuring the site specific practices remain in place.
5.6.4 Enablers and constraints within the social space

In exploring the social space, the power managers have in shaping ongoing learning was a dominant theme. Managers, when they developed an environment that supported ongoing learning and facilitated the attendance at training events by staff, were found to enable ongoing practice within the sites studied. When managers also engaged and shared their experiences of ongoing learning about technologies, they were considered to be explicitly condoning ongoing learning by staff. Colleagues, through sharing their site knowledge were also found to be enabling ongoing practice. Constraints to practice were present in the form of unsupportive environments, feelings of being judged negatively for undertaking learning, and individuals being unclear as the role learning has within their work roles.

5.7 Dispositions and traditions

Using the Table of Practice (Table 5.1) to present and discuss the nature of practices ensures that the aspects of practice and practice architectures are considered, as well as the intersubjective spaces where these practices are realised. The Table also places importance on recognition of the project and landscape of the practice. The final areas to reflect on are the dispositions, (an individual’s personal and professional history) and the traditions that are currently present in the site.

Practices are actioned by people, and it is important to acknowledge the dispositions that practitioners bring to any site. Each of the practitioners that were part of this study brought to their site their own history, experience, knowledge and skills and interpretations of how the practice of ongoing learning about technologies should be enacted (Kemmis, Wilkinson, et al., 2017, p. 250). For these practitioners, each had their own understanding of what it was to be a professional within the library environment, and came to this moment in time with their own level of confidence in using new technologies. These practitioners were actioning their practice based on this knowledge and experience, within the traditions of their site.
The practice traditions found in each of these sites showed a history of ongoing learning being undertaken primarily as an individual pursuit. Across all sites, when attempts had been made in the past to encourage social learning through sharing of experiences and knowledge these had not been sustained. Whilst training plans and the use of professional development plans encouraged ongoing learning and development of staff, they were implemented with varying degrees of enthusiasm, and did not include specific recognition of a range of methods of learning (both informal and formal) about new and emerging technologies.

Given the importance of the site in shaping the practice of individuals, it might be expected that differences across sites might be in evidence. This was not the case. Whilst the documentation supporting ongoing learning was more evident at Lindsay Library, this did not appear to result in a different experience for individuals within this site when compared to other sites. Managers, as individuals at each site, were found to influence practice rather than groups of managers at any one site being of greater influence. Individuals at each of the sites expressed views and experiences that were shared by others at different sites. There was no evidence found that one site resulted in a different experience for all participants. This may be further evidence of the individual nature of ongoing learning practice found in this study.

5.8 Conclusion

In analysing this study’s findings this chapter has highlighted the influences present within the semantic, physical and social space of the site that are shaping the practice of ongoing learning about technologies. Using the Table of Practice as a means of presenting and directed the analysis of the practice, the connections between the practice and the practice architectures have been explored.

Individual managers, through their language and behaviour have a strong influence on shaping practice. The power of managers to shape the language and conversations within a site and in providing opportunities and
direction means they have been identified as having an important role in influencing ongoing learning. Whilst individuals bring to the site their own understanding, skills and knowledge of how to go about enacting the practice, they have limited ability to shape their environment. Impacted by their working space, competing priorities and deadlines, ranging levels of autonomy over their work time, and limited conversations about their practice with managers and colleagues, participants are constrained in their ability to improve their practice. It is only together with managers and through ongoing conversations about a range of areas influencing practice that improved practice will be realised. The following Discussion chapter, in considering the findings of this study with respect to the literature, will explore some of the ways this improved practice might be achieved.
Chapter 6

6 Discussion

6.1 Introduction

At the outset of this study, there was a focus on understanding an individual’s practice of learning about emerging technologies and to use this understanding as a means of supporting ongoing sustainable learning practices more broadly. Yet individuals do not act in isolation, and the use of the theory of practice architectures has focused this study beyond just individual practice, to also consider the site specific influences on that practice. By considering together both the elements of individual practice, and the practice architectures, this study has been able to add to the research literature and offer some thoughts for practitioners and library managers to consider when they are discussing ongoing learning within their own workplaces.

Research into workplace learning, especially research into learning about new and emerging technologies has, to this point focused on identifying the actions of library staff in keeping up to date with technologies and the influencing factors for success of a variety of programs designed to assist library staff to learn about emerging technologies (Forsyth et al., 2009; Pegrum & Kiel, 2011; Stephens & Cheetham, 2011; Varlejs, 1999) The theory of practice architectures focuses attention on how practices happen within a site, exploring beyond just the actions of the practice to examine the language and relationships that are present at the time of the actions (Kemmis, Wilkinson, et al., 2014, p. 39). In acknowledging the site specific influences, the theory of practice architectures recognises that practices take place within unique sites and the landscape, traditions, language, physical and social space all shape the practice, and help to sustain it within the site.

This chapter will discuss the findings of this study in relation to the literature from both the research and professional practice communities. As seen in the analysis of the findings presented in Chapter 5 (Table 5.1), the language
used by individuals and between staff within the site, has a major influence in shaping the practice of ongoing learning about technologies. Other major arrangements identified as shaping practice were the language, behaviour and actions of managers in creating and sustaining a learning environment, supporting individual practice, setting direction for ongoing learning and facilitating opportunities to undertake shared learning. In exploring further the manager’s role in shaping the practice, this chapter will also look at how training plans and professional development plans might be used to support ongoing learning.

Previous research into programs designed to encourage learning about emerging technologies has not taken into account the reasons why library staff choose to undertake ongoing learning about emerging technologies. In researching the different types of learning that is occurring within workplaces there is evidence to support the acknowledgement of the variety of methods staff use to learn about technologies including not only attending training events and workshops but through informal methods such as asking colleagues and individual exploration. An unexpected and notable finding of this study was evidence of the influence an individual’s understanding about the role learning has alongside a person’s work tasks has on ongoing learning practice. For those staff who considered learning an integral part of work, the two are seamless, yet for others, learning remains a discrete practice to be undertaken only when work tasks are completed.

Finally, this chapter will address two of the physical arrangements that were highlighted as shaping ongoing learning practice, that of lack of time as a constraint to learning, and the open plan office space, the latter both enabling and constraining learning practice. In examining these two arrangements, ways of better supporting ongoing learning are discussed.

6.2 Finding a common language to define emerging technologies

Having a shared understanding of the sayings, doings and relatings used to describe a practice within a particular site enables individuals to understand the practice and work with colleagues to achieve common goals (Mahon et
al., 2017, p. 9). It is not always the case that having experienced a particular practice a group of individuals will chose similar language to describe their practice. For this reason, it was important at the beginning of this study to understand participants’ perception of the term emerging technologies. Having an understanding of how participants define emerging technologies captures their shared language as it is present within their site, and provides understanding of what the phenomena is, whilst articulating what is excluded (Altrichter, Kemmis, McTaggart, & Zuber-Skerritt, 2002, p. 126).

Emerging technologies, as described by the research literature, are seen as having attributes such as being radically new, fast growing, not yet fully understood, having a high potential for impact, still evolving and providing uncertainty (Gachago et al., 2013; Li, 2009; Rotolo et al., 2015; Veletsianos, 2010). The literature has focused on language that describes both the characteristics of the technology as well as the context within which the technology is being used. This focus on both individual characteristics as well as context reflects the understanding that the sayings of a practice are actioned within the semantic space of the site and influenced by the cultural-discursive arrangements of that site. The participants in this study used contextual language to describe emerging technologies. In most instances the context was that of the participant’s own individual understanding although in some cases, the context described was that of the library in which the participant worked. Whilst participants in discussing examples of emerging technologies referred to some hardware (interactive pens, 3D printers, drones, video conferencing hardware, Google glasses and Oculus Rift glasses), in the main they actually described what Butterfield and Ngondi (2016) defined as applications software. Applications software are the programs which perform a specific role on a computer or other device to perform a group of coordinated functions. Examples of this type of software include accounting programs, email, database, or library management programs. In contrast systems software is that which enables people to effectively use computer hardware and provides a platform on which applications software runs. Examples of systems software are macOS, Microsoft Windows and iOS. (Butterfield & Ngondi, 2016).
The Literature Review chapter discussed the range of definitions used both within the research literature and in the LIS field to describe emerging technologies. A strong finding to emerge from this study was the lack of a common understanding within each of the sites. The absence of a shared language evident in this study and the range of definitions offered by the research literature offers library managers and staff the opportunity to initiate discussions with the aim of developing a site specific definition of emerging technologies. This definition could then inform strategic discussions, discourse and relevant documentation about the place ongoing learning about technologies has in developing staff and improving library services. Table 6.1 provides a summary of the characteristics used to define emerging technology from both the research and practitioner literature as well as from the participants of this study. This table highlights the range of technology based characteristics, contextual characteristics and those specifically discussed in this study. In acknowledging both the social nature of the development of meaning and the importance of context in shaping practice, the site ontological basis of this study suggests that library staff within each site work together to develop their common understanding of reality. So whilst it is not possible to develop a comprehensive definition of emerging technologies for the LIS field or even for academic libraries, Table 6.1 in setting out the variety of definitions used in the literature and as raised in this study may provide a starting point for such a conversation.

In setting out Table 6.1 in this way, the lack of characteristics specifically describing the technology used by participants is highlighted as well as the unique characteristic raised by participants that new or emerging technologies were those new to their workplace and being investigated for their usefulness within the workplace. Rogers (2003, p. 166) in describing his innovation decision process includes a stage of moving from knowledge of a particular innovation, or in this case technology, to persuasion during which an individual seeks to gain an understanding of how this technology fits with present or future situations. The participants, in describing an emerging technology as still being considered for its usefulness are engaging in a
decision making process before acceptance of the technology occurs. Recognition that not all learning about emerging technologies will lead to the technology being accepted is important and will be discussed later in the chapter in relation to concerns about spending time learning useful technologies.

Table 6:1

**Summary of definitions of emerging technologies from the research literature and this study**

<table>
<thead>
<tr>
<th>Characteristics focused on the technology from the research literature</th>
<th>Characteristics highlighting the context of the technology from the research literature</th>
<th>Characteristics highlighted in the participants of this study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radical novelty, using a new principle to achieve something (Rotolo et al., 2015)</td>
<td></td>
<td></td>
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<tr>
<td>Relatively fast growth (Rotolo et al., 2015)</td>
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<tr>
<td>Coherence, having gained an identity and momentum of its own (Rotolo et al., 2015)</td>
<td></td>
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<tr>
<td>High potential for impact (Li, 2009; Rotolo et al., 2015; Veletsianos, 2010)</td>
<td>Be not yet fully understood, and the impact on the workplace still to be determined; may not yet fully understood (Veletsianos, 2010)</td>
<td>Be not yet fully understood, and the impact on the workplace still to be determined; may not yet fully understood</td>
</tr>
<tr>
<td>Uncertainty and ambiguity (Li, 2009; Rotolo et al., 2015)</td>
<td>Be not yet fully understood, and the impact on the workplace still to be determined; may not yet fully understood (Veletsianos, 2010)</td>
<td></td>
</tr>
<tr>
<td>Still evolving, in development or undergoing refinement (Gachago et al., 2013; Rotolo et al., 2015; Veletsianos, 2010)</td>
<td>Be a new technology either to the individual or the workplace (Veletsianos, 2010)</td>
<td>Be a new technology either to the individual or the workplace</td>
</tr>
<tr>
<td></td>
<td>Is not yet commonly used with the workplace and is used by risk takers or early adopters (Rogers, 2003; Cervone, 2013; Gachago et al., 2013)</td>
<td>Is not yet commonly used with the workplace and is used by risk takers or early adopters</td>
</tr>
<tr>
<td></td>
<td>May cause people to experience a cycle of euphoria, adoption, activity and use, maturity, impact and enthusiasm with some becoming part of the business (acceptance), while others fade into the background (rejection)</td>
<td></td>
</tr>
</tbody>
</table>
Table: Characteristics of Emerging Technologies

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provides the opportunity to improve personal learning or change the way work is undertaken within the workplace</td>
<td>Provides the opportunity to improve personal learning or change the way work is undertaken within the workplace</td>
</tr>
<tr>
<td>Older technology employed in a new way (Veletsianos, 2010)</td>
<td>Older technology employed in a new way</td>
</tr>
<tr>
<td>Be under investigation as to the relevance or usefulness within the workplace</td>
<td></td>
</tr>
</tbody>
</table>

In developing a common understanding of emerging technologies library management and staff have the opportunity to broaden and direct the practice of learning in this area. Through ongoing conversations about the nature of emerging technologies, individuals’ understandings will move beyond the personal perspective as seen in this study to a more expansive and possibly strategic perspective for the benefit of the library and its stakeholders. Language including characteristics such as those listed above would become common place when discussing technologies. Emerging technologies have the potential to provide high impact, and extensive learning opportunities. Management and staff of university libraries need to have a common understanding of what emerging technologies are and how staff go about learning about these technologies in order to take advantage of their potential.

6.3 The language of learning

When discussing the language of learning, participants reported a mix of reactions when referring to learning experiences as playing (section 4.3.2 and section 5.4.3). A review of the literature in this area highlights the consequence of this language when used to describe learning in a workplace setting.

With the introduction of programs designed specifically for library staff to facilitate the ongoing learning about new technologies such as the 23 things
program and other Learning 2.0 programs, there has been a focus on describing the learning process as playing (Blowers, 2006; Forsyth et al., 2009; O'Neil & Pegrum, 2018; Pegrum & Kiel, 2011; Quinney et al., 2010). In first developing the 23 things program ten years ago, Blowers (2008) emphasised the importance of encouraging staff to play as a means of continuously learning. This theme of play was used throughout the implementation of the 23 things programs and its iterations (23 mobile things, 23 research things) in libraries across the world, with an emphasis on turning learning into a fun experience by encouraging participants of the program to play and explore (Stephens, 2012, p. 5; Titangos & Mason, 2009, p. 45). The growing use of technology sandboxes (places where software developers and users can test and use new content) also enable staff to play and experiment without fear of “breaking” new software programs or impacting current data (Frydenberg, 2013, p. 50).

Considering the notion of play as a form of learning it is useful to examine a definition of play. When considering the characteristics and purpose of play, Huizinga’s definition of play is considered a strong influence on more recent understandings by biologists, anthropologists, educationalists and psychologists (Brooker, Blaise, & Edwards, 2014, p. 12). Huizinga’s (1955) definition of play is:

Summing up the formal characteristic of play, we might call it a free activity standing quite consciously outside 'ordinary' life as being 'not serious' but at the same time absorbing the player intensely and utterly. It is an activity connected with no material interest, and no profit can be gained by it. It proceeds within its own proper boundaries of time and space according to fixed rules and in an orderly manner. It promotes the formation of social groupings that tend to surround themselves with secrecy and to stress the difference from the common world by disguise or other means. (p. 13)

The voluntary nature of play and being separate from real life, where a person loses track of time, forms the basis of a more recent definition by Brown and Vaughan (2010) who define play as:

Apparently purposeless (done for its own sake); voluntary; has inherent attraction; freedom from time; diminished consciousness of self; improvisational potential; and continuation desire. (p. 17)
The purposeless or experimental nature of play in the context of learning suggests that play is important when undertaking problem solving or creative learning. Using the term play to describe the practice of learning endorses a freedom for individuals to explore and trial new technologies with less perceived stress in contrast to more formal language such as learning which implies the gaining of knowledge or basic skills (Walsh, 2015, p. 87). Walsh (2015) in exploring play as a means for teaching information literacy skills to higher education students, concedes that the voluntary nature of play makes it difficult to force adults to participate in learning that is described as play.

Descriptions of the 23 things program as playing with emerging technologies may have been one of the factors in the low course completion rates reported for these programs (Stephens & Cheetham, 2012, p. 14). Participants of the program may have questioned the validity of the program, and the use of their time to undertake a play activity. This study also found that some participants were uncomfortable with the concept of spending time playing rather than learning. Yet it is possible to provide opportunities for adults to play, as well as providing an environment that considers play acceptable practice (Walsh, 2015, p. 84).

Despite play being seen as an appropriate learning tool for children, with much of a child’s early learning done through play, for adults, play does not have the same connection to learning. In trying to address this, Rieber and colleagues (1998) refer to “serious play” and define this as:

that special kind of intense learning experience in which both adults and children voluntarily devote enormous amounts of time, energy and commitment and at the same time derive great enjoyment from the experience (p. 29)

Serious play is described as intense motivation coupled with goal-directed behaviour. Researchers have suggested that managers are reluctant to use the term play at work due to its connection to activities from childhood or being seen as the opposite of work, however there is a growing interest in the use of serious play or serious games to improve morale and promote learning in organisations (Verenikina & Hasan, 2010, p. 121).
of play as a means to imagine and explore without a required outcome opens opportunities for creativity and innovation, and ongoing learning for individuals, groups of workers and organisations (Statler, Roos, & Victor, 2009, p. 102). Interestingly, with the practice theory literature, play has been described as occurring when people within an organisation engage in purposeful activities with the intention of achieving a desired outcome (Statler, Heracleous, & Jacobs, 2011, p. 246). Practices by their nature require a purpose for undertaking actions. These different understandings of play are supported by the range of understandings reported by this study’s participants.

The value of play, or serious play, would only be realised if the entire organisation has the same understanding of the term, and then through common understanding the ability to drive collective knowledge creation. Discussions between participants raised the lack of a common understanding of the use of the word play to describe learning experiences, distinguishing between those that saw play as distinct from work, in contrast to those staff that used the word to describe an explorative process through which they gained knowledge.

Through developing a common understanding of play; that of experimentation as a means of continuing to learn about technologies, there may be a reduced negativity attached to this type of learning as a waste of time, or just playing. A shared understanding of the acceptability of play as a learning practice may also empower staff to creatively explore new and emerging technologies beyond those needed for their immediate tasks for the future benefit of the library and its clients.

Language and common understanding, as realised within the semantic space are a core element of a person’s practice. As a common understanding of emerging technologies as being those that are explored and trialled as a means of identifying their suitability for a particular site, the use of terms such as play to describe the practice of learning gives the quality of legitimacy to the practice.
Discussion and deliberation on the use of the term play within the context of learning offers organisations the opportunity to also define what activities might be considered appropriate when engaging in learning experiences. In particular, discussion about the time spent exploring the breadth and depth of the features of a particular technology and its usefulness for the library or a particular work role either currently or in the future. In any discussion about play as learning, whilst not dictating outcomes for particular moments of learning, it may be important to discuss the positive outcomes that may result when play occurs within a workplace. Such outcomes may include personal development, increased creativity, innovative products and services, and to acknowledge that such play can be transformational for organisations (Kurt et al., 2010). In sanctioning play as a learning activity, organisations can also include the social aspect of knowledge generation and sharing through activities such as participation in communities of practice to share and collectively explore the outcome of these play activities. Individuals might also be able to express the outcomes of their exploration of technologies through the ability to have a conversation with academics about the usefulness of a technology to their students. Whilst play can be undertaken alone, as was seen in this study, Walsh and Clementson (2017) argue that the social nature of play, relying on teamwork and communication, can be important to learning as through dialogue and sharing, new knowledge is developed. Having discussions about appropriate play within the workplace is a starting point for embedding this form of practice of learning within a workplace.

To strengthen the enabling nature of common understandings within a site it may also assist to acknowledge the cultural-discursive arrangements shaping the practice, including terms such as exploring, trialing and play into the written policies of an organisation. The sites studied had documentation in the form of training and development plans and these could provide the means of embedding appropriate language within site.
6.4 Embedding language in training plans to support ongoing learning

Whilst each of the sites studied had a training plan, the language used in each reflected the arrangements shaping the ongoing learning practice. Kennard Library’s plan focused on the learning experience and opportunities available to staff, while plans at the other two sites concentrated on identifying training programs as a source of ongoing development (section 5.4.3). The importance of language and workplace discourse in shaping practice cannot be underestimated.

Language and discourse provide individuals a means of describing their practice, and hold a practice in place, allowing it to continue and develop within the site (Nicolini, 2012, p. 189). Discourse is more than just the words used to describe or action practice, it is the language of conversations, dialogues, spoken and written communication that constructs the reality of the practice (Higgs, 2016, p. 7). To assist with holding a practice in place, discourse can be formalised in the form of written policies, rules, and signage. One way that discourse can be seen as shaping practice is when new staff enter into a site they are shown the policies and rules which provide them with understanding about how to act and what is considered appropriate language and activities within a new site (Lloyd, 2010b, p. 159). New staff gain understanding through reading documents and watching others, and are then able to use appropriate language and reproduce the required practice expected within a site, thus continuing to sustain that practice (Nicolini, 2012, p. 81).

The development of training plans is often driven by identifying the training needs of staff, whether through a needs analysis or by identifying core competencies required (Fontanin, 2010; Lockhart & Majal, 2012; Rutledge, LeMire, Hawks, & Mowdood, 2016). Even though the recognition by the participants that ongoing learning about technologies was an important development requirement for all library staff, the discourse of the training plans was not being used to convey appropriate learning practice. Despite language supporting and encouraging ongoing development for all library
and administrative staff written within the training plans, there was no clear direction or objectives addressing ongoing learning about technologies in particular, except at Lindsay Library.

The interdependence of arrangements is evident when considering the ways in which training plans support ongoing learning. The language used within the plan provides individuals an understanding of what is both appropriate in describing the practice as well as providing direction on how to go about the practice. In this case, training plans could include acknowledgement that ongoing learning about technologies, and in particularly emerging technologies, is valued as a professional development activity for staff as well as supporting the aim of the library to continue to provide relevant services to clients. Included in these training plans may also be the specific actions managers could undertake to facilitate and support ongoing learning. Although the training plans examined for this study outlined the role of managers in assisting and directing ongoing learning of staff, participants perceived that this assistance not always being actioned by their managers. As reported in the Findings Chapter (section 4.10.1) some managers were perceived as being very supportive of ongoing learning, alternatively other managers were mentioned for their lack of support as noted by participants from manager behaviour and language. The pivotal role managers could have in supporting ongoing learning will be discussed now in detail as much of the power in supporting individual staff members, and the provision of an environment conducive to learning, lies within the role of managers.

6.5 The manager’s role in supporting ongoing learning

The Literature Review highlights the importance library managers, in particular senior managers, place on ongoing learning in the workplace (Hallam, 2009; I. Smith, 2002). Assistance and encouragement from managers, in the form of mentoring, provision of direction, support and feedback, and the creation of a culture that supports and actively encourages learning is often cited as an important influence on workplace informal learning (Ellinger, 2005, p. 409; Skule, 2004, p. 14). This section of the Discussion will explore further the role managers’ have in developing a site
that enables the practice of ongoing learning as well as the influence they exert as part of that social space to enable and constrain the practice of the library staff.

6.5.1 Managers taking on the primary role of supporting ongoing learning

In exploring the role that managers’ play in supporting ongoing learning it is necessary to acknowledge the shift, especially in larger organisations, away from specialist learning and development staff or departments with complete responsibility for the ongoing learning needs of staff, to a more dispersed model where line managers are increasingly involved in this aspect of staff management (Gibb, 2003, p. 283). This shift has resulted from an increase in research and understanding of the contribution informal workplace learning has in the ongoing development of staff. Interestingly, participants did not report their managers specifically acknowledging the role of informal learning in professional development or meeting organisational goals. This change in responsibility for ongoing learning from central learning and development staff to line managers also recognises that the latter may understand both the organisational needs and the individual’s training needs better than other parts of the organisation removed from the daily work of staff (Gibb, 2003, p. 283).

Whilst not disagreeing that line managers may have greater contact with and understanding of staff and their role in achieving organisational goals, the move away from specialists driving the training and development of an organisation can also represent a perceived change in the importance and relevance of learning and development within an organisation. If an organisation is seen to be investing in the employing of a person or team to support ongoing development this provides clear evidence to all staff that their ongoing development is a priority for the organisation. At one of the researched sites, there was a specific staff member within the library dedicated to staff development. In contrast, when the responsibility for ongoing development is dispersed to individual managers and supervisors, this highly visible support for ongoing learning can be lost in the daily managerial activities of assisting, guiding, coaching and providing feedback.
There are arguments for both the need for learning and development professionals to provide strategic and specialist knowledge in the area of professional and organisational learning and development as well as the vital role line managers have in enabling ongoing learning of staff (P. Knight, 2002, p. 26).

The transfer of responsibility for individual development to line managers does not herald the end of the role of speciality learning and development staff, instead providing the opportunity for these professionals to focus on a more strategic role within the organisation, ensuring the ongoing performance of individuals and teams for the improvement of the organisation as a whole (J. Knight, 2015, p. 36). Both learning and development specialists, and line managers, have the opportunity to work together to meet the learning needs of both the organisation and individual staff.

As line managers take on more of the responsibility for ensuring the ongoing learning of individuals, it is important to understand just how they influence and impact the practice of learning. Line managers, frontline managers, supervisors and team leaders are all terms used to describe the, usually middle level managers, who have responsibility for overseeing and coordinating the work of others (J. Cohen, 2013, p. 504). These managers are often promoted or employed due to their expertise in the particular work being undertaken by their directly reporting staff and have the responsibility for ensuring that these staff have the skills and knowledge to complete the work tasks required (J. Cohen, 2013, p. 510). None the less, increasingly these managers also have responsibility for extending the skills of staff and to be the communication point between senior management of an organisation and the staff, being the person who is able to share the vision and direction of the organisation with workers (MacNeil, 2004, p. 98).

In examining written documentation in the form of site training plans and through discussion between participants, this study found mixed messages as to whose responsibility it was to ensure ongoing development of staff.
(section 4.8). Training plans included statements outlining the responsibility of staff to engage with learning opportunities as well as the role of managers to work with staff to ensure ongoing development. Participants reported uncertainty about whether they, as the recipient of the benefits through skill development, should not have the greater responsibility for their own development. Clearer discussion and direction on the role of staff development, its benefits for both individuals and the organisation, and the responsibilities of individuals and managers in undertaking and supporting this development may shape better practice.

6.5.2 Providing support and direction

Managers have an important role to play in enabling the practice of ongoing learning, especially in the area of learning about technologies. Participants identified two responsibilities they believed managers had to support their ongoing learning practice (section 5.6.2). The first function of the manager was to assist and support individuals to engage with a range of development activities to enable workplace learning. The second function, with a broader focus, saw participants expecting the organisation’s management, and their own managers in particular, to provide direction and focus for individual staff’s development activities. Whilst the first of these functions is discussed widely in the research literature on workplace learning (J. Cohen, 2013, p. 514; MacNeil, 2004, p. 98), there is less literature highlighting the importance that managers have in providing direction for workplace learning specifically. These two functions will now be explored further.

As managers are often the people placing work demands and deadlines on staff, they are also the ones who are able to assist with balancing those work demands to prioritise the ongoing development of staff (MacNeil, 2004, p. 96). Managers, as they work with individuals to ensure they are completing work tasks, also influence the degree of challenge, the value of the work individuals undertake, and the amount of personal agency and autonomy individuals have in directing their own work tasks and time (Eraut, 2012, p. 27). Participants in this study, were trying to balance what they considered their work tasks with making time for ongoing learning. They were looking to
managers for assistance and advice, yet there was little reported evidence that conversations about competing priorities were being had in any of the workplaces. In initiating conversations about competing demands, managers have the ability to support staff and discuss with them the library management’s expectation about the role learning plays within their work role.

Managers, in undertaking their role of supporting the ongoing development of staff, also need to be open to having conversations with staff about individual learning needs. At the Lindsay and Kennard Libraries, line managers were specifically tasked, as stated in the library’s training plans, with the role of identifying the ongoing development needs of staff reporting directly to them. At all three sites, annual performance conversations were also seen by library staff as an opportunity for the managers to discuss ongoing development needs with individuals. Varlejs (2006, p. 4) in highlighting best practice for librarians’ ongoing development listed as the number one priority, the regular identification of learning needs through discussions between individual employees and management. These discussions should focus not only on individual learning needs but also organisational goals and objectives (Varlejs, 2006, p. 4). As acknowledged by the participants these annual performance conversations did not always result in clear plans for meeting their personal ongoing development needs with regard to learning about technologies.

At the Lindsay Library, participants commented that managers should be intervening specifically when staff were not actively engaged in any ongoing learning about new technologies. The expectation was that managers should not only be including development in learning plans but also requiring accountability from staff to ensure they did undertake the practice. The Lindsay Library training plan clearly stated that both individuals, and supervisors had responsibility for the ongoing development needs of staff and participants were asking for accountability to be sought by managers.
As stated previously, managers are often employed for their skills in a particular area and may not always possess managerial skills such as good verbal communication, being able to motivate and influence others, or to monitor performance and provide feedback (Kirwan, 2013, p. 102). Yet, these are some of the skills that enable managers to support ongoing learning, as well as develop the conducive semantic, physical and social space to enable the practice of ongoing learning. Kirwan (2013, p. 101), in his discussion on the role of the line manager in supporting ongoing learning, argues that there has been a shift in the emphasis of the skills of line managers. No longer are field of expertise skills the most important skills needed for the role, but instead the ability to manage one’s self, relationships with others, the environment, the organisation and change. To assist with developing these competencies, some current managers may need their own training and development to improve their skills in these areas (Kirwan, 2013, p. 101).

Managers, in controlling the conversations, and often the work loads of staff have the power in the relationship. Three of the participants felt comfortable enough to initiate conversations with their managers about their ongoing learning needs, while the other participants left it to their managers to guide their future performance development. The control managers have over a staff members’ work tasks was especially evident for those staff working in the lending services area, with their work tasks managed through rostered desk shifts and off desk tasks such as shelving. Staff within this area have fewer opportunities to undertake explorative learning on their own, or to attend workshops unless sanctioned by their manager. Contrast this with a reference or liaison library who has more control over how they structure their work day. Whilst observations can be made from comments made by the two lending services staff in this study, further research exploring interplay between the work role of a staff member, their manager’s control over their work tasks, and opportunities for ongoing learning would be useful to examine this relationship further.
In examining the participants’ expectation of support and direction from their managers when it comes to ongoing learning, a number of practice architectures have been affirmed. The need for explicit conversations to discuss ongoing development needs and the inclusion of positive steps for ongoing development and responsibilities for both staff and managers included in training plans could improve the capacity for staff to actively undertake their learning practice. Ensuring managers have the skills to support ongoing development of the staff may also aid individuals’ practice. Most participants perceived that managers held the power to support their ongoing development, so understanding how managers can leverage this power appropriately is important.

6.5.3 Environments that promote learning and sharing

As well as supporting individuals’ ongoing development, it was also seen by participants to be the purview of managers to provide an environment that actively promotes the sharing of learning and new knowledge generation among teams for the development of all in the team (Eraut, 2012, p. 29). Managers are in a position to shape the practice architectures that enable the learning culture within their teams, not only by enabling staff to experiment, make mistakes and reflect on their own personal learning as they undertake the practice but to also encourage sharing among the team to increase skills and knowledge and to facilitate new knowledge generation and increased productivity (J. Cohen, 2013, p. 514; Ellinger, 2005, p. 401; Gibb, 2003, p. 292). Managers are also able to model the sayings, doings and relatings that are appropriate for the practice. For example, at Forrest Library one of the senior managers was not only undertaking her own ongoing learning but actively sharing her learning with others. Participants agreed that the lack of conversations with their managers about what was appropriate ongoing learning meant they felt they were not supported to undertake individual learning. Managers were seen to have the ability to enable ongoing practice through the development of and support for an environment that encouraged sharing between colleagues (Eraut, 2004, p. 270).
Within the LIS field, ongoing research into the success of the 23 things program highlights managerial support as an important influence on the success of the program (Stephens, 2013; Stephens & Cheetham, 2012). Stephens (2013, p. 133) as part of his study of what made for best practice in the delivery of the 23 things program in libraries, found that when managers actively participated in the program, staff interpreted this to mean that the program was not only supported by management, that it was worth spending time doing, and that it was also possible to make time during a busy schedule to complete the program. When managers did not actively engage in the program themselves, it was found that this had a negative influence on the staff who were expected to complete the program. Stephens (2013) did not clarify how this negativity was expressed or the connection between managers’ lack of engagement and the staff’s perceived negativity towards the program. Beyond this identification of positive and negative influences of managers completing the program, no more in depth analysis of specifically what role managers play in supporting the 23 things program was explored by Stephens and colleagues (Stephens, 2013; Stephens & Cheetham, 2012).

Management engagement in the practice of ongoing learning as an enabling practice architecture has not been highlighted in other studies that researched the role managers’ play in supporting workplace learning. Participants in this study however, did identify the importance of managers’ modelling ongoing learning practice. When managers were seen to attend training sessions or workshops, to be actively exploring new and emerging technologies, or engaging in conversations about technologies, participants felt more comfortable engaging in ongoing learning themselves as part of their daily work practice. Conversely, when managers did not actively engage in ongoing learning, participants felt this influenced their own willingness to undertake ongoing learning. The active and open engagement by managers across the organisations may be considered an enabling practice architecture for ongoing learning.
6.5.4 Providing direction on what to learn

While literature (J. Cohen, 2013; Ellinger, 2005; Eraut, 2004; Kirwan, 2013) has highlighted the important role line managers can have in enabling the practice of ongoing learning through support mechanisms such as feedback and conversations, there is less focus in the literature on the other function that the participants of this study identified as being an important managerial task. As expressed through negative reactions from their managers to their exploration of new technologies as shared by Jacob [Kennard] and Olivia [Kennard], participants felt that their library organisations and their direct managers had not provided any direction about what technologies they could or should be learning.

With increased distribution of the learning and development role from specialist learning and development staff to line managers, it has been argued that line managers tend to focus only on the short term requirements needed to do the role (J. Knight, 2015, p. 27). Whilst managers are able to provide clear guidelines on how to get the job done as it is required now (Kirwan, 2013, p. 110), this does not necessarily provide the strategic direction that is being sought by staff, particularly when looking at the myriad of new technologies available.

There was no clear strategic direction with regard to learning about technology specifically referred to in any of the training plans in this study. The lack of direction may be due to a number of reasons; for example, ongoing learning about technologies was not seen as an important aspect of the libraries’ future; the difficulty of setting a strategic direction when technologies were continually changing, an organisation-wide discussion on the role and influence of changing technologies had not been undertaken; or that management believed that the ongoing influence of technologies was an accepted fact and did not require explicit mention in the training plans of the library. Managers provide the communication link between the organisational goals and direction developed by senior managers, and their work teams. Without an organisation-wide discussion about the future direction of
technological use or how the library might explore future technological developments it is difficult for managers to assist staff when it comes to identifying which technologies to learn. The result, as seen in this study, was that individuals were trying to keep up to date with the various technologies they encountered, often in an ad hoc manner, without having a clear direction about which technologies they should be focusing their attention on. Training plans explicitly outlining the discussed direction and development opportunities available to staff within the learning about emerging technologies space would be a clear practice architectures enabling learning practice.

While research confirms that ongoing development in the area of technology is an important part of the skill development of staff, and the future of libraries, it appears that there is no clear strategy on what direction that technological future might take within academic libraries. This lack of direction is having a significant influence not only on ongoing learning for staff, but in helping libraries to plan and manage change in the future. Managers have acknowledged the impact that technology is having on changing the library profession and that staff need to both undertake ongoing learning and also be willing to share the knowledge they gain with colleagues (Partridge, Lee, et al., 2010, p. 326). Yet, having acknowledged the importance of this ongoing learning, and sharing of knowledge, there still appears to be a lack of direction as to what types of technologies should be focused on, or how to go about learning these technologies and opportunities for sharing this learning. Without this direction from their managers about where to focus their learning time, individual learning is incremental in nature and focused in the main on learning new aspects of technology currently used, or responding to external forces such as requests from academics for a particular technology or learning a particular technology to address a specific question. Whilst some staff are choosing to scan the horizon of new technologies through reading blogs and magazines, or reading the Horizon report (Adams Becker, Cummins, Davis, Freeman, Hall Giesinger, & Ananthanarayan, 2017; Adams Becker, Cummins, Davis, Freeman, Hall Giesinger, Ananthanarayan, et al., 2017) for future technological trends in
education and libraries in particular, the lack of definitive understanding of a particular direction of their organisation by staff may be constraining their practice.

6.5.5 Planning and reporting on ongoing learning about technologies

One of the initial drivers for researching the practice of workplace learning about technologies was to explore whether it was possible to incorporate the planning, reporting and discussion of ongoing learning about technologies within development plans for individual staff. Whilst this study has expanded beyond this focus on the actions of individual practice to acknowledge the importance of the site in influencing practice, the understanding of ongoing learning, especially the recognition of informal learning remains an important outcome.

Professional organisations such as ALIA, focus their personal development and career development schemes on the individual (ALIA, 2017b, 2017a). The ALIA professional development scheme acknowledges that learning is at times informal in nature and includes a range of activities as examples of learning activities such as volunteering for a committee, mentoring a colleague, reading of journals and relevant blogs and visiting a makerspace (ALIA, 2017b). Although ALIA reports that 40% of its members participate in the professional development scheme none of the participants mentioned the professional development scheme when they discussed their own ongoing development (ALIA, 2018, p. 10). One practice architecture that could enable ongoing learning would be the inclusion of information about and support for staff involvement in the ALIA professional development scheme included in training plans and forming part of all staff development plans. This would be an explicit indication of the important role ongoing learning for all staff has within the library organisation.

6.5.6 The role of individual development plans in supporting ongoing learning

In identifying the inclusion of learning about emerging technologies within individual development plans it is worth considering how best to implement this practice architecture. Workplace learning enhances the skills and
knowledge of individual staff members and enables employees to undertake their current roles and better adapt to change in the future (Bednall, Sanders, & Runhaar, 2013, p. 45; Bernadette van Rijn, Yang, & Sanders, 2013, p. 611; Cacciattolo, 2015, p. 5). Ongoing learning has also been found to enhance both the quality and consistency of individual performances which in turn result in improved performance of the organisation as a whole (Ashton & Sung, 2002, p. 81; Bednall et al., 2013, p. 45). Currently it is through the formal professional development process and structured development planning that individual staff formally identify their personal learning needs and set their own development goals (Bednall et al., 2013, p. 46).

Professional development plans are individually based and can be considered to be a social-political arrangement that is intended to enable better performance of individuals within an organisation (T. Smith, Salo, & Grootenboer, 2010, p. 58). Whilst aiming to develop both the organisation and individuals, development plans are rooted in the understanding that knowledge and skills are developed by the individual. At the Kennard Library, as part of the Staff Development Policy, professional development plans were specifically identified as a means of “assisting staff to understand priorities, define goals, and improve performance”. These plans were also used as a “basis for reward and recognition for performance, bonus payments, loadings, linked advancement, accelerated increments and incremental advancement.”

This study found that training development plans consisted of identifying training events or conferences to be attended in the coming year with the aim of developing individuals with little thought to the social or workplace nature of learning. At Forrest and Kennard Libraries, the training and development plans included identifying conferences for staff to attend and the completion of software courses. Conferences identified were the national ALIA and VALA – Libraries, Technology and the Future Inc conferences, software trainings included Advanced Excel, and in-house Human Resource software. Kennard Library also included the completion of the 23 Research Things program by certain members of staff. The training and development plans
from Forrest and Lindsay libraries included reference to identifying opportunities specifically to be included in individual development plans.

Focusing on identifying training opportunities as forming the major part of development plans fails to acknowledge the breadth of less formal learning opportunities that have been linked to improved individual and organisational performance. These learning opportunities can include the broadening of tasks for individuals through job redesign, job rotations, learning from colleagues through discussion opportunities and coaching by colleagues (Ashton & Sung, 2002, p. 83). Training sessions and conferences are able to provide participants exposure to knowledge and skills, yet each workplace has its own specific knowledge and skills often understood only at that site (Lloyd, 2014, p. 101). It is only through interaction within the semantic, material and social space of a site that this knowledge is developed. There are examples of both Forrest and Lindsay Libraries providing opportunities to engage with local knowledge to improve the practice and performance of individuals. Forrest Library’s training plan includes providing three lunchtime sharing sessions as a means of stimulating learning through the sharing of knowledge whilst Lindsay Library not only planned discussion groups, their plan specifically included staff swaps, and mentoring as means of developing staff. These opportunities form valuable practice architectures in supporting ongoing learning and development of staff.

Critics of the individual focus of development plans as a means of improving both individual and organisational performance highlight the assumption that individuals will choose to engage with the shared goals and values of the organisation even when they have individual plans, but this may not always be the case (Ashton & Sung, 2002, p. 81; Bednall et al., 2013, p. 46; Butler et al., 2004, p. 13). Questions have also been asked about the presumed causal link found between organisations with strong performance management and development plans also being identified as high performing organisations (Fuller & Unwin, 2011, p. 49). Whilst the value of individual development plans as a means of improving both individual and organisational performance is still being researched, these plans appear to
remain the major choice for organisations such as libraries as seen by their use by all staff across all three sites. For this reason it is important to consider further what practice architectures around these plans can better enable ongoing learning at a time when workplace learning research has shown that professional development is more than just attending formal training events.

The individually focused nature of development plans does not take into account the growing literature confirming knowledge and learning as a social activity best undertaken within the semantic, physical and social space of the learning practice. Fenwick (2008, p. 20) in a discussion of the practice view of workplace learning discusses the meshing of the individual and social aspects of learning and knowledge development. Fenwick also questions whether it is possible to promote and encourage the practice of learning that occurs within a social space, whilst still focusing on rewarding individuals for personal knowledge acquisition (Fenwick, 2008, p. 20). In practice, learning and knowledge development is often the result of problem solving activities done as a collective with individuals working together, sharing individual knowledge to create collective learning (Lloyd, 2011, p. 281).

Participants identified the importance of the social aspect of learning confirms the role colleagues had in supporting, and being a source of, knowledge development identified in this study. Individuals as they act and learn within a workplace are in a constant relationships with their colleagues; behaviour and the use of knowledge by one individual within the workplace impacts others (Fenwick, 2008, p. 21). This is evidenced in the intersubjective spaces where practice is shaped by the practice architectures present. For this reason it is important to recognise the influence colleagues have on ongoing learning practice.

6.6 Colleagues’ role in supporting ongoing learning about technologies

Colleagues have an important involvement in supporting the ongoing learning about technologies. Colleagues were identified as a good resource for answering specific questions about using a particular technologies,
especially if a quick answer was needed. Knowles (1975, p. 105), in describing the development of self-directed learners wrote of learners identifying a range of resources from which to gain knowledge and skills. Whilst books are often the first thought when describing a resource, humans, with previous training, experiences and a range of knowledge, can also be considered a resource (Knowles, 1975, p. 109). Participants identified colleagues as a suitable resource, and through proactive interaction were able to gain knowledge from this source.

While participants looked to managers to provide direction for their learning about technologies, it was also through social networking with colleagues that they gained knowledge about trends and possible technologies that might be worth investigating. Whilst social interactions in and of themselves might not be considered learning events per se, they may involve discussions about the latest trends, new technologies or the possible impact on the library of emerging technologies (Rafiq, Jabeen, & Arif, 2017, p. 27). The attendance at workshops such as described at Forrest library, where particular technologies were presented and discussed in terms of their relevance to current or future library practice is one example of such social interactions. Through social networks learners have the opportunity to identify various colleagues with a range of expertise which in turn provide opportunities for mentoring or assistance in learning from them in the future (Eraut, 2011, p. 9; Corcoran & McGuinness, 2014, p. 180).

One important role colleagues have in shaping the practice of learning not mentioned by the participants was that of co-creating knowledge. Participants attended workshops presented by colleagues about a range of technologies, yet this was a one way interaction. Some of the most effective learning situations have been found to occur when colleagues are in an environment where they are sharing their individual knowledge and working together to solve problems (Cooke, 2012, p. 8; Eraut, 2011, p. 8; Massis & Massis, 2010, p. 248).
One’s work colleagues are a vital resource for learning as well as a social support for ongoing learning (Eraut & Hirsch, 2007, p. 30; Gijbels et al., 2010, p. 242). Through support and feedback colleagues are able to help build confidence in individuals to support their ongoing learning (Eraut & Hirsch, 2007, p. 44). Phillip [Lindsay] reported that colleagues influencing how he felt about attending workshops either through their encouragement or perceived judgement. Through their support colleagues are able to provide the motivation to keep learning (Corcoran & McGuinness, 2014, p. 189).

Colleagues are an important consideration when identifying the practice architecture arrangements shaping ongoing learning practice. In providing not only quick answers to technology based questions but as a source of site specific information on how certain technologies are used within the workplace, colleagues influence ongoing practice. Colleagues also have the ability to motivate ongoing learning and support learning practices within the workplace through their language and actions. Collegiate support for learning builds trust between colleagues and encourages mutual learning as colleagues share their own learning (Eraut & Hirsch, 2007, p. 44). The influence of colleagues in sharing knowledge, and supporting ongoing learning cannot be underestimated and provides the opportunity to identify particular practice architectures involving collegiate learning specifically relevant to a library site.

So far in this Discussion the influence of language, managers and colleagues in shaping ongoing practice has been discussed, identifying the practice architectures that may improve this practice. The influence of language in shaping practice was also observed in the ways in which participants identified the relationship between their learning practice and work tasks as designated by their role. To explore this further the next section of this chapter discusses the dichotomy of the work/learning relationship and the use of words such as “learner” in defining oneself within a work environment.
6.7 The relationship between learning and work

An unexpected finding of this study was the differing attitudes of participants to the relationship between learning and work. Some participants regarded learning as something to be done when their work tasks were completed and only if they had extra time. This seems at odds with the idea that the workplace is a place of ongoing learning by its very nature and as a place where, through participation in tasks, individuals need to constantly develop their knowledge and skills (Billett, 2004, p. 315). This distinction between learning and work expressed by some of the participants may stem from a more historical understanding of learning as something that is done in formal institutions prior to beginning work (Marsick & Watkins, 2001, p. 25).

Research from the early 21st century often considered learning and work to be separate practices with their own actions and language and often occurring within their own separate locations (Boud & Solomon, 2003, p. 327). Learning was seen as the transfer of knowledge from a teacher or expert to a learner and occurred within an educational institution such as school or university. This learning was then taken into the workplace and applied in order to complete work tasks. This idea of learning suggests that an individual is like a container that has gained knowledge and skills from formal education that is then transferred into the workplace via the learner (Boud & Hager, 2012, p. 18; Hager & Hodkinson, 2009, p. 631). Jacob, from Kennard Library, reflected this view when he spoke of preferring to learn from an expert. He indicated that he preferred to be told what he needed to know, rather than working with others to develop his understanding.

Considering learning as something done before entering the workplace assumes that nothing concerning that knowledge will change. In an environment of constantly changing workplaces, this is not true. Change both in the knowledge needed to work in libraries and the environment in which libraries operate means that all library staff need to undertake lifelong learning.

Contrary to the notion that learning is a transfer of skills prior to entry into the workforce, some researchers have argued that the workplace is a legitimate
learning environment providing opportunities for less formal and more unstructured learning (Billett, 2004, p. 312; Eraut, 2004, p. 247; Marsick & Watkins, 2001, p. 25). The use of terms such as “lifelong learning” and “work based learning” suggest an understanding that the practice of learning is embedded within everyday work and living practice and that learning is not just an individual based practice, but occurs within social environments such as the workplace. Furthermore it suggests that that interaction with others is a key component of ongoing learning practice (Boud & Hager, 2012, p. 21). In describing learning as changes in the way an individual thinks or acts, it can be seen that learning does not only occur within the confines of a particular setting, such as an educational institution, but is a continually evolving process in any context whether it be work, home, or other social settings (Mulcahy, 2011, p. 205; Tanggaard, 2009, p. 701). Participants described and recorded examples of learning events that arose from simply engaging and completing workplace tasks (Billett, 2004, p. 314). Practice theorists build on the concept of the workplace learning environment suggesting that it is not only the completing of tasks but also the understanding the discourse and relationships that are present within the workplace that also shapes the learning experience and subsequent work practices of today’s employees (Lloyd, 2009, p. 404, 2011, p. 278). Practice theorists, such as Schatzki and Kemmis and colleagues consider learning as being beyond a psychological process occurring within an individual’s own mind, instead locating that process within the intersubjective space with its shared semantic, physical and social spaces (Kemmis, Edwards-Groves, et al., 2017, p. 54).

Individuals bring a particular set of experiences to any social situation, in this case the workplace, and these experiences influence how they engage with opportunities for ongoing learning, as well as the discourse surrounding that learning (Ahlgren & Tett, 2010, p. 22). For those participants who separate learning and work, their experience may equate learning with attending tertiary institution to gain the knowledge and generic skills required to be a librarian, and work with carrying out the tasks of a librarian within the workplace. In contrast, those participants who considered learning as an
important part of their ongoing work as librarians, bring different experiences and understandings to their workplace. Learning is not just gaining the necessary skills and knowledge to undertake the role of being a librarian, but instead, learning, as part of work is about becoming a better librarian, constantly developing new knowledge and skills (Tanggaard, 2009, p. 699). Knowledge of, and within, a profession is not stable and is continually subject to influences of others and the environment in which the profession is practiced (Fenwick, Nerland, & Jensen, 2012, p. 3). To explore the different understandings of workplace learning further it is necessary to understand the relationship individuals have with the idea of being a learner at work, the development of ‘becoming’, and the transition from novice to expert.

6.7.1 Being a learner

While workers may not consider themselves to be learning whilst undertaking work related practices, it is not possible to separate the activities by which an individual uses their prior knowledge and learning to engage with work activities and in so doing change their own knowledge; and so engage in learning practice (Billett & Somerville, 2004, p. 314). Yet to use the term learner, to describe someone within the work environment, raises issues of individual interpretation of the word. Learner is a word often used to describe someone who does not have the expertise or knowledge to perform the required tasks of a particular job or practice or a novice (Boud & Solomon, 2003, p. 330; Harman, 2012, p. 282). A metaphor used by Boud and Solomon (2003) is in relation to learning to drive a car. A learner is someone who requires a more experienced driver beside them, directing and correcting them as they move from incompetent to competent in the skill of driving a car. For the participants, in wanting to appear professional and competent as librarians, to admit there were aspects of their job or at least new technologies that they were still learning may have been uncomfortable or stressful. When participants saw evidence of their managers also learning about new and emerging technologies, this could have been interpreted as evidence that it was acceptable to be an expert in one area of a person’s job, as managers may be, but at the same time still need to be learning in other areas, in this case about emerging technologies. A manager, through their
actions of attending workshops or shares their own learning about technologies with staff, can demonstrate that being considered a learner is not something that to be ashamed of or makes you less professional.

Whilst workplace learning research appears to take it for granted that workers understand the role of learning in the workplace, this is not always the case (Harman, 2014, p. 52). Although the theory of practice architectures differentiates between the sayings, doings and relatings as separate elements of practice, the interplay between sayings and relatings can be seen in the language used to describe feelings involved with the practice. Through associations between the descriptions of novice or learner as less than competent, workers who identify themselves as professionals or as managers within an organisation may not be comfortable describing themselves and being classified by others as a workplace learner (Harman, 2012, p. 282). While none of this study’s participants directly voiced a concern about being labelled a learner, they did identify the need to continue to learn about technologies in order to be viewed as competent and professional by colleagues and academic staff.

6.7.2 Moving from a novice to an expert

Linked to the discussion about the role learning plays within the workplace is the acknowledgement by the participants that there were times within a staff member’s career that learning was seen as an appropriate use of time. Participants agreed that when a staff member was new to an organisation, or beginning a new role, it was expected that part of their work time would be spent gaining knowledge of the appropriate technologies necessary for that role. This acceptance of learning being appropriate when starting a new role or at the beginning of one’s career is often associated with the Dreyfus Model of Skill Acquisition. This model advances that for individuals to acquire the skills necessary to undertake a particular work role they pass through five stages: novice, competent, proficient and expert and mastery (Dreyfus & Dreyfus, 1980). Although nearly forty years old, this model of skill acquisition, moving from novice to master as a means of becoming a professional is still
being used in current research, including in the LIS field (Hall-Ellis & Grealy, 2013; Karlsson et al., 2012; Lloyd, 2009, 2011).

The Dreyfus model proposes that when a person is new to the profession, beginning in a new workplace or starting a new role, it is considered acceptable that this person will begin as a novice, spending time learning new technology systems, or learning new ways of doing things in practice that they may have learnt about only in theory. Learning, through reading, experimenting and consulting others is considered an acceptable means of moving from being a novice through competent to proficient within a given workplace (Boud & Solomon, 2003, p. 330; Dreyfus & Dreyfus, 1980, pp. 7–10). Practice theorists describe this as learning how to be within the workplace, testing what previous knowledge is acceptable and relevant within the current workplace (Lloyd, 2009, p. 402). Within the library environment the Dreyfus model has suggested that new graduates often arrive in the professional workplace with novice or competent skills and it is the responsibility of the library managers to provide the means for these graduates to develop proficiency and expertise (Hall-Ellis & Grealy, 2013, p. 598). This progression through the five-stages suggested by the model is seen as providing a career path for librarians (Hall-Ellis & Grealy, 2013, p. 598).

Acceptance by participants of time spent learning when in new roles does not take into account the importance of lifelong learning now required within the library profession in order to meet the changing technological needs of clients (McPherson-Crowie, 2012, p. 582; Popp, 2013, p. 181). While the Dreyfus model may be appropriate when it comes to the acquisition of one particular skill such as a basic understanding of the Dewey Decimal System, the ongoing learning about changing technologies does not align with the notion that at some point a person arrives at the point of being a master of the profession (Harman, 2012, p. 277). In keeping with the theory of practice architectures, an individual brings their own understanding and narrative to the workplace of how they see themselves, but this is not fixed, it is also shaped by the narratives of the workplace (Ahlgren & Tett, 2010, p. 26;
In considering the learning about technologies, it is not possible for individuals to identify or be identified along a continuum of novice to master due to the ever changing nature of the technologies relevant within the workplace. As an individual cannot be pigeonholed within a stage on the continuum it is not appropriate to suggest that there are only certain times within a person’s career that it is acceptable to be learning. Learning is an ongoing process that is necessary throughout an individual’s career. Developing cultural-discursive arrangements around what it means to be learner within a workplace, and how individuals relate to themselves as a learner, may be one way to shape the practice for a better outcome for both individuals and the organisation.

This study’s findings demonstrate that some participants were uncertain about the value of ongoing learning to them and their workplace and thus it would help to have open workplace discussions on how ongoing learning about technologies can and does add value for the individual and the organisation. While the importance of themselves and their colleagues keeping up with technologies in order to assist clients was clear for many participants, there was no evidence of discourse within the library around the need to continue learning in order to display professionalism as a librarian to academics and the university.

Being able to openly discuss and integrate ongoing learning about technologies as part of everyday work practices may go some way to increasing understanding of the integral part technologies play as part of a librarian’s skill set, and also sanction the inclusion of learning as a crucial part of their work practices. One company which has successfully integrated ongoing learning, in this case learning about safety, within work practices is SupplyCo, an electrical company in New South Wales, Australia (Scheeres, Solomon, Boud, & Rooney, 2010). In an effort to embed ongoing learning about safety and safety practices within the organisation, SupplyCo management made safety an integral part of what the company did, not as an addition to their core business. The ethos of the company became that of supplying electricity safely. This was achieved through practice architectures
such as continual discussions and forums, mandated work activities, posters, performance indicators and written procedures that all conveyed a culture of ongoing learning about safety as a normal part of work practices (Scheeres et al., 2010, p. 23). In order for libraries and their staff to be seen as supporting the ongoing learning endeavours of their clients, there is a need to embed ongoing learning, including about technologies within the everyday work of those library staff (McPherson-Crowie, 2012, p. 591).

SupplyCo can be seen as an organisation that has been able to successfully integrate individual’s ongoing learning as an acceptable and value adding contribution to their corporate goal. This moves beyond seeing learning as an individual activity where a person new to the role or organisation moves from a novice to master status, to making learning a social, group driven practice that is the responsibility not only of the individual but also of groups of individuals and the organisation, and an integral part of the profession. While this study found that individuals who were having specific conversations with their managers regarding ongoing learning about technology felt more comfortable about integrating learning into their work practices, there was not the same ongoing, library wide, pervasive discussions about the role that ongoing learning about technologies plays within the library and how this might add value to the profession and organisation.

This discussion of how learners are seen within the workplace has highlighted the importance of recognising and discussing the relationship that individuals and the organisation have in identifying the role learning has within a person’s role across a person’s career. Despite research’s acknowledgment of the workplace as a learning environment (Billett, 2004, p. 312; Eraut, 2004, p. 247; Marsick & Watkins, 2001, p. 25), there is still evidence that staff consciously separate learning from their work tasks. The nature of ongoing learning about technologies means that the knowledge required to be a librarian is not stable and that lifelong learning is necessary for a career in the library profession (Fenwick et al., 2012, p. 3). The concept of the Dreyfus model of a person moving from novice to master within their
professional may no longer fit within modern workplaces and their reliance on changing technologies. Individuals bring to each workplace their own history and previous experiences of workplace learning. Through discourse and social knowledge development it is possible to reshape these understandings, and to promote the fluidity of the relationship between learning and work. One way of achieving this is through greater understanding of the types of learning that take place within the work environment and recognising the different ways in which individuals undertake these types of learning.

6.8 Types of learning in the workplace

Participants used words such as learning, playing, exploring, and trialling as the ways in which they were enacting the practice of learning about technologies, yet, they were not articulating the type of learning they were actually doing. In an attempt to explore the process of learning that is occurring in this practice, it is necessary to consider the doings of learning. Research literature has suggested a number of means of classifying the types of learning that are occurring at work, in particular categorisation of the types of knowledge being acquired (Margaryan, Milligan, & Littlejohn, 2013, p. 2). These include codified, cultural and personal knowledge (Eraut, 2007, p. 405), and professional and personal knowledge (Le Maistre & Pare, 2004, p. 46). In addition to the literature highlighting the types of knowledge developed through learning at work, research has also focused on what is being learnt. Eraut (2004, p. 265) proposes a detailed typology of what is being learnt in the workplace including task performance, role performance, awareness and understanding, academic knowledge and skills, decision making and problem solving, teamwork, and judgement. Researching workplace learning at the same time as Eraut (2004), Boud and colleagues identified three significant areas of learning that individuals are undertaking at work. These actions are mastery of organisational processes, dealing with the atypical, and negotiating the political (Boud & Middleton, 2003, p. 198; Boud & Solomon, 2003, p. 328). These three actions will form the basis for a discussion on what participants were doing as they went about learning about technologies.
Mastery of organisational processes describes learning tasks that empower the individual to perform the administrative requirements or prescribed tasks for their job. This learning is replicating the existing practices within an organisation, completing tasks and processes as they are currently enacted by others. Mastery of organisational processes ensures workers gain an understanding of existing knowledge with an aim of supporting the practice traditions already established within the workplace. In the case of learning about technologies participants described learning to use of the library management software, learning how to use the *Lib Guides* software and the room booking software so they could assist library clients. These are all examples of mastery of organisational processes.

Participants undertook this learning by asking colleagues for assistance or referring to documented sources such as site procedure documents in order to ensure what they learnt correctly aligned with the current practice of the site (Boud & Middleton, 2003, p. 199). Learning the way a software program is being used within a particular site extends beyond simply the mouse clicks and keystroke entries required to use the software. This type of learning also includes understanding the procedures and implicit knowledge that could be associated with the software program. For example, as Zoe [Lindsay] learnt how to use the room booking software from her manager, she would also have been learning site specific knowledge such as which clients get priorities in room bookings, or the acceptable means by which the library accepts requests for room bookings. Whilst learning how to use a particular technology from sources such as colleagues, the language used (sayings), the actions shared (doings) and the means by which the software program is incorporated into other library practices (relatings) are all part of the learning experience. Learning from colleagues and written procedures assists with the continuity of the practice by reinforcing the current language and actions expected by those performing the practice as well as supporting organisational requirements and consistency of service.
The second area of learning proposed by Boud and colleagues is engaging with the atypical and was also described by the participants of this study (Boud & Middleton, 2003, p. 198; Boud & Solomon, 2003, p. 328). Dealing with situations where there is are no set procedure or process already in place leads to the need for individuals or groups to work together to develop strategies for a successful outcome (Boud & Middleton, 2003, p. 199).

Ongoing technological change sees workers engaging more and more often with situations not previously encountered, requiring practical judgement rather than relying on set procedures (McCormack, Pancini, & Tout, 2010, p. 42).

Learning when attempting to solve a new problem can build upon previous experience with similar situations. The participating liaison and reference librarians described experiences where they needed to learn new databases and new applications software in order to answer particular information requests from clients. Building on previous experience with journal databases they were currently familiar with and being able to transfer this knowledge to learning how to search a new database is an example of atypical learning. Eraut (2004, p. 265) describes this as problem solving and atypical learning requires developing knowledge in problem analysis as well as knowing when to seek help from others. Developing skills in atypical learning can also give learners greater confidence in their ability to solve new problems. Linda [Lindsay] acknowledged that every time she was able to learn a particular technology she was building her confidence to then learn new technologies in the future. While the participants often attempted to use their prior knowledge of similar software program to direct their learning, research suggests that engaging with colleagues, not only as a source of learning about existing practice, but also as a means of learning together, is a strong source of atypical learning (Boud & Middleton, 2003, p. 199; Littlejohn, Margaryan, & Milligan, 2012, p. 227).

Despite the identified value of social learning, the participants reported limited examples of being able to work together with a group of colleagues to problem solve. Tamara [Forrest] reported wanting to use the library wiki more
in order to share what she had learnt with others, yet this required a network of people to engage with this technology which at the time was not happening in her workplace. Individuals have the ability to learn to understand, however the social nature of learning suggests that it is through problem solving together, sharing experiences and individual knowledge, that new knowledge is best developed (Littlejohn et al., 2012, p. 227). One social-political arrangement that may support ongoing learning may be through managerial support for relevant groups of individuals to connect and share both their learning experiences, and also to raise issues or problems for discussion. This is more than just one person sharing their experiences so others can benefit, this is collaboration in order to create new knowledge and solve workplace issues. Through collaboration, an increased understanding about the use of and learning about new and emerging technologies could result in benefits for the organisation and staff.

The third area of learning categorised by Boud and colleagues (2003, p. 198) is learning in order to negotiate the political. Working in any workplace necessitates understanding not only how to negotiate relationships within the organisation but also how to continue learning to map out a career path within the workplace (Boud & Middleton, 2003, p. 198; Eraut, 2004, p. 265). Even though the majority of participants in this study did not directly refer to learning about technologies having a direct influence on their personal career paths, there was debate about the importance of keeping up with technology in order to provide ongoing services for clients. Participants also valued being seen as having professional status within the university context which may also impact their career path. At Kennard Library, where the library staff had just undergone a restructure, participants shared that one of the questions asked during the interviews for positions within the new structure was about how individuals kept up with new and emerging technologies as part of their own development. Sean [Kennard] and Sara [Forrest] both expressed how crucial it was that they and their colleagues continued learning about technologies in order to be seen as professional and relevant by academic colleagues, university management and so indirectly perhaps, have a positive impact for future employment and promotion.
Not one of the participants confirmed having to plan or record their learning about technology as part of their performance discussions with their manager nor how it might be included as part of the ALIA professional development scheme which aims to promote excellence and ongoing learning (ALIA, 2017b). Whilst acknowledging that keeping up with technology was an important aspect of their role and it was an important part of being seen as professional, participants were not then giving this practice strong emphasis within the development paths available to them. By incorporating career path planning as part of the personal development plans of individuals, the organisation could not only support staff to learn how best to negotiate their workplace but also make explicit practice architectures that will help enable ongoing learning as an important step in a person’s career path in academic libraries.

So far this Discussion Chapter has focused on the language used to describe and action ongoing learning as well as the role managers and colleagues have in supporting ongoing learning. In focusing on the dichotomy found between work and learning, as expressed by many participants the influence of a person’s interpretation of language and their dispositions (previous experiences and knowledge) has been highlighted. To continue to examine the ways in which ongoing learning about technologies can be better supported the impact of two material-economic arrangements will be considered. Emphasised by the participants as having a significant influence on the shaping of their practice was both time as a finite resource and the impact of physical space on learning.

6.9 How time as a resource is shaping the practice of learning about technologies

All practices enacted within a site compete for finite resources such as space, physical objects and time (Southerton, 2013, p. 343). Practices occur within time and space, influenced by the historical conditions that have occurred previously and in turn influencing the future (Kemmis et al., 2012, p. 35; McKenzie & Davies, 2013, p. 3). This view emphasises time as a social
construct as perceived by those individuals and groups of individuals who are undertaking the practice. Contrasting with this social constructivist view of time, participants viewed time as a resource, something that was finite, and which could be allocated to various practices (Southerton, 2013, p. 342). Both physical space and time as a resource have been described as material economic arrangements in reviewing action research in the education field (Rönnerman & Salo, 2018, p. 101).

Time has been identified as an important determinant of learning, with investment of time and effort believed to lead to expertise (K. G. Brown, 2005, p. 466). Yet, from studies of Learning 2.0 programs and from the participants in this study, time, or to be more precise, lack of time, is cited as one of the main reasons that learning about technologies, or any kind of learning at work, is not being undertaken. The concept of time, as it is referred to here, suggests that it is something that is separate from the individual, a resource that not only can be measured but also allocated to enact a practice (Duncheon & Tierney, 2013, p. 243; Southerton, 2013, p. 342).

Participants’ raised a number of examples of workplace conditions that impacted on their time including being under extreme pressure at work, decreasing staffing levels, perceived heavier workloads and the feeling of having to do more with less. These conditions were offered as valid reasons for not having time to spend undertaking learning at work. Within the research literature, heavier workloads, other priorities, and difficult economic times have all been cited as reasons for not spending time learning at work (Chan & Auster, 2003, p. 280; Corcoran & McGuinness, 2014, p. 191; Gross & Leslie, 2010, p. 661). Participants in this study cited “lack of time” and “I don’t have enough time” as their initial answers to any discussion about barriers to undertaking learning about technologies, and for this reason it is important to explore this issue further.
6.9.1 Time as a constraint to ongoing learning about technologies

As discussed in the Findings chapter of this thesis (section 4.9.2.1), time was cited as a major reason why learning about technologies wasn’t being undertaken as part of normal work practices. As a constraint on the practice, the perception of lacking time was both a very strong and accepted influence among participants. This major barrier to workplace learning supports the findings of a number of research studies in the LIS area; both of workplace learning in general and those studies focusing on learning about new technologies. Separate studies focusing on the ongoing learning by cataloguers and distance education librarians found that lack of time was cited by the majority of participants when asked to identify barriers to undertaking ongoing learning (Cassner & Adams, 2006, p. 93; Hider, 2006, p. 46; Park, Tosaka, Maszaros, & Lu, 2010, p. 169). In the two studies by Hider (2006, 46) and Park and colleagues (2010, 169), 77% and 65% of respondents respectively cited lack of time as the greatest barrier to their continuing education. For distance education librarians, the percentage was even higher, with 86% of respondents listing time constraints as the greatest challenge to undertaking ongoing professional development (Cassner & Adams, 2006, p. 93). Time constraints were listed as a greater barrier to ongoing learning than financial support for attending training events, time release to attend training events, and the lack of training opportunities available.

Looking at studies of programs designed to assist with the ongoing learning of technologies, researchers found lack of time to again be a major barrier to both undertaking learning and completing the programs offered. At Edith Cowan University Library in Western Australia, lack of time, and competing priorities, were among the most common reasons given by staff for why the 23 things program was not completed when it was offered there (Gross & Leslie, 2010, p. 661). Stephens and Cheetham (2012, p. 6) in identifying best practice for conducting the 23 things programs, listed allocating time for learning as one of the most important tools that should be put in place to
ensure the best possible success of the program, as this was the major reason for participants of the program not successfully completing it.

Stephens and Cheetham (2012) and Gross and Leslie (2012) both concluded that allocating time for staff to specifically focus on learning was necessary to ensure the success of Learning 2.0 programs. They did not, however, attempt to delve deeper into understanding more about what staff meant when they specified lack of time as a barrier to learning. As part of this study, understanding more about this perceived lack of time was seen as an important step towards identifying how this practice architecture might be shaped for a more positive outcome.

6.9.2 Increasing workloads and competing priorities impacting on ongoing learning

When participants were asked to expand further on how time was influencing their ability to undertake the practice of ongoing learning, they focused on the reasons for the perceived lack of time. These reasons included a reduction in staffing levels leading to greater workloads as well as competing priorities. Both these reasons have been highlighted as barriers to learning in other studies of workplace learning (Chan & Auster, 2003, p. 280; Gross & Leslie, 2010, p. 661). Interestingly, Corcoran and McGuinness (2014, p. 191) whilst highlighting the economic environment as influencing the amount of time library staff had for continuing professional development, reported that librarians felt that tighter budgets meant that some “privileges” were being rolled back. This seems to imply that professional development and ongoing learning were perceived as a privilege that was no longer available for staff in times of high financial pressure. This appears to be in conflict with the shared responsibility for ongoing development between individuals, employers, training providers and professional associations (Hallam, 2007, p. 20) and will discussed further in section 6.9.4.

Research into the impact of changing workloads on workplace learning in general has found that there is an ∩ (inverted U) relationship between perceived increasing workloads and workplace learning (van Ruysseveldt & van Dijke, 2011, p. 472). Whilst increasing workloads provide the opportunity
for increased learning as individuals are encouraged to look for more efficient
ways to undertake their roles, there comes a point when workloads are so
overwhelming high that there is no time for exploration, reflection and
therefore learning. As a person perceives an increase in their workload they
often experience feelings of being overwhelmed, a sense of incompetency
and dissatisfaction which do not relate well to being involved with learning
opportunities (Kyndt, Raes, Dochy, & Janssens, 2013, p. 285). Also
impacting on workloads and ongoing learning was the autonomy that a
person had over their work day. Workers with a higher degree of autonomy
over their workday, that is those who had greater control over when they did
various tasks, were more likely to see and take up opportunities for learning
(van Ruysseveldt & van Dijke, 2011, p. 473). In contrast, individuals who had
lower levels of autonomy undertook fewer learning opportunities when they
perceived they had increased workloads. The lower the level of control a
person has over their work tasks and how they undertake their work, has
been associated with having fewer opportunities to actively engage in solving
problems as part of work, and therefore reduced uptake of these and other
learning activities (Kyndt et al., 2013, p. 285; van Ruysseveldt & van Dijke,
2011, p. 479). The majority of participants in the current study were
reference and liaison librarians, who, when not required to complete rostered
desk shifts reported having a high level of autonomy over how they
structured their work tasks within their day. When undertaking a reasonable
workload, reference and liaison librarians, would expect to have the time
available to undertake the learning required to first, answer client’s questions
and second, have the possibility of further time to explore technologies in
general. Thus when workloads increase, the time to undertake adequate
learning to address client’s questions is limited and there is little time for
extra learning. At times like this, it would be expected that staff would identify
that lack of time was impacting on their ongoing learning.

Among the participants of this study there were two staff who were working
in a front desk role. Both staff members felt they had limited autonomy over
their work tasks and workloads as their workday was controlled by rostered
desk shifts and daily required tasks such as shelving. This lack of autonomy
resulted in both staff reporting that they had limited time to undertake learning within their working day. Naomi [Forrest], confirmed that when she was undertaking the reference component of her joint role (front desk librarian 2.5 days per week, reference librarian 2.5 days per week), she had greater autonomy over how she structured her work tasks and therefore was more likely to engage in learning opportunities during the reference period of her work. It could be argued that through focusing on roles that were lower in autonomy, management may be able to enable more ongoing learning by developing ways to increase autonomy over workloads for these staff (van Ruysseveldt & van Dijke, 2011, p. 481). This does raise a numbers of issues, including how to go about increasing staff’s autonomy over their work tasks within the present structures of the ways in which library services are offered, for example at rostered desk shifts.

When considering workloads and autonomy over one’s work tasks, it is important to also consider the impact of the number of hours a person works during any given week. That is, the difference between full and part time staff. Part time work has been found to have a negative effect on the ability of individuals to undertake ongoing learning. Part time work provides fewer opportunities to attend formal training sessions, through attendance at workshops and conferences, as well as take advantage of informal learning opportunities such as talking to colleagues, sharing experiences and reading professional literature (Chan & Auster, 2003, p. 280). None of the participants in this study identified as working part time, yet a recent study based on Australian Tax Office and Australian Bureau of Statistics data found that 39% of librarians and 55% of library technicians worked part time (Butt, Lama, & Sengkey, 2019). These statistics suggest that senior managers and line managers need to acknowledge the difficulty of undertaking ongoing learning for a large proportion of their workforce.

Studies of the impact of workload on ongoing learning (Kyndt et al., 2013; van Ruysseveldt & van Dijke, 2011) acknowledge that there are other factors besides workload and autonomy, such as personal motivation, that also influence workplace learning. Yet, in trying to identify means of changing
practice architectures to better support ongoing learning, managers have considerable power within the workplace through relationships with staff, allocation of workloads and managing individuals’ autonomy over their work days.

Participants reporting competing priorities had a major impact on their practice. Gross and Leslie (2010, p. 661) found that competing priorities influenced the ability of library staff to find time for ongoing learning. If this idea of competing priorities is considered in conjunction with the discussion about considering ongoing learning as an extra commitment, as was highlighted by participants, it is interesting to consider whether allocating time to undertaking learning is given a lower priority than other work tasks by staff, managers and/or the organisation. It may be informative to explore further whether the position descriptions, and lists of required tasks of the jobs of library staff, includes undertaking ongoing learning. If ongoing learning, and in particular learning about technologies as they impact upon a library staff member’s role, is not included in the task list of a person’s position description, it may implicitly signal that this has a lower priority within a person’s role. Stephens and Cheetham (2012) include a quote in their study from a library manager who said:

I heard a number of comments in the lunch room from staff saying ‘oh I haven’t got time’ and I said to one of them ‘well if a customer comes to the front desk and asks can you issue some books to them would you say you don’t have time’ and she said ‘no that’s my job’ and I said ‘well it’s also your job to learn how to manage new technology so make the time it’s important’ (p.12)

By specifically expressing the understanding that ongoing learning about technologies is in fact an integral part of a person’s role, rather than an added extra, this manager quoted above is identifying that in their library, ongoing learning does have as much importance as other aspects of a person’s role. For ongoing learning to make a long term difference to both the individual and the organisation it needs to be embedded in a staff member’s everyday activity and given the same status as other tasks that need to be completed (Gross & Leslie, 2010, p. 662). Formal recognition
within position descriptions of the priority that ongoing learning has as part of an individual’s role is a straightforward means of highlighting the importance placed on learning by the organisation’s management. Whilst competing priorities will always be an issue for many library staff, social-political arrangements such as clear written policies, statements in individual and organisational development plans and position descriptions could explicitly enable the practice of ongoing learning within a workplace.

Feelings of being overwhelmed, lacking in confidence and fear of making a mistake with respect to learning about technologies, as reported by participants, give insight into some of the emotions surrounding the practice. The participants referred to feelings of being overwhelmed by the number and seemingly never ending availability of new technologies which have been found to in turn evoke feelings of anxiety, fatigue, scepticism and inadequacy (Salanova, Llorens, & Cifre, 2013, p. 433). Through clear practice architectures outlining the specifics of ongoing learning practice within a person’s work role might help to relieve some of these negative feelings.

6.9.3 Making time to learn and spending that time wisely

While for the majority of participants who saw not having time to learn as a barrier to their practice, some participants shaped time in such a way as to enable ongoing learning. These participants actively sought to allocate time to learn within their working week. By viewing ongoing learning about technologies as an important part of their personal development and therefore their role, participants such as Tamara [Forrest] and Sean [Kennard] were clear about consciously allocating time during their week to undertake learning. This deliberate allocation of time as part of an individual’s workload in order to learn about emerging technologies supports findings from previous research that learning about technologies was more likely to be successful when time is allocated by individuals (Gross & Leslie, 2010, p. 662; Long & Applegate, 2008, p. 180; Stephens & Cheetham, 2012, p. 6). By considering learning about technologies in the same way as other work place tasks, such as responding to academic staff’s questions and
undertaking rostered desk shifts, these participants were purposefully shaping their practice for what they saw as the best outcome for themselves personally and for their organisation.

Previous research has found that library staff are more comfortable spending time learning when it is directly related to a work goal (Chan & Auster, 2003, p. 274; Gross & Leslie, 2010, p. 661), however the participants of this study expanded further on relating learning to immediate goals. The participants expressed that they wanted to ensure that the time they did spend learning about technologies was a worthwhile and appropriate use of their time. Participants wanted to make sure that time spent learning was not wasted by spending too much time learning a particular technology that was of no ongoing value to a person’s role. Previous studies have highlighted the importance of the relevance of technologies to a person’s work role as one influence on the completion of Learning 2.0 programs (Chan & Auster, 2003, p. 274; Gross & Leslie, 2010, p. 661). This study found that the decision of how relevant a particular technology is to a person’s role was generally left to the individual. Once again the importance of the managers and the organisation initiating discussions and providing guidance for the ongoing learning about technologies to shape ongoing practice is emphasised.

6.9.4 The importance of time in enabling the learning about emerging technologies

In discussing the importance and allocation of time as a means of supporting staff to keep up to date with technologies, considering whether continuing professional development should be conducted in work time or in personal time is also important. As part of membership schemes for Library and Information professionals in Australia, the UK and New Zealand, continuing professional development schemes place the responsibility for ongoing development with the individual (Broady-Preston & Cossham, 2010, p. 10). Individuals, through continual professional development gain enhanced job satisfaction and security as well as professionalism (Mackay, 2017, p. 141). Participants agreed that as individuals they gained not only skills but greater employability through ongoing professional development. As Vanessa [Kennard] articulated, the long term outcome of her ongoing learning was as
much a benefit for her employers as for herself. Alice [Lindsay] and Olivia [Kennard] acknowledged that learning was now a necessary part of their roles so it needed to be considered a core activity rather than an added extra.

Individuals are not the only beneficiary of continued development. The organisation within which that individual works also benefits through the ability of that person to continue to meet the changing needs of the market as well as assisting to achieve greater organisational success (Mackay, 2017, p. 141). In recognising the value of social knowledge, developed within the context of the site, there also needs to be a shift away from focusing on the individual as the recipient of knowledge acquisition (Boud & Hager, 2012, p. 26). In combining the concepts of professional learning (acquisition of knowledge by the individual) with professional practice (deploying knowledge within a particular context) it can be seen that ongoing professional development is a partnership between the individual and the employer with potential benefits to both. (Broady-Preston & Cossham, 2010, p. 10; Corcoran & McGuinness, 2014, p. 193; Milligan & Littlejohn, 2014). Time spent on learning as part of an individual’s workday can be beneficial to both the employee and the employer as Angela [Forrest] suggested:

I think ultimately we’re responsible for our development individually but it’s support – it’s a good environment if you’re organisation sees it as it can only benefit the organisation if everyone is allowed to be a bit challenged by new things and try things [Angela, Forrest].

ALIA, as part of their professional development scheme, requires members to identify the amount of time they spend undertaking professional development activities over the course of a year, nominating a minimum of 30 hours per year and 120 hours over three years to gain ALIA Certified Professional membership (ALIA, 2017b). In nominating a time requirement rather than focusing on attendance at events such as conferences and workshops, this scheme allows members to identify a number of informal and workplace learning activities to include within the allocated hours. These activities can include reading of professional journals and the identification of how workplace experiences have resulted in the development of new skills
and knowledge. By accrediting both the need to record hours spent in professional development and the variety of ways this development may occur, ALIA is supporting the critical role that ongoing development has as part of staff member’s development. Also, as part of the ALIA Career Development Kit there is an emphasis on both individual goal setting and reflection and the valuable role a supervisor can play in supporting ongoing development. It is noted that in the list of support that supervisors can provide for individuals contained in the Career Development Kit, there is no mention of assisting with time allocation (ALIA, 2017a, p. 12) which participants viewed as important.

As can be seen from this discussion about time, there is a deeper understanding needed when considering the perceived constraint of a lack of time to undertake learning. Lack of time as an identified constraint has been found to include issues such as perceived workloads, competing priorities, the pressure of having to complete learning within a certain timeframe, wanting to ensure time spent learning is not wasted, and focusing learning on relevant technologies to ensure the best use of time. Whilst individuals within the current study were grappling with these issues with regard to time, there was no evidence of a collective understanding at any of the sites about how to discuss or solve the constraint of time as it shapes ongoing learning. In order to shift time as a practice architecture from constraining practice to instead enabling improved practice there needs to be organisation-wide discussion or at least a discussion between individuals and their managers around topics such as where the task of ongoing learning fits within a person’s position description. This discussion could include how much time should be allocated to learning and how that allocation might be managed in a practical sense. In acknowledging that learning about technologies that occurs in direct response to a client request is considered an acceptable use of time due to the relevance of the learning, group discussions about how best to focus learning on relevant technologies might assist individuals to feel confident in the way they are currently targeting their learning. Understanding the possible reasons behind comments such as “I don’t have time” or “I can’t find time” as apparent rationale for not undertaking learning about
technologies, may assist in beginning discussions. This can then lead to the identification of practice architectures that will improve ongoing learning practice.

6.10 How physical space is shaping the practice of learning about technologies

An individual’s physical surroundings at work, the way they interact with the layout of equipment, the desks in an open plan office and environmental factors such as the amount of natural sunlight and air can have a significant impact on the way people work and subsequently the way they learn at work (O’Toole, 2001, p. 10). Understanding how a workspace, and of interest in this study, how open plan offices in particular, influence the work and learning of those within that space enables the identification of how physical spaces are shaping the practice of ongoing learning.

Much of the focus of the literature investigating the role of work space in shaping learning has emphasised the impact on individual learning; that is on the experiences and motivations of individuals (Eraut, 2004; Kersh, 2015). The organisation of the physical space in workplaces can provide clear messages as to the power hierarchy of workers, with managers, longer serving staff or those with roles requiring privacy (managing staff, communicating with clients) being given offices whilst others work in open plan spaces (O’Toole, 2001, p. 11). All but two of the participants worked in an open plan office. One of the participants who at the time of the study had an office, was about to be moved into a new open plan space suggesting that open plan space were still forming part of newly renovated areas within library staff spaces. Within the sites studied, it was only senior management and some line managers that had their own offices. For this reason, the influence that workspace, in particular the open plan office space, will be discussed in relation to its impact on shaping the learning experiences and practice.
6.10.1 Open plan offices

The literature does not have an agreed definition of what an open plan office looks like, and there are a number of different office layouts that could be considered open plan. These layouts include desks surrounded by high partitions preventing individuals from seeing each other, desks with lower partitions allowing both sight and hearing access between desks, and small groups of desks in a completely open area allowing staff ability to move where they work throughout the day (Parkin, Austin, Pinder, Baguley, & Allenby, 2011, p. 32). The participants for this study worked in open plan offices that had groups of desks with low partitions, providing both sight and hearing access to other colleagues. Each participant had access to their own permanent work desk, and the hardware and applications software they required for their job. The two staff working in smaller offices, did so alone.

Research into the benefits and difficulties of open plan offices has found that while open plan offices make better use of space in contrast to individual offices, they also result in a high level of distraction for individuals including having to listen to noisy conversations, phones ringing, people moving about, and decreased privacy (Irving & Ayoko, 2014, p. 7; Parkin et al., 2011, p. 33). Individuals report difficulty in concentrating without interruptions from colleagues, research that was supported by this study with participants discussing the difficulty of being interrupted constantly by those working around them (Irving & Ayoko, 2014, p. 7). Stressing that interruptions from colleagues were not always unwelcome, participants reported that even with the use of headphones as a means of shutting out unwelcomed noise, and a signal to others they were not to be interrupted, this did not always work in preventing interruptions. Increased noise and distractions have been found to lead to decreased productivity, work satisfaction and motivation in open plan office spaces (Parkin et al., 2011, p. 33). This would suggest that the open plan work environment can have a considerable influence on both the work and learning experiences of the individuals who work in them and an influential material-economic arrangement in constraining practice.
One important finding from this study which has not appeared in the research literature was described by participants as the idea of being judged by their colleagues for what was on their computer screens. Participants described feeling of being self-conscious if a colleague passed their desk and saw either a learning video or social media sites such as Twitter on the screen. Despite expressing confidence that there was nothing wrong with them accessing such sites as part of their learning practice, the lack of privacy, in particular with what they were accessing on their computers, was shaping the practice of participants. In seeking privacy in a physical space people look to create a buffer zone that prevents intrusions and observations from others (Zhang, Wang, & Xu, 2011, p. 4). Open plan offices do not provide individuals with the privacy to feel that they can protect themselves from the observations and monitoring of others and this needs to be acknowledged as a constraining influence of open plan offices on individual continuing learning. In contrast, managers who, having their own offices, are exempt from having their actions monitored and go some way to preventing interruptions.

Given the social nature of learning, and the finding that participants went about learning about technologies through asking colleagues, it was expected that the literature and the participants would also report positive aspects to working in an open plan office environment. Research has found that being able to overhear colleagues’ conversations, while being a source of distraction, can also result in being able to support colleagues’ learning by assisting with questions or problems (Irving & Ayoko, 2014, p. 7). As well as helping others, overhearing conversations within a workplace also provides staff, especially those new to the environment, with a better understanding of who within the workspace knows what information, and who might be best to target when seeking information (Irving & Ayoko, 2014, p. 11). Participants agreed that being in an open plan office allowed them to have quick conversations, gain help readily, and to be able to help others with problems in a way that would not be as easily navigated if individuals were in their own offices. Shared workspaces have been found to provide opportunities for greater communication and interactions between staff enabling knowledge

The limited research into the impact of workspaces on learning experiences, although acknowledging that the office setup can have an impact, hasn’t always been able to clarify what a good environment encompass when it comes to supporting workplace learning (Trede, McEwen, & Sheehan, 2013, p. 99). More research is needed into the specific features of the workplace physical environment that can shape workplace learning (Trede et al., 2013, p. 103).

Reviewing the limited literature on the impact of workspace design on workplace learning has found workspaces both enable and constrain ongoing learning in a mixture of ways. Whilst open plan sites offer opportunities to enable learning through collaboration with colleagues, the negative influences of noise, distraction, and lack of privacy appear to outweigh the benefits (Parkin et al., 2011, p. 33; Zhu, 2013, p. 53). Academics working in open plan offices, acknowledge that the open plan office provides the opportunity to collaborate with colleagues more and increases informal interactions, also report feeling that talking and collaborating provides distractions for others so is less likely to happen (Parkin et al., 2011, p. 41). Visual privacy, noise control, natural light, ventilation, temperature and conversational privacy have all been found to be barriers to focusing on work and learning in an open plan office (Zhu, 2013, p. 49).

In contrast to the open plan space, individual offices were believed to result in greater productivity and were better suited to concentration and quiet work (Parkin et al., 2011, p. 45). Participants also highlighted the need to be able to focus and concentrate when undertaking prolonged or intense learning. Olivia [Kennard] detailed the need to be able to concentrate when she was learning Endnote as it required considerable focus. Having a space that enabled participants to remove themselves from the distraction and
conversations of others, was an important consideration for participants of this study. They believed that having a space away from the open plan office, which they described as a learning space, would actually provide a number of benefits. A designated learning space would allow participants to spend time away from the open plan space to concentrate on learning a particular technology. This type of space would also provide a clear signal to all staff that learning was an important part of a person’s role, and that spending time learning during a workday was supported and valued by the management of the organisation. A learning space would also allow staff to watch videos, experiment with new technologies or focus on developing skills in private, without the feeling of being negatively judged by colleagues.

The literature has focused on the individual needs of workers within the workspace. It is important that the personal experiences (dispositions) of individuals are acknowledged as shaping their learning experiences as they enter into intersubjective spaces (Kersh, 2015, p. 842). Consideration of workspaces is one example where the interplay between elements of practices and practice architectures can be seen. Participants who have experienced positive encounters with gaining and sharing knowledge and learning from colleagues in an open plan office were more likely to consider the positive aspects of the open plan office. These individuals saw the open plan office as enabling their practice, and so in turn shaping how they personally used the physical space to enhance their practice. At the same time the physical office space could be seen to constrain practice due to noise and distraction, requiring participants to change the way they enacted the practice by removing themselves to a separate area allowing them to concentrate.

This study has shown that learning about technologies is undertaken through a combinations of methods including individual exploration and interactions with colleagues as well as other more formal means. To support these informal methods of learning, staff need access to individual learning spaces to assist focused learning. These should be combined with spaces that encourage interactions between colleagues to support spontaneous and
informal learning experiences. The provision of a variety of spaces and
discussion among work groups and management about the value and
purpose of each, are some examples of material-economic arrangements
that may strengthen the means by which the physical space enables better
practice.

This chapter has drawn attention to the range of cultural-discursive, material-
economic and social-political arrangements present in the intersubjective
space in the sites studied. It has also illustrated the complexity of the
interdependence between the language used within a site, the physical
aspects of the site, and the relationships as seen in the power managers,
and to a lesser degree colleagues, have in shaping individuals’ practices.
The theory of practice architectures by its nature encourages the
transformation of practices as practitioners strive to improve their practice
(Mahon et al., 2017, p. 16). So in considering what changes might be
suggested in order to improve practice, it is important to be aware that any
change to one practice architecture by its nature could impact the elements
and other practice architectures discussed in this study. In considering any
suggested change, there must be acknowledgement that ongoing learning is
only one practice happening with the site of an academic library. Kemmis
and colleagues describe the interdependence of practices within a site as the
“ecologies of practices”, stressing that the sayings, doings and relatings of
one practice are shaped by the sayings, doings and relatings of other
practices (Kemmis, Wilkinson, et al., 2014, p. 47). While this study has
focused on exploring the practice of ongoing learning about technology with
a view to assisting individuals and organisations to improve that practice, it
must continue to be emphasised that practices are shaped by the traditions
that have held them in place until this moment in time and the landscape in
which they exist. Suggesting changes to the way managers interact with staff
about ongoing learning about technology does not take into account the
practice of management as enacted by these managers and the traditions,
elements of practice and practice architectures shaping managerial practice.
Improving practice is not as easy as making one change to a workplace or
having one conversation, as any change will not only shape the practice of
ongoing learning, but also other practices within the site. In concluding this chapter by providing a summary of the myriad of possibilities available that may improve practice, it is important to keep in mind the purpose of the practice is undertaken (project), the dispositions of those undertaking the practice, the practice landscape, and the practice traditions.

6.11 Conclusion

This study has highlighted a number of possible changes that could be made in organisations that may enhance the enabling of the practice of learning about technology within an academic library setting. Below Table 6.2, in continuing to use the Table of Practice format used to analyse the practice (Kemmis, Wilkinson, et al., 2014, p. 226), summarises some of the actions that could be undertaken with a view to improving the practice of ongoing learning about technologies.

A collective understanding of the purpose of the practice (the project) provides a clear reason as to why the practice is important. This study found that whilst individuals expressed a commitment to their own personal development, discussions library-wide as to the purpose ongoing learning had with the workplace would generate a shared purpose. The project of this practice would be to continue to provide relevant services to clients, development of skills by staff to meet changes in the profession, and to develop and maintain professional standing for the library and staff within the wider university community.

The dispositions of practice are the skills, knowledge and values that an individual brings to the practice, in this case, confidence in their own ability and a willingness to share their learning with others for the benefit of both themselves and others within their site. In acknowledging the purpose and dispositions of a practice, it is recognised that practices occur within both the practice landscape and through the practice traditions present in that landscape. Libraries should strive for a practice landscape that recognises the ever changing nature of technologies that will impact both services and
staff and the need for all library staff to be continually learning within that landscape.

Finally, developing a practice tradition that recognises the continual influence of technological change on the library, its services and staff and in doing so ongoing learning will be a discussed and embedded part of work practices for all library staff. Practice traditions will emphasise that individuals, through continuing to learn, discuss, share and work with others, will shape a workplace that adapts to technological change and be seen by stakeholders as being at the forefront of this aspect of the profession. Individuals new to the library will have opportunities to shape their own learning practice based on a clear discourse and social arrangements they encounter in the workplace.

Table 6:2

*Improving the practice of learning about technologies*

<table>
<thead>
<tr>
<th>Elements of practices</th>
<th>Practice architectures in the site</th>
</tr>
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<tbody>
<tr>
<td><strong>Project</strong></td>
<td><strong>Practice landscape</strong></td>
</tr>
<tr>
<td>Through discussions between staff and management develop a clear understanding about</td>
<td>Through continued recognition that new and emerging technologies are a constant within the practice</td>
</tr>
<tr>
<td>the purpose of ongoing learning about technologies including such reasons as:</td>
<td>landscape, acknowledge that the landscape will continue to have a changing impact on the practice</td>
</tr>
<tr>
<td>• to continue to provide relevant services to clients,</td>
<td>of learning about technologies.</td>
</tr>
<tr>
<td>• ongoing personal knowledge development in order to maintain skills needed due to</td>
<td></td>
</tr>
<tr>
<td>changes in the profession, and</td>
<td></td>
</tr>
<tr>
<td>• develop and maintain professional standing within the wider University community.</td>
<td></td>
</tr>
<tr>
<td><strong>Sayings</strong></td>
<td><strong>Cultural-discursive arrangements</strong></td>
</tr>
<tr>
<td>A variety of words and phrases will be acknowledged as describing how learning</td>
<td>Staff and managers will understand what is meant by the term emerging technologies within the</td>
</tr>
<tr>
<td>about technologies is undertaken including words such as learning, playing,</td>
<td>context of their own worksite</td>
</tr>
<tr>
<td>trialling, experimenting. All will be acknowledged for the value they have in</td>
<td>Staff and managers will have an agreed language with which to discuss how individuals are</td>
</tr>
<tr>
<td>describing the practice.</td>
<td>learning about technologies. This would including expanding individuals’ understanding about the</td>
</tr>
<tr>
<td>Individuals will have clear understanding about what emerging technologies are at</td>
<td>range of ways learning can be undertaken.</td>
</tr>
<tr>
<td>their own site and more broadly in the</td>
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</table>
profession and the literature and thus
develop the language to describe how and
why they are undertaking the practice of
learning about technologies.

Training plans will express the importance
of ongoing learning about technologies and
the place informal and personal learning
have in ongoing staff development.

Individual development plans will explicitly
acknowledge informal learning activities as a
means of ongoing learning.

<table>
<thead>
<tr>
<th>Doings</th>
<th>Material-economic arrangements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individuals will undertake, and reflect on, a range of informal learning activities as a means of ongoing learning about technologies.</td>
<td>Learning spaces will be provided acknowledging that at times learning is better done away from distraction.</td>
</tr>
<tr>
<td>Individuals will take advantage of opportunities such as workshops and forums as a means of sharing knowledge and learning.</td>
<td>Opportunities are provided through workshops, forums, and presentations on new and emerging technologies and managers encourage any interested staff to attend and share their learnings with others.</td>
</tr>
<tr>
<td>Individuals will discuss with managers the appropriate allocation of time within their workday as a means to undertake both formal and informal learning activities.</td>
<td>Managers will encourage all staff to take advantage of a variety of opportunities to undertake ongoing learning about technologies.</td>
</tr>
<tr>
<td></td>
<td>Managers will work with individual staff to incorporate ongoing learning as part of their work role including time allocation and direction for learning.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Relatings</th>
<th>Social-Political arrangements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individuals will have understanding of the role ongoing learning has within their work tasks.</td>
<td>Managers and individuals in their teams will develop a shared discourse about workplace learning as an important part of workplace development including increasing knowledge of staff about the role workplace learning has in individual and organisational development on an ongoing basis.</td>
</tr>
<tr>
<td>Individuals will have awareness and understanding of the organisational strategic direction as it pertains to ongoing learning particular with regard to emerging technologies.</td>
<td>Management will provide clear direction on their commitment to assisting staff to keep up to date with technologies.</td>
</tr>
<tr>
<td>Individuals will take up the opportunities provided to share their ongoing learning with colleagues as a means of developing collective knowledge.</td>
<td>Management will provide clear direction on the possible impact of technological change to ongoing library services and the direction that best serves the library and its clients with regard to new and emerging technologies.</td>
</tr>
<tr>
<td>Individuals will have clear understanding of the expectations of their organisation with regard to knowledge and skills development about emerging technologies.</td>
<td>Management will facilitate, actively support and participate in ongoing opportunities for all levels of the library to both share learning experiences and to work collectively to address challenges provided by the ever changing technology landscape.</td>
</tr>
<tr>
<td>Individuals will feel supported to continue to engage in ongoing development through clear goals within their individual development plans.</td>
<td>Clear guidelines and expectations will be developed through discussions between</td>
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Ongoing learning about technologies will be included in individual learning plans and the importance of this ongoing learning to both individuals and the organisation is recognised.

<table>
<thead>
<tr>
<th>Dispositions (Habitus)</th>
<th>Practice traditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individuals are able to understand and demonstrate the value of ongoing learning about technologies as part of their personal development.</td>
<td>Acknowledging that changes in the technology landscape will continue thus the practice of ongoing learning about technologies will need to continue. As such it needs to become a discussed and embedded part of work practices for all library staff.</td>
</tr>
<tr>
<td>Individuals display confidence not only in their own ongoing ability to continue learning but also in working with others to ensure collective learning.</td>
<td>Individuals and the collective staff, through continuing to learn, discuss, share and work with others will shape a workplace that readily adapts to ongoing technological change and thus be seen by its clients and stakeholders as being at the forefront of this aspect of the profession.</td>
</tr>
<tr>
<td>Individuals feel their knowledge, skills and previous experiences are valued for their capacity to continue to develop ongoing learning practice.</td>
<td>Individuals new to the library will be able to develop their own learning practice based on a clear discourse and social arrangements they will find in their new workplace.</td>
</tr>
</tbody>
</table>

*Note. This table is adapted from ‘Table of invention’ for analysing practice (Kemmis, Wilkinson, et al., 2014, p. 226)*

In researching the practice of ongoing learning about technologies it has been possible to examine the practice in terms of its elements (sayings, doings, relatings) and to identify the practice architectures that are shaping and being shaped by the practice. Remembering that practices are site specific and only transferability rather than generalisations can be inferred from this study, some possible ideas for improving practice have been shared. These ideas may provide prompts for conversations in other workplaces about the practice of ongoing learning. Through discussions between managers and staff, individual library staff will have the opportunity to develop a better understanding of the direction of the library with regard to future technologies and expectations around how learning might be encompassed within work roles. Including ongoing learning in individual’s
work plans and articulating the planning and review of this area of development within annual performance reviews may strengthen ongoing practice. Inclusion of recognition of informal learning as a significant and vital part of individual and organisation development in documents such as training plans will support the discourse of the importance of ongoing learning about technologies as a significant part of the library’s future.

In line with recent developments in workplace learning as a social activity, management has the opportunity to support greater reflection and knowledge sharing through the instigation and ongoing support of communities of practice or other similar sharing forums. Only with management involvement and support will such forums be sustainable, and signal to staff that management encourages and supports ongoing learning about technologies as a means of developing staff. The ongoing development of staff at all levels of an organisation benefits both individuals and the organisation. This in turn will improve services to clients and other library stakeholders. This study provides not only a greater understanding of the practice of learning about technologies within academic libraries but also signals tangible methods for enabling this practice for a more sustainable future.
Chapter 7

7 Conclusion and Further research

7.1 Introduction

This thesis investigates how academic librarians are engaging in ongoing learning about emerging technologies within their workplace. Technological developments continue to change the way libraries provide services, the range of services offered and how their clients’ access information. Library staff must be constantly learning about new and emerging technologies in order to continue to provide the services expected from a library. This chapter reviews the theoretical and methodological basis for this study, summarises the key findings, addresses the research questions, and discusses this study’s contribution to existing knowledge and implications for practice. All research by its nature has limitations and so raises the possibility for future opportunities for further research (Price & Murnan, 2004, p. 66). These limitations and opportunities are discussed. A final reflection on this study concludes the chapter and thesis.

7.2 Summary of the key findings

Unless library staff understand how best to sustain ongoing learning about new and emerging technologies their ability to meet the changing needs of their clients and other library stakeholders will be compromised. This study deepens understanding of the practice of ongoing learning about technologies by academic library staff. In developing greater awareness of how the practice is being enacted, this study also highlights how the practice might be better enabled and strengthened to ensure future sustainability.

This thesis addresses three research questions which formed the basis for examining the practice of academic library staff’s ongoing learning about technologies. The key findings for each of these questions follows.
7.2.1 How is the practice of workplace learning about emerging technologies currently enacted by academic librarians?

Participants were using a variety of methods to undertake their ongoing learning about technologies, the doings of the practice. These methods including engaging in exploration of the technology on their own, seeking help from colleagues, and attending workshops and presentations offered by their library or organisation. Participants became aware of new and emerging technologies at conferences and through attending external training sessions for relevant technologies when such sessions were offered and appropriate. Individual exploration, as a starting point for learning, was the preferred method for participants when first encountering a new technology. Colleagues were acknowledged as a quick and expert source of knowledge when seeking site specific learning about a particular technology. Attending workshops and presentations offered participants the opportunity to learn about and evaluate a range of new technologies.

The practice of ongoing learning was focused on the individual seeking knowledge for personal use in the work context. There was little evidence found of consistent language (sayings) among participants to describe their learning practice or the characteristics of emerging technologies. There were also few opportunities for colleagues to come together to develop common site-specific knowledge through sharing, exploring and evaluating emerging technologies, despite participants saying they value this type of learning.

In considering the relatios of the practice, participants differed in the way they perceived learning to be a part of their work role and professional identity. Those participants who judged ongoing learning and keeping up to date with technological developments as integral to being a librarian, reported that spending time on learning was important and justified. In contrast, participants who spoke of learning as an extra activity, or something to be done only when core tasks were completed, were not as comfortable taking time during their work day to learn about technologies. For these participants, only when learning about a technology specifically was required
to respond to a client’s request, was spending time learning considered appropriate.

7.2.2 What enables and/or constrains library staff’s ongoing learning about emerging technologies within the academic library setting?

Practice architectures are the site specific arrangements that both enable and constrain the practice of groups of individuals. These practice architectures are the cultural-discursive arrangements shaping the sayings of a practice, the material-economic arrangements shaping the doings of a practice and the social-political arrangements shaping the relatings of a practice. Many of the practice architectures present in the sites studied were discussed in terms how they both enabled and constrained the ongoing learning practice of participants. Some of the identified practice architectures included the language and behaviour of managers, the availability of time to allocate to learning practice, open plan offices, the use of training and development plans within a workplace, and the behaviour of colleagues. Each of these arrangements will be considered in turn, however there was evidence of the interplay between arrangements, for example in the language managers used to develop a supportive learning environment.

The language and discourse of managers was found to be among the most influential practice architectures within the semantic space. As a cultural-discursive arrangement, the discussions managers had with certain participants about ongoing learning about technologies provided these staff with explicit support for ongoing learning. Conversely when managers did not engage in discussion with participants about ongoing learning, these participants expressed a lack of clear understanding about the place ongoing learning had within their work role. Through shared conversations about learning practice, managers can provide positive support for ongoing learning, as well as model appropriate language to describe the practice. For example, if a manager uses language such as *exploring emerging technologies* or *playing with a range of technologies*, they are signalling to the individual that use of this type of language is both appropriate and also describes ways in which the practice may be undertaken (the doings).
Current training plans and personal development plans, as examples of site specific cultural-discursive arrangements, surprisingly did not provide participants with the language or insight to discuss, record and evaluate their own learning, in particular informal learning and learning about emerging technologies. Only one site’s training plan used the language of learning to discuss ongoing professional development. All three sites’ training plans focused on identifying formal training activities as appropriate methods for ongoing learning in general, with none documenting specifically the need for ongoing learning about emerging technologies by staff. Participants reported that ongoing learning about emerging technologies and informal learning methods of learning were not discussed as part of personal development plans. The exclusion of documented support worked to constrain ongoing learning practice through a lack of language and guidance on how staff are expected to undertake this practice.

Time, as a resource to be allocated within a work day, was found to shape ongoing learning within the physical space. In exploring the influence of time, as both an enabling and constraining material-economic arrangement, complex relationships were discovered. For example, some participants found that competing priorities, the precedence of certain core tasks over learning activities, and perceived lack of time constrained their practice. Conversely, those participants who considered learning to be an integral part of their ongoing work were better able to encompass learning into their work practice. Participants identified increasing workloads as constraining their practice by restricting the availability of time to spend learning about technologies not directly related to work tasks. This was also true even for those participants who perceived ongoing learning as vital to their role. For those participants that identified learning as an activity separate from their core work, finding time to spend learning after completing their core tasks was difficult. Only a few participants consciously allocated time within their work week to focus on learning. The reasons that so few participants were purposefully allocating time could include a lack of understanding of the role learning plays within a person’s role, what methods of learning are
considered appropriate within the site, and a lack of clear direction as to which technologies they should be learning.

Open plan offices, another material-economic arrangement, provided opportunities to quickly and easily consult colleagues about technologies. Participants sought out colleagues to answer questions in order to learn the site specific application of particular technologies. When this occurred, the open plan office layout enabled the ongoing practice of the workplace. Conversely, the noise and interruptions from colleagues that were also a part of working in an open plan office, were identified as constraints to ongoing learning. This was the case, in particular, when sustained concentration was required to learn about a new technology. Participants identified that the provision of a space away from the open plan office, equipped with the necessary hardware and applications software, would assist their practice, enabling focused learning.

Considering the social-political arrangements present within the site, the actions of managers proved to be a major influence on the learning practice of participants. The behaviour of managers as they modelled learning behaviour and shared their learning experiences with staff, provided participants with the realisation that such behaviour was acceptable and supported within the workplace. This social-political arrangement enabled participants to feel comfortable in undertaking their own ongoing learning. Alternatively, when managers were not modelling learning behaviour nor encouraging the sharing of ongoing learning, participants believed this constrained their practice. Through the modelling of learning behaviours managers also signalled to staff that ongoing development was important for all library staff as they strived to meet the changing needs of their clients and other library stakeholders.

Within the social space, managers were also found to have a powerful role in shaping the practice of individuals through the development and maintenance of a supportive learning environment. This included facilitating opportunities for staff to build individual and collective knowledge through
discussions about new and emerging technologies and the benefits these may have for the library. Participants also looked to managers to provide clear directions about future use of technologies in the library, as a means of identifying which technologies they should be learning about. Colleagues, as they engaging in learning themselves, encouraged others to likewise participate in learning opportunities and through sharing their knowledge with co-workers were also found to be enablers of ongoing practice within the social space.

Participants described that the nature of emerging technologies meant that formal training sessions had limited application in learning the range of technologies they might encounter. Training sessions and conference attendance did, however, have a role in raising awareness of new and emerging technologies that may be relevant to their workplace. Participants reported that technologies were often learnt in response to a client’s request so it wasn’t always possible to identify in advance which formal training sessions, if available, might be useful for individual staff. In contrast to formal training events, in-house sessions that encouraged the sharing of knowledge about new and emerging technologies, and their possible relevance to the library, were considered to be a useful means of learning by participants.

None of these arrangements exists in isolation, together they shape the ongoing practice of individuals. In considering the conditions that may improve the practice of ongoing learning, it is critical to remain cognisant that in influencing any arrangement, this will impact both individual practice and the other arrangements present in the intersubjective space.

7.2.3 How might conditions enabling the practice be further supported and those constraining the practice be changed to enhance the practice

This study highlights the crucial role that language has in shaping and sustaining practices. Any practice has its own specialised language associated with it (Kemmis & Grootenboer, 2008, p. 47). In the case of the practice being studied here, there was a language used to describe emerging technologies and language used to describe the actions
associated with learning about technologies. However there did not seem to be a shared language or language consistent with the literature. For example, when characterising emerging technologies individuals relied on their own understanding of what they considered emerging technologies based on their individual knowledge and experience. The participants spoke of technologies that were new to them or their organisation, rather than new or emerging technologies in the research sense. There was also a tacit assumption between participants that the group understood what types of technologies were being discussed when speaking together about emerging technologies.

Similarly when discussing the actions involved with learning about technologies, a range of sayings were used. In describing how they engaged in ongoing learning, participants employed words such as learning, playing, trialling and exploring. Some participants expressed comfort with using language that implied action without objectives such as playing or exploring. In contrast, other participants perceived that play implied an action not appropriate within the workplace.

As language assists with the enacting of practices, the lack of a shared language emphasised the need for managers and staff to openly and positively discuss individual understandings of emerging technologies. Through this discussion a common understanding about what emerging technologies are, as acknowledged by the particular site, can be developed. With shared knowledge and language it is possible to then have a robust discussion between managers and staff and between colleagues about how staff might undertake the practice of ongoing learning about these technologies. Such shared knowledge about technologies and learning requirements creates practice architectures of support and understanding about how ongoing learning is to be conducted, when and for what purpose within the organisation.

The social nature of workplace learning means that through a mutual understanding of the practice, those enacting the practice will be in a position
to shape the arrangements that enable the practice, in particular the social political arrangements. Following reflection on the discourse of ongoing learning, training plans and in turn, individual development plans could then support individuals and managers to identify opportunities for and recognise evidence of ongoing learning about technologies. Library training and development plans could also include the facilitating of opportunities for sharing knowledge between staff and the allocation of time and suitable learning places for individuals to undertake ongoing learning. As each site is unique, the understanding and knowledge, and the training plans and development plans, developed for one library, will not necessarily be suitable for another.

Presently library staff are accessing a range of workshops, presentations and similar opportunities to support their ongoing learning about technologies, in addition to individual informal learning. This study found that the provision of a dedicated learning space away from everyday workspaces would be useful for individually focused learning and also signal to colleagues that time spent learning is valued as part of a staff member’s everyday tasks. Findings from this study supported previous studies that cite perceived lack of time to undertake learning as one of the most important practice architectures constraining the ongoing learning practice (Gross & Leslie, 2010; Hider, 2006; Park et al., 2010; Stephens, 2013). Practice architectures such as managerial support, the inclusion of learning about technologies in training and development plans, and a place with suitable equipment to undertake learning, enables staff to feel supported and able to allocate time to undertake ongoing learning.

Shared knowledge development of an organisational wide strategic direction about how the library sees technology influencing services in the future can be developed. Whilst much of the practice of learning about technologies is currently reactive in nature, (learning technologies in order to answer client questions), there is an opportunity through discussion for libraries to be more proactive in the technology space. This could occur through allocating time for a variety of staff to explore the features, and benefits for library
stakeholders, of a range of emerging technologies not currently used in the library.

Library staff were aware of the need to continue to provide relevant services to clients through the use of new and emerging technologies. They were intent on improving and maintaining their professional standing within the university community through ongoing skill and knowledge development. This study highlights the range of opportunities that may assist individuals to enhance their practice, as well as opportunities for managers and staff together to make changes within the work site to support and sustain the practice.

7.3 Reflections on the methodology

In considering the theory of practice architectures as a means of analysing and interpreting the data for this study, it is necessary to reflect on the methodology used to collect that data. In examining previous research into library staff's ongoing learning and in particular ongoing learning about technologies, surveys and face to face interviews have been used to examine past experiences (Auster & Chan, 2004; Forsyth et al., 2009; Kiel & Pegrum, 2009; O'Neil & Pegrum, 2018; Stephens & Cheetham, 2011, 2012; Varlejs, 1999). In contrast, this study used an action research method to enable participants to record and reflect on their learning experiences close to the time they were occurring. This method also required both participants and the researcher to explore the practice over time, providing data of real time experiences in a way that has not been researched before. The action research method provided participants the opportunity to bring often unconscious learning experiences to front of mind through discussions, and the recording of, and reflection upon, particular learning moments.

Analysis of the data yielded in-depth understanding of the enablers and constraints to ongoing learning about technologies. Previous research has identified factors such as scheduling time, ongoing managerial support and promoting concepts of play and exploration all supporting ongoing learning about technologies (Stephens, 2013, pp. 135–136). Lack of time, distractions
and lack of organisational participation in ongoing learning have been found to be barriers to ongoing learning (Stephens, 2013, p. 135; Stephens & Cheetham, 2011, p. 42). Through focus group sessions this study identified that barriers to learning such as lack of time actually included facets such as workload pressures, a perceived dichotomy between work and learning and concern about spending time learning about the right technologies. The action research method provided the means for the researcher and participants to deliberate on their practice following episodes of learning, and to consider their experiences in light of previous research and their own previous discussions.

Action research engages participants in a process of constructing their own understanding affected by their social context, reflecting the constructivist epistemology of this study. Although time consuming by its nature, the value of groups of library staff researching their own practice, incorporating research literature, and undertaking greater reflection on practice, can only provide benefits for both individuals and organisations. In this study, the researcher shared research literature about self-directed workplace learning models giving participants the opportunity to discuss how this literature might be relevant to their own practice. The cyclical nature of action learning provided the researcher with the opportunity to reflect back to participants’ previous comments in the light of their ongoing learning. Examining practice across three sites also meant that the researcher was able to share observations and experiences across sites in order to further discussion based on others’ experiences.

This pattern of ongoing action and reflection with participants is not possible with other types of research methods. The uniqueness of this method confirms the relevance of action research to ongoing LIS research by empowering researchers to work with practitioners rather than to just observe their practice. Action research complements the investigation of practice in this study as it seeks to aid the investigation, and understanding, of a participant’s own practice, with a view to transforming that practice. Participants in this study were able to do more than just complete a
questionnaire for a researcher to take away and analyse. Instead they were able to discuss the topic of investigation with peers and then return to that discussion following learning experiences with a view to possibly improving their own practice.

The action research method has involved practitioners in the researching of their own practice. This method, as a means of developing practitioner research in the LIS field, provides opportunities for librarians to improve their own practice and solve problems within their own workplace (Watson-Boone, 2000, p. 87). This study has illustrated the steps that are undertaken through the action research cycles. Whilst no two action research projects will be the same, the evidence based research provided as part of this method benefits both the theoretical and practical exploration of library practice (Wilson, 2013, p. 116).

The nature of the action research methodology argues against it being suitable for generalisation to other workplaces, with the emphasis being on site specific actions (Edwards-Groves & Kemmis, 2016, p. 91). However, it is possible for readers of this research to make their own judgements about similarities to their own workplaces and therefore extrapolate which results and recommendations may be relevant to their own situation. This study investigated practice at three academic libraries and found similar results across the sites which could indicate the results may be relevant to the broader academic library setting across Australia. Whether the findings would be similar in other types of libraries would need to be examined through further research in this area.

Action research as a methodology has its limitations. As shown in this study, the completion of the cycles of action research require sustained commitment from participants and the researcher. Participants were asked to attend an information session and three focus group sessions as well as undertaking two periods of recording of learning experiences. This was a substantial commitment by participants. In cases when a group of colleagues undertake an action research project in order to address a workplace
problem this commitment itself will usually bring tangible benefits for the participants. In this study, participants increased their awareness of their own practice and through reflection on their experiences identified a number of actions they could undertake to improve that practice.

Action research methodology focuses on both research and action. The practical nature of the research provides opportunities for the identification of extensive implications for practitioners within the site studied. It is important not to diminish the theoretical aspect of research in both informing participants’ actions throughout the study and in considering the outcomes and possible relevance to other sites.

Action research is only one methodology that can be used to research practices, however, as this study has shown, this methodology, with a focus on individuals working together to explore and possibly transform individual practice within a particular site, is well suited to this task. Data collected as part of an action research project captures the experiences of participants as they work to transform their practice, providing implications for theory that are closely related to the experienced world. Action research, through incorporating theory and practice together, results in theory built on action rather than theory development isolated from the practical situations of the workplace. Within the LIS environment, action research could be used to assist problem solving, decision making and service improvements in many aspects of libraries, from a small scale project to improve a particular information literacy class, to a whole of library change management project.

7.4 Reflections on the theoretical framework

Previous research about how librarians keep up to date with emerging technologies has focused on measuring the incidents of self-directed learning (Varlejs, 1999), assessing the success of particular programs promoting ongoing learning (Cheetham & Chivers, 2001; Forsyth et al., 2009; Kiel & Pegrum, 2009; Stephens & Cheetham, 2011, 2012), and identifying the influences that are enabling or constraining the practice (Stephens, 2013). This study, in adopting the theory of practice architectures as a
framework for analysing the practice, has been able to provide a richer understanding of the practice architectures shaping ongoing learning about technologies. The theory acknowledges the importance of language, action and relationships of individuals coming together to represent the project (or purpose) of learning practice.

By focusing on the various arrangements that combine to shape a practice, the theory of practice architectures provides a holistic view of a practice as it is enacted within its context, both the individual agency and the social site (Lloyd, 2014, p. 99). This theory facilitates a greater understanding of the interplay between the individual and the site and forces the researcher to consider more than the individual/holism dichotomy that was the focus of early practice theorists. The theory of practice architectures directs attention to the intersubjective space; the space where individuals encounter and interact with each other within the specific site. This space, as seen through the interlocking semantic, physical and social spaces, is the medium through which the practice is realised, focuses attention on the meshing of the practice with the practice architectures. This was seen through the doings of participants as they sought help for colleagues, being assisted by the open plan office setting. This interplay was also evident in the connections between the participants valuing workshops that provided opportunities to share their experiences with emerging technologies, and the role of managers in facilitating sharing opportunities in order to support ongoing learning. Without the framework of the theory of practice architectures this interplay of the individual and the site could have be missed.

A further strength of the theory of practice architectures is the inclusion of consideration of the aims of the practice, the dispositions, the practice landscape and the practice traditions as an integral part of the analysis of practices as developed in Chapter Five. Recognition of the aims and motivation as well as the skills and knowledge individuals bring to a practice, acknowledges that people do not come to practices or sites as blank slates, all are a product of previous experiences. Participants who had experienced
positive encounters with learning about technologies in the past, brought confidence to their current learning events.

The site ontological perspective of this theory, that is, that practices always happen in sites of practice shaped by practice architectures, emphasises the importance of considering the practice landscape and traditions that are holding the current practice in place. Each site is different, but similarities between sites do exist. The practice tradition of learning as being a solo pursuit with the intent of individuals gaining knowledge and skills has the potential to impact on any initiative to change the practice going forward. Sites can develop site specific architectures to support encouraged practices and to change those that are currently constraining practices.

The theory of practice architectures and its site ontological approach brings a new perspective to LIS research. Research on the nature of knowledge and knowing within the LIS field has often concentrated inquiry into the facts of the profession, human behaviour and the contextual influences on human action (Budd, 1995, p. 315). The theory of practice architectures is instead directing attention as to how the practices of humans happen, how they are shaped and what conditions make the practices possible (Mahon et al., 2017, p. 17).

Following a decade of using the theory in research Kemmis and colleagues have begun considering epistemological perspectives, looking to the question of how humans learn in practice (Kemmis & Mahon, 2017, p. 227). Learning in practice takes the form of individuals coordinate their practice with others, learning the language of their site and developing increasingly appropriate ways to relate to others within the site (Kemmis & Mahon, 2017, p. 227). The theory of practice architectures continues to evolve to meet the needs of researchers in explaining human practice. The dynamic nature of this theory offers opportunities for its wider application to future LIS research.

The theory of practice architectures invites researchers to look beyond considerations of what actions individuals undertake, or where an individual’s
action is taking place. By considering how practices are realised within the site the theory offers the opportunity to consider how the practice might be shaped if conditions were different (Kemmis, Wilkinson, et al., 2017, p. 242).

By using the theory of practice architectures as a framework, this study contributes to future research by examining how this theory can be used to investigate practices and to consider how these practices might be made more sustainable in the future.

Practices remain dynamic entities, constantly under tension from the traditions that aim to hold them in place and the influence of other practices shaping the site within which they exists. This study considered only one practice, in apparent isolation. Future research, in considering this practice within the network of the numerous practices that make up a librarian’s professional practice, could expand understanding of the interactions between practices within a given site.

7.5 Contributions

7.5.1 Contribution to library and information studies research

This study contributes to both LIS research and theory. A major contribution is through the application of the theory of practice architecture to the study of the continuing and informal learning practice of librarians, in particular the learning about emerging technologies. This theory, developed through practice within the education field by Kemmis and colleagues is less than ten years old and is beginning to be used within a number of fields as a means of social enquiry (Mahon et al., 2017, p. 3). Within the LIS field, whilst there has been research and commentary on information practices, few have used the theory of practice architectures to frame research of the professional practice of librarians (Cox, 2012, 2013; Lloyd, 2010a, 2011; Moring & Lloyd, 2013; Pilerot et al., 2017). The use of the theory of practice architectures and in particular, the systematic use of the Table of Practice, to present, analyse and discuss the practice has not previously been seen in LIS research. This research has demonstrated the potential usefulness of such a framework in researching other library and information practices.
Combining the theory of practice architectures successfully, with the action research methodology, has advanced this alliance as a feasible methodology for future research of professional practice. Together they offer practitioners and researchers a way of identifying and transforming professional practice during times of constant change.

In examining the practice of workplace learning in academic libraries through a theory of practice architectures lens this study has revealed the complexity of how individuals undertake practices within the intersubjective space of their workplace. In describing and analysing the complexity of ongoing learning practice this study has demonstrated the value the theory of practice architecture can have in framing research into other practices within the LIS field.

At a time when change is relentless, and the professional practice of librarians is constantly evolving as library staff aim to meet the changing information needs of their clients and other stakeholders, understanding the complexity of practices and the practice architectures that sustain them is crucial. The transformative outlook of the theory of practice architectures, provides researchers and professionals the resources to identify and shape conditions for improved professional practices in the future.

Whilst outcomes from studies using the theory of practice architectures as a lens for analysis, are not directly transferable due to the site specific nature of the theory, they may offer insights for understanding other similar situations. This study provided insights into the practice architectures present within the three academic libraries studies, and it highlights the considerable role managers may have in shaping environments in which individuals enact a range of library practices.

7.5.2 Contribution to, and implications for, practice

This study by using a site ontological perspective to research workplace learning, highlights the interplay between the elements of practice and the
practice architectures present within the site. This interconnectedness was found in some participants’ ability to plan and direct their own learning and other participants being constrained by a perceived lack of clear direction about the place of informal learning within their workplace and which technologies would be most useful for them to learn to support their work and the work of their clients. Managers who facilitated an environment that supported and valued ongoing learning were found to be enabling participants to spend time exploring a range of technologies that may have relevance to their work, their organisation or their clients. This view of workplace learning as an interconnection between the individual and the site contributes to research on learning in this area.

With respect to implications for practice a number of recommendations can be made that may support improved practice for ongoing learning about technologies within academic library sites. A number of practice architectures shaping ongoing learning about emerging technologies can be implemented or strengthened in order to improve practice. These include:

- The introduction of continuing discussions between managers and staff on the value and role ongoing learning about emerging technologies has within the particular library.
- The provision of space and the allocation of time to undertake ongoing learning within work roles.
- The establishing of clear directions on the role and possible direction of emerging technologies within the library with an aim of identifying those types of emerging technologies to be the focus of ongoing learning by staff.
- The implementation of sustainable opportunities to share and build knowledge between staff based on exploring the variety of emerging technologies and their implications for the library.
- The inclusion of ongoing learning about emerging technologies within training plans and individual professional development plans, including acknowledgement of the role both formal and informal learning methods have in ongoing learning.
Empowering staff to embrace a tradition of ongoing learning about technologies through language and actions across the library workforce.

In considering these recommendations it is important to be mindful of the site specific nature of practices. Each of these recommendations should be considered within the context of particular workplaces with their own current practices. Workplace discussions of the relevance, possibilities and challenges of these ideas is recommended.

The theory of practice architectures focuses attention on creating conditions that invite the possibilities of better practice. This study, in using this theory as a framework for action research, identifies a range of practice architectures that can be set in place to better enable ongoing learning to aid library staff to continue their mission to effectively meet the changing information needs of library clients and other stakeholders.

7.6 Limitations of this study

All research has limitations and it is important to explicitly acknowledge them. The ontological perspective of the theory of practice architectures means this study provides greater understanding of a particular site, suggesting generalisation is not possible. The lack of generalisation of results is also a feature of action research as it is intended to focus on a group of individuals and actions within a specific situation. Instead this research offers transferability where readers, through consideration of the description of the experiences of those engaged in the site, and the description of the site itself, are able to reflect on whether or not the findings are relevant within their own site. In identifying lack of generalisation due to the chosen theoretical framework and research methodology as a limitation, the insights gained have been substantial and provide conversation prompts for other workplaces around the issue of ongoing learning about technologies.

This study based its research on the perceptions and experiences of participants who self-selected to be part of the study. It is assumed that this
self-selection was based on an interest in the ongoing learning about technologies and was a result of a personal motivation to keep up to date with emerging technologies. The experiences and insights expressed as part of this study may have been different to those of library staff who had a different understanding of the need for, or willingness to, undertake ongoing learning about technologies.

The self-selection of staff also meant that the majority of participants were at the time of the study employed as reference or liaison librarians. Only five of the nineteen participants were not reference or liaison staff, two were front desk staff, two were information management staff and one manager with no staff reporting directly to her. These participants’ roles do not reflect the full range of staff roles within an academic library setting. In accepting participants to undertake the research, the relevance of role was not a consideration. Instead there was a focus on engaging library staff who were willing to reflect upon and share their own practice and convening a group large enough to provide insights through focus group discussions.

Identifying the limitations of this study does not detract from the contribution of the findings and recommendations within the LIS field. With evolving theories of knowledge development and workplace learning continuing to be discussed in the research literature, this study adds to discussion and practice literature in this area.

7.7 Opportunities for further research

In acknowledging some of the limitations of this study opportunities for further research are revealed. This study focused on the experiences of individual participants as they enacted the practice of ongoing learning with their site. In retrospect the inclusion of interviews with managers within these sites might have given a richer perspective of the site within which the practice was being undertaken. It is recommended that this extra perspective be considered for future research. Future studies would benefit from the participation of staff more explicitly involved with new and emerging
technologies such as systems librarians, repository managers and digital services librarians.

This study identified that staff working in different departments within a library and reporting to different managers would experience a variety of practice architectures shaping their everyday practices. This was observed through the different experiences reported by the two lending services staff included in this study. Further research into the practice of ongoing learning in a range of areas within a library’s organisational structure would add to the understanding of how a person’s role shapes ongoing learning practice.

The theory of practice architectures proposes that different types of libraries (academic, public, school or special) would each have their own practice architectures influencing ongoing learning about technologies. The influence of technological change is relevant for all types of libraries, yet the means of undertaking ongoing learning and the arrangements shaping practice may differ across the library sector. Further research into the ongoing learning practice by library staff across a range of libraries could identify similarities across library sectors.

Both the methodological choice and the theoretical framework offer the possibility of improved practice. Further research using an action research method and the theory of practice architecture to research implementation of some of the recommendations of this study would be an interesting addition to this work. For example, researching the ongoing learning practice of staff within one of the sites studied as the library introduces one or more of the recommended practice architectures would be an informative undertaking and would enable evaluation of the findings. This would also add insight into the shaping of practice through the changing of practice architectures.

Finally, future research into how it might be possible to plan for and acknowledge both informal learning events and social learning activities in individual development plans would add to the growing literature on the social aspect of workplace learning.
7.8 Conclusion

Initially this study was envisaged as a means of learning more about how to encourage and support library staff to continue learning about emerging technologies in their workplaces. This developed from the researcher’s own experience as a manager with responsibility for training and development within an academic library, intent on continuing the learning that had begun by staff following the implementation of the 23 things program.

The result of this study has been a greater understanding of the interconnectedness between the individual practice of learning about technologies and the social site in which the learning takes place. Exploring the practice of ongoing learning has highlighted the importance that both language (sayings) and relationships with others and objects (relatings) have alongside the actions that make up a practice (doings). Individuals’ interpretations of words such as playing, exploring and learning, as well as the language used within the workplace shape practice. Attitudes, language and actions of managers and colleagues also influence ongoing practice. Managers in promoting an environment of knowledge sharing and learning opportunities have the opportunity to exert a significant positive influence on ongoing learning practice.

Individuals and groups of individuals, through greater understanding of their own practice, have the ability to shape the site within which they work, as well as advancing their own practice. Developing a site that enables learning through such initiatives as providing clear discourse about learning and appropriate technologies to learn, and the inclusion of learning about technologies as part of training and development plans, will assist library staff to establish sustainable learning practices. The provision of appropriate spaces to allow concentrated learning and opportunities for library staff to share and learn from others will also promote ongoing learning. Many library staff are keen to explore the opportunities afforded by emerging technologies to improve and develop library services to meet the changing needs of their clients. Sustainable ongoing learning practice will support them in this
endeavour and provide benefits for their organisations and library stakeholders.
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Appendices

Appendix A: Agenda for each Focus group

A series of focus groups was held with participants over the 6 month period of the data collection phase of the project. The following outlines the agenda and questions that were followed during each of these focus group sessions.

1. Agenda for Initial Focus Group (held following the Information Session)
   1. Welcome, introduction to the researcher and the project.
   2. Presentation of the aim of the research, discussion of commitment required and signing of consent forms.
   3. Discussion around the following questions
      a. What do you understand by the term “emerging technologies”? Are you able to give some examples of emerging technologies you have encountered recently?
      b. Do you find you have a need to learn about new or emerging technologies? In what context? Are you able to provide some examples?
      c. Do you think you are experiencing much change in the technologies you are using to do your job? Can you give examples? Is the same true for the clients that you provide services to?
      d. How are you currently keeping up to date with emerging technologies?
      e. How much time on average would you spend at work learning about emerging technologies?
      f. Are there particularly methods of learning that you prefer when learning about emerging technologies?
      g. How effective do you believe you are in keeping up to date with emerging technologies?
h. What factors do you think affect your learning experiences of emerging technologies, both positive and negative? Prompts: great sharing environment at work, not enough time.

4. Presentation and discussion about the participant journals, how to fill them out, what is required etc.

5. Presentation of timelines, process, contact with the researcher, next focus group meeting

6. Any further questions

2. Agenda for Mid Study Focus Group (held approximately two month after the Initial Focus group)

1. Welcome

2. Discussion around the following questions:
   a. How did you find the experience of keeping a record of your learning experiences?
   b. Were you surprised by what you were learning, how you were learning or the amount of time you spent learning in this area?
   c. How effective do you think this learning was? Why?
   d. What factors influenced, both positively and negatively, how you learnt about emerging technologies?
   e. What changes could improve how you currently gain skills and knowledge of emerging technologies?

3. Presentation on self-directed learning theory
   a. Discussion on how this might affect learning about emerging technologies

4. Presentation on praxis and practice architecture theory
   a. Discussion on how this might affect learning about emerging technologies

5. Agreed timelines, contact with the researcher, next focus group meeting

6. Any further questions
3. Agenda for Final Focus group (held approximately two month after the Mid Study Focus group)

1. Welcome

2. Discussion around the following questions:
   a. What was your continuing experience of keeping a record of your learning experiences?
   b. Last focus group we discussed self-directed learning. Did you incorporate any of the theory of self-directed learning into your learning experiences?
   c. What effect, if any, do you think reflecting on your learning has?
   d. Does the recording of experiences, or the use of the learning process effect the learning experience, either positively or negatively?
   e. What factors influenced, both positively and negatively, how you learnt about emerging technologies? What can you do to enhance or change these factors?
   f. How can you use your experiences to embed the continuous learning of emerging technologies in your everyday work practices?
   g. Can you use your experiences to assist others or your workplace in keeping up to date with emerging technologies?
   h. What effect has being part of this study had, if any, on your understanding of your own learning and the factors that impact on your learning?

3. To what degree have you incorporated self-directed learning theory into your practice of learning about emerging technology?

4. What happens now, researcher explains her continuing process

5. Thank you to participants
PARTICIPANT INFORMATION SHEET

Learning on the job. Keeping up to date with emerging technologies

Invitation to participate

You are invited to participate in a research study on how academic librarians are keeping up to date with emerging technology.

The study is being conducted by Helen Reid from the School of Information Studies at the Charles Sturt University as a part of her doctoral candidature.

Before you decide whether or not you wish to participate in this study, it is important for you to understand why the research is being done and what it will involve. Please take the time to read the following information carefully and discuss it with others if you wish.

1. What is the purpose of this study?
It has been shown that in the ever changing technological environment of academic libraries it is important for library staff to keep up to date with new and emerging technologies. This study is looking at how librarians might embed ongoing learning into their everyday practice.

2. Why have I been invited to participate in this study?
Any academic librarian, eligible for Associate Membership of ALIA, at participating universities is invited to participate in this study.

3. What does this study involve?
If you agree to participate, you will be asked to actively participate in four focus group sessions over a period of six months. During that period you will be asked to keep an electronic journal recording and reflecting on any occurrences of learning about emerging technology that you experience over two 4 week period.
Focus groups will involve 8-10 other librarians from your library only. With your permission, these focus group sessions will be recorded and transcribed for analysis. Electronic journals will only be available to the researcher and her supervisors for analysis.

4. Are there risks and benefits to me in taking part in this study?
In-principle permission for staff from your library to participate in this study has been given by your University Librarian, however, your personal involvement is entirely voluntary. There is a considerable time commitment involved over the course of the research including involvement in focus groups and recording learning experiences. However, the benefits of participation for you may include increased personal engagement with learning about emerging technologies, greater awareness of the self-directed learning and practice theory and the opportunity to develop your professional practice in order to incorporate regular ongoing learning.

5. How is this study being paid for?
This research is not funded by any organization

6. Will taking part in this study (or travelling to) cost me anything, and will I be paid?
There is no financial cost to the participant and no payment for participation.

7. What if I don't want to take part in this study?
Your consent to participate in this research is entirely your choice. Only those people who give their informed consent on the accompanying form will be included in the project. Whether or not you decide to participate is your decision and non-participation will not disadvantage you in any way.

8. What if I participate and want to withdraw later?
If you do decide to participate, you may withdraw from the project at any time without giving a reason and have the option of withdrawing any data, which identifies you. While we will destroy data already collected from you at your request upon withdrawal, if you decide to withdraw after participating in a focus group, we may not be able to remove your comments from the audio recording and transcription, if they have begun to be analysed. Any comments expressed as part of the focus groups will not be transcribed, or will be removed from any transcription and will not be analysed or used in any way as part of the project.

10. How will my confidentiality be protected?
All comments and responses will be treated confidentially. The names of individual persons will not be used in the thesis or any associated publications. Only the researcher will have access to raw data which will be stored securely.
Data will be retained for the length of the project and in accordance the appropriate Codes for at least 5 years after the final publication using the data.

Focus group participants will be requested to maintain the confidentiality of the group discussion and not divulge the specific content to outside parties, however it is not possible to ensure total confidentiality.

11. What will happen to the information that I give you?
Data generated by this study will be used in a thesis to be submitted for Helen Reid’s PhD. It may also be used in the development of papers for journals and conferences. Individual participants will not be identified in any thesis, paper or presentation.

Participants will be offered the opportunity to be informed of any papers or presentations arising from this study.

12. What should I do if I want to discuss this study further before I decide?
If you would like further information please contact Helen Reid (0417 552 143 or helenreid.research@gmail.com) or Dr Bob Pymm ((02) 6272 6220 or rpymm@csu.edu.au).

Thank you for considering this invitation.
This information sheet is for you to keep.

NOTE: The Faculty of Education Human Research Ethics Committee has approved this project. If you have any complaints or reservations about the ethical conduct of this project, you may contact the Committee through the Executive Officer

Lisa McLean
Executive Officer
Faculty of Education Human Ethics Committee
Charles Sturt University
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02 6338 4966

Any issues you raise will be treated in confidence and investigated fully and you will be information of the outcome
CONSENT FORM

Learning on the job. Keeping up to date with emerging technologies

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Email: mkennan@csu.edu.au
Phone: +612 6933 4893

I agree to participate in the above research project and give my consent freely.

I have read and understood the information sheet given to me and have been given the opportunity to ask questions about the research and received satisfactory answers. I have retained a copy of the information sheet.

I understand that I am free to withdraw my participation in the research at any time and without any reason, and that if I do I will not be subjected to any penalty or discriminatory treatment as a result of my withdrawal. I accept that if I withdraw after participating in a focus group, the researcher may not be able to remove my comments from the audio recording and transcription.

I understand that the findings of this study will be reported in a doctoral dissertation, journal papers and at conferences, and that individuals will not be identifiable in those reports.

I consent to:

• Actively participate in four focus group sessions over a period of six months which will be recorded for transcription purposes
• Keep any discussions or comments made within the focus groups confidential
• Keep an electronic journal recording and reflecting on any occurrences of learning about emerging technology that I experience over two 2-month period

I understand that my personal information will remain confidential to the researcher.

Name: ___________________________ Email: ___________________________
Signature: ______________________ Date: __________________________

NOTE: The Faculty of Education Human Research Ethics Committee has approved this project. If you have any complaints or reservations about the ethical conduct of this project, you may contact the Committee through the Executive Officer

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### Appendix C: Participant Journal

## Learning on the Job - Participant Journal

Title of activity: ________________________________  
Date: _______________  How much time did you spend? ______________________

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>What new technology have you learned or expanded your knowledge of?</td>
<td></td>
</tr>
<tr>
<td>How did you learn it?</td>
<td></td>
</tr>
<tr>
<td>Why have you decided to learn this particular technology? What was your motivation?</td>
<td></td>
</tr>
<tr>
<td>What tools or equipment did you use? Was there anything you needed that you didn't have?</td>
<td></td>
</tr>
<tr>
<td>What or who helped or hindered the experience?</td>
<td></td>
</tr>
<tr>
<td>How did I feel during the experience</td>
<td></td>
</tr>
<tr>
<td>Was it an effective learning experience/did it identify further avenues to learn/ Reflection on the experience?</td>
<td></td>
</tr>
<tr>
<td>Any other comments, issues, thoughts?</td>
<td></td>
</tr>
</tbody>
</table>
Example of a completed journal

<table>
<thead>
<tr>
<th>Title of activity: Creating a Research Poster Template in PowerPoint</th>
<th>Date: 27/9 How much time did you spend? 3 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>What new technology have you learned or expanded your knowledge of?</td>
<td>Microsoft PowerPoint</td>
</tr>
<tr>
<td>How did you learn it?</td>
<td>Googling for PowerPoint templates and tutorials/info, as well exploring the interface</td>
</tr>
<tr>
<td>Why have you decided to learn this particular technology? What was your motivation?</td>
<td>I was asked to create a conference poster template for a conference we will be running in the library</td>
</tr>
<tr>
<td>What tools or equipment did you use? Was there anything you needed that you didn’t have?</td>
<td>My PC and MacBook Air laptop at home: I worked on this on a Sunday afternoon/evening</td>
</tr>
<tr>
<td>What or who helped or hindered the experience?</td>
<td>Having a quiet place in my office at home to work on this. Felt a little hindered as I didn’t have anyone to ask advice from (I’ve never created a conference poster before in PowerPoint and would have appreciated some advice, so I texted my sister who is a researcher but she didn’t get back to me)</td>
</tr>
<tr>
<td>How did I feel during the experience</td>
<td>Excited to be learning something new: a little stressed as I didn’t have a lot of time to work on it.</td>
</tr>
<tr>
<td>Was it an effective learning experience/did it identify further avenues to learn/Reflection on the experience?</td>
<td>Pretty effective: found a bunch of templates and instructions from other universities and created a template. Even though I have used PowerPoint for a number of years there is still a lot I need to learn: it surprises how many features I have not explored in some software programs I have used for years: it is a constant process of learning!</td>
</tr>
<tr>
<td>Any other comments, issues, thoughts?</td>
<td></td>
</tr>
</tbody>
</table>
Appendix D: Handout on Self Directed Learning given to participants during Mid Study Focus Group

Information about Self-directed learning and Praxis and practice architectures

The research suggests that there is a continuum of characteristics of formal/informal learning. Self-directed learning is a subset of informal learning.

Candy’s model of self-directed learning
Straka’s model of self-directed learning

While self-directed learning appears to be an individual-focused undertaking, individual learners can have considerable effect on the organisation within which they learn. Through acting upon their learning and sharing their reflection and knowledge they are able to assist others in their development and change the practice architectures within which their development is occurring.

Praxis and Practice architectures

An individual’s praxis is formed as they undertake actions based on what they currently know and choosing to act in a way to improve their own experiences and those of others.

However praxis isn’t formed in isolation. The way an individual thinks, speaks and acts is often affected, both positively and negatively, by the environment in which they work, the attitudes and practices of others, their own education, and their previous experiences of certain events. These influencing factors are known as the practice architectures that enable or constrain a person’s action (Kemmis, 2008, p. 21).
Appendix E: Data Collection Schedule

The ‘x’ indicates attendance at either a Focus Group Session or where an interview was conducted following the Focus Group session.

<table>
<thead>
<tr>
<th>Library/Group</th>
<th>Information Session</th>
<th>Initial Group Focus Session</th>
<th>One on One Interview</th>
<th>Mid Cycle Focus Group</th>
<th>One on One Interview</th>
<th>Final Focus Group</th>
<th>One on One Interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forrest Library (Group 1)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Tamara</td>
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<td>x</td>
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<td>Sara</td>
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<td>x</td>
<td></td>
<td>x</td>
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<tr>
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<td></td>
<td>x</td>
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<tr>
<td>Zoe</td>
<td>x</td>
<td>x</td>
<td>Moved to Lindsay Library</td>
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<tr>
<td>Forrest Library (Group 2)</td>
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<tr>
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<td>Attend at Forrest Library</td>
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<tr>
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</table>