Get Ready, Get Learning:
Investigating university students’ transition to online distance learning in the health sciences

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ABSTRACT

This research explores the online distance learning experiences of students studying health professional courses in the Australian higher education sector. Policies and technological advances have led to diverse student populations choosing flexible study options, while managing complex lives juggling work, home and study demands. This thesis investigates student engagement with orientation resources and advances theoretical understanding about student transition to online distance learning.

Educational design research (EDR), a pragmatic research approach, provided the research framework. Design principles informed by social-constructivist and distance learning perspectives supported the creation of online orientation resources. These were then implemented with postgraduate health science students at one university, and later re-contextualised for development at a second university with undergraduate nursing students. A conjecture mapping process aligned to the three phases of EDR (analysis and exploration, design and construction, and evaluation and reflection) informed the research process. This enabled the key design features and intended outcomes to be identified and directed the analytical process. Mixed methods data sources, including learning management system tracking statistics that captured student engagement with the resources, and other survey and interview data, assisted with the interpretation of meanings about how the students transitioned to online distance learning.

Comparative analysis of the research conducted at the two universities led to both practical and theoretical outcomes. Six refined design principles provided evidence-based guidelines for educational designers developing orientation resources; suggesting that universities need flexible and varied approaches to support online distance learners. Transition was conceived as a multilayered concept, involving students adjusting to being a university student, managing the distance and online environment and re-positioning their occupational mindset, enabled by self-regulatory behaviours. The research also strengthened the iterative EDR framework. Conjecture mapping ensured the research
process was responsive to new theoretical perspectives, changes in the university environments studied, and unanticipated research outcomes that emerged during the extended research project. The result was a robust systematic inquiry producing research outcomes that can be transferred to new contexts.
STATEMENT OF CANDIDATE

The work in this thesis has not been submitted for a higher degree to any other university or tertiary institution. The contents are original and all reference to the work of others has been appropriately cited.

I give consent to this copy of my thesis, when deposited in the University Library, being made available for loan and photocopying online via the University’s Open Access repository eSpace.

University of Sydney and Charles Darwin University Human Research Ethics Committee approval was obtained for all aspects of this study.

Signed

Helen Wozniak

Helen Wozniak
PUBLICATIONS DERIVED FROM THIS RESEARCH

Peer Reviewed Journal Articles


This paper outlines the complete EDR project described in this thesis, involving multiple iterations conducted at two contrasting universities. It describes the enhancements made to the EDR process, which included conjecture mapping to manage the project activity. It also illustrates how analytic generalisation can extend the spread of EDR and broaden theory through refinement of the emergent design principles.


The focus of this paper is the third phase of EDR (evaluation and reflection) conducted in Contextual Case 1. It describes the results of iteration two and three that led to modification of the design principles andillumination of factors that influence postgraduate student transition of online distance learning, and lessons for educational designers and universities wishing to support such students. This paper relates to Chapter 4, Section 4.3 of this doctoral study.


This paper describes the first two phases of EDR conducted in Contextual Case 1 (University of Sydney): the analysis and exploration of the orientation needs of postgraduate students, leading to the design and construction of a suite of resources known as *Getting-On-Track*. The third element, *Get Learning*, is the subject of this doctoral study in Chapter 4, Sections 4.1 and 4.2.

Peer Reviewed Conference Publications


Predominantly drawing from the third phase of EDR in Contextual Case 2, this paper develops the layers of transition described in Chapter 6, Section 6.3. Focusing on interviews from five undergraduate nursing students (Chapter 5, Section 5.3.5), it blends tracking data, illustrating the students’ level of engagement with the orientation resource, with their experiences of being an online distance learner, to distil themes associated with transition.

This paper relates to Chapter 5, describing the EDR project in Contextual Case 2. The paper synthesises the three phases of EDR, focusing on interpreting the LMS tracking data to understand how a large cohort of undergraduate nursing students engaged with the orientation resource. The relationship between demographic factors and engagement is identified.


Located in Contextual Case 1, this paper describes the unexpected access patterns that were identified during iteration two of Phase 3 (Chapter 4, Section 4.3.2). It proposes possible reasons for these variations and how the project team managed the unanticipated student engagement with the orientation resource.
TERMS AND DEFINITIONS

Conjecture map: A schema that illustrates how theoretically salient features of an educational design are predicted to work together to produce desired outcomes. It guides the evaluation of the design, the choice of data sources and the analytical process used to determine how well the educational design achieved its desired outcomes (Sandoval, 2014). In this research, the conjecture map consisted of design elements, mediating processes (observable actions or artefacts created from student engagement with the designed elements) and intended outcomes.

Design conjecture and theoretical conjecture: Developed as part of a conjecture map to articulate the anticipated links between the components of the conjecture map. Design conjectures propose how the elements of the designed learning environment might work together to generate learning activity (described as mediating processes). Theoretical conjectures propose links between the mediating processes and the intended outcomes to consider why such outcomes may have occurred when the designed environment is enacted (Sandoval, 2014).

E-learning: In the context of this research, e-learning refers to the use of information and communication technologies (ICT), in particular web-based technologies, to enable learning (Phillips, McNaught & Kennedy, 2012). The term e-learning should be considered equivalent to the terms online learning and technology-enhanced learning, as all three imply the use of ICT and the web.

External, distance and off-campus study mode: When students study by distance, external or off-campus study mode, they are not required to physically attend classes at the university campus. Generally, course materials are provided online, although in some situations students may also receive paper-based or other digital materials by mail. With the advent of the world-wide web this is reducing, such that external students are entirely reliant on using online technologies to complete their study.

Induction and orientation: For this research, the term induction will be used
synonymously with the term orientation and is defined by Forrester, Motteram, Parkinson & Slaouti (2005) as:

A series of planned activities developed specifically for the purpose of acquainting students with the systems, procedures, formalities and regulations of a particular institution. Induction should also support the transition to distance learning by equipping students with the requisite knowledge, skills and attitudes to become effective distance learners. (p. 293)

**Unit and course:** A course refers to the full qualification that the student is studying, such as a Bachelor’s degree. This consists of a number of units or subjects that form the study plan for the course. Each unit is usually one semester in length, contributes credit points, which when combined constitute a course of study.
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I have been very lucky to have worked with inspiring project teams at both universities. The collaboration with educational designers and academic staff at both universities provided a powerful creative space to develop the orientation resources. Gratitude also goes to the students who have participated in the research and enriched my understanding about their experiences as online distance learners.

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matured you have never questioned my persistence, and have always brought me back to reality with your fantastic sense of humour and wonderful positive attitude. I am very lucky to have you here. You did get to the finish line first, completing school just before I completed my journey, so we have much to celebrate. Finally, I cannot forget to mention my feathered cockatiel companion, Jamie, who has nibbled the pages of many drafts, chewed through mouse cords and sat on my shoulder talking and chirping while I have stared intently into the computer screen.
CHAPTER 1: POSITIONING THE RESEARCH

Recent developments in online technologies alongside changing government policies have provided new opportunities for diverse cohorts of students to study online at a distance from a university campus location. While these changes have promoted more flexible learning pathways, the retention of online distance learners to course completion has been significantly lower than more traditional modes of education delivery. This attrition may in part be due to online distance students managing a complex trio of lifestyle demands, involving work, study and family responsibilities. It may also mean that they do not have the necessary skills to make a successful transition to online distance learning. While transition has received attention in the first year experience literature, the research has largely focused on the campus-based student experience. A challenge remains, therefore, in how to support the transition of online distance learners and orientate them to this mode of learning. This thesis reports research undertaken in Australia that designed, implemented and evaluated student engagement with an orientation resource at two different universities. It is an important demonstration of how educational design research (EDR) blends theory and practice to inform iterative cycles that advance theoretical understanding of student transition to online distance learning at university. The research was strongly influenced by my background as a health professional and educator and is therefore situated in the health professional education context.

Chapter 1 provides the background to the research, is informed by literature illuminating general trends in the higher education sector, and leads to identification of the educational issue to be investigated. The purpose of the research is then outlined, and research questions are identified. The settings where the research was undertaken is also described, and the EDR framework is illustrated, detailing the phases of the research conducted at each university. This leads to a statement about the significance of the research for higher education practice and theory related to online distance learning. The
chapter concludes with an outline describing the organisation of the thesis.

1.1 Background to the research

Internationally, higher education is on the cusp of significant change brought about by the globalisation of economies, the spread of knowledge through technological advances, and the greater mobility of people across the world (Ennew & Greenaway, 2012; Marginson & van der Wende, 2007). Governments from developed nations have also recognised the need to have an educated workforce due to the close relationship between education, employment and income (OECD, 2013). These factors have led to development and innovation through mass access to education (Altbach, 2013; Laurillard, 2012), and new opportunities for education to be traded in the domestic and international market place (Norton, 2014). For example, education is the fourth largest export industry in Australia after natural resources (Go8, 2014). This rapidly changing environment requires adults to update skills and engage in retraining opportunities throughout their career, leading to improvements in the quality of life (Gibbons et al., 1994; Perez, 2004).

Continuing professional education is particularly important in the health professions, where the aging population and changes in healthcare delivery have led to workforce shortages and increased training opportunities (Loftus, Gerzina, Higgs, Smith & Duffy, 2013). There is also emerging evidence that baby boomers, particularly those from skilled professions, are reassessing their retirement intentions and delaying exit from the workforce in the wake of the global financial crisis (Taylor, Pilkington, Feist, Dal Grande & Hugo, 2014). In addition to these trends, the education of health professionals is no longer focused on knowledge acquisition alone, but focused more on development of research and analytical skills offered through retraining opportunities over the working life of a health professional (Frenk et al., 2010). This enables career flexibility and mobility by encouraging mature-age entry into university, leading to a richer mix of professionals in healthcare occupations (Higgs, 2013). For example, Duckett (2005) noted that opportunities are now available for career advancement in nursing where an
Australian enrolled nursing qualification can be transitioned to a registered nursing degree course through credit transfer.

Aligned to these global trends, the Australian Government has recognised inequalities in the higher education sector, and instigated policies to increase access and participation in higher education (Bradley, Noonan, Nugent & Scales, 2008; DEEWR, 2009; Radloff & Coates, 2013). As a result, Australian university courses currently have a substantially different student demographic to previous decades. There are greater numbers of students studying part time, by distance mode, or who may be the first in their family to attend university, with many managing a complex balance of priorities between work, home and study life (Devlin, 2013; King & James, 2013; Norton, 2014).

Ease of access to university has also been made possible through advances in technology in our daily lives, such as the availability of information and communication technologies (ICT), that enables access to information anywhere, anytime (Garrison & Anderson, 2003). A parallel trend is the increasing number of university courses that are using online and distance education approaches to present flexible study options for students (Guri-Rosenblit, 2014). These trends in higher education, when coupled with changes in the health sector, have led to health courses in Australia having the highest growth in applications to study at university in the decade from 2005 to 2014 (DET, 2014).

While attracting students to enter university is the first stage of developing the knowledge economy, student retention and completion rates are important factors impacting on the amount of available government funding for higher education institutions in Australia (Marginson, 2013). Retention and completion rates by online and distance students lags behind campus-based students, with reports of up to 50% drop out attributed to students studying in these modes (Coates & Ransom, 2011; Levy, 2007; Rovai, 2003; Simpson, 2013). While there are complex reasons for such high attrition rates, individual researchers, such as Tyler-Smith (2006), have identified the importance of managing early learning experiences for first-time online learners. Universities also
consider the first year experience a crucial stage in transitioning to successful study, however approaches so far have mostly considered the on-campus and undergraduate student experience (Gale & Parker, 2014; Kift, 2008; Kift, Nelson & Clarke, 2010).

Coupled with the importance of scaffolding student transition to university study, evidence has also emerged that students may not necessarily have sufficient skills to use technology for learning (Creedy et al., 2007; JISC, 2007, 2008; Kennedy, Judd, Churchward, Gray & Krause, 2008). Even though James, Krause and Jennings (2010) noted a dramatic rise in the use of ICT for study-related purposes, a wide variety of researchers examining how students use technology, have indicated that an adept use of ICT for informal personal use, does not necessarily translate to effective use of ICT for formal study (Bennett, Maton & Kervin, 2008; Bullen, Morgan & Qayyum, 2011; JISC, 2007; Kennedy et al., 2008; Sharpe, Beetham, Benfield, DeCicco & Lessner, 2009). Within each generation the extent to which ICT is harnessed to support learning varies widely, suggesting that each university needs to shape their support strategies for students transitioning to study according to their context and community needs (Corrin, 2014; Greene, Moos & Azevedo, 2011). Muilenburg and Berge (2005) determined that once a student completed one online unit, their perceived barriers to learning online were reduced. However further evidence is required to determine if overcoming transition barriers early in the students’ journey may improve retention of online distance learners (Brindley, 2014; Rovai & Downey, 2010).

The role of the teacher in universities is also changing. Rather than focusing on delivering content, university teachers are required to become managers of student learning, often mediated by technology across a range of formal face-to-face and online learning environments and informal spaces (Ellis & Goodyear, 2010). This has occurred through widespread adoption of Learning Management Systems (LMS) at universities where teaching staff design and manage the online components of university courses. Yet many academic staff fail to maximise the use of such technology due to low digital fluency (Johnson, Adams Becker, Cummins & Estrada, 2014). Pressure on staff time to
manage individual student learning may also occur due to an increase in student-to-staff ratios without parallel funding expansion to universities (McDonald, 2013). All these forces mean that designing for student learning in the online and distance learning environment is complex and open to further research (Goodyear, 2011).

The high level of flexibility in study options afforded to contemporary student cohorts presents a substantial challenge to orientation programs. Although there are multiple technologies available to support learning, it is likely that these diverse student cohorts may be inexperienced in distance education. This mode of study requires a high level of independence, self-regulation and coping with the actual or perceived isolation of studying off-campus, in addition to managing the technology associated with study (Brindley, 2014; Wiesenberg, 2013). Although an orientation program is commonly recognised as an appropriate institutional provision for new university students, Sharpe and Benfield (2012) identified that there were limited orientation options available for students studying online or at a distance to the organisation. Reports about student orientation programs for online distance learners are mostly descriptions of the static information supports rather than research that examines actual student engagement in the orientation process of learning how to use the technology for online distance learning (Bozarth, Chapman & LaMonica, 2004; Comrie, 2007; Scagnoli, 2001; Sharpe & Benfield, 2012).

In summary, contemporary universities are attempting to establish support structures and processes for a diverse student population that are increasingly combining both study and work while maintaining their family responsibilities (Norton, 2014). Today’s students may be the first in their family to attend a higher education institution, or may be returning to study after a break from secondary schooling, or may be returning to study to advance their career pathways. To meet these challenges, universities are providing more flexible study opportunities using technology to open up opportunities for study in part-time, online and distance modes of learning (James et al., 2010; Norton, 2014). Despite these changes, Australian data indicates that undergraduate students who study online by
distance have a completion rate of just 46.6% after nine years, compared with 76.6% for students studying on-campus (Edwards & McMillan, 2015). This lower retention has stimulated exploration of barriers to online learning (Muilenburg & Berge, 2005), how technology is used to support learning (Bozarth et al., 2004; Brindley, 2014), and how the student transition to study may be improved (Gale & Parker, 2014; Kift et al., 2010). Education in the health professions mirrors these trends, with health science courses becoming an area of significant growth in the Australian higher education sector (Norton, 2014) due to workforce demand and pressure to continue learning and maintaining standards of healthcare provision (Frenk et al., 2010; WHO, 2013).

The educational issue providing the stimulus for this doctoral investigation was how to design orientation resources for students transitioning to learning at university, where the learning is conducted at a distance to the university and is mediated by the use of educational technology. The purpose of the research is outlined further in the next section.

1.2 Purpose of the research

This research had a dual developmental and theoretical purpose (Plomp, 2013). The developmental aspect of the research was to design online orientation resources for health science students transitioning to university study in distance and online learning environments. The theoretical component was to identify and validate guiding principles for such designs; and in doing so, extend our understanding about student transition to online distance learning. Therefore the overarching research question was:

*What guiding principles underpin the design of orientation resources that support the transition of online distance learners studying health professional courses at university?*

The research was underpinned by a pragmatic approach (Johnson & Onwuegbuzie, 2004; Saba, 2003) which focused on problems (for my research, an educational issue), and aimed to produce outcomes that would enhance practice through iterative research.
cycles conducted in naturalistic settings (Reeves, 2000; Wang & Hannafin, 2005). 
Adopting a mixed methods approach enabled me to use pluralistic means to understand 
the educational issue at two universities, labelled as Contextual Case 1 and Contextual 
Case 2 (McKenney & Reeves, 2014; Wang & Hannafin, 2005). For example, in both 
cases research questions were directed at understanding the levels of engagement with the 
orientation resource and considerations about why the levels of engagement may have 
occurred. While student engagement is a broad multifaceted phenomenon (Kahu, 2013; 
Krause & Coates, 2008; Zepke, 2015), in this research engagement is defined as the 
“student’s emotional, behavioural and cognitive connection to their study” (Kahu, 
Stephens, Zepke & Leach, 2014, p. 523), focusing on their transition to the university 
online distance learning environment, rather than their achievement of learning outcomes. 
Engagement levels were analysed by examining the extent of student activity with the 
orientation resources and the degree to which students felt legitimised and supported 
(Beer, Clark & Jones, 2010; Coates, 2007). Lessons learnt from the design and 
implementation of the orientation resource in Contextual Case 1 prompted a more in-
depth analysis of the relationship between student demographic factors and engagement 
levels at the second university (Contextual Case 2), including interviews with students 
about their transition experience. The specific research questions are outlined in the 
following section.

1.3 Research questions

Three main research questions with subsidiary questions framed the investigation and 
hereafter will be presented as RQ 1, RQ 2 and RQ 3.

RQ 1: How do health science students engage with online orientation resources 
designed to support the transition to online distance learning?

RQ 1a. What is the level of student engagement with the orientation resource?

RQ 1b. What types of orientation activities do students explore to develop their 
skills in using the learning management system (LMS)?
RQ 2: Why does this level of engagement occur?

RQ 2a. Is there a relationship between the levels of engagement and student demographics? (expanded in Contextual Case 2)

RQ 2b. Is there a relationship between the levels of engagement and study success? (Contextual Case 2 only)

RQ 2c. What do students say about their experience using the resource and their beginning online learning experiences? (expanded for Contextual Case 2)

RQ 3: What guiding principles underpin the design of effective orientation resources?

RQ 3a. What educational design features will assist health science students to make the transition to online distance learning?

RQ 3b. What lessons emerge from the implementation of the online orientation resources in two university contexts?

1.4 Settings and participants

The research was conducted at two university locations, spanning the period from 2006 to 2011. Each university is referred to as a contextual case to reinforce the importance of context in educational design (Reeves, 2015; Seale, 2008). Contextual Case 1, studied from 2006 to 2008, was at the University of Sydney, a traditional research-focused university. A total of 491 health science students studying postgraduate courses fully online (predominantly in the allied health and nursing disciplines) participated in three iterations of implementing the online orientation resource known as Get Learning. My role in the project traversed that of project manager, designer and researcher and built on prior individual research and development work I had undertaken in the health discipline of orthoptics (Wozniak, 2007; Wozniak & Silveira, 2008).

Outcomes and findings from student engagement with the orientation resource from Contextual Case 1 guided the development of a second resource at Charles Darwin University (CDU). CDU is a regional dual-sector university that delivers an online undergraduate nursing qualification (incorporating residential teaching blocks for
practical skill development) to a diverse group of students who would not normally access higher education. A resource known as Get Learning Online @ CDU was developed from 2009-2011, with 591 students provided access across two iterations of the implementation. I managed the development project, was a member of the design team and conducted the research.

The next section provides a brief introduction to the research framework for this doctoral study, namely educational design research (EDR), illustrating how it guided the extended investigation. An introduction to the rationale for using EDR and its key features are also presented.

1.5 Research design

Educational technology research has been frequently criticised for its lack of theoretical underpinnings and the gap between theory and practice due to the difficulties in applying research outcomes to complex learning environments (Evans & Haughey, 2014; Gunn & Steel, 2012; Hew, Kale & Nari, 2007; Reeves, 2000). Educational design research (EDR) is one approach that is gaining momentum as a way to address these limitations due to the close association between researchers and practitioners. Its cyclical and iterative approach embeds theory into the educational design process while also developing solutions to educational issues (Barab & Squire, 2004; Design-Based Research Collective, 2003; McKenney & Reeves, 2012; McKenney & Reeves, 2014; Reeves, Herrington & Oliver, 2005; Reimann, 2011; Sandoval, 2013; Wang & Hannafin, 2005). Figure 1.1 (on page 10) illustrates the EDR approach used in this research.

In Phase 1, known as ‘analysis and exploration’, theories about student learning, use of technology, and distance education were blended with an analysis of contextual factors at each university to develop a set of draft design principles (DPs) that informed the second phase of EDR ‘design and construction’. During this second phase the DPs that emerged from the first phase were reified into the design elements of the orientation resource which was then modified through the testing of the prototype.
The EDR process was enhanced by constructing a conjecture map to identify how the orientation resource would be used when implemented in the third ‘evaluation and reflection’ phase (Sandoval, 2004, 2014). This included articulation of how it was expected to function (design conjectures) and influence student transition (theoretical conjectures). This mapping process helped to identify the data collection methods to be used during implementation (Phase 3) and focused the analysis on the most “salient features” of the orientation resource design (Sandoval, 2014, p. 19). It generated a manageable data set that informed the research questions while still being open to capturing unanticipated events. For example, at the first university, students entered the orientation resource through unanticipated navigational pathways and missed the context of the embedded activities designed to support development of online learning skills. This impacted the extent of student engagement, so individualised feedback was provided by the project team to assist students to find further orientation supports and activities. Outcomes from the experience at the first university led to modifications to the DPs and generated further research questions that were investigated during the research cycles at the second university; for example, why the different levels of engagement may have
occurred, and if demographic factors influenced student engagement levels.

By conducting EDR in two university contexts, the research also provided an extended analysis of the space inhabited by students transitioning to online distance learning, demonstrating how research conducted at one university may be transferable and inform development at another (Gunn & Steel, 2012). A retrospective analysis of the lessons learnt across both contexts led to the EDR outcomes for this research (see Figure 1.1). This demonstrated a reflective form of EDR whereby richer, thicker descriptions of the DPs emerged to describe how to support student orientation to online distance learning (Holmberg, 2014). It also enabled close consideration of how students embodied this transition space while not being physically present (Diekelmann, Schuster & Nosek, 1998). Therefore, EDR not only led to the development of practical resources (two orientation resources), but also principles about their design and theoretical knowledge about student transition to online distance learning.

Completion of a comprehensive EDR process provided me with a unique opportunity to synthesise the student transition experience at two universities, which contributed to the significance of this research.

1.6 Significance of the research

This research is significant because diverse cohorts of students are entering university juggling a complex mix of study, family and work responsibilities, yet research about student engagement and transition to university has primarily focused on campus-based experiences (Briggs, Clark & Hall, 2012; Coates & Ransom, 2011; Gale & Parker, 2014; Kahu, 2013; Kift, 2015). By undertaking an iterative EDR approach, informed by theories about learning and technology, to create orientation resources for new online distance learners across two contrasting university contexts, I was also able extend the reach of the EDR outcomes. Comparative analysis of the outcomes from both contexts demonstrated analytic generalisation (Kopcha, Schmidt & McKenney, 2015; Yin, 2009), where research outcomes led to development of a broader theory. McKenney and Reeves (2014,
p. 138) suggested that when “designs are tested in multiple settings and under varying
conditions, or when design features are systematically varied under similar conditions,
theory development can occur”. As a result the most significant benefit for higher
education from this research was the enhanced knowledge and practices that emerged,
rather than the refined and maturing orientation resources alone.

There were three significant contributions from this research:

• **Development of six DPs:** The DPs that emerged provide rich descriptions of key
elements that can be adapted by others who wish to support online distance
learners in their own contexts. These DPs not only provide suggestions about
fundamental design features for orientation resources, but also highlight
important macro-level university constructs that could support such initiatives.
The DPs suggest that students need an opportunity to practise using the LMS but
also need assistance with academic writing, information literacy and selecting a
manageable study load. Orientation resources should have clear navigation and
incorporate opportunities for interaction with academic staff and other students.
Universities should consider that orientation to online distance learning is an
extended journey beyond the first few weeks of study, and engagement levels
with orientation activities will vary, indicating that universities should target
their support to discrete student cohorts.

• **Improved theoretical knowledge about transition:** I was also able to improve
our understanding about the student transition experience, by carefully
examining the varied student experiences that emerged in each Contextual Case,
leading to the development of a conceptual framework for the transition of
online distance learners to university study. This model includes four layers of
transition to online distance learning: adjustment to the university, the online
environment, distance and becoming a health professional. It was theorised that
managing these layers was fostered by self-regulation enabling transition from
the student’s domain of life to the domain of academic study.
Enhancement to the EDR framework: This research also made a significant contribution to the conduct of EDR, which rarely reports a full cycle of all three phases beyond one context (Anderson & Shattuck, 2012). The EDR framework was enhanced by aligning a conjecture mapping process with the three phases to focus the data collection during multiple iterations of implementation. This enriched the analysis and interpretation, contributing further knowledge about the conduct of EDR, which is an increasingly popular approach to studying educational design in technology-rich learning environments.

The structure used to report the iterative EDR approach used in this research is detailed next in the final section (1.7).

1.7 Structure of the thesis

The thesis represents the EDR process undertaken across two university contexts and explores the key findings associated with the design of orientation resources and the transition of online distance learners in its seven chapters. The first chapter has provided background to the educational issue, the purpose of the investigation and research questions, an overview of the research design, and the significance of the research outcomes.

Chapter 2 introduces the theme of online distance education, outlining the evolution of distance education and the theoretical foundations and learning perspectives underpinning the research. It further develops the background and rationale for the study through an examination of the literature associated with retention and student engagement at university, exploring what is known about how students use technology, and factors contributing to student transition. Approaches to orientation are then synthesised, drawing on work completed in the United Kingdom (UK), United States (US), Canada, New Zealand and Australia, to identify characteristics of relevance to online distance learners. This chapter concludes by identifying the need and justification for the research.

Chapter 3 commences with an explanation of educational design and the pragmatic
research paradigm. These theoretical foundations led to justifying why EDR was adopted as the framework for this research. After a synthesis of the factors that may constrain the impact of EDR on practice and theory, the application of EDR to this research is outlined. This includes further development of the phases of EDR to include a conjecture mapping process to capture the design trajectory and guide conceptualisation of the reasoning process that emerged from EDR. The mixed methods approach to data collection to capture student engagement with the orientation resources is then described, including the process of analysis which contributed to the rigour of this research.

The next two chapters (4 and 5) detail the design of the online orientation resources and results of the iterations at each university, with Chapter 4 describing three iterations at the University of Sydney, and Chapter 5 two iterations at Charles Darwin University.

Chapter 4 begins with an examination of the first university context, which when combined with the discussion of learning theory in Chapter 2, contributed to the development of the four draft DPs. These DPs guided the second EDR phase: the design and construction of the orientation resource. Following development of a conjecture map to focus analysis of the third implementation and evaluation phase, the levels of student engagement with the resource were studied using the LMS log data files and student evaluations. This led to refinement of the DPs.

Chapter 5 outlines the EDR process undertaken in Contextual Case 2, and describes the interlude between both contextual cases. Once again the contextual information is interwoven with the DPs to inform the design of the resource at the second university. The third implementation phase at the second university is then described, which included a more detailed data set with demographic information, academic grades and interviews with five students.

The final two chapters (Chapters 6 and 7) provide a retrospective view of the research outcomes from both contexts and a discussion of the lessons learnt from both a practical and theoretical viewpoint. Chapter 6 provides a comparative analysis to synthesise conclusions about the research questions, develops thick descriptions in the form of DPs
and reflections about how the results contribute to our understanding of student transition to online distance learning. The final chapter (7) presents the research contributions to practice and theory, including the development of the EDR framework, the implications and limitations of the research, and recommendations for further study.

Next, Chapter 2, builds on the background described in Section 1.1 by providing a detailed literature review that explains the rationale for conducting this research.
CHAPTER 2: LOCATING THE EDUCATIONAL ISSUE IN THE LITERATURE

This chapter explores the rationale for researching the complex educational issue of health science students’ transitioning to online distance learning at university. I develop the background provided in Chapter 1, Section 1.1 further by focusing on the Australian higher education context, while also being informed by distance and online educational research conducted in New Zealand, Canada, United Kingdom (UK), and the United States of America (US).

Chapter 2 traces the evolution of distance education and the impact that technology has had on defining the online distance learning space. Just as technology has changed higher education, learning theories have also provided new perspectives about learning. Four different theoretical learning perspectives are outlined to highlight specific elements that influenced the design of the orientation resources. I was also influenced by three distance and online learning pedagogical models that blend elements of these learning theories, further guiding design decisions.

To place my research in the context of higher education in Australia, I examine trends towards widening participation and higher numbers of health professionals studying by online distance modes. I discuss literature that reveals factors associated with retaining online distance learners until completion of their course and student engagement with university. While there is widespread discussion globally about how students use technology, it appears that they do not necessarily optimise the use of ICT for learning. Transition into university is noted as an important concept (particularly the first year campus experience); however the transition experience for the online distance learner is an area that has received scant attention. Specialist distance education providers, such as the Open University in the UK, community colleges in the US, Athabasca University in Canada, and Massey University in New Zealand, have offered some suggestions about how to support online distance learners. Even so, reports are primarily descriptive with
little consideration about how students actually utilise transition supports or their experience of using these supports. More recently, learning analytics has provided a new opportunity to study how students engage in university study.

In Chapter 2, I synthesise a wide variety of fields to identify the need for my research. This analysis brings to the surface design considerations identified during the conduct of EDR (explored further in Chapter 3) and the development and implementation of the online orientation resources studied at each university (Chapters 4 and 5).

2.1 Impact of technology on distance education

During the 1990s the World Wide Web created opportunities to share and use vast amounts of information from widely dispersed computer locations both in real time or asynchronously. This technology-based revolution also changed the way that computers were integrated into learning environments (Molenda, 2008; Phillips et al., 2012), and has consequently changed the landscape of both distance education (Evans, Haughey & Murphy, 2008; Moller & Huett, 2012) and campus-based higher education (Beetham & Sharpe, 2013; Garrison & Anderson, 2003). The evolution of distance education is explored next, leading to a blurring of the boundaries between traditional campus-based higher education and distance education, and the need to characterise the meaning of online distance learning.

2.1.1 Generations of distance education

According to Spector (2012) the defining feature of distance education is that students are separated from their instructors in time and place. As technology has evolved and been used to support the delivery of distance education, the concept of five generations has been used to describe the shifts occurring over time (Anderson & Dron, 2011; Garrison, 1985; Garrison & Anderson, 2003; Taylor, 2001). Although the classification of each generation varies, the first generation generally refers to the use of print-based correspondence courses where students studied alone, completing readings and activities designed by their teachers, who provided feedback as students progressed.
through their study materials. The second generation of distance education emerged when multi-media, such as audio or video tape, was used to enhance a one directional mode of communication (teacher to student). The advent of tele-media in the form of audio, video conferencing or broadcast TV (third generation) provided improved opportunities to connect dispersed students with their teachers and the advent of the internet led to two-way communication via web-based computer conferencing (fourth generation). While a fifth generation encompassing intelligent databases, Web2.0 and semantic web technologies has been suggested (Anderson & Dron, 2012; Taylor, 2001), the development is in its infancy. The predominant form of distance education today, centres on the fourth generation of distance education. This generation enables students to connect with a wide variety of resources and their teachers, providing opportunities for interaction with other students across time via both synchronous (e.g., virtual classrooms) and asynchronous communication techniques (e.g., discussion forums) (Hanna, 2003).

2.1.2 Blurring the boundaries between distance and traditional higher education

As technology provided new options for two-way interaction in distance education, a major impetus for streamlining technology into campus-based higher education practice was through the enterprise adoption of learning management systems (LMS). This web-based technology enabled teachers to manage and support students studying their units and courses outside of the physical classroom space (Coates, James & Baldwin, 2005). The LMS provided opportunities for students to access resources online thereby promoting greater flexibility in study timing and options. The communication tools associated with the LMS also opened up new channels for interaction between teachers and students and between students (campus-based or those diversely distributed) regardless of where they were located. Collectively the LMS tools enabled more efficient management of assessment and learning tasks with wider opportunities to provide feedback to students about their progress.

Technological advances have therefore blurred the boundaries between traditional
campus-based universities, where students were required to attend campus for their study, and universities who previously specialised in distance learning (Beetham & Sharpe, 2007; Ellis & Goodyear, 2010; Laurillard, 2012). By offering units in modes other than face-to-face delivery, for example, blending with online delivery or providing fully online offerings, many universities have been able to increase their market share and attract greater numbers of student enrolments (Guri-Rosenblit, 2014; Naidu, 2003). This variety of study options for students has created a tension in the higher education community. Distance education providers argue that they are better versed at meeting the needs of their students located at a distance to the campus, and that they have teachers with the attitudes, strategies and experience to integrate modern technology into their practice. On the other hand, distance education is a space that is increasingly being entered by traditional campus-based universities (Palloff & Pratt 2007; Peters, 2003; Rumble, 2000; White, 2005). In the context of my research it is therefore important to clarify the term online distance learning.

2.1.3 Conceptualising the meaning of online distance learning

A plethora of terms have been used to describe the variations in how technology is incorporated into higher education practice (e-learning, online learning, technology enhanced learning, networked learning, computer mediated communication). A meta-analysis of research associated with distance, blended and online learning, that incorporated historical perspectives and future directions in technology and higher education practice, was undertaken by Siemens, Gasevic and Dawson (2015). In their analysis, online learning is considered a form of distance education in which a key element is the separation in place between the student and the teacher, including the requirement of a communication medium connecting them. They considered online learning to be “a form of distance education where technology mediates the learning process and teaching is delivered completely using the Internet, and students and instructors are not required to be available at the same time” (Siemens et al., 2015, p.
This view removes the more traditional first and second generation forms of distance education and also proposes that blended learning is a broader concept where online learning can be intertwined with more traditional campus-based approaches.

There is still a need to determine what is meant by the term online distance education. Zawacki-Richter and Anderson (2014) authored a volume with contributions from respected online and distance education researchers worldwide, to provide an analysis of this area of research and highlight new exploratory directions for researchers and educators. As commented by Peters (2014, p. x) in the foreword to the book: “online distance education is a comprehensive, many-sided process and a multifunction system”.

Anderson and Zawachi-Richter (2014) suggest a more open use of the term:

Online distance education can be considered as the natural extension of distance education into another medium. Such extensions have been common throughout the decades since distance education was first developed based on text-based correspondence models. Thus, online distance education is both a revolution and an evolution. (p. 490)

I concur with the view that online distance education is a broad area of study that can encompass elements of traditional distance education and blended learning without clear boundaries (Bullen & Janes, 2007). As my investigation was situated in higher education courses where students crossed the boundaries between distance, online and blended learning, I identified that online distance learning is best represented as a continuum, and is illustrated in Figure 2.1 adapted from Bullen & Janes (2007, p. ix).

*Figure 2.1* Continuum of online distance learning
In Contextual Case 1 students were fully separated from their teachers in both their place and time of learning, and the course delivery traversed both traditional print-based distance delivery (first generation distance education) with the use of asynchronous modes of online learning to promote interaction (different place, different time). Contextual Case 2 also represented a broad spectrum of delivery modes, with the majority of students studying at a distance to the university and fully reliant on online mechanisms to complete their courses using both synchronous and asynchronous technology (different place, different or same time). This was mixed with a smaller group of students studying predominantly on-campus who also had choices to blend their learning by attending campus-based lectures or adopting a more distance mode of study so they could manage study commitments with other lifestyle choices.

Regardless of where research investigations are situated on this continuum, several educational researchers have lamented the fact that university education has not taken full advantage of the opportunities available from technology (Ellis & Goodyear, 2010; Kinchin, 2012; Kirkwood, 2009; Moller & Huett, 2012; Reeves, 2006; Zemsky & Massy, 2004). For example, transmission modes of delivery have been replicated online by depositing lecture materials in the LMS. Distance education scholars in Canada and the US have also criticised simplistic technology focused characterisations of the evolution of distance education (Anderson & Dron, 2011; Moller, Robison & Huett, 2012). They argue that greater consideration should be given to understanding how learning theory intertwines with the choice of technology. Irrespective of how the elements of distance education, online learning or blended learning are defined, there is universal agreement amongst scholars that research should be grounded with a clear understanding of learning theory, rather than focusing on specific technological features (Anderson, 2008; Conole, 2012; Goodyear, Carvalho & Dohn, 2014; Jones & Kennedy, 2011; Laurillard, 2012; Mayes & de Freitas, 2007; Oliver & Herrington, 2001; Spector, 2012). Anderson and Dron (2011, p. 81) provide an apt metaphor to explain this: “in a dance: the technology sets the beat and creates the music, while the pedagogy defines the moves”. This
statement highlights the importance of using learning theories to design educational experiences that are afforded by technology (including those that assist students to transition to university study). These theoretical perspectives and the ensuing pedagogical models that influenced the design of the orientation resources are discussed in the next section.

2.2 Learning theories that shaped the research

Like technology, changes in our understanding about student learning have also had an impact on distance education and higher education practices. Learning theories have been broadly clustered into different perspectives: behaviourist, cognitive and situated (including socio-constructivist) (Greeno, Collins & Resnick, 1996; Mayes & de Freitas, 2007), with inclusion of an additional humanistic perspective proposed by Stewart in a more recent Australian higher education text (2012).

The first and second generation of distance education were predominantly associated with behaviourist and cognitive perspectives, where student learning was considered an individual activity controlled by the teacher who provided the content and directed the student’s activity (Anderson & Dron, 2011). As technology provided a greater avenue for two-way communication between teachers and students, and between students, situated perspectives and combined viewpoints such as social constructivism have become the predominant philosophical approach underpinning the design of distance education today (Kovanovic et al., 2015). In addition self-theories encompassing personal growth and self-regulation are also integral to understanding online distance learning (Artino & Stephens, 2009; Dweck, 2000; Kift et al., 2010). As Mayes and De Freitas indicate “there are really no real models of e-learning only e-enhancements of models of learning” (2007, p. 13). A brief overview of the four perspectives is presented in the following subsections including underlying assumptions framing the generation of the original draft DPs driving the design of the online orientation resource at the first university (outlined further in Chapter 4, Sections 4.1.2 and 4.2). Learning theory also informed the
subsequent modifications of these DPs and the synthesis of the findings from this research.

2.2.1 Behaviourist perspectives

Reductionist approaches to learning emerged in the early 20th century (Skinner, 1938), where learning was considered to be a change in observable behaviour. Tasks were broken down into sequences of hierarchical competencies. This view influenced instructional design systems (Gagne, 1970), and when technology was applied to this approach it led to programmed instruction. Students were presented with a stimulus (created by the teacher) and directed to provide a response. This was followed with automated feedback about their performance and directed their progress to the next level of instruction. This overall approach to learning has largely been dismissed in higher education due to the rigid controlling influence of the teacher being at odds with adult learning theory which advocates the centrality of the learner in the educational transaction (Knowles, 1978). However, as suggested by Bates (2008), some elements are still relevant to competency development in workplace learning, an example being mastery of clinical procedural skills in the health professions. Sequencing of learning tasks and provision of feedback are still considered good practice principles for learning with technology (Ally, 2008; Chickering & Ehrmann, 1996). Both these features were incorporated into the design of the orientation resources for this research (see Chapter 4, Section 4.1.2).

2.2.2 Cognitive perspectives

As understanding about human cognition developed, learning theorists focused on cognitive processes, which sought to understand how information was processed and concepts were formed (Bruner, 1960; Dewey, 1938; Piaget & Cook, 1952). Dewey and Bruner played a key role in translating these concepts into the education context. Dewey emphasised the unique and individualised nature of learning, highlighting the importance of the student as the creator of understanding, while Bruner focused on the importance of
building on prior knowledge through discovery approaches to learning which enabled the forming of relationships between concepts and ideas. Early generations of distance education, particularly print-based correspondence courses with individual tutor support by tele-conferencing, invested significant resources in the design of learning materials to create a dialogue (both written and verbal) to foster cognitive development (Evans et al., 2008). As research into neuroscience progressed, understanding about memory was also applied to education. One example with significance to students transitioning to new learning environments was cognitive load theory. It proposed that learning is maximised when materials are presented in manageable ‘chunks’ mirroring the capacity of the working memory (Sweller, van Merrienboer & Paas, 1998).

Characteristics derived from cognitive learning theories and how individuals construct knowledge also contributed to the design of orientation resources in this research. These included assumptions that learning is an active process where students need to build on their prior concepts and experiences, and that providing information in small sections will lead to enhanced learning. However focusing solely on this cognitive learning approach in isolation is short-sighted, as it does not consider the enrichment to learning that can be generated by fostering online interactions between students and between students and their teachers (Garrison & Anderson, 2003; Kovanovic et al., 2015).

2.2.3 Situated and socio-constructivist perspectives

Situated perspectives emphasise the role of context in learning and introduce the concept of community in the learning process. Vygotsky (1978) highlighted the social and cultural aspects of learning, emphasizing how culture and other people in our environment shape our understanding. A situated perspective suggests that one’s social environment is a central element to how we learn, and that learning is mediated through language and debates with other students and reconstructed based on this experience. A teacher’s role is not to direct but to scaffold and support the learning process.
Lave and Wenger (1991) also considered that learning was a social activity situated within the student's everyday life. Students are considered participants in a range of communities of practice (for example, work life, home life, and study life) and their success depends on how well they fit into the community of practice (CoP). Students may enter the CoP at first in the periphery, but by active engagement with more experienced peers and teachers they will experience legitimate peripheral participation and move to become more fully active participants in the community. Situated learning reinforces the value in designing authentic learning activities that mirror as closely as possible real world experiences, a notion that has been further articulated in the e-learning and distance education context (Herrington, Reeves & Oliver, 2010; Jonassen, Davidson, Collins, Campbell & Haag, 1995).

The blending of both cognitive and situated perspectives, commonly referred to as social-constructivism is a core underpinning principle driving online learning developments today (Anderson & Dron, 2011; Garrison & Anderson, 2003). It was also a strong mediator driving decisions made during the design of the orientation resources for the contextual cases studied in this research. Transition to online distance learning was considered an active process originating from the students’ socio-cultural context and enabled by fostering interpersonal interactions within the online environment. The LMS created opportunities to link students with each other, their teachers and associated content, and created a rich learning space for students to work collaboratively to create meaning. Such social constructivist perspectives recognise the complexity and contextual influences on learning beyond the formal study environment.

Learning in the information-rich digital environment does provide added difficulty, where students need to not only make sense of an array of information sources, but also manage and nurture their connections between computer networks and human elements (Evans & Haughey, 2014). This increasing complexity and chaos associated with the fluid nature of networks prompted development of a newer connectivist theory of learning (Siemens, 2005). Connectivism recognises both technical and non-technical
aspects of networks that aid learning. Students can tap into an ever-expanding and constantly changing source of information and apply it to new situations while maintaining and developing new connections. However, managing fluid learning environments that change rapidly may disrupt the development of a learning community and present challenges for less autonomous and experienced students (Anderson & Dron, 2011). This view is relevant to my research, as students without any physical presence at the university may struggle to appraise the vast array of information sources available to them and may also be impacted by a change in learning environments due to universities upgrading their online systems.

2.2.4 Humanistic perspectives

A final perspective that influenced the conception of this research was considerations about self-theories and motivational factors, such as a human’s innate drive towards self-improvement and growth. A broad spectrum of social scientists (Mezirow, Kolb), psychologists (Bandura, Dweck, Maslow, Rogers, Winnie, Zimmerman) and philosophers (Schön) have contributed to the development of this person-centred perspective.

A fundamental notion developed by Maslow (1954) and Rogers (1969) was that learning can progress when a supportive environment is provided and the student’s potential is fulfilled through reflective thought processes. Self-theories foster awareness of our capabilities, belief in our ability to control events, and to reflect and self-regulate our learning processes. A notion espoused by Bandura (1997) was that students were more likely to succeed and take on new challenges if they believed in their own ability. Dweck’s (2000) research into self-efficacy suggested that a student’s goal orientation could affect their ability to persist and succeed. Central to enhancing self-efficacy for online learning is fostering metacognition and reflection (Cho & Shen, 2013; Winne, 2014). These concepts were originally highlighted in Mezirow’s (1991) theory of transformative learning and Schön’s (1987) concept of a reflective practitioner. Kolb’s
theory of experiential learning embeds reflection into learning and practice, an integral component of health professional education (Kolb, 1984; Loftus et al., 2013). He describes a cycle where students’ perceptions drive their motivation towards learning, giving it personal meaning (concrete experience). Engaging in reflective observation leads to further processing, analysis and conceptualisation that can be applied to new situations (active experimentation). Since reflection plays a central role in critical self-appraisal of a student’s frame of reference, leading to new learning and transformation, it was important to create opportunities for beginning online distance learners to reflect on their transition journey.

A closely related concept espoused by Zimmerman (1990), known as self-regulation, refers to a student’s ability to monitor, adapt and change one’s learning approaches. The relationship between self-regulation and student success in online learning environments has been confirmed by several researchers (Artino & Jones, 2012; Cho & Shen, 2013; Sun & Rueda, 2012), however Winne (2014) suggests that students are seldom taught how to develop their self-regulatory behaviours. Winne (1997, p. 399) uses the acronym of COPE to describe self-regulation: learner actions will be influenced by the conditions, what the learner can do (operations), the products achieved, which are then evaluated and used to inform future practices. Therefore researchers need to consider how students can evaluate their online learning actions and enrich their self-regulatory skills. Current research directions have contributed to developing the concept of learner dispositions describing how students behave in new learning contexts (Deakin Crick & Goldspink, 2014), and considerations about social influences, such as the role of peers and community for self-regulation (Garrison & Akyol, 2013; Hadwin, Järvelä & Miller, 2011). These views purport a need to develop both individual awareness of learning processes to improve engagement with study and understand more about the role of the student’s socio-cultural context. Both may be crucial factors for students transitioning to online distance learning.

In summary, most educational designs incorporating online distance strategies will
include a blend of these four theoretical perspectives (Anderson & Dron, 2011; Beetham, 2007; Conole, Dyke, Oliver & Seale, 2004). In this research, components of each perspective influenced the project team’s approach to designing the orientation resources. This was conceptualised in the development of draft DPs that underpinned the core ideas about how to develop supports for online distance learners in each context. This is outlined further in the first phase of EDR described in Chapter 4, Sections 4.1.2, 4.2.1 and Chapter 5, Section 5.2.1.

2.3 Pedagogical models that guided the design process

While each of these broad learning perspectives highlighted elements to be incorporated into the design of the orientation resources, further pedagogical models were also identified to guide how decisions were made during the design phase of EDR (Evans & Haughey, 2014). Defining concepts of particular relevance to this research was the notion of separation between students and teachers, and between students (Benson & Samaranwickrema, 2009), as well as considering how to provide opportunities to enhance interaction between them while recognising the importance of creating a community of learners (Anderson, 2008). The three pedagogical models that incorporated these themes of distance, interaction and community, and were highly relevant to this research, were: the theory of transactional distance (Moore, 1993); the Community of Inquiry model (Garrison, Anderson & Archer, 1999); and the five stage model of online learning (Salmon, 2000). The significance and application of these models in the research will be described in the next three subsections.

2.3.1 Moore’s theory of transactional distance

The theory of transactional distance helped to move distance education research from the realm of physical science to that of social science incorporating both the cognitive and situated theoretical perspectives. Consequently this theory highlighted the centrality of the learner to the educational transaction (Saba, 2003), by describing the relationship between the student and the teacher as not only being at a physical distance but also at a
psychological distance to the educational institution. The term *transactional distance* was first coined to understand the relationship between the student and the teacher (Moore, 1993); one that is bridged by balancing dialogue, structure (course design) and learner autonomy. By varying the amount of dialogue and structure, the teacher could reduce the transactional distance, although this was also influenced by the level of learner autonomy, as more self-directed learners were able to manage learning in environments with less structure and/or less dialogue and greater transactional distance. Garrison (1989) has also argued that an essential element for learning at a distance is dialogue and debate, as these processes enable students to negotiate and formulate their own meaningful knowledge.

Transactional distance theory has been applied to educational design in online learning contexts by highlighting the need for designers to “flesh out the specific nature of the dialogue and structural elements to be included to support students” (Benson & Samarakkreme, 2009, p. 15). Benson and Samarakkreme provide an example of how new online learners who are early in their course and studying fully online may be expected to demonstrate low levels of autonomy, and have a high need for structure to be able to reduce the transactional distance. They suggest structuring tasks to engage students in dialogue and scaffolding supports to assist them early in the learning process.

Being cognisant of the theory of transactional distance guided considerations about the structure and dialogue of the orientation activities in the development phases of the EDR, e.g., designing activities that embed communication opportunities and support students in their choices about how they participate. It also provided a framework to interpret and evaluate the student’s experiences of engaging with the resources in the third phase of EDR (Chapters 4, 5 and 6). The next two models underline the notion of using interaction to create a socially constructed community of learners that supports the transition process.

### 2.3.2 Community of inquiry model

Another model of e-learning that informed this research, and which has received wide
acceptance in the online distance education discourse, is the Community of Inquiry Model (CoI) (Evans & Haughey, 2014; Garrison et al., 1999). Garrison, Anderson and Archer were influenced by the social constructivist and situated theoretical perspectives, arguing that a quality e-learning experience occurs when an environment is created that supports a CoI through three essential elements; cognitive presence, social presence, and teaching presence. This model supports the view that teachers need to create a learning environment that promotes a climate of trust and a willingness to collaborate, and negotiates clear expectations, with the teacher modelling appropriate online behaviour. Social presence directs the designer to consider how affective behaviours can be expressed in an online environment, thus designing for open communication to encourage development of ideas and creation of a cohesive online community. Cognitive presence involves designing an intellectually stimulating environment that supports sustained critical discourse and higher order knowledge acquisition and application.

The CoI model provided a structure for making decisions about the type of orientation activity to be planned in each contextual case, and how the student should engage in their inquiry process; as well as considering the timing of the activity, the workload, and the role of the teacher. Although teaching presence is considered to be the reinforcing element that facilitates and directs the cognitive and social presence, the project team needed to consider how to support development of social presence and minimise the need for teacher presence during the transition process. For example, in Contextual Case 1, instructions for the communication activities clearly defined the level of interaction that would be provided by the moderators.

2.3.3 Salmon’s five stage model of online learning

The third pedagogical model that influenced the educational design of the orientation resources was Salmon’s five stage model of online learning. Through her experiences in moderating online discussion forums in the United Kingdom, Salmon (1998, 2000) developed a good practice framework for tutors (known as e-moderators) to design online
activities called e-tivities that promoted student participation in online discussions. This model of online learning describes a five-stage progression for students ranging from novices beginning to communicate online to fully autonomous online learners. In the initial stages (1 and 2), the focus is on accessing the online communication tools and socialising and establishing their online identity. During Stage 3, students begin to exchange information and build their understanding through their online dialogue, leading to more advanced conferencing to construct knowledge and share their interpretations with others (Stage 4). Finally, in the fifth stage, known as ‘development’, they are able to engage in critical thinking and adopt responsibility for their own learning while at the same time supporting other students in their journey through the stages. This model aligns most closely with a social constructivist approach to learning and highlights the importance of collaboration and dialogue in the learning process. It details how the e-moderator should support the student as they move through each stage and incorporates scaffolding and guidance by the e-moderator which gradually diminishes as the student progresses through each stage.

Prior to developing the orientation resources for Contextual Case 1, I had applied this model to student orientation in a blended learning environment related to the allied health discipline of orthoptics (Wozniak & Silveira, 2008). In this prior work, the framework was refocused on the student’s role rather than that of the e-moderator. My research outcomes indicated that the quality of the student contributions in the asynchronous discussions improved when students completed activities designed to promote development through the stages. In addition, their self-evaluations also correlated with their assessment results (Wozniak, 2006; Wozniak & Silveira, 2004). While there has been some criticism about the rigidity of the five stages (Evans & Haughey, 2014), this model has also been applied to scaffold the academic writing skills of nursing students in a UK university (Griffiths & Nicolls, 2010). They also observed improvement in assessment results following the implementation of this approach, but noted that access, variable IT skills, competing demands of study, and clinical placement attendance,
influenced the degree of engagement in the activities. Both these examples highlight the potential of this model to guide the design of online orientation resources in each contextual case.

While the learning theories and pedagogical models described in Sections 2.2 and 2.3 provide frameworks for making decisions about the design of online distance learning environments, higher education is framed within a broader socio-economic and political context (Evans et al., 2008). Chapter 1 provided a broad overview of global higher education and health professional sector trends. The next section focuses this discussion on trends in the Australian higher education context and the education of health professionals.

2.4 Higher education and health professional education in Australia

Opportunities for students to engage in online distance learning have opened the door to university education for those who would not previously have had the chance to participate. The availability of technology providing flexible access to enter and study at university, has meant that the fastest growing modes are online and distance learning (Simpson, 2012; Zawacki-Richter & Anderson, 2014). This trend of expanding participation is explored next in the Australian health professional education context.

2.4.1 Diverse student cohorts

As outlined in Chapter 1, Section 1.1, policy initiatives in Australia and deregulation of entry into the higher education sector have generated new pathways for students to study at university (Bradley et al., 2008; DEEWR, 2009). These reforms were aimed at substantially increasing the number of Australians completing a university degree by improving equity and access, and allowing universities to diversify their portfolios to grow student numbers according to demand (Radloff & Coates, 2013). More specifically, the Australian Government placed direct targets for under-represented groups. For example, the federal government noted that universities would increase participation from
students with a low socioeconomic status (LSES) from 15% to 20% of the higher education population by 2020 (King & James, 2013). This trend brought to light gaps in the current support models for students who may not have the required prior social and academic capital (due to limited family exposure to higher education), and may not easily adapt to the university culture (Devlin, 2013).

As a consequence, widening participation and availability of technology to provide alternative study modes has changed the mix of students enrolled in university courses. In 2013, more than a quarter of students studying higher education courses completed either all or part of their courses by distance (18% in fully online distance mode with a further 9% blending on-campus and off-campus study) (Norton, 2014). Many of these students were also managing a complex balance of priorities between work, home and study. The competing demands for contemporary students are well evidenced in an Australian longitudinal study from 1994 to 2009 (James et al., 2010). Essentially, the authors confirmed the trend for increased enrolments in online modes of delivery from rural students and those with low socio-economic backgrounds. It also found that students were spending less time on-campus and undertaking paid work while studying. In order to manage their learning environment, James et al. (2010) noted a dramatic rise in the use of ICT. More importantly, they noted that ICT use for informal personal engagement did not necessarily translate to effective use of ICT for formal study (a topic discussed further in Section 2.6.2).

Changes in enrolment patterns are also apparent in the postgraduate population, accounting for 22% of all university enrolments, with an estimated 30% studying online (Edwards, 2011; Norton, 2014). Commencing university students (particularly those studying by distance) must rapidly develop effective skills to study online in a context of competing priorities and time constraints. The associated pressures are particularly salient for groups of students in current employment and seeking further education opportunities. This was apparent in both contextual cases (for example, enrolled nurses who were studying a Bachelor of Nursing part time and online at CDU).
This research is situated within the context of health professional education (predominantly nursing and allied health), so the parallel impacts of technology on the health workforce and education of the health professions is outlined in the next section.

2.4.2 Educating the health professions

Worldwide analysis of the health workforce indicates that there is a shortage of healthcare workers globally in both developed and developing countries. The World Health Organisation (WHO) has identified the need to transform health education to “increase the quantity, quality and relevance of health professionals” (2013, p. 11), and to overcome the imbalance between access to health professionals in urban and rural or remote areas (WHO, 2010). Strategies suggested by the WHO include improved educational pathways to enable workers to advance their skills, and increased opportunities to access distance or online education courses (WHO, 2010, 2013). WHO’s policy recommendations were also a response to changes in the health of populations and the impact of technology on lifestyle. Life expectancy has doubled in the 20th century, leading to an aging population with a greater prevalence of chronic conditions, such that individuals carry a level of disability burden in their later years requiring support from a range of health professionals (Duckett, 2005; Frenk et al., 2010). This, coupled with the explosion of biomedical scientific knowledge, has provided a greater choice of treatment options delivered by healthcare providers who need to constantly update their knowledge and skills (Duckett, 2005). In addition, the advent of the internet has empowered the consumers of healthcare systems to actively seek out healthcare information, including alternative treatment options. This means consumers have wider access to knowledge, healthcare information and community support, placing greater expectations on the type and quality of care they expect from health professionals contributing to their well-being (Duckett, 2005; Rogers & Forman, 2013).

These global trends in growth of the health workforce, and therefore in health professions’ education, are also evident in Australia. The first long-term national
projections of the Australian health workforce indicated that there would be a significant shortage of nurses (109,000) by 2025 (HWA, 2012). Using training pipeline analysis methods, Health Workforce Australia (HWA) studied the gap between graduate numbers and workforce needs and concluded that the education sector should “identify strategies to reduce the education attrition rate” and “pursue innovations in methods of training” (HWA, 2012 p. 142). One example was to create educational pathways through online learning options for nurses to upgrade their qualifications. While workforce data for allied health professions is more difficult to evaluate, similar trends were noted in an earlier report examining the health sector capacity for clinical education (Health Education and Training, 2008). Therefore, with widening participation and health sector demand, it is not surprising that the education of health professionals in Australia has seen the highest growth in enrolments at university in the decade from 2005 to 2014, with a 92% increase in all student enrolments (from 99,267 in 2005 to 190,696 in 2014), and a 110% increase in commencing students over the same period from 30,340 to 63,575 (DET, 2007, 2014).

