A TEACHER'S RESEARCH JOURNEY INTO E-LEARNING: ALIGNING TECHNOLOGY, PEDAGOGY AND CONTEXT

A thesis presented in fulfilment of the requirements for the degree of
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DECLARATION

I declare that this thesis represents my own work except where due acknowledgement is made and that this material has not been included in a thesis or report submitted to Massey University or any other university for a degree or other qualification.

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ABSTRACT

e-Learning has the potential to radically change the way we teach and learn in higher education, but there is ongoing debate as to what constitutes effective e-learning environments. This study explores the interrelated areas of e-learning technology and pedagogy within the context of a postgraduate special education and educational psychology programme. The study is framed in a scholarship of teaching and learning approach and covers three successive phases of overlapping activities of teaching, learning and research.

The first phase of the research focuses on the design of a community of practice approach to e-learning. The aim is to enable students to develop their identity as members of the professional community by bridging the gap between university-based learning and its real-world application. In the second phase of the research, alternative technology is used to investigate a better alignment of e-learning technology and pedagogy. The findings here show that a community of practice pedagogy is better aligned with a social constructionist e-learning technology. In the third phase of the research an e-learning alignment guide is developed to analyse the changes in e-learning in relation to the interrelated areas of technology, pedagogy and context. The guide is applied to the e-learning case studies in Phases 1 and 2 of this study. The profiles of alignment from these case studies illustrate the complexities and tensions in e-learning and the potential of linking advanced technologies with effective teaching practices to change the way we teach and learn.

The key finding of this study is that careful alignment of technology, pedagogy and context is needed to actualise the potential of e-learning in higher education. The e-learning alignment guide developed in this study enables analysis of e-learning environments to provide alignment profiles. Aligning innovative technologies with appropriate pedagogies in different contexts is essential for e-learning to meet the needs of learners in the digital age. The enormous and rapid development of new educational technologies has seriously challenged traditional forms of pedagogy. This study shows that both a scholarship of teaching and learning approach and the use of the e-learning alignment guide can make a positive contribution to designing effective e-learning environments.

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CHAPTER ONE:
INTRODUCTION AND OVERVIEW

e-Learning is a disruptive technology that is currently influencing how learning is approached in higher education. (Garrison & Anderson, 2003, p. 20)

1.1 INTRODUCTION

This study focuses on e-learning in higher education, and in particular on how e-learning changes the way we teach and learn. Privateer (1999) states that, " it makes little sense for academia to continue a tradition of learning significantly at odds with technologies that are currently altering how humans learn and interact with each other in new learning communities" (p. 77). This notion that technology plays a role in changing the ways in which we learn and engage with knowledge is widely explored in e-learning literature (Bates, 2005; Prensky, 2001; Siemens, 2004). However, as Laurillard (2005) posits, the promises made for e-learning will only be realised if we begin with an understanding of how students learn, and design the use of learning technologies from this standpoint. These views suggest a tension between a pedagogy-orientated and technology-oriented focus in e-learning environments. This tension provided the direction for my research journey where the aim was to investigate the influences of technology, pedagogy and context in a postgraduate special education and educational psychology e-learning programme.

This chapter introduces my research, teaching and learning journey and provides an overview of the thesis structure. The background context of my research process is outlined, and the scholarship of teaching and learning approach that is used in this study is introduced. Three vignettes of e-learning in the area of special education are presented. The vignettes provide hypothetical concrete examples of the changes that have occurred in e-learning over time, and illustrate the reciprocal interaction of technology and pedagogy within e-learning that is explored within this study. The overall rationale for the study is presented and the key research question that threads throughout the research is highlighted. The chapter ends with an overview of how the thesis is organised, and a summary of the seven chapters. All key e-learning terms with their acronyms are defined in Appendix A in the glossary.

1.2 BACKGROUND

This thesis is an account of my professional research journey through the changing terrain of e-learning. The aim of the research is to explore, through a scholarship of teaching and learning approach (SoTL) (Boyer, 1990), how the interrelated and changing areas of technology, pedagogy and context influence e-learning practice.

Rather than researching the dimensions of e-learning in isolation from my teaching, I chose to focus on improving my own practice as I embarked on a new mode of distance teaching. This is in keeping with the SoTL approach which draws on the work of Boyer, (1990) who emphasised that teaching should not be seen as being distinct from scholarship. According to Boyer, the concept of scholarship is already inherent in teaching, and the same robust criteria for documenting and evaluating teaching should be used as in other forms of scholarship (Herteis, 2004). The context for researching my teaching was the postgraduate special education and educational psychology (SEEP) programme being delivered via 'block mode' (extramural studies and some contact block courses) at Massey University. When Massey University introduced web-based learning as an option for distance teaching, I welcomed the opportunity to explore the interface between the emerging new technologies and teaching and learning.

The research journey involved three phases of teaching, learning and research activities over a six-year period, and at each phase the focus became more refined based on the findings of the previous phase. The one key focus that threaded through all phases of the research study was to explore the inter-relationship between technology, pedagogy and context in e-learning. Implicit in this was the underlying goal of effectively aligning these three dimensions of technology, pedagogy and context to support sound e-learning practice. This started out in Phase 1 with a focus on using the e-learning technology provided by the university to develop an online community of practice (CoP) (Wenger, 2006) approach to teaching within the SEEP programme. The CoP approach was based on Wenger's (2006) notion that "communities of practice are groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly" (para. 3). Within this study, the CoP approach was integrated into the e-learning environment to frame the interaction between the

groups of people (see chapter 4). Tensions and opportunities that arose from this phase of the research led to an alternate technology being used in Phase 2 of the study. Findings from both Phase 1 and Phase 2 contributed to the exploration in Phase 3 of an e-learning 'alignment guide' for practitioners to use when designing their online teaching and learning programmes. The developments that occurred in e-learning technology over the six year duration of this study provided the rationale for the new directions taken in each phase, culminating in the development of an 'alignment guide' in Phase 3. The aim of this guide was to chart the changing terrain within the technology, pedagogy and context dimensions of e-learning, and the structure of this emerged as the study evolved. Designing e-learning environments is a complex process as technology continually changes and this has a reciprocal influence on the pedagogy, as outlined in the vignettes below.

1.2.1 Vignettes

The development and growth of new information technologies over the past decade has led to substantial changes in e-learning. Often the best way to identify these changes is to examine the practice – what effect the changes have on the learner. The following three vignettes illustrate these changes via hypothetical practical examples that serve to provide the context for this research project. The descriptions presented below describe three scenarios of e-learning within a special education context – each illustrating a different reciprocal interaction between technology and pedagogical practice. This evolution through the three examples provides the backdrop for this research, as the changes illustrated within these vignettes link to the questions raised, the tensions encountered and the insights gathered within the three phases of this research project.

Vignette One:

Samantha is a primary school teacher and lives with her two young children on a farm outside of town. She has taken a year off teaching to further her studies in special education. She received her course handbook and readings in the mail and has read the required texts and journal articles set by the lecturer. After putting her children to bed she sits at her computer, downloads a journal article, finishes typing her essay and prints it out. She will courier her essay assignment to the lecturer tomorrow for marking and will start reading the journal article for her

next assignment.

Vignette Two:

Paula is in her second year of teaching, and doing part-time postgraduate extramural study to improve her skills in working with learners with diverse learning needs. Although she is travelling on her two-week holiday break from school, she has gone to an Internet café and booked a morning computer session to catch up on course-work and interact with classmates in her e-learning environment. She logs in to the class forum, reads the discussion thread that the lecturer is facilitating for the class on one of the set readings, types in her comment and poses some more questions. She reads two of the assignments already posted by other students and provides formative feedback and her peer rating of their work. She uploads her assignment for peer-evaluation and types in her reflections in her online journal. Two of the members of her study group are currently online so she logs in to the chat room for a synchronous discussion with them on their collaborative wiki assignment. She ends with a short note of congratulation to a fellow student on her wedding. She notes the time for the next virtual lecture with the lecturer and downloads the two prescribed readings to read on the beach during the rest of her holiday break.