These drivers influenced the delivery of health professional education at both universities in this study. In Contextual Case 1 at the University of Sydney, a variety of postgraduate courses were offered by distance and online study mode for health professionals to extend their skills. Contextual Case 2 at Charles Darwin University (CDU) encompassed a regional university with a limited pool of local students. Consequently CDU made a strategic decision to extend its course offerings across all jurisdictions to attract a wider student base through online and distance study options, particularly in the undergraduate nursing degree course. This created opportunities for students to study and become registered nurses regardless of a student’s location.

The characteristics of student cohorts enrolling in health science courses at both undergraduate and postgraduate levels have changed. Many are now from a mature-age group, studying part time while employed and managing family responsibilities (Creedy et al., 2007; Griffiths & Nicolls, 2010; Hegney et al., 2007; Walker, 2009). One large Australian study researching nurses’ use of ICT in the workplace found that of those
undertaking studies to become registered nurses, 75% were aged over 35 years (Hegney et al., 2007). The increase in mature-age students entering nursing courses was confirmed in another Australian study comparing academic performance and attrition, with results showing that engaging in paid employment over 16 hours per week, not age, had a negative effect on achievement (Pitt, Powis, Levett-Jones & Hunter, 2012).

There are several implications that flow from both the expansion of higher education to embrace online and distance courses, and the need to train more health professionals to meet workforce demands. Greater participation rates in higher education, coupled with a diversity in the student population and a static higher education funding base, adds pressure to provide adequate educational opportunities for these students. Krause and McEwan (2009a) sum up these relationships, drawing links between these trends and the need to ensure that students are able to manage their transition to university study in a technology rich environment:

Higher education institutions face a significant challenge as they witness the conflation of several key trends and policy initiatives. These include the widening participation agenda which aims to increase numbers of non-traditional and first-in-family students in a universal higher education system; the global financial crisis which arguably will lead to an increase in the numbers of under-prepared students in the first year; an emphasis on performance-based funding which typically includes indicators such as student retention and progression; and the imperative to equip students with digital literacy skills by integrating emerging and existing technologies into the curriculum. (p. 261)

This statement highlights other important issues in the higher education sector that also influenced the conceptualisation of this research; namely engaging and retaining students and supporting them to manage in a learning environment reliant on technology. The next two sections examine the literature related to student retention and engagement with their university study, leading to a closer examination of how students use technology for their learning.
2.5 Student retention and engagement at university

Distance education has traditionally suffered from student drop-out and low completion rates (Carr, 2000; Kovanovic et al., 2015), which is a persistent problem in Australian higher education (Edwards & McMillan, 2015). Greater flexibility in how students can study university courses has brought to the surface the complex array of factors affecting retention and persistence. One factor, student engagement with study (noted previously in Section 1.2 as consisting of emotional, behavioural and cognitive dimensions), is beginning to provide some insights about the relationship between retention and student perceptions about their university experience. Retention and student engagement is explored in the next two sections focusing on key themes relevant to online distance learners.

2.5.1 Student retention and online distance education

While it is well known that retention and completion by distance students lags behind campus-based students (Levy, 2007; Rovai, 2003; Simpson, 2012, 2013), a number of studies have identified the complex array of factors that contribute to students’ persistence with study (Calvin & Freeburg, 2010; Cameron, Roxburgh, Taylor & Lauder, 2011; Crosling & Heagney, 2009; Hart, 2012; Hershkovitz & Nachmias, 2011; Rovai & Downey, 2010; Stoessel, Ihme, Barbarino, Fisseler & Stürmer, 2015). Factors associated with dropping out are varied and complex, including demographics, such as age, ethnicity, gender; and student characteristics, including academic preparation, computer and information literacy, and time management. Other internal factors, such as individual student preferences resulting in poor course fit and lack of commitment; unsatisfactory academic experience and lack of social integration; and external factors, such as employment, financial issues and changed personal circumstances have also been suggested (Crosling & Heagney, 2009; Hershkovitz & Nachmias, 2011). Research undertaken in the US has noted that non-traditional students (particularly mature-age who are returning to study), who are also more attracted to online learning, tend to have a
higher attrition rate of up to 50%, with many of these (27%) dropping out in their first year of study (Rovai & Downey, 2010). Strategies to better support students may have an impact on this high attrition rate although, as already noted, retention is a multifaceted issue and may not be a helpful indicator to assess the effectiveness of online learning (Kovanovic et al., 2015; Means, Toyama & Murphy, 2013).

Worldwide research examining retention in the health sciences has predominantly studied retention in the nursing discipline (Andrew et al., 2008; Gazza & Hunker, 2014; Hamshire, Willgoss & Wibberley, 2013). In Australia, an attrition rate of 24.5% has been cited, however these statistics are difficult to obtain as universities do not necessarily collect comparable datasets (Gaynor et al., 2007). Eley et al. (2010) noted that the key reasons for withdrawing from nursing courses differed between younger and older students, with family issues contributing to the former group, and disillusionment with nursing, or health reasons contributing to the latter group. A critique of literature related to student retention in nursing and midwifery in the UK by Cameron et al. (2011) recognised the link between widening access, non-traditional entry, and increasing attrition rates in pre-registration courses. Important factors leading to persistence with study were support and personal commitment, however the term support was not clearly articulated and there was no discussion about retention for students studying online.

The role that technology can play in supporting student persistence with their study remains unclear. A US-based study by Calvin and Freeburg (2010) surveyed over 500 adult distance learners (average age 36) and found that access to computers was not problematic, but managing time and understanding how to use technology for learning (for example, how to complete assignments) influenced student persistence and performance. Although computer competence was not flagged as a primary reason for ceasing study, the authors postulated that increased technical competence enhanced the students’ self-regulatory behaviours and contributed to more effective learning. There is also evidence from another large web-based survey of US participants (n=1056) (Muilenburg & Berge, 2005) that students’ ability and confidence with online learning
technology contributed to their enjoyment with online learning. It was noted that once students had completed one online unit their perceived barriers significantly reduced. Identical themes continue almost a decade later (Cochran, Campbell, Baker & Leeds, 2014; Gazza & Hunker, 2014).

While support for students features as a common theme in the literature related to retention and persistence (Conceicao & Lehan, 2013; Crosling & Heagney, 2009; Dolan, Donohue, Holstrom, Pernell & Sachdev, 2009; Hart, 2012; Krause & McEwen, 2009a), there is limited attention given to the nature of ICT support that may enable students to continue with their study. More than a decade ago, Kirkwood (2006) collated student surveys and course evaluation data from the UK Open University, a key provider of distance education for cohorts between the ages of 25 to 45 years. His conclusion was that: “Learners need to be oriented appropriately, to know not only what they are supposed to do, but also why they are expected to do it and what it will contribute to their learning” (Kirkwood, 2006, p. 128). This observation flagged the possible relationship between study persistence and students’ self-regulatory skills, an emerging theme in the retention and study persistence literature (Cho & Shen, 2013; Sun & Rueda, 2012), and confirms the need to provide scaffolds for self-regulated learning strategies (Greene et al., 2011). This relationship contributed to the development of the DPs (see Chapter 4, Section 4.1.2.1) and was highlighted as a factor under consideration in the earlier discussion of learning theories (Section 2.2.4).

Conclusions made from these and other international studies all highlight a critical need to provide support to students in their first year of study to improve retention, especially for those studying at a distance (Boyle, Jinhee, Ross & Simpson, 2010; Gazza & Hunker, 2014; Hart, 2012; Rovai & Downey, 2010). Elements that were consistently identified with successful completion and persistence related to: how well the student engages with learning at university; how technology was used to assist their study; and, the role that support plays in promoting persistence to continue studying (Bean & Eaton, 2001; Pitt et al., 2012; Tinto, 2012). Each of these aspects is discussed in the following
2.5.2 Student engagement with university

While retention statistics provide information about students completing their study at university, it does not provide adequate information about the broader university learning experience. Consequently studies exploring student engagement, defined initially as the “time and effort students devote to educational purposeful activities” (Radloff & Coates, 2010, p. 1), have proliferated in recent years (Trowler & Trowler, 2010; Zepke & Leach, 2010). While this approach to the study of student engagement favours behaviourist methodologies using quantitative data obtained through opinion surveys, it does provide insights into how we can support students as they enter the university and manage their learning journey (Colley & Lefever, 2012).

The University Experience Survey (UES), and its forerunner, the Australian Survey of Student Engagement (AUSSE), attempt to capture elements of this construct and reveal information that draws links between student retention and student engagement. Results from the AUSSE, conducted at 25 to 55 Australian higher education providers from 2007 to 2010, asked a question related to students’ intentions to persist with study or if they considered leaving (Coates & Ransom, 2011). Although this did not provide exact dropout rates, it did provide some insights about student retention from the large samples of data collected. Key findings describing the experiences of students studying either by distance or in the health professions are summarised as follows:

- Departure intentions in the health field of education showed that 31% of respondents in first year and 36% in later years (predominantly third year) had considered leaving, and in the nursing field of education 29% and 49% respectively (Coates & Ransom, 2011);

- Over all the fields of education, part-time and external students had higher departure intentions than full-time campus-based students; for first year students, 30% had departure intentions if studying part time and externally, and 26% for
full-time campus-based students; with later years increasing to 38% and 33% respectively (Coates & Ransom, 2011).

This data confirms the proposition that distance students in their first year of study are more likely to consider leaving university than their campus-based peers. Furthermore, approximately one third of students studying health courses had considered leaving in their first year, a level that remained in later years of study. Coates and Ransom (2011, p. 11) confirmed that support is a “prime lever for engagement” and plays a key role in overcoming early departure. If universities improved their transition pathways and provided long-term support to assist students to manage their lifestyle changes when commencing study, including help with adjustment to academic study, student engagement may improve. Coates and Ransom (2011) also called for:

Greater flexibility and innovation [suggesting that] we need to consider alternative methods to deliver it [support] so that students located at remote campuses, part time students studying in evening courses, or students with tight timetables can access relevant and timely support. (p. 16)

The importance of ensuring engagement of students early in their course has also been identified as critical to student success in university courses (Hosein, Ramanau & Jones, 2010) and essential for mature-age distance students (Kahu et al., 2014).

Other research has also noted wide variation in styles of student engagement at university for campus-based students (Coates, 2007), students studying by blended learning (Holley & Oliver, 2010) and distance education modes (Sun & Rueda, 2012). While suggesting that at-risk students with low levels of engagement or little prior experience with online study require support, this research does not provide guidance about specific strategies to better engage these groups of students.

The majority of engagement research has focused on undergraduate students, but, as described in Sections 2.4.1 and 2.4.2, postgraduate coursework study is also an important element for universities, particularly in the health sector. Information gained from a similar student engagement survey, known as the Postgraduate Survey of Student Engagement (POSSE), and gathered from fifteen Australian and New Zealand institutions
in 2010 with a response rate of 21% (Edwards, 2011), showed that students studying all their classes online have lower levels of engagement across all the scales measured (e.g., active learning, supportive learning environment, and student-staff interactions). In the field of health education (nursing and allied health, combined), the active learning scale was low, indicating that these students were not as engaged in learning at the university, or with their fellow students, as students from other disciplines. One could surmise that this may be due to the online learning strategies used in their courses, although this level of information is not evident.

More recently, student engagement has delved further into the broader university experience and is now considered a complex holistic construct encompassing student behaviours and actions, that is also influenced by how they think and feel about their learning experiences, as well as a more encompassing socio-cultural entity extending to include societal and community influences (Coates & Ransom, 2011; Kahu, 2013; Solomonides, Reid & Petocz, 2012; Zepke, 2015). Given the complexity of this concept, scholars such as Coates (2007) and Kahu (2013, p. 769) have suggested that more fine grained approaches “that focus on narrower populations, including single institutions” is needed including further analysis of the role of online technologies in enabling student engagement. For example, Kahu et al. (2015) used video diaries from mature-age distance students and highlighted the fluctuating and diverse emotional reactions of mature-age distance students when beginning study. They suggested a need for universities to offer more preparation and guidance to smooth the transition process for these students.

As noted in Chapter 1, Section 1.2, student engagement in this research is considered an ongoing process, beginning before enrolment and continuing throughout the student’s journey; influenced by the student’s background, their personal perspectives, and conditions generated by the university to enable transition and development (Coates & Ransom, 2011; Nelson, Smith & Clarke, 2012). This study brings a fresh approach to evaluating direct evidence of student engagement with orientation supports, by tracking their access and learning about the students’ experience of transitioning to university.
How university students use technology for learning is an element contributing to both retention and student engagement literature and is discussed in the next section.

2.6 Students and technology

A key concern associated with technology in higher education is appreciating how students use it for learning. This section begins with an overview of the role of digital competence in a global world; then the focus shifts to an exploration of ICT skills in the health professions, predominantly with nursing students. This leads to a further exploration about how university students are using technology for their study.

2.6.1 Digital competence

Digital competence in the wider education context (including both secondary and tertiary education) has been considered by the European Union Digital Competence project (Janssen & Stoyanov, 2012). Expert opinions were sought to identify the key components and descriptors of digital competence and defined it as “the confident, critical and creative use of ICT to achieve goals related to work, employability, learning, leisure, inclusion and/or participation in society” (Janssen & Stoyanov, 2012 p. 1). It is identified as one of the key competencies for lifelong learning (Beetham, McGill & Littlejohn, 2009), and is considered to be a vital component enabling us to acquire other key competencies such as language (Ferrari, 2013). This is relevant to this research as the key competency, “learning about and with digital technology”, is noted as one of the 12 building blocks of digital competence and encompasses the ability to use an LMS (Janssen & Stoyanov, 2012, p. 3).

During the early 21st century, a popular belief espoused by Prensky (2001, p. 3) emerged in the educational literature, suggesting that the new generation of students born after 1980, known as “digital natives”, required a different type of education to that provided in universities by staff who were predominantly born prior to 1980 and known as “digital immigrants”. It was argued that digital natives (also known as the Net
Generation) had grown up with technology and had different learning preferences that were not well matched to current higher education teaching practices. Studies in Australia and the UK have shown that this is not necessarily the case, and this simplistic dichotomy does not describe the students of today (Kennedy et al., 2009; Margaryan, Littlejohn & Vojt, 2011). Evidence in both undergraduate and postgraduate studies shows that there is wide variation within each generation, and that, even though technology is part of everyday life, students do not necessarily understand how technology can support their learning at university (Bennett et al., 2008; Bullen et al., 2011; Jelfs & Richardson, 2012; Masterman & Shuyska, 2012). Consequently there is a broad consensus that educators and researchers should reject the stereotypes of the digital native and Net Generation student and instead focus on enhancing attitudes related to the use of technology for study.

2.6.1.1 ICT in the health sciences

Research in Australia examining digital competence in the health professions has mainly focused on studying the nursing profession (Button, Harrington & Belan, 2014; Eley, Fallon, Soar, Buikstra & Hegney, 2008a; Hegney et al., 2007). A large Australian study of nurses undertaken by the Australian Nursing Federation in 2005 found that there were significant gaps in understanding how to use ICT for information searching and information management (Hegney et al., 2007). However, those who had completed university study were more familiar and confident in how to use technology to support patient care (Eley et al., 2008a; Eley, Fallon, Soar, Buikstra & Hegney, 2008b; Hegney et al., 2007). Despite this finding, a more recent review synthesizing associations between nursing students and e-learning still found strong evidence of anxiety towards ICT and poor information literacy skills, which suggests that support to develop lifelong information literacy is still an urgent need in nursing curricula (Button et al., 2014).

Regardless of the levels of digital competence upon entry at university, it is clear that students entering university present a diverse array of characteristics. In order to develop support strategies designed to enable students to succeed with study in online distance
learning environments, it is important to understand how students use technology for their study.

2.6.2 How students use technology to study

In the decade from 2003 to 2012, a series of major research projects exploring learners’ experiences of using ICT at university were undertaken in the UK, Australia and Canada. In the UK, the Joint Information Systems Committee (JISC) commissioned work known as the JISC Learner Experiences of e-Learning programme (Creanor, Trinder, Gowan & Howells, 2006), and in Australia, work was conducted across three universities exploring over 2000 first year university students’ ICT use (Kennedy et al., 2008). The findings from this large body of work determined that even though students were quite technologically savvy there was a lack of homogeneity in the group studied, especially when going beyond the entrenched technologies of mobile phones and email (Conole, de Laat, Dillon & Darby, 2008; Creanor et al., 2006; JISC, 2007, 2008; Kennedy et al., 2008; Sharpe et al., 2009). Even though ICT was considered part of a student’s daily life, they had a limited understanding about how it could be used for learning at university. In the case of the JISC investigation follow-up interviews with students after they commenced university study revealed that 50% of participants felt that their skills were stretched (JISC, 2008). Recommendations included the suggestion to provide a needs-based induction with periodic reorientation of students about the various ways that technologies shape their learning and university experiences (Kennedy et al., 2009). A similar conclusion was also reached in a Canadian study that interviewed and surveyed students from a broad spectrum of disciplines including health sciences, reinforcing the important role that context plays in supporting student use of ICT (Bullen et al., 2011).

Internationally, this body of work had been limited to predominantly studying students under the age of 25 years. For example, the Australian research concentrated on a younger age group with only 6.5% of students studied over 35 years of age, 4% part-time and 10% distance-based students (Kennedy et al., 2009). Exceptions are a UK
project examining the learner experiences of technology in practice-based courses, where
the mean age was 38 years (Sharpe et al., 2009), and a study conducted at a regional
Australian university canvassing a broader age group (Newton & Ellis, 2012). Both
studies found no difference in use and perceptions of ICT with age, reinforcing that there
is considerable diversity in the types of technology that students use while studying. A
suggestion was made by Newton and Ellis that “strategies are required to assist incoming
university students in their transition to access and use technologies to engage in learning
opportunities” (2012, p. 277). Finally, a systematic review examining the experiences of
online learning by working students in the UK, concluded that the student experience is
enhanced by: provision of induction programs (both online and face-to-face); opportunities for students to interact with each other; and flexible delivery that makes full
use of asynchronous opportunities in online and off-line modes (Carroll, Booth,
Papaioannou, Sutton & Wong, 2009a).

The research evidence outlined in this section has identified the need to know who
the students are and how they are engaging in their courses. Consequently a one-size-fits-
all approach will not meet the technology needs of students starting university,
confirming the suggestion a decade earlier by Kirkwood and Price (2005, p. 260) that
"students need to understand not only how to work with ICTs, but why it can be of benefit
to do so.” Therefore one can surmise that support strategies should not only address the
technical dimension of learning with ICT but also how to develop students’ self-
regulatory behaviours as they learn with ICT (Calvin & Freeburg, 2010; Cho & Shen,
2013; Greene et al., 2011).

The next two sections provide a review and critique of literature that examines the
topic of student support when commencing university study and appraises more specific
examples describing how orientation has been delivered to students studying by online
and distance modes.
2.7 Supporting student transition to online distance learning

Earlier discussion has suggested that the characteristics of online distance learners may range from those who are highly experienced in the online environment (or believe they are), to students substantially lacking in experience and/or confidence. Some students, particularly with LSES backgrounds, also enter university without the necessary socio-cultural capacity to succeed in the tertiary education environment (Devlin, 2013). All are potentially at risk of stumbling in their substantive studies. Furthermore, universities around the globe, have been calling for better preparation of students studying in the health professions in relation to the use of ICT for learning (Button et al., 2014; Cameron et al., 2011; Creedy et al., 2007; Deepwell & Malik, 2011; Eley et al., 2010; Eley et al., 2008a, 2008b; Gazza & Hunker, 2014; Mancuso-Murphy, 2007; Ternus & Shuster, 2008).

In order to develop support strategies and enable students to succeed with study in this flexible learning environment, it is important to understand the transition process as students move into their academic study life. Seale (2008), who reflected back over a decade of research published in the journal Research in Learning Technology, suggests that the focus should be on considerations of context and understanding relationships between learning and technology. She highlights that “for students the context is key transitional periods, such as the transition between school and university” (Seale, 2008, p. 2). Transition has therefore been defined as “a significant change in a student’s life, self-concept and learning: a shift from one state of understanding, development and maturity to another” (Hussey & Smith, 2010, p. 156). In this research, I have extended the notion of transition to include transitioning from work, or from family life, to university study. Regardless of where students are transitioning from, there has been considerable interest, particularly in countries represented at the First Year in Higher Education conferences and publications (http://fyhe.com.au/), to understand the first year experience at university, which is explored in the next section.
2.7.1 First year experience and transition pedagogy

Widening participation in higher education, coupled with greater options about how to study at university (on-campus, blended or online), has provided a stimulus for investigating the challenges associated with the first year experience (FYE). For more than a decade, Kift (2004, 2008, 2015) has studied the FYE in Australia and advocates an institution-wide, integrated, co-ordinated and intentional approach to learning and teaching and other support systems for students. Kift’s work is derived from Tinto’s theorising around conditions which drive student persistence and success (Tinto, 2006-2007, 2012). These include recognising the role of learning communities, an important construct for online distance learners, because when provided with opportunities to develop social presence, a feeling of belonging to a supportive online community may emerge (Gazza & Hunker, 2014; Joo, Lim & Kim, 2011; Kim, Kwon & Cho, 2011).

Kift created the term transition pedagogy where an “intentionally designed first year curriculum is harnessed to mediate the learning experiences of diverse commencing cohorts” and provides “optimal capacity to deliver an integrated and holistic FYE” (2010 p. 2). Since 2002, Kift has identified and implemented FYE strategies to guide policy and practices at one Australian university, which included: developing a curriculum that engaged students in learning; provision of proactive and timely access to learning and life support; intentional fostering of a sense of belonging; and creation of sustainable academic and professional partnerships between organisational units across the university. Her work provides insight into the key issues for students transitioning to university and reinforces the importance of each institution’s context when developing local solutions. A limitation of the transition pedagogy work to date, is that it has not been applied to the situation where students are commencing study fully online and distant from the university setting, a gap identified by Kift (2015) in her more recent writing.

The concept of transition has also been the subject of further analysis both in the UK and Australia. The UK research has primarily focused on transitions between school and
university (Briggs et al., 2012; Christie, Tett, Cree, Hounsell & McCune, 2008). For example, this UK work identified that students needed to develop their identity as they moved from schooling to their next phase as autonomous learners in the higher education sector, and that a variety of strategies was needed to achieve this change. However a limitation of this work is its focus on younger students. The Australian Teaching and Learning Council’s (ALTC) Good Practice Report *Student Transition into Higher Education* (Gale & Parker, 2011) synthesised a wide range of ALTC projects that contributed to understanding student transition to higher education. Gale and Parker (2014) present a typology of student transition at three levels: “transition as induction” which encompasses familiarisation towards campus life and university policies and norms; “transition as development” focussing on development of identity tailored to meet the needs of the individual; and, “transition as becoming” an extended whole-of-life construct, conceived in response to increasing diversity and multiple pathways into, out of and back into university. They recommend further research to “foreground the student’s lived reality” and “broaden the scope of investigation” beyond first year undergraduate students (p. 734).

Despite this body of work associated with transition, it appears that “there is relatively little research to date on the ways that technology can be used to help smooth this transition and facilitate the construction of an appropriate learning identity” (Sharpe, Beetham & de Freitas, 2010, p. 116). A neglected area in transition research was identified by Tobbell and O’Donnell (2013), who highlighted that students entering postgraduate study still doubt their ability to manage study life. I contend that the concept of transition should be conceived as an extended dynamic construct that is not only applied to entry or starting university study, but also to transforming one’s self to being an online distance learner, and shifting to a new or expanded health professional role. One developmental approach, that describes a model depicting the stages of learner development and transitioning in relation to using technology, is explored in the next section.
2.7.2 Stages of learner development

A review and critique of the UK-based JISC program of research examining student experiences of e-learning, and outlined in Section 2.6.2, provided a wealth of knowledge about student use of technology. One framework developed from this earlier research has relevance to this doctoral study. Sharpe et al. (2010) developed a conceptual model to explain the diversity of students’ readiness to learn online, and mapped the stages of development that they considered would lead to effective use of technology for study. For example, students first gain access to technologies (functional access); gain skills in using the technology (skills); make informed choices about when and how to use the technology in response to contextual factors (personal practices); and then use these skills and practices to create their own learning environments (termed creative appropriation). This framework is informed by Vygotsky’s concept of the zone of proximal development, where students may be at different stages of readiness for learning, and if provided with the right amount of support, the student’s capabilities can be stretched (Hall, 2007; Vygotsky, 1978, p. 86). Sharpe et al. (2010) proposed that their model is not prescriptive and that students could be at different stages simultaneously depending on the type of technology they were using. They suggested using the framework as a planning and self-assessment tool for all levels (students, teachers and universities), arguing that understanding student differences enables universities to provide better support for learners.

Further work by Sharpe and Benfield (2012) reviewed the policies and practices of nine UK tertiary education institutions that had indicated a commitment to supporting students to develop skills for learning in the digital age. They noted that there were few examples where students were provided with an opportunity to develop their personal practices as those identified in the stages of development, and that very few reached the creative appropriation level. This work reinforced the need for “student training in the use of the VLE (virtual learning environment)” (p. 13). They repeatedly heard the message that: “institutions wanting to better support students to use digital technologies are feeling
their way in new terrain” (p. 15), recommending the need to “prepare students for their experience of learning with technology” (p. 2). They also noted that “induction is an important stage and students need flexible access to induction resources and activities” (p. 16).

While the research described above highlights developmental stages, extended transitions, and diversity of student needs, the main focus has been on the campus-based student. It has not considered the wider constructs of transitioning oneself into the technologically mediated space inhabited by online distance learners. This gap was confirmed by an international research review of online distance learners suggesting the need for more research directed at student support (Zawacki-Richter & Anderson, 2014). The next subsection turns to a closer examination of induction and orientation programs in the higher education sector in order to identify key concepts that influenced the design of the orientation resources for the contextual cases studied in this research.

2.7.3 Orientation as a support strategy

Throughout this chapter, the concept of supporting students who are transitioning to online distance learning has been explored and critiqued. This section develops the theme of support to derive characteristics that informed the development of orientation resources for the online distance learners studied in this research. The focus of the literature review and critique was to examine supports for online distance learners and ascertain:

- What guidelines are currently available regarding support for online distance learners?
- What content areas should be included?
- When should support be provided?
- How should support be delivered? Should it be mandatory?
- What has been the student experience of receiving such supports?

By focusing on each of these questions, evidence-based propositions were synthesised and these contributed to the analysis undertaken in the first phase of EDR
This information, when integrated with the contextual background at each university and the elements extracted from learning theories and the pedagogical models described in Sections 2.2 and 2.3, informed the development of the draft DPs (Chapter 4, Section 4.1.2).

2.7.3.1 Guidelines for providing support

Orientation at Australian universities generally encompasses an O week (the week prior to semester starting), which largely caters for the campus-based students who are welcomed to the university environment and provided with information about campus and study life in a short compressed period of time. This experience is not easily available or relevant for online and distance learners, many of whom study part time and may never attend a physical campus location. Consequently the majority of orientation information found on university websites is usually presented as static webpages. There is usually a focus on computer requirements, how to log into university systems such as the LMS, a set of frequently asked questions (FAQs), and browser and plug-in computer requirements to guide students in their hardware set up for online learning (Ko & Rossen, 2010). While there has been some discourse about self-assessment tools for students to assess their readiness for online learning, conclusions indicated that this alone is not adequate for satisfaction and success with online learning (Erlich, Erlich-Philip & Gal-Ezer, 2005; Shih, Muñoz & Sánchez, 2006).

By contrast, distance education providers have a long history of meeting the needs of students and supporting them during their study (Rumble, 2000; White, 2005). Institutions devoted entirely to distance learning, such as the Open University in the UK, Athabasca University in Canada, and Massey University in New Zealand, offer a range of supports, from the provision of teaching materials, to tutor support and personal advice during recruitment, enrolment and the first year of study (Brindley, 2014; Rumble, 2000; White, 2005). Rumble (2000) postulated that the move into the consumer age, should lead universities to consider advice from the service industry which focuses on knowing the customer. He proposed that research into student support was ripe for new innovative
One strategy undertaken by the IMS Global Learning Consortium was to develop a best practice framework for student orientation to online learning (IMS Global Learning Consortium, 2010; Krause & McEwen, 2009b). From this emerged the Student Induction to E-Learning (SIEL) report, providing a self-assessment checklist for universities. These guidelines offer benchmarks for whole of institutional planning for induction, covering the period from recruitment to design and delivery of an orientation program. While providing a starting point for planning they do not, however, outline how these benchmarks are best implemented in practice.

2.7.3.2 Content for orientation programs

While guidelines such as those from the IMS Global Learning Consortium, and web-based information sources can provide some general guidelines, there is evidence from the UK and US that expectations about what should occur in orientation programs may differ between those delivering the programs and the recipient (Bozarth et al., 2004; Forrester & Parkinson, 2006). Bozarth et al. (2004) found that students wanted help with study skills, such as time management, whereas instructors highlighted that students needed technical skills, although both groups recognised the need to enhance online communication skills. Other researchers in Australia, New Zealand and the US have highlighted an expanded range of content for orientation indicating that students require a range of capabilities prior to engagement with online learning materials beyond technical skills and self-confidence with computers (Brace-Govan, Luxton & Wagstaff, 2001; Cho, 2012; Dray, Lowenthal, Miszkiewicz, Ruiz-Primo & Marczynski, 2011; Harmon, 2012; Kahu et al., 2014). These include: self-management skills; how to become an online learner; comfort with online communication, including the development of student identity in the online space; and assistance with information literacy and academic writing.

The most rigorous analysis of the support required for students engaged in networked learning was undertaken by Levy (2006) in the UK. She used an action research approach...
to unpack the key elements of learning to learn in a networked environment and presented a framework for support that “reflects the assumption that initial induction, while important, will not be sufficient to support the developmental process, for newcomers to networked learning” (p. 238). Four successful engagement processes were identified: an orientation to the features of the learning space; an ability to communicate either asynchronously or synchronously; the need for opportunities to develop social networks with other participants; and self-management skills to cope with information overload and time constraints. She also acknowledged considerable variation in learner readiness to participate in networked learning environments, indicating that addressing this was best supported by providing a non-linear, looser structure to orientation activities.

It was apparent that the design of an orientation resource may require flexible parameters. This stems from the increasing diversity of students entering higher education (Section 2.4.1), and recognition that students may move through developmental stages as they become online distance learners (Section 2.7.2). Orientation resources should therefore accommodate a diverse set of needs and enable students to access elements at any point in time during their transition to online distance learning. This has also been confirmed by Simpson (2012), who worked with the UK Open University, and suggests that online distance learners require both academic or non-academic supports which traverse three skill dimensions: cognitive (general learning, literacy); organisational (time management, prioritising); and emotional (motivation, stress management, help seeking).

2.7.3.3 Delivery of orientation programs

Despite considerable suggestions about what type of support is needed, it is also important to determine when and how online distance learners can be supported in their transition to university study. The traditional O week has been criticised for its overload of information (Dunbar-Morris, 2010; Smyth & Lodge, 2012), with Tyler-Smith suggesting that cognitive load theory explains why this approach may not be appropriate for adult online distance learners (2006). Australian researchers also highlight the current focus on campus-centric orientation, noting that universities need to "explicitly unpack
the notion of orientation as a process rather than an event” (Smith, 2011, p. 5), and calling for a “longer and thinner” induction period (Crosling & Heagney, 2009, p. 12). While the importance of orientation early in the transition period to university is not questioned, several authors propose implementing a pre-semester activity and continuation of just-in-time support for the whole first year of study (Comrie, 2007; IMS Global Learning Consortium, 2010; Levy, 2006; Motteram & Forrester, 2005; Nelson, Quinn, Marrington & Clarke, 2012; Price, Richardson & Jelfs, 2007). Although suggestions include the use of online resources, these are often merely descriptive accounts of what is recommended. How supports can be implemented to meet the needs of the online distance learner is largely omitted from the discussion. The limited evidence available is described in the following paragraphs to highlight further suggestions that informed this research.

There is evidence that support for online distance learners should actively engage them in the orientation process by providing online activities in a safe environment (Bozarth et al., 2004; Brindley, 2014; Cho, 2012; Salmon, 1998; Scagnoli, 2001). This would provide students with an opportunity to make mistakes while receiving support. This is particularly the case when using online communication tools, since online study frequently requires students to work collaboratively. Structuring activities with meaningful peer interaction may require students to be instructed in how to engage actively with their online learning community (Anderson, Annand & Wark, 2005; Geer, 2003; Meyer, 2004; Price et al., 2007; Salmon, 2000). Salmon’s five stage model of online learning (2000), outlined in Section 2.3.3, is one framework. In addition, a report by Dolan et al. (2009), describing experiences of non-traditional mature-age adults returning to study, found high levels of anxiety when submitting assignments. These researchers, from the UK, US and New Zealand, advocate designing activities that include opportunities to practise submitting mock assignments, in the form of a scavenger hunt, to build confidence before the course commences. This should possibly be expanded to include academic integrity principles because of the high levels of plagiarism identified in the graduate online health sciences student population (Ewing, Anast &
A further consideration that the design teams at each contextual case needed to contemplate was whether the orientation activities should be mandated. Voluntary access had been the norm, but this was also associated with low levels of engagement (Bozarth et al., 2004; Brace-Govan et al., 2001). On the other hand, there were some US-based examples (Britto & Rush, 2013; Jones, 2013; Kelso, 2009), including one in the discipline of nursing (Carruth, Broussard, Waldmeier, Gauthier & Mixon, 2010), which required students to complete the orientation program before gaining access to unit materials. Most of these reports do not provide data about the impact of their interventions; although there was some evidence (albeit impacted by low return rates for surveys) that participation in mandatory online orientation courses did lead to higher satisfaction with online learning (Kelso, 2009). One exception is an isolated report from a six week orientation course showing that attrition lowered from 35-50%, prior to implementation, to 15% when an orientation course was provided to a small group of online undergraduate students, with 90% returning to complete further study (McVay-Lynch, 2001). Given the lack of clear evidence that mandatory approaches positively impact learning outcomes, and the current need for flexible options for diverse student cohorts, it would appear that this approach is at odds with the notion of an extended transitional phase.

Synthesising the evidence suggests that supports developed to assist in the transition to university may be enhanced if they embed the following characteristics:

- An extended transition commencing prior to semester and extending up to the first year of study;
- A wide variety of student needs, from managing the online environment to developing an online identity and associated study skills; and,
- Opportunities to practise skills required by online distance learners, such as communicating and submitting assignments.
2.7.3.4 Evaluation of student participation in orientation programs

It was also necessary to review and critique evidence detailing student engagement with designed orientation interventions. Literature here is limited, although there are two notable exceptions, one in the US (Cho, 2012) and one in Ireland (O'Donnell, Sloan & Mulholland, 2006).

A comprehensive online orientation program designed for continuing education students’ studying online in the US is described by Cho (2012). The resource was provided through the LMS and centred around four modules including: the nature of online learning focusing on assignments and online communication; how to navigate the LMS; technical requirements; and learning skills presented as a self-assessment of self-efficacy and motivation. Unfortunately Cho’s report is largely a descriptive account of module development, with its evaluation impacted by poor engagement by staff and students in the evaluation process (including only a 2% response rate by students who were given access to the resource).

A different approach to evaluation was undertaken by O’Donnell et al. (2006) at the University of Ulster, where access to the resource was monitored via LMS log files. Their resource consisted of a two-stage package to introduce both distance and on-campus students to online study. The first component was a primer that provided technical information about using the LMS, information about online communication, study and time management skills, assessment and plagiarism, and other university support services such as counselling. Quizzes were available as a self-test. The second stage consisted of a survival guide, with activities so students could try using LMS tools at any time during their course. Despite all students being provided with access to the survival activities within their LMS, only 20% of students logged into the package, with even less (10% of those logging in) reviewing more than 10 pages of content. Survey respondents, although small in number, did comment that the package had equipped them with the knowledge and skills to study online.

Both these studies were impacted by low response rates from small-scale
implementations of orientation resources. While there is ample evidence calling for greater support for online distance learners over an extended orientation timeframe, there are surprisingly few examples that analyse the implementation of educational innovations which address this need. An emerging area of research that can provide new insights about student engagement with their learning environments (including support resources), is the study of learning analytics which captures data on “specific, observable behaviour in real time”, rather than relying on retrospective perceptions from students in the form of surveys (Lockyer, Heathcote & Dawson, 2013, p. 2). The role of learning analytics for understanding student learning is discussed next.

2.7.3.5 The potential of learning analytics to understand student engagement

As universities embrace technology-mediated options for widening participation in their courses, new opportunities have emerged to examine the data-laden footprints left by students as they engage in their study. Increasingly, educational web data mining is being used to discover information about student activity and patterns of access, and behaviour with online learning materials, “for the purposes of understanding and optimizing learning and the environments in which it occurs” (Dawson, 2011, p. 2). Although this has the potential to empower teachers to tailor their delivery to diverse groups of students, extracting and analysing large data sets can be problematic for time-poor academics. Much of the current research findings, such as the Course Signals Project at Purdue University in the US (Arnold & Pistilli, 2012), have been limited to specialised research groups designing analytical tools to facilitate data extraction and analysis techniques (Ferguson, 2012). The ability for lay individuals outside of these research skill sets to access data is confounded by the inflexibility of institutional IT systems which do not easily combine data sources, such as enrolment data, with tracking data from the LMS. Early learning analytics research has tended to focus on macro-level analysis to identify students at risk of failure, rather than how this data can influence the design of learning experiences (Buckingham Shum, 2012; Lockyer et al., 2013).
While learning analytics promises to make visible how students manage learning in their own context, it also has the potential to enable students to modify their learning trajectory in response to individual actions. Its role in influencing how educators understand and design the student learning process is still emerging (Ferguson, 2012). Dawson et al. (2011) highlight a gap in the literature regarding the use of results from learning analytics in the evaluation and design of teaching and learning experiences. They suggest that:

Future research and professional development should seek to merge learning design with learning analytics and data interpretation. A sound understanding of learning design principles will greatly assist academics in better interpreting the learning analytics data into informed pedagogical action. (p. 4)

Lockyer et al. (2013, p. 10) suggest that learning analytics could inform the design of learning experiences in two ways. The first, termed “checkpoint analytics”, refers to collecting information about the student access to learning materials, such as log-ins to the online learning materials, or access to files, as a way of “providing lead indicators of learning”, therefore understanding what students have completed as part of their learning process. The second is “process analytics”, which maps student pathways and learning activity, such as the relationships and connections they form during a learning task (for example, an online discussion). They argue that this use of learning analytics will not only provide greater understanding about how students learn with online technology but also inform the design of effective learning activities.

Learning analytics, and more specifically “checkpoint analytics”, provides an opportunity to gather data to examine how students engage online and may help to identify ways they use technology to assist their transition to study. I used computer data footprints that captured patterns of student access to orientation resources, including their completion of practice activities in this research. Where possible this was matched with student demographic information. This is described further in Chapter 3, where the research design and methods of data collection are outlined.

The next section draws together the arguments outlined in Sections 2.4 to 2.7 to
support the rationale for researching student transition to online distance learning at university.

2.8 Need for this research

It is clear that online distance learning is undergoing considerable growth and is a mode of learning that appears to meet the needs of an increasingly diverse student cohort (Guri-Rosenblit, 2014; Norton, 2014). Students studying in the health sciences are adopting and transitioning to this mode to improve their qualifications but, at the same time, are also needing to manage a complex array of priorities including work, study and home life (Loftus et al., 2013). These trends highlight the need for universities to effectively support this transition. Research is also indicating that higher education cannot assume today’s students already using technology for personal use, can apply the same technologies to mediate their learning (Kennedy et al., 2008). It appears that diversity in student cohorts, mirrors diversity in their ability to use this technology for learning. Researchers studying the first year experience and those studying students’ use of technology agree that more needs to be done to prepare students to learn online (Kennedy et al., 2009; Newton & Ellis, 2012).

Responses to supporting students as they make their transition to university have largely been piecemeal. Literature is limited to either identifying the need for universities to provide support to beginning online learners (Krause, McEwen & Blinco, 2009), or descriptive accounts of local initiatives restricted to one context (Bozarth et al., 2004). Research falls short of providing evidence-based conclusions that could be transferred to other contexts. Evaluations of such examples are mostly surveys of student opinions and levels of satisfaction that rarely provide ongoing analysis of how this information contributes to understanding the broader student transition space. There is very little evidence about how students actually engage with, or use support resources, or the impact of their participation on learning outcomes. Forrester et al.’s (2005) suggestion sums up these observations:
The timeliness of information, initiatives and activities however would appear to be crucial so that students do not feel overwhelmed when they begin programmes. Appropriate activities should facilitate the incremental development of skills, though their delivery warrants further investigation so that induction for distance students becomes a longer term process, meeting the needs of learners as required. (p. 302)

A long-term approach to online distance learner support is also advocated by Simpson (2012), who recognised the importance of support, from enrolment to induction and preparation, continuing as students encounter stressful events such as assignment submissions, and also assisting students to return to study after unsuccessful prior attempts. Woodley and Simpson (2014, p. 472) also warn against adopting a “retention goulash approach” that provides a range of strategies that do not necessarily target the main area of concern in a particular context.

Research discussed in the preceding sections has located the educational issue: transition of online distance learners to study at university. It also provided evidence-based suggestions about how to design and implement supports that may address this issue. These include the need to design flexible supports that comprise opportunities to practise skill development; and address a wide variety of orientation needs during an extended transition period. This provided a rich source of research evidence to inform this doctoral study. It also reinforced the need to develop DPs that would emerge from studying online distance learners’ engagement with orientation supports and inform associated transition theories.

2.9 Summary

This chapter began by charting how technology has led to an evolution in distance education. It argued the importance of applying learning theories in the design of online distance education and described three pedagogical models that informed the EDR conducted at the two universities studied in this research (refer to Chapter 4, Section 4.1.2 and Chapter 5, Section 5.2.1). The literature review then turned to a consideration of the Australian higher education context, and more specifically education in the health...
professions. It outlined the expansion of access for increasingly diverse students and the problems associated with course completion, suggesting that studying student engagement and their use of technology may provide clues about how to support the student transition process. While strategies to support first year students early in their course have been developed for campus-based students, a need to research the transition experience of students located more distant to the university was identified, including how they engage with orientation supports. This background led to formulation of the overarching research question examined in this thesis: What guiding principles underpin the design of orientation resources that support the transition of online distance learners studying health professional courses at university.

The next chapter (Chapter 3) introduces the educational design framework (EDR) that guided the iterative research process undertaken at the two university contexts, each of which is outlined in the subsequent chapters (4 and 5).
CHAPTER 3: FRAMEWORK GUIDING THE RESEARCH

This research studied the design, implementation and evaluation of orientation resources created to support health science students as they transitioned to online distance learning at two different Australian universities. The research required a methodology that could capture the evolution in the design of the orientation resources and shape a retrospective comparison of their implementation across the two contexts. For this reason educational design research (EDR) was adopted as the underlying framework guiding the study.

EDR is exploratory and open, situated in the practices and contexts of the project team (teachers, researchers, designers), and begins with a close analysis of the issue and related learning theories (Herrington, McKenney, Reeves & Oliver, 2007). Chapter 1, Section 1.5, provided an overview of the phases of EDR, and Section 1.7 mapped these to the structure of this thesis. Chapter 2 formed part of the first phase of EDR, analysis and exploration, providing a synthesis of the online distance learning literature. Chapter 3 provides an in-depth justification of why EDR is an appropriate framework for this research.

The chapter commences with an overview of educational design and how a pragmatic epistemology can guide research associated with educational design and technology. Further details about EDR (building on Chapter 1, Section 1.5) are then introduced, illustrating the value of EDR for linking research to practice and production of both practical and theoretical outcomes. This discussion provides the background to one of the contributions to knowledge from this thesis: namely augmentation of the EDR framework by integrating conjecture mapping. This enabled me to manage an extended EDR project by making explicit the thinking and decision-making processes associated with the EDR process.

Further details about the settings and participants from both contexts are described
next, with an overview of a mixed methods approach to data collection, which included collection of both quantitative and qualitative data. While research at each context occurred sequentially, the timing of the doctoral work, more recent development of the EDR approach (McKenney & Reeves, 2012; McKenney & Reeves, 2014), and conjecture mapping process (Sandoval, 2014), informed the retrospective analysis and the reporting of the research in this thesis. This provided an opportunity for comparative analysis of the lessons learnt from each university and to build a holistic picture of the transition space for students beginning online distance learning. Finally, concepts related to research rigour and quality are discussed, including the ethical considerations for the study.

3.1 Situating the research in the educational design space

Educational design is integral to understanding how technology can support quality university learning experiences because it offers a considered approach towards the creation of learning episodes that connect students, teaching staff and knowledge. Jones and Kennedy (2011, p. 19) have noted “that design has become a key term for research in learning technology”. Design refers to the process of investigating: the purpose of the learning and the needs of students; how this process influences decisions that are made about the learning encounter; what solution will meet the student’s needs; our situational requirements; and how the developed design stands up when implemented, including what needs to be changed next (Beetham & Sharpe, 2007). There are a range of terms used to describe the process of designing e-learning experiences for students. These include: educational design (O'Reilly, 2004); design for learning (Beetham & Sharpe, 2007); learning design (Agostinho, Oliver, Harper, Hedberg & Wills, 2002); and teachers-as-designers (Goodyear & Retalis, 2010). They all broadly encompass the general process of linking theory about learning and teaching to the practice of designing student learning experiences. These terms have become central to the discussion about e-learning. This is in part due to the increased transparency of online learning design and artefacts. The process of planning and development is essentially more visible in online
settings compared with face-to-face teaching where this is largely left to the discretion of an individual teacher. The difference in terms can be partly explained as semantics but it is also related to the detail and scope of the design. For example, the term learning design originated from the discipline of instructional design as a method of describing the details of all elements involved in a specific teaching and learning interaction (Agostinho et al., 2002; Lefoe, 1998). It was also a method to create strategies for sharing the learning designs across the higher education community, usually in the form of learning objects (Oliver & Herrington, 2001). The ability to encapsulate the design process and share learning designs was investigated by an Australian Government funded project which depicted a wide range of learning designs as an interaction between three main elements: tasks, resources and supports (Harper, Oliver, Hedberg, Wills & Agostinho, 2003). Learning designs have also been further developed by Goodyear (2005, p. 92), who drew on the field of architecture to describe what he terms “pattern languages” that provide a detailed account of a learning event as a method of sharing key attributes of the learning design. Regardless of the term used, the “aim of design in all its forms is to generalise across cases, streamlining the process of future design by offering general principles of application” (Beetham & Sharpe, 2007, p. 7).

The term adopted for this research project is educational design. It is broadly defined as “the set of practices involved in constructing representations of how people should be helped to learn in various circumstances” (Goodyear & Retalis, 2010, p. 10). Educational design can be considered at the macro-level, the meso-level or the micro-level (Jones, 2007). The macro-level refers to the broader university level, whereby the design decisions about particular technology and infrastructure are somewhat divorced from direct influence by the individual teacher. This may include decisions such as which LMS the university will adopt. It may also refer to discipline-based whole-of-curriculum design decisions such as embedding problem-based learning across a whole course (Conole, 2012). At the other end of the spectrum, the micro-educational design level relates to the detailed design of individual learning episodes which may include the explicit details of
how the learning task should run, by whom and when, usually over the space of hours or
days, and is more closely aligned to the term learning design. My early work preparing
students to interact in online discussions in the discipline of orthoptics would be
considered educational design at the micro-level (Wozniak, 2007). Meso-educational
design refers to the “level of interaction that is intermediate between small-scale, local
interaction and large-scale policy and institutional processes” (Conole & Jones, 2010, p.
279). It may be considered the more difficult space and may highlight misalignment
between the other levels (Ellis & Goodyear, 2010).

The meso-level is an important area of research as it helps to illuminate what can be
hidden from analysis in more locally based micro-levels by directing attention to the
complex relationships inherent in the educational design process in a more holistic way.
This research examined the transition of health science students to online distance
learning, with the focus on designing supports for students as they enter the online
distance learning environment, rather than studying detailed individual interactions
between a single teacher and their students. For these reasons the research is situated
primarily in the meso-educational design space, aimed at uncovering design principles
(DPs) that inform processes that facilitate students making the transition to online
distance learning.

The educational design of resources to support this transition was strongly influenced
by a pragmatic epistemology. This stance clearly defines the research questions but is
also open to pluralist methods which consider alternative approaches to an investigation
and is open to diverse lenses mixing quantitative and qualitative approaches (Jones &
Kennedy, 2011).

3.2 Pragmatism and researching educational design

A pragmatic philosophical viewpoint enables both the development of greater
understanding about how learning occurs in the area being investigated, and also assists
in the practical application of this new understanding to educational issues. Pragmatism
emerged in the 19th century as a more moderate alternative viewpoint to objectivism and subjectivism, recognising that the nature of knowledge and truth is contemporary and ever-changing rather than precise and absolute (Johnson & Onwuegbuzie, 2004; Luo, 2011). First espoused by the natural scientist Charles Sanders Peirce and the philosopher William James in the 19th century (Biesta & Burbules, 2003), pragmatism has covered a range of philosophical areas (logic, methodology, ethics, politics and education). However, the assertions most relevant to this research were those advocated by John Dewey (1938), who combined the logic of Peirce and the ethics of James to develop ideas about how to carry out scientific inquiry associated with human activity. For Dewey, research was a process of inquiry which is directed towards making sense of experience, situated in a particular context (Morgan, 2014).

A pragmatic viewpoint considers that the mind and the world are connected, with research being process and action oriented, whereby actions emerge from beliefs which in turn are informed by actions (Morgan, 2014). Knowledge emerges from the inquiry process and the experience of outcomes are generated from actions (Greene, 2007; Johnson & Onwuegbuzie, 2004). When applied to educational research, pragmatism highlights the importance of involving practitioners in the research process, to first identify and state what the issue is, then develop suggestions about how the issue might be solved, which is then studied to determine if the expected result occurs (Biesta & Burbules, 2003). This, combined with reflection, can lead to new knowledge and a cyclical process of inquiry moving from one situation or context to another (Biesta & Burbules, 2003). Truth and reality are constantly changing so that there is no end to the research; rather, each situation can build on prior understandings (Johnson & Onwuegbuzie, 2004). Table 3.1, overleaf, is based on the work of Philips et al. (2012); Freebody, Markauskaite and Irwin (2011); and Creswell (2009); and summarises the characteristics of the pragmatic paradigm, and also its application to educational design, which is explored in the next section.
### Table 3.1
**Application of the pragmatic research paradigm to EDR process**
(Synthesis of Creswell, 2009; Freebody et al., 2011, Phillips et al., 2012, Morgan, 2014)

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Description of dimension for pragmatic paradigm</th>
<th>Application to educational design and this research</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Research purpose</strong></td>
<td>To understand and change. To understand applications, how they work and solve real world issues.</td>
<td>To refine educational theory and practices through iterative analysis of an implemented solution across two university contexts. This in turn reveals new understandings about the issue being studied and also the research approach used (EDR).</td>
</tr>
<tr>
<td><strong>Ontology</strong></td>
<td>Reality and truth are contemporary and changing. Reality is constructed by what occurs at any one time and is influenced by a range of social, historical, cultural and political factors that inform the lived experience.</td>
<td>The researcher is free to choose a range of data collection and analysis methods depending on their needs and purposes which may change over the course of the study.</td>
</tr>
<tr>
<td><strong>Epistemology</strong></td>
<td>Knowledge consists of <em>warranted assertions</em> emerging from experience and an inquiry process which reflects interactions between beliefs and actions. It is acquired over time and informs thinking and decision making.</td>
<td>Practitioners and researchers work together to design the solution, examine the solution in practice and reflect on the outcomes. Knowledge is constructed by participants.</td>
</tr>
<tr>
<td><strong>Axiology</strong></td>
<td>Research is value laden and can be biased. It informs the inquiry and resulting actions. Such beliefs are subject to change based on our conscious actions.</td>
<td>Researchers practise reflexivity. They maintain a healthy doubt about the effectiveness of the solution and combine this with a range of data collection techniques to gain multiple perspectives by using triangulation during data analysis.</td>
</tr>
<tr>
<td><strong>Methodology</strong></td>
<td>Can involve a mix of both inductive and deductive approaches depending on the context and stage of the research. A focus is on deriving knowledge about the issue drawing from both quantitative and qualitative methods.</td>
<td>Multiple iterative cycles with results used to inform the development of each solution and emergent theory. Cycles utilise mixed methods techniques that are viewed collectively for the analysis.</td>
</tr>
<tr>
<td><strong>Validity</strong></td>
<td>Considers whether the data collection methods measure what they are intending. Multiple perspectives are sought which can involve triangulation.</td>
<td>Varied data sources that enable the capture of key decisions about the research design and solution. Emergent design principles and lessons learnt are embedded in a narrative that can be applied and transferred to other similar settings.</td>
</tr>
<tr>
<td><strong>Research outcomes</strong></td>
<td>Rich descriptions of complex phenomena that are empowering and act as a catalyst for change which can lead to emancipatory outcomes.</td>
<td>Practical and theoretical contributions: description of a practical design solution and building of theory through development of contextually sensitive DPs.</td>
</tr>
</tbody>
</table>
3.2.1 Application of pragmatic inquiry to educational design

Applying a pragmatic inquiry process to educational design emphasises that the process of designing educational experiences is developmental and creative (Laurillard, 2012; Phillips et al., 2012). As stated by Jones and Kennedy (2011):

Design involves both a systematic approach, which may involve rules and protocols derived from research, and an art applied in a set of local and context based practices. Design thought of in this way, is a skilful and creative activity which is open to improvement and development from the application of research and scholarship. (p. 19)

Research in educational settings is commonly aimed at influencing practice or policy through collaborative projects between researchers and practitioners which serve to enhance the impact of the project, and determine a broader understanding and explanation about its effects. Freebody et al. (2011, p. 17) reinforce this collaboration between researchers and practitioners considering that educational research should be conceived as “research-as-project” rather than “research-as-science”.

In addition, pragmatism is increasingly being recognised as the most suitable approach for education technology research (Anderson & Shattuck, 2012; Phillips et al., 2012). The past decade indicates a shift towards developmental research which draws on alternative philosophical approaches from pluralist perspectives (Johnson & Onwuegbuzie, 2004; Jones & Kennedy, 2011; Richey & Klein, 2007). Students are part of a wider educational environment with a range of influences that cannot be easily quantified or controlled (such as their social interactions and their underlying beliefs), and the overall design of the learning activity being studied (Goodyear & Ellis, 2008; Laurillard, 2012).

As this research is situated in the educational design space (at the meso-level), it required a multidisciplinary approach to inform the research (Jones & Kennedy, 2011; Phillips et al., 2012). The research focused not only on designing the orientation resource for online distance learners, but also understanding how the students engaged with the resource. The aim was to generate knowledge about the design requirements that enabled students to make the transition to online distance learning. The next section outlines the
methodological approach used in this research, namely educational design research (EDR), which espoused the pragmatic dimensions outlined in the right-hand column of Table 3.1 (p. 68).

### 3.3 Educational design research

Educational design research (EDR) is an emerging methodology that blends design, research and practice concurrently (Gravemeijer & Cobb, 2006; Gunn & Steel, 2012; Laurillard, 2012; McKenney & Reeves, 2014). First suggested in 1992 by both Brown (1992) and Collins (1992) as design research, it was also named development research, design experiments, design-based research and formative research. This methodology focuses on a complex, real and relevant educational issue. Practitioners and researchers collaborate to identify a solution that is developed iteratively over a long period of time (for example, across multiple semesters of implementation and evaluation). The outcome is a set of design principles (DPs) derived from iterations of implementation. These DPs can be used to inform the development of knowledge and theories about learning, leading to further adoption by other practitioners illustrating transferability and applicability of the EDR framework (Design-Based Research Collective, 2003; McKenney & Reeves, 2012; Reeves et al., 2005). As Wang and Hannafin (2005) state:

> In many ways, design-based research is intrinsically linked to, and its development nourished by, multiple design and research methodologies. Researchers assume the functions of both designers and researchers, drawing on procedures and methods from both fields, in the form of a hybrid methodology. (p. 6)

Educational designers and technology researchers advocate EDR because it generates useful knowledge to inform the development of strategies to enhance student learning (Amiel & Reeves, 2008; Barab & Squire, 2004; Collins, Joseph & Bielaczyc, 2004; DiSessa & Cobb, 2004; Joseph, 2004; Ma & Harmon, 2009; Reeves et al., 2005; Wang & Hannafin, 2005). It features prominently as an eclectic methodological approach that helps to bridge the gap between educational research, policy and practice, as well as enabling the researcher to capture the essential components of the educational design
which can then be applied to new learning contexts (Anderson & Shattuck, 2012; Herrington et al., 2010; Markauskaite, Freebody & Irwin, 2011).

Figure 3.1 Three phases of conducting EDR
From McKenney & Reeves (2012, p. 77)

Guidelines on how to implement EDR have evolved from Reeves’ (2000) early model of development research to describe three phases for conducting EDR, as illustrated in Figure 3.1 (McKenney & Reeves, 2012). During the first phase of EDR, the issue is identified and analysed through a review and critique of the literature and exploration of the context where the issue emerged. This theoretical background informs the development of a set of draft DPs that help to guide the second phase of EDR, which focuses on the design and construction of a practical solution to the issue being researched. In the third phase, the designed solution is evaluated as it is implemented to examine how it worked in practice. This process is repeated across multiple iterations or cycles of data collection and evaluation. Each iteration can create new research directions, leading to a return to earlier phases of analysis and exploration. Further modifications are made to the designed solution that is then implemented in further iterations. The results from these iterations inform the practical and theoretical outputs of EDR, namely refinement of the solution and improved theoretical understanding about the educational issue being addressed. These are expressed as DPs and contribute to dissemination of the solution through implementation and spread locally or more broadly to other contexts.

Other important characteristics of EDR relevant to this research are that it is:
grounded, so theory guides the design; flexible, enabling changes to be made to the initial design as they are implemented; and contextual, where there is a close examination of the conditions that led to the observed outcomes (Wang & Hannafin, 2005).

Since EDR constitutes a relatively new approach to researching educational design, gaps in the publications reporting EDR examples have been identified (McKenney & Reeves, 2014; Reimann, 2011). These will be explored in the next section as they informed my adaptation of McKenney and Reeves’ (2012) EDR framework to include a conjecture mapping process (see Section 3.4).

### 3.3.1 Gaps in the practice of EDR

EDR is becoming popular in the academy with an eight-fold increase in the number of publications in the decade from 2000 to 2010 (Anderson & Shattuck, 2012). To date, the majority have been conducted in the United States (73%), in science-related disciplines (51%), with only 26% in the higher education sector. While Reeves and Reeves (2011) advocate the relevance of EDR for researching education in the health professions, there are few examples describing EDR projects in the health sciences. Blake and Doherty (2007) and Dolmans and Tigelaar (2012) are two examples, however both are limited in scope as they describe implementation in one context with few iterations. Anderson and Shattuck (2012, p. 24) concluded that EDR still largely describes research undertaken in small projects at one institution, highlighting the need for EDR to consider the transferability of its outcomes to meet “the challenge of promoting widespread adoption of the tested interventions”.

A key need for the educational research community is to develop mechanisms that enable the results of EDR to be applied to other contexts and therefore strengthen theories that enhance educational design. This has been referred to as case-to-case generalisation (Firestone, 1993), and can lead to “analytic generalisation” when this contributes to the development of educational theory (McKenney & Reeves, 2014, p. 138). The value of engaging in EDR across additional contexts was noted by van den Akker et al. (2013)
who suggested that:

These heuristic principles will be additionally powerful if they have been validated in the successful design of more interventions in more contexts. Chances for such knowledge growth will increase when CRD [curriculum design research] is not conducted through isolated studies, but connected within the framework of research programs, because projects can then build upon one another. (p. 67)

Sandoval (2014, p. 31) also highlights that “working across multiple contexts could perhaps illuminate key variations and their influences”, and that this may not necessarily involve moving from small scale to larger scale research projects. He notes that “moving to new contexts at the same scale” (p. 31) can help to “illuminate” “local departures”; provide “clearer accounts of the elements of design” by undertaking more in-depth research; which can lead to the development of generalisable design explanations. This doctoral research provides an example of such an approach by studying two contexts sequentially. Implementing an orientation resource at two universities built a richer picture about what was important and what variations might be significant when designing supports.

EDR has also been criticised for its open eclectic character. The extended timeframe can complicate the capture of developments in each phase, lead to challenges associated with managing large data sets that emerge from the iterations, and confuse the reasoning processes to advance emergent theories of learning beyond the context where they were studied (Dede, 2004; Kelly, 2004; McKenney & Reeves, 2014; Walker, 2011). This long-term process can lead to difficulty in applying EDR to doctoral study (Oh & Reeves, 2010), however advice on how to map the phases to candidature is available (Anderson & Shattuck, 2012; Herrington et al., 2007). Muukkonen-van der Meer (2011) provides one example spanning several years where EDR was applied to doctoral study researching four case studies examining the use of technology for collaboration and knowledge construction.

Additional suggestions have been made to assist researchers with extended EDR projects. Reimann (2011) and McKenney and Reeves (2014) describe how a retrospective
analysis of all iterations of EDR can help to develop a chain of reasoning during analysis of extended studies with large data sets. Other educational design researchers outline the importance of this integrative analysis which captures the events that shape the design trajectory and explain the complexity of this process (Barab, Baek, Schatz, Scheckler & Moore, 2008; Cobb & Gravemeijer, 2008; Sandoval, 2004). Conjecture mapping has been suggested as a way of capturing this design trajectory to guide interpretation during the EDR process (Cobb & Gravemeijer, 2008; Reimann, 2011; Sandoval, 2014).

My research illustrates how a long-term approach can be managed as part of a higher degree project, by focusing on the analysis of the extent of student engagement with the designed orientation resource rather than tracking the fine-grained detail of each individual student’s learning trajectory. Aligning a conjecture mapping approach to the three phases of EDR enabled me to more clearly map the boundaries of the research. This approach will be outlined in the next section.

3.4 Application of EDR to this research

While the three phase model of EDR outlined in Figure 3.1 (p. 71) provides a framework for the conduct of EDR, it lacks a clear structure for capturing the developments in each phase and guiding the reasoning process about the emergent theories that result from enactment of the designed solution. Sandoval (2004, p. 214) originally proposed that the design process would be more rigorous if researchers considered how theories about learning are represented in a designed learning environment. He proposed the term “embodied conjectures” to describe this aspect of design, and illustrated how mapping the elements of the designed learning environment, and the outcomes that would be expected when it was implemented, could provide a more structured empirical framework for the conduct of EDR. Ten years later he developed this concept further, naming the framework “conjecture mapping”, described as a “means of specifying theoretically salient features of a learning environment design and mapping out how they are predicted to work together to produce desired outcomes” (2014, p. 19).
Using a conjecture mapping approach enables a clearer articulation of exactly how the DPs developed in Phase 1 are reified into the design and construction of the solution in Phase 2; and how choices are made for testing the enactment of the design when implemented during Phase 3. The top section of Figure 3.2, overleaf, illustrates how I have extended the three phases espoused by McKenney and Reeves (2012), shown previously in Figure 3.1, to include the conjecture mapping process as an integral part of this research.

For this thesis, the term design principle (DP) was used to describe what Sandoval (2014, p. 21) termed “high-level conjecture” that illuminates how to best support learning in a particular context. The DPs for this research emerged from Phase 1 and were developed from the analysis of theoretical learning perspectives (Chapter 2, Section 2.2 and 2.3); analysis of the literature surrounding student transition to online distance learning (Chapter 2, Section 2.7); and exploration of Contextual Case 1 (Chapter 4, Section 4.1.1). This led to the creation of the draft DPs which are outlined in Chapter 4, Section 4.1.2. During Phase 2, these DPs are reified into the design elements of the orientation resource, taking into consideration the contextual factors identified in Phase 1. Sandoval (2014, pp. 21-23) refers to this as “embodiment”. I contend that this is a confusing term given its association with post-structural philosophies. For example, phenomenology considers that embodiment is a broader concept entailing the internalisation of societal and cultural factors that shape individual lived experiences of a particular phenomenon (Merleau-Ponty, 1962). The term embodiment has also received attention by writers exploring the apparent disembodiment experienced when interacting with online environments (Burbules, 2004; Land, 2004). To avoid this confusion I have labelled this section of the conjecture map “design elements” rather than using Sandoval’s term “embodiment”. In keeping with Sandoval’s other suggestions for describing this section of the conjecture map, and the need to standardise terminology associated with EDR (McKenney & Reeves, 2014), I have adopted Sandoval’s terms for the remaining parts of the conjecture map.
Phases of EDR
(McKenney & Reeves, 2012)

Phase 1: Analysis & Exploration
- Analyze orientation needs for online distance learners
- Develop draft design principles (DP)

Phase 2: Design & Construction
- DPs reified into the design elements
- Mapping of how learners are expected to engage with the orientation resource

Phase 3: Evaluation & Reflection
- Design and theoretical conjectures envisioned
- Selection of data sources used to evaluate
- Iterations of implementation which determine effectiveness of mapping and conjectures

Phases of EDR adapted to this research with elements of the conjecture map noted in italics (Wozniak, 2015)

Components of the conjecture map for this research (adapted from Sandoval, 2014, p.21)

- Design Elements
  - Tools and Materials
  - Task structures
  - Participant structures
  - Discursive practices

- Mediating Processes
  - Observable Interactions
  - Participant Artefacts

- Intended Outcomes
  - Results that inform understanding about transition to online distance learning

Figure 3.2 Aligning the conjecture mapping process to the three phases of EDR
The design elements that illustrate reification of the DPs into the designed solution include the following components which are illustrated in the lower section of Figure 3.2:

- “tools and materials” - in this situation, the LMS tools and the associated content;
- “task structures” - the structure of the online orientation activities to be undertaken by the students;
- “participant structures” - the way it is planned that the students and moderators are intended to engage in the tasks (individually or as a group); and the degree of moderation by the project team to enable student participation; and,
- “discursive practices” - the type of interaction that is designed; for example, the building of ideas as they are shared between students collaborating in online discussions.

Sandoval (2014, p. 21) then suggests that researchers identify the “mediating processes” that are expected to emerge if students engage with the design elements. This can include what the participants do as they use the orientation resource, termed “observable interactions”; and also “participant artefacts” to indicate activity or thought processes while engaging with the resource. In EDR this usually consists of observations made in classrooms, but in the context of this research it included indicators that the students had accessed and engaged with the orientation resources, such as their data footprints (LMS tracking data) and the content of any artefacts created from participant engagement in the orientation activities (e.g., quiz completions, content of discussion postings). The relationship between the designed solution and mediating processes is described in the form of “design conjectures” which consider “if learners engage in this activity (task + participant structure) with these tools, through this discursive practice, this mediating process will emerge” (Sandoval, 2014, p. 24). This then helps to define the “intended outcomes” resulting from participant engagement with the online orientation resource and assists the researcher to identify what they were expecting to emerge from the implementation of the designed solution that would inform thinking about the
phenomena under investigation. In this research the outcomes included establishing how well the orientation resource aided the students’ transition to online distance learning. The relationship between mediating processes and intended outcomes are “theoretical conjectures” (Sandoval, 2014, p. 24). Therefore design conjectures help to determine why a design functions the way it does and theoretical conjectures help to determine how the design influences student transition to online distance learning. The lower section of Figure 3.2 illustrates a generic conjecture map for this research, with the design and theoretical conjectures shown as one arrow. When presented in Chapter 4, Figure 4.4 (p. 122), and Chapter 5, Figure 5.3 (p. 173), each of the components of the conjecture map may link to several other components. Consequently the DCs and TCs are illustrated with multiple arrows to map the explicit connections between different parts of the conjecture map. This ensures that analysis of the EDR results occurring in Phase 3 can trace back to identify the design element/s that may have caused the observed result. A conjecture map should be developed during Phase 1 and 2 and then used to interpret the research results during Phase 3, evaluation and reflection.

Conjecture mapping also assisted the project team to make choices about the data sources to be used to evaluate the implementation of the design during Phase 3 (Figure 3.2, p. 76). Defining the DC and TC aided in managing the large data sets that emerged from this extended EDR project and helped to recognise unintended outcomes. This, in turn, promoted the feedback loop to the earlier phases by identifying new areas for analysis and exploration (Phase 1); provided a clear rationale for making changes to the designed solution (Phase 2); or guided further evaluation directions during the next iteration. For example, early in Phase 3 in Contextual Case 1, it was noted that the students did not necessarily access the orientation resource in the anticipated manner. Consequently they bypassed key content and engaged in the practice activities without grasping the purpose of the activity. This led to modifications being made to the participant structures during the iteration by providing one-on-one support to students who appeared confused when online. This raised questions about the role of the
moderators during implementation of the resource and will be further outlined in Chapter 4, Section 4.3.4.

Due to the timing of this research (2006-2011), the conjecture maps shown in this thesis in Chapter 4, Figure 4.4, and Chapter 5, Figure 5.3, are a retrospective re-construction of the EDR process undertaken using Sandoval’s (2014) more recent conjecture mapping framework and terminology. The original research did utilise Sandoval’s earlier work (2004) to guide the project team’s expectations about how the orientation resources would be used and what intended outcomes were expected. Aligning the conjecture mapping framework to the three phases of EDR strengthened the reporting and retrospective comparative analysis of this iterative EDR project. It ensured that the key constructs associated with enacting the design in the two naturalistic settings were captured and available for retrospective analysis to determine if links between the components of the conjecture map had been “articulated and justified” (Sandoval, 2014, p. 28). The design trajectory and chain of reasoning used to capture such understandings is detailed further in Section 3.6 where the process of analysis is described.

This research encompassed an extended research study and a close involvement between the researcher, the designers of the orientation resource, and the participants (teachers and students of health sciences courses) at two different universities. The progression through each context maps the evolution of the design and also my movement between the roles of project manager, designer and researcher. This extended engagement contributed to a deeper understanding about the different contexts of practice and the influence of institutional forces on these practices. This was then reflected in the emergent DPs and the contribution that this research makes to the theories surrounding student transition to online distance learning environments. The process was consistent with the outcome of EDR: to develop theories emerging from practice rather than theories that are later translated into practice (Reimann, 2011).

The next section provides an overview of the settings and participants at each university and illustrates how the iterative nature of the EDR and conjecture mapping
process influenced how each of the research questions described in Chapter 1, Section 1.3, were addressed during the EDR project.

3.4.1 Settings, iterations and participants

As noted in Section 3.3.1, there is a gap in the EDR literature describing a more complete evolution of an educational design traversing a number of iterations that have then been applied to solve a similar issue at a different context. McKenney and Reeves (2012) suggest that each time the three phases are conducted it becomes an iteration. Each phase consists of a “cycle of action” (p. 78), with its own narrative process used to make design decisions so that outcomes from each iteration contribute to theory generation (Reimann, 2011). Figure 1.1 (p. 10) illustrates the iterations conducted at each university (Contextual Case 1 and 2) and Table 3.2 outlines further details about the settings and participants studied.

Table 3.2
Participants studied in each iteration for Contextual Case 1 and 2

<table>
<thead>
<tr>
<th>Context</th>
<th>Contextual Case 1</th>
<th>Contextual Case 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>University of Sydney</td>
<td>Charles Darwin University</td>
</tr>
<tr>
<td>Iteration</td>
<td>Iteration 1 2006</td>
<td>Iteration 2 Semester 1 2007</td>
</tr>
<tr>
<td>Level and mode of study</td>
<td>Teachers and a sample of post-graduate distance</td>
<td>Post-graduate distance students studying in health sciences</td>
</tr>
<tr>
<td>Number of courses &amp; faculties</td>
<td>N/A</td>
<td>Six courses in two faculties</td>
</tr>
<tr>
<td>Number of students</td>
<td>20</td>
<td>179</td>
</tr>
</tbody>
</table>

The universities are named in this thesis as this adds to the contextual richness driving the educational design process in each setting. This was considered ethically
appropriate as individuals remain anonymous throughout the reporting of the EDR process (see Section 3.7.2). The time in between implementation at the first university and second university represents my career movement and the enactment of the first two phases of EDR at the second university (Chapter 5, Sections 5.1 and 5.2).

For Contextual Case 1 at the University of Sydney, an online orientation resource (Get Learning) was developed and three iterations were carried out between 2006 and 2008 with postgraduate health science students studying by distance and online. The first iteration consisted of a review by experts and a trial with a small sample of students (n=20). In the second iteration, all students studying one of five Masters level courses in the Faculty of Health Sciences and Faculty of Medicine and one professional doctorate course in the Faculty of Health Sciences were able to access the resource suite voluntarily (n=179). Student engagement with the resource was closely monitored by the project team who viewed LMS tracking data and activity completions. In the first few weeks of the semester, I shared a role in providing email messages to students to assist them in accessing the materials and completing tasks. During Iteration 3 at the University of Sydney, the participants were expanded to include an additional course in a third faculty (Faculty of Nursing and Midwifery, n=292). However, during this iteration close moderation and support were not provided by the project team, enabling consideration about the role of moderation and one-on-one support for students who are new to online distance learning. Section 3.5 outlines the data collection in Contextual Case 1, predominantly focusing on analysis of the levels of student engagement with the resource (RQs 1a and 1b) as well as student opinions about the orientation resource (RQ 2c). Enactment of the phases of EDR for Contextual Case 1 is described in further detail in Chapter 4.

The DPs developed from Contextual Case 1 were then applied to the development of a similar resource in a second context at Charles Darwin University (Contextual Case 2 - 2009-2011). The CDU project team redefined the issue at the new university location, taking account of this new context during the analysis and exploration phase, and
developed a new resource to meet the needs of undergraduate students. Two iterations were carried out: Iteration 1 as a pilot in 2010 with staff and students (n=50); then, following modifications, Iteration 2 was undertaken with a large number of undergraduate students studying a nursing course in the School of Health (n=541). Students were either studying fully online by distance or in a blended format combining both face-to-face and online activities. Students included in the research were enrolled in either a first semester core unit taken by all commencing students; or a second year unit, consisting of continuing students with prior online experience, and a proportion of new students entering the course at the second year level due to prior study in relevant courses or workplace experience. For both these iterations there was limited moderation and support provided by the project development team of which I was a member. Data collection methods were expanded to provide further insights about why the levels of engagement may have occurred with a more in-depth analysis of the student demographics (RQ 2a) and academic results (RQ 2b), as well as student interviews to gather stories about their transition experiences (RQ 2c). This provided a deeper understanding about student engagement with the resource. The enactment of EDR for Contextual Case 2 is outlined in Chapter 5.

Studying student engagement with designed solutions (orientation resources) in two different contexts opened the door to identifying similarities and differences in student engagement with the online orientation resource at each university and contributed to development of theories about student transition to online distance learning (RQ 3). Retrospectively comparing the experiences from two university contexts enabled a synthesis of the observed practice. Therefore EDR enabled me to draw together an extended design experiment to derive underlying principles that both enriched prior theories about student transition and build new knowledge about the transferability of these principles, which is discussed in Chapter 6.
3.5 Data collection

EDR typically adopts a mixed methods approach requiring a wide variety of data sources to capture the evolution of the design and direct the development of the emergent DPs (Wang & Hannafin, 2005). In this research the data collection and analysis was not directed towards assessing whether the innovation worked to improve student learning outcomes per se, instead it captured the design trajectory and evaluated the enactment of the designed resource. This research focused on “climate” variables such as how the students accessed and engaged with the resource, the extent of activity completions, and why this may have occurred (Collins et al., 2004, p. 36). The conjecture mapping process guided the selection of data sources, and enabled a retrospective comparative analysis of the design and theoretical conjectures. This lead to refinements of the DPs and also illuminated features of the student transition experience (Reimann, 2013).

The phases of the EDR, depicted in Section 3.4 with Figure 3.2, encompass a multiphase mixed methods design (Creswell & Plano Clark, 2011). This design enables the blending of qualitative and quantitative data sources generated during the phases of EDR. Data collected from each iteration builds on previous phases and iterations (McKenney & Reeves, 2012). As outlined in Section 3.4, the choice of data sources was influenced by the conjecture mapping process. For example, during Phase 3 where the resource was implemented, the project team was able to envision the mediating processes that were expected to occur, leading to the collection of evidence about how students engaged with the resource. Data sources may vary over time in response to the changing design trajectory (Reimann, 2011). For example, the results from Contextual Case 1 highlighted a wide variation in engagement levels with the orientation resource. Consequently the DPs were refined, and when they were applied to the second context, additional data sources were added to include more detailed demographic information, academic results, and student interviews in order to determine if these factors influenced variations in student engagement. Further details about the data sources for each context are provided in Table 3.3, showing the relationship between data sources and the RQs.
Table 3.3
Relationship between research question, data source and method of analysis

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Data collection strategy</th>
<th>Data type</th>
<th>Analysis</th>
</tr>
</thead>
</table>
| **Contextual Case 1**
University of Sydney | | | |
| **RQ 1: How do health science students engage with an online orientation resource designed to support the transition to online distance learning?** | | | |
| **RQ 1a. What is the level of student engagement with the orientation resource?** | LMS log files (two 17 week semesters) - Pages accessed - Extent of access - Dates accessed - Duration of access - Activity completions including discussion postings | Quantitative | Engagement level Descriptive statistics Chi square Mann-Whitney U |
| | LMS log files (one 16 week semester) - Pages accessed - Extent of access - Dates accessed - Duration of access - Activity completions including discussion postings | | |
| **RQ 1b. What types of orientation activities do students explore to develop their skills in using the learning management system?** | LMS log files (as above) - Student surveys for each module of resource (5 surveys in total) - Design team development records during moderation | Quantitative and Qualitative | Engagement level Descriptive statistics Chi square Thematic analysis |
| | LMS log files (as above) - Student survey (1 survey for resource) - Student interviews | | |
| **Contextual Case 2**
Charles Darwin University | | | |
<p>| | | | |
| | | | |
| <strong>RQ 2: Why does this level of engagement occur?</strong> | | | |
| <strong>RQ 2a. Is there a relationship between the levels of engagement and student demographics?</strong> | LMS log files (as above) - Demographic data (Iteration 2 only) - Enrolment type - Course of study - Age / Gender | Quantitative | Engagement level Descriptive statistics Chi square |
| | LMS log files (as above) - Demographic data - Enrolment type - Mode of study - Subject being studied - Age / Gender - Enrolment date - If first online unit at CDU | | |</p>
<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Data collection strategy</th>
<th>Data type</th>
<th>Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Contextual Case 1</strong> University of Sydney</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RQ 2b. Is there a relationship between the levels of engagement and study success?</td>
<td>LMS log files (as above)</td>
<td>Quantitative</td>
<td>Descriptive statistics</td>
</tr>
<tr>
<td></td>
<td>Academic results for unit being studied including if and when they withdrew from study</td>
<td></td>
<td>Chi square</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ANOVA</td>
</tr>
<tr>
<td><strong>Contextual Case 2</strong> Charles Darwin University</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RQ 2c. What do students say about their experience using the resource and their beginning online learning experiences?</td>
<td>Student survey (as above)</td>
<td>Quantitative</td>
<td>Descriptive statistics</td>
</tr>
<tr>
<td></td>
<td>Discussion board postings</td>
<td></td>
<td>Thematic analysis</td>
</tr>
<tr>
<td></td>
<td>Design team development records</td>
<td></td>
<td>Phenomenological analysis</td>
</tr>
<tr>
<td></td>
<td>Student survey (as above)</td>
<td>Qualitative</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Student interviews</td>
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<tr>
<td></td>
<td>Discussion board postings</td>
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<tr>
<td></td>
<td>Design team development records</td>
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<td></td>
</tr>
<tr>
<td><strong>RQ 3: What guiding principles underpin the design of effective orientation resources?</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RQ 3a. What educational design features will assist health science students to make the transition to online learning?</td>
<td>All of the above</td>
<td>Quantitative</td>
<td>Conjecture mapping</td>
</tr>
<tr>
<td></td>
<td>Design team development records</td>
<td>Qualitative</td>
<td>Retrospective comparison</td>
</tr>
<tr>
<td>RQ 3b. What lessons emerge from the implementation of the online orientation resources in two university contexts?</td>
<td>All of the above</td>
<td>Quantitative</td>
<td>Conjecture mapping</td>
</tr>
<tr>
<td></td>
<td>Design team development records</td>
<td>Qualitative</td>
<td>Retrospective comparison</td>
</tr>
</tbody>
</table>
The approach to analysis and mixing of the results is discussed in Section 3.6. Each of the sources of data, outlined in Table 3.3, will be outlined in the next two subsections as either quantitative or qualitative data sources, including how the information collected informed each research question.

### 3.5.1 Quantitative data

Quantitative data sources provided the mechanism for evaluating the student engagement with the orientation resources at both universities. These consisted of LMS tracking data, student administration information, such as demographic enrolment information and assessment results, and evaluation surveys.

#### 3.5.1.1 Learning Management System log files

E-research is a term that has been created to describe the digital data collection possibilities available to researchers investigating how technology supports student learning (Markauskaite, 2010). One component of e-research integral to this thesis is that of data mining which can assist practitioners to learn more about how students engage with technology. It has been defined by Nachmias (2011) as:

> Tools and techniques for discovery of non-trivial, potentially useful and ultimately understandable patterns or structures from data drawn from the Web… These methods are used to provide insight into and understanding of students and the settings in which they learn. (p. 65)

For this research the Learning Management System (LMS) log files were captured and downloaded as Excel files to analyse levels of student engagement during each iteration. This consisted of information plotting each student’s access to the orientation resource, including the date, time, and length of time they accessed the resource. It also captured how they entered the resource (the modules they accessed), pages accessed and the activities completed. Considerable data cleaning was undertaken before analysis and this is explained in Section 3.6.1. The LMS log files provided the key source of data to answer RQs 1a and 1b, seeking to understand how the students engaged with the orientation resources and the related activities. The ethical considerations of gathering
these data sources will also be discussed in Section 3.7.2.

3.5.1.2 Demographic data

In the first analysis and exploration phase, demographic information consisting of age, gender and prior educational background was collected from the project team members at both universities to gain contextual information to inform the design process. Once the resource was developed and implemented additional detailed demographics (age, gender, course of study) were collected from the student administration database and used to confirm the initial demographic parameters.

The amount of demographic data available varied for each context and iteration. For example, in Contextual Case 1, demographic data such as age, gender, course being studied and type of enrolment (full-time or part-time) was only available for Iteration 2. In order to provide a richer analysis, more detailed demographic data was collected during implementation for Contextual Case 2, including age, gender, enrolment type (part-time or full-time study), information about the mode of study (fully online or blending on-campus with online) and whether the student had studied online previously at the university. Matching the demographic data with the LMS log files provided information for RQ 2a, aiding an appraisal of the relationship between the levels of engagement and student demographics.

3.5.1.3 Student evaluations

Anonymous evaluation surveys embedded within the resource collected student opinions about their experiences using the orientation materials. A slightly different approach was taken in each context. For Contextual Case 1 a series of short three minute feedback surveys were provided to students at the end of each module. Each survey asked for opinions about the relevance, helpfulness, achievement of learning objectives, improvements, and suggestions about additional supports. The survey questions are provided in Appendix 1. For Contextual Case 2, one survey was used to provide a global analysis of the benefits and limitations of the resource, asking questions about the
students’ overall opinion about components of the resource, their recommendations about its use for beginning students, how they engaged with the site (access level, Quest completions, time spent accessing site and completing tasks), and any general comments (see Appendix 2). The survey data enabled triangulation with the LMS data describing the level of student engagement with the activities to address RQ 1b and to also gather opinions about the resources and provide insights for RQ 2c (their experience as a beginning online learner using the resource).

3.5.1.4 Student academic results

Academic performance is dependent on many factors. Despite this, it was decided to capture this data in Contextual Case 2 to examine if there was any relationship between student engagement with the resource. This was achieved by measuring their access, activity completions, time spent accessing the resource, and their academic success (measured by their unit results/grade), including whether the student withdrew from the unit of study. This was only possible in Contextual Case 2 as this aspect was not included in the research design for Contextual Case 1. This contributed data to inform RQ 2b (relationship between engagement with the resource and study success).

3.5.2 Qualitative data sources

Adopting a mixed methods inquiry enabled collection of qualitative data consisting of discussion board postings and student interviews. These sources of data are described next, with the approach to analysis and blending outlined in Section 3.6.

3.5.2.1 Discussion board postings

A series of discussion activities were embedded in the orientation resources developed for both contextual cases. While the purposes of the discussion varied, the postings made by students provided further insights about other themes that were important at the time they completed these activities. Content analysis of asynchronous discussion postings provided additional thematic data for RQ 2c, a common analytical technique in educational technology research (De Wever, Schellens, Valcke & Van Keer, 88
3.5.2.2 Student interviews

Student interviews were included in the research plan for both contextual cases to gather more in depth information about the student’s perspective of the transition process to online distance learning. Interviews can be helpful when research participants can’t be directly observed (as in this case with an online resource) and when information is difficult to determine in any other way (Creswell, 2009). A key strength of interviews is the “richness of the communication that is possible” (Gillham, 2000, p. 62) through the use of unstructured open-ended questions.

In Contextual Case 1, student participation in interviews was requested as part of the consent process but there was no uptake of this option to be able to pursue this form of data collection. This may have been a result of participants being time poor and because this option was flagged when the students first entered the resource before they had engaged with the orientation content and activities. For Contextual Case 2 there was also a limited response; however nine students who indicated they were willing to participate in the interview process were contacted by email. Five students consented and participated in interviews which were held after the conclusion of the semester so as not to influence their access to the resource. As the students were located in dispersed locations the interviews were conducted using a Skype to landline or mobile phone connection and recorded using digital recording software (Powergramo©). An interview guide was used consisting of open-ended questions divided into sections to address themes related to all research questions. The interviews asked each student to reflect on their experience of using or not using the resource, its strengths and weaknesses, comments about transitioning to online learning, and their perceptions about the types of supports that would assist in their transition. Appendix 3 details the email that was sent to students requesting their participation and includes the interview guide.

Inclusion of interviews in the latter stages of the research allowed for testing and
refinements of the emerging DPs and further analysis of the student transition experience. Each student interview formed a series of instrumental case studies (Thomas, 2011). Interview data helped to illuminate why the levels of engagement with the resource may have occurred through listening and analysing the stories of these five individuals. This provided additional insights regarding RQs 1 and RQ 2c and helped to provide further revelations about the experiences of students studying online and by distance. It also helped to challenge any assumptions made about the transition to online distance learning, including any flaws or limitations regarding the orientation resource. From an iterative perspective it also informed RQs 3a and 3b by gathering suggestions from the students about the design of supportive resources (to identify design features and lessons learnt from students’ online learning experiences and engagement with the orientation resource).

3.5.2.3 Design team development records

Apart from capturing the student engagement with the resource during Phase 3 of the EDR, it was also important to capture the design decisions made by the project team during the earlier phases. A key component in documenting the development process during Phase 1 and 2 was identifying the elements of the designed solution that reify the DPs. Project notes are useful when used in conjunction with other data sources to bring another perspective during the retrospective analysis (Reimann, 2011).

As a participant in the design team for both contexts, I reviewed project records illustrating outcomes of team meetings between the stakeholders such as academic and support staff and the project development team. In Contextual Case 1 the development notes were recorded as electronic documents. For Contextual Case 2, project notes were shared with team members via an electronic wiki to manage the design process more efficiently with members who were located at a distance to the university. These records helped to capture the design trajectory and formulate the design and theoretical conjectures.
3.6 Data analysis

Collection of the quantitative and qualitative data occurred concurrently during all phases of EDR at each context and then sequentially when repeated in Contextual Case 2. This method of analysis aligns with the iterative nature of EDR driving changes to the design and moving them forward to further iterations of implementation. Cerniak, Imhof and Reimann (2010) described a similar research design for the NextTELL project spanning multiple locations across several years:

Making sense of the data is typically a highly inferential, interpretative, and cyclical process. Furthermore, these interpretations and the decisions based on them will profoundly shape the development of the design. This necessitates articulating carefully the key constructs that were used making interpretations and decisions. The interpretive framework will hardly stay static over the course of a design experiment, hence articulating, critiquing, and refining the framework need not only to be practiced, but also to be documented. (p. 12)

Figure 3.3 provides an overview of how the analysis and mixing of data was achieved drawing on the notation system described by Creswell and Plano Clark (2011).

![Figure 3.3 Overview of mixed methods data sources and approach to analysis](image)

The data sources are represented in the top boxes with the relative weighting of quantitative or qualitative data sets (capitals QUAN or QUAL for the primary data type).
Of note is the overlap in data sets with a wider variety of data sources for Contextual Case 2. The plus sign indicates that the quantitative and qualitative data were analysed concurrently and combined to enhance the analysis of student engagement with the resource and was primarily determined through analysis of the LMS log files matched to demographic information (RQ 1). The additional data sources gained from the surveys, discussion postings, design team notes and student interviews helped to enhance the analysis and offer further possible explanations about why the levels of student engagement may have occurred (RQ 2).

In the final analysis, depicted in the lower part of the diagram, all data sets across both contexts were retrospectively analysed and compared to draw out commonalities and differences and establish transferable DPs and theories to enhance our knowledge about student transition to online distance learning.

In the next section, the method of analysis of each type of data source will be discussed according to the contribution to either qualitative or quantitative analysis. Finally, the mixing of the data analysis will be explained, as well as the process for adopting a retrospective meta-analysis spanning both contextual cases (refer to Table 3.3, p. 84-85).

### 3.6.1 Quantitative analysis

The mixing of data mined from educational systems can be analysed in many ways (see Chapter 2, Section 2.7.3.5). Due to the limited integration of the university IT systems at both universities, LMS log files, activity completions and demographic information was matched manually through the student identification number. Incomplete entries were removed from the data set. Each categorical variable was then coded, with analysis made using Excel’s pivot table function or SPSS (Statistical Package for Social Sciences). Once the data set had been cleaned, identifiable information, such as the student ID, was removed and replaced with a case number. All subsequent analysis was completed with this de-identified data set consisting of 41 items for each contextual case.
Appendix 4 outlines further details of these items that were coded for analysis for each context.

3.6.1.1 Analysis of levels of engagement

This EDR research project used LMS log files to observe the levels of engagement with the online orientation resource, particularly identifying the degree of student activity with the resource. This method of analysis was consistent with the pragmatic and exploratory nature of EDR inquiry as it enabled discovery of patterns and relationships within the data and was not reliant on a prior hypothesis about the nature of these relationships. As Markauskaite (2010, 2011) outlines, it differs from statistical analysis as the analysis starts with the data, and ends with patterns and rules, informing action and proposing new theories of a practical nature. It also helped to uncover the extent of non-access and illuminated themes not previously recognised regarding supports for students commencing online distance learning.

The beginning phase of data analysis was to transform large volumes of raw data into understandable data sets (García, Romero, Ventura & de Castro, 2011). The raw data was converted into descriptive access levels that plotted the extent to which students reviewed the materials within the resource or engaged with associated practice activities. This was particularly useful in the early stages of the research to enable the project team to more fully understand if the design elements and mediating processes played out as anticipated by the conjecture mapping process.

The LMS log file data analysis enabled me to ascertain a number of aspects related to the research questions:

- Timing of access during the semester: Did students only access at the beginning of semester or did they return to the site later in the semester? (RQ 1)
- Level of access: Did the pathway students used to enter the resource stop at homepage access or continue to more deeply embedded pages? Did the students find the embedded activities? (RQ 1b)
• Degree of engagement with the resource: Evaluation of the pages accessed was combined with examining the extent of completion of the embedded online activities to determine a continuum of engagement with the resource (no access, access to homepage only, access to pages beyond the homepage, access to start an activity, access to complete an activity). (RQ 1)

• Reporting of the pages that were accessed the most, and those that were not accessed, possibly due to lack of interest or time. (RQ 1)

• Timing of the day that the access occurred: to confirm the flexible study options used by health professionals. (RQ 1)

There are limitations to the analysis of LMS log files. Data showing that the students accessed the page does not necessarily indicate that they read and understood the content. It is an indication that the section was considered relevant to the students’ access needs at that time. Of equal importance was identifying the areas that the students didn’t access, or accessed only briefly, which indicated that either these sections were not found by students or were not relevant to their needs. The LMS used for Contextual Case 1 (WebCT) differed from that used for Contextual Case 2 (Blackboard 9.1). Combining the access data with analysis of the activity completions enabled some direct comparisons to be made between the iterations and different contexts. Lack of engagement in the activities may have been indicative of the common lurking behaviour of online study (Hara, Bonk & Angeli, 2000; Palmer, Holt & Bray, 2008). Therefore the key to this analysis was understanding the extent of student engagement with the resource.

3.6.1.2 Statistical analysis

Descriptive statistics, such as showing data as percentages, were used to describe a number of the research findings. Demographic data derived from the student enrolment data base was analysed by SPSS to provide a descriptive account of the different cohorts of students. SPSS was also used to analyse the student evaluation survey results. This included an analysis of the Likert scale questions to provide information about the
relevance and effectiveness of the resource and its activities in Contextual Case 1 (Appendix 1). Since the evaluations were anonymous it was not possible to link this information to the access levels for specific students.

Due to the exploratory nature of the research and categorical nature of many of the variables, non-parametric statistics were used to assess the extent of associations between variables (Pallant, 2010). A chi-square test of independence, with a 2 by 2 design using Yates’ correction for continuity, or Cramers V for a 2 by 3+ design, was used to examine the relationships between many of the variables. For example, the level of engagement was compared in a number of ways: between Iteration 2 and 3 (Contextual Case 1); age (Contextual Case 1 and 2); unit studied (Contextual Case 2); mode of study (Contextual Case 2); enrolment type (Contextual Case 2); and whether the students were studying their first online subject (Contextual Case 2). Additional analysis undertaken for Contextual Case 2 included evaluating the associations between enrolment data and timing of access, student semester results (including withdrawals) and the level of engagement (access and activity completions). Finally, to determine if there were any differences between cohorts and the number of pages accessed and duration of accesses, a Mann-Whitney U test was used.

Parametric statistical analysis was used when examining the number of pages accessed and the duration of these accesses with the academic results (grades) in Contextual Case 2. An independent groups design (one-way between groups Analysis of Variance - ANOVA) was used, using the Brown-Forsyth test of robustness, to explore the impact of grades on these variables. A one way between groups ANOVA compares the variance between the groups (students failing, passing the course or gaining a higher grade) with the variability within each group, and the post-hoc test determines which groups differ.

Despite the majority of data sources containing quantitative data, the richness of this mixed methods study was enhanced through simultaneous analysis of the qualitative data to add explanatory and interpretive power to the results.
3.6.2 Qualitative analysis

The qualitative analysis was carried out in two different ways: thematic analysis of most data sources, and a phenomenological analysis of the interview data. Pseudonyms were used to refer to the interview participants.

3.6.2.1 Thematic analysis

The majority of the qualitative data consisted of short descriptions from project team notes, comments from the open-ended survey questions, or online postings made in the discussion board activities. This lent itself to categorical analysis, where a constant comparative technique was used to identify themes which were reviewed and revised as all data sets were analysed. This was not a purely inductive process, as the conjecture mapping process had already identified the intended outcomes and enabled the analysis to either match or show discordance with the identified conjectures (Hays & Singh, 2012).

Thematic analysis of the text-based data was undertaken for Contextual Case 1 by reviewing the research team development notes, moderator notes, discussion postings and open-ended student survey responses. During the implementation of the iterations each piece of text-based data was read and the themes identified and discussed by other members of the design team. This data analysis was integrated with the student engagement data to ensure that the findings generated from each iteration could be acted upon as the resource design evolved. Later, during a retrospective analysis, the NVivo software package was used to manage the coding and thematic analysis of these data sources and reveal the dimensions associated with the phenomenon of transitioning to online distance learning at university.

In Contextual Case 2, textual data, including designer and research team development notes, open-ended student survey responses, discussion postings, and the addition of transcribed student interviews was analysed using NVivo. In order to accommodate my bias in the analysis, I bracketed my personal meanings and interpretations. My distance from the world of the students was demonstrated by my role as designer and researcher and because I had no teaching relationship with the participants in the research. I also
used a semi-structured interviewing approach to enable the interviewees to engage in conversation and enhance recall of their lived experience of transitioning to online and distance learning. An inductive thematic analysis was carried out initially to categorise and generate themes that emerged from the data (Teddle & Tashakkori, 2009). Key themes were identified and coded using a constant comparative analysis, and compared to previous themes, identified from Contextual Case 1, and literature exploring the student experiences of online distance learning. I particularly drew on the work of Muilenburg and Berge (2005), who used factor analysis to identify key constructs from a survey conducted with a large number of online learners, leading to categorisation of student barriers to online learning. These themes helped to triangulate the information gained from the other data sources to confirm conclusions about the types of activities that the students engaged in (RQ 1), why they engaged the way they did (RQ 2), and assisted in modifying the principles of design and emergent conceptions about student transition to online distance learning (RQ 3).

3.6.2.2 Phenomenological analysis

Drawing on the pragmatic viewpoint whereby the researcher can “borrow” additional analysis techniques for inquiry into complex issues (Phillips et al., 2012, p. 78), an interpretative approach was used for Contextual Case 2 to extract meaning from the interview transcripts. These sought to capture the lived experience of a small number of students and the phenomenon of transition to online distance learning. Mayoh and Onwuegbuzie (2015) advocate the inclusion of phenomenology with mixed methods research, as it enhances the results gained from other methods, enabling analysis of data from different perspectives. They suggest it can be a secondary stage in the research to explore unanticipated findings. Results from Contextual Case 1 revealed unexpected diversity of engagement with the resources, stimulating further inquiry to understand the reasons for these variations.

I adopted a descriptive (eidetic) phenomenology to focus on the essential features of the interviewees’ individual experiences. Espoused by Giorgi and Giorgi (2003), the
importance of initially describing the participant’s lived experience of the phenomena being studied is highlighted. During the interpretation of the interview transcripts and recordings I needed to set aside my preconceived biases about online distance learning to extract individual meanings from the ways the students encountered their world of online distance learning (Moustakas, 1994). In the initial analysis “the essence” of the students’ experience was identified by highlighting sections of the interview transcripts (Creswell, 2007, p. 58). When combined with the data footprints from the LMS log files, a textual description was developed and re-crafted into a narrative that captured the essence of their online distance learning experiences (Chapter 5, Section 5.3.5). Threads of commonality across all interviewees were then extracted by coding the data into themes, with comparisons made to the themes extracted from the literature and other data sources, such as the surveys and discussion board postings. Additional themes emerged which were then grouped to interpret the width of the student’s stories (Hycner, 1995). This process enabled a richer understanding about the student experiences and provided additional perspectives for reconsidering RQ 2 (especially 2c) that sought to understand why students engaged or did not engage with the online resources in Context Case 2. The analysis led to the development of a transition framework that captured the essence of the students’ online distance learning experiences (Chapter 6, Section 6.3).

3.6.3 Mixed methods approach and the retrospective meta-analysis

This mixed methods study was primarily exploratory research. That is, the draft DPs derived from the literature and theories about online distance learning informed the designed solution which, when implemented, generated both qualitative and quantitative data to provide insights about student engagement with the orientation resources. Parallel analysis of the quantitative data sources that identified the levels of engagement with the qualitative data (survey comments, discussion postings and interviews) added further insights about why the patterns of engagement may have occurred (Teddlie & Tashakkori, 2009). These results were then used to refine the emergent DPs. It is
important to note that the conjecture mapping process also informed the analysis, as this enabled identification of divergent results. For example, this occurred in Contextual Case 1, where the students’ pathways to accessing the orientation resource did not play out as intended in the original design, and consequently the expected mediating processes did not occur (Chapter 4, Section 4.3.2.2). One of the benefits of undertaking mixed methods research with parallel analysis was uncovering divergent results, noted as being an important aspect when conducting EDR (Herrington, 2012). For Contextual Case 2, the value of analysing the interview transcripts in a holistic manner with a phenomenological lens led to a closer examination of the personal stories of the five students interviewed. Relating these stories to the underlying pedagogical models of distance education assisted in revealing barriers and enablers for transitioning to online distance learning.

Finally by studying EDR across two contexts, further retrospective analysis enabled the research to move beyond the description of DPs and make a broader contribution to theory. This led to identification of four dimensions associated with the transition of online distance learners to university study: adjustment to university, adjustment to the distance between student and the university, adjustment to the online environment and adjustment to new health professional roles. It also enabled me to extract lessons learnt from implementing orientation resources in both university settings. It is this aspect of the analysis that enabled me to answer questions about the transferability of the designed solution to other settings (RQ 3b). Thomas (2011, p. 141) notes how this cross context analysis enables the researcher to “drill deeper” into the research and undertake a “more searching analysis of the cultures of the two environments”. Holmberg (2014, p. 307) has advocated for a more reflective approach to EDR, whereby its outcomes move away from “prescriptive guidelines” to the generation of “thick descriptions of what has worked.” It should be noted that this doesn’t necessarily enable the researcher to indicate greater applicability of their findings. It is up to the research community at large to review the descriptive DPs and lessons learnt and apply these to their own context, a concept that will be considered in the Chapter 7, Section 7.3.4.
It was this overarching descriptive argument and analysis of the research parameters that contributed to the research rigor and assessment of aspects such as credibility, trustworthiness and, more importantly for EDR, the usefulness of the research findings to other educators and designers (Barab et al., 2008). These aspects are discussed in the next section.

3.7 Research quality and rigour in EDR research

Criteria used to assess the quality of the research and analysis of the results vary according to the type of research approach, with quantitative data analysis more concerned with validity and reliability, and qualitative data analysis with concepts of credibility and dependability (Teddlie & Tashakkori, 2009). Reeves (2011) suggests that the time for a realignment between research rigour and impact is emerging. He considers that EDR is a method that gives a much needed realignment between the desire for achieving rigorous research and the practice of providing data to drive forward educational innovations. Nieveen and Folmer (2013) outline four quality criteria applicable to the conduct of EDR, including relevance, consistency, practicality and effectiveness. Each of these quality criteria will be outlined in relation to this EDR project.

Relevance, also known as content validity, ensures that the solution developed is based on underpinning learning theories and encompasses the appropriate breadth of content and practice activities required for student orientation. This was particularly important during Phase 1 and 2, where the context and issue was analysed and solution developed. The conjecture mapping process that aligned the draft DP with the design elements assisted in ensuring achievement of relevance. This could then be assessed through the results of student evaluations querying the relevance of components of the orientation resource to their needs.

Consistency, also known as construct validity, enabled the solution developed to be designed in a clear, coherent manner. This aspect was illuminated during Phases 2 and 3,
where the conjecture mapping process helped to link the design features elements with
the mediating processes and the intended outcomes. The research was also strengthened
by peer review of scholarly work published during the EDR projects conducted at both
universities (Wozniak, 2013; Wozniak, 2015; Wozniak, Mahony, Lever & Pizzica, 2009;
Wozniak, Mahony & Pizzica, 2012; Wozniak, Mahony, Pizzica & Koulias, 2007;
Wozniak & McEldowney, 2015).

Practicality refers to the requirement for the solution to be usable in the settings for
which it was designed. In a similar way to consistency, this was also determined
primarily by tracking data gained from both contexts but also included the data from the
student evaluations, and interviews. Once again, conjecture mapping helped to focus the
analysis and identify unanticipated outcomes.

An assessment of effectiveness ensures that the solution achieves the desired
outcomes it was intended to produce. This was primarily determined through the
conjecture mapping process described in Section 3.4, by identifying the mediating
processes and outcomes that are expected during the implementation of each iteration. As
noted by Sandoval (2004), this enhances the rigour of the EDR process:

At the very least, then, mapping embodied conjectures in the way
suggested here is likely to show researchers what they are more and less
sure of prior to the implementation of a particular design. Consequently,
the nature of the gaps in the theoretical knowledge that informs the
design is more likely to be seen. In turn, this is likely to help researchers
to sharpen their analytic focus on those gaps and generate needed
theoretical contributions. (p. 221)

As well as considering the rigour of the research, it was also important to have an
awareness of the roles that I played through the EDR.

3.7.1 Role of the researcher in the study

Another aspect to consider during the conduct of EDR was my role as researcher and
designer during the conduct of the research. My position in both contexts traversed the
roles of project manager, designer and researcher working as part of an e-learning
development group (faculty-based for Contextual Case 1, and within the central
university support team for Contextual Case 2). My role with the University of Sydney in Contextual Case 1 was to project manage the development of the resources in consultation with the academic sponsors, educational designers and broader stakeholders who were primarily course co-ordinators. In Contextual Case 2, the design team also included two designers working at a distance to the university and a broader cross section of university stakeholders, such as student administration representatives and library and academic support staff. It was important to be aware of the impact of my views and background on both the conduct of the research and also the analysis of the results.

Given the extended timeframe of the research across several years, the gap between each context and my doctoral candidature commencing after the research was conducted at the first university, I have been provided with a unique opportunity to retrospectively view the individual outcomes of each contextual case and also to compare the outcomes achieved from EDR conducted at two very different organisations. Two processes enhanced the research. One was the conjecture mapping process, explained in Section 3.4. This approach enabled me to focus the reporting of this research on the salient features of the resource design in Contextual Case 1: that then informed the development in Contextual Case 2. It also opened up an opportunity to engage in retrospective analysis to understand how the reality of my world shaped the research outcomes for each context. The longitudinal research provided an opportunity to stand back from each context and engage in cross-contextual analysis and bring a broader understanding about how e-learning innovations may be enhanced or hindered in different university contexts. Lessons learnt from this EDR project added richness to the research outcomes (DPs) and provided opportunities to develop an emergent theory about how to support students as they transition to online distance learning at university.

These multiple roles, the timeframe of the research and the iterative nature of EDR also provided an opportunity to engage in critical reflection about how my multiple roles may have influenced the research process. While managing the design project at each university, the research team (including myself) were vested in ensuring that the
orientation resource was developed and implemented successfully. My place in the research was therefore not value-free. By taking into account comments made in the design team notes, reviewing the peer reviewed publications plotting the research outcomes, and returning to examine the data from two different settings during the conjecture mapping process during this doctoral research, I was able to consider how I may have influenced the research process. This space between development, implementation, and retrospective analysis led to the realisation that the main contribution to knowledge from this work was not the orientation resource itself, but rather the modified DPs, an improved understanding about transition to online distance learning, and enhancement of the conduct of the EDR process (Chapter 7).

3.7.2 Ethical considerations

The conduct of the research was approved by the Human Research Ethics Committees at both universities (refer to Appendix 5). In both contexts I had no teacher-student relationship with the students and in all cases the students were informed of the study when they first entered the online resource site. All data collected was de-identified and stored in password-protected computer storage folders or locked office locations.

The ethics of collecting, analysing and storing e-research data has been considered by Slade and Prinsloo (2013), who suggested an ethical framework to guide research involving learning analytics. One of the ethical principles of particular relevance to this research was the need to undertake transparent processes that outlined the purpose of the research for participants, and enable access to the data as well as indicate how individual identity would be protected. Consequently the consent process included an option for students to opt out of the collection of their data, and de-identification occurred prior to any analysis. This approach is confirmed by Reeves (2011) to be a moral practice recognising the complexity of the educational environment.

For Contextual Case 1 at the University of Sydney, a pop-up window appeared outlining the research when students first accessed the resource, indicating that their
activity as they explored the site would be accessible by the researchers. At that stage, students could request that their tracking logs not be included in the analysis for study and that this would not affect their ability to access any of the materials or participate in any of the activities. In addition, all evaluation surveys were anonymous. During the conduct of this research no student requested removal from the research. Students were asked if they would consent to participation in interviews to discuss their opinions of the resource, but no students indicated that they would participate in this part of the research. As noted earlier, any identifying information, such as the student ID, was removed after the data matching and cleaning process. Approval was granted from the University of Sydney Ethics Committee to use the data as part of this thesis (refer to Appendix 5).

In Contextual Case 2 at CDU, students were informed about the resource and the research via two methods. First, information about the resource and the research was provided on the first page of the resource site with a link to a survey where they could choose to opt out of the tracking data or participate in student interviews about their experience with the resource. Second, a notice was posted in their formal study unit site explaining the reason for this additional online resource in their listing of enrolled unit based online sites, as well as a copy of the Participant Information Sheet. The students who were interviewed were given a pseudonym. The electronic recordings of the interviews were stored in password-protected computers and only available to the researcher and the transcriber who had signed a confidentiality form. Appendix 5 provides the Human Research Ethics Committee approval letters for the research.

### 3.8 Summary

This chapter described the research design that was informed by educational design and a pragmatic epistemology. EDR formed the framework for this research which draws on educational theory to investigate complex practical issues. Phases of analysis and exploration, design and construction, and evaluation and reflection were completed through multiple iterations conducted at two contextually different Australian institutions.
identified as Contextual Case 1 and 2. A conjecture mapping process conceptualised the expected student engagement with the resources, directed a multiphase mixed methods design for data collection, and focused the analysis process so that the designed and theoretical conjectures could be evaluated.

This research extends the EDR methodology by examining two sequential contexts. It also demonstrated the blending of the model of EDR proposed by McKenney and Reeves (2012) with the conjecture mapping process developed by Sandoval (2014). The next chapter follows the EDR journey at the first university context.
CHAPTER 4: CONTEXTUAL CASE 1

This chapter demonstrates the application of the educational issue: student transition to online distance learning, described in Chapter 2 to the conduct of an EDR approach described in Chapter 3, at one university in Australia. Figure 4.1 summaries the EDR phases undertaken for Contextual Case 1.

Contextual Case 1: University of Sydney

Figure 4.1 Overview of EDR for Contextual Case 1
adapted from (McKenney & Reeves, 2012, p. 77; Oh & Reeves, 2013, p. 995)

After providing an overview of the university context, the first two phases of EDR are described. Phase 1, analysis and exploration, provides an overview of the student transition space applied to the context of postgraduate health science students studying online and by distance at the University of Sydney. It details the four draft DPs that guided the design process illustrating the close link between learning theories and design decisions. The application of these DPs to the second phase of EDR, design and construction, led to the development of the orientation resource known as Get Learning. The third phase focused on evaluating the patterns of engagement with the orientation resource from two further iterations. This data primarily informed RQs 1a and 1b, seeking to determine how students engaged with the designed resource including the
practice activities, and why the patterns of engagement may have occurred by analysing the relationship between engagement and demographic factors (RQ 2a), student comments and opinions, and design team records (RQ 2c). These results were then used to refine the draft DPs and create empirically verified guiding principles for future development of online orientation resources (RQ 3). It also provided a synthesis of issues to consider when applying the DPs to new contexts.

4.1 EDR Phase 1: Analysis and Exploration

The research had its evolution in the Faculty of Health Sciences, one of sixteen faculties at the University of Sydney. The faculty provided numerous specialist allied health postgraduate coursework qualifications (graduate certificate, diploma, masters) servicing the metropolitan Sydney area and also state-wide, national and increasingly globally located health cohorts. Students were mainly enrolled part time (76% of postgraduate coursework students in 2006) and were likely to be juggling employment and family responsibilities. To meet the demand, postgraduate courses were offered by distance education where students were not required to visit the Sydney campus. Courses ranged from a print-supported model with some online delivery to a wholly online and interactive model. Regardless of the model, technology was increasingly being used to support the teaching and learning process which had primarily been through the university’s enterprise LMS WebCT since 2001.

Alongside the more widespread use of the LMS, the University of Sydney had committed significant resources through a strategic e-learning initiative since 2004 (http://sydney.edu.au/edlearning/projects/2004.shtml). Project teams, consisting of both academic and professional educational design staff, worked across several faculties to carry out e-learning projects, meet identified needs, and provide a framework to promote educational change and innovation. As one of the three inaugural project managers, I worked closely with a faculty-based Academic-in-Charge and a representative group of academics to consider project proposals in an expression of interest process carried out.
across five health sciences faculties (Wozniak, Scott & Atkinson, 2005). Once projects had been selected, it was my role to work with educational designers and the project academics to scope out each of the projects to be carried out during one project period (three to six months) and to lead the overall project management (Ward, West, Peat & Atkinson, 2010). It was within this university context that strategic e-learning projects to address student orientation needs were developed.

4.1.1 Analysis of context for orientation resource development

In 2006 the largest health sciences faculty at the university commenced “The Starting-Out Project: orienting postgraduate coursework students to study in flexible learning environments”. It consisted of two strategic e-learning projects that were scoped to develop resources to prepare commencing postgraduate students for study in online distance learning environments (http://sydney.edu.au/elearning/projects/2006.shtml). The project that provided the backbone for this research focused on preparing commencing postgraduate students for online distance learning using the university’s LMS. The design brief was informed by the available literature about transition to distance and online learning (described in Chapter 2, Sections 2.5 to 2.7). The need for the project was further verified by the project team’s review of contextual information to inform the first phase of EDR. This included: evaluation of accessible orientation resources on the web; interviews with staff and students, analysis of current support materials provided to students when they enrolled in postgraduate courses; prior experiences from the educational designers in the project team, who also provided University’s e-learning help desk support; and local faculty research about commencing students’ views of their orientation needs.

Profiling of the current postgraduate student group identified that, in general, the cohorts were female; employed in health professional practice, usually fulltime; and residing in Australia, but with increasing numbers of students from other parts of the world. Most had a bachelor degree and basic computer skills but were uneasy about
They were also pursuing education for a career change or advancement through specialisation to enhance their current professional practice. This was consistent with the characteristics of online distance learners in the health professions outlined in Chapter 2, Section 2.4.2. This demographic, coupled with the imminent major upgrade of the university’s LMS planned for early 2007, provided additional impetus to develop support strategies for students as they transitioned to online distance learning.

This background enabled defining the educational issue within the University of Sydney context. The next stage was to draw on aspects from the theoretical perspectives and pedagogical models discussed in Chapter 2, Sections 2.2 and 2.3, and match these foundational constructs with the contextual nuances of postgraduate education at the University of Sydney, to guide decisions about the design of the learning environment. Goodyear (1999, para. 23) suggests that this is where beliefs about learning are turned into a “space of commitments and possibilities” in an intermediate stage between “philosophy and action”. Mayes and De Freitas (2004, p. 13) consider that “this is the crucial stage in the design process: where the learning theory is unpacked into a detailed pedagogical approach”. In the online learning environment this ensures that technology is used as a lever for implementing appropriate pedagogical practices rather than having the technological tools drive the educational design process. Four DPs emerged and are described in the next section. How each DP embeds the learning theories and pedagogical models described earlier (Chapter 2, Sections 2.2 and 2.3) is outlined with a supporting table to illustrate their connection with these theoretical perspectives and pedagogical models.

4.1.2 Generation of draft design principles

The project team developed a set of draft DPs to guide the design and construction of the orientation resource at the University of Sydney. Draft DPs are statements that “recommend how to address a specific class of issues in a range of settings” (McKenney
& Reeves, 2012, p. 19). They formed the basis of beginning statements from which we made design decisions about the educational intervention (an orientation resource) in a principled way. Each DP is explained next.

### 4.1.2.1 Design Principle 1: Three dimensions of orientation

**Orientation involves the interplay of three dimensions: technological, interpersonal and reflective practice, that blend in the transition from the student’s current world (often involving work and family life) to an academic world of study.**

This DP underpins the transition space for online distance learners (see Table 4.1, 1a).

<table>
<thead>
<tr>
<th>Elements derived from theoretical perspectives and pedagogical models</th>
<th>Supporting literature sources</th>
</tr>
</thead>
</table>
| 1a. Transition to the learning space-orientation to their space | Lave & Wenger (1991) – situated learning  
Levy (2006) – orientation to networked learning |
| 1b. Provide opportunities to project learner identity | Salmon (2000) – stages 1 & 2 of model of online learning  
| 1c. Activities that use the tools in the LMS should match as close as possible to how the tools are used in formal study | Lave & Wenger (1991) – situated learning  
Oliver & Herrington (2001) – authentic learning |
| 1d. Provide opportunities to self-assess learner readiness for online learning | Zimmerman (1990) – self-regulation |
| 1e. Include stories from other learners and teachers about how to make the transition to online learning | Bandura (1997), Dweck (2000) - self-efficacy |

DP 1 draws on the theory of legitimate peripheral participation by Lave and Wenger (1991) whereby learners initially experience or engage in the learning process on the periphery of the community of practice. They gradually work their way to the centre of that community (in this case, a community of online distance learners). This was conceived as an interactive process between individuals and their environment where
learning is “situated within the practices of communities and the outcomes of learning depend on the ability of the learner to participate in those practices” (Mayes & de Freitas, 2004, p. 9). The role of orientation was to assist the student to become aware of the context of online learning by observation and practice, and, in doing so, develop their online identity (Forrester & Parkinson, 2006) so that they could participate and move to more legitimate participation in the online learning community (Lave & Wenger, 1991).

The design of the activities embedded within the orientation resource was influenced by Salmon’s model of online learning (Salmon, 1998, 2000). This model embraces a social constructivist approach highlighting the importance of collaboration and dialogue in the learning process. Consequently the orientation resource contained authentic activities similar to the tasks that students would complete in their formal study, while simultaneously modelling progression through Salmon’s five stages (Table 4.1, 1b and 1c).

The CoI model (Chapter 2, Section 2.3.2) also informed this DP (Garrison et al., 1999). Of particular relevance is the concept of social presence which refers to the creation of a climate that supports and encourages learning. This directs the designer to consider, if and how, affective behaviours can be expressed in an online environment, providing opportunities for students to share aspects of their world and their opinions in a fun and supportive environment.

DP 1 recognised the emotional aspects of transition to university study (Christie et al., 2008; Kahu et al., 2015). It highlighted the need to address concerns around technical requirements for online study, guidance and advice about managing and organising study time, understanding how to navigate learning resources and the LMS and beginning to traverse the pathway from home and work life to study life (Forrester et al., 2005). It also embedded reflective aspects to prompt consideration about this transition phase (Table 4.1, 1d) which could be facilitated by sharing stories from other students about their experiences (Table 4.1, 1e). Goodyear (2001) outlines the relationship between the educational space created by universities and the student’s own place where they learn,
suggesting that how students use this space will depend on a complex array of factors, many of which the teacher is not able to influence. This DP therefore aims to provide guidance to the student about their place and is diagrammatically represented in Figure 4.2.

Figure 4.2  The transitional learning space of student orientation  
(Wozniak et al., 2009, p. 224)

Three essential features of the construct in Figure 4.2 are:

- the social divide across which the orientation timeline stretches between the domain of students’ personal lives and the domain of study;
- key dimensions of learning practice, such as critical reflection and interpersonal interaction, that go from one side to the other; and
- technology which stands in the middle, enabling the orientation process and social and physical distances to be crossed, while at the same introducing its own specific barriers and transition costs.

Transitioning to the students’ online distance learning space was conceptualised as a period of reflective and interpersonal realignment traversing the enrolment threshold and mediated by technology. This concept of the transition space provided a basic framework for starting to think about how the complex combination of physical, social and technical conditions of student orientation might be addressed on a consistent basis along the
underlying timeframe. This led to the second DP.

4.1.2.2 Design Principle 2: Orientation as an extended process

Orientation is an extended process continuing after enrolment.

This DP reinforced the notion that orientation involves an extended time frame starting from the period when prospective students make the decision to enrol in a course, then enter the online distance learning environment, and participate in the learning community. Resources designed to support this process needed to provide flexible access, depending on where the individual student was along their journey, provide just-in-time support and guard against falling into the trap of information overload (Brescia, Miller, Ibrahima & Murry, 2004; Comrie, 2007; Forrester et al., 2005; Laing, Robinson & Johnston, 2005; Levy, 2006; Moisey & Hughes, 2008; Motteram & Forrester, 2005).

DP 2 recognised the individual approach to learning (constructivist theory), as well as Beetham’s (2010) suggestion that when, and how, students access and engage in learning activities will depend on the degree of learner autonomy. Moore’s theory of transactional distance (1993) also informed DP 2, surmising that providing learning supports, such as orientation activities, should be encouraged early in the student’s academic life, but the students’ individual requirements will determine when they participate (Table 4.2, 2a)

Table 4.2
Relationship between DP 2 and learning theories

<table>
<thead>
<tr>
<th>Elements derived from theoretical perspectives and pedagogical models</th>
<th>Supporting literature sources</th>
</tr>
</thead>
</table>
| 2a. Flexible design enabling learners to access activities and modules as required by their learning needs. | Dewey (1938) – individual construction of knowledge  

4.1.2.3 Design Principle 3: Orientation success requires active participation

Orientation is aided by participation in activities within a safe risk-free environment.

DP 3 stemmed from experiential learning theory described in Section 2.2.4, indicating that we learn from personal experiences (Kolb, 1984). Provision of
opportunities to practise being an online distance learner was central to this DP (Table 4.3, 3a and 3b).

Table 4.3

<table>
<thead>
<tr>
<th>Elements derived from theoretical perspectives and pedagogical models</th>
<th>Supporting literature sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>3f. Developmental steps from simple navigation to communication in groups</td>
<td>Gagne (1970) – instructional design</td>
</tr>
<tr>
<td>3g. On completion of tasks feedback should include links to further supports and guides and prompt reflection about development</td>
<td>Schön (1987) – reflective practice, Kolb (1984) – reflection</td>
</tr>
</tbody>
</table>

There was considerable evidence that novice online learners desire an opportunity to practise, make mistakes and learn from their experience (Bozarth et al., 2004; Brace-Govan et al., 2001; Brescia et al., 2004; Dolan et al., 2009; Forrester et al., 2005; Levy, 2006; Motteram & Forrester, 2005; Vaill, 2013). Salmon (1998 p. 14) highlighted the need for “full scale encouragement to learn by doing, by experimenting and by making mistakes in a supportive environment”.

Inherent in the design of such practice activities was the concept of scaffolding,
which is a core element of constructivist theory, whereby a supportive structure is provided to students who may be approaching a task for the first time, and the element of structure in the theory of transactional distance (Table 4.3, 3c). It builds on Vygotsky’s concept of the zone of proximal development, mentioned in Section 2.7.2, whereby students move to greater participation in the online community as they become more familiar with the learning environment of an online distance learner. Other features that informed such structures when designing online orientation activities were the provision of clear guidelines and manageable steps in (Table 4.3, 3d, 3e and 3f). Other supportive elements (Table 4.3, 3g and 3h) that informed the design of these activities included feedback and links to further help for novice learners (McLoughlin, 2002).

4.1.2.4 Design Principle 4: Interaction is a core attribute

Interactions between content, teachers and other students is a core attribute of online learning which requires an appreciation of how knowledge is constructed and how to communicate and collaborate with peers in mainly text-based systems.

DP 4 extended DP 3 further by highlighting the social aspects of online participation and socio-constructivist views of learning. It was built on the premise that acquisition of knowledge is achieved through active participation, where students construct new ideas or concepts from their current or past knowledge. This is best achieved when knowledge is distributed socially with others. When applied to the context of online distance learning, the central role of dialogue in the learning process is highlighted, such that asynchronous discussion between students and teachers or between students, contributes to the development of a community of online learners (Garrison & Anderson, 2003; Laurillard, 2002; Levy, 2006). Elements that contributed to this DP had communication as a central focus (Table 4.4, 4a and 4d) but also emphasised the value of engaging in communication with others either directly (Table 4.4, 4b and 4e) or by learning about the experiences of peers (Table 4.4, 4c).
Table 4.4  
*Relationship between DP 4 and learning theories*

<table>
<thead>
<tr>
<th>Elements derived from theoretical perspectives and pedagogical models</th>
<th>Supporting literature sources</th>
</tr>
</thead>
</table>
| 4a. Provide guidelines for communication online | Salmon (2000) – Model of online learning all stages  
Garrison, Anderson & Archer (1999) – CoI |
| 4b. Participate in group activity | Salmon (2000) – Model of online learning all stages  
Garrison, Anderson & Archer (1999) – CoI |
| 4c. Opportunities to listen to experiences of others in the CoP | Lave & Wenger (1991) – Community of Practice  
| 4d. Include communicative elements to guide learner’s progress during activities | Salmon (2000) – Model of online learning all stages  
Moore (1993) – Transactional distance theory |
| 4e. Provide opportunities to communicate with other learners | Lave & Wenger (1991) – Community of Practice  
Garrison, Anderson & Archer (1999) – CoI  
Salmon (2000) – Model of online learning |

These four DPs, along with the contextual information, were used to make decisions about the design of the orientation resource. In keeping with the suggestions made by Gravemeijer and Cobb (2006) and McKenney and Reeves (2014), I used a retrospective lens for analysing and reporting the next two phases of EDR. The translation of each DP into the design elements is described next and then, following prototyping, the conjecture map is developed to illustrate how it was expected that students would engage with the designed orientation resource.

### 4.2 EDR Phase 2: Design and Construction

The design process was iterative commencing in 2006 and extending until the orientation resource was implemented in 2007. This section describes the reification of the DP into the design elements of the orientation resource, refinement of the prototype
(Iteration 1) and the conjecture map. Throughout Phase 2, feedback was sought from a range of university staff and current students.

### 4.2.1 Get Learning orientation resource design

The resource to be described in this thesis was known as *Get Learning*, one component of a broader suite of resources known as *Getting-On-Track* consisting of three stages - *Get Real, Get Started* and *Get Learning*. Prior to enrolment, prospective students encountered *Get Real*, an open access website with diagnostic elements driven by user-generated input enabling prospective students to reflect and assess their own readiness for study (Lever, Mahony & Wozniak, 2007; Wozniak et al., 2009). Upon enrolment students received *Get Started* (as a PDF via email): an instruction leaflet encouraging them to log in and begin to navigate the institution’s learning LMS, with simple visual explanations to help them accomplish this. Prior to the start of the formal study, students gained access to *Get Learning*, an activity-driven website housed within the institution’s password-protected LMS. Researching student engagement with the third component of this orientation suite is the focus of this thesis, so the design elements of *Get Learning* will be outlined in more detail next, including how each of the DPs were reified into the elements of the resource. Figure 4.3 (p. 181) illustrates two parts of the conjecture map: alignment of the DPs to the design elements and the mediating processes (ways that students were expected to use *Get Learning*). The remainder of the conjecture map, the intended outcomes, design and theoretical conjectures will be outlined in Section 4.2.3, after the prototyping (Iteration 1) is described.

*Get Learning* provided a gradual post-enrolment initiation into the construction of an online community, blended with an introduction to the role and responsibilities of being an online distance learner. The tools and materials used the same LMS encountered by students in their university study and embedded task structures in the form of bite-sized interactive activities so students could experiment with common online learning tasks in a supportive risk-free environment (DP 3).
Table 4.5 (p. 119) provides details of each of the five modules, activities and supports assisting the student with online learning. The modular design made the skills and expectations explicit by introducing the student to the concept (e.g., time management in Module 1) leading to an activity. While sequential completion of the modules was implied, the pathways for accessing the modules were not prescribed, allowing for student choice and flexibility in module completion (DP 2). The participant structures aimed to encourage students to try out the practice activities, which provided timely scaffolds to assist them to hurdle any technical barriers in the form of video clips or images or pdf guides (DP 1). These activities aimed to do more than simply develop a student’s technical abilities in online distance learning. They enabled students to explore what it meant to actively engage with other students in an online environment to build a collaborative community of learning (DP 4).
Table 4.5  
Get Learning modules, activities and supports  
(Wozniak et al., 2009)

<table>
<thead>
<tr>
<th>Get Learning Module</th>
<th>Activities</th>
<th>Supports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module 1:</td>
<td>Navigation task and self-test using quiz tool</td>
<td>Link to Technology challenge in Get Real</td>
</tr>
<tr>
<td>Finding your way</td>
<td>Time management exercise using calendar tool</td>
<td>Feedback on self-test</td>
</tr>
<tr>
<td>around</td>
<td></td>
<td>Link to life zone of Get Real</td>
</tr>
<tr>
<td>Module 2:</td>
<td>Posting and replying to discussion forums</td>
<td>Discussion activity moderated</td>
</tr>
<tr>
<td>Communicating with</td>
<td>Managing university and LMS email</td>
<td>Student use monitored and individual encouragement provided by moderators to lurkers to post</td>
</tr>
<tr>
<td>others</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Module 3:</td>
<td>Forming online groups</td>
<td>Discussion activity moderated</td>
</tr>
<tr>
<td>Building collaborative groups</td>
<td></td>
<td>Tips on how to construct knowledge in online groups</td>
</tr>
<tr>
<td>Module 4:</td>
<td>Submitting assignments online and getting feedback</td>
<td>Student use monitored and individual feedback provided on assignment submission</td>
</tr>
<tr>
<td>Getting your</td>
<td>Searching for online resource</td>
<td>Links to university resource for postgraduate students</td>
</tr>
<tr>
<td>assignment done</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Module 5:</td>
<td>Paraphrasing activity</td>
<td>Student comments about academic honesty</td>
</tr>
<tr>
<td>Doing the right thing</td>
<td>Endnote activity</td>
<td>Links to plagiarism policies, how to contribute to group work, academic writing skills</td>
</tr>
<tr>
<td></td>
<td>Reflection about group activity in Module 3 - Collusion</td>
<td></td>
</tr>
</tbody>
</table>

Salmon’s model of online learning was introduced in Modules 1 to 3 as a framework to guide their discursive practices (DP 4). Collaborative learning activities were embedded in Modules 2 and 3 to scaffold development of online social and cognitive presence (Garrison et al., 1999) and encourage inquiry, more reflective dialogue and deeper learning (DP 4). These activities aimed to foster collaboration and the sharing of ideas through asynchronous discussion activities. First students were asked to post to the initial discussion forum by sharing some simple non-threatening information such as their location and the month of their birth. This then led to a further activity to form a group based on the season in which they were born as part of the activities in Module 3. This self-created group was then asked to share their reasons for studying online and summarise the groups’ contributions. The final activity asked students to reflect on their participation in the discussion groups and identify tips for making online discussions...
work. These simple discussion activities replicated the first three stages of Salmon’s model of online learning which addressed significant obstacles for many students (Levy, 2006). The subsequent activities, undertaken in Modules 2 and 3, focused on building supportive groups online, and fostering the sense of an online community. Although the design of the discussion activities anticipated some level of moderation by project team members to model teacher presence in the online discussion environment (participant structures) (Garrison et al., 1999), they could also be implemented without any monitoring or moderation if resourcing was not available.

Overall there were 12 different activities embedded into the design of the five modules which required the use of five different types of online tools within the LMS: calendar, discussion, email, quiz and assignment submission. Further details of the Get Learning orientation resource is described in a publication by Wozniak, Mahony, Lever and Pizzica (2009).

The next section outlines the initial prototyping (Iteration 1) that was undertaken to refine the Get Learning orientation resource prior to completing the conjecture map and then implementing the resource in authentic settings as part of Phase 3.

4.2.2 First iteration to refine the prototype

Prototype testing of Get Learning in 2006 was conducted with a limited group of staff and postgraduate students. This indicated a proof of concept but motivated a substantial redesign of the early prototype, extending it well beyond its scope which was outlined in the original project plan. The scope extended to development of additional activities which fostered navigation around WebCT and the inclusion of an information literacy activity to search for a journal article as part of the assignment submission activity in Module 4.

In early 2007 prior to the implementation, a more comprehensive teacher evaluation was undertaken by reviewers, including local champions of online learning and 20 teaching and support staff from relevant postgraduate degree courses. Several comments
(both general [G] and specific [S]) were received, enabling further refinement to the specific content and instructions. No major design faults were identified, which meant the reviewers agreed to the content and the style of activities completed in each of the modules. They also mentioned the value of the resource for orientation of new teaching staff and particularly the casual teaching staff who generally were not available to attend face-to-face workshop sessions about using the LMS. These excerpts are representative of the overall response:

Thanks for the opportunity to look at this - what a great resource - I really like the upbeat you can do it language, really important for students who feel anxious ... I think it will be fabulous for students and a godsend for lecturers particularly those who are casual and juggling teaching for us with other jobs. (Iteration 1, ID# G2)

Get Learning general: The content is wonderful – just what unit coordinators need – we can refer our students back to the information – what a great tool! (Iteration 1, ID# S3)

Following modifications to Get Learning, the final task to be completed as part of Phase 2 was to develop a conjecture map to define how the overall design was expected to “play out” during the third implementation phase of EDR (Sandoval, 2004, p. 213).

4.2.3 Conjecture map for Get Learning

As outlined in Chapter 3, Section 3.4, making sense of how a designed learning environment operates in reality can be achieved by specifying the design conjectures (DCs). Given that this design was a new initiative, the project team did not know if, or how, the students would access the orientation resource, and if they would actually engage with the content and activities. Phase 3 (exploration and reflection) was primarily concerned with determining whether the design elements enabled the mediating processes to occur (RQ 1), rather than evaluating the extent of the outcomes of such student engagement. The DCs are represented as arrows between the design elements and mediating processes, shown previously in Figure 4.3 (p. 118), which is developed into the full conjecture map in Figure 4.4. The DCs are also listed.
It was anticipated that the design elements of the Get Learning resource would:

DC 1: Enable new online distance learners to navigate through the modules and locate and participate in the embedded activities. Three design elements (tools and materials, task structures and participant structures) influenced achievement of the mediating processes associated with student access and engagement in the activities. This included both the observable interactions and participant artefacts that indicated access to modules and completion of activities. This was evidenced from the LMS tracking data.

DC 2: Lead to access prior to and early in the semester. This drew links between the tools and materials (the LMS being available) and the mediating process that demonstrated students’ access occurring predominantly early in the semester before becoming committed with tasks associated with their formal study. This was determined by analysing the time of access from LMS tracking data. It was anticipated that the design of the orientation resource would stimulate students to access and participate in the resource and require minimal guidance and moderation from the project team.
DC 3: Demonstrate collaboration between students in the discussion activities modelling the first three stages of Salmon’s model of online learning. Therefore completion of the activities with the designed participant structures would enable students to share their ideas and build on each other’s knowledge, which was evidenced from content analysis of the discussion board postings (participant artefacts).

While the DCs and mediating processes indicated how we expected students would engage with Get Learning, the intention was to orientate students to online distance learning and aid their transition to this learning environment. The final column in Figure 4.4 lists the intended outcomes expected from implementing the orientation resource. The project team expected that students would confirm the relevance of the Get Learning content; that participation in the activities would lead to lessening the technical anxiety of using the LMS for finding information, completing assignments and communicating with others online; and, that the communication activities would demonstrate interaction between students that could lead to development of a collaborative online community. It was not possible to link student engagement with the resource to their achievement in their formal study or their retention in their course of study. Given the beginning nature of the initiative, and that the students were likely to be new to online distance learning, this EDR project did not aim to measure learning. Instead, by analysing student engagement with the orientation resource it was hoped it would inform our understanding of student transition (DP 1). Therefore the TCs aimed to gather preliminary insights about whether the mediating processes would lead to the intended outcomes. The TCs are described next and illustrated in the right-hand section of Figure 4.4. As a result of:

TC 1: Accessing the module content and activities, the students report achievement of the intended learning objectives for each of the modules and the relevance of the content included in the orientation resource to their transition to online distance learning (evaluated from survey results, LMS tracking data and content analysis of the discussion board posts);
TC 2: Accessing the resource, activities are completed successfully and students report a lessening of anxiety about online learning. They also note the value of engaging in practice activities in a risk-free environment (assessed through activity completions and analysis of the survey data);

TC 3: Students participating in *Get Learning*, the three dimensions (technology, interpersonal and reflection) underpinning the design, will emerge as themes in the participant artefacts or survey information confirming their relevance for transition to online distance learning.

This thesis reports a retrospective analysis of the orientation trajectories used by students that provided evidence to formulate a chain of reasoning for answering each of the research questions: how students engage with the resource (RQ 1) and why the levels of engagement occurred (RQ 2). By defining the extent to which the design and theoretical conjectures actually play out during implementation, evidence was gathered about the two main outcomes of EDR: modification of the initial DPs and greater theoretical understanding about transition to online distance learning (RQ 3). It also helped to uncover unanticipated mediating processes and unintended outcomes, which, in turn, led to development of additional DPs or new understandings about designing for student transition to online distance learning. The next section describes the third phase of EDR, implementation of two iterations (known as Iteration 2 and 3) in the authentic practice setting.

4.3 EDR Phase 3: Evaluation and Reflection

4.3.1 Overview of a further two iterations

The *Get Learning* resource was implemented in two further iterations: Iteration 2 occurred in Semester 1 2007 and Iteration 3 during Semester 2 2007. Table 4.6 provides an overview of the characteristics of the cohorts for each iteration. More detailed data was available for iteration 2, including age, gender and mode of enrolment. This confirmed the anticipated student characteristics obtained during the exploration, Phase 1 (Chapter
4, Section 4.1.1), justifying the design to meet the needs of predominantly female, mature-age students, studying part time.

Table 4.6
Participant and implementation characteristics for Iteration 2 and 3

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Iteration 2, Semester 1 2007</th>
<th>Iteration 3, Semester 2 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of students given access</td>
<td>178</td>
<td>291</td>
</tr>
<tr>
<td>Gender</td>
<td>69% female, 31% male</td>
<td>Not known</td>
</tr>
<tr>
<td>Age</td>
<td>Range 21-66 yrs. Mean 37.6 yrs.</td>
<td>Not known</td>
</tr>
<tr>
<td>Enrolment mode</td>
<td>84% part time</td>
<td>Not known</td>
</tr>
<tr>
<td>Resource made available</td>
<td>7 days prior to semester 1</td>
<td>14 days prior to semester 2</td>
</tr>
<tr>
<td>Project team moderation</td>
<td>Discussion board: initial post with follow-up weaving and summarising</td>
<td>Discussion board: one initial post, no follow-up</td>
</tr>
<tr>
<td></td>
<td>Email advice to assist in accessing content and activities</td>
<td>No advice to assist navigation</td>
</tr>
</tbody>
</table>

The main difference between the implementation of these iterations was the degree of moderation and monitoring that was undertaken. During the second iteration, the project team was interested in understanding if the design of the resource led to engagement with the modules and participation in the activities, so it was decided to monitor student access carefully and provide feedback to the students about their access patterns (see Section 4.3.2.2). Two members of the project team (including myself) carried out this moderation activity. Student access and engagement with the resource was closely monitored, on a daily basis, in the weeks prior to the formal commencement of the semester and through the first three weeks of the semester, by reviewing the LMS tracking statistics and analysing the sections of the resource accessed each day. This approach allowed the project team to evaluate two design conjectures (DC 1 and DC 2).

In addition, the moderation of discussion board activities in Get Learning (three activities in total, occurring in Modules 2 and 3) differed between Iteration 2 and 3. During Iteration 2, the same two project team members not only provided introduction
messages but also engaged in some additional summarising and weaving of postings (Salmon, 2000). In the third iteration, the effect of adopting a more minimalist monitoring approach was evaluated, as the resource design was intended to function as a stand-alone resource with negligible monitoring. This was a pragmatic response to reduced staff time, as well as an opportunity to observe student activity under limited moderation conditions and gain an insight about the future maintenance and sustainability of the resource.

For Iteration 2, access was provided to 178 postgraduate students enrolled in six coursework Masters courses in the Faculty of Health Sciences (sexual health n=84, developmental disabilities n=23, information management n=10) and the Faculty of Medicine (medical education n=48, paediatric medicine n=6, renal medicine n=3) and one professional doctorate course in the Faculty of Health Sciences (n=4). The majority were studying at Masters level (121, 68%), part time (149, 84%), and resided within Australia (152, 85%). All courses were delivered fully online with no face-to-face sessions. Overall for Iteration 2, the majority of students were commencing their studies in Semester 1 2007 and ranged widely in age (from early 20s to late 60s). In Iteration 3, the cohort was expanded to include students enrolled in postgraduate studies in a third faculty, Nursing and Midwifery, although precise data regarding the age and gender was unknown. Students from the additional faculty in Iteration 3 may have commenced their studies in semester 1 or 2, but students in Iteration 3 from the original two faculties were commencing study in semester 2 and did not include any students who had already accessed the resource in Iteration 2. In Iteration 3, 291 students were given access to the resource.

Get Learning was made available to postgraduate students prior to the commencement of each of two semesters in 2007 (one week prior for semester 1 and two weeks prior for semester 2). Students were sent an advisory email by a teacher responsible for the course in which they were enrolled. They were provided with the Get Started guide in PDF or hardcopy, and encouraged to work through the five modules commencing immediately with the suggestion that they were completed by the end of the
first week of semester. Their participation in the Get Learning resource was not mandated and did not contribute to assessment scores.

Students were asked to complete an anonymous three minute feedback evaluation survey at the completion of each module (Appendix 1). The survey asked for feedback about the achievement of module specific learning objectives, Likert-scale opinions about the relevance and helpfulness of the module activities for their learning (RQ 1b) and some open-ended questions to suggest improvements to the resource (RQ 2c). The number of participants that completed the module feedback surveys varied, ranging from 41 to five responses across all the modules, with a tendency for a reduction in completions for the latter modules and also a lower number of responses in Iteration 3 (see Table 4.7).

Table 4.7
Completion of Module Feedback Surveys

<table>
<thead>
<tr>
<th>Module number and Content Focus</th>
<th>Iteration 2 n=119</th>
<th>Iteration 3 n=108</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module 1: Navigation</td>
<td>40</td>
<td>27</td>
</tr>
<tr>
<td>Module 2: Communication</td>
<td>41</td>
<td>21</td>
</tr>
<tr>
<td>Module 3: Groups</td>
<td>28</td>
<td>5</td>
</tr>
<tr>
<td>Module 4: Assignments</td>
<td>29</td>
<td>8</td>
</tr>
<tr>
<td>Module 5: Academic Integrity</td>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td>Total responses for all surveys</td>
<td>150</td>
<td>66</td>
</tr>
</tbody>
</table>

As the surveys were completed anonymously and were located on the last page of each module, it is likely that the students completing the surveys had also attempted the activities and may have completed more than one survey. Therefore the survey data only gives insights about the opinions of those students who engaged with the resource and does not illuminate factors that may have caused students to not progress to this level of engagement with Get Learning. The results aimed to triangulate the LMS data, and provide further insights about the design of Get Learning to illuminate other aspects not captured from this data source.
During the conduct of EDR it is usual practice to make modifications to the designed solution in between iterations. While this occurred between the prototyping in Phase 2 and the second iteration, with a broadening of content and activities, the time period between Iteration 2 and 3 was short (two weeks) so the only changes made were those described above (timing when the resource became available and the level of moderation). In addition, some minor modifications to the instructions and labelling of sections were made to provide a more explicit link between module content and activities. Therefore the analysis and synthesis of the two iterations conducted during Phase 3 of EDR will be reported simultaneously to make comparisons between iterations.

As noted in Chapter 3, Section 3.6.1, the data presented in the following sections was extracted from the LMS, cleaned and coded manually and cross matched by analysing the mediating artefacts created when students engaged in the activities within the resource, as well as project team comments collected during each iteration. For example, in Module 1 data was able to be extracted to determine the extent of engagement with the two practice activities: if the student had read the calendar entry and added a calendar entry and if they had started the quiz and completed it, including the time taken to complete the quiz. Appendix 4 lists the 41 items coded from Iteration 2 (demographic and engagement data) and 28 items for Iteration 3 (predominantly engagement data). This data set contributed to the analysis presented in the next section.

4.3.2 Evaluation of access and engagement with Get Learning

This section will evaluate the extent to which the design conjectures proposed in Section 4.2.3 led to the observed mediating processes by evaluating the levels of access and engagement in the resource. Data collected for both Iteration 2 and 3 will be examined with particular attention to identifying unexpected mediating processes and other outcomes such as unusual access pathways. The results and analysis to be discussed in this section are primarily addressing RQ 1: How do health science students engage with an online orientation resource designed to support the transition to online distance
learning? It also considers the sub-questions: RQ 1a: what is the level of student engagement with the orientation resource; RQ 1b: what types of orientation activities do students explore to develop their skills in using the LMS; and RQ 2a: is there a relationship between the levels of engagement and student demographics? First, the extent of access and engagement in activities will be outlined; then the degree to which moderation and monitoring of student activity may have impacted engagement, and also the timing of access. As each area is discussed comments from students about their experience of using the orientation resource are integrated with the narrative analysis (RQ 2c), as well as outlining any unanticipated mediating processes and outcomes.

4.3.2.1 Overall level of engagement with the resource

Engagement with the resource was expressed as a continuum outlined in Table 4.8: from no access (Column A), to only accessing the homepage (Column C), to accessing deeper pages in the resource (Column D to E), to starting an activity (Column F), to full engagement by completing an activity (Column G).

In Iteration 2, Get Learning was accessed by 156 (87.6%) of the 178 students (22 did not access the resource); and, of the 156, a further 14 accessed the homepage but did not explore further. Therefore, 142 (80%) showed an interest in the resource by exploring beyond the homepage by accessing the modules or engaging with the activities. During Iteration 3, 226 (78%) accessed the resource (65 did not access the resource); and, of the 226, a further 19 accessed the homepage but did not explore further, so therefore 207 (71%) engaged with the content or activities in the resource. A Chi-square test for independence (with Yates Continuity Correction) indicated that there is a significant association between accessing the resource and enrolment in first semester (Iteration 2), although the effect size is considered small ($\chi^2[1, n=469] = 6.631, p=0.010, \phi = 0.125$). This could be explained by the higher levels of monitoring and feedback provided by two project team members during Iteration 2 and will be discussed later in Section 4.3.2.2. Table 4.8 also shows these statistically significant associations.
Table 4.8
Extent of engagement with the resource for Iteration 2 and 3

<table>
<thead>
<tr>
<th>Access and degree of engagement with resource and activities</th>
<th>low engagement</th>
<th>high engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td>n (%) n (A+B)</td>
<td>A: Did not access</td>
<td>B: Accessed with or without exploring past homepage (C+D)</td>
</tr>
<tr>
<td></td>
<td>C: Did not access deeper pages</td>
<td>D: Accessed deeper pages with or without activity finished (E+F)</td>
</tr>
<tr>
<td></td>
<td>E: Accessed deeper pages didn’t start any activities</td>
<td>F: Activity started (G+H)</td>
</tr>
<tr>
<td></td>
<td>G: Activity started but did not finish</td>
<td>H: Started and finished at least 1 activity</td>
</tr>
</tbody>
</table>

Overall Access
Iteration 2 (Semester 1)
- 178
- 22* (12%)
- 156* (88%)
- 14 (9%)
- 142 (91%)
- 22** (26%)
- 120** (84%)
- 30** (25%)
- 90** (75%)

Overall Access
Iteration 3 (Semester 2)
- 291
- 65* (23%)
- 226* (78%)
- 19 (8%)
- 207 (92%)
- 106** (51%)
- 101** (49%)
- 55** (54.5%)
- 46** (45.5%)

*p<0.05, **p<0.001
A key design conjecture (DC 1) was that students would not just access the resource but also actively participate in the activities valuing their role in assisting transition to online distance learning. By combining the tracking data from the LMS with the participant artefacts produced from completing activities, it was possible to determine the granularity of engagement with the activities (RQ 1b). For example, the LMS tracking data was able to indicate if the discussion area was accessed, if discussion postings were read and also if any discussion postings were made. If the discussion area was not accessed then this is noted in Column E of Table 4.8; if a posting was read with no active engagement by posting or replying then this was considered to fall into Column G; and if a posting was successfully made with a record of the discussion post in the forum, it was considered to fall into Column H. Likewise, if the quiz (assessment) was started but not submitted this was also considered G, and H if submitted. The data was analysed for all activities and combined, so that if a student completed any one of the 12 activities with evidence of completion then they were included in Column H. Statistically significant associations are discussed next.

As noted earlier, there was a significant association between accessing the resource and enrolment in Semester 1 (Columns A and B). There was very little variation in engagement with the content of the resource between Iteration 2 and 3 (Columns C and D); however, the degree of engagement in the activities did differ between iterations with higher commencement of an activity (Column F) and completion of an activity (Column H) in Semester 1. A Chi-square test for independence (with Yates Continuity Correction) confirmed this and indicated that there was a significant association between starting an activity and enrolment in first semester ($\chi^2 [1, n=349] = 44.732, p=0.000, \phi =0.364$) and also completing an activity and enrolment in semester 1 ($\chi^2 [1, n=221] = 18.878, p=0.000, \phi =0.302$). The phi value indicated that this is a medium effect size. It is possible that the differences noted in Columns E to H is related to the moderation support provided in Iteration 2. This difference is further analysed in the next section.
4.3.2.2 Unexpected initial access pathways

As indicated in Section 4.3.1, two project team members carefully monitored the access pathways during the early weeks of Iteration 2 and were surprised at the different ways that students initially entered the content and activities of Get Learning. This was unexpected as DC 1 had predicted that all the students would go directly to the homepage and then move to the module of their choosing, subsequently engaging with the related activities. This would mean that they potentially had an understanding of the background associated with the activity and its relevance to becoming an online distance learner.

A closer analysis of Column D in Table 4.8 noted three different access pathways, two of which were not anticipated in the original design (alternative entry 1 and 2). Table 4.9 details these access pathways and Figure 4.5 provides a visual representation of these variations (see p. 133).

Of those students accessing the resource, 70% (100) in Iteration 2 and 32% (66) in Iteration 3 used the expected pathway accessing the homepage and then moving to one of the modules to explore its content (expected entry pathway). A small number of these (18 in Iteration 2 and 24 in Iteration 3) visited the homepage initially and then did not select a module until they returned for a second visit. This meant that the embedded activities in each module were accessed within the narrative and content intended for a beginning online distance learner. The vast majority accessed Module 1 as their first module “Finding your way around”, with the next most popular initial module being Module 4 “Getting your assignment done”.

One of the alternative entry pathways noted from the tracking data was where students accessed the homepage but then explored the course tools links on the left hand side of the homepage rather than moving to review the content modules on their initial entry (Alternative entry pathway 1, see Figure 4.5, Top). A larger number of students used this pathway in Iteration 3, compared with Iteration 2 (123, 60%; 32, 23% respectively).
Table 4.9
Initial access pathway for each iteration

<table>
<thead>
<tr>
<th>Group D from Table 4.8</th>
<th>Identifiable initial access pathway</th>
<th>Iteration 2</th>
<th>Iteration 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expected entry pathway (Figure 4.5, Top)</td>
<td>Accessed the homepage, and then selected one of the 5 modules from the homepage either on the first access or when they revisited the homepage at a later date</td>
<td>70% 100</td>
<td>32% 66</td>
</tr>
<tr>
<td>Alternative entry pathway 1 (Figure 4.5, Top)</td>
<td>Accessed the homepage, and then explored the course tools on the left hand menu</td>
<td>23% 32</td>
<td>60% 123</td>
</tr>
<tr>
<td>Alternative entry pathway 2 (Figure 4.5, Bottom)</td>
<td>Accessed the resource through the icons on the course list, missing the homepage completely</td>
<td>7% 10</td>
<td>8% 18</td>
</tr>
</tbody>
</table>

Figure 4.5   Multiple entry pathways
Top: Homepage illustrating expected entry pathway and Alternate entry pathway 1
Bottom: Alternate entry pathway 2 accessed from course list
This meant that students accessed activities via the course tools menu through the link to announcements, assessments, assignments, calendar, discussions or mail, rather than the module pages. A second, less frequent, alternative entry pattern was noted where students accessed the resource initially by skipping the homepage entirely, entering the resource through the “New Discussion Message”, “New Assignment” or “New Assessment” icons on the course listing page (see Figure 4.5, Bottom). A similar percentage of students used this entry pathway in each iteration (Iteration 2: 10, 7%; Iteration 3: 18, 8%). Both of these alternative entry pathways presented a risk to the intended design by taking the students directly to activities or pages without the associated module content, hence the students may have missed the context of the activity and its relationship to developing online learning attributes. It is unclear from this data why the first alternative entry pathway was greater in Iteration 3, however this may have been due to prior experience in using the LMS in semester 1, leading to habitually exploring other LMS sites this way.

The importance of providing clear signposts for navigation also emerged as a theme from the survey data analysis. Navigation was noted by some as not being “instinctive”, with students indicating the need for improvements to be made to link the completion of activities to the next section of the resource or opening the activities in a new window so the content and activity could be viewed simultaneously. There were however multiple supportive comments indicating that the resource was: “easy to follow and well structured”; “gave me guidelines to participate in all activities, well presented and organised”; “structure and activities well thought out”. There were also suggestions that the video guides and pictures were helpful providing: “a visual cue as to what I needed to do, very helpful for non-IT person”. Evidence of alternate entry pathways led to the development of an additional DP related to providing navigation signposts for new online distance learners, outlined in Section 4.3.5.

Further analysis of these alternate access patterns will be considered in the next section as it is important to consider if the initial access pathway had any impact on the level of further engagement in the resource, such as starting activities and completing
them. It is also helpful to understand if the close monitoring and guidance activities undertaken by the moderators during Iteration 2 had any real impact on how the students engaged with the resource as this has implications regarding the sustainability of such resources over time.

Due to the emergence of unexpected entry pathways to the modules and activities during Iteration 2, as well as an observation of other signs of incomplete engagement with the resource (e.g., lurking but not participating), the project team decided to develop a range of strategies to provide more intensive initial support to these students, particularly when it was noted that the students appeared to miss vital content and the underpinning rationale for engaging in each of the activities. Depending on the issue identified by the moderators, customised suggestions and advice were sent as mail messages to the students during the first 3 weeks of the semester. For example, in Iteration 2, students who entered the resource via the alternative entry pathways, accessing activities without viewing the module content, may have been confused by the navigation. These students were given further supportive one-on-one instructions in an email from the moderators. Students who only accessed the first module were encouraged to try out other modules. Those who appeared to be reading the discussion postings in Module 2 or 3 but not participating were also encouraged to become more active by highlighting the value of participation and sharing ideas in online discussion forums.

A total of 143 students received an encouraging message from one of the moderators (some receiving more than one) and most students 76% (108) acted on the information provided in the message by going back into the resource and following up on the suggestions provided or advising the moderators their reasons for not engaging. Two comments in the evaluation surveys noted that the emails they received were encouraging and the moderators’ interaction in the discussions were helpful and supportive. This confirmed that a personalised approach which demonstrated supportive teacher presence online may be required to encourage students to see the relevance of orientation activities to online distance learning. In contrast, during Iteration 3 there was no customised
guidance or ongoing support provided to students and activity completions were much lower. This provides some evidence that one-on-one support will lead to greater engagement by students and is a possible reason for the higher completion of activities noted in Iteration 2 (Column H in Table 4.8, p. 130).

4.3.2.3 Other factors that influenced levels of engagement

Evidence noted in Chapter 2, Section 2.6, indicated that students will vary how they use technology for their study and that this is not related to age or other demographic factors. Age and gender data was available for Iteration 2 and statistical analysis confirmed that there was no association between age and the various degrees of engagement with the resource or between gender and the levels of engagement with the resource (refer to Appendix 6) (RQ 2a).

Given the variation in entry pathways into Get Learning (Figure 4.5, p. 133), and that this was not expected (DC 1), I then determined if this had any impact on the extent of engagement with the resource materials and activities. This analysis is outlined in Table 4.10.

Table 4.10
Relationship between extent of engagement with the resource and entry pathways for Iteration 2 and 3

<table>
<thead>
<tr>
<th>n (%)</th>
<th>Access and degree of engagement with resource and activities</th>
<th>Access and degree of engagement with resource and activities</th>
<th>high engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>low engagement</td>
<td>high engagement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Accessed resource beyond homepage</td>
<td>E Accessed deeper pages didn’t start any activities</td>
<td>F Activity started (g+h)</td>
</tr>
<tr>
<td>Iteration 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expected entry</td>
<td>100</td>
<td>17 (17%)</td>
<td>83 (83%)</td>
</tr>
<tr>
<td>Alternate entry 1</td>
<td>32</td>
<td>5 (16%)</td>
<td>27 (84%)</td>
</tr>
<tr>
<td>Alternate entry 2</td>
<td>10</td>
<td>0 (0%)</td>
<td>10 (100%)</td>
</tr>
<tr>
<td>Iteration 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expected entry</td>
<td>66</td>
<td>40 (61%)</td>
<td>26 (39%)</td>
</tr>
<tr>
<td>Alternate entry 1</td>
<td>123</td>
<td>58 (47%)</td>
<td>65 (53%)</td>
</tr>
<tr>
<td>Alternate entry 2</td>
<td>18</td>
<td>8 (44%)</td>
<td>10 (56%)</td>
</tr>
</tbody>
</table>

*p<0.05
Table 4.10 groups access according to the type of entry pathway used: accessing the activities from the homepage and modules, as expected; or via the course tools link (Alternate entry pathway 1); or via the activity icon links (Alternate entry pathway 2). To control for the effect of the different moderation and monitoring undertaken in the iterations, the level of engagement from different entry pathways was compared within the same iteration. Chi Square analysis for Column G and H of Iteration 2 shows that there is a significant association between the method of entering the resource and the completion of activities ($\chi^2 [2, n=120] = 10.777, p=0.005, Cramer's V=0.300$) with a moderate effect size. The highest completion of activities occurred when the resource was entered as the design intended, from the homepage into the modules and then to the activities. This was despite the fact that during Iteration 2 the moderators provided additional guidance when students explored the resource with the alternative patterns to encourage them to access the modular content and engage in the activities. A similar result occurred in Iteration 3, even when there was no additional guidance. Chi Square analysis for Column G and H shows that there was again a significant association between the method of exploring the resource and the completion of activities ($\chi^2 [2, n=101] = 7.953, p=0.019, Cramer's V=0.281$) with a moderate effect size.

It can be concluded from this information that navigation plays an important role in ensuring that students engage in online activities and that this is maximised when the activity is situated within the context of development of that skill. Therefore, students appeared to be more likely to complete the activities if they accessed them as part of the modules which described the role that these activities had for effective online distance learning. This provided information about RQ 2 (why the levels of engagement occurred) and will be discussed further in Section 4.3.5, where additional DPs emerged from this analysis.

4.3.2.4 Engagement with the modular content

The Get Learning resource was organised into five different modules, with activities linked to the content provided in each module (Table 4.5 p. 119). Figure 4.6 outlines the
total amount of time students accessed each module in hours and minutes for Iteration 2 and 3.

The relative patterns in overall time spent accessing each module is very similar across each semester, with the first two modules attracting more than 50% of the total time students engaged with the Get Learning resource. The assessment module also attracted a very similar percentage of engagement time. This data suggests that the navigation, communication and assessment modules were accessed for the longest period of time possibly indicating that these were the areas most valued by these students (RQ...
The main difference between these results is the percentage of time students engaged with the third module that focused on building collaborative groups online (less in Iteration 3). One reason could be that the lack of teacher presence in the online discussions during Iteration 3 lowered the incentive for students to complete these types of activities in the practice environment. The fact that all modules attracted a level of engagement by students helps to confirm that the content provided was of interest to the postgraduate students (TC 1). This was confirmed from the analysis of the survey results, where respondents were asked to self-assess if they felt the module objectives had been accomplished in each module. When combining the responses across all modules, 76% (n=114) of students felt they had met all the objectives in the modules in Iteration 2 and 62.1% (n=41) in Iteration 3. There were no instances where students indicated that none of the objectives had been met.

In addition, respondents were asked to indicate if they agreed or disagreed with the statements that the resource was relevant and helpful (TC 1). Analysis of the survey results across all modules indicated that participants found the modules both helpful (Iteration 2, 88.9%; Iteration 3, 80.3%) and relevant (Iteration 2, 96.7%; Iteration 3, 81.8%) by strongly agreeing or agreeing with the statements (RQ 2c). The largest difference in opinion between the semesters was in Module 1 (Finding your way around) where in Iteration 2 students rated the relevance at 92.5% and as 74.5% in Iteration 3, possibly because some students were more familiar with the LMS by semester 2. The ratings for relevance of all other modules was higher than 80% for Iteration 3, indicating that the content foci of all other modules were still considered relevant later in the year, lending further weight to the tracking data and conclusion that all content areas were appropriate for students. The overall tone of the content was appreciated with survey comments also reinforcing the supportive environment: “writing style very accessible”; “very easy to work through at your own pace”; and “very clear and helpful”.

Figure 4.6 (p. 138) also illustrates that there was higher overall time students accessed the resource in Iteration 2, which is further outlined in Table 4.11.
Table 4.11
Length and timing of sessions accessing resource

<table>
<thead>
<tr>
<th>Category</th>
<th>Iteration 2</th>
<th>Iteration 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total user sessions:</td>
<td>1225</td>
<td>820</td>
</tr>
<tr>
<td>Mean number of user sessions</td>
<td>7.85 (1-62, 10.6)</td>
<td>3.63 (1-29, 4.2)</td>
</tr>
<tr>
<td>Mean total time accessing resource</td>
<td>01:46 (00:01-14:12, 2:29)</td>
<td>00:30 (00:01-07:04, 1:07)</td>
</tr>
<tr>
<td>Median (hrs:min)</td>
<td>00:40</td>
<td>00:04</td>
</tr>
<tr>
<td>Mean user session length (hrs:min)</td>
<td>0:13</td>
<td>0:05</td>
</tr>
<tr>
<td>Most active day:</td>
<td>5-Mar-07 (day 1 of semester)</td>
<td>23-Jul-07 (day 1 of semester)</td>
</tr>
<tr>
<td>Least active day:</td>
<td>18-Jun-07</td>
<td>16-Sep-07</td>
</tr>
<tr>
<td>Most (least) active hour of the day:</td>
<td>16:00 - 17:00 (05:00 - 06:00)</td>
<td>11:00 - 12:00 (05:00 - 06:00)</td>
</tr>
</tbody>
</table>

On average, students in Iteration 2 engaged with the resource twice as long per session and three times as long overall, when compared with students accessing the resource in Iteration 3. Of note is the large range and standard deviation for both semesters, indicating the considerable variation in access for each student with regards to overall sessions and time spent accessing the resource. This variation is also reflected in the median time students spent accessing the resource which was considerably greater for Iteration 2. It is possible that the maximum values provided in the range data is an artefact of measurement. This could include time that the students stepped away from the computer and remained logged into the resource and therefore may not actually represent active time engaging with the content or activities of the resource, although the LMS would automatically log them out after a period of 20 minutes of inactivity. In both semesters the largest number of students visited the resource once (mode = 1) and the most active day was the first day of semester, although the most active hour varied between semesters being in the late afternoon in Iteration 2 and late morning in Iteration 3.

This data reinforces the wide variation in how students engage with such orientation.
resources (RQ 1). Once again, it is likely that the moderation support provided in Iteration 2 contributed to the greater number of sessions per student and the longer time that they engaged with the Get Learning orientation resource.

4.3.2.5 Engagement with the practice activities

Very few students completed all activities in every module. In Iteration 2, a total of five out of 90 students who completed any activity completed all five activity types (Table 4.12), and in Iteration 3 only one student out of 46 completed all activity types. The mean number of activity type completions for Iteration 2 was 2.15 (SD 1.25 Range 1 to 5) and for Iteration 3 was 1.82 (SD 1.08 Range 1 to 5).

Table 4.12
Extent of engagement with activities in each iteration

<table>
<thead>
<tr>
<th>Module and Activity</th>
<th>Type of engagement with activity</th>
<th>% who completed activity</th>
<th>N (range)</th>
<th>Iteration 2</th>
<th>Iteration 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module 1: Calendar Tool (no moderation prompts)</td>
<td>Viewed entry</td>
<td>59 (1-40)</td>
<td>39 (1-12)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Added entry</td>
<td>6 (1-12)</td>
<td>4 (1-4)</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Module 2: Mail</td>
<td>Sent mail</td>
<td>24 (1-5)</td>
<td>8 (1-2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Read mail</td>
<td>57 (1-8)</td>
<td>5 (1-4)</td>
<td>238%</td>
<td>63%</td>
</tr>
<tr>
<td>Module 2 &amp; 3: Discussion</td>
<td>Read message</td>
<td>92 (1-2589)</td>
<td>74 (1-556)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Posted message</td>
<td>62 (1-21)</td>
<td>24 (1-9)</td>
<td>67%</td>
<td>32%</td>
</tr>
<tr>
<td>Module 1: Quiz (no moderation prompts)</td>
<td>Started quiz</td>
<td>81 (1-9)</td>
<td>39 (1-12)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Finished quiz</td>
<td>72 (1-9)</td>
<td>37 (1-8)</td>
<td>89%</td>
<td>95%</td>
</tr>
<tr>
<td>Module 4: Assignment submission</td>
<td>Read instructions</td>
<td>59 (1-33)</td>
<td>46 (1-20)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Submitted assignment</td>
<td>31 (1-2)</td>
<td>11 (1-2)</td>
<td>53%</td>
<td>22%</td>
</tr>
</tbody>
</table>

It was also possible to analyse the spread of engagement across all the different activity types and consider the degree to which the students engaged in lurking behaviour: such as reading a discussion board message but not progressing to posting a message; reading a calendar entry but not actually creating an entry as instructed in the activity; starting a quiz but not completing it; accessing the assignment instructions but
not submitting the assignment sheet; and, finally, reading a mail message but not sending a mail message as outlined in the activity instructions. Table 4.12 compares activity participation between the two iterations. Some, but not all, of the differences between iterations can be attributed to the level of moderation. In both iterations, no actions were made by the moderators to encourage completion of the calendar entry or the quiz submission, and the percentage of students completing the activity is very similar between these iterations. The difference in the mail results can be explained by the moderators using mail as the mechanism for providing supportive feedback messages and is an artefact resulting from moderator activity. In Iteration 3, the number of students sending mail is higher than those reading mail so this reflects the true engagement with this activity.

One of the key purposes of the resource was to encourage interaction through the discussion board and foster collaboration (DC 3). The large difference between those reading a discussion message and posting a message between Iteration 2 and 3 is also likely to be due to the encouragement of the moderators during the first three weeks of the semester. Prior researchers (Levy, 2006; Salmon, 1998) have highlighted the need to promote active engagement with discussion postings. The difference in these results between iterations lends weight to the principle that teacher presence will promote greater engagement in discussion board postings. This finding was incorporated in the refinement of the DPs in Section 4.3.5.

In both iterations, there was evidence of students spontaneously engaging in supportive online behaviours and encouraging each other to enhance the interpersonal dimension of DP 1 (DC 3). Although students were isolated from each other in place and time they used encouraging tones in their communications: “good summaries provided so far”, prompting others to contribute by posting questions to each other. Later in the evaluations for this module, students stated that they appreciated the experience: “it was good having us post our own messages and replying to each other. I found it good since everyone else is doing the same thing, I felt comfortable posting up a message” (Iteration
Survey results provided evidence about the student experience of using the resources (RQ 2c). Participants valued the support of their peers as indicated by these comments:

“the thing which worked well in this activity was the element of participation, which stimulated interaction in an actual online environment with others, beyond simple posting of singular messages” (Iteration 2, survey Module 3, ID #93); “group discussion is very important in sharing ideas so this session was informative in regards to how to form a group that works as a team” (Iteration 3, survey Module 3, ID #53).

Other comments from the survey results referred to all activities, offering complimentary opinions about the practical nature of the resource, its structure and timely availability and the socialisation provided by the interactive communication activities. There was a strong sense of the perceived relevance of the resource to the participants’ current needs. Students stated that the activities in the resource were “real” and “enabling”. The discussion activities drew many positive comments and provided an opportunity for peer support and encouragement seeing “what other people had to say regarding the problems they were having”. Many participants commented on the “hands-on” and “practical” approach of the activities in the resource. The instructions and guidelines for activities in each module were described as “well structured”, “easy to read” and “easy to follow”. Importantly, students felt they were “not overwhelmed with too many instructions” and actively participated in the activities embedded in each module. Participants reported active behaviours such as “clicking around”, “practicing”, “experimenting”, “making mistakes and correcting them”, “flipping through the windows”, “enacting the tasks” and referring to the instructions “repeatedly”. In the assignment submission activity, participants noted how closely the task mirrored the requirements of assessment tasks within the subjects in which they were enrolled. In activities, such as managing email accounts, searching electronic databases and locating and downloading electronic journal articles through the library, participants expressed enthusiasm and relief at being able to see the immediate results of their efforts and being
guided to successfully complete tasks which had previously been a “source of intimidation and concern”. Participants consistently offered remarks that the active engagement in tasks was the main advantage of the resource: “active participation, actually doing tasks was helpful”.

Aligned to participants valuing the relevance and the opportunity to practise, many also enthusiastically expressed the value of doing so in an environment they considered to be “non-threatening”. There were numerous comments across all module evaluations valuing these attributes of the resource: “the interactive activities worked well to socialise me into the actual process of studying online”; “very practical, hands-on approach is good”; “gave opportunity to put theory into practice in a safe environment”. This also extended to comments made in the discussion activities with comments that they “worked well, especially for those who are not IT literate, and very non-confrontational”; “I felt comfortable posting up a message”.

It can be concluded that while those students who completed the activities clearly valued this active engagement, full completion varied according to the type of activity being undertaken. Engagement in communication with peers in an open forum was enhanced when there was teacher presence. Students may also be more likely to complete a practice assignment if they are guided in this process and provided with feedback about their success in submitting an assignment file; whereas for the quiz where feedback is provided instantaneously, the activity could be completed without moderator support. The implications of this engagement on the theoretical conjecture regarding participation in a risk-free environment (TC 2) will be discussed further in Section 4.3.5, where modifications were made to DPs 3 and 4.

### 4.3.3 Evaluation of timing of access to resource

The intention of the design was that students would access the resource as soon as possible, preferably prior to the commencement of semester or early in the semester (DC 2). Table 4.13 indicates that this was the case, with 75% of students in Iteration 2
accessing by the end of the first week of semester and 69% in Iteration 3.

Table 4.13  
Relationship between the timing of first access and completion of activities

<table>
<thead>
<tr>
<th>Timing of first access</th>
<th>Iteration 2</th>
<th>Iteration 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N (%) that</td>
<td>N (%) that</td>
</tr>
<tr>
<td></td>
<td>accessed</td>
<td>completed an activity</td>
</tr>
<tr>
<td>Accessed week prior to semester (1 week prior semester 1 and 2 weeks prior for semester 2)</td>
<td>31 (20%)</td>
<td>23 (74%)</td>
</tr>
<tr>
<td>Accessed week 1</td>
<td>86 (55%)</td>
<td>52 (60%)</td>
</tr>
<tr>
<td>Accessed week 2 to census date (approx. week 4 of semester)</td>
<td>27 (17%)</td>
<td>14 (52%)</td>
</tr>
<tr>
<td>Accessed after census date to anytime to end of semester</td>
<td>12 (8%)</td>
<td>1 (8%)</td>
</tr>
<tr>
<td>Totals</td>
<td>156</td>
<td>226</td>
</tr>
</tbody>
</table>

The difference noted in the pre-semester access is due to the earlier availability of the resource for Iteration 3. Earlier access was enabled in Iteration 3 following comments from students in the evaluation surveys from Iteration 2 and improved university processes that enabled earlier release of Get Learning to students. Apart from the pre-semester period and first week of semester, the period up until census date was also a significant time event as students were able to withdraw from a course of study and were not required to pay the university fees. This allowed time for the students to try out the unit of study and assess their own ability to continue with their study choice or make the decision to discontinue their study.

DC 2 also intended that students would try out some activities as early as possible. Table 4.13 shows that there was a trend indicating greater engagement with activities with earlier access, although for Iteration 2 this is likely to be related to the additional moderation provided during this iteration. The trend is still evident in Iteration 3, especially in the early weeks of the semester, although a lower number of students completed activities in this iteration.
Although DC 2 postulated that access would be predominantly early in the semester, the design team was also interested to determine if access also occurred later in the semester, as DP 2 suggested an extended orientation period. The last day of access was captured from the LMS tracking data and is shown in Table 4.14. A similar trend is shown in both iterations, whereby approximately half of the students were still accessing Get Learning beyond the census date, suggesting that students were still seeing value in accessing the resource later in the semester, perhaps using it to provide just-in-time support.

Table 4.14
Timing of last access with Iteration 2 and 3

<table>
<thead>
<tr>
<th>Last access to resource</th>
<th>Iteration 2</th>
<th>Iteration 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior to semester</td>
<td>2 (1.3%)</td>
<td>38 (17%)</td>
</tr>
<tr>
<td>During week 1</td>
<td>22 (14%)</td>
<td>28 (12%)</td>
</tr>
<tr>
<td>From week 2 to census</td>
<td>41 (26.3%)</td>
<td>66 (29%)</td>
</tr>
<tr>
<td>After census date to anytime to end of semester</td>
<td>91 (58.4%)</td>
<td>94 (42%)</td>
</tr>
<tr>
<td>Total</td>
<td>156</td>
<td>226</td>
</tr>
</tbody>
</table>

Analysis of the survey results from both iterations provides further commentary about the timing of access. Continuing students offered the resource in Iteration 3 indicated that although the resource was still useful, access to it in the first semester of their enrolment would have been preferable. Two students commented:

\[
I \text{ found that the example questions worked well as they enabled a better insight into the module. It is a shame this approach to course requirements was not incorporated at the beginning of the first semester.} \\
(\text{Iteration 3, survey Module 5, ID #63})
\]

\[
I \text{ came a bit late should have been introduced on the first semester on my part. But it is a good tool.} \text{ (Iteration 3, survey Module 1, ID #6)}
\]

Commencing students also indicated that earlier access to the resource would have been helpful. One student said:

\[
I \text{ felt I should have received this much earlier, especially when I was accepted on the course, now I feel am rushing this, when there is a lot of other things that have to be taken into consideration. I think this is a brilliant idea and is good for those who haven’t studied in ages.}
\]
Evidence for ongoing transition to online distance learning was also noted in other comments from both iterations: “The whole program is a very good resource, not only for getting prepared for e-learning but also for future reference” (Iteration 2, survey Module 1, ID #3), with some students in Iteration 3 noting that the resource did provide new information and greater understanding that they did not already have:

I already know how to complete these activities as I am a longstanding student of Sydney University, however I did learn some things which I did not know about. (Iteration 3, survey Module 2, ID #32)

I found the content relevant, as well it cleared a few issue/problems I had been experiencing from last semester. (Iteration 3, survey Module 2, ID #34)

This reinforces the value of providing accessing to Get Learning over a longer time frame reinforcing an extended orientation and transition timeline which contributed to understanding the educational design features for orientation resources (RQ 3).

Evaluation of the iterations of implementation in the third phase of EDR informed the reflections made about the extent of achievement of the conjectures and the relevance of the DPs in guiding the resource design. These aspects, including the relationship between this analysis and RQs, are outlined in the next two sections.

4.3.4 Reflections about the design and theoretical conjectures to inform the RQs

Examination of the iterations, engagement data and student experiences provide insights regarding the practicality of the DCs and the effectiveness of the TCs developed for the Get Learning orientation resource (Chapter 3, Section 3.7). Appendix 8 illustrates the themes that emerged from the analysis of the qualitative data sets and also contributed to answering RQs 1 and 2, and informed further development of the DPs that underpin how to design orientation resource for postgraduate health sciences students as they make their transition to online distance learning at university (RQ 3).

The design of the Get Learning resource aimed to provide timely and supportive activities for postgraduate health sciences students commencing study in an online
distance learning environment. The design intention was to encourage active participation in the embedded activities within the context of developing skills to be successful online distance learners (DC 1 and DC 2). The tracking data available from the LMS and analysis of the participation in the activities helped to provide evidence regarding the level of engagement (RQ 1a) and participation in the activities (RQ 1b). Triangulating this analysis with student survey results, discussion board postings and moderator notes helped to illuminate why these levels of engagement may have occurred (predominantly RQ 2c).

Overall, a high percentage of students accessed the resource, with only a slight difference between Iteration 2 and 3, indicating that students were sufficiently curious to access and explore the resource (DC 1). A surprising range of initial access patterns were noted, which indicated limitations to achievement of DC 1. Students did not necessarily follow the intended pathways for accessing the resource materials and activities, and therefore, missed the context of completing these activities for development of their online learning skills. This highlighted the need to provide clear navigation pathways between information and the practice activities, as well as methods to support new learners early in the semester. As noted in Chapter 2, Section 2.6.2, there was no clear age-related pattern of engagement but diversity of engagement patterns across the cohorts in Iteration 2 and 3 was noted. The relationship between how the students accessed the resource and their completion of practice activities indicated the value of situating activity participation within a skills development context. This reinforced the need to carefully design navigation and provide clear signposts linking activity to its related context. This was incorporated into a new DP in Section 4.3.5, Table 4.15 as DP 5 (p. 154-155).

Although not necessarily practical from a university resourcing perspective, engagement was higher when personalised feedback and support is provided. The length of time students spent exploring the resource was much higher during Iteration 2, which may be because this iteration occurred in semester 1 at the commencement of the
academic year rather than in the second half of the academic year for Iteration 3; or because the project team was more actively encouraging access during Iteration 2 by closely monitoring the type of access and providing assistance to maximise the student engagement. This led to the inclusion of aspects related to guidance and teacher presence in DP 3 and DP 4.

Participation in the activities was also significantly greater during Iteration 2. Differences between iterations were particularly noticeable with engagement in collaborative learning activities, such as asynchronous discussions and online group activities, indicating variable achievement of DC 3 which led to changes to DP 4 (See Section 4.3.5, Table 4.15). Activities that can be completed individually with automated immediate feedback (e.g., quiz activities) were completed by the majority of those students who commenced the activity. Other activities that may not receive such immediate reinforcement, such as mock assignment completion and online discussions, can lead to online lurking behaviours, such as reading instructions or postings by other students but not moving to the next step of active participation. It appears that dialogue through moderator encouragement and support plays a role in moving students to become more active online distance learners. This is supported by the distance education theory, where provision of both structure and dialogue reduces the transactional distance and provides a supportive learning environment enabling engagement for online learners (Goel, Zhang & Templeton, 2012).

Making the orientation resource available prior to the commencement of semester did encourage student engagement prior to becoming involved in formal study activities indicating achievement of DC 2. It appeared from Iteration 3, that the earlier the resource is provided, the earlier the engagement, although this did not necessarily translate to active participation with the practice activities. Therefore engagement in the activities appears to be enhanced through one-on-one support. Even though first access was predominantly prior to the commencement of semester, there was still evidence of continuing access beyond the first few weeks of semester. This reinforces the view that
orientation may be an extended process where students return to supportive information in a just-in-time fashion (DP 2).

While the focus of the analysis in this context was on understanding how health science students engaged in the resource (RQ 1), and therefore the practicality of the DCs, there is some evidence to begin to consider the effectiveness of the orientation resource and the intended outcomes (TCs). This provided insights about why these patterns of engagement may have occurred (RQ 2) and enhances our theoretical understanding about orientation and student transition to online distance learning.

The fact that all modules were accessed in similar proportions in Iteration 2 and 3, and that the navigation, communication and assessment modules were the most popular, demonstrates the relevance of this content to orientation and transition (TC 1). In addition, data from the survey results indicated that the intended learning objectives for each module was achieved, signifying that the content and activities in each module of Get Learning were aligned to the design intentions (TC 1). Survey respondents were also asked to suggest improvements to the resource and outline any areas where they needed further assistance. Comments were overwhelmingly positive, indicating that no improvements were needed, with 70% of the comments in both iterations stating that they did not need any further assistance (Iteration 2, 105 of 150 responses, and Iteration 3, 49 of 66 responses).

What was clear from the survey comments was the value in allowing students to practise online learning skills in a safe environment. Get Learning was noted as improving confidence and lessening anxiety, particularly overcoming fears associated with online learning (e.g., work would not be lost into cyberspace) (TC 2). Students commented that the resource allayed their technical anxiety: “any sort of practise will help in online learning, having a step-by-step guide makes it so much easier - takes some of the anxiety out of it” (Iteration 2). The opportunity for practicing activities was seen as “confidence building” and allaying “anxiety” (TC 2). Although comments expressed a level of anxiety towards the technology and online aspects, and trepidation about the
unfamiliar text-based study environment, it was also apparent that these students were adventurous and open to new experiences. The convenience of flexible study options was an over-riding factor for choosing to study in this manner. The inclusion of an information literacy component into Module 4, where students needed to find an electronic resource, was an addition resulting from feedback from Iteration 1 to expand the foci of assistance. One comment received reinforced this addition: “Thanks so much for this one! The online library has been a source of intimidation and concern for me, and this exercise was very helpful. I’m sure I’ll refer to it repeatedly.” (Iteration 2, survey Module 4, ID # 133)

Other students indicated that they would like more information about how to do library searches, how to use referencing software (five students), and more time to explore the academic writing site that was mentioned in module 5 (http://writesite.elearn.usyd.edu.au/). This provides some insight that students require a more integrated orientation to the distance study environment, beyond learning how to manage the online learning systems. This will be discussed further in Chapter 6, Section 6.2.6.

The intention of Get Learning was to encompass three dimensions of the orientation transition space, including a period of reflection, development of interpersonal interaction in online spaces, all mediated by the technology of the LMS (TC 3). Although the students were not explicitly asked to comment on the effectiveness of the resource in achieving these principles in the surveys or discussion activities, analysis of this qualitative data did uncover the notion of a novice making the transition to online distance learning (DP 1). References to the technical and interpersonal dimension of DP 1 were far more prominent than reflective comments. There were numerous comments that indicated that students needed to traverse a technology threshold, with several of the themes that emerged from the analysis connecting to the sense of a technology threshold. Students frequently commented in the early discussion postings that they were new to learning online: “a new challenge for me”; “I have been on a steep learning curve”;
“giving this a go for the first time, so fingers crossed it works” (Iteration 2); but also in Iteration 3: “attempting to get the swing of computer technology computer style”. There was indication from the evaluations that the resource and activities did meet their needs: “the content is very appropriate as it gave me the ability to work my way around the navigation of WebCT in my own time” (Iteration 3); “it works well because it is like a practice run to the real thing” (iteration 2). There were also comments suggesting that those who had studied in prior semesters still valued the engagement they had with the resource: “I already know how to complete these activities as I am a long standing student of Sydney University, however I did relearn some things which I did not know about.” (Iteration 3, ID #32).

Whilst the majority of comments received aligned with the technology dimension, there was also a strong focus on the interpersonal dimension, which was reinforced through the discussion activities and the need for peer and university support to provide encouragement and persistence in making this transition (TC 3). Survey data from the second and third module highlighted the value of sharing ideas and opinions with peers through asynchronous discussion. Comments noted the value of using the discussion board to build a collaborative group and how this interaction stimulated ideas. It is possible that in this postgraduate learning environment, where students were already health professionals and participants in the larger community of health practitioners, that once they became comfortable with the tools for learning, they could bridge the transactional distance and become legitimate participants in their new community of online distance learners.

The reflective dimension of the transition space was the least apparent from the data examined. Evidence of engaging in reflection was noted minimally in the discussion board postings, mostly when considering the role and responsibilities of an online leaner, such as needing to consider time delays when communicating asynchronously or a mention of self-realisation that their preference for learning was not in the virtual space. Some students commented on the advantage of reading “different perspectives” and
“sharing ideas” when using discussion boards. This aspect of TC 3 was not fully substantiated from the data collected at this contextual case, suggesting a need for further investigation by other qualitative techniques, such as student interviews, to more fully appreciate the lived experiences of these students.

As well as reflecting on the conjecture mapping process through the extent of achievement of the DCs and TCs, an important outcome from EDR conducted at this context was to modify the original DPs (RQ 3). The next section outlines these modifications which are outlined further in Table 4.15 (p. 154-155).

### 4.3.5 Modifying the design principles

As outlined in Chapter 3, Section 3.3, EDR enables development of creative approaches to solving real-world educational issues. The findings presented above indicate that Get Learning beneficially addressed the call for commencing student orientation at the postgraduate level by providing relevant support for this transition and an opportunity to practice authentic activities in a risk-free environment (Wozniak, Mahony, et al., 2012). However EDR also has the dual role of enhancing theoretical understanding through the modification of DPs to guide future educational developments (McKenney & Reeves, 2012). Therefore the analysis of data contributing to answering RQ1 and 2 also informs RQ 3, which aims to use the lessons learnt from the third phase of EDR to develop these DPs.

Using data mining techniques to examine the initial student access patterns to Get Learning helped to identify the most pertinent types of interventions that assisted these students as they entered the real online learning environment. In addition, the findings of this research indicated the value of using LMS tracking data to identify students who had not entered the resource; who appeared to have lost their way in its technicalities; and/or who had chosen a pathway to suit their own perception of their needs, with the attendant risk of being ill-prepared in the areas they skipped over. This highlighted the need to design careful navigation signposts to provide greater scaffolding.
### Table 4.15

*Modifications to the Design Principles following Phase 3 of EDR*

<table>
<thead>
<tr>
<th>Initial Draft Design Principle</th>
<th>Comments from implementation</th>
<th>Modified or new design principle</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DP 1</strong> Orientation involves the interplay of three dimensions, technological, interpersonal and reflective practice, that blend in the transition from the student’s current world (often involving work and family life) to an academic world of study.</td>
<td>Technological dimension is most apparent and interpersonal dimension is enhanced when there is teacher presence contributing to changes to DP 4. Content related to navigation, communication and assessment appears to be most relevant to these postgraduate students. There is a need to explore in more detail the reflective dimension.</td>
<td>Orientation primarily involves the interplay of technological and interpersonal dimensions that blend in the transition from the student’s current world (often involving work and family life) to an academic world of study. The role that reflection plays in facilitating this transition needs further investigation.</td>
</tr>
<tr>
<td><strong>DP 2</strong> Orientation is an extended process continuing after enrolment.</td>
<td>The earlier the access, the greater the student engagement, with access continuing beyond the traditional O week period. Varied access patterns led to development of DP 5.</td>
<td>Orientation is a process which is enhanced through early access and continues throughout the semester.</td>
</tr>
<tr>
<td><strong>DP 3</strong> Orientation is aided by participation in activities within a safe risk-free environment.</td>
<td>Students value the opportunity to practise in a non-threatening environment not linked to formal study tasks and assessments. Activities with automated and immediate feedback have higher engagement levels. Participation was also greater in iteration 2 where one-on-one guidance was provided. Students also value scaffolds and such supports that provide individual guidance.</td>
<td>Orientation is aided by participation in activities within a safe risk-free environment which is supported with customised guidance and feedback.</td>
</tr>
<tr>
<td><strong>DP 4</strong> Interactions between content, teachers and other students is a core attribute of online learning which requires an appreciation of how knowledge is constructed and how to communicate and collaborate with peers in mainly text-based systems.</td>
<td>Students studying online value teacher presence and peer interactions. Moderation and individual guidance enhances active participation in asynchronous discussion.</td>
<td>Interactions between content, teachers and other students is a core attribute of online learning which requires an appreciation of how knowledge is constructed and how to communicate and collaborate with peers in mainly text-based systems. Teacher presence in communication activities is an important factor enabling students to actively participate rather than merely lurk in the background.</td>
</tr>
<tr>
<td>Initial Draft Design Principle</td>
<td>Comments from implementation</td>
<td>Modified or new design principle</td>
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<td>-------------------------------</td>
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<tr>
<td>DP 5</td>
<td>Access patterns are varied and with students taking different pathways to explore the resource. Consequently the project team needed to respond with greater scaffolding and support in the early stages of access. Engagement will vary according to individual needs and does not appear to be linked to gender or age group.</td>
<td>Clear navigation is required to support non-linear pathways of exploration enhancing the flow from content to the related activity. Explanations may be needed to situate the practice activities within the context and purpose of the activity for development of online learning skills. Adequate support that guides students from content to activities and vice versa should be part of the design.</td>
</tr>
</tbody>
</table>
Some students did not engage in the discussion board activities included in Modules 2 and 3, suggesting that a moderation role is needed to provide a sense of teacher presence (Shin, 2003). Individualised supports and feedback appeared to assist students to feel comfortable about participating in online learning communities. The observed student engagement levels reinforced the need for timely, interaction-based orientation activities, and highlighted students’ needs for both individual support and ongoing access to orientation-style resources throughout the semester.

Based on these results, and the reflections from Section 4.3.4, Table 4.15 (p. 154-155) illustrates the modifications that were made to each DP. This included the development of a new DP which captured the unexpected outcome related to the diversity of student access pathways into Get Learning.

4.3.6 Further retrospective reflections

As well as developing a maturing intervention and theoretical understanding about student transition to online distance learning, it was hoped that EDR would also lead to further implementation and spread (McKenney & Reeves, 2012). In this instance, the changing university landscape meant that this resource did not continue beyond these iterations. All members of the project design team did not continue in their roles in the USyd e-learning department as they moved to other universities. In addition, the academic leadership and sponsors also changed or retired from their positions. At the same time, the two main faculties involved, the Faculty of Health Sciences and the Faculty of Medicine underwent restructuring processes where the educational design and development centres had a change in focus and responsibility.

This raised the dilemma of whether to locate such orientation resources within the context of disciplinary study or provide university-wide supports. In addition, questions emerged about the ownership and management of student support and the limitations of resource development when continuation, dissemination and spread are impacted by institutional change. Both these topics are discussed in Chapter 7, Section 7.4.3.
4.4 Summary

Chapter 4 demonstrated the application of the EDR process to the issue of postgraduate health science students’ transitioning to online distance learning at the University of Sydney. Four DPs, grounded in learning theories, guided the development of Get Learning, a web-based resource housed within the LMS, designed to provide an activity-based orientation to becoming an online distance learner. The construction of a conjecture map assisted the design, implementation and evaluation process, by articulating how the DPs were reified into the design and construction of Get Learning, and how it was expected that the students would engage with the designed solution. Design conjectures defined how it was anticipated that students would utilise the modules contained in Get Learning, and theoretical conjectures outlined how it was expected that the resource would enhance students’ development as a beginning online distance learner.

Get Learning was implemented over three iterations: first as a prototype, then with two further iterations during Semester 1 and Semester 2 in 2007, with a total of 469 students, studying post-graduate health science courses. The focus of the evaluation was on the patterns of engagement with the resource (RQs 1a and 1b). The majority of the students took up the opportunity to engage with the independent and self-paced orientation opportunity, with highest access to the modules addressing navigation, online communication and online assessment. An unexpected diversity of access pathways was revealed, with additional guidance and support enhancing engagement with the practice activities. These outcomes, and the survey responses, provided insights about the student transition experiences (RQ 2c), and the design of such resources (RQ 3). The original draft DPs were modified in response to these findings, highlighting the need for clearer navigation pathways, and the value of teacher presence as a support strategy to encourage student participation. The transferability of these findings to other contexts is examined in the next chapter (5), where the refined DPs were applied to the design of an orientation resource at a second university setting (Contextual Case 2).
CHAPTER 5: CONTEXTUAL CASE 2

The setting for Chapter 5 was Charles Darwin University (CDU), a newer, regional university in the remote Northern Territory (NT) of Australia. Figure 5.1 illustrates the EDR process undertaken in this second university context.

This chapter begins by outlining the circumstances and timeframe between Contextual Case 1 and 2. Then three phases of EDR describe the development and implementation of an orientation resource known as Get Learning Online @ CDU with a large group of undergraduate nursing students. The modified DPs that emerged from Contextual Case 1 guided the design, and a conjecture map once again informed the evaluation and reflection process. This third phase was enriched with additional data sets, including detailed student demographic information, academic results, and a small number of student interviews. Analysis of the student engagement, along with these additional results, enabled further understanding about student transition to online distance learning (particularly RQ 2: why the levels of engagement may have occurred; relationship with student demographics RQ 2a; study success RQ 2b and student experiences RQ 2c), and led to further refinements of the DPs.
5.1 EDR Phase 1: Analysis and Exploration

The first phase of EDR begins by describing the unique context at CDU and my place in the research conducted from 2009 to 2011. This led to a closer analysis of the drivers that informed the evolution of a similar orientation need for undergraduate nursing students studying at CDU.

5.1.1 The university context: paving the way for change

CDU is one of the largest employers in the NT and like many organisations in the remote region of northern Australia has a highly mobile population. The university is a dual sector organisation, providing qualifications spanning all levels, from post-secondary to higher degree. It is located primarily in Darwin, with eight campuses scattered around the vast distances of the NT. Not surprisingly, CDU provides over 85% of the higher education and vocational education and training in the Northern Territory, yet on a national scale is a relatively small provider of higher education in Australia, with less than 1% of the total student numbers in 2012 (0.78%), and 0.6% of the total equivalent full-time student load (EFTSL) (DET, 2014). CDU is not only a regional university, but remote from all other major capital cities in Australia, which impacts its student base and staff profile. The local potential student market is very small due to the low population of the NT and, since 2006, CDU extended the reach of its courses by offering distance education options in order to attract students from other States and Territories in Australia. In the period between 2001 and 2007, the number of commencing external (also known as off-campus) students studying by distance mode increased by 250%, while the number of commencing students studying on-campus declined (Charles Darwin University, 2011). The university also aimed to secure a niche market by offering flexible study plans, which enabled access and opportunity for non-traditional students to study at university (Evered, 2008).

In parallel with the growth of external students, CDU had moved rapidly to the online delivery space. The push to adopt e-learning strategies was made more complex by the
high staff mobility (Northern Territory Government, 2014), and the relatively recent introduction of the LMS (known as Learnline). Consequently, with a change to the teaching and learning culture, challenges to the achievement of a quality teaching and learning experience for students emerged. In the subsequent period, the teaching and learning performance at CDU lagged behind the national norms (Charles Darwin University, 2011). Overall, the university was performing poorly across all indicators (retention, progression, graduate destination and student experience), so in 2008 the University Council determined that improvement of teaching and learning quality was its highest priority (Webb, 2007).

I arrived at the university in late 2007 to lead the academic development unit responsible for supporting academic staff with their teaching and learning practice. The unit provided educational design and staff development, where many were new to using online technologies to deliver courses to off-campus students. This changing environment at CDU provided the political climate for this EDR project.

At the same time, the Australian Government commenced several funding streams to develop a more sustainable and forward-thinking tertiary education sector (DEEWR, 2009) in response to the Bradley Review of higher education (Bradley et al., 2008). One of the funding streams was the Diversity and Structural Adjustment Fund (DSAF), which encouraged universities to develop strategies to support their areas of speciality. In late 2008, CDU received a significant funding boost of $3 million from the DSAF to make a significant “step change towards best-practice flexible delivery” (Webb, 2008, p. 3). The DSAF project had several aims, including a substantial upgrade of the university’s technology infrastructure to the newest version of the LMS (Blackboard) and an associated staff development program. It also included a targeted approach for facilitating improvements in pedagogic approaches through engagement of external consultants and adoption of a peer review process supported by my team (Philip & Wozniak, 2009). The management of the DASF project brought together a broad cross section of the university staff, including disciplinary academics and associated support staff, such as librarians and
student administration officers. This also provided a climate which was open to innovation and change.

One component of the DSAF project was to “develop an optimal flexible learning management system” (Webb, 2008, p. 6). This involved changing the LMS to the newest version of Blackboard (9.0), which had a very different interface, representing a large change in online architecture. While the initial upgrade was problematic (Li, 2010), the closer engagement between academic staff and the group I managed, provided a stimulus and incentive to develop improved student support materials as the university moved to the next Blackboard 9.1 environment in November 2010.

Alongside these technical changes, the student profile continued to change. By 2011, the shift in student mix meant that external students had become the most dominant segment of the higher education student cohort at CDU (Charles Darwin University, 2011), equating to 73% of all students, compared with the overall national average of 12.8% external students in Australia (DET, 2011). As well as having high numbers of external students, 74% were over the age of 25 years (Charles Darwin University, 2013). The student growth at the university had centred on the areas of national skills shortages in nursing and education. Many of these students entered university after a long gap from secondary education which, when combined with studying away from the campus, led to a high attrition rate of 31% in 2011. This was greater than all other universities in Australia. Notably, students studying externally, part time and over the age of 25, had the lowest completions (DET, 2013). In the political climate of higher education, where funding was tied to retention and completions, it was critical to consider strategies to support external students as they commenced their study. It was within this unique context that a new educational design research (EDR) project emerged. The next section outlines an analysis of the orientation needs of CDU students which formed part of the first phase of this EDR project at CDU.
5.1.2 Defining the focus of the EDR project

The needs assessment process for the DSAF project conducted in April 2009 had identified fragmented support structures for both students and staff in terms of online delivery. Recommendations included a suggestion that CDU “provide an orientation to Learnline to all first-time student users to identify technical barriers early on and familiarise students with learning in an online environment” (Matthews & Weber, 2009, p. 16). Towards the end of 2009, I formed a project advisory team to undertake a more in-depth analysis of the student experience of Learnline and assemble a team of representatives from diverse sections of the university including: the two academic faculties; the Language and Learning Support Centre; the Library; Student Administration and Corporate Communication. By involving a large cross section of the university it was hoped this would build wider support for the resource and provide a base for continuation beyond the initial implementation.

A detailed analysis of free text student comments about Learnline collected as part of the unit evaluations known as Student Evaluation of Learning and Teaching (SELT) were collated from data collected during 2008-2009. Coding of the 202 comments showed that 17% were related to students being confused about how to use Learnline, with suggestions that they would like: “training in use of Learnline”, “assistance in how to use Learnline” and “more Learnline support”. A further 12% of comments considered that there should be greater interaction between students and staff with Learnline, so “external students don’t feel so isolated”.

In response to these findings, the project advisory group contracted two educational designers to work with the project advisory team and the unit I managed, to develop support materials for the CDU context drawing on my previous experiences in Contextual Case 1 at the University of Sydney and the emergent DPs (see Chapter 4, Section 4.3.5). Initially, an analysis was made of the current support materials available for students to assist them to make the transition to external study at CDU. This uncovered a bewildering array of what could be termed orientation resources, fragmented and embedded deep
within the CDU website, as well as inconsistent terminology across the CDU environment regarding student portals and student support. For example, information about how to get started with Learnline was found in six different formats and locations, revealing duplication across both academic and organisational departments. A comment received from a nursing student, studying online and by distance, in a course experience questionnaire in 2009, exemplified this when asked to suggest how their course could be improved: “I found the websites associated (Learnline and CDU homepage) difficult to navigate and course information is not uniform between subjects [units] which adds to this confusion and difficulty.” (Nursing student 2009)

At this time the university was heavily reliant on maintaining student numbers in its strategically placed Bachelor of Nursing course, one of the first in Australia to deliver a registered nursing qualification by distance through online learning. In the same survey when commenting on the best aspect of their course other nursing students had highlighted the importance of Learnline in enabling them to study online and at a distance to CDU. Collective comments included: “flexibility of external study”; “being able to study at own pace”; “Learnline is the best mechanism for me at it delivers a classroom like environment”; “allowing external students like me to interact between fellow students, lecturers, and similarly access school resources without difficulty” (Nursing students 2009). Although one student when reflecting back on the whole course suggested that they needed: “a little more time allowed for new students to access Learnline before the course starts so as to familiarise themselves with how it works” (Nursing student 2009).

An additional factor that led the project group to locate the orientation resource development within the discipline of nursing was the flexible approach taken by CDU in providing access for study and career enhancement in nursing. Students with enrolled nurse qualifications were encouraged through accelerated entry to begin their study at the second year level of the course, hence reducing completion time by one year (if
completing full time). Provision of this flexibility in entry generated a unique cohort of students, many of whom had not studied for several years and also had work and parenting responsibilities. Also, the units within the nursing degree had relatively large enrolment numbers (e.g., up to 300 students) and were managed by a single academic staff member. All of these factors led to a need for supporting nursing students. Finally, the nursing academics had already recognised the need to provide support materials for students in their early stages of study by developing an information literacy online tutorial known as Health Online (Turnbull, Royal & Purnell, 2011).

It was with this background that the project team moved to work closely with nursing staff to develop a new orientation resource by drawing on existing CDU resources and the underpinning DPs from Contextual Case 1. The objectives influencing the development of the resource were to:

• build student confidence in using the university’s LMS, including how to navigate around an online unit;
• develop understanding about the demands of online distance learning; and
• provide timely and targeted support in the use of specific LMS tools and their functionalities.

The next section considers how these objectives were enacted in the second design and construction phase at CDU.

5.2 EDR Phase 2: Design and Construction

The design process drew on the rich contextual information gathered in Phase 1 and lessons learnt from the University of Sydney experience, while also reviewing more recent literature to inform the design of a new orientation resource. For example, diverse access patterns had been noted during implementation in Contextual Case 1, with literature confirming that students use technology in diverse ways (Bennett et al., 2008; Bullen et al., 2011; Kennedy et al., 2008). This also highlighted new directions for researching the student transition experience, leading to the inclusion of expanded
demographic data and the inclusion of interviews with students about their transition experiences. The following three sections provide an overview of the design and construction phase: application of the DP to the CDU context; testing the prototype; and development of a conjecture map.

5.2.1 Applying design principles to design the solution

The project team’s focus was again on creating an activity-based resource to support student understanding about how to use the university’s LMS (Learnline) for their study. Therefore the DPs that emerged from Contextual Case 1 were reformulated and applied to the CDU context. Each design principle (DP) is outlined in relation to how it was reified into the proposed design of the CDU orientation resource. Then the DPs will be mapped to the design elements in the conjecture map (Figure 5.3, p. 173).

**DP 1: Orientation primarily involves the interplay of technological and interpersonal dimensions that blend in the transition from the student’s current world (often involving work and family life) to an academic world of study.**

The design focus for Get Learning Online @ CDU was to enable the transition of students to the technological dimension of online distance learning and introduce them to the interpersonal elements of creating an online learning community. As it was focused on the post-enrolment stage, it was not addressing the reflective elements of making a decision to study online, although it was anticipated that inclusion of student interviews would provide greater insight into the students’ lived experiences of transitioning to online distance learning.

**DP 2: Orientation is a process which is enhanced through early access and continues throughout the semester.**

The resource was focused on the post-enrolment period and students were given access prior to, and during, the first semester of study. University technical processes meant that enrolment needed to be finalised and access could not be provided earlier than nine days prior to the commencement of semester.
DP 3: Orientation is aided by participation in activities within a safe risk-free environment which is supported with customised guidance and feedback.

The orientation resource was housed in the LMS and utilised a range of tools in the eleven Quest activities. The activity design aimed to encourage students to practise using the more common tools and resources contained within a typical online unit at CDU. There were four main content areas: “For Successful Study”; “For Communicating”; “For Collaborating”; and “For Assessment”; which were organised around how new students should use the LMS to become competent online distance learners. Where feedback was required, this was automated or designed to require minimal moderation. Due to resourcing limitations and the large student numbers at CDU, wherever possible, self-sustaining strategies were adopted in the design of the activities. This was a response to the stakeholders stipulating that the resource would need to be able to be completed without significant moderation by CDU staff. It was recognised that this was not optimal, given the experiences from Contextual Case 1, but it was a realistic response to the political climate at CDU. As will be noted in Section 5.3.1, during implementation I did engage in limited monitoring of student activity, providing feedback about the assessment activities and posting a concluding summary discussion message. In addition, students at CDU had the advantage of accessing a 24-hour free telephone help line to troubleshoot any technical matters with the LMS.

DP 4: Interactions between content, teachers and other students is a core attribute of online learning which requires an appreciation of how knowledge is constructed and how to communicate and collaborate with peers in mainly text-based systems. Teacher presence in communication activities is an important factor influencing active participation rather than lurking.

Some of the activities encouraged students to make contact with other students via email, discussion or group activity and create a learning community. The discussion board activity aimed to promote sharing of ideas about online discussions with peers, asking students to make an initial posting then to reply by building on the ideas of others. Another activity requested that students join a group and complete a blog post to share
their ideas about how groups could use LMS tools in online group work. Given advances in technology for online learning, an online classroom recording was used to simulate a synchronous online classroom experience with both audio and video rather than text-based media. Teaching presence was created through a Questmaster support role in the form of an audio-recorded introductory message, an email which provided immediate feedback on completion of some Quest activities, and encouraging comments in activities, such as the discussion board, group blog and assignment submissions. Other multimedia devices, such as audio and video recordings of nursing students and CDU staff explaining topics associated with online distance learning (e.g., time management), were also included. The decision to limit the role of the moderator in this resource is explained more fully in Section 5.3.1.

DP 5: Clear navigation is required to support non-linear pathways of exploration enhancing the flow from content to the related activity. Explanations may be needed to situate the practice activities within the context and purpose of the activity for development of online learning skills. Adequate support that guides students from content to activities and vice versa should be part of the design.

The “Welcome” landing page was the only entry point to the resource, and navigational signposts, such as “Start Here”, were used to provide students with information about what was contained within each section of the resource. Each content section contained an explicit description of the type of navigation used to assist in understanding how to move around the different sections of the resource, as well as how to move to the next page or section. Each content area included an organiser image that mapped the structure of the content and key concepts, and also incorporated a range of information and activities to build student familiarity with, and confidence in, using the LMS. Cartoons also provided an appealing overview of each section. Each activity included links to the associated content pages, so that the context and purpose of each activity was explained, to allow for students navigating to the Quest activity by varying pathways. Links to other CDU supports, such as narrated slideshow demonstrations, were used to assist students to overcome the technical hurdles of beginning online learning.
Figure 5.2 (p. 169) illustrates the initial homepage and an example of an organiser diagram that showed the relationship between the activities and each section of the resource. Table 5.1 outlines the structure of the resource, detailing the module components, the Quest activities and associated supportive information.

Table 5.1
Get Learning Online @ CDU modules, activities and supports

<table>
<thead>
<tr>
<th>Modules</th>
<th>Activities</th>
<th>Supports</th>
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<tr>
<td>1. Getting Started</td>
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<td>How to get help</td>
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<td></td>
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<td>Glossary of terms</td>
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<tr>
<td>2. Your Quest</td>
<td>Quest 1: Navigation challenge</td>
<td>Overview of 10 challenges</td>
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<td></td>
<td>Quest 2: Downloading a file</td>
<td>Audio message</td>
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<tr>
<td>3. Quest Test</td>
<td>Quiz for LMS readiness</td>
<td>Feedback on quiz results</td>
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<td></td>
<td></td>
<td>Links to other modules</td>
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<td>4. For Successful Study</td>
<td>Quest 3: Using the calendar</td>
<td>Success strategies</td>
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<td>What to expect in Learnline</td>
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<td>What people say about online learning</td>
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<td></td>
<td></td>
<td>Managing your study</td>
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<td></td>
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<td>How to download files</td>
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<td>How to use course menu</td>
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<tr>
<td>5. For Communicating</td>
<td>Quest 4: Using the discussion board</td>
<td>Useful communication tips</td>
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<td></td>
<td>Quest 5: Sending external email</td>
<td>Using the discussion board</td>
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<td></td>
<td>Quest 6: Using Wimba</td>
<td>Sending messages and emails</td>
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<td>Using Wimba</td>
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<td>Creating a blog</td>
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<td>Using chat</td>
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<td>6. For Collaborating</td>
<td>Quest 7: Joining a group</td>
<td>About online collaboration</td>
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<td>Teamwork and working in groups</td>
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<td>7. For Assessment</td>
<td>Quest 8: Taking a test</td>
<td>About Learnline assessment tools</td>
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<td>Quest 9: Submitting an assignment</td>
<td>Taking tests and surveys</td>
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<td></td>
<td>Quest 10: Safe Assignment</td>
<td>Submitting assignments</td>
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<td></td>
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<td>Using Safe Assignment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Grades and feedback</td>
</tr>
<tr>
<td>8. Learnline User Tips</td>
<td></td>
<td>Tips from other users</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Links to other CDU support sites</td>
</tr>
</tbody>
</table>
Figure 5.2 Selected pages of Get Learning Online @ CDU

Top: Homepage with navigation menu - Iteration 2

Bottom: Map of Quest activities and their relationship to the content areas of the orientation resource
5.2.2 First iteration to refine the prototype

Get Learning Online @ CDU was initially developed in Blackboard 9.0 during the first half of 2009. As well as being reviewed by 10 members of the project team during its development, it was comprehensively evaluated by an panel of three academic staff and also 34 students who participated in a review, with the incentive to win an iPod Touch donated by the university if they completed all Quest activities and the evaluation.

There were mixed reviews from the three academic staff. Two stated they would recommend the resource, as it covered important topics, used appropriate language and had activities that were helpful. The main criticisms were that the navigation was not clear enough, and that it was not emulating an actual formal unit Learnline site, even though the university did not have a standard template design.

Despite the incentive for students to participate in Iteration 1, only 34 (58%) of the 58 students accessed the resource, with 22 completing one or more of the activities, and 6 completing all activities. Excellent feedback was provided by the students in the form of a survey and email feedback. Eleven of the 13 students (85%) agreed or strongly agreed that the resource was useful, relevant, and appropriate for beginning students. They indicated that the videos and YouTube resources were useful, and the Quest activities helped them to understand how to use Learnline tools. Comments about navigation were similar to those from the staff, with 70% agreeing or strongly agreeing that it was easy to find their way around. Comments about possible improvements suggested clearer signposts: “It is difficult to know what part of the Quest I am up to as I am jumping around windows”. As noted by DP 2, the students also considered that a resource such as this should be available prior to enrolment, to assist them to decide if they wished to study online, and should remain available throughout their study at CDU, with none indicating that it should be made compulsory prior to gaining access to Learnline sites for formal study. Overall, the comments were positive, with the online classroom activity (using the Wimba tool) being noted as excellent: “a great concept to test Wimba. Very well done, it forces students to check their microphone and speakers. This was the best
part of the experience”, “Loved the cartoon it was a fun way to learn”, “the overall tutorial was great and would be awesome for new students to engage in”. However, at least one student disagreed: “I don't think the site works. There is some really good content on the site... I just don't think it will meet its intended purpose with the majority of the student body.” This highlights the diversity of opinion that occurs with any given support resource.

As a result of this feedback, changes were made to the navigation of the resource, modifying titles and headings, adding images and short explanations to outline how to move around the resource. There were some limitations to navigation inherent in the Blackboard system such that it was not always possible to have activities open in a new webpage, or tab, and have a direct link back to the content page after the activity was completed.

Just as the Get Learning Online @ CDU resource was being finalised for implementation, the university upgraded to the more stable Blackboard 9.1 version. To test compatibility, further prototype testing was undertaken in November 2010. A total of eight students attended an on-campus computer lab session at CDU and two off-campus students (who had reviewed the resource previously) were asked to join the testing group. Each student who participated received a $50 iTunes voucher as an incentive to participate. No major concerns were identified, however several links and instructions needed modification. One of the off-campus students commented positively on this additional prototype testing: “Thanks for giving me the opportunity to provide feedback. Of particular note, I was impressed that a lot of the changes I suggested during the first review were reflected in the latest version; it's nice to see that you all listened rather than ignore the productive criticism!”

Institutional factors influenced the scale of the next iteration of implementation, which was due to take place in the first semester of the 2011 academic year. Expansion beyond the nursing discipline was difficult to harness due to a range of management and political factors prevalent at the time. Academics and managers were busy preparing for
the government audit of the university, and the team that I led was engaged in an external review of operations. This led to a significant change in staffing during 2011, where those engaged in the DSAF project had their positions reviewed and subsequently left employment at CDU during early to middle 2011. The tension between developing a generic orientation resource or locating one within a disciplinary context, is considered in Chapter 6, Section 6.2.6, and the impact of change on continuation and sustainability of educational innovations are aspects that will be further discussed in Chapter 7, Section 7.4.3.

5.2.3 Conjecture map for Get Learning Online @ CDU

As completed for Contextual Case 1, a similar conjecture mapping process was used to guide the implementation of the Get Learning Online @ CDU. Figure 5.3 illustrates the design elements and their relationship to the DPs, described in Section 5.2.1. Next, the mediating processes were envisaged, identifying the type of activity that was expected to occur as students engaged with Get Learning Online @ CDU. Once again, this primarily consisted of reviewing the data or artefacts extracted from the LMS to determine evidence about how, and when, students engaged with the resource and their actions while engaging in the activities (RQ 1). The intended outcomes that were expected as a result of students engaging with the resource were also identified. Differences between this conjecture map and that developed in Contextual Case 1 are indicated with italics. The availability of demographic enrolment data, semester results and qualitative information from student interviews enabled additional analysis to be made. For example, matching access and engagement levels with this data enabled identification of the student characteristics of those utilising the resource (RQs 2a and 2b). It should be noted that the conjecture map that is illustrated in Figure 5.3 represents a reconstruction of the project teams’ design intentions using Sandoval’s more recent terminology (2014).
<table>
<thead>
<tr>
<th>Intended Outcomes</th>
<th>Design Conjectures</th>
<th>Mediating Processes</th>
<th>Theoretical Conjectures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content areas in resource noted as relevant by students for development as online distance learner which is confirmed by LMS tracking &amp; interviews</td>
<td>TC 1</td>
<td>TC 2</td>
<td>TC 3</td>
</tr>
<tr>
<td>Extent of access may vary according to student characteristics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access may lead to retention and successful academic outcomes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Online resource required low levels of maintenance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students value trialling of practice activities in safe environment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students’ experience of online distance learning illustrates awareness of key constructs (e.g. persistence, time management) and skill development that was included in the resource</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Online discussion contributions demonstrate online collaboration</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 5.3 Conjecture mapping elements for Get Learning Online @ CDU
Adapted from Sandoval (2014)

The design conjectures (DC) resulting from implementation of the Get Learning Online @ CDU resource were similar to those from Contextual Case 1. Therefore the realisation of the design elements described in Section 5.2.1 above would:

DC 1: Enable new online distance learners to navigate through the modules and locate and participate in the embedded activities (assessed by tracking data and activity completions)

DC 2: Lead to access soon after enrolment, prior to, and early in the semester, with some students returning to explore just-in-time (determined by analysis of timing of access from LMS tracking data and matching this with other demographic data, such as enrolment date);

DC 3: Demonstrate collaboration between students in the discussion activities, evidenced from content analysis of the discussion board.

Since there were additional data sources available (demographic information and student interviews) to illuminate why student engagement may have occurred in the way it did (RQ 2), there was a greater focus during Phase 3 on informing the theoretical
conjectures associated with the transition to online distance learning. Therefore, as a result of engaging with the resource:

TC 1: Content areas of most relevance to transition will be confirmed, and students will report a lessening of anxiety about online learning. They will also note the value of engaging in practice activities in a risk-free environment (assessed through activity completions, survey analysis and interviews);

TC 2: Using collaborative online learning tools, such as discussion, group spaces and the online classroom, online students will articulate the importance of collaboration and peer support for completion of online learning (analysis of the discussion board postings, student surveys and interviews);

TC 3: Matching demographic information and assessment results with engagement levels will determine if a specific population demonstrates higher engagement with support resources, and if such engagement leads to higher retention and improved academic achievement (tracking data matched to student demographics and results, RQ 2b).

TC 4: Interviews with a sample population of these students will provide further insights about the appropriateness of the three dimensions (technological, interpersonal and reflection) that underpin the concept of transition to online learning. It will also highlight other important elements for online distance learners including the enablers and barriers to this transition (RQ 2c).

Next, the implementation of Get Learning Online @ CDU is outlined, where one further iteration was evaluated.

5.3 EDR Phase 3: Evaluation and Reflection

5.3.1 Overview of the second iteration

The resource was made available to a total of 553 students, studying two undergraduate units, nine days prior to the commencement of semester 1, 2011. One Nursing unit (NUR120 Introduction to Professional Nursing) was completed by the
majority of commencing students in the Bachelor of Nursing course. The other, a second year unit (NUR219 Mental Health Nursing), was taken by both continuing students, and also new students who had prior qualifications (predominantly an enrolled nursing diploma with work experience) and who could enter the Nursing course in second year. Tracking data could not be extracted for 12 students, so the access patterns were analysed from 541 students (285 NUR120; 256 NUR219). No students indicated that they wished to be removed from the data set.

Since this resource was available prior to the opening of other unit-based Learnline sites, an email was sent via the Blackboard tool to all enrolled students nine days prior to the commencement of semester explaining the purpose of the resource, with suggestions about how to engage with the materials, along with instructions about how to access Learnline (similar to the Get Started guide from Contextual Case 1). An announcement was also placed in the Learnline sites for NUR120 and NUR219 to encourage access, although this was not made available to students until the commencement of semester. An additional email was sent on the second day of semester (1st March) to all enrolled students who had not accessed the resource using the Early Warning System tool in Blackboard 9.1.

Due to the large numbers of students enrolled in the units, the high workloads of academic staff, and fact that many of the project design staff were no longer available, a minimal moderation plan was used to monitor this implementation. This provided data about the impact of reduced teacher presence on student engagement. Moderation was limited to two further emails, one to remind students about the research project and inform students near the end of the census period at the end of March that moderator feedback was available for activities completed, and one near the conclusion of the semester to thank students for their participation.

Table 5.2 (p. 177) outlines the demographic characteristics of the sample population (expressed as percentages), which highlights the non-traditional characteristics of students who study in this discipline at CDU: predominantly a female cohort studying
off-campus, with a large representation of part-time study, a mean age of 30.4 years for the first year unit, and 35.9 years for the second year unit. The demographic characteristics of the study groups are similar to that of all undergraduate nursing enrolments at CDU, depicted in the third column of Table 5.2.

There were differences in the demographic composition between the first and second year unit. The second year unit had a greater number of students studying off-campus, located in states other than the NT, and consisted of older age groups. The higher percentage of younger students in the first year unit may have been a result of the marketing strategy used in 2010 designed to attract more school leavers living in the NT into the Nursing course. As expected there was a much higher percentage of students in the first year unit studying online for the first time. The reason that there were still approximately one third of students not studying online for the first time is that students could study part time and are able to design a flexible study program choosing units in the order that they wished to study. The suggestion that the second year unit would also have a moderate component of commencing students was not borne out by the demographic information, so possibly these students with direct entry to second year did not choose to study this particular unit in their first semester of study.

A Chi-square test for independence (with Yates Continuity Correction) indicated no significant association between the populations for each unit, for gender and enrolment type (Gender: $\chi^2 [1, n=541] = 0.699$, $p=0.403$, phi =0.041; enrolment type $\chi^2 [1, n=541] = 0.135$, $p=0.713$, phi =0.020). There was, however, a significant difference in the demographic characteristics of study mode, first online unit and age group (Study mode $\chi^2 [1, n=541] = 64.615$, $p=0.000$, phi =0.346; First online unit $\chi^2 [1, n=541] = 196.778$, $p=0.000$, phi =0.607; Age Group: $\chi^2 [4, n=541] = 38.395$, $p=0.000$, Cramer’s V =0.226). Home location was not analysed due to low numbers in some states and fact that this parameter is more accurately reflected in the study mode information. Since there were demographic differences between the first and second year unit an analysis of the access and engagement levels was conducted separately for each unit (RQ 2a).
Table 5.2  
Demographics for each unit and the overall Nursing course

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Characteristic</th>
<th>This study Semester 1 2011 NUR120</th>
<th>This study Semester 1 2011 NUR219</th>
<th>All Nursing Semester 1 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Female</td>
<td>84</td>
<td>87</td>
<td>86</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>16</td>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>On-campus study (still requiring substantial online study)</td>
<td><strong>38</strong></td>
<td><strong>9</strong></td>
<td>12</td>
</tr>
<tr>
<td>Study Mode</td>
<td>Off-campus study (distant to campus and fully online)</td>
<td><strong>62</strong></td>
<td><strong>91</strong></td>
<td>59</td>
</tr>
<tr>
<td></td>
<td>Mixed: Overall course attendance – mixture of on-campus and off-campus study</td>
<td>N/A</td>
<td>N/A</td>
<td>29</td>
</tr>
<tr>
<td>Enrolment type</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Part time</td>
<td>38</td>
<td>40</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>Full time</td>
<td>62</td>
<td>60</td>
<td>57</td>
</tr>
<tr>
<td>First online unit</td>
<td></td>
<td><strong>69</strong></td>
<td><strong>9</strong></td>
<td>unknown</td>
</tr>
<tr>
<td>Age group</td>
<td>Previous online study at CDU</td>
<td><strong>31</strong></td>
<td><strong>91</strong></td>
<td>unknown</td>
</tr>
<tr>
<td></td>
<td>Under 25</td>
<td><strong>31</strong></td>
<td><strong>16</strong></td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>25-34</td>
<td><strong>42</strong></td>
<td><strong>35</strong></td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>35-44</td>
<td><strong>18</strong></td>
<td><strong>23</strong></td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>Over 45</td>
<td><strong>9</strong></td>
<td><strong>26</strong></td>
<td>24</td>
</tr>
<tr>
<td>Home location</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Northern Territory</td>
<td>51</td>
<td>23</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>Victoria</td>
<td>13</td>
<td>27</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Queensland</td>
<td>9</td>
<td>20</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Western Australia</td>
<td>8</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>New South Wales</td>
<td>7</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>South Australia</td>
<td>10</td>
<td>4.5</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Tasmania</td>
<td>0.5</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Australian Capital Territory</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>Unknown / International</td>
<td>1</td>
<td>0</td>
<td>0.5</td>
</tr>
</tbody>
</table>

**p<0.01**
As well as gathering demographic characteristics for each student, a range of different data sets were extracted from the LMS. This included participation data, such as results from each of the eleven activities (RQ 1b), responses to the evaluation survey (RQ 2c), and page tracking data provided by the university LMS team (RQ 1a). Once again, this data set was then manually coded and analysed to determine the overall access data for each student, including: dates of access (first and last access); the level of access (homepage only, or exploration of other pages within the resource); which sections of the resource were accessed; the number of pages accessed and approximate duration of each access (noting that tracking data only indicated the time the pages were accessed and not the time when the student clicked out of the resource).

Finally, a full dataset was created by manually matching the student identification number with unit enrolment (NUR 120 or 219) and demographic data, such as study mode (on-campus or off-campus study), age group and end of semester grade, or the timing of withdrawal if students did not complete the unit (RQs 2a and 2b). Following this, any identifying information, such as student identifiers, was removed from the data set. Appendix 4 lists the 41 items that formed the quantitative data set.

As for Contextual Case 1, the uptake for student interviews was low, however nine students did indicate their willingness to participate. Five students were able to be contacted and consented to participation in a recorded interview at the conclusion of the semester. The interview questions are outlined in Appendix 3 and sought to provide data to assist in understanding why the levels of engagement occurred (RQ 2) and thus explore, not only the interviewee’s impressions of the resource, but also their experience as a new online distance learner to inform understanding about transition to university (RQ 2c). Table 5.3 provides a summary of the demographic and engagement characteristics of the five students interviewed. All of the students interviewed were studying in an off-campus mode located in three states (NSW, QLD and WA) distant to the institution and fully reliant on learning using online technologies. Three were studying the second year unit and two the first year unit, with an age range from 29 to 52
The engagement levels varied for the students interviewed, with two students accessing the resource in a limited manner, not completing any of the Quest activities, and three completing from four to ten of the eleven activities. Interviews were conducted during July 2011 after the completion of the semester and release of academic results. Their academic results were not known to me at the time of the interview.

While the interviews only provided insights from students who accessed the resource, the varying engagement levels and varied assessment results do help to illuminate further themes about student transition to online distance learning that cannot be gleaned from analysis of LMS engagement levels and survey results alone (enhancing interpretations for RQ 2c and RQ 3).

Table 5.3
Overview of interviewed students’ characteristics and engagement patterns

<table>
<thead>
<tr>
<th>Pseudonym</th>
<th>Emma</th>
<th>David</th>
<th>Natalie</th>
<th>Tammy</th>
<th>Anne</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit studied</td>
<td>NUR219</td>
<td>NUR219</td>
<td>NUR219</td>
<td>NUR120</td>
<td>NUR120</td>
</tr>
<tr>
<td>Age</td>
<td>29</td>
<td>52</td>
<td>35</td>
<td>32</td>
<td>33</td>
</tr>
<tr>
<td>First online</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td># activities finished</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td># of accesses</td>
<td>2 prior to semester starting</td>
<td>2 prior to semester starting</td>
<td>2 prior to and during week 1</td>
<td>5 from week 1 up until census date</td>
<td>3 from day 1 of semester up until the mid-semester break</td>
</tr>
<tr>
<td>Duration of accesses</td>
<td>11 mins</td>
<td>15 mins</td>
<td>76 mins</td>
<td>317 mins</td>
<td>212 mins</td>
</tr>
<tr>
<td># pages accessed</td>
<td>70</td>
<td>44</td>
<td>267</td>
<td>236</td>
<td>488</td>
</tr>
<tr>
<td>Grade</td>
<td>Fail</td>
<td>Credit</td>
<td>Pass</td>
<td>Fail</td>
<td>Distinction</td>
</tr>
</tbody>
</table>

Although the mixed methods data collection occurred sequentially, the analysis and reporting of the results will be woven together to illuminate how they inform each of the design and theoretical conjectures and the research questions. This, then, leads to further
reflection and modification of the DPs associated with designing orientation resources for students making the transition to online distance learning at university.

### 5.3.2 Evaluation of access and engagement with *Get Learning Online @ CDU*

Of the 541 students who were given access to the resource, 293 (54%) accessed the resource, with just less than half the students (n=248) never accessing the resource. This lack of access can be partially explained by the fact that 46 (19%) withdrew from studying either unit NUR 120 or NUR219. Unlike Contextual Case 1, all accesses occurred via the homepage without any alternative entry pathways into the resource. This was a helpful feature of Blackboard 9.1, enabling a direct link from the landing page, after logging in to the LMS, to the homepage of the resource. As noted earlier, there was no support provided to encourage students to engage with the materials, other than the initial welcome email and announcement in related academic units. This was likely to have contributed to the overall smaller engagement with this resource at CDU when compared to Contextual Case 1 at the University of Sydney and will be discussed in Chapter 6, Section 6.1.

To more fully understand the levels of engagement, I again considered whether the students progressed beyond the homepage welcome message, to explore deeper pages within the resource. Any access to the homepage without further exploration on that day, or following dates, could have indicated that the student accidently clicked on the course title link in their list enrolled of units in Learnline, or that they had some interest, initially noting the welcome page, but decided not to investigate the resource further. A total of 96 students were classified as falling into this category of homepage only visits. Therefore, a total of 196 students (36% of the total number enrolled in *Get Learning Online @ CDU*), accessed the resource and explored beyond the homepage. However, of the 196 students, only 34% (n=67) proceeded to engage in one or more of the 11 Quest activities. The progression of engagement is illustrated in Table 5.4, where Column A refers to students who never accessed, Column B to any access, Column D to access beyond the homepage.
and Column F to the completion at least one activity. Section 5.3.2.3 will provide more
details about how students engaged with the activities.

Table 5.4

<table>
<thead>
<tr>
<th>Overall engagement with Get Learning Online @ CDU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access and degree of engagement with resource</td>
</tr>
<tr>
<td>low engagement</td>
</tr>
<tr>
<td>high engagement</td>
</tr>
<tr>
<td>n (%) (A+B)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Overall Access both units</th>
<th>541</th>
<th>248 (46%)</th>
<th>293 (54%)</th>
<th>97 (33%)</th>
<th>196 (67%)</th>
<th>129 (66%)</th>
<th>67 (34%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Access NUR120</td>
<td>285</td>
<td>110** (39%)</td>
<td>175** (61%)</td>
<td>42** (26%)</td>
<td>133** (76%)</td>
<td>85 (64%)</td>
<td>48 (36%)</td>
</tr>
<tr>
<td>Overall Access NUR219</td>
<td>256</td>
<td>138** (54%)</td>
<td>118** (46%)</td>
<td>55** (47%)</td>
<td>63** (53%)</td>
<td>44 (70%)</td>
<td>19 (30%)</td>
</tr>
</tbody>
</table>

**p<0.001

When considering levels of engagement for each of the units, it was noted that a
higher percentage of students from the first year unit accessed the resource (NUR120:
n=175, 61%; NUR219: n=118, 46%) (Column B), and explored beyond the homepage
(NUR120: n=133, 76%, NUR219: n=63, 53%) (Column D). A Chi-square test for
independence (with Yates Continuity Correction) indicated a significant association
between both accessing the resource and exploring deeper pages and studying the year
one unit NUR120 ($\chi^2 [1, n=541] = 12.732, p=0.000, \phi =0.153; \chi^2 [1, n=293] = 16.269,
p=0.000, \phi =-0.236$). This association did not hold when comparing the engagement
with the activities in the resource between the units ($\chi^2 [1, n=196] = 0.669, p=0.414, \phi$
$=-0.058$) (Column F). These results tend to indicate that students studying the first year
unit were more motivated to review deeper pages in the resource than those studying the
second year higher level unit, but once students decided to complete activities there was no difference noted (RQ1).

Accessing the resource did not lead to students completing the anonymous evaluation survey. Only 17 students completed the evaluation survey, with all indicating that they engaged in at least one activity. This suggests a probable response rate of 25% (17 out of 67 students who completed an activity). Due to the low response rate, and fact that the opinions gathered are only of those who actively engaged, generalisations about the student experience of using the resource cannot be made, or considered representative of the whole student population. They can, however, provide some insights about the value of such a resource and indicate areas that need further development or consideration. These evaluation results will be discussed further in Sub-Sections 5.3.2.2; 5.3.2.3 and 5.3.3.1.

5.3.2.1 Relationship between Engagement and Demographic Characteristics

The more detailed demographic information from Contextual Case 2 enabled a similar analysis of the relationship between these demographic characteristics and the levels of engagement (RQ 2a). The demographic factors that were analysed included: whether the unit was the student’s first online unit at CDU; the mode of enrolment for the unit (on-campus or off-campus); the study load for the course (if the student was studying a full-time load of four units per semester or a part-time load less than four units); the age of the student, and finally, their gender. The results for each demographic factor are described, first with the data for both units combined, and then for each individual unit, to focus on any differences between the first and second year units. Appendix 7 outlines the data which contributed to this analysis.

First online unit studied

Analysis of the access data for both the units combined, indicated that student engagement is higher when students are studying online for their first semester at the university, 74% (n=164), compared with 40% (n=129) for students not studying their first
online unit. A Chi-square test for independence (with Yates Continuity Correction) indicated a significant association between accessing the resource and first semester of online study ($\chi^2 [1, n=541] = 60.493$, $p=0.000$, $\phi=0.334$). This association was also present when access to deeper pages in the resource was evaluated ($\chi^2 [1, n=293] = 31.081$, $p=0.000$, $\phi=-0.326$) (81%, $n=132$ versus 50%, $n=64$), which is a truer reflection of real engagement with the content of the resource. The analysis indicates that this association can be considered strong. This relationship did not continue when engagement with the Quest activities was considered ($\chi^2 [1, n=196] = 1.550$, $p=0.213$, $\phi=-0.089$) (37%, $n=49$ versus 28%, $n=18$).

Given the high number of students in the first year unit who were also studying their first online unit, it is not surprising that the association was also apparent when the data for NUR120 was evaluated both for access and access beyond the homepage (accessing: $\chi^2 [1, n=285] = 41.757$, $p=0.000$, $\phi=0.391$; and accessing deeper pages: $\chi^2 [1, n=175] = 12.883$, $p=0.000$, $\phi=0.289$). Even though the numbers of students studying their first online unit was much smaller in the second year unit, NUR219, a significant association was also found when analysing access or no access to the resource, although the strength of the relationship was considerably less ($\chi^2 [1, n=256] = 8.906$, $p=0.003$, $\phi=0.187$). This association did not continue when examining students who accessed deeper pages, with the analysis being influenced by the low numbers of students who were studying online for the first time.

This finding is consistent with a study of students in the US where prior experience with online study improved their perceptions about barriers towards online study. Muilenburg and Berge (2005) noted that the perceived barriers to online study were dramatically lower when students had completed just one online course compared to those who had not studied online. This provides greater insight about strategies that universities should consider when making decisions regarding their focus for student support, suggesting that they should target those students who are new to studying online. This will be discussed further in Chapter 6, Section 6.2.5.
Mode of enrolment and attendance pattern

When considering other study factors, such as full-time or part-time study load, and enrolment mode, such as on-campus or off-campus, there was generally no association between these factors and any level of engagement (refer to Appendix 7). The only association noted was for students studying off-campus in the first year unit ($\chi^2 [1, n=175] = 4.738, p=0.030, \phi = -0.179$), although the effect size is small. A tentative conclusion could be that students studying off-campus, and therefore relying solely on the online delivery of learning materials, are more likely to access pages deeper in the resource as they do not have the same supports available as the students who are studying on the university campus.

Age and gender

The final two demographic factors considered were gender and age. Even though there was a much higher percentage of females studying at CDU, the level of engagement was almost exactly the same for each gender for all levels of engagement, indicating that gender did not have any influence on how the students accessed the resource in the CDU context. This finding was in line with the experience from Contextual Case 1 (Chapter 4, Section 4.3.2.3).

Unlike the University of Sydney results there was an association found between accessing the resource and increasing age, not only for the whole sample population but also when the data was analysed for each unit separately. It should be noted that the effect is considered small (Both units: $\chi^2 [3, n=541] = 16.272, p=0.001, \text{Cramer’s } V = 0.173$; NUR120: $\chi^2 [3, n=285] = 14.886, p=0.002, \text{Cramer’s } V = 0.229$; NUR219 $\chi^2 [3, n=256] = 12.204, p=0.007, \text{Cramer’s } V = 0.218$). This association did not, however, hold for engagement with deeper pages and completion of the practice activities.

Combination of demographic factors

It was noted that engagement in activities was higher when students were studying off-campus, studying their first online unit and also when they were over the age of 25 years. Analysis selecting all students who met this combination of demographic factors
The statistical analysis showed that this effect was greatest when considering access versus no access, and access to deeper pages of content, with both reducing but still showing an association for engagement with the activities. (Comparing access and no access – Column A and B, \( \chi^2[1, n=541] = 42.373, p=0.000, \phi =0.28 \); comparing access to deeper pages and no further access Column C and D, \( \chi^2[1, n=293] = 24.115, p=0.000, \phi =-0.287 \); comparing engagement in activities Column E and F, \( \chi^2[1, n=196] = 7.161, p=0.007, \phi =-0.191 \).

A limitation to the rigour of these findings is that performing a large number of statistical analysis increases the likelihood of finding a demographic attribute to be significant by chance. To avoid this, only associations with a p value < 0.001 were used to answer RQ1a (levels of student engagement with the resource) and RQ 2a (relationship...
between patterns of engagement and demographics). The analysis showed that accessing
the resource and exploring beyond the homepage is significantly associated with
enrolment in the first year unit. Hence DC 1 was at least partly achieved with students
exploring the content of the resource. When considering the demographic factors, a
stronger association was found with students who were studying their first online unit at
CDU and those over 25 years of age studying their first online unit. This provides further
evidence that there may be factors that influence how students approach their engagement
with online resources. This will be explored further in Chapter 6, Section 6.2.5. It should
be noted that these associations did not extend to participation in the activities and thus
the design did not fully achieve DC 1. This suggested that there were likely to be more
complex reasons why many students did not engage actively with the practice activities.
The next section will review which content areas were accessed.

5.3.2.2 Engagement with the Modular Content

The resource was organised into eight modules with a total of 81 different pages,
organised to illustrate the different ways in which content could be presented in an online
unit. As noted in Table 5.1 (p. 168), the Quest activities were interspersed throughout
each section providing a context for each activity.

Figure 5.4 outlines the number of times each module was accessed for the students
that explored beyond the homepage (n=196). The sections accessed most often were
generally the first few modules: “Modules 1 to 3”, which is consistent with the intention
to provide a beginning overview to studying online. The distribution of modules accessed
was very similar when data for the first year and second year units were analysed,
indicating that the students who did explore the resource beyond the homepage accessed
the modules in similar proportions regardless of their year of study.

The most visited section was Module 3 “Quest Test”, which was promoted as a self-
assessment quiz for the students to assess their readiness for using the LMS. Other areas
that drew several visits were the “Getting Started”, “Your Quest”, “For Successful Study”
and “For Assessment” sections, highlighting the types of matters of most concern for
students. There was a trend for pages deeper in each section of the resource to have fewer visits; often as little as 10% of the students who visited the higher level page accessed further deeper pages in the resource. An exception was the “For Assessment” section which had consistently high numbers of visits for all pages. Modules that were visited the least were those that provided information about online communication tools, such as the discussion board in the “For Communicating” section, and pages that provided videos of students and teachers describing their experiences of using the LMS in the “For Successful Study” section.

Since some students accessed the same pages multiple times, Figure 5.4 can overestimate the popularity of pages across the whole cohort. Consequentially, the number of students who accessed each module (regardless of the number of times each module was accessed) was analysed to highlight the most popular sections of the resource (Figure 5.5). There is a subtle but important difference between Figures 5.4 and 5.5. The “Getting Started” module, which provided an overview of online learning and the purpose of the resource, was accessed by the highest number of students followed by the “Your Quest” section which provides information about the 10 Quest activities and structure of the
resource. These two modules are also listed in a linear order on the left-hand navigation bar. Beyond this, students then appeared to select sections in the following order of popularity: “For Successful Study”, where topics related to managing the study environment were outlined, including organisational skills and time management, understanding student responsibilities, as well as finding their way around the online learning environment; the “For Assessment” section, describing the various types of assessment tools; and the self-assessment readiness test (“Quest Test”). Although the “Quest Test” recorded a high number of page accesses, these were from a smaller number of students. These students tended to access and repeat the “Quest Test” several times to improve their score and achieve mastery, suggesting that students will be motivated by an active approach to self-assessment of their abilities. The communication and collaboration modules were accessed by fewer students. The interviews revealed that students did not value these asynchronous collaboration tools, preferring alternative mechanisms, such as social media, to build connections and a sense of community with their peers (see Section 5.3.5).

![Figure 5.5](image_url)

**Figure 5.5** Number of students accessing each module of the resource
The survey data from 17 students also sought to gather information to triangulate the LMS tracking data. As expected, students indicated that they looked at each of the sections and worked their way through the information in a range of ways: linear pattern (7); dipping in and out randomly (7); quick overview to return later (2) or didn’t find anything of interest (2). There was less agreement that it was easy to find their way around and locate relevant information, (strongly agreeing or agreeing, 11 [65%]; neutral 3 [18%]; disagree 3 [18%]), with complaints from three students that “the assessments were in different places”; how difficult navigation was with Learnline units; and confusion about why they even had access to the resource. One of the interviewed students also indicated that they wondered what the unit was all about but they “knew it wasn’t a subject…. and didn’t get into a panic about it” (Natalie). These comments highlight the need for clear information about the units and resources that are to be made available through Learnline, and hinted at the importance of a “Get Started” stage prior to accessing Learnline, even though the opening statements on the homepage indicate that “Get Learning Online @ CDU is a student orientation resource to help you become familiar with using Learnline.” It also appears that some students did not appreciate the quest exploration to find each activity, despite both an audio introduction to the Quest and organisational map of where to find the quests in each section of the resource. Once again, this highlights the importance of clear labelling and organisation of online resources (DP 5), and the importance of teacher presence to enhance engagement (DP 4). The next section delves further into the access patterns and considers RQ 1b, seeking to determine what types of activities were attempted by students.

5.3.2.3 Engagement with the Practice Activities

There were eleven activities embedded within the resource. The percentage of students attempting activities was small, with only two students (one studying the first year unit and one the second year unit) completing all eleven activities successfully. Table 5.6 shows the number of students who accessed the page where the Quest activity information was provided and the number in each unit who attempted the activity.
For example, the most popular activity was the “Quest Test” in Module 3, which consisted of ten questions for students to self-assess their skills and understanding of a wide range of aspects of Learnline (navigation, terms used, how the various tools are used for learning). Table 5.6 shows that approximately three-quarters of the students who accessed the information about the “Quest Test” went on to attempt the quiz, but of the
59 students who started the quiz 16 (27%) did not complete the quiz. The other activities that had the greatest engagement included the navigation task (M2: Quest 1) and other Quest activities related to completing assessments (M7: Quests 8-10).

Few students completed the online communication activities in the “For Communicating” module (M5: Quest 4 & 5). This may be due to the fact that this resource was not supported with direct teacher presence providing encouragement to engage in online communication activities. The data extracted from the LMS did not allow the researcher to identify the students who were lurking; that is, reading the messages but not actively engaging in the communication tasks. This indicated a limitation of the tracking data available for analysis by the LMS. Lurking is a common behaviour exhibited by online learners and has an impact on the degree of engagement and collaboration between learners (Carroll, Booth, Papaioannou, Sutton & Wong, 2009b; Palmer et al., 2008). The implications of this form of non-activity online will be considered in Chapter 6, Section 6.1.1. Despite this, content analysis of postings from students who did participate in the discussion activities indicated sharing of ideas and encouragement of each other’s opinions. This participation resembled the initial stages of building a collaborative online community (DC 3). The interview data did help to reveal further insights about the perceived limitation of such text-based asynchronous communication modalities, bringing into question the ability of a generic orientation resource to promote such an online community (see Section 5.3.5).

The level of engagement in the activities was considerably higher in the first year unit (NUR120). Overall those that did engage to this level were predominantly studying off-campus and, at least for the first year unit, were also studying online for the first time at CDU (see the two right-hand columns in Table 5.6). This provides some evidence that students who are studying by distance and not attending the campus are more likely to engage in the practical aspects of orientation resources.

Although the percentages of students completing activities was generally small, their focus on assessment-style activities correlates with Palmer’s (2012) survey of student
satisfaction with a range of LMS tools. Palmer (2012) noted that the online quiz rated significantly lower levels of satisfaction for off-campus students. Therefore, providing an opportunity for students to try out a quiz activity in a non-threatening environment may help to improve student perceptions.

In the survey, the majority of students indicated that the resource was useful, appropriate for beginning Learnline users. Respondents indicated that the Quest activities helped them understand how to use Learnline tools (strongly agreeing or agreeing, 15 [88%], neutral 1, strongly disagreeing 1), and that they would recommend the resource to other students (strongly agreeing or agreeing, 13 [76%]; neutral 2; disagree 1; strongly disagreeing 1). Comments received ranged from appreciating the opportunity to “actually perform the tasks” (one student). Few (4, 22%) agreed that the Quest activities should be compulsory for students to complete.

All five students interviewed commented that they found the Get Learning Online @ CDU resource helpful, even those who had limited engagement with it prior to the commencement of semester. However the foci of their comments differed. The students who were new to studying online noted that they found the resource useful, returning to check on aspects later in the semester:

It was extremely helpful because I had no idea what I was doing until I looked at that. ...explaining where everything was on the site, was handy for learning how to use it in the first place. (Anne)

I probably found all of it, to be honest, helpful because I actually went back and did a couple of things because I wasn’t too sure. (Tammy)

Those who were not studying their first online unit found it helpful from the perspective of explaining the changes of the LMS. Communicating information about changes to university systems to students was identified as a gap in the information that they received from the university, and a cause of some anxiety to continuing students as noted in the following quotes:

I logged on originally when the first emails came out and I think from when I first started with eLearning a few things had changed with the Learnline site, so every semester when I first start again I just have a
quick look at what’s changed, because again, even this semester, it’s changed. (Emma)

They seem to have changed it for the second year and that confused me because I thought, oh yeah no problems, straight into it. Now I’m thinking oh well that’s changed and that’s changed a bit, only slightly but it was a change. I think if you relied heavily on not being adaptable or you are not adaptable then you would have probably struggled a bit. (David)

Despite the variation in engagement with the activities between the interviewees, the ability to try out the LMS tools was seen as beneficial to the transition to online distance learning.

I remember thinking that this was a good activity when I first started, I remember that standing out in my mind, just the little activities involved in it. (Natalie)

The little quizzes that it had for each different things were really handy to make sure that I was doing it the right way, so that was good. (Anne)

One of the students who was less aware of the Get Learning Online @ CDU resource and had not engaged with the activities, suggested that it would be helpful if the university provided a way of allowing students to practise prior to study!

Before you actually start your studies, play about with it, go on so you can do it in your sleep…. If there was just some way that they could send you out a disk where you could actually do some practical things using it without knowing that you’re going to do any damage to any of your assignments. (David)

The overall lower engagement in completing Quest activities has implications for how and when student support is provided. The interaction between providing a safe place for students to try out such activities with their completion of higher stakes assessments in their formal online unit warrants further investigation.

While the data presented thus far provides some insight about the level of engagement with the resource (RQs 1 and 2) it was also helpful to consider further access information. The timing of accesses is reviewed next and matched to the timing of enrolment into the unit (DP 2 and DC 2), as this provides insights about the possible design features for such resources (RQ 3).
5.3.3 Evaluation of timing of access with timing of enrolment

Since Get Learning Online @ CDU was not a compulsory formal study unit, it was helpful to determine when, and for how long, students accessed the resource. The resource went live nine days prior to the start of the semester, available from the time a student completed their enrolment until the end of semester. As noted in Section 5.3.1, access was promoted in a number of ways, including an early warning email sent to all students who had not accessed the resource by the second day of semester (1st March). The timing of first access for students studying either unit peaked in the pre-semester period prior to 28th February and the first week of study, tapering off after the census date on 31st March where enrolments are finalised. It is notable that there were still 35, out of 293 (12%), students who accessed the resource for the first time after the census date, indicating access to supports throughout the semester, perhaps as a just-in-time approach to explore such resources. Figure 5.6 illustrates the time period of initial accesses associated with each unit studied.

![Figure 5.6 Timing of access to Get Learning Online @ CDU](image_url)
The time of first access can also be analysed with respect to the time each student enrolled, as this event triggered access to the resource. As Table 5.7 indicates, students who enrol early are more likely to access the resource. A significant relationship between enrolment date and the timing of first access to the resource was found with the first year unit (NUR120: χ² [2, n=285] = 6.099, p=0.047, Cramer’s V =0.146; NUR219: χ² [2, n=256] = 3.287, p=0.193, Cramer’s V =0.113).

Table 5.7
\[ \text{Relationship between time of enrolment and first access to the resource} \]

<table>
<thead>
<tr>
<th>Access</th>
<th>Unit studied</th>
<th>Enrolment before 20/2/11</th>
<th>Enrolment between 20/2/11 and 27/2/11</th>
<th>Enrolment after semester commenced 28/2/2011</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessed Resource</td>
<td>NUR120</td>
<td>122 (66%)*</td>
<td>29 (57%)*</td>
<td>24 (48%)*</td>
<td>175</td>
</tr>
<tr>
<td></td>
<td>NUR219</td>
<td>83 (48%)</td>
<td>18 (51%)</td>
<td>17 (35%)</td>
<td>118</td>
</tr>
<tr>
<td>No Access</td>
<td>NUR120</td>
<td>62 (34%)</td>
<td>22 (43%)</td>
<td>26 (52%)</td>
<td>110</td>
</tr>
<tr>
<td></td>
<td>NUR219</td>
<td>89 (52%)</td>
<td>17 (49%)</td>
<td>32 (65%)</td>
<td>138</td>
</tr>
<tr>
<td>Total</td>
<td>NUR120</td>
<td>184</td>
<td>51</td>
<td>50</td>
<td>285</td>
</tr>
<tr>
<td></td>
<td>NUR219</td>
<td>172</td>
<td>35</td>
<td>49</td>
<td>256</td>
</tr>
</tbody>
</table>

*p<0.05

Some students still continued to access the resource through the entire semester and even during the final examination period (Access after the census date of 31st March 2011: overall n=78, 27%; NUR120 n=49, 28%; NUR219 n=29, 25%). The timing of the students’ last access emphasised that the peak time for this last access to the resource was in the first weeks of the semester with a similar spread. Therefore most students seem to have accessed the information that they needed early in the study period, possibly becoming busy with other study requirements.

5.3.3.1 Timing of access and engagement with activities

The timing of completion of the activities (n=161) was also analysed. Given the tendency to access the resource early in the semester, it is not surprising that the majority of activities were completed in the period prior to semester starting (57%, n=92). Up until
the census date, a further 27% (n=44) were completed and, finally, 16% after the census date (n=25). It is noteworthy that practicing assessment-based tools (quiz and assignment submission including the plagiarism check, Quests 8, 9 and 10 respectively) demonstrated a more even spread across the semester. This was possibly related to students trying out these activities closer to the timing of real assessment deadlines in their formal units.

When asked at what stage in the enrolment process the students felt the resource would be beneficial, 13 (72%) indicated after enrolment and prior to the commencement of semester, in line with the timing of access patterns. Almost half of the survey responders (8, 44%) considered that prospective students should be provided with guest access to try out online learning, and nine (50%) agreed that the resource would be useful for the whole time a student was studying at CDU, indicating further support of an extended orientation timeline (DP 2).

5.3.3.2 Number of pages accessed and duration of access
The majority of students accessed the resource only once (54%, n=106), but some students engaged with the content of the resource up to six times during the semester. Table 5.8 illustrates that students who accessed the resource beyond the homepage, (n=196), exhibited very large variation in the mean number of pages visited ($\bar{x}=61$, SD 89.2), although the median was much lower ($\bar{x}=26$), indicating a skewed distribution towards lower numbers of pages accessed by the students. Estimates of the duration of access are limited by the LMS log file data which did not record when the student exited the resource. As with the number of pages, the total time that students explored the resource also exhibited a large range and skewed distribution ($\bar{x}=32.9$ mins, SD 62.9, $\bar{x}=7.5$), which was similar for the duration of access per visit ($\bar{x}=17$ mins, SD 29.4, $\bar{x}=5.5$).
Table 5.8

*Number of pages accessed and duration of access*

<table>
<thead>
<tr>
<th>Unit</th>
<th>Number of pages accessed</th>
<th>Total duration of accesses</th>
<th>Duration per visit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Median</td>
<td>SD</td>
</tr>
<tr>
<td>All (196)</td>
<td>61.2</td>
<td>25.5</td>
<td>89.2</td>
</tr>
<tr>
<td>NUR120 (133)</td>
<td>69.9*</td>
<td>27</td>
<td>98.4</td>
</tr>
<tr>
<td>NUR219 (63)</td>
<td>43*</td>
<td>24</td>
<td>62.4</td>
</tr>
</tbody>
</table>

*p<0.05

First year students accessed more pages in the resource for a longer time overall. This was confirmed as a significant difference with a Mann-Whitney U test although the effect size is considered small (Number of pages accessed: U = 3453.5, z = -1.985, p = 0.047, r = .14; duration of access U = 3417.5, z = -2.086, p = 0.037, r = .15). There was no difference found for the duration of each visit for students studying the first year unit and students studying the second year unit (U = 3573.5, z = -1.666, p = 0.096, r = .12). This analysis reinforces the engagement results outlined in Section 5.3.2, showing that students enrolled in the first year unit (NUR120) not only accessed deeper pages in the resource but also reviewed more of the content than students in the second year unit.

5.3.4 Relationship between access, engagement and grades

Research question 2b sought to consider if student engagement was related to their study success. Overall, 19.4 % (n=105) of students withdrew from studying the unit, with a slightly higher withdrawal from the first year unit (NUR120 21.1%, n=60; NUR219 17.6%, n=45). There was no association between withdrawing and any of the levels of engagement described earlier (access or no access; accessing deeper pages or finishing an activity). As noted in Chapter 2, Section 2.5.1, the reasons for withdrawing from study are complex and multifaceted so it is not possible to draw conclusions about the role that this orientation resource may have played in a decision to withdraw from study.
However, there was a significant association between those students who withdrew from study and the combination of demographic characteristics identified previously (studying off-campus; age over 25 years and studying an online unit for the first time), compared with students who did not withdraw and who did not have these demographic characteristics ($\chi^2 [1, \text{n}=541] = 27.551$, $p=0.000$, Phi = 0.226). Therefore, the group of students with these demographic characteristics were not only engaging more extensively with the orientation resource, but were also more likely to withdraw from study. This suggests that universities should seek to understand the reasons for withdrawal from particular demographic groupings of students and also pay more attention to the strategies for recruitment and subsequent support for such students during their academic journey.

If we just consider the students who continued their study and completed the unit, analysis showed there was no association between any of the levels of engagement described earlier and passing the unit, regardless of the grade they achieved. Overall, 29.6% (n=160) students failed the unit they were studying with a similar percentage for each unit (NUR120 28.1%, n=80; NUR219 31.3% n=80). There was also no relationship between engagement (access and no access; access to deeper pages and engagement in activities) and the achievement of higher grades in either unit, or in any of the demographic groupings identified earlier. Although previous studies have noted a relationship between student engagement in online learning environments and academic grades (Beer et al., 2010; Macfadyen & Dawson, 2010), engagement in an orientation resource primarily at the commencement of semester is unlikely to predict later performance in disciplinary-based assessment results due to the large number of factors that contribute to performance in academic study.

Since a relationship was found between the number of pages accessed and the duration of access, and unit studied, an analysis of these parameters with the grades achieved was undertaken for the group of students who did explore the resource beyond the homepage and who did not withdraw from study (n= 157). Figure 5.7 shows these relationships and also the average time the student engaged with the resource.
Despite the large variance in data for each grade grouping, as shown by the standard error bars, a one-way between-groups analysis of variance was conducted using the Brown-Forsyth test of robustness to explore the relationships between these variables. There was a statistically significant difference at the $p < .05$ level in the number of pages accessed ($F(2, 154) = 3.839 \ p = 0.024$) and duration of accesses ($F(2, 154) = 3.999 \ p = 0.021$). Post hoc comparisons using the Tukey HSD test indicated that this was significant when comparing the students with a grade above a pass with students who failed. There was no significant difference between the other two combinations (failing and passing, or passing and gaining a grade above a pass). This may lend some weight to the fact that
students who perform well in their academic study display a more thorough use of the online resources available to them (Cho & Shen, 2013; Korkofingas & Macri, 2013; Yu & Jo, 2014). This analysis showed that although they may not engage in the orientation activities, such students appear to review resources more extensively and for a longer period of time.

5.3.5 Further themes relating to the student transition experience

The additional analysis undertaken from this contextual case was the inclusion of interview data which sought to explore more deeply the student experience of online distance learning, and to provide further insights for RQ 2c, exploring individual student experiences of transition and why these students engaged with or did not engage with the resource. As noted in Section 5.3.1, five students were interviewed with their levels of engagement summarised in Table 5.3 (p. 179).

In the first stage of analysis, the interviews were analysed holistically to try to capture the essence of each individual student’s story of making the transition to online distance learning (see Chapter 3, Section 3.6.2). A further interpretive lens was also used in the analysis, drawing on the learning theories and pedagogical models that informed draft DPs outlined in Chapter 2, Sections 2.2 and 2.3. This led to further understandings about the lived experiences of students making the transition to online distance learning and the generation of a theoretical construct to depict this transition (outlined in Chapter 6, Section 6.3). Each story is summarised below with reference to these elements, with the two students who engaged the least with Get Learning Online @ CDU outlined first (see Table 5.3, p. 179).

Emma, aged 29 and from NSW, was studying a second year subject part time and had been an online distance learner for the past two years. She reviewed the resource twice, scanning most sections (except assessment) for a total time of 11 minutes but did not engage with the activities. She reported being busy in her home life and was struggling with understanding the expectations that were required to study at university level. She
had experience in the healthcare setting as a medic in the defence forces and felt that the
university should have recognised her prior learning in this role. She was aware that she
needed to improve her academic writing but did not find the feedback she received on her
assignments enabled her to evaluate her own work. She felt frustrated, stating that there
was too much variation in assessment practices in the units she was studying. She was
also annoyed with her difficulty in locating relevant resources, and the fact that an
asynchronous discussion board was suspended due to inappropriate comments, which led
to her disengaging with the unit and deciding not to submit the next assignment. She
gained support from her friends and family, with other students supporting her
emotionally rather than academically; and appeared to either not value or had limited
opportunity to develop higher levels of collaborative learning with others. Emma failed
the unit and appeared to be struggling to manage not only the transition to university
study but also the transactional distance created by the distance and online mode of study.
It appeared from her comments that she had not expected these difficulties and this
impacted on her ability to self-regulate her learning and to succeed.

David, aged 52 and from a Queensland regional city, was also studying the second
year unit, and managing a full-time load in his second year of study. He accessed the
resource twice prior to the semester commencing, for a total time of 15 minutes, selecting
a few sections (“Your Quest” and the “For Assessment” sections), and did not complete
any of the activities. He had worked in the healthcare sector as an enrolled nurse for many
years and was motivated to study to upgrade his qualifications to become a registered
nurse. He demonstrated strong self-efficacy skills, actively seeking out opportunities to
improve his academic writing skills. He had engaged with other CDU supports, such as
virtual webinars conducted in Wimba by the Language and Learning Support Centre, as
well as library sessions to improve his information searching skills. He rated these at a
higher priority at this stage of his development than reviewing the Get Learning Online
@ CDU orientation resource. During the interview he reflected back over his prior year,
indicating the steep learning curve he had negotiated. He recounted how unprepared he
was for the level of work needed, and the difficulty in navigating the online learning environment. He found he had to learn to trust the online environment, especially the assignment submission, wishing there was a way to receive a confirmation that assignments had been received successfully. His positive and proactive attitude enabled him to put these difficulties behind him and actively prepare himself each year by getting online early in 2011 so he could prepare and note any changes from the previous year of study. He also actively sought out support from other students who studied nursing. He preferred the synchronous virtual classroom sessions even if he could not be there in real time, finding that viewing the archived session provided a greater sense of teacher presence than asynchronous discussions, due to their time delay. David appeared to have made the transition not only to university study but also seemed to be managing the distance and online environment by seeking out opportunities for dialogue and support, which, when matched with his autonomous approach to learning, helped to lessen the transactional distance. He received a credit grade for the unit.

Natalie, aged 35 and from Queensland, engaged in a full-time load in her second year of study. She was very motivated to become a nurse, relishing the opportunity to study at university, unlike other members of her family. She also commented on the steep learning curve when transitioning to university study. Her positive attitude to finding support led her to seek a range of supports. She sought out her local area library to enable her access to study resources, used all available online tutorials, and made the most of the academic literacies unit in the first year of the course so she could develop her computer and academic writing skills. She demonstrated an awareness of changing her learning style from prior school study, recognising the need to take more responsibility for her learning and to consciously limit her work commitments while she studied, to allow sufficient time to make her transition. She stated how she utilised all available resources as early as possible, and this was borne out by analysis of her engagement with the Get Learning Online @ CDU resource. She accessed it the first day it was made available, and explored the resource for 76 minutes, reviewing all sections and completing a number of the
activities during this initial access. She stated that she valued the opportunity associated with the virtual classroom for developing a sense of belonging to a learning community, and that she would prefer more opportunities to collaborate in the study environment. She recorded a pass in semester 1, 2011. Once again, it appeared that Natalie’s motivation to study and self-regulated learning skills enabled her to make the transition to university study. She sought out university support and structures to assist her, and also made the most of engaging with her local supports that would assist her to succeed.

Tammy, aged 32 and from Western Australia, commenced study for the first time as an online distance learner at CDU in 2011. She had previously studied at a local university in a face-to-face setting but needed to take a break from study to manage new parenting responsibilities. For much of her interview she made comparisons to her prior study experiences, indicating how much harder she found the online distance learning environment. She felt the academic expectations were high and she struggled with self-paced learning, finding the learning environment lonely. She missed the face-to-face interaction where she gained confidence from others. She utilised the Get Learning Online @ CDU resource extensively, returning to the resource five times from the first day it was made available, recording a total of 317 minutes accessing all sections of the resource and participating in all Quest activities. She stated how she struggled with the academic nature of university study, suggesting that the unit was too “book-based” for what she termed a “practical” profession like nursing. She felt isolated, clearly finding the transactional distance impacted her learning and needed greater social and teacher presence and dialogue. Unfortunately, Tammy had failed her unit and indicated in the interview that she would try for one more semester but was considering returning to her local university as online learning did not really suit her. Although the transactional distance did impact her learning, it was apparent from the interview that Tammy’s attitudes and self-regulatory behaviours were impacting her approach to online distance learning and extending this transactional distance.

Anne, aged 33 and from Queensland, was also studying her first online unit at CDU during this initial access. She stated that she valued the opportunity associated with the virtual classroom for developing a sense of belonging to a learning community, and that she would prefer more opportunities to collaborate in the study environment. She recorded a pass in semester 1, 2011. Once again, it appeared that Natalie’s motivation to study and self-regulated learning skills enabled her to make the transition to university study. She sought out university support and structures to assist her, and also made the most of engaging with her local supports that would assist her to succeed.
university and accessed *Get Learning Online @ CDU* three times from the first day of semester, for a six week period until late April, exploring all modules for a total of 212 minutes. She completed the Quest activities associated with online assessment tools. In her interview Anne recounted being daunted initially with the online environment, feeling overwhelmed, but recognising the need to be prepared for study, and also to be organised to fit it around work and family life. She enjoyed the orientation resource as she had needed help with computers especially when trying out the assessment activities. In her formal study she reached out, using both asynchronous and synchronous communication opportunities, to make connections with other students through the discussion board and Facebook group, finding the live classroom added value as the teacher presence reduced her sense of isolation. The flexibility afforded by online distance learning suited her current life circumstances, but she noted that delays making study resources available, coupled with limited individualised feedback detracted from the learning experience. Anne achieved a distinction in the unit and clearly was managing this mode of learning effectively.

Each of these stories reflected elements of the learning theories that informed this EDR project. They also provided a richer understanding about the diversity of experiences from online distance learners. This analysis contributed to a further synthesis of the student transition experience in described in Chapter 6, Section 6.3.

Next, the interview data and other qualitative data (student surveys and responses to the discussion board activities) were analysed together using constant comparative techniques to highlight comparisons and differences in the representations contained within the data sources. These themes were compared to those from the literature outlined in Chapter 2, Section 2.5.1, describing the experiences of students studying online (Kerr, Rynearson & Kerr, 2006; Muilenburg & Berge, 2005). Four themes emerged to encapsulate the students’ transition to online distance learning: technical issues, lifestyle factors, social interactions and academic skills. Each theme will be discussed in the following paragraphs outlining how each contributed to creating a barrier for this
transition, as well as how each could be overcome. Figure 5.8 maps each theme with their barriers (top row in italics) and their enablers (bottom row).

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Enablers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical</td>
<td>Lifestyle</td>
</tr>
<tr>
<td>Navigation</td>
<td>Time</td>
</tr>
<tr>
<td>Changing university systems</td>
<td>Competing demands</td>
</tr>
<tr>
<td>Use of online tools</td>
<td>Asynchronicity</td>
</tr>
<tr>
<td>Early access</td>
<td>Delayed responses</td>
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<tr>
<td>Exploration</td>
<td>Online synchronous classroom</td>
</tr>
<tr>
<td>Flexible study plans</td>
<td>Informal spaces</td>
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<tr>
<td>Family supports</td>
<td>Online learning support</td>
</tr>
<tr>
<td>Local study groups</td>
<td>Integrated university support</td>
</tr>
</tbody>
</table>

**Figure 5.8 Transition to online distance learning themes**

A number of what could be considered technical issues was identified as creating anxiety and difficulty for new online distance learners. These were described by students as difficulty with navigation and finding things, understanding how different online tools work (such as the online classroom or discussion board) and the impact of yearly changes to university systems.

*I remember thinking that I wish I had this when I first started because I haven’t used the computer or internet much prior to studying – just navigating around a website was quite new to me.* (Natalie)

*Knowing just where to find certain areas and if someone has commented on your comment, where to find that.* (Tammy)

*Took me a while but I am slowly still learning how to navigate around my units. I’m still not sure when I get a reply to a question I have asked in group discussions, where it is?* (Survey, Q7 #11)

When asked what advice they would give students who were new to studying online at university, all of the interviewees mentioned early access to the orientation resource prior to commencement of study and time to allow students to click around and explore each of their other unit Learnline sites.
Take the time to actually go through, click through each subject [unit] because each subject is set out differently, so at the beginning of each subject go through it a couple of times and try and click on things and look for things. Sometimes you assume that things are under a certain heading and they may not be there, so you can miss information. (Natalie)

I’d probably tell them to get online as soon as they are able to access the site and just have a bit of a look around and get familiar with it before you actually start your semester because if you don’t then you’re very overwhelmed when you first start if you haven’t had a look around first to work out how to use it. (Anne)

A number of lifestyle factors were recognised as impacting on students’ ability to succeed and stay connected with their study requirements. Time was mentioned as a constraint, largely due to competing demands between study, family and work commitments. All interviewees were positive that the flexibility provided by off-campus study modes did influence their choice to study at the CDU, noting that if they were able to organise themselves, and also received support from family and work, that they would persist and continue.

The flexibility of the courses. Although you will have a study guide of what areas to study first it gave me the opportunity to choose subjects [units] that I thought were a bit easier when I knew that I was going to have a baby. (Emma)

I didn’t have to worry about attending lectures at certain times, so it meant that I could pick up the kids from school so it fits in better with my life. (Anne)

To prepare for it and just be ready that it is a big change if you’ve not done this before, just get organised, time management. It comes with practise too, the further on in your studies you get, the better you get at knowing what to read and how to read articles. (Natalie)

Closely related to the lifestyle supports was the concept of social interaction with their peers. The lack of synchronicity in their learning experiences was highlighted as stemming from the absence of face-to-face interaction in a fully online course. All the students mentioned the advantage of the synchronous tools, such as the virtual classroom (known as Wimba), commenting that it was not utilised enough in the units they were studying. They were generally less enthusiastic about the use of the asynchronous discussion board, seeing it a useful place to exchange tips or solve navigation queries but
did not feel that this tool was helpful in developing their understanding of concepts about their topics of study. It was therefore unlikely that they would progress to the higher stages of online development suggested by Salmon (2000).

I do think I missed out on that community learning, it is really isolating sometimes but, I thoroughly enjoy Wimba. It would have been really good being there, but even the ones that are archived, so you’re not really interacting are good. You’re kind of just listening, you’re hearing voices, you’re seeing the lecturers, and you feel like, ‘yeah, I am a part of this, but also a little bit on my own here... I’m not a fan of the discussion board – it’s not an immediate response that you get, it’s more like an email isn’t it, then sometimes I read some of the discussion board and it just bores me what they’re talking about and to me it’s not relevant to the subject so I only go on when it’s compulsory to go on. (Natalie)

Alternative opinions were provided about the effectiveness of the discussion board.

When we were doing the semester quite a lot of us used the discussion boards and any problems we were having, or if you didn’t know how to do something we’d get on there and just ask and other people would give us advice on stuff so that was pretty handy... Don’t be afraid to talk to the other students on the discussion boards, because you’ll need them. (Anne)

Usually every unit has a Coffee Chat Room, introduce yourself and find out who’s in your area. Yeah, that was good just to read how far and widespread everyone on the course is as well and people that have been in a similar situation. (Emma)

The students found more value in the student-initiated informal learning spaces where students from all years were available to mentor and guide them with their study. These ranged from virtual spaces, such as Facebook groups, to face-to-face study groups in some locations.

People post it on social network sites or they do it in your student Inbox if you’re from a particular area or even under your units, your group discussions we’ll get together and work our way through things. .....If you live in this particular area we can all get together if you’re studying this unit and discuss information and share it all, like little study groups. .....Yeah it’s students just starting it all up to help everyone out. (Tammy)

The external students set up Facebook pages so we could talk to each other on there ..... Also because with the Facebook pages we’ve got not just the first year students, we’ve got second year and third year nursing students on there so if we had any queries we could always ask advice from them as well, it’s been good, they’ve been very supportive. ..... One of the girls on one of the discussion boards said “We should start a Facebook page” and everybody agreed so we just did it, everybody joined on. (Anne)
These comments, and the fact that the communication and collaboration content areas of the resource were accessed the least (Section 5.3.2.2), indicated that these students did not fully appreciate the role of online communication and collaboration for the construction of knowledge with peers (stage 4 of Salmon’s Model). This may be due to the lack of moderator support in the orientation resource and also may be related to the design of their formal units, which may not encourage the development of an online community.

Additional transition issues beyond navigating the LMS and studying online emerged during all the interviews, highlighting the integrated nature of the online learning experience. The students mentioned the need to improve their academic writing and mastering skills in how to access and analyse information sources.

Although everything sent from university was exceptionally good for information for the course, it didn't actually prepare you for the amount of academic work and to the level that was needed – it is very much a methodology to answering assignments and that took a fair time for me to pick up. I know I do the job [enrolled nurse], but actually putting it into words in academic way is a little bit difficult. (David)

Get to know your Librarian and how to access the library online – if you’ve never done it before – that took me a lot of time and I still sort of struggle with it, I still have to think about how to research something properly so that I’m not wasting time. That would be my first advice. (Natalie)

The students did not appear to appreciate the complexity of boundaries between the range of systems used to support their learning; although they could clearly identify disconnections between them, and how this contributed to their confusion about where to go for assistance.

By the second semester it [library] changed slightly, they changed the webpage and that delayed me in my research, in starting my semester. I was probably three or four days behind while I got to grips with that. (David)

I had a bit of problem using the library last term and eventually just gave up because I wasn’t actually able to find the information. Well, through Learnline we were given a list of recommended readings and then when I went to open up the actual recommended readings I had a few problems. Some of them wouldn’t open and some of them had a time limit and closed me out and I was like “Oh!” it got a bit frustrating; I presume that I could have looked into it a bit more but I just gave up. (Emma)
It appears from these student interviews that universities may need to foster a more integrated approach to support, where information literacy, academic language and use of the LMS could be encouraged and seamlessly provided as students journeyed from their pre-study life to their academic life. Another area of need identified by the students was the provision of academic advice regarding their enrolment load. Initially these students had decided to study a full-time load but later reduced this to cope with the pressures of working, managing family responsibilities and completing study requirements.

*Just time management, like I think I’m quite good with my time management but full-time work, when you’re working 40 hours a week, I was doing three subjects so it wasn’t even the full four subjects that you normally get, it’s just too much, well I felt it was too much….. It’s not worth it, take the pay cut and deal with it for the couple of years that you have to or go part time with your study.* (Natalie)

Discussing the student experience of online distance learning with students managing this transition reinforced the need to provide a supportive environment not only for their technological needs, but also a broader range of well-co-ordinated supports (informing RQ 3). This has implications for the way universities structure their study assistance services, and highlights the importance of the transition pedagogy concept for new students (Kift et al., 2010) (Chapter 2, Section 2.7.1). This is a theme that will be revisited in Chapter 6, Section 6.2.6.

### 5.3.6 Reflections about the design and theoretical conjectures to inform the RQs

The conjecture map developed during the second phase of EDR provided a guide for considering how the quantitative and qualitative data informed the outcomes from the third evaluation and reflection phase. This section evaluates the extent of achievement of both the DCs and TCs which directed further refinement of the DPs.

Similarly to Contextual Case 1 the *Get Learning Online @ CDU* resource aimed to assist students to build confidence in using Learnline by engaging with modules to assist them in developing skills as an online distance learner, and by participating in the practice activities (DC 1, RQ 1). Overall, just over one-third of the students who were provided
access to the resource engaged with the resource by exploring the resource beyond the homepage (36%), with one-third of these students progressing to active engagement by completing activities in the resource. The fact that a relationship was found between participation in the activities and the timing of enrolment suggested that students are ready and willing to engage in supportive activities during the pre-semester period (DC 2). Even though the value of practice activities was identified in both the surveys and interviews, comments indicated that active engagement was limited by the time available to engage and other study and work-life constraints. The generally low levels of participation in the activities may have resulted from the limited ongoing monitoring and one-on-one support provided in this context. Given the higher engagement noted in Contextual Case 1, teacher presence to promote engagement in standalone resources may need further consideration. This raises further questions about the non-use of online resources, an area that has been highlighted in the human-computer interaction literature (Satchell & Dourish, 2009) and will be considered in Chapter 6, Section 6.1.1. It may be equally important to consider why students may not have engaged with the orientation resource to gain further understanding about the transition process.

The tracking data provided insights into the content areas that were accessed and identified as the most valuable and relevant to this cohort of students (TC 1, RQ 1). As noted in Section 5.3.2.2, a higher number of students accessed the first two modules (“Getting Started” and “Your Quest”), possibly because students navigated the resource in a linear fashion or they perceived that the content was of greater interest. In addition, the assessment module and tips for successful study were seen to be more important than the module describing the communication and collaboration aspects of online learning. The interviews reinforced this finding, where students had mixed views about online discussions beyond answering queries and helping students to find resources. This constrains the development of a collaborative online learning community.

*Just the social interaction is different, you can read your group discussions and everything and you sort of do feel a little bit like you are*
in a group, that’s what you’re thinking, but you don’t have the one-on-one contact and you are not face-to-face with other students. .... there was some good feedback which boosted my confidence, but this didn’t happen very much. (Tammy)

Large enrolments in the units that these students were studying, with only one lecturer to manage their learning, may have influenced the students’ opinions about the value of building knowledge with peers through asynchronous online discussion. This suggested that DC 3 was not achieved. Instead, the interviewees preferred the synchronous online classroom even though they may not have been present for the session and were relying on viewing a recording of the session. They also valued the role that social media, divorced from university, played in connecting with their peers, a finding similar to that found by researchers studying transition of postgraduate learners (Masterman & Shuyska, 2012). This challenges the notion of developing online collaboration within an orientation resource (TC 2). The data also suggested that students will be selective in their use of online resources and only target those elements that are relevant to their study (RQ 2c).

When analysis of the demographics was combined with analysis of the engagement levels, it becomes apparent that students studying online for their first semester were more likely to engage with the resource (RQ 2a). This pattern was noted in the older age groups and with those studying off-campus, regardless of which unit they were studying (first or second year units). There was also evidence that the students who were studying online for the first time, off-campus and over the age of 25, engaged to higher levels, accessing deeper pages and participating in the activities. Therefore the DC 1, suggesting that students would access and participate in the resource activities, appears to vary according to different student characteristics and provides some weight to theoretical conjecture suggesting that engagement may be linked to specific demographic characteristics (TC 3).

Although engagement with the resource was not associated with higher academic grades for the semester of implementation, there was a relationship between higher
performing students and the number of pages they accessed and their duration of access (RQ 2b). This could merely be a reflection that the more studious students explore online resources more than those who perform to lower levels. These results align with the research of others, suggesting that a complex array of factors may influence how students choose to engage in their learning journey (Buckingham Shum & Deakin Crick, 2012; Dai, 2012; Jadric, Bubas & Hutinski, 2010). This area of research, known as learning dispositions, uses a range of learning analytics data, including engagement data, to uncover why students may choose to engage in learning environments in particular ways. This theme will be explored in Chapter 6, Section 6.3.5. Overall data from this contextual case suggests that universities should consider targeting discrete populations when designing support materials (TC 3, RQ 3).

As identified in Contextual Case 1 making such resources available prior to the commencement of study promoted access and Contextual Case 2 supports this supposition (DC 2, RQ 3). It also extends this conjecture, suggesting that early enrolment is linked to greater access and engagement, with students generally trying out activities prior to the commencement of semester. Once again, an extended period of access occurred throughout the semester, with some indication that students would try out the assessment-style activities later in the semester just-in-time. DC 2 did accurately represent the early access patterns identified from the LMS tracking data, which was confirmed by the student opinions provided in the interviews and student surveys.

In the interviews, students reported an ongoing transition process beyond their first year into the second year of study. They described managing complex life circumstances: negotiating work and home life with parenting responsibilities, as well as study, and saw the need for wide-ranging supports to enable study success. The interviewees mentioned supports far beyond managing their learning using the LMS. These included: enrolment advice to assist them to choose units and in what order they should study them; information literacy help, such as how to find online resources and how to appraise these sources; and writing skills, such as how to construct academic arguments and use
referencing conventions. This provided further understanding about the technological, interpersonal and reflective aspects of their transition space, described in TC 4. It also helped to highlight the enablers and barriers that have been mapped in Figure 5.8 (p. 205). Chapter 6 will discuss these findings further.

5.3.7 Modifying the design principles

The experience of implementing an orientation resource in Contextual Case 2 provided additional information about the character of all the DPs, which were then extended or modified and therefore provide guiding principles for designing orientation resources (RQ 3). In addition, a new sixth design principle was developed to capture the theme associated with characterising students who showed greater engagement with the orientation resource.

**DP 1:** Orientation entails a broad transition space encompassing many elements beyond managing the LMS for learning. It is primarily focused on the interplay of technical and interpersonal dimensions that blend in the transition from the student's current world (often involving work and family life) to an academic world of study aided by self-regulatory mechanisms.

The changes to DP 1 reflect a broader conception of transition. It extended beyond orientation to the online learning environment to include the choices that students need to make about their study load, and their identified need to enhance their academic and information literacy skills. While the role of reflection is unclear, the results from this contextual case suggest that students who demonstrate self-efficacy may manage this transition more easily. This construct is considered in greater detail in Chapter 6, Section 6.3.

**DP 2:** Orientation is an extended process, where early enrolment increases access and participation, which then reduces, but still continues throughout the semester.

The results from Contextual Case 2 indicated that early enrolment, and, hence, early access prior to the commencement of formal study, will ease the transition process, and provide opportunities for students to engage more fully in support activities before being overwhelmed by competing study deadlines. Ongoing, just-in-time support throughout
the semester was also supported, such as completing mock assessment tasks.

**DP 3:** Orientation is aided by an opportunity to practise using online learning skills in a safe risk-free environment. They should stimulate curiosity and embed automated feedback on student performance.

For DP 3, participation in activities, while valued, was not achieved to the same level in Contextual Case 2. Factors that may have influenced this difference between the two contextual cases will be examined in Chapter 6, Section 6.1.2.

**DP 4:** Interactions between content, teachers and other students is a core attribute of online learning, requiring an appreciation of how knowledge is constructed and how to communicate and collaborate with peers using a range of online systems, both text and audio-based, including non-university based environments. Teacher presence is an important factor influencing active participation rather than lurking.

The implementation at CDU did not include moderator participation in the communication activities, and these were infrequently accessed by students. This reinforced the suggestion that teacher presence is an important factor in the creation of an online collaborative community. Perhaps it would be better to create discussion activities with content associated with their discipline area, rather than trying to create an artificial sense of community. Results did suggest that students will seek out other non-university provided platforms, such as social media, to collaborate with their peers and to gain a sense of community with other online distance learners.

**DP 5:** Practice activities should be clearly situated in the context of online learning with clear navigation prompts and supports that acknowledge non-linear pathways used by students to explore resources. Adequate support that guides students from content to activities and vice versa should be part of the design, although this alone may not encourage active participation.

There was a tendency for students to only access top-level pages of the resource. One suggestion is that resources be designed with a predominantly flat structure, making use of the scrolling features of modern mobile devices, rather than embedding information within subpages and folders.
DP 6: Student engagement with orientation resources will vary. Orientation should target students studying their first online distance unit and older age groups.

Student engagement with the orientation resource and completion of practice activities will vary. While incorporating customised guidance, feedback and one-on-one supports in the design, this, alone, will not lead students to access, and then participate in the practice activities. There is evidence that students who are over 25 years, studying off-campus and studying their first online unit, will show greater levels of engagement, including participation in the practice activities, suggesting that it may be important to target particular demographic groupings for support. There is also evidence that students who engage with online resources for longer periods may achieve better academic results.

5.4 Dissemination and continuation

Similarly to the University of Sydney experience, the resource described in the Contextual Case 2 at CDU was not continued beyond this iteration, and was impacted in a similar way by the changing political climate at the university. Despite this, my presentations describing the results of this EDR project at a range of professional development activities during 2012 and 2013 at CDU, did contribute to dissemination of the DPs. Three years after this EDR project, a newly designed generic orientation resource was implemented in 2014 for all first-time learners at CDU. A number of the DPs that emerged from the EDR project were adopted in the new resource design (See Figure 5.9). The new resource named “Learnline Student Orientation” was contained within the LMS, and provided information about getting started with study, navigating Learnline, developing an online presence, strategies for communicating with other students and staff, use of common assessment tools and how to manage study with other lifestyle priorities. It also utilised a range of activities for students to practise their online learning skills. The homepage of the resource mirrors more closely other Learnline unit sites (therefore addressing comments made by staff in the first iteration), and the navigation uses a flatter structure for each section, with the reader scrolling to access the
majority of the content materials. The design and implementation of the new CDU Learnline orientation resource, demonstrated an example of spread of a designed solution, which is one of the desired outputs from conducting an EDR project (McKenney & Reeves, 2012).

Figure 5.9 Homepage of new CDU orientation resource 2014

5.5 Summary

EDR provided a framework for applying the lessons learnt from Contextual Case 1, to the development and implementation of an orientation resource, known as Get Learning online @ CDU, at a second contrasting university context. Following prototype testing, evaluation data from a second iteration of implementation, with 541 undergraduate nursing students, was expanded beyond LMS tracking data and survey results, to include student demographic information, academic grades and five student interviews. Consequently, the conjecture map, DC and TC, aimed to illuminate further insights about student transition to online distance learning.

Just over one-third of the students provided with access to the orientation resource explored beyond the homepage, with one-third of these, actively participating in the practice activities. Early enrolment, was associated with greater access prior to semester,
and greater engagement with the activities, although again, there was evidence that students continued to access pages within the resource, throughout the semester. All content areas in the resource were explored, although higher access was noted for the sections associated with navigating Learnline, tips associated with successful study, and completing online assessments (RQ 1a and 1b). There was also a significant association between access, and completion of activities, for students who were over the age of 25 years, studying their first online semester unit, by off-campus study mode (RQ 2a). Given this was the cohort with the highest drop-out rate, this confirmed the importance of identifying students with the greatest need for support, as they transition to online distance learning. Lastly, there was some indication that students who spent more time online, exploring Get Learning Online @ CDU, achieved higher assessment results, but due to the multiple factors associated with achievement at university, this is not likely to be associated with engagement in the orientation resource alone (RQ 2b).

Interview data confirmed the varied access patterns noted in the LMS tracking data and also provided a richer understanding about the student experience of transitioning to online distance learning. These students detailed their multiple demands associated with study, work and home life, highlighting that transition to online distance learning encompasses several support needs, from not only managing the LMS, but also their study load, and other academic tasks, such as writing and information literacy (RQ 2c). Analysis of the data from Contextual Case 2 led to further modifications to the DPs associated with designing supports for students transitioning to online distance learning (RQ 3).

The next stage of this research was to focus on the meso-level of educational design and consider how implementation in these two different university contexts informed the research community about the nature of student transition to online distance learning; how universities can design appropriate support strategies; and how EDR outcomes inform educational practice and theory. Each of these elements will be the focus of the final two chapters.
CHAPTER 6: DISCUSSION OF THE EDR OUTCOMES

The previous two chapters detailed the conduct of three phases of EDR at two different universities. This chapter presents a retrospective comparative analysis of designing, implementing and evaluating these orientation resources, which are synthesised to create the two main outputs of this EDR: procedural knowledge to inform the practice of developing orientation resources presented as DPs; and theoretical understanding of the phenomenon of student transition to online distance learning (McKenney & Reeves, 2012). Figure 6.1 locates this chapter within the overall EDR framework applied to this research.

![EDR Phases Diagram]

**Contextual Case 1: University of Sydney**
- Phase 1: Analysis & Exploration
  - 2006 & prior
- Phase 2: Design & Construction
  - Sem 2 2006
  - Sem 1 2007
  - 3 iterations
- Phase 3: Evaluation & Reflection
  - Sem 2 2007
  - Sem 1 2007

**Contextual Case 2: Charles Darwin University**
- Phase 1: Analysis & Exploration
  - 2009-2010
- Phase 2: Design & Construction
  - Sem 2 2010
  - Sem 1 2011
  - 2 iterations
- Phase 3: Evaluation & Reflection
  - 3 iterations

**Educational Design Research Outcomes**
- Comparative analysis of practice
- Practice interpreted to produce emergent DPs
- Interpretation informs educational theory

*Figure 6.1  Location of this chapter within the EDR phases adapted from (McKenney & Reeves, 2012, p. 77; Oh & Reeves, 2013, p. 995)*

The first section presents a comparative analysis of the tracking and demographic data that emerged from implementing the resources at the two contrasting universities. The analysis focuses on describing how health science students engaged with the resources (RQs 1a and 1b) and why the levels of engagement may have occurred (RQs 2a and 2b). The retrospective analysis considered the continuum, from engagement to non-participation, building a richer understanding about the diverse ways that students utilised...
university supports. Consideration was also given to how well the design and theoretical conjectures described the EDR process as it played out in practice. Further synthesis of these results through a review of the conjecture maps led to the development of six DPs (RQs 3a and 3b). These DPs highlight important design characteristics which could guide development of other supports for online distance learners in different contexts. The DPs focused on the meso-educational design level, but suggested broader university-wide (macro-level) implications for improving transition for online distance learners. Chapter 6 concludes with an interpretation of the essence of the students’ experience of transition (RQs 2c and 3b). A conceptual framework depicting multiple layers of transition encountered by online distance learners is outlined, and proposes that transition success may be influenced by self-regulatory factors.

### 6.1 Practice analysed: Comparisons between contexts

The iterations conducted in two different university contexts provide a point of comparison to evaluate the extent of engagement with the orientation resources. Table 6.1 summarises the key design features of the online orientation resources and the overall engagement data expressed as a percentage of the whole cohort who were given access to the resources. As outlined in Chapter 3, Table 3.3 (p. 84-85), this summary was informed by the analysis of the LMS log files and artefacts created from completion of the practice activities embedded within the resources, and student records, including demographic information which was more detailed for Contextual Case 2. Drawing on the comparative data in Table 6.1, the engagement levels are described as a continuum between access and non-access. The analysis considered how health science students engaged with the resources (RQ 1a), and the practice activities (RQ 1b), and if the levels of engagement were related to other factors, such as student demographics (RQ 2a) and study success (RQ 2b).
### Table 6.1
Comparison of iterations for the two contextual cases

<table>
<thead>
<tr>
<th>Features</th>
<th>Contextual Case 1 University of Sydney</th>
<th>Contextual Case 2 Charles Darwin University</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Semester 1 2007 Iteration 2</td>
<td>Semester 2 2007 Iteration 3</td>
</tr>
<tr>
<td>Level of study</td>
<td>Postgraduate</td>
<td>Postgraduate</td>
</tr>
<tr>
<td>Age</td>
<td>Mean age 38 years</td>
<td>Mean age unknown-likely similar to Iteration 2</td>
</tr>
<tr>
<td>Days available prior to semester</td>
<td>7</td>
<td>14</td>
</tr>
<tr>
<td>% of accesses occurring in pre-semester period</td>
<td>20</td>
<td>49</td>
</tr>
<tr>
<td>Teacher presence: monitoring access</td>
<td>Three weeks of close monitoring of access levels, individual emails to students to provide advice about access issues and recommend further engagement strategies</td>
<td>None</td>
</tr>
<tr>
<td>Number of students given access</td>
<td>178</td>
<td>291</td>
</tr>
<tr>
<td>% of whole cohort accessing</td>
<td>88%</td>
<td>78%</td>
</tr>
<tr>
<td>% of whole cohort accessing deeper pages beyond homepage</td>
<td>80%</td>
<td>71%</td>
</tr>
<tr>
<td>Teacher presence: monitoring of discussion activities</td>
<td>Close monitoring of the discussions, encouraging messages posted with a summary feedback on assignment submissions</td>
<td>Minimal moderation one summary posting, feedback on assignment submissions</td>
</tr>
<tr>
<td>% of whole cohort completing activities</td>
<td>51%</td>
<td>16%</td>
</tr>
<tr>
<td>Mean time (median) accessing resource</td>
<td>1 hour 46 mins (40 mins)</td>
<td>30 mins (4 mins)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>33 mins (8 mins)</td>
</tr>
</tbody>
</table>
6.1.1 A continuum of engagement levels

Overall access was greater for Contextual Case 1 (mean 83%) compared to Contextual Case 2 (54%). A similar trend was noted when access beyond the homepage was compared (mean 76% and 36%, respectively). The latter comparison is a more accurate view of the actual engagement level because merely clicking on the homepage does not equate to active engagement with the resource materials. One possible explanation for this difference is that the postgraduate students (Contextual Case 1) were more motivated and placed a higher value on utilising orientation supports than the undergraduate cohort (Contextual Case 2). Artino and Stephens (2009) found that postgraduate students in the US had higher levels of academic motivation (engagement and perseverance) than their undergraduate counterparts. This finding, along with Tobbell and O’Donnell’s (2013) research confirming that there is a need for targeted support for postgraduate students in the UK, may explain the difference in access levels in this research. I theorise, in Section 6.3, that other factors may be influencing the transition process for undergraduate students (e.g., focusing on overcoming the challenges to university study, such as academic writing and information literacy), rather than the distance and online elements of their transition. Additionally, the time gap between the contextual cases (2007 for Contextual Case 1, and 2011 for Contextual Case 2) may have contributed to the engagement differences. Technology has become a more ubiquitous facet of everyday life (Luckin, Clark & Underwood, 2013), so students participating in research in Contextual Case 2 may have perceived reduced barriers for online learning, leading to their decision not to engage with the orientation resources.

The increase in diversity and non-traditional nature of student cohorts studying by online distance mode provided the stimulus to research the relationship between engagement levels and student demographic factors. It was found that, for the most part, age did not contribute to the observed differences in engagement between each contextual case; although there was a small association between access and increasing age with Contextual Case 2. The strongest relationship between access levels and demographic
factors was with undergraduate students aged over 25 years, studying their first online unit at a distance to the university in Contextual Case 2 (72% accessing beyond the homepage). The access level of this subgroup was similar to the entire cohort studied in Contextual Case 1 (76%). Evidence from Muilenburg and Berge (2005) and, more recently, Lee and Tsai (2011), indicated that once students have completed one online unit their perceived barriers to studying in this mode reduce, supporting the findings of this research. New online learners are more likely to access orientation supports.

The engagement levels in this research were substantially greater than those reported by other researchers. O’Donnell et al. (2006) noted that only 20% of their students logged into their resource and a very small percentage (2.5%) were considered actively engaged, by accessing more than 20 pages of content. The different cohort characteristics could partially explain the higher levels of engagement I observed, as 76% of students were studying fully online, whereas O’Donnell et al. reported that 60% were online learners. Wide variation in self-reported access to support services has been reported in a study of undergraduate distance online learners in New Zealand (Brown, Keppell, Hughes, Hard & Smith, 2013). Using video reflections collected from a sub-set of students, it was found that students fell into two discrete categories. Approximately 25% were labelled “Support Seekers” (p. 69) who engaged in the online environment early, interacted online and actively sought out lecturer feedback or other university support services. A much larger group (75%), labelled as “Lone Wolves”, had very limited contact with the university, their lecturer or other students. Both these reports indicated a much lower level of engagement, highlighting the variation in approaches that students may take when accessing support resources. Therefore when designing resources, supports may need to target specific cohorts differently. Postgraduate students appear to be more engaged, whereas undergraduate students studying online for the first time may have higher motivation to utilise such supports. The theory of transactional distance (Benson & Samarawickrema, 2009; Goel et al., 2012; Moore, 1993) can be used to understand these variations. The structure created by the orientation resource may act as an enabler for
some students and lessen the comparatively large transactional distance that online distance learners need to traverse to engage with such orientation supports.

6.1.1.1 Non-engagement with the resources.

While this research investigated the levels of engagement with the resource, conjecture mapping also sought to understand other divergent perspectives that emerged from implementation of the design, such as when mediating processes did not occur as expected (Herrington, 2012). Consideration was given to an analysis of the students who did not engage with the resources. Satchell and Dourish (2009) suggest that those who do not use technology can provide important information for designers, and is a research area that has been neglected in favour of studying human computer interaction (HCI). Satchell and Dourish propose that there is a continuum of stages, from use to non-use, where the user makes a conscious decision about their level of engagement. An array of terms related to the levels of engagement has been suggested as follows:

- **Conscious avoidance or disinterest:** those who did not access, perhaps considering that the resource was not needed for their learning or who were time poor, so did not prioritise access. This could refer to students who either never clicked on the homepage of the resources, or did so briefly but never explored further. This form of non-use was represented as Groups A and C in Table 4.8 (p. 130) and Table 5.4 (p. 181). They constituted 25% of students from Contextual Case 1, and 64% from Contextual Case 2 (reducing to 28% for first online learners over 25 years of age).

- **Lagging adoption:** students who clicked on the homepage but did not engage on this first view, returning later in the semester to review the resource, or those who accessed for the first time much later in the semester. Both these types of lagging adoption were evident in both contextual cases: 21% of the total cohort for Contextual Case 1, and 15% for Contextual Case 2 demonstrated these access characteristics.
- **Disenchantment**: those who reviewed the resource for a short time but did not persist, perhaps because it did not meet their needs, or they were not sufficiently motivated or time poor. Analysis of the total time students accessed the resource showed a large difference between the mean and median, indicating that this may have been a factor in this research. Generic orientation supports which are divorced from the discipline area of study may contribute to this form of limited use and is explored further in Section 6.2.6.

- **Lurking**: passively engaged, thus displaying a sense of absence. This was evident in both contextual cases and appears to be more notable when there is limited teacher presence. In this situation, students are not provided with direct support so fail to actively engage. Some researchers have questioned the negative value judgement associated with lurkers (Savin-Baden, Sinclair, Sanders & Second Wind, 2011; Wise, Speer, Marbouti & Hsiao, 2013), suggesting that new online learners may choose to stay invisible or engage in listening behaviours rather than demonstrating active engagement.

While this research was not able to present a complete understanding about this typology of non-use, the LMS data provided evidence of a continuum of non-use, indicating the need for more research about the impact of these levels of engagement on the learner’s transition to online learning (see Chapter 7, Section 7.4.1). The interview data also confirmed that non-use may not be a negative construct. Two of the five students interviewed from Contextual Case 2 did not engage extensively with the resource. Both of these students had already studied an online unit, indicating that they had other priorities, such as managing their study workload. This concurs with Satchell and Dourish’s view (2009, p. 15) that non-use is “often, active, meaningful, motivated, considered, structured, specific, nuanced, directed, and productive”. Understanding patterns of non-use, alongside use, enables a richer assessment about the student transition experience and should be recognised when studying student engagement with online resources. Low overall engagement may stem from multiple causative factors.
While the LMS data tracked accesses, the purpose of both orientation resources was to promote active participation in the practice activities. This is explored next.

### 6.1.2 Engagement with the activities

Embedding activities within the orientation resource was an intended design element. It highlighted how online learning tools could assist students to organise their learning, promote collaboration with their peers, and assist them to complete assessment tasks. Levels of engagement with the activities was generally low, especially in the iterations where the teaching presence was minimal (Contextual Case 1, Iteration 3, 16%; Contextual Case 2, Iteration 2, 12%). When individualised emails (i.e., high teaching presence with scaffolding) were sent to students with a personalised message and a hint about how to gain full advantage of the resource activities (Contextual Case 1, Iteration 2), the participation with activities was much higher (51%). Although it cannot be assumed that the higher teaching presence and scaffolding supports were fully attributable to the increased engagement, it was also observed that in 76% of cases this individual support did lead to more active participation. Additionally, while the subset of students from Contextual Case 2 (off-campus, aged over 25, studying their first online unit) had a matching level of access to Contextual Case 1, they did not reach the same levels of activity participation (33% for Contextual Case 2 versus 51% for Contextual Case 1). The lack of teacher presence may have been the reason for this difference. Researchers have noted the positive influence of scaffolding in online learning environments, which can lead to improved learning (Azevedo & Hadwin, 2005). Therefore, when planning orientation supports there should be consideration about the extent of teacher presence (see DP 4, Section 6.3.4). The dialogue element of Moore’s theory of transactional distance (1993) supports the importance of teacher presence in lessening this distance early in the transition period. Evidence from Woodley and Simpson’s research (2014) suggests that universities should take a more proactive approach, reaching out and contacting students about their online distance learning experience, rather than waiting.
Another factor that influenced engagement with activities in Contextual Case 1 was the pathway students used to access the activities. Students who navigated from the module content to the activities as intended were more likely to complete the practice activity. This pathway provided a clear context illustrating how the activity contributed to becoming a successful online distance learner. Again, drawing on transactional distance theory, it follows that, if dialogue is reduced, designing how the activities are structured within the resource may be an important design consideration.

Different types of activities prompted different levels of engagement. The highest engagement was with the quiz-style activities (Contextual Case 1 80%, and Contextual Case 2 69%). This mirrors other research showing that students prefer to practise and master higher stakes assessment tools in the online environment (Palmer, 2012). Communication activities prompted much higher engagement by the postgraduate students in Contextual Case 1 (students were three to four times more likely to post a message on the discussion board than the undergraduate students in Contextual Case 2). Posting a message in the LMS discussion forum relied entirely on text-based asynchronous communication that used students’ actual names. This required students to project their identity online (Turkle, 1999). It is possible that heuristic knowledge from prior university study enabled the postgraduate students to be more comfortable with their university identity. They could then transform this identity to the online distance learning environment. In contrast, the undergraduate students may have needed to firstly develop their sense of self as a university student, before being able to project this into an unfamiliar online space. Additional reasons for the lower participation in Contextual Case 2 may relate to the communication tools used and the activity design. Asynchronous text-based email, discussion board, and blogs used in the LMS are different to other social media platforms used by students, as they do not easily project a sense of individual identity (Donath, 2014). In addition, the design of the discussion activities did not closely model Salmon’s five stages of learner development (Salmon, 2000), as with Contextual
Case 1. A more explicit rationale for the asynchronous discussion activity and its role in development as an online distance learner may have improved their engagement with these activities. Finally, the class sizes were much larger in Contextual Case 2, with only one academic to manage a large group of online students. In this situation it is easy for students to adopt a lone wolf approach to study and to stay invisible in the online discussion forums (Brown et al., 2013).

Learning analytics may provide additional methods to understand the extent of student activity in online learning environments. As universities move to develop more individualised and automated monitoring and feedback, there is a potential for teachers to promote effective learning pathways and for students to engage in self-monitoring and regulation of their engagement in online learning environments (Buckingham Shum & Deakin Crick, 2012; Clow, 2013; Roll & Winne, 2015; Siemens, 2013). Research conducted at the University of Michigan with students studying undergraduate physics, combined data from student demographics, academic results and motivation survey results to provide a personalised support strategy with suggestions to improve their study success (Wright, McKay, Hershock, Miller & Tritz, 2014). This is one area that requires further study and will be discussed in Chapter 7, Section 7.4.2.

The next two sections consider other factors that may have influenced the levels of engagement noted in this research: timing of access, and academic grades.

### 6.1.3 Timing of access and engagement

The timing of access for those students who did utilise the resources was similar in both contexts, with the majority of students visiting the resources in the pre-semester period or first week of semester. The earlier the resource was available the greater the access, which doubled when the resource was available, more than one week prior to the start of semester (See Table 6.1). It was also noted from Contextual Case 2 that early enrolment was significantly associated with greater access and activity completions prior to the commencement of semester. There is strong evidence that the pre-semester period
is an important time for students to up-skill and prepare for the online distance learning environment (Laing et al., 2005; McVay-Lynch, 2001; Patterson, Krouse & Roy, 2012; Sharpe & Benfield, 2012). Tyler-Smith (2006) suggests that this may be due to the effects of cognitive overload, when students become overwhelmed with other study commitments during semester. While it was important to provide early access to support materials, it was also evident that students were still accessing the resources throughout the semester. Provision of student supports throughout their study lifecycle has also been recognised by other researchers (Brown et al., 2013; Shillington et al., 2012).

There was considerable variation in the length of time that students engaged with the resources in both contextual cases. This matches current theorising about non-traditional student cohorts and online distance learners, indicating considerable diversity in approaches to study and use of technology (Brown et al., 2012; Devlin, 2013; Kennedy et al., 2008). It is noteworthy that greater teacher presence and moderation in Contextual Case 1, Iteration 2, resulted in a three times greater mean time accessing the resource (1 hour 46 minutes) compared with Contextual Case 1, Iteration 3 (30 minutes), and Contextual Case 2 (33 minutes), where there was low teacher presence. Other research has also confirmed the important role that such supportive behaviours have on learner motivation, satisfaction and achievement (Dennen, 2005; Garrison & Akyol, 2013; Joo et al., 2011).

6.1.4 Engagement, retention and grades

The relationship between engagement with the resource and persistence with study and academic achievement is less clear and was only analysed in Contextual Case 2. As discussed in Chapter 2, Section 2.5.1, retention for distance and online courses is low (Edwards & McMillan, 2015; Levy, 2007; Rovai, 2003; Simpson, 2013). This research showed a significant association between withdrawal and students aged over 25 years, studying by distance and their first online unit, confirming Lee and Choi’s (2011) observation that students new to studying online and, for their research, those with lower
academic backgrounds, are more likely to drop out. Since this sub-group from Contextual Case 2 also had higher levels of engagement with the resource, including participation with the activities, it is possible that this experience may have assisted them to make the decision to withdraw from study.

There are many unresolved questions about the factors that contribute to decisions to study as an online distance learner, including how universities should provide advice to students about this lifestyle choice. Social cognitive theory of career and academic interest developed several years ago, may provide some guidance (Lent, Brown & Hackett, 1994). It posits that an individual makes decisions based on what information is relevant to their current interests and goals, and this can ultimately influence their achievement levels. Orientation supports may need to include additional supports beyond enhancing online learning skills, such as providing assistance to help students make decisions about study load, capacity to manage their time and strategies to fit study into an already full life (Kahu et al., 2015). This broader scope is exemplified in the quote from Natalie from Contextual Case 2:

….and don’t work full time. I did that this semester and when I wasn’t – last year, I was working part time. So don’t take on full-time study and full-time work. I mean it’s doable, I got through it, but I just got through it, I’d say: don’t do it, it’s not worth the stress.

There is also emerging evidence that students from Contextual Case 2 do not drop out completely from their study, rather they may be “taking a break”, returning once they are able to manage study with their other lifestyle demands (Maddocks, 2015, p. 35). Maddocks suggests that a more long-term view is needed when recording student retention and progression statistics.

As outlined in Chapter 5, Section 5.3.4, there is a large number of factors that may impact academic performance, including internal factors, such as motivation and satisfaction with the unit, learning approach, prior knowledge; and external factors, such as family supports, organisation support and quality of feedback on work (Beer et al.,
2010; Macfadyen & Dawson, 2010). For Contextual Case 2, engagement levels were not found to be related to the grade achieved at the end of the semester of study. There was, however, a relationship between those students who achieved a grade level above a pass and the length of time they accessed the resource, including the number of pages. One explanation is that students who perform well may also be more thorough in their use of the LMS and therefore spend more time studying and accessing the online materials. Research has confirmed a relationship between time accessing resources and academic achievement (Cho & Shen, 2013; Lee & Choi, 2011; Macfadyen & Dawson, 2010; Morris, Finnegan & Wu, 2005; Yu & Jo, 2014).

6.1.5 Summary of overall engagement

Overall engagement with the orientation resources across both contexts led to the following conclusions related to RQs 1a and 1b and RQs 2a and 2b (level of engagement - access and activities, and the relationship to student factors):

- Postgraduate students demonstrated higher levels of engagement than undergraduate students, including engagement with activities designed to enhance their competence with tools for online distance learning,
- Engagement in the practice activities was greatest when there was teacher presence encouraging individual students to participate, and personalised feedback about their progress,
- Undergraduate students over 25 years, studying at a distance to the university and studying their first online unit, demonstrated access levels at a similar level to postgraduate students, although this did not extend to completion of the online activities.
- When resources are made available prior to the commencement of semester, students will access them to prepare for the study environment. Early enrolment was also associated with higher levels of access.

The data footprints left by students as they accessed the resources at the two
contrasting university locations provided these insights about implementing orientation resources. Adopting a conjecture mapping approach grounded the analysis and enabled relationships to be identified between the design elements, mediating processes and the intended outcomes. Mixed methods analysis, including triangulation of LMS tracking data with survey and interview data, coupled with phenomenological interpretation provided a richer understanding about transition to online distance learning. The next two sections draw on this complete data set to derive two main outcomes of this EDR project (Plomp, 2013). The DPs that emerged from the practice of EDR at both contextual cases are outlined first (research questions 3a and 3b). The chapter then concludes by describing the development of a broader theory about online and distance students’ transition to university study (RQ 2c, Section 6.3).

6.2 Practice interpreted: Design principles

There is widespread recognition that a one-size fits all approach to student support will not meet the needs of our diverse student population (Britto & Rush, 2013; Bullen et al., 2011; Laing et al., 2005; Palmer, 2012). Simpson (2012, p. 13) indicated that supporting students to succeed in an online distance learning environment is a complex concept due to the difficulty in bringing together what he terms the “cavalcade of activities” that occur in any organisation. While different students will have different needs, one of the goals of EDR is to develop DPs that others can apply to their own context (Design-Based Research Collective, 2003; McKenney & Reeves, 2012; Reeves et al., 2005).

The original draft DPs were developed following analysis and exploration of the context in Contextual Case 1, and drawing on theories of online distance learning (Phase 1 of EDR). The DPs were then reified into the design elements of the resource in the second phase of EDR (design and construction). They were adjusted in response to evaluation and reflection following implementation (Phase 3 of EDR). A retrospective review of the conjecture maps constructed at each university (Chapter 4, Section 4.2.3...
and Chapter 5, Section 5.2.3) enabled a further assessment of whether the design features played out in practice. That is, did the design conjectures accurately describe how the design elements contributed to the expected mediating processes; and, did the theoretical conjectures lead to emergence of the intended outcomes? Interpretation conducted in this way helped to uncover findings that were not anticipated, and identified issues that were not part of the original resource design considerations. Over the course of the research, the draft DPs were expanded and extended to develop new DPs. Providing DPs as thick descriptions to encapsulate the lessons learnt from this EDR project conducted at two different universities enhanced the rigour of their development (Holmberg, 2014; Plomp, 2013; Sandoval, 2014). The final DPs that emerged from this iterative process are outlined next, drawing on other literature sources that informed the underlying theme of each DP. Chapter 7, Section 7.3.4 will examine the notion of transferability of these DPs to other contexts.

6.2.1 Design Principle 1: Orientation is a broad transition space

**DP1:** Orientation entails a broad transition space encompassing many elements beyond managing the LMS for learning. Additional elements include selecting a study load that is manageable, mastering academic writing and learning how to identify and appraise information sources. Orientation is primarily focused on the interplay of technical and interpersonal dimensions that blend in the transition from the student’s current world (often involving work and family life) to an academic world of study aided by self-regulatory mechanisms. Transition is also aided by supports located outside the university setting.

Research results from both contexts have highlighted the technological and interpersonal dimensions of student transition. The original construct (Figure 4.2, p. 112), depicting this transition of moving from the domain of life (work, home and family) to a domain of academic study, appeared to be a valid representation of the transitional learning space. Although the technological dimension was originally conceived as a refracting layer forming a potential barrier for students to cross both the physical and social distance, it appeared from this research, that this may be a more extended layer. Technology may impact multiple transition needs. These were initially situated in the
LMS and included navigating online resources; manipulating online tools, such as the online classroom; and using such tools for communication and managing assessment items; but they also extended to negotiating an array of other technologies, such as library information systems or processes dictating enrolment pathways. The additional influence of supports outside the university setting was also not clearly recognised in the original depiction of transition. The interpersonal dimension associated with transition extended beyond interactions with teachers and other students conducted within the confines of the LMS tools, to include significant supports provided by family members and fellow students that were not instigated or controlled by the university (such as local study groups and Facebook groups). The importance of informal learning spaces and supports external to universities is not necessarily embraced in discussions about student support (Laurillard, 2012; Simpson, 2012).

Evidence for a reflective dimension in the original transition framework was less apparent in this EDR, possibly because the data collection methods did not focus on this aspect. Some students (such as Natalie and David in Contextual Case 2), did however engage in spontaneous self-awareness of their transition. Analysis of the stories of these two students suggests they were able to seek out additional supports that assisted them to successfully manage their transition to online distance learning.

The broad transition space described in this DP aligns with Lave and Wenger’s (1991) notion of legitimate peripheral participation. When students increase engagement with the online community of practice, they become more active participants in that community. This implies a social constructivist theoretical framework, assuming alignment between the philosophy of the orientation resource and the formal disciplinary unit design. If the intention of the formal study unit is to promote an active online presence, then the design of orientation resources needs to provide sufficient triggers to engage students in this process. This occurred in Contextual Case 1, where Salmon’s model of online learning (2000) was embedded in the communication activities, and students studying postgraduate courses were encouraged to collaborate with each other.
Large class sizes in the nursing course in Contextual Case 2 may have limited the achievement of an online community of practice. Brown et al (2012) also noticed this opposite effect. In their study of first-time distance learners in Australia and New Zealand, it was found that some students preferred to study alone as a “Lone Wolf” (p. 70). This may be why some students did not access the orientation resources in this research.

The broadening of the transition space to encompass other aspects of online distance learning was noted at both contextual cases, so an additional DP was developed to embrace this theme (see DP 6, Section 6.2.6).

### 6.2.2 Design Principle 2: Extended orientation timeframe

**DP2: Orientation is an extended process, where early enrolment increases access and participation, which then reduces, but still continues throughout the semester.**

Evidence from the LMS log files and the qualitative data confirmed that making the resource available before the semester commenced eased the transition process, possibly before students were overwhelmed by competing study deadlines. Some students also returned to the orientation resources multiple times throughout the semester, trying out higher stakes activities, such as submitting assignments. This notion of a longer and thinner orientation aligns with the work of other researchers (e.g., Clay, Rowland & Packard, 2008; Hegney et al., 2007; Laing et al., 2005). It also demonstrates Vygotsky’s zone of proximal development where online distance learners may be at different stages of readiness for their transition (1978). This research highlights two important aspects of this design principle: the need for early access to learning supports prior to the commencement of semester; and the provision of ongoing support beyond the usual short O week prior to semester starting.

While early access was shown to be important, this is often thwarted by contextual limitations, which make it difficult for non-enrolled students to be given access to the LMS. University systems have evolved primarily from an on-campus culture and have a
legacy of inflexible administrative systems which drive the batch processing of enrolment data into the LMS. In the case of Contextual Case 2, this was exacerbated by an extended acceptance period for enrolment up to two weeks after the semester commenced. Flexibility towards enrolment and prolonged relationships between students and universities is an emerging trend. Universities are beginning to provide opportunities for new students to engage with the university culture year round, through summer semester enrolment, and participation prior to course commencement (Norton, 2014). One example is the University of Western Australia’s Facebook page which supports students in the pre-enrolment period (Cluett, 2010). Such an approach circumvents contextual administrative limitations, but also potentially takes students into less secure territory, where concerns about digital identity become more apparent (Wozniak, Uys & Mahony, 2012).

Opportunity for early access requires management of the information overload experienced on enrolment. In their review of literature describing attrition with students studying online courses, Lee and Choi (2011) noted that learners are often overwhelmed with information received immediately after enrolment, a factor noted to be an important issue for novice online learners (Sun & Rueda, 2012). Clay et al. (2008) found that a major cause of drop outs in their context, were misguided perceptions about the demands of online study and the fact students often failed to read the large amount of information provided to them prior to course commencement. They addressed this area of concern by combining a mandatory online orientation with a quiz and weekly targeted guidance materials, delivered as manageable chunks of information; and found that retention significantly improved. The study by Brown et al. also concluded that “although learner stories affirm the importance of the first few weeks of study, there are ebbs and flows in the life of a distance student over the semester and a second critical at-risk period was identified in later weeks” (2012, p. 92). They emphasised that “contrary to popular belief, the crucial period for ensuring the success of first-time distance learners extends well beyond the first few weeks of study” (p. 93). Furthermore, Shillington (2012) described a
student framework at Massey University in New Zealand which highlighted crucial transition stages, from making a decision to study, choosing the course of study, enrolling, the first few weeks, progression and completion. At each of these key time periods, the university identified factors that would contribute to successful transition, which were then aligned with university resources to meet these needs. These reports confirm the outcomes of this research and this DP; therefore, it is recommended that universities carefully consider the students’ study lifecycle and provide opportunities for them to access appropriate supports at important stages in their study journey.

6.2.3 Design Principle 3: Navigation signposts and practice activities

DP3: Orientation is aided by participation in activities within a safe risk-free environment which is supported with customised guidance and feedback. Clear navigation is essential, including prompts and supports that acknowledge non-linear pathways used by students to explore resources.

This design principle merged two former DPs (Chapter 5, Section 5.3.7, DP3 and 5) because of the association found between the navigation pathways into, and within, the resource, and student participation in the practice activities. While the percentage of students who completed the activities embedded in the resource was mostly low, there was evidence from the survey and qualitative data that the opportunity to try out using the tools that are essential for study was valued by some students. As explained in Section 6.1.2, when students were proactively encouraged to engage in the activities, or provided with access prior to the commencement of semester, then completion of activities was increased. Students engaged more highly with activities that mirrored assessment tasks or where immediate feedback was provided (quiz-style activities). New online distance learners, especially undergraduate students, need encouragement to be actively involved in communication-based activities (see also DP 4).

The tracking data indicated that deeper pages within the resources were accessed less frequently. Perhaps orientation resource designs should use a predominantly flat navigational structure, to make use of the scrolling features of modern mobile devices,
rather than embedding information within subpages and folders. This research also surmises that clear linkages from online learning concepts to the associated activities, and vice versa, helped students to situate the activity in their development of online learning skills. Despite encouraging activity completion with audio prompts, organiser diagrams and cartoons, there was a tendency for students to merely view an activity rather than participate fully. Goel et al. (2012) evaluated Moore’s three dimensions of transactional distance in an e-learning environment (structure, dialogue and autonomy), and found that ease of using technology was positively correlated with the dimension of structure. They also emphasised that learners should be encouraged to participate in practice opportunities prior to commencing online study. DP 4 and DP 6 suggest that providing more explicit teacher presence and a closer link between disciplinary study and activity participation could stimulate more active engagement.

6.2.4 Design Principle 4: Interaction promoted through teacher presence

DP4: Interactions between content, teachers and other students is a core attribute of online learning, requiring an appreciation of how knowledge is constructed and how to communicate and collaborate with peers in both synchronous and asynchronous settings. Teacher presence in communication activities is an important factor influencing student participation rather than lurking in the background. Recordings of synchronous learning events do partially compensate and provide a sense of presence in an online community.

Evidence from this research highlights the important role that teacher presence plays in encouraging interaction in asynchronous discussion activities. When closer moderation was provided in Contextual Case 1, Iteration 2, there was a much higher level of participation in the discussion-based activities. Despite providing alternatives, such as an audio welcome and videos of lecturers describing important tips for new online distance learners in Contextual Case 2, participation in the practice communication activities was low. This aligns with the suggestion by Brown et al. (2012) that teachers play an important role in the development of a safe, nurturing online communication space, so that learners, especially those new to online distance learning, feel welcomed and
confident enough to engage in the digital environment. They also noted that, despite learners having adequate IT skills, they may not necessarily be comfortable expressing themselves online, requiring encouraging dialogue between teachers and other students to assist in the development of an online community of learners. Laurillard (2012) also stresses that teachers provide the key difference between formal and informal learning environments by assisting the learner to make connections between formal learning and the learner’s own context. Despite attempting to design a self-sufficient orientation resource, the moderation role of the teacher appears to add an important element to highlight the purpose of the communication activities.

An unanticipated outcome from Contextual Case 2 was the value students placed on the recorded virtual classroom activity (using Wimba software). Students valued the feeling of connection with the teacher and other learners, created when they watched a recording of a virtual classroom session, even though they were not able to participate in the real-time interaction. All the students interviewed highlighted the value of these recorded virtual classrooms. They described the feeling of connectedness with teachers and other students, regardless of whether they were present at the live classroom event, or watching the recordings at a later date.

Students studying at CDU preferred this form of verbal pseudo-immediate interaction over the asynchronous text-based discussion activities, which were hampered by the delays between posting and replying. Other researchers (Bower, 2011; Falloon, 2011) have also noted the value of virtual classrooms in lowering attrition, providing greater connection between students and teachers in online distance learning environments, and the importance of preparing students for participation in such web-based learning environments.

6.2.5 Design Principle 5: Orientation targeting specific cohorts

**DP5:** Student engagement with orientation resources and their subsequent completion of practice activities will vary. Despite incorporating customised guidance, feedback and one-on-one supports in the design of the orientation resources, this alone will not
lead students to access and then participate in the practice activities. Students will choose their level of engagement and timing of engagement with such supports. There is evidence that students who are over 25 years, studying off-campus and studying their first online unit will show greater levels of engagement, highlighting the importance of targeting particular demographic groupings for the provision of supports.

This research highlighted the diversity of engagement levels with the resources and the embedded activities. This was not surprising given the increased diversity of students entering university to study at both undergraduate and postgraduate levels (Edwards, 2011; James et al., 2010; Norton, 2014), and reinforces that student needs and perceptions about online learning may vary according to whether they were new distance students, students studying on-campus, or students at risk of not progressing (Palmer, 2012; Shillington et al., 2012; Zepke, 2013). It follows that each of these groups of students may need different types of supports at different times, as evident in DP 2 (Clay et al., 2008; Hachey, Wladis & Conway, 2014; Lee & Choi, 2011; Sun, Tsai, Finger, Chen & Yeh, 2006).

In the case of undergraduate students, Contextual Case 2 identified higher engagement with the orientation resource for students who were aged over 25 years, studying off-campus and completing their first online unit of study. Sun and Rueda (2012) researched the relationship between student engagement and motivation, self-efficacy and self-regulation in a distance learning environment in the US, and found that first-time distance education students had lower emotional engagement in the online environment. They suggested that this could contribute to higher anxiety and lower computer self-efficacy, concluding that “educators should identify those who have never taken a distance education course previously and provide necessary support through a helpdesk or extra training to ease their anxieties” (p. 200).

The implication of this diversity and the need to target specific populations of students was confirmed by Lee and Choi’s (2011) and Gazza and Hunker’s (2014) review of the literature surrounding student drop out, where the former noted that students who are unsuccessful in their first online course may have lower self-esteem and be unwilling
to try another online course in the future. The importance of targeting students who are new online distance learners was reinforced by the findings of a large study of community college online students in the US (Hachey et al., 2014). Analysis of successful completion of online study showed that the best predictor of success was if the student had successfully completed a prior online course, with results indicating that those most at risk of attrition or unsuccessful outcomes were those who had not studied online at the college previously, or who had a prior unsuccessful outcome, either performing poorly or not completing the previous course. Given the link between successful completion of one online course and future successful completion of additional courses, this suggested that students most at risk (i.e., those studying their first online unit) should be provided with orientation and individualised supports. Questions emerging from these variations are increasingly suggesting that metacognitive dimensions may be an important factor to investigate: specifically, the impact of self-regulation and online learning success (Siemens et al., 2015). This is discussed further in Section 6.3.5.

6.2.6 Design Principle 6: Seamless integration with other university supports

DP6: Clear links between wide ranging supports are required so that students experience a seamless transition to university study. These include orientation to the LMS, strategies to develop academic literacy and information literacy skills, and also study load advice. This requires co-ordination across university departmental structures. In addition, students returning to study each year also need timely information about system upgrades and changes to their learning environment.

Data from both contexts, but more clearly articulated in the interviews from Contextual Case 2, indicated that students’ desire wide ranging supports beyond orientation to the LMS. Simpson’s (2012, p. 15) taxonomy of support for online distance learners was confirmed by this result. These supports include: academic support, which comprises academic writing, using the LMS and information literacy, such as searching library databases; and non-academic supports, comprising decision making associated
with managing study load, planning time and pastoral care for coping with the emotional
stresses resulting from managing the study / work / lifestyle balance. Students desired
assistance with all these skills in a co-ordinated just-in-time way, with clear options about
how to access these supports throughout their journey as online distance learners. The
need for a wide range of supports to be co-ordinated has also been recognised by other
researchers (Buultjens & Robinson, 2011; Crawley, 2012; Crosling & Heagney, 2009;
Motteram & Forrester, 2005; O'Donnell et al., 2006). Beetham & Oliver (2010, p. 164)
concluded there were “few examples of universities responding strategically, ….at the
level of integrating support for students’ digital literacies”.

While strategic approaches to manage the first year on-campus experience are
increasingly common in Australian universities (Kift, 2008; Nelson, 2014; Nelson,
Quinn, et al., 2012; Nelson, Smith, et al., 2012), this research did highlight the extended
nature of transition for the online distance learner (DP 2). Of particular note was the rate
of change in university technical systems used by the online distance learner. Changes in
the library management tools and also the LMS during the course of this research at both
universities, highlighted the ongoing need for all students (new and continuing) to be
provided with updates about changes prior to the commencement of each semester. There
is also a call to introduce strategies to improve transition into second year (DeAngelo,
2014) and overcome what has been termed the “second year slump” (McBurnie,
Campbell & West, 2012, p. 14), indicating that supports should extend beyond the initial
entry to university.

One point of contention in the limited literature available is whether support is best
achieved generically or within the disciplinary context of study, and if participation
should be mandated. Therefore, closer integration of orientation activities with the
students’ course of study should be considered. This could improve the motivation
required to complete practice activities in learning environments where discipline experts
are providing active teacher presence. Conclusions by O’Donnell et al. (2006), who
designed a generic orientation resource, indicated that their resource should have included
communication-based activities managed by local tutors from specific disciplines. On the other hand, integration with formal study requirements may restrict the opportunity for students to stumble around, ask stupid questions and make mistakes in a safer low stakes environment outside their formal study space. There is one example in the discipline of Nursing where an integrated approach was trialled. Students were provided with scaffolded activities that encompassed information literacy, academic writing, and use of online tools (Cassar, 2010). Unfortunately, this report is a descriptive account with no evaluation data provided to assess its utility. As noted by Bullen et al. (2011), the use of ICT varies in different disciplinary contexts, so an alternative could be to improve the link between generic supports and formal study activities, maintaining a centrally located orientation resource but directing students to the generic resources and activities when, and if, they are needed while completing formal study tasks. This does require commitment and leadership to integrate a plethora of systems commonly dispersed between university administrative and academic units.

6.2.7 Summary

These six DPs provide guiding heuristic statements about how future orientation supports could be designed for online distance learners and represent one of the outcomes of this EDR project. They reinforce the importance of macro-level educational design and recent conclusions made by Kift (2015, p. 58), who reviewed the past decade of her experience with transition pedagogy, suggesting that it should encompass “an integrative whole-of-institution and whole-of-student approach”. Examples of co-ordinated approaches to transition for online distance learners at Australian universities, remains a gap in our practice. Kift (2015, p. 64) noted that implementation of transition pedagogy is a “complex and multi-dimensional challenge” and that “the experience for students who enter our virtual environments also continues to demand attention” (p. 65).

A second outcome of this research was the development of theoretical understanding of the student transition space. Here, I return to consider the second research question
(RQ 2c), which determined why the observed level of engagement occurred, through a closer study of the student survey responses and discussion board comments (both contextual cases), and stories that emerged from the interviews (Contextual Case 2). Laurillard (2012, p. 31) highlights the complexity of student’s lives which “entangle school, home, work, and social encounters in the individual’s perception of self as learner”. In the next section, I delve more deeply into these constructs to uncover the layers of transition revealed by my research.

### 6.3 Practice interpreted: Layers of transition

As described in Chapter 3, Section 3.6.2, an interpretive lens was cast over the qualitative data to capture the essence of the students’ experience across both contexts (RQ 2c). The notions of embodiment and embodied interaction were used to uncover further elements of the students’ experiences to describe how they make this transition. First, these concepts will be described and then this viewpoint is used to draw connections between the data collected from both contextual cases. This analysis informed an emergent theoretical framework for online distance learners’ transition to university study (Wozniak & McEldowney, 2015).

More than a decade ago, Diekelmann et al. (1998, p. 14) studied the experience of nursing teachers moving from face-to-face teaching to distance delivery and coined the phrase “the absence of physical presence”, where teachers struggled with the loss of interaction and visual cues to guide their “embodied teaching” in such environments. She argued that teaching and learning was a lived experience and that the embodied experience is recast in the distance environment due to the loss of physical presence. She also highlighted the importance of dialogue for distance learning, whether it be through text-based discussion, audio or video methods. Dorish (2001), studying human-computer interaction, used phenomenological perspectives to highlight the importance of embodiment as a “property of our engagement with the world that allows us to make it meaningful” (p. 126). This stance claims that there is a close association between mind
and body, suggesting that technology is a *place* rather than merely a *space* (p. 149); so we should examine how users *act through* this place (p. 154). He coins the term “embodied interaction” (p 126) to describe how users of technology create and communicate their own meaning. This is termed “engaged action”, rather than actions being separated from meaning, which is termed “disembodied cognition” (p. 189). More recently, Kehrwald (2014) and Metlevskiene (2011) have also considered the concept of embodiment in online distance learning environments. Metlevskiene concluded that the online learner’s approach to using the online medium varied, suggesting that they need to be “informed, scaffolded, and modelled to engage in the process of re-membering the body online” (p. 419).

In this research, the LMS is the *space* which provides the tools to enable a learner to become situated within the distance and online university *place*. How a student enters into, inhabits and acts within this *place* can be examined from the data footprints and also by extracting meanings that emerged from the lived experiences of students transitioning to this *place*. Learners and teachers new to the online environments comment on the lack of non-verbal cues that form part of our usual communication in the face-to-face environment. Not having a physical presence online can have two opposite outcomes. Students may feel confusion and loss from the sense of disembodiment, which distances them further from engaging in the online place. This can lead to disengagement and possibly ultimately withdrawal from study (Evans, Knight, Sonderlund & Tooley, 2014; Koole, 2014; Lander, 2005). Alternatively, they may also gain empowerment from their control over the learning situation, where they can choose their level of participation and engagement (Baxter & Haycock, 2014). It appears that the former is of most concern when considering transition for online distance learners, and where orientation activities in risk-free environments may have their place.

A comparative analysis of the themes from each context was undertaken, using the perspectives described above referring to earlier diagrammatic characterisations developed from Contextual Case 1 (Appendix 8), and the four themes that emerged from
the analysis of Contextual Case 2 (Figure 5.8, p. 205): technical issues, lifestyle factors, social interactions and academic skills. Similarities and differences were identified to reveal how the students entered and participated in the space and place of online learning. Comparisons made between the two contexts led to conceptualising transition for online distance learners as a multi-layered concept (Wozniak & McEldowney, 2015) similar to the “transition as becoming” described by Gale & Parker (2014, p. 735). Figure 6.2 illustrates the themes from each contextual case that supported the defining of each layer.

**Figure 6.2** The layers of transition for online distance learners

One layer, particularly noticeable for the undergraduate students, was their need to
adjust to university study and its imposed expectations. Other layers that needed to be traversed were the online place, where the learner connects to their learning environment; and the distance between the university and learner, illustrating that for these learners the university was not a physical space inhabited by the learner. A further layer related to the development of professional roles, either branching into new areas of healthcare in the case of postgraduate study, or acquiring new qualifications as a novice practitioner for undergraduate students. It became apparent from this analysis that the ability of a learner to adjust to each of these layers of transition may have been influenced by their self-regulatory mechanisms. Each layer is described next.

6.3.1 Adjustment to university

In both contexts, students were managing a transition from home and work life to that of academic study, which necessitated managing a complex array of competing demands on their time. In order to cope with fitting university study into their lives, they needed organisation and time management skills (refer Natalie’s comment, p. 209). Adjustment to university was more complicated with the undergraduate students from Contextual Case 2, displaying a range of attitudes towards this transition. Some expressed frustration about the expectations of tertiary study as shown in Tammy’s discussion about academic writing standards:

The only problem that I have with university is they seem to be all about reference, reference, reference, and the amount of work that they ask for; I haven’t had to do that in my other courses...... they seem more book orientated rather than people orientated. (Tammy)

The non-traditional nature of this cohort meant some had a large time gap between their prior school or vocational study and entering university; so their transition also entailed developing new study skills, such as academic writing and sourcing and appraising information (encapsulated in DP 1, Section 6.2.1). Hussey and Smith (2010, p. 159) refer to this as a “process of socialisation into a culture of knowledge”, where different disciplines may have differing sub-cultures and ways of thinking.

The importance of this layer was reinforced by Scottish research which interviewed
postgraduate online distance learners studying at university (Bayne, Gallagher & Lamb, 2014). They identified that the university space was conceived in fluid ways with varied typologies; from a material space to an imagined space, which students navigate differently throughout their learning journey. They suggested that further research was needed to understand the distance students’ experience of such spaces. Zepke (2013), although not referring specifically to online distance learning, confirmed that non-traditional students need to master the social and cultural aspects of the university environment. He suggested that until they feel a sense of belonging these students will fail to engage fully. He contends that our current assumption that students need to fit university around their complex lives may need a reassessment. Such learners expect that university should fit around their complex lives, offering different study pathways which should be able to be varied according to the learner’s individual situation. This was reinforced by interviews conducted with mature-age distance students in New Zealand (Kahu et al., 2014) and has implications for how universities structure their course offerings in future.

6.3.2 Adjustment to online

A second layer of transition was associated with adjustment to the online place which included the technical and interaction themes. This represented a number of adjustments that needed to be made, from learning about how to navigate the LMS, to the development of an online identity, to feeling a sense of belonging within an online community. Navigation was a dominant theme that emerged from the qualitative data (surveys, discussions, interviews) at both contextual cases. This was further complicated when additional adjustments needed to be made by students to adapt to yearly LMS changes, or alterations to other online systems, such as the library catalogue search tools (see Emma and David’s comments, p. 208). Students who did participate in the activities expressed the need to learn to trust the online environment. They valued the opportunity to try out the LMS tools and library search engines in the safer trial environment where
there were no adverse consequences. Just as important in this dimension, was noting the areas that these students did not mention. Internet access and development of computer skills were not commented on, matching other researchers who have found that going online is less about access and the ability to manage a computer, and more about how technology is used for learning and individual attitudes (Dray et al., 2011). Regardless of age or technical ability, students who have a positive attitude towards technology are more likely to engage and interact successfully (Jelfs & Richardson, 2012).

There are reports which highlight the struggles of becoming an online student. Research conducted by experienced online teachers (Savin-Baden et al., 2011) likened the online environment to being a silent and liminal space where learners may not know what to say, or how to create their sense of self. In the self-reflexive interpretive narrative inquiry of their experience, they contrasted their feeling of “silence and stuckness” (Savin-Baden et al., 2011, p. 4) with the overwhelming online noise from the volume of postings in large discussion groups. Regardless of whether interaction was derived from the teacher or other learners, the importance of guiding students to develop a learning identity has also been reinforced through work conducted in the Higher Education Academy in the UK. Successful transition to tertiary study led to successful engagement and also enhanced learning outcomes for learners (Sharpe, 2010; Sharpe & Benfield, 2012; Trowler & Trowler, 2010). Siemens (2014) has also reinforced the importance of providing opportunities for online learners to be able to control their personal digital identity, suggesting that educational designers should be more explicit about the rationale for structuring the design of online learning environments, including the learning activities, embedded within. This notion was also reflected in DP 3, previously discussed in Section 6.2.3.

6.3.3 Adjustment to distance

Closely related to adjusting to the online place, is adjusting to this distance between the learner and the university. This refers to both the physical distance, and also the
transactional distance or psychological and communication gap, between the learner and the teacher (Moore, 1993).

A common barrier noted by students in both contextual cases was adjusting to the asynchronous nature of distance learning. This presented a time lag between posing a question, contributing to a discussion or submitting an assignment, and receiving a reply or feedback on progress (see Natalie’s comment, p. 207). Students grappled with the notion of this time delay and lack of instantaneous communication, and absence of face-to-face interactions with other students, thus constraining the development of personalised relationships. All the interviewed undergraduate students valued the virtual classroom available to them at CDU (known as Wimba), as it provided a more personalised interaction with the teacher, which appeared to lessen the transactional distance. The role of virtual classrooms in online distance education has been researched by Falloon (2011) and Bower (2011). Bower, also using an EDR approach, studied the design dimensions of virtual classroom environments, finding that there were several types of misunderstandings and misuses of these environments. They included operational, interactional, managerial and design-based misunderstandings, each of which could impact the learning outcomes achieved. For example, not setting up the space correctly could be overcome more quickly, while the incorrect choice of tool for the instructional goal could lead to more persistent problems. This prompted Bower to recommend training for both teachers and learners as a strategy to overcome these concerns.

In this research, even when students accessed the archives of the virtual classroom sessions, they still valued the sense of nearness to others that this promoted, despite the fact that they were merely observing a recorded session. Perhaps the CDU undergraduate students appreciated the dialogue and structure provided, such that the audio and occasional video within the virtual classroom provided a more real approximation to the familiar face-to-face learning environment. Goel et al. (2012), when evaluating the relevance of Moore’s theory of transactional distance, concluded that dialogue
contributed positively to an intention to persist with online study, reinforcing the central role that interaction plays in the social constructivist approach to learning (DP 4), which may then lead to greater student satisfaction with online learning.

Another feature noted in Contextual Case 2 was how some of the students actively sought out other forms of support to lessen both the physical and psychological distance. They arranged study groups with students who lived in their local area or used social networks, such as a Facebook group, to connect with other students choosing avenues outside of university systems. Empirical data from the US has indicated the importance of first year students engaging in meaningful academic discussions outside classrooms to enhance study persistence and progression beyond first year (DeAngelo, 2014). Such non-university created supports were not noted in Contextual Case 1 possibly because the research was conducted prior to the proliferation of social media. It is possible that these postgraduate students already had prior experience as a university student and a stronger sense of their own identity as a health professional so did not feel the same transactional distance. Regardless of this difference, this research confirmed the connectivist pedagogy which posits that learners will strategically build networks of information, contacts and resources in order to stay connected (Siemens, 2005). How to connect these wider informal learning spaces with formal learning spaces, and also design, integrate and assess the impact of these connections, requires further investigation (Gazza & Hunker, 2014; Morosanu, Handley & O’Donovan, 2010).

6.3.4 Adjustment to the health professions

A less visible transition was the adjustment to becoming a healthcare professional which featured more prominently in the data from Contextual Case 2. Here, students repeatedly recounted their strong desire to gain a nursing qualification, a motivational factor that enabled them to persist and overcome other barriers that the university, or the online or distance learning environment presented to them. When answering a question about what had kept her persisting with study, Natalie responded as follows:
Knowing that this is what I want to do. It’s taken a long time, I’ve done lots of other jobs before I went into nursing, I did a Diploma of Nursing and I actually did that initially thinking that – it was only an 18 month course – if I really didn’t like it I could still get through it, it’s not a three year degree that I’m entering into. But I really enjoy the job I’ve chosen as a nurse. (Natalie)

Simpson (2008, 2012) highlights the crucial role that motivation plays in student retention for online distance learners. There is evidence that this will also promote resilience and persistence (Hart, 2012). Solomonides et al. (2012) also considered that student initiation into a specific professional community is an integral component of student engagement, which influences the student’s feelings of belongingness while studying. This points to the advantage of encouraging social connectedness through informal learning spaces.

6.3.5 Role of self-regulation

It was evident throughout the qualitative datasets that how each student managed these layers of transition will vary, according to their own attitudes and circumstances. This was broadly considered to be a reflection of self-regulation, which considers how learners adapt to changing learning contexts and manage their learning so they can improve their situation and achieve their goals (Zimmerman & Schunk, 1989) (see Chapter 2, Section 2.2.4). Since online distance learners have more control over their time and how they engage in learning, I contend, as other researchers have noted, that in order for students to succeed, they need to have refined self-regulatory behaviours to keep them motivated and on task (Artino & Jones, 2012; Cho & Shen, 2013; Shea et al., 2014; Sun & Rueda, 2012). Self-regulation does not just refer to personal attributes, but also the ability of learners to seek out assistance and proactively manage their learning environment (Hodges, 2005).

A number of features of self-regulation were noted in this research, indicating that this construct could enhance a student’s ability to cope with these transitions. There was a broad awareness by students at both universities that their study would be more successful if they were well organised. These metacognitive skills of goal setting and
planning are an important element of self-regulation (Zimmerman, 1990). Students in the postgraduate setting (Contextual Case 1) made comments that demonstrated a sense of self awareness of their own abilities, where they could readily identify gaps that they may need to work on to improve their self-efficacy. There was a sense that engagement with their peers would facilitate a rethink of their conceptions about the topic to be studied, and that sharing ideas and other points of view would enhance their learning. By contrast, the undergraduate students from Contextual Case 2 displayed greater variation in their attitudes to transition, from well-developed self-regulatory skills, such as actively seeking out study supports (see Chapter 5, Section 5.3.5; David’s and Natalie’s stories), to expressing a sense of frustration with the learning experience, focusing on exposing the shortcomings of the external environment (university or teacher errors), rather than considering their learning gaps (for example, Emma’s story). Similar differences between postgraduate and undergraduate students’ self-regulatory behaviours have also been described in the literature (Artino & Stephens, 2009; Garrison & Akyol, 2013; Lee & Tsai, 2011).

Research that reviewed the evidence for an association between student factors (e.g., motivation, self-regulation and confidence with computers) and dropping out of online courses, concluded that those with a high internal locus of control contributed to persistence with study and completion of online courses (Lee & Choi, 2011). They also found that when students had completed more than one online course, their attitudes to online learning were more positive, suggesting that supports to improve self-regulatory behaviours should be targeting students who are new to studying online (Sun & Rueda, 2012). The widely accepted CoI framework for designing online learning experiences is currently being revisited, to give greater consideration to the importance of learner self-regulation in successful online learning (Garrison & Akyol, 2013). There is currently debate as to whether social, teacher and cognitive presence provide adequate guidance regarding the role of self-regulation in collaborative learning, with a suggestion that a fourth presence is needed (learner presence). Regardless of this, researchers are noting the
importance of self-regulation and the need to more explicitly raise awareness of this construct and scaffold its development, particularly for learners who have less experience with university study (Garrison & Akyol, 2013; Shea et al., 2014; Sun & Rueda, 2012; Vovides, Sanchez-Alonso, Mitropoulou & Nickmans, 2007). There is new appreciation of the importance of learner dispositions, which includes the approaches that learners take to solve problems in particular contexts (Buckingham Shum & Deakin Crick, 2012; Deakin Crick & Goldspink, 2014). Brown et al. (2013) considers that this is more important than knowledge and skills, and that it cannot be taught, but, rather needs to be cultivated. One concept being developed by the Carnegie Alpha Lab Research Network in the discipline of mathematics is that of productive persistence which works to focus on developing an improved mindset, noted as being a key predictor of college course completion (Bryk et al., 2013). Combining learning analytics with this information may provide new directions to support students as they transition into the online distance learning place.

6.3.6 Summary

In this research, I contend that there is a complex array of transition needs for online distance learners in both undergraduate and postgraduate contexts. This includes managing the transition into a life of study at university, managing the technology and online learning environment, adjusting to the transactional distance, as well as entering a new professional role in the healthcare environment. Regardless of whether the online distance learner is entering university for the first time, or returning to university to expand their qualifications, there are transition needs that traverse multiple dimensions. This aligns closely to the concept of “transition as becoming” which, if considered as comprising multiple layers, as described in this section, could be a valuable framework to manage further theorising around the phenomenon of transition (Gale & Parker, 2014).

6.4 Chapter Summary

This extended EDR project researched online distance learners’ engagement with orientation resources at two universities as they made their transition to university study.
Overall, postgraduate students from Contextual Case 1 had a higher level of engagement with the designed orientation resources than the undergraduate students from Contextual Case 2, from the perspective of accessing the information and participating in the practice activities (RQ 1). It was postulated that one factor contributing to this difference was the increased support and teacher presence in Contextual Case 1. Despite this, a diversity of engagement was noted in each contextual case, demonstrating a continuum of engagement from use to non-use. Students at both universities valued early access prior commencing their semester study commitments, and there was evidence from Contextual Case 2, that undergraduate students over 25 years studying their first online distance unit, had higher levels of engagement (RQ 2a).

The comparative retrospective analysis provided an opportunity to distil features associated with the design and implementation of such resources, leading to the emergence of six DPs that can be utilised by other practitioners to meet the transition needs of their online distance learners (RQ 3). It also led to the development of a framework describing multiple layers of transition for online distance learners, and revealed the possible role that self-regulatory behaviours may have in enabling this transition (RQ 2c). This overall analysis contributed both practical and theoretical research outcomes. These will be synthesised in the next concluding chapter, which also outlines the limitations of the research and proposes new opportunities for future investigations.
CHAPTER 7: CONCLUSION

This study designed orientation resources to investigate the transition of online distance learners to university study in the health sciences. Chapter 2 identified that advances in technology (Phillips et al., 2012) and policies providing opportunities for wider participation in higher education (DEEWR, 2009) were fuelling the growth in online distance courses, leading to a blurring of the boundaries between traditional university study and distance education (Laurillard, 2012; Siemens et al., 2015). Students studying in the health sciences at both undergraduate and postgraduate level were adopting this mode of learning to enhance their qualifications or to enter the health professions (Loftus et al., 2013), demonstrating the highest growth in student numbers in Australia for the decade to 2014 (DET, 2014). Students were returning to study juggling a complex lifestyle with work, study and family responsibilities (Hegney et al., 2007; Pitt et al., 2012).

With low retention of online distance learners (Edwards & McMillan, 2015), research had been directed at exploring the broader concept of student engagement, a construct that considers emotional, behavioural and cognitive connections with study (Kahu et al., 2015). Findings from other researchers have predominantly focused on student responses to surveys, such as the UES, or the former AUSSE and POSSE (Coates & Ransom, 2011; Edwards, 2011), and identified the link between continuation and student engagement. Increasingly, however, it had been recognised that student engagement was a complex construct, that extended beyond individual student behaviours and actions to include their wider socio-cultural context (Kahu, 2013; Zepke, 2015). Likewise, the need for universities to provide support to students as they entered tertiary study, including guidance about the use of technology for learning, was also identified (Kennedy et al., 2009; Sharpe et al., 2009). There were, however, few examples addressing the transition process for online distance learners (Kift, 2015), although a preparation period extending beyond the traditional O week for mature-age distance learners was suggested (Brindley,
2014; Brown et al., 2012; Simpson, 2012). This background contributed to the need for this doctoral investigation and led to formulating the overarching research question: *What guiding principles underpin the design of orientation resources that support the transition of online distance learners who are studying health professional courses at university?*

The EDR framework guided the mixed methods, multiphase research process (Creswell & Plano Clark, 2011; McKenney & Reeves, 2012). Draft DPs, grounded in socio-constructivist and distance education learning theories, informed the educational design process (Chapters 2 and 3). The online orientation resources were then implemented at two different universities, first with postgraduate health science students at the University of Sydney (Chapter 4), then with undergraduate nursing students at Charles Darwin University (Chapter 5). Iterative cycles of evaluation and reflection enabled refinements to the designed resource and DPs. The EDR methodology was enhanced in two ways: embedding a conjecture mapping process guided the retrospective analysis, to capture the significant design features of the developed resources (Sandoval, 2014); and studying implementation and spread across two different contexts demonstrating analytic generalisation, to inform transition theory (McKenney & Reeves, 2014) (Chapter 6). Mapping the expected design and theoretical conjectures to describe how it was anticipated that the students would engage with the content and activities enabled identification of both expected and unexpected variations, and enhanced the rigor of the EDR outcomes.

The doctoral research extended conceptualisation about the experience of students’ transition to online distance learning, contributing both practical and theoretical outcomes. These included: DPs that can inform future educational designs of support resources for online distance learners; improved theoretical understanding about transition for diverse non-traditional cohorts choosing to study by these modes; and the enhancement of the EDR approach when managing extended projects across multiple contexts.
This chapter summarises the key findings in relation to the research questions, outlines the significance of the research, including contributions to practice and theory, identifies the limitations of the research, and outlines areas for further investigation.

7.1 Summary of the findings

The first two research questions sought to determine how health science students engaged with the online orientation resources designed to support their transition to online distance learning, and why the levels of engagement may have occurred.

DPs informed the design and construction of the orientation resources housed within the university’s LMS at each university (Get Learning and Get Learning Online @ CDU). The DC and TC that emerged from the conjecture mapping process guided the data collection strategies that evaluated how the students engaged with the orientation resources, specifically, what they accessed, when access occurred and the extent of engagement with the embedded practice activities, by capturing artefacts, such as discussion postings, quiz results or mock assignment submissions from activity completion (RQs 1a and 1b). The research also sought to establish why the observed levels of engagement may have occurred (RQ 2) by linking access and engagement levels with student demographic information, reviewing project team development notes, content of discussion postings, survey results and, in the case of Contextual Case 2, academic grades and student interviews.

The participants in the research were students studying health science-related courses at postgraduate level (University of Sydney) then, later, an additional group of students studying at an undergraduate level, at a second university (Charles Darwin University). They were predominantly female, with a mean age of 35 years, often studying part time, with the majority completing their study away from the campus, and therefore highly reliant on learning by using the university’s LMS. A diverse array of access levels with the orientation resources were noted, ranging from no access, limited access to the homepage only, access to content materials, to full engagement with the associated
activities (RQ 1). A greater percentage of postgraduate students accessed the resource than undergraduate students, which was also the case for completion of the activities, although this appeared to be influenced by the level of teacher presence and support provided during implementation. Access was highest in the period prior to, and in the first few weeks of semester; with earlier enrolment contributing to greater access and engagement. Despite this peak period, students continued to access the resources throughout the whole semester, suggesting an extended orientation period. All content areas of both resources were accessed, however components addressing navigation of the LMS, self-assessment of online learning skills, time management and understanding how to complete assessment tasks, uniformly had the highest accesses.

Where access could be matched to demographics, there was no association between access, and age and gender, although in Contextual Case 2, students who were over 25 years, studying online for the first-time and enrolled in off-campus modes, showed higher engagement for both the extent of access and participation with the activities (RQ 2a). These students achieved the same engagement level as the postgraduate cohort in Contextual Case 1. There was no relationship between accessing the resource and academic grades, although those who completed the semester to a level above a passing grade, did access more pages in the resource for a longer time; suggesting that success in online learning may be associated with greater time online (RQ 2b). Given the interest in retaining online distance learners, it was also noted that the students who withdrew from study had similar characteristics to those who had higher levels of engagement. This reinforces the fact that universities should focus their support on student cohorts with a greater risk of discontinuing study.

Survey data, discussion postings from both contextual cases, and student interviews from Contextual Case 2 provided insights into the issues that online distance learners face as they transition to the university study environment (RQ 2c). Themes that emerged reinforced the need for an orientation phase, and confirmed the design specifications of the resources, particularly the difficulty in navigating the technical interface of the LMS.
and the learning curve associated with communicating online. The postgraduate cohort appeared to value more highly the ability to share ideas with each other using asynchronous communication tools, while the undergraduate cohort preferred the sense of connectedness created from a virtual classroom experience and utilised informal social media interfaces to connect with their peers. This difference may be due to the earlier timeframe for the research in Contextual Case 1, where sharing knowledge between postgraduate students in asynchronous discussions was an integral component of their formal study environment. Both cohorts managed a study life with complex competing lifestyle demands. The students desired more integrated university support services that ranged well beyond the LMS to include enrolment advice, assistance with academic writing and development of information literacy skills.

As indicated in Chapters 4 and 5, even though both orientation resources were valued by the students who accessed them, the resources did not continue to be available to students, following changes in staffing and organisational structures at each institution. This does highlight the fact that the spread of design solutions can be impacted by forces at play in authentic settings. Rather than aspiring to widespread adoption of solutions developed as part of EDR projects, carrying out small-scale interventions across multiple contexts can highlight key variations and lead to powerful practical and theoretical outcomes, in the form of DPs and development of associated theories (Plomp, 2013; Sandoval, 2014). Ascertaining these practical and theoretical outcomes was the focus of the third research question, which sought to determine guiding principles that underpin the design of effective orientation resources and conveys the significance of the research, which will be described next.

7.2 Significance of the research

This research is significant as it provides an example of an extended EDR project consisting of multiple iterations across two contexts, demonstrating how the orientation resources matured and spread. As indicated by Kopcha et al. (2015) when referring to my
research in the introduction to a special edition of EDR research papers, “comparisons made across iterations and between contexts strongly inform the broader theory upon which the intervention was built” (p. v). There were three main outcomes from this EDR project that constitute a contribution to knowledge:

- Development of six empirically tested and refined DPs;
- Development of a conceptual model depicting student transition to online distance learning; and
- Enhancement of the EDR framework by integrating conjecture mapping with the three phases of EDR.

These outcomes primarily relate to RQ 3a (guiding principles and design features for orientation resources) and 3b (lessons learnt through implementation).

### 7.2.1 Contribution to practice: Design principles

One practical contribution to the educational community from the EDR was the creation of theoretically grounded, empirically tested DPs. These are considered a set of conditions or guidelines that may assist others to develop similar solutions in other contexts (McKenney & Reeves, 2012). Six DPs were refined during the conduct of this research. They describe design features that can be adopted by educational designers when developing interventions to support transition of online distance learners. A thick description of the six DPs was provided in Chapter 6, Section 6.4, therefore in this section each DP is abbreviated with a summary of their overall themes.

- **DP 1** Orientation is a broad transition space beyond learning to use the LMS,
- **DP 2** Orientation has an extended timeframe,
- **DP 3** Opportunity to participate in practice activities in a risk-free environment is valued by students and enhanced with clear navigation signposts and customised guidance,
- **DP 4** Interaction with content and peers is enhanced with teacher presence,
- **DP 5** There is diverse student engagement with orientation resources, so
supports should target specific cohorts, particularly those studying their first online unit,

DP 6 University supports should be co-ordinated to provide seamless transition for students.

DPs 1, 3, and 4 provide suggestions regarding characteristics of orientation resource design, and DPs 2, 5 and 6 provide meso-level advice for universities about how to implement such supports.

The original conception of the orientation space for the online distance learner (DP 1) recognised the three dimensions of transition, technical, interpersonal and reflection which were illustrated in Figure 4.2 (p. 112). Throughout the EDR project, this DP provided a helpful construct to describe how students move from their current life into the domain of academic study. The relative importance of each dimension varied, such that the technological hurdles extended beyond navigating and using the tools of the LMS to include other aspects of learning, such as accessing the library and further information literacy skills, and developing academic writing expertise. The interpersonal dimension encompassed the development of both formal university and increasingly informal connections through the use of social media. The reflective dimension was not fully apparent, however there was an indication that students who demonstrated self-regulatory behaviours managed their transition more easily. DP 1 illustrated that orientation is a broad transition space supporting the notions suggested by Coates and Ransom (2011) that universities need to support students with their lifestyle changes when commencing academic study.

Two other DPs highlighted further design characteristics for orientation supports. DP 3 described the importance of clear navigation for orientation supports, as without these clear signposts students may struggle to gain value from such resources. In addition, situating the practice activities within a framework, outlining their purpose and their value to students in trying out online learning tools in a risk-free environment, was recognised as a beneficial design feature. The advantage of providing some form of
moderation and feedback about activity completion was also clearly evident from the tracking data, since engagement levels increased when this level of support was provided (DP 4). These DPs are an indication of the value in aligning design with learning theory. The theory of transactional distance, which emphasised the need for structure and dialogue to lessen the transactional distance for these students (Moore, 1993); the CoI model, outlining the role of teacher presence in supporting new online distance learners (Garrison et al., 1999); and the early stages of the five stage model of e-learning to model online collaboration (Salmon, 2000), are concepts echoed in these refined DPs.

The other three DPs (DPs 2, 5 and 6) provided models for universities to consider when implementing orientation resources for online distance learners in their own context. This represented outcomes of interest to the meso-educational design level between local teaching episodes and higher macro-level contextual processes (Zawacki-Richter & Anderson, 2014) (Chapter 3, Section 3.1). Orientation was considered as occurring across an extended timeframe, beyond the first initial weeks when students were confronted with a large amount of information (DP 2). The importance of providing preparatory information to students as early as possible was borne out by the tracking data, as well as providing just-in-time support during later stages of the semester. Even students who had studied online in previous semesters indicated the need for updating their online learning skills due to the inevitable changes that take place in university technological platforms. A diversity of student cohorts is commonplace in the universities of today, so students with different characteristics are likely to require different levels of support. From this research, those who were over 25 years, studying off-campus and studying online for the first time, appeared to gain particular value from accessing the orientation resource (DP 5). This was not surprising given that other research has identified that new online learners are most at risk of not continuing with their study (Hachey et al., 2014; Muilenburg & Berge, 2005). Finally, the importance of integrating student support systems across an organisation was a clear statement from the students in this research (DP 6), reinforced by Kift’s (2015) transition pedagogy experiences.
7.2.2 Contribution to theory: Transition to online distance learning

A second outcome of this EDR was theorising around the experience of students transitioning to online distance learning. I used an interpretive lens to extract meanings about the way students encountered and constructed their study world. Analysis indicated that students traversed a complex study journey with multiple layers of transition: adjusting to university study, the online place, the distance between themselves and the university, and adopting new healthcare professional roles. These concluding remarks explain the key theoretical findings from my research and build on the original conception of the transitional learning space of student orientation depicted in Figure 4.2 (p. 112); the DPs described in Chapter 6, Section 6.2; the layers of transition listed previously (and described in Chapter 6, Section 6.3); and also refers to other theoretical concepts outlined in Chapter 2.

Student transition to online distance learning is a complex construct. While this has been highlighted in recent work by other scholars who have identified the roller-coaster of emotions associated with beginning study (Kahu et al., 2015; Wiesenberg, 2013), my research provided evidence about how students engage with orientation supports as they transition to online distance learning. Student engagement with the orientation resources was studied by: examining their behaviours (access, length of access, participation in orientation activities), and interpreting their experiences and stories (through comments in the discussions, survey results and interviews), which revealed their emotional reactions (interest, enthusiasm and the sense of connectedness with others). It was apparent that the act of engaging with the orientation resources was influenced by antecedents, such as their workload, family and work-life balance; the design of the resource including the availability of the resource prior to semester to enable engagement in the orientation process; and their self-regulatory mechanisms. This builds on Kahu’s (2013) holistic framework of student engagement that has affective, cognitive and behavioural components (Chapter 2, Section 2.5.2); and resonates with the situated, socio-constructivist and humanistic perspectives of learning, where a student’s context, culture
and environment shape their approaches to learning (Chapter 2, Section 2.2.3 and Section 2.2.4). Figure 7.1 illustrates my theoretical model of transition to online distance learning, depicting the interconnections between the concepts that emerged from my research. This is described further in the following paragraphs.

![Theoretical Model of Transition to Online Distance Learning](image)

**Figure 7.1** A theoretical model depicting transition to online distance learning at university

Students commencing university study have a diverse set of backgrounds represented as the domain of life, depicted on the left in Figure 7.1. Components associated with their domain of life (home surroundings, work commitments, personal background, extent of informal supports), may impact their adjustment to university (one of the layers of transition), and is of particular relevance for non-traditional students studying by online and distance modes. Other researchers have confirmed this relationship. For example, Kahu et al. (2014) studying first semester learning experiences with mature-age distance students, and their families in New Zealand, identified that an important element of this adjustment was negotiating a time and space for their study; and Devlin (2013) has also recognised the impact of a student’s socio-cultural background on their ability to master an unfamiliar university culture. This was especially the case for the undergraduate students in Contextual Case 2, and my research therefore extends conceptions about
transition to a broad range of coping mechanisms beyond developing academic study skills.

Apart from adjusting to university, other core transitional layers identified in my research (depicted as the centre element of Figure 7.1) included: the need for online distance students to familiarise themselves with the nuances of the online environment; the need to bridge the transactional distance between themselves, their teachers, and their peers; and the need to begin to develop their identity as a health professional. These layers encapsulate the interpersonal and technical dimensions shown in Figure 4.2 (p. 112) which captured the project team’s initial thinking about transition and student orientation, and directed the design of *Get Learning* in Contextual Case 1. If students are able to manage these layers of transition, then I hypothesise, they can manage their transition from the domain of life to the domain of academic study. This is illustrated as the right-hand element in Figure 7.1. This notion of transition extends beyond simple behavioural tasks, such as navigating the online interfaces (LMS as well as the library and student enrolment processes). Rather, it also encompasses the emotional components associated with transition, including: overcoming anxieties associated with going online; understanding how to manage their online presence and participate in an online collaborative community; and choosing online tools that will best satisfy their learning needs. This growth culminates in becoming an effective online distance learner. While it was evident that the students studied in my research did harness informal supports from their family and peers to support this development, the widening of the university reach to attract non-traditional cohorts, who often elect to study online and by distance, underscores the need for universities to reach out and support a broad range of transition needs, especially in the early stages of commencing university study. This led to another element of Figure 7.1, the design of university orientation supports.

The DPs identified from my analysis of student engagement with the designed orientation resources (Chapter 6, Section 6.2 and Chapter 7, Section 7.2.1) indicated that universities need to provide integrated, extended support, for a wide cross section of
university and study activities. These need to provide early access prior to the commencement of semester, opportunities for students to try out the skills required by online distance learners in a safe environment, and gain feedback and guidance from teaching staff, while building connections with other students. In both contextual cases there was considerable variation in how the students accessed the orientation resources, highlighting diverse approaches, and the need to continue orientation beyond the first year of study. Students appeared to make strategic choices about their level of engagement with the resources, such that non-use did not necessarily equate to non-engagement (e.g., David’s story, Contextual Case 2, p. 201). There is however, a risk that the non-use identified in both contextual cases (Chapter 6, Section 6.1.1) could indicate a lone wolf approach to study noted by other research (Brown et al., 2013), and may lead to disengagement with online distance learning. I have concluded, as with others (Shillington et al., 2012; Simpson, 2012), that universities need to provide varied approaches to support, targeting different layers of transition that embrace an extended transition journey.

My research shows that providing support through orientation resources does appear to be an important lever to enable transition from the domain of life to the domain of academic study. It is more of a challenge to empower online distance students to gain maximum benefit from accessing and engaging with orientation supports, resulting in retention and achievement of successful study outcomes. This leads to a two further implications from my research: the role of self-regulation in managing transition, and how learning analytics might enhance student understanding about their transition experience.

The students’ ability to move from their domain of life to the domain of academic study and manage the layers of transition identified in my research, appeared to be influenced by self-awareness of their capabilities and their approach to seeking out supports (not necessarily university-initiated) to proactively manage their learning environment, all of which are components of self-regulation (Zimmerman & Schunk,
This finding strengthens the relationship between self-regulation and study success in online distance learning environments (Artino & Jones, 2012; Cho & Shen, 2013; Sun & Rueda, 2012). My research reinforced the need for universities to cultivate and support the development of a mindset that supports students to monitor and adjust their approach to studying in new learning contexts; particularly for students who are situated at a distance from supports located at the physical university setting, and studying their first online course. This finding relates to the reflective dimension in the original construct shown in Figure 4.2 (p. 112). It was apparent that this should also include the role that peers and the students’ wider support network (family, work and friends) could play in fostering such growth and development. There have been recent calls to adopt learning analytics, to identify student actions, and harness this data to inform them about strategies they can take to manage their own learning context (Roll & Winne, 2015). Roll and Winne suggest that value to student learning is enhanced when interventions (such as the orientation resources developed in my research), are characterised “as affording opportunities for learners to more productively regulate learning in the service of achieving outcomes they value” (p. 8). It is only by studying authentic learning settings, and therefore capturing the rich contextual environment that influences what, when, and how online distance learners engage; that universities can move towards successful supports that will enable online distance learners to manage these multiple layers of transition.

The missing link currently, is understanding how these elements and the act of engaging with preparatory supports, such as the orientation resources, influences study consequences (learning, achievement, retention and ultimately work success). This is important, because engagement is known to improve student satisfaction and retention (Trowler & Trowler, 2010), and low retention and completion rates by online distance learners is a persistent problem in Australian higher education (Edwards & McMillan, 2015). Learning analytics could provide rich opportunities for further study. Given the importance of engagement and development of self-regulatory behaviours for study
success, the potential to feedback to students, information about their learning pathways so they can make choices about how they engage and develop as online distance learners, remains an area ripe for further investigation. Opportunities for further research in this area is discussed in Section 7.4.2.

Calls from the academy to research the student learning experience in context rich settings supports an examination of the third contribution to knowledge from my research; namely the value of mapping the educational design trajectory, using a conjecture mapping approach, when adopting EDR as the research framework.

7.2.3 Contribution to methodology: Enhancement of the EDR process

This research demonstrated how combining the three phase model of EDR with the conjecture mapping process espoused by Sandoval (2014) underpinned the project activity (Kopcha et al., 2015). This enhancement to the three phases of EDR, illustrated in Figure 3.2 (p. 76), enabled retrospective analysis and reporting of an extended EDR study (Wozniak, 2015). It also responded to criticisms about the limited reporting of EDR studies that extend beyond the initial two phases of EDR (Phase 1, Analysis and exploration, and Phase 2, Design and construction), and that EDR frequently only reports the results of the first iteration of the third phase (Anderson & Shattuck, 2012). In this research, all three phases were reported at two institutions to verify the design of the orientation resource, resulting in iterative refinement of the DPs. A conjecture mapping framework enabled relationships between the design elements, mediating processes and intended outcomes, to guide a systematic inquiry process. This approach focused the data collection strategy used to evaluate the design and theoretical conjectures during implementation. Unexpected results were identified, such as when the resource design in Contextual Case 1 did not lead to students following the expected access pathways; and the surprising value students placed on virtual classroom recordings in Contextual Case 2. Using the conjecture mapping process to examine the relationships between the elements of the conjecture map enhanced the trustworthiness of the research outcomes (Sandoval,
It also guided the reflective reasoning process undertaken, which led to achievement of the prior two contributions: formulation of the DPs and development of the layers of transition. Finally, using conjecture mapping to manage analysis of the extensive data helped to overcome data overload, a barrier associated with an extended EDR project (Dede, 2004).

This EDR study provided significant contributions in the form of DPs to guide the design of educational interventions for online distance learners in new contexts, a theory of transition to online distance learning, and the enhancements to the practise of EDR. There were also limitations to the study and further areas of research identified. Each of these is outlined in the next two sections.

7.3 Limitations of the research

EDR has been criticised for the complex nature of its investigation and amount of data that needs to be analysed from long-term projects (Chapter 3, Section 3.3). This is particularly relevant when conducting EDR for doctoral studies and can limit the use of this research framework (Herrington et al., 2007; Oh & Reeves, 2010). There were four limitations identified from this doctoral study, the extended timeframe and gap between the first and second contextual cases, my overlapping role as designer and researcher, the risks associated with generating educational theories from LMS data sets, and the limits to transferring the research outcomes to new contexts.

7.3.1 Timeframe for EDR across two contexts

This EDR project was conducted over an extended timeframe, with a two-year gap between completion of Contextual Case 1 (2007) and beginning the design work for Contextual Case 2 (2009). It is possible that the DPs generated from Contextual Case 1 would not be relevant to Contextual Case 2, and the refined DPs from Contextual Case 2 may also have limited currency. The research was also impacted by advancements in educational technology over this timeframe, such as the inclusion of virtual classrooms as a medium for delivery of online distance education in Contextual Case 2.
While such a timeframe may impact more traditional research paradigms, EDR has distinct advantages over other forms of educational research. It is grounded in educational theory and is process oriented. The initial DPs emerged from educational theory and underwent modification in response to the cyclical analysis undertaken following the iterations. This ensured that the research process was responsive to the changing environments and emerging issues. In addition, the relevance of researching how to support online distance learners has remained justified over the timeframe of this research. Reports indicate that student retention remains poor (Edwards & McMillan, 2015), and the current global climate of expanding access to higher education continues to present an ongoing gap in our understanding of such modes of delivery, including the role that personalised and adaptive learning pathways have on the future of online distance education (Kovanovic et al., 2015; Zawacki-Richter & Anderson, 2014).

7.3.2 Researcher as designer and investigator

The role of the researcher in the design, and subsequent analysis of the results from each iteration, can also be considered a limitation due to the bias that may have occurred. As noted in Chapter 3, Section 3.2, EDR is associated with a pragmatic philosophy which recognises the contemporary and changing nature of educational practice. Bias was counteracted through my membership with the project teams at both universities, so that decisions about the resource design, its implementation and methods for data collection to determine the students’ experience of engaging with the resources were team-based, not individual decisions. Each decision was also aligned to known educational theories and situational awareness about the constraints at each university setting. In addition, the development teams were staffed by experienced educational designers who did not have a formal teaching role with the students participating in the research.

I was, however, solely responsible for conducting the interviews for Contextual Case 2. I was aware of the impact that my frame of reference may have had during this aspect of the data collection and managed this by using a flexible approach to the interviews.
The interviews were conducted using an open-ended general guide (Teddlie & Tashakkori, 2009) to illuminate the student’s lived experience of transitioning to online learning. This enabled the students to digress and express their opinions and experiences during the interview, thus lessening the influence of the researcher. The informal nature of the interview (using Skype, in the students home location, at a flexible time, and after all study for the previous semester had been completed), and, the fact that I had no formal relationship with the students, also helped to provide a safe environment for collection of this data.

A further element to enable objectivity during the retrospective analysis of this research was the use of the conjecture mapping process that clearly mapped the expected relationships between the design elements and enactment of the design in practice. This defined the trajectory of the research and enabled me to identify any unintended outcomes or failings of the design, an advantage of the EDR approach (O'Neill, 2012).

7.3.3 Quantity of data collected and its role in theory development

A major data source collected was tracking information extracted from the LMS log files, recording accesses to the resource, pages accessed and participation in the embedded activities. It is important that data that merely captures the event (a student accessing an area of the resource) is not used to develop theories of causality; such that it is concluded that if event $x$ is recorded it will lead to learning outcome $y$. Reimann et al. (2014, p. 11) argue that big data, alone, that focuses on capturing accesses to web-based environments, cannot be used to explain multilayered concepts, such as learning theories. Rather, rich data, that takes account of the learning context, is needed. While this research did not explain if access to the orientation resources led to successful learning outcomes, it did aim to uncover elements that contributed to our understanding about how to design orientation resources and identify elements that influence the student transition process. The raw event-focused LMS tracking data was triangulated with a range of other data sources, including contextual and student demographics, such as age, mode of study
and experience with online learning, student survey data, discussion board postings and interviews describing the student transition experience. In addition, the conjecture mapping process provided guidance about the management of this data, and enabled recognition of unintended outcomes during the research.

Our understanding about how this data contributes to the pedagogy of transition and educational design, and ultimate retention and completion of study, is currently in its infancy. While this research was not able to equate what activity leads to such individual successes, it did provide a window into our understanding about how support resources are used. It illuminated principles that can be applied to the design of other supports for students studying in online distance learning contexts, noted as a valid research approach by other learning design researchers (Lockyer et al., 2013). The role that these large datasets have in educational research is an avenue that is beginning to be addressed by the data mining and learning analytics research community (Clarke & Nelson, 2013; Macfadyen, Dawson, Pardo & Gasevic, 2014). Of particularly interest for future research is how to harness this data to improve the design of learning experiences (Lockyer et al., 2013).

### 7.3.4 Transferability to other contexts

As with many forms of developmental research which reports implementation of a design in different contexts, transferability beyond the settings studied can be limited. Plomp (2013) and Sandoval (2014) contend that when the DPs are validated with similar interventions in other contexts, as was the case in this research, their power is enhanced, and should contribute to the development of more generalisable theory. By conducting the EDR in two contrasting contexts, with a focus on different levels of study (undergraduate and postgraduate), it was possible to identify the elements of the design, and aspects of student transition to online distance learning settings that were significant in each context. The emergent DPs are available to inform further EDR in the area of student support and are open to further investigation and analysis in other university
contexts and wider discipline groups (Wozniak, 2015).

7.4 Further research

This research provided a stimulus to consider further questions about the usability of LMS tracking data and student engagement in orientation support resources, how to sustain educational innovations, and the relationship between student transition and retention.

7.4.1 Researching the full spectrum from access to non-access

This research was able to provide insights from those students who did access the resources in each context, but it did not illuminate explanations for the observed behaviours of those not fully utilising the resources. Although interviews from Contextual Case 2 did gain some insights from two students with limited engagement with the resource, it did not capture the reasons for the continuum of non-use outlined in Chapter 6, Section 6.1.1, identified by Satchell & Dourish (2009). One factor identified by Kahu et al. (2015) for mature-age distance learners was the relationship between academic emotions and student engagement, where boredom, frustration, and anxiety, worsened by disconnection with other students, can lead to disengagement and withdrawal. Illuminating reasons for diversity in how and why students access, or do not access, support resources, is an area that requires further study. Krause (2012, p. 457) reinforces this gap, considering that student engagement is a complex multidimensional construct describing it as a “messy or wicked policy challenge confronting the sector”.

This research was affected by low participation rates in the qualitative datasets (surveys and interviews). The planned interviews with students in Contextual Case 1 did not go ahead and there was also limited uptake from students in Contextual Case 2 so the five interviewees may not have represented the opinions of the diverse student population. The question of how to harness the student voice for higher education research has been noted in a UK project investigating student engagement (Seale, Gibson, Haynes & Potter, 2014), which is further complicated with online distance learners who
have busy complex lives. The difficulties in researching the population of students who
do not continue as online distance learners has also been recognised by Simpson (2013).

7.4.2 Successful transition and retention

Australian media reports continue to observe wide variation in attrition, across
universities. Reports suggest that growth in student numbers due to improved access, and
options to study online, have contributed to high drop-out rates (up to 27%), particularly
in the regional university sector (Harvey, 2014), with mature-age, part-time, rural
students the most vulnerable (Hare, 2015a). It has been estimated that first year attrition
costs the Australian economy up to $450 million each year (Hare, 2015b). My research
confirmed these findings indicating that students over 25, studying off-campus and part
time were most likely to access the orientation resource but also had a higher attrition
rate. Recent Australian research has also revealed substantially poorer completion rates
from all of the following categories of students: disadvantaged (low SES); first in family;
regional or remote; and off-campus, part-time and mature-age (Edwards & McMillan,
2015). There is evidence from studies by Brown et al. (2012) and Kahu et al. (2014) that
longitudinal approaches following a subset of students along their learning journey
reveals important information about the transition experience. Brown et al. concluded that
learner stories provide a valuable insight into the student experience, and that there is
value in new online distance learners engaging in reflection early in their transition
journey, while Kahu et al. suggested that universities need flexible course designs to
assist these learners to manage their time and space for learning. The role of reflection,
including raising awareness and developing self-regulatory skills, for aiding transition,
warrants further research to interpret this component of the first DP described in Section
6.2.1.

The timeframe for supporting students who are transitioning to online distance
learning also requires greater study. Evidence from my research suggests that transition is
an extended journey. Learning analytics could contribute to our understanding about the
ebb and flow of a student’s journey and hence help to identify the most opportune time for the provision of student supports. This research demonstrated the value of using datasets that bring together student enrolment information with their LMS tracking data. This can provide insights regarding the variation in student engagement with orientation resources, the influence of teacher presence, the timeframe for optimal orientation activities and the types of student characteristics that might benefit from such resources. Currently, there are limited opportunities available for teaching staff to automate the capture of these data sets and extract the parameters that may lead to greater understanding about how students learn in online distance learning environments (Corrin, Kennedy & Mulder, 2013; Siemens, 2013).

Growing interest in these data sets leads researchers to raise further ethical questions about the use of such data sets. One opinion from internationally renowned e-learning commentators Siemens and Long (2011) identified the risk of collating student actions into generalisable pathways, forcing them to adhere to support pathways that are sanctioned as being the best study options. This reduces the rich individuality and choice that characterises adult learners and risks a “return to behaviourism” (p. 38) and would not enable variability in interpreting the different levels of engagement from use to non-use as described in Section 6.1.1 (Slade & Prinsloo, 2013). Our understanding about how this data contributes to conceptions about student transition, retention and completion of courses is currently in its infancy. While this research was not able to equate what activity leads to individual successes, it did provide a window into understanding how support resources are used, and illuminated principles that can be applied to the design of other supports for students studying in online distance learning contexts. A key outcome of EDR from this research was not the designed solution (orientation resource), but the refinements that were made to the DPs and the enhancement of our theoretical understandings about transitioning to online distance learning (Wozniak, 2015).
7.4.3 How to sustain educational innovations

This research was considered as occurring at the meso-educational design level, between local teaching episodes and a higher university-wide level (Conole & Jones, 2010). Zawacki-Richter and Anderson (2014) have called for research in the field of online distance education to be guided by a systematic agenda to situate it within the macro-, meso- and micro-spaces. Even though meso-level research is considered a more difficult space, where top-down and bottom-up approaches may collide, it helps to illuminate the interactions between the other levels (Ellis & Goodyear, 2010). Ellis and Goodyear argue that investigating the meso-level is important as it can highlight the linkages between each of these layers and enable wider application.

This research demonstrated the difficulties of such meso-educational research, as continuation of the orientation resource at both universities may have been impacted by inadequate connections between the meso- and micro-, and meso- and macro-layers at each contextual case. At each university adoption, continuation and dissemination was impacted by management and staffing changes. Even though Contextual Case 2 attempted to overcome this by creating a project team with membership from a wide spectrum of the university support services, this was not sufficient to ensure ongoing sustainability. This confirms other evidence that staffing changes impact the likelihood of initiatives continuing (McGill, Klobas & Renzi, 2014).

The need to foster sustainability leads to further research questions about ownership and maintenance of orientation resources that include activities requiring ongoing moderation and teacher presence. The issue of embedding such supports within a disciplinary framework was also suggested in the discussion of DP 6 (Section 6.4.6). Other researchers have noted that students appreciate guidance about using technology for learning when this is provided by lecturers from the discipline area in which they are studying (Seale, 2008), and that lecturers need to take more of a lead in developing their learners (Sharpe & Benfield, 2012). Seale (2008, p. 2) writes that: “The implication is that at key transitional points students need guidance to be contextualized by a subject
expert (course tutor), as opposed to a process expert (e.g., librarian).” The relationship between disciplinary guidance in the use of orientation resources, and overall ownership for the sustainability of such generic resources, needs further investigation. One area that may provide direction for future research is the development of another strand of research known as design-based intervention research (DBIR), which matches the same underpinning principles of EDR but also embeds a commitment to “developing capacity for sustaining change in systems” (Fishman, Penuel, Allen, Cheng & Sabelli, 2013, p. 143; Penuel, Fishman, Haugan Cheng & Sabelli, 2011). It aims to forge stronger links between researchers, practitioners, policy makers and organisational leaders by developing pathways for innovations to travel through the systems and processes at each context. While there was an attempt to create these connections for Contextual Case 2, the constraints of staff mobility and changes in university structures impacted further iterative cycles.

7.5 Final comment

How universities respond to their changing environment with increasingly diverse student cohorts is an important issue. Even though this research spanned a number of years, it is relevant in the current higher education climate because there is a need to examine more closely the student experience of transition to online distance learning. Key findings indicated that there is a diversity of experience for such cohorts, and that transition is an extended journey which transcends the online learning environment, requiring adjustment to a broad range of support needs. A one-size-fits-all approach to transition will not be adequate, rather, it needs to be contextualised to the local environment and stages of each student’s individualised learning journey.
APPENDICES

Appendix 1: Contextual Case 1: Three minute feedback survey and results

At the end of each of the five modules, students were asked to complete an online survey using the WebCT survey tool. The survey questions and results are below. All questions were included in all surveys, with question 4 aligning to the different learning outcomes in each module. The results for questions 1, 2 and 4 are pooled for each semester.

Question 1 – Relevance
Please indicate the extent to which you disagree or agree with this statement.
I found this module relevant for preparing me for online postgraduate studies.

<table>
<thead>
<tr>
<th></th>
<th>Semester 1 (%)</th>
<th>Semester 2 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Strongly DISAGREE</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>b. Disagree</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>c. Neutral</td>
<td>5</td>
<td>4.5</td>
</tr>
<tr>
<td>d. Agree</td>
<td>66</td>
<td>54.5</td>
</tr>
<tr>
<td>e. Strongly AGREE</td>
<td>27</td>
<td>27</td>
</tr>
<tr>
<td>Not answered</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

Question 2 - Helpful
Please indicate the extent to which you disagree or agree with this statement.
I found this module helpful for preparing me for online postgraduate studies.

<table>
<thead>
<tr>
<th></th>
<th>Semester 1 (%)</th>
<th>Semester 2 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Strongly DISAGREE</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>b. Disagree</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>c. Neutral</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>d. Agree</td>
<td>65</td>
<td>48.5</td>
</tr>
<tr>
<td>e. Strongly AGREE</td>
<td>24</td>
<td>32</td>
</tr>
<tr>
<td>Not answered</td>
<td>2</td>
<td>1.5</td>
</tr>
</tbody>
</table>

Question 3 - Improvements
Please comment on "What worked well and why?" and "What needs improvement?" in this module:
Answers analysed using NVivo

Question 4 – Varied for each module

Module 1 objectives (Tick all that apply)
I feel I now:
 a. Know how to find my way around the My WebCT page
 b. Know how to access individual WebCT sites
 c. Know how to locate information in different parts of a WebCT site
 d. Know how to complete a quiz
 e. Feel comfortable with using WebCT to support my learning

Module 2 objectives (Tick all that apply)
I feel I now:
 a. Can use WebCT discussions to post a message
 b. Feel more confident reading and replying to discussion messages
c. Recognise the importance of structuring discussion postings
d. Able to use WebCT email

**Module 3 objectives** (Tick all that apply)
I feel I now:
a. Recognise that respect and participation will influence how successful online collaboration will be
b. Appreciate that is it important to contribute to an online discussion by building on the ideas of others
c. Recognise that I might need to take on different roles in a group discussion
d. Feel more confident that I may be able to rank the value of the discussion postings of others

**Module 4 objectives** (Tick all that apply)
I feel I now:
a. Able to complete an assignment coversheet
b. Can successfully submit an assignment
c. Able to locate resources to help me write and submit an assignment
d. Can connect to the electronic journal collection
e. Can download electronic copies of journal articles

**Module 5 objectives** (Tick all that apply)
I feel I now:
a. Am confident I am putting adequate personal strategies in place to avoid accidental or negligent plagiarism
b. Can write paraphrases which are adequate for my postgraduate course
c. Have adequately set up EndNote on a computer I will be using for my postgraduate course
d. Have adequately set up EndNote on a computer I will be using for my postgraduate course
e. Am aware of which referencing style/s I am expected to use in written work in my units of study this semester, and have a strategy in place to ensure I use the style/s accurately
f. Am aware of some of the possible pitfalls for academic honesty in group work and am ready to initiate conversations with group colleagues on strategies to manage them

**Results from Question 4:** % meeting none to all objectives

<table>
<thead>
<tr>
<th>Objectives Met</th>
<th>Semester 1 (%)</th>
<th>Semester 2 (%)</th>
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<tbody>
<tr>
<td>All objectives</td>
<td>78</td>
<td>62.1</td>
</tr>
<tr>
<td>More than one/less than</td>
<td>11</td>
<td>21.2</td>
</tr>
<tr>
<td>One objective</td>
<td>9</td>
<td>15.2</td>
</tr>
<tr>
<td>Not answered</td>
<td>2</td>
<td>1.5</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

**Question 5 - Further assistance**
If there was anything in the previous list you haven’t yet accomplished, what further assistance would help you achieve these outcomes?

Qualitative comments analysed using NVivo

**Question 6 - Get Real**
Did you use the Get Real site [http://www3.fhs.usyd.edu.au/getreal/index.html](http://www3.fhs.usyd.edu.au/getreal/index.html) before you started this orientation?
<table>
<thead>
<tr>
<th></th>
<th>Semester 1 (%)</th>
<th>Semester 2 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Yes</td>
<td>43</td>
<td>38</td>
</tr>
<tr>
<td>b. No</td>
<td>55</td>
<td>59</td>
</tr>
<tr>
<td>Not answered</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
Appendix 2: Contextual Case 2: Evaluation survey and results

Likert scale questions: SA, A, neither agree or disagree, D, SD
1. Overall, I found Get Learning Online @ CDU a useful resource
   N=17, SA 7, A 8, N 1, D 0, SD 1
2. It was easy to find my way around the unit and locate relevant information.
   N=17, SA 4, A 7, N 3, D 3, SD 0
3. The amount of information in the resource was appropriate for beginning Learnline users.
   N=17, SA 4, A 9, N 2, D 1, SD 1
4. It was useful to hear the student and teacher views and advice about studying online
   N=17, SA 4, A 8, N 3, D 1, SD 0, N/A 1
5. The QuickTutes and YouTube videos were useful
   N=17, SA4, A 9, N 2, D 1, SD 0, N/A 1
6. The Quest activities helped me to understand how to use Learnline tools.
   N=17, SA 6, A 7, N 2, D 1, SD 1

Open-ended question:
7. Any further comments? (7 comments analysed with NVivo)

Other questions:
8. Which of the following describes the way/s you worked through the information presented in Get Learning Online @ CDU?
   Tick all responses that apply to your experience.
   N= 16 (not answered by 1)
   7 I worked through all information in the order presented.
   6 I dipped in and out of sections randomly but eventually read all of the information presented.
   1 I dipped in and out of sections randomly covering only the information that seemed relevant to me.
   2 I navigated quickly through the unit with the intention of coming back to read information at a later time.
   2 There was nothing of interest to me in the unit and so I did not read the information presented.

9. Which sections of the Get Learning Online @ CDU Unit did you view? Tick each section you viewed.
   16 ticked Start Here
   13 ticked Learnline Quest
   13 ticked Using Learnline for Successful Study
   14 ticked Using Learnline For Communication
   12 ticked Using Learnline For Collaboration
   14 ticked Using Learnline For Assessment
   15 ticked Learnline Tools
   10 ticked Help and Support
10. I can see myself revisiting the *Get Learning Online @ CDU* unit to experiment with using Learnline.
Answer 9 True 4 False

11. How many Quest activities did you complete?
   
   6 All
   3 Most
   5 Some
   3 Few
   0 None

12. I think that this resource would be beneficial for the following situations (click as many as you like)

   8 Offer prospective students guest access to try out this online experience before they enrol in a course or unit
   13 Available prior to the semester starting- i.e. after enrolment but before day 1 of the semester
   4 It should be compulsory for students to complete the WebQuest activities before they are able to access any of their Learnline sites for units they are studying
   6 It should be available for all CDU students during their first semester of study at CDU
   9 It should be available for the whole time a student is studying at CDU

13. I would recommend *Get Learning Online @ CDU* to other students. (Likert scale)  
SA 11, A 2, N 2, D 1, SD 1

14. Indicate how long it took you to complete all the sections of this site (excluding this feedback survey). You can add a short comment about this, in reality would you do this all at once or just complete the parts relevant to you at the time you need them?  
13 comments analysed with NVivo

15. Gender and Age

   F: 5
   M: 0
   Did not answer gender 12

   Age:
   <20 1
   20-30 3
   30-40 7
   40-50 4
   >50 2

16. Postcode during semester:

   NSW: 6   WA: 1
   VIC: 2   QLD: 3
   SA: 1    NT: 4
   Tas: 0   ACT: 0

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Appendix 3: Contextual Case 2: Interview guide

Email to students who consented to telephone interview

Hi,

Earlier this year you accessed a student orientation resource known as Get Learning Online @ CDU available as unit in Learnline. You indicated on the consent form that you were willing to participate in a telephone interview. I am emailing to let you know that I am wanting to conduct the follow-up telephone interviews with you as soon as convenient. Since it has been a while, I have attached the Information Sheet that was made available to you in the Learnline site to remind you about the research project.

I will generally attempt to contact you through the day, or during the early evening, over the next few weeks. If this is not convenient, could you please reply to this email and indicate a preferred time.

As stated in the Information Sheet, I'd like to remind you that your participation is voluntary and if you do not wish to be contacted, please email to let me know.

Regards,

Assoc Prof Helen Wozniak

Telephone Interview Guide and Questions

Steps:

1. Email sent to student regarding the phone interview.
2. If student agrees to interview, time and date set.
3. Set up voice recording (computer + Skype recording).
4. Call student. Be ready to take notes as well as automatically record audio.
5. Introduce self and explain the reason for the phone call.
6. Check with student that they are happy to talk for 30 minutes about their experience of the online orientation resource Get Learning Online @ CDU. Also ask for permission to record the telephone call.
7. Turn recording ON.
8. If permission is granted, inform the student the recorder is now switched on, and that you’ll also take notes as the interview progresses.
9. Repeat your name, student’s name, reason for interview, date and time, and ethics statement. All information and personal details gathered in the study will remain confidential. No individual will be identified in any publication of the findings of the research. If you decide to participate, you are free to withdraw your consent and discontinue participation at any time without having to give a reason and without consequence

Thank you for agreeing to this follow-up telephone interview.

As you may remember, a while ago you participated in an online orientation resource known as Get Learning Online @ CDU. I’d now like to ask you a few questions about
your experience with this resource. As a researcher, I am interested in your thoughts and understanding of your experience, especially as a new student studying at CDU and using Learnline.

There are 6 questions, but at any time please add any comments that you think important information that I should know as we go along. There are no right or wrong answers. We are interested in the diversity of opinions on this.

10. If required, provide any further clarification about what happens to the data etc., before proceeding with questions.

Brief reminder about the orientation site.

Q1. Looking back, what were the most useful elements of the site?

Q2. What was missing, or should be improved?

Q3. What advice about orientation activities would you give to a friend or colleague planning to begin an online course at CDU?

Q4. Looking back to the time that you were deciding what to study and where to study what sorts of resources would have helped you to better prepare yourself for study?

Q5. Now that you have been studying at CDU for a few months are they any other areas that you feel could support you better for making the transition to study?

Q6. Any other comments?
Appendix 4: Quantitative items coded for analysis at each Contextual Case

**Contextual Case 1**

<table>
<thead>
<tr>
<th>Items</th>
<th>Iteration 2</th>
<th>Iteration 3</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Record Number</td>
<td></td>
</tr>
<tr>
<td>2 Semester</td>
<td>Semester</td>
<td></td>
</tr>
<tr>
<td>3 Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Age as of Mar 5 2007</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Date of Birth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Age Grouping</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Degree Name</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 Level of Qualification</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 Details regarding enrolment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 Date of Enrolment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 Enrolment Status Session 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 Full or Part time Session 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 State provided in mailing address</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14 Country provided in mailing address</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 First Access date</td>
<td>First Access date</td>
<td></td>
</tr>
<tr>
<td>16 Last Access date</td>
<td>Last Access date</td>
<td></td>
</tr>
<tr>
<td>17 Total No Days Accessed</td>
<td>Total No Days Accessed</td>
<td></td>
</tr>
<tr>
<td>18 Number of sessions resource accessed 9</td>
<td>Number of sessions resource accessed</td>
<td></td>
</tr>
<tr>
<td>19 Total Time</td>
<td>Total Time</td>
<td></td>
</tr>
<tr>
<td>20 Access</td>
<td>Access</td>
<td></td>
</tr>
<tr>
<td>21 Access past homepage</td>
<td>Access past homepage</td>
<td></td>
</tr>
<tr>
<td>22 Accessed and engaged in activities</td>
<td>Accessed and engaged in activities</td>
<td></td>
</tr>
<tr>
<td>23 Accessed and completed activities</td>
<td>Accessed and completed activities</td>
<td></td>
</tr>
<tr>
<td>24 How they entered the site</td>
<td>How they entered the site</td>
<td></td>
</tr>
<tr>
<td>25 Entered and explored site from homepage</td>
<td>Entered and explored site from homepage</td>
<td></td>
</tr>
<tr>
<td>26 Explored via course tools</td>
<td>Explored via course tools</td>
<td></td>
</tr>
<tr>
<td>27 Explored via icons</td>
<td>Explored via icons</td>
<td></td>
</tr>
<tr>
<td>28 Intervention and response</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29 Number of activities completed</td>
<td>Number of activities completed</td>
<td></td>
</tr>
<tr>
<td>30 Mail Read Msgs</td>
<td>Mail Read Msgs</td>
<td></td>
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<tr>
<td>31 Mail Sent Msgs</td>
<td>Mail Sent Msgs</td>
<td></td>
</tr>
<tr>
<td>32 Discussions Read Msgs</td>
<td>Discussions Read Msgs</td>
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</tr>
<tr>
<td>33 Discussions Posted Msgs</td>
<td>Discussions Posted Msgs</td>
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</tr>
<tr>
<td>34 Calendar Viewed Entries</td>
<td>Calendar Viewed Entries</td>
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</tr>
<tr>
<td>35 Calendar Added Entries</td>
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</tr>
<tr>
<td>36 Assessments Began</td>
<td>Assessments Began</td>
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</tr>
<tr>
<td>37 Assessments Finished</td>
<td>Assessments Finished</td>
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</tr>
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<td>Assessments Total Time</td>
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</tr>
<tr>
<td>39 Assignments Read</td>
<td>Assignments Read</td>
<td></td>
</tr>
<tr>
<td>40 Assignments Submitted</td>
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<td></td>
</tr>
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<td>41 Assignments Total Time</td>
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## Contextual Case 2

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<tr>
<td>1</td>
<td>Case #</td>
<td>De-identified student ID</td>
</tr>
<tr>
<td>2</td>
<td>Gender</td>
<td>Male or female</td>
</tr>
<tr>
<td>3</td>
<td>Age in 2011</td>
<td>5 categories</td>
</tr>
<tr>
<td>4</td>
<td>State</td>
<td>State of residence while studying</td>
</tr>
<tr>
<td>5</td>
<td>Study Mode</td>
<td>Studying on-campus with some face-to-face sessions but still requiring substantial online study (internal / on-campus) or study away from the campus fully online (external / off-campus)</td>
</tr>
<tr>
<td>6</td>
<td>Unit of Study</td>
<td>NUR120, NUR219</td>
</tr>
<tr>
<td>7</td>
<td>Attendance pattern</td>
<td>Studying a full-time load during the semester of study, or a part-time load.</td>
</tr>
<tr>
<td>8</td>
<td>First online unit</td>
<td>The unit was taken as part of their first semester of study at the institution</td>
</tr>
<tr>
<td>9</td>
<td>Unit enrolment</td>
<td>The time period when enrolled in the unit (prior to resource availability, after resource available but prior to semester starting or after commencement of semester)</td>
</tr>
<tr>
<td>10-11</td>
<td>Date of access- first and last access</td>
<td>Timing of first access to the resource and timing of last access to resource</td>
</tr>
<tr>
<td>12-19</td>
<td>Modules accessed</td>
<td>Access to each of the modules 1-8</td>
</tr>
<tr>
<td>20</td>
<td>Pages accessed</td>
<td>Number of pages accessed in the resource</td>
</tr>
<tr>
<td>21</td>
<td>Duration of access</td>
<td>Total duration of accesses from time site entered to time the last page in the site was accessed, for all instances of access</td>
</tr>
<tr>
<td>22</td>
<td>Times accessed</td>
<td>The total number of times the resource was accessed excluding accesses where only the homepage was accessed.</td>
</tr>
<tr>
<td>23</td>
<td>Mean duration of access</td>
<td>Total duration divided by the number of accesses</td>
</tr>
<tr>
<td>24-38</td>
<td>Activity completion</td>
<td>Participation in the 11 activities dispersed through the resource modules, with details of which activity started or completed</td>
</tr>
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<td>39</td>
<td>Engagement level</td>
<td>Categories of access from no access, to only visiting the homepage, accessing pages beyond the homepage to participation in the Quest activities</td>
</tr>
<tr>
<td>40-41</td>
<td>Grade / Withdrawal</td>
<td>The grade the student received in the academic unit where the resource was promoted including if they withdrew from the unit and date of withdrawal.</td>
</tr>
</tbody>
</table>
Appendix 5: Ethics approval letters

Charles Darwin University:

Original HREC approval letter, reference number H11002.
University of Sydney:

Email approval to utilise data from Sydney University study for PhD. This study had prior ethical approval #: 02-2007/9761

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From: Patricia Engelmann [mailto:patricia.engelmann@sydney.edu.au]
Sent: Thursday, 2 February 2012 12:45 PM
To: Helen Wozniak
Cc: jenny.pizzica@uts.edu.au

Subject: Study of the impact of an integrated orientation program on students' learning online and flexibly delivered postgraduate coursework programs Ref. 9761

Dear Helen,

Your letter dated 23 January 2012 was considered by the Executive Committee of the HREC on 1st February 2012.

I am pleased to advise that the Completion Report has been accepted. The Committee has no objection to use of the data for your current study.

Kind regards,

Patricia

PATRICIA ENGEIMANN | Ethics Administration Officer | Research Integrity
THE UNIVERSITY OF SYDNEY

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Next page: Original ethics approval letter from the Human Research Ethics Committee,

The University of Sydney for the project titled: “Study of the impact of an integrated orientation program on students’ learning online and flexibly delivered postgraduate coursework courses”.
5 February 2007

Ms J Pizzica
Centre for Innovation in Professional Health Education and Research
Edward Ford Building – A27
The University of Sydney

Dear Ms Pizzica,

Thank you for your correspondence dated 13 January 2007 addressing comments made on your protocol entitled “Study of the impact of an integrated orientation program on students’ learning online and flexibly delivered postgraduate coursework programs”.

Details of the approval are as follows:

Ref No.: 02-2007/3761
Approval Period: February 2007 to February 2008

Authorised Personnel: Ms J Pizzica
Dr N Wozniak
Dr N J Mahony

The HREC is a fully constituted Ethics Committee in accordance with the National Statement on Ethical Conduct in Research Involving Humans – June 1996 under Section 2.8.

The approval of this project is conditional upon your continuing compliance with the National Statement on Ethical Conduct in Research Involving Humans. We draw to your attention the requirement that a report on this research must be submitted every 12 months from the date of the approval or on completion of the project, whichever occurs first. Failure to submit reports will result in withdrawal of consent (or the project if applicable).

Chief Investigator / Supervisor’s responsibilities to ensure that:

1. All serious and unexpected adverse events are to be reported to the HREC as soon as possible.

2. All unforeseen events that might affect continued ethical acceptability of the project are to be reported to the HREC as soon as possible.

3. The HREC must be notified of any changes to the protocol. All changes must be approved by the HREC before continuation of the research project. These include:
   - If there are any changes to investigators (e.g. Leaving the University)
   - Any changes to the Participant Information Statement and/or Consent Form.

4. All research participants are to be provided with a Participant Information Statement and Consent Form, unless otherwise agreed by the Committee. The Participant Information Statement and Consent Form are to be on University of Sydney letterhead and include the full title of the research project and telephone contacts for the researchers, unless otherwise agreed by the Committee and the following statement must appear on the bottom of the Participant Information Statement. Any person with concerns or complaints about the conduct of a research study can contact the Senior Ethics Officer, Centre for Innovation in Professional Health Education and Research, Edward Ford Building – A27, The University of Sydney.

5. The HREC approval is valid for four (4) years from the Approval Period stated in this letter. Investigators are requested to submit a progress report annually.

6. A report and a copy of any published material should be provided at the completion of the Project.

Yours sincerely,

[Signature]

Associate Professor J D Watson
Chairman
Human Research Ethics Committee

cc: Ms Helen Wozniak, Centre for Innovation in Professional Health Education and Research, Edward Ford Building – A27, The University of Sydney

Encl: Focus Group Bulletin
Appendix 6: Contextual Case 1: Additional statistical analysis

Age and gender data was available for Iteration 2 and analysis confirmed that there was no association between age and the various degrees of engagement with the resource or between gender and the levels of engagement with the resource.

Relationship between age and access levels

Access or no access  \( (\chi^2 [3, n=178] = 2.784, p=0.426) \)
Access  \( (\chi^2 [3, n=156] = 1.719, p=0.633) \)
Access to deeper pages  \( (\chi^2 [3, n=142] = 0.705, p=0.872) \)
Access and engagement in activities  \( (\chi^2 [3, n=120] = 1.867, p=0.601) \)

Relationship between access and gender

Access or no access  \( (\chi^2 [3, n=178] = 0.704, p=0.401) \)
Access  \( (\chi^2 [3, n=156] = 1.001, p=0.317) \)
Access to deeper pages  \( (\chi^2 [3, n=142] = 0.436, p=0.569) \)
Access and engagement in activities  \( (\chi^2 [3, n=120] = 1.532, p=0.216) \)
### Access and Degree of Engagement with Resource and Activities

<table>
<thead>
<tr>
<th>Low Engagement</th>
<th>High Engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>n</strong> (A+B)</td>
<td><strong>n (%)</strong></td>
</tr>
<tr>
<td>A Did not access</td>
<td>High engagement</td>
</tr>
<tr>
<td>B Accessed with or without exploring past homepage (C+D)</td>
<td></td>
</tr>
<tr>
<td>C Did not access deeper pages</td>
<td></td>
</tr>
<tr>
<td>D Accessed deeper pages with or without activity completion (E+F)</td>
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<tr>
<td>E Accessed deeper pages didn’t start any activities</td>
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<tr>
<td>F Activity started (G+H)</td>
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<tr>
<td>G Activity started but did not complete</td>
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<tr>
<td>H Started and completed at least 1 activity</td>
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#### Iteration 2 and Age

<table>
<thead>
<tr>
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<th>n (A+B)</th>
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<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
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<td>Under 25</td>
<td>2</td>
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<td>2</td>
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<tr>
<td>(15)</td>
<td>(87%)</td>
<td>(15)</td>
<td>(85)</td>
<td>(9)</td>
<td>(91)</td>
<td>(30)</td>
<td>(70)</td>
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<td>25 to 34</td>
<td>10</td>
<td>53</td>
<td>6</td>
<td>47</td>
<td>7</td>
<td>40</td>
<td>11</td>
<td>29</td>
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</tr>
<tr>
<td>(63)</td>
<td>(84%)</td>
<td>(11)</td>
<td>(89)</td>
<td>(15)</td>
<td>(85)</td>
<td>(27.5)</td>
<td>(72.5)</td>
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<tr>
<td>35 to 44</td>
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<td>3</td>
<td>49</td>
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</tr>
<tr>
<td>(60)</td>
<td>(87%)</td>
<td>(6)</td>
<td>(94)</td>
<td>(18)</td>
<td>(82)</td>
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<td>(82.5%)</td>
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<tr>
<td>(40)</td>
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#### Iteration 2 and Gender

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<td></td>
<td>(11%)</td>
<td>(89%)</td>
<td>(11%)</td>
<td>(89%)</td>
<td>(17%)</td>
<td>(83%)</td>
<td>(21%)</td>
<td>(79%)</td>
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<tr>
<td>Male</td>
<td>55</td>
<td>9</td>
<td>46</td>
<td>2</td>
<td>44</td>
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<td>39</td>
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<td>26</td>
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<tr>
<td></td>
<td>(16%)</td>
<td>(84%)</td>
<td>(4)</td>
<td>(96)</td>
<td>(11)</td>
<td>(89)</td>
<td>(33)</td>
<td>(67)</td>
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Appendix 7: Contextual Case 2: Additional statistical analysis

The next two tables detail the relationship between student engagement levels and demographic characteristics for Contextual Case 2.
<table>
<thead>
<tr>
<th>Demographic characteristic</th>
<th>n</th>
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<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
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<td><strong>Access and degree of engagement with resource</strong></td>
<td></td>
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<tr>
<td>low engagement</td>
<td>BOTH NUR120 NUR219</td>
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<tr>
<td>high engagement</td>
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<tr>
<td>n (%)</td>
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<td>Accessed with or without exploring past homepage (C+D)</td>
<td>Did not access deeper pages</td>
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<tr>
<td>First online semester</td>
<td>221</td>
<td>57 (26)**</td>
<td>164 (74)**</td>
<td>32 (19)**</td>
<td>132 (81)**</td>
<td>83 (63)</td>
<td>49 (37)</td>
</tr>
<tr>
<td>Not first online semester</td>
<td>320</td>
<td>191 (60)**</td>
<td>129 (40)**</td>
<td>65 (50)**</td>
<td>64 (50)**</td>
<td>46 (72)</td>
<td>18 (28)</td>
</tr>
<tr>
<td>First online semester</td>
<td>197</td>
<td>51 (26)**</td>
<td>146 (74)**</td>
<td>27 (18)**</td>
<td>119 (82)**</td>
<td>73 (61)</td>
<td>46 (39)</td>
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<tr>
<td>Not first online semester</td>
<td>88</td>
<td>59 (67)**</td>
<td>29 (33)**</td>
<td>15 (52)**</td>
<td>14 (48)**</td>
<td>12 (86)</td>
<td>2 (14)</td>
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<tr>
<td>First online semester</td>
<td>24</td>
<td>6 (25)*</td>
<td>18 (75)*</td>
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<tr>
<td>Not first online semester</td>
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<td>50 (50)</td>
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<tr>
<td>Off-campus</td>
<td>410</td>
<td>189 (46)</td>
<td>221 (54)</td>
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<td>On-campus</td>
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<td>46 (64)</td>
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<tr>
<td>Off-campus</td>
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<td>62 (35)</td>
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<td>21 (18)*</td>
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<td>56 (60)</td>
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<tr>
<td>On-campus</td>
<td>109</td>
<td>48 (44)</td>
<td>61 (56)</td>
<td>21 (34)*</td>
<td>40 (66)*</td>
<td>29 (73)</td>
<td>11 (27)</td>
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<tr>
<td>Off-campus</td>
<td>234</td>
<td>127 (54)</td>
<td>107 (46)</td>
<td>51 (48)</td>
<td>56 (52)</td>
<td>37 (66)</td>
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<tr>
<td>On-campus</td>
<td>22</td>
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<td>11 (50)</td>
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<tr>
<td>Full time</td>
<td>333</td>
<td>142 (43)</td>
<td>191 (57)</td>
<td>67 (35)</td>
<td>124 (65)</td>
<td>81 (65)</td>
<td>43 (35)</td>
</tr>
<tr>
<td>Part time</td>
<td>208</td>
<td>106 (51)</td>
<td>102 (49)</td>
<td>30 (29)</td>
<td>72 (71)</td>
<td>48 (67)</td>
<td>24 (33)</td>
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<tr>
<td>Full time</td>
<td>178</td>
<td>64 (36)</td>
<td>114 (64)</td>
<td>30 (26)</td>
<td>84 (74)</td>
<td>51 (61)</td>
<td>33 (39)</td>
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<tr>
<td>Part time</td>
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<td>61 (57)</td>
<td>12 (20)</td>
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<td>34 (69)</td>
<td>15 (31)</td>
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<td>Full time</td>
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<td>77 (50)</td>
<td>37 (48)</td>
<td>40 (52)</td>
<td>30 (75)</td>
<td>10 (25)</td>
</tr>
<tr>
<td>Part time</td>
<td>101</td>
<td>60 (59)</td>
<td>41 (41)</td>
<td>18 (44)</td>
<td>23 (56)</td>
<td>14 (61)</td>
<td>9 (39)</td>
</tr>
</tbody>
</table>

*p<0.05, **p<0.001
<table>
<thead>
<tr>
<th>Demographic characteristic</th>
<th>n (A+B)</th>
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<th>Accessed with or without exploring past homepage (C+D)</th>
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<th>Accessed deeper pages didn’t complete activities</th>
<th>Quest activity completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 to 34 years</td>
<td>207</td>
<td>103 (50)*</td>
<td>104 (50)*</td>
<td>28 (27)</td>
<td>76 (73)</td>
<td>48 (63)</td>
<td>28 (37)</td>
</tr>
<tr>
<td>35 to 44 years</td>
<td>113</td>
<td>38 (34)*</td>
<td>75 (67)*</td>
<td>28 (37)</td>
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<td>29 (62)</td>
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<tr>
<td>Over 45 years</td>
<td>91</td>
<td>34 (37)*</td>
<td>57 (63)*</td>
<td>21 (37)</td>
<td>36 (63)</td>
<td>21 (58)</td>
<td>15 (42)</td>
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<td>Under 25 years</td>
<td>88</td>
<td>46 (52)*</td>
<td>42 (48)*</td>
<td>14 (33)</td>
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<tr>
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<td>119</td>
<td>46 (39)*</td>
<td>73 (61)*</td>
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<td>35 to 44 years</td>
<td>53</td>
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<td>Over 45 years</td>
<td>25</td>
<td>6 (24)*</td>
<td>19 (76)*</td>
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<td>6 (25)</td>
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<td>42</td>
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<td>15 (36)*</td>
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<td>9 (60)</td>
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<td>88</td>
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<td>35 to 44 years</td>
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<td>34 (57)*</td>
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<tr>
<td>Male</td>
<td>78</td>
<td>35 (45)</td>
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<td>29 (67)</td>
<td>21 (72)</td>
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<tr>
<td>Female</td>
<td>463</td>
<td>213 (46)</td>
<td>250 (54)</td>
<td>83 (33)</td>
<td>167 (67)</td>
<td>108 (65)</td>
<td>67 (34)</td>
</tr>
</tbody>
</table>

*p<0.05
Appendix 8: Contextual Case 1: Emergent themes from qualitative analysis

1. Transition Issues
   - Anxiety
   - Literature searching challenging
   - Information overload
   - Time management
   - New with technology
   - Reliance on text based environment

2. Resource Design
   - Closely related to study tasks
   - Increased confidence
   - Moderator role supportive
   - Trying out assignments
   - Safe
   - Value collaboration
   - Not just for novices
   - Peer support
   - Clear layout & instructions
   - Practical
   - Early access
   - Learning curve for collaboration using textual medium
   - System IT problems lowers satisfaction
   - Navigation

3. Additional Needs
   - Raise awareness about yearly system changes
   - Need to adjust to asynchronicity


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Pedagogy and Education, 18*(2), 107-121. doi:10.1080/14759390902992576

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doi:10.1080/02602930701698892

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Oliver, R., & Herrington, J. (2001). *Teaching and learning online: A beginner’s guide to e-learning and e-teaching in higher education*. Mt Lawley, Australia: Centre for Research in Information Technology and Communications, Edith Cowan University.


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technology and it's not about the distance. In L. Moller & J. B. Huett (Eds.), *The next generation of distance education* (pp. 21-29). Dordrecht: Springer.