Vignette Three:

Grant is a special needs teacher at a rural intermediate school who, despite his isolated work place, stays connected with others in the field and continually updates his skills and knowledge via his personalised e-learning space. After the day's teaching he logs on to his computer and reads the blogs of three practitioners from different parts of the world who are part of his community of practice. He adds his comments to their posts, and updates his own blog, making links to their ideas and his professional practice. He reads the three new resources that have come directly to his home-page through his RSS feeds, and downloads a podcast of a lecture on autism to listen to on his *ipod* while travelling home. He then gets a video-*Skype* call from a colleague overseas with whom he is collaborating on a journal article. He opens their wiki space to discuss with him the changes he has made on their article. Before logging off, he uploads to *Flickr* the photos from the school sports day to share with the school community.

The learners described in the three vignettes above are all engaging in e-learning. The difference between them lies in the kind of e-learning they are experiencing in terms of the context, technology and pedagogy that is being used. Each of the three scenarios reflect a different approach to e-learning: (1) scenario one describes a formal learning context using non-networked computers and an information-transfer pedagogy; (2) scenario two describes a formal learning context with networked computers that provides an interactive learning environment where class members collaborate and interact online; (3) scenario three describes an informal learning context using self authoring and social networking technologies that enables a self-directed, individualised learning environment that is located within an authentic everyday work context and contributes to the wider learning community.

The three vignettes provide the background for my own professional e-learning research journey, described in this thesis. They represent the development in technology and the resultant implications for pedagogy that I encountered as the journey progressed. Throughout the three phases of my journey, I examined the interrelated areas of technology, pedagogy and context in e-learning with the rationale of improving practice. The aim was to focus on the changes, as outlined in the scenarios above, that technology affords, and to investigate the implications of these changes for effective e-learning practice in various contexts.

Using a SoTL approach (Boyer, 1990), my journey involved activities in the interrelated areas of *teaching, learning* and *research* over three consecutive phases. The *learning activities* involved my own professional development in the field as I became a student of e-learning: taking courses; engaging in literature searches; collaborating on joint research projects; and participating within a community of e-learning practice. The *teaching activities* involved my own professional practice where I implemented different e-learning technologies and pedagogies in my own teaching practice over three consecutive phases. The *research activities* involved the documentation of my learning and teaching as research outputs, and the presentation of these to the wider community. These included conference papers, journal articles and community presentations, aimed at developing knowledge and describing practice, which, consistent with a SoTL approach, were then made public for critical review and evaluation, as well as for others

to use.

The focus of the SoTL approach throughout the three consecutive phases was on investigating the shifts in technology and the interplay, tensions and influences of this on context and pedagogy. The three phases resulted in different approaches to e-learning that will be explored in depth in this thesis. These are alluded to in the three vignettes above where: (1) Samantha is *learning **about*** special education using an e-learning environment that enables her to access information and complete assignments to send to her lecturer for evaluation (monological transmission mode); (2) Paula is *learning **to be*** a special education teacher using a closed, formal e-learning environment that facilitates online collaboration and co-construction of meaning through discussion with fellow students (dialogical interaction); and (3) Grant is *learning **as*** a special needs practitioner using an open, informal and personalised e-learning environment where he designs his own ongoing learning and contributes to the learning of others through self and joint publishing, and networking within a global community of practice (multi-conversational networks).

The vignettes illustrate the dynamic relationship between the three dimensions of technology, pedagogy and context and introduce the orientation taken in this thesis — that all three dimensions need consideration when designing e-learning environments. As Garrison and Anderson (2003) point out, "e-learning is a disruptive technology that is currently influencing how learning is approached in higher education" (p. 20), and they suggest that the influences of technology will change our ideas and approaches to cognition and pedagogy. As outlined in the next section, an investigation of the potential for technology to change pedagogy was the underlying rationale for embarking on this e-learning journey.

1.3 RATIONALE FOR THE STUDY

Given the rapid pace of change in the field of e-learning technologies and the resultant implications for distance teaching (Dertouzos, 2002; Schank, 2005; Twigg, 2003; Weigel, 2002), there is an urgent need for sound research-based theory to guide practice. As Laurillard (2005) states, "few of the current generation of academics have ever learned through technology, so practice develops slowly, and theory hardly at all"

(p. 240). With this concern in mind, I embarked on this research journey to investigate theory and practice through both learning and teaching with e-learning technology. The rationale for this thesis was to explore the links between technology, pedagogy and context with the overall aim of contributing to theory and practice.

As illustrated in the three vignettes above, technology, pedagogy and context are inextricably linked in e-learning environments. The emergence of new technologies offers both opportunities and challenges previously unimagined for e-learning. This thesis sets out to explore, from a SoTL (Boyer, 1990) approach, these opportunities and challenges within e-learning and teaching. It aims to expose some of the tensions that arise when there is a mismatch between the technology, pedagogy and context, and to show how, through a reflective alignment of these, e-learning environments can be enhanced.

Grounded in an exploration of the changing e-learning terrain, this study focuses on the implications of the shifts in technology for teaching and learning. There is one key question that threads through-out the three phases and three activities of this study:

> *How do the interrelated areas of technology, pedagogy and context influence practice within a changing e-learning environment?*

Each phase of the study builds on the findings from the previous phase and involves the three activities of learning, teaching and research. The research focus becomes more refined through the three phases of examining how e-learning technology changes and what the implications of these changes are for the teacher and learner. Different conceptions of pedagogical practice for different e-learning contexts are explored, leading to the development of a conceptual guide for aligning technology, pedagogy and context when designing e-learning environments.

1.4 OVERVIEW OF THE THESIS

The thesis is organised into seven chapters. This chapter provides an introduction to, and overview of, the research. The following chapters are structured as follows:

Chapter Two: The Research Journey

Chapter two describes the research method and design used in this study. The chapter begins by stating the overarching research question that guided the e-learning journey throughout the three phases of the research. This involved an investigation into how the interrelated areas of technology, pedagogy and context influence practice within a changing e-learning environment.

The research design involved three successive phases of overlapping activities based on a scholarship of teaching and learning (SoTL) approach (Boyer, 1990): *learning activities*, *teaching activities* and *research activities*. The activities were conceptualised as three intersecting spheres and this is presented in detail in this chapter. The various dimensions of these activities are outlined, including the underlying epistemology of contructionism, and the research approaches of reflective practice, practitioner research, and case studies. Finally the three successive phases of the research process are presented, outlining the learning, teaching and research activities within each of the three phases, and the ethical considerations.

Chapter Three: The Theoretical Terrain

Chapter three follows on from the description of the research journey to provide a progressive review and analysis of the evolving literature within the field of e-learning that I accumulated as the journey progressed. It provides an overview of the broader theoretical terrain through which this journey traversed. This has been conceptualised metaphorically as a theoretical 'compass' that guided the direction of my journey. The four quadrants of the 'compass' are the areas of technology, pedagogy, context and critiques.

The chapter begins with an overall introduction to the metaphor of a compass and is followed by a discussion of the key research areas that inform the study and key terms used in this study (a full glossary of terms is included as Appendix A). The next section of the chapter looks at the literature on e-learning *technology* as the first quadrant of the e-learning 'compass'. The evolution of tools for teaching online from the first wave of e-learning to the second wave, and the shift from 'Web 1.0' 'learning management

systems' to 'Web 2.0' and social software tools is outlined. The next section outlines the second quadrant of the 'compass' and provides an overview of literature related to *pedagogy*. Various theories of learning are presented and the shift from individualised learning to social constructionism and learning within a CoP is explored. This is followed by a discussion on *context* as the third quadrant of the 'compass', and covers institutional and discipline related issues of e-learning. The final section focuses on *critiques* as the fourth quadrant of my e-learning 'compass' and provides the critical perspective for this study. The theory presented in this chapter constituted my metaphorical 'compass', setting the direction for traversing through the three phases of teaching, learning and research as presented in the next chapters.

Chapter Four: Phase 1 of the e-Learning Journey

This chapter presents Phase 1 of the SoTL research. The *learning activities* of Phase 1 of the research are initially described outlining the courses and workshops I attended. This professional development provided the background knowledge and skills needed to engage in the *teaching activity,* which in Phase 1 involved a case study on using *WebCT* which is the LMS (Learning Management System) used by the university. This chapter provides a detailed description and evaluation of the implementation of *WebCT*. The opportunities and limitations of using this tool to accommodate a constructionist and CoP approach to e-learning are outlined as Case Study 1. Both the technology and the pedagogy used in this case study are described. Data from student evaluations as well as an analysis of discussion postings and participation in the e-learning environment, are used to illustrate the opportunities and tensions in terms of a pedagogy-technology alignment. Findings from this case study in the *teaching activity* were collated in the *research activities* of Phase 1 as publications and conference presentations, and these are documented in this chapter. The tensions and opportunities identified from these three activities of *learning, teaching* and *research* in Phase 1, formed the basis for the second phase of the SoTL journey, outlined in the next chapter.

Chapter Five: Phase 2 of the e-Learning Journey

In Phase 2 of the research, my *learning activities* involved gaining a deeper understanding of the CoP approach as well as how to design and develop *Moodle* as a

new LMS (Learning Management System) that purported to afford a more social constructionist approach to e-learning. This is outlined in the first section of chapter five followed by a discussion of the case study in the *teaching activity,* which involved using a CoP approach with *Moodle.* This is presented as Case Study 2, with information on the rationale for selecting this technology, a description of implementation and the evaluation and findings. Data from the participants' feedback as well as analysis of the online activities using the new tools is presented. The findings from this phase again show the importance of aligning pedagogy with technology and point the way forward towards a new mode of e-learning that accommodates a more flexible approach using e-learning Web 2.0 tools. These insights are documented as part of the *research activities* of Phase 2 and formed the basis of the development of an e-learning alignment guide outlined in Phase 3 of the research.

Chapter Six: Phase 3 of the e-Learning Journey

Chapter six follows a similar format as the previous two chapters and presents Phase 3 of the research. The *learning activities* are initially outlined and involve participation in collaborative projects to extend my knowledge of e-learning nationally and internationally, and become more confident and competent in using new Web 2.0 technologies for designing e-learning environments. The insights gained from these projects, as well as the reflections on Phases 1 and 2, resulted in charting the changing terrain of e-learning with the goal of providing a tool to consider alignment of various dimensions of e-learning environments. This e-learning alignment guide (eLAG) is presented in the *teaching activities* section of this chapter, where the technological changes are outlined along with the impact of this on pedagogy within different e-learning contexts. The public presentations of the work done in this phase are listed in the *research activities* section of this chapter.

Chapter Seven: The Journey Revisited

This final chapter of the thesis provides the conclusions and insights from the overall research journey. The chapter begins by revisiting the research questions, drawing conclusions and highlighting the implications of the study. This is followed by a discussion on the significance of the study and the original contribution that it makes to

e-learning practice. The eLAG is applied to Phase 1 and Phase 2 case studies to illustrate the use of the tool. The three scenarios of e-learning in special education are revisited to illustrate the alignment of technology, pedagogy and context using the eLAG. The strengths and limitations of the study are identified and finally recommendations are made for further research and practice within the areas of technology, pedagogy and context.

1.5 CHAPTER SUMMARY

This chapter provided an introduction and background to the e-learning journey that will be presented in this thesis. The research aim and rationale was introduced as well as an overview of the structure of the seven chapters of this thesis. Throughout the six chapters that follow, the underlying theme of the e-learning journey will be reinforced — that in the rapidly changing environment of e-learning, where advances in technology continue to offer the potential of exciting new options, rigorous research is needed to ensure that sound pedagogy guides the uptake of new approaches.

As outlined in the vignettes presented in this chapter, e-learning involves a complex interlinking of pedagogy, technology and context. The eLAG developed in this thesis, and presented in chapter six, provides a way of considering alignment of these dimensions when designing e-learning environments. For example, in vignette one on Samantha's learning, early forms of e-learning support a *uni-directional* (teacher to student), transmission mode pedagogical style where the technology used by teachers and learners aligns with information and content transfer using CD-Roms and personal computers. Later forms of technology, known as Web 1.0 or networked computers, align with an e-learning environment that accommodates learner interaction within a formal community of learners — as outlined in scenario two of Paula's learning — through the use of Learning Management Systems, such as *WebCT*, *Blackboard* and *Moodle*. This allows for *bi-directional* (interactive, conversational) interaction, but this is largely driven by the use of software prescribed by the institution with the course and content structured by the teacher. Emerging tools such as blogs, wikis, podcasts and other social networking tools and folksonomies of Web 2.0 (Downes, 2006) align with a different, more individualised conception of pedagogy and knowledge management

— as outlined in scenario three of Grant's learning — which accommodates informal *multi-directional* (networked, multi-conversational) learning.

The three vignettes serve as an introduction to the e-learning journey described in this thesis. This journey is based on Boyer's (1990) SoTL approach and involves three phases of investigating the alignment of technology to support a particular pedagogical e-learning approach within the context of the SEEP teaching programme. The outcome of the journey was to chart the changes relating to technology, pedagogy and context within e-learning and thus provide a tool, the eLAG, for practitioners to use when navigating the complex terrain of e-learning and teaching.

CHAPTER TWO:
THE RESEARCH JOURNEY

> *The scholarship of teaching and learning is an imperative for higher education today, not a choice . . . Scholars of teaching and learning understand classroom difficulties as problems and puzzles to be systematically explored and addressed in ways that contribute to a growing teaching commons.*
> (Huber & Hutchings, 2005, p. 13)

2.1 INTRODUCTION AND CHAPTER OVERVIEW

This chapter describes my journey through the changing terrain of e-learning over a six-year period. It outlines the three phases of my research of teaching postgraduate education papers within new online environments and describes what I did, how and why. The journey began with the notion that as a 'disruptive technology' (Garrison & Anderson, 2003), e-learning has the potential to change the way we teach and learn (Laurillard, 2005a). The purpose of my journey was to investigate the inter-relationship between technology and pedagogy in e-learning. I set out as a teacher, learner and researcher to explore the potential of e-learning to change the way we teach and learn, and charted the changes along the way.

As a *teacher*, the challenge was to design and develop the e-learning component of the special education and educational psychology (SEEP) programme. To do so effectively meant embarking on a journey both as a *learner* in e-learning, participating in courses and workshops, and as a *researcher* in e-learning, documenting and analysing findings of my online teaching practice, and engaging with others in the community of e-learning practice through conferences, journal articles, symposia, and presentations. My own learning, through professional development activities, informed and was informed by my teaching practice, which in turn informed and was informed by my research. This occurred in three progressive phases of 'research as teaching and learning'.

This chapter begins by stating the overarching research question that provided the direction for my e-learning journey. This led me to the research issues that provided the rationale, motivation and orientation for traversing the e-learning terrain. The journey progressed over three successive phases of overlapping activities of research, teaching

and learning, based on a scholarship of teaching and learning (SoTL) approach (Boyer, 1990). This approach is conceptualised as three intersecting spheres of teaching, learning and research activity and is presented in this chapter.

After outlining the research questions, the various dimensions of the SoTL approach are described, including the underlying epistemology and the specific research approach used. These are conceptualised as being at the intersections of the three activities of teaching, learning and research. The epistemology, located at the core of all three activities, is that of contructionism (Papert, 1991), detailed below. The research approaches include reflective practice, practitioner research and the case study approach. These are presented in the next sections along with the ethical considerations of the overall research process. Finally the three successive phases of the research study are illustrated with a summary of the three activities of learning, teaching and research within each of the three phases.

2.2 RESEARCH QUESTIONS AND ISSUES

This study is grounded in an exploration of the e-learning terrain. It highlights the implications of the shifts in technology for pedagogy within different teaching and learning contexts. My e-learning journey was guided through all three phases and within all three activities by one overarching question:

> *How do the interrelated areas of technology, pedagogy and context influence practice within a changing e-learning environment?*

The research focus was refined sequentially over the three research phases as new issues and sub-questions emerged. At the start of the journey, as I embarked on teaching in an online environment, the focus was on using the LMS provided by the university, which in this case was *WebCT*, to design an online environment for the SEEP programme that was based on a Community of Practice (CoP) model. The learning and research activities within Phase 1 of the study raised questions and issues relating to using *WebCT* as the *technology*, and a CoP approach as the model for *pedagogy* within the *context* of the SEEP programme. The findings from Phase 1 on the relationship between these three areas of technology, pedagogy and context in e-learning led to a shift in

focus to using an alternative *technology* called *Moodle*, in Phase 2 of the study. The outcome of this trial led to a Phase 3 focus on charting the changing e-learning terrain in order to better align the three areas of technology, pedagogy and context.

The three phases raised issues and questions that allowed for a progressively more detailed focus on how new technologies might afford new ways of learning, teaching and engaging with knowledge. These issues raised parallel questions of how e-learning environments have evolved and can now support: (1) learning that is formalised, well controlled and structured within an institutionalised context and oriented towards defined skills training; (2) learning that tests the boundary of the formal and informal through meaning-making within a community of learners, situated in authentic contexts; and (3) learning that is informal, self-initiated, life-long and life-wide through networking with different CoPs. The research fore-grounded questions relating to the differences between e-learning environments that are sequential, closed and linear or simultaneous, open and networked. These questions are examined through a SoTL approach throughout the three phases of this study.

There was an acknowledgement throughout this study that research, teaching and learning can never be context-free (Flyvbjerg, 2001). In exploring the relationship between the three areas of context, pedagogy and technology in e-learning, the following sub-questions were posed in the context of the SEEP programme:

- What is the relationship between technology and pedagogy for the SEEP e-learning context?
- What are the implications of using different technologies and pedagogies for the SEEP teacher and learner?
- How do we align technology and pedagogy within the SEEP e-learning context?

These sub-questions were investigated over the different phases within the SEEP programme from the integrated perspectives of being a teacher, a learner and a researcher. The SoTL approach that framed the inquiry is outlined in the next section.

2.3 QUALITATIVE RESEARCH

According to Berg (2004) qualitative research "seeks answers to questions by examining various social settings and the individuals who inhabit these settings" (p 7). He goes on to state that qualitative techniques allow researchers to share in the understandings and perceptions of others; explore how people make meaning in their daily lives and learn about and make sense of themselves and others. This study is located within this broader framework of qualitative research as it seeks to answer questions relating to the experiences of those involved in the e-learning environment of the Special Education and Educational Psychology programme over a period of six years. The specific research questions in this study focus on: the relationship between technology and pedagogy within the SEEP programme; what the implications are of using different technologies and pedagogies for the SEEP teacher and learner; and how the technology and pedagogy is best aligned within this context.

When referring to the 'family' of qualitative research approaches, Erickson (1986) prefers to use the term *interpretive* as he believes it avoids connotations of being non-quantitative and points to the key feature of *interpreting* human meaning in social life. This fits well as an overarching term for this research given that quantification was used as one data source in this study which aimed to interpret the perspectives of various participants in the e-learning environment of the SEEP programme. Erikson (1996) describes interpretive research as involving: (a) intensive, long-term participation in the field setting; (b) careful recording of what happened; and (c) subsequent analytic reflection on the documentary record obtained in the field. As will become evident in this chapter – all three of these elements were used in this study: (a) the study took place over a six year period and evolved into three phases of research – the first two phases involving case studies of field work and culminated in a third phase which was more reflective and theoretical; (b) a variety of data collection sources were used including documentation analysis, surveys of both teachers and learners, and analysis of both the content and number of online discussion forum post; and (c) reflection on this data involved ongoing co-construction of meaning through presentation of findings and interacting with other professionals.

Schwandt (2003) sees this qualitative research approach of reflecting on findings as being:

> a kind of activity (like teaching) that in the doing transforms the very theory and aims that guide it. In other words, as one engages in the "practical" activities of generating and interpreting data to answer questions about the meaning of what others are doing and saying and then transforming that understanding into public knowledge, one inevitably takes up "theoretical" concerns about what constitutes knowledge and how it is to be justified, about the nature and aim of social theorizing, and so forth. In sum, acting and thinking, practice and theory are linked in a continuous process of critical reflection and transformation (p 295).

In this study the 'taking up of theoretical concerns about what constitutes knowledge' is linked to a constructionist epistemology and research approach. This approach seeks to elicit understandings from the experiences and accounts of the participants in the study. Constructionist research holds that the world and our place in it are not simply 'there', but rather that we actively construct it and the meaning that we draw from it. The purpose of a constructionist approach to research is to explore 'how we come by, now use and/or might transcend our current conceptual orientations" (Holstein & Gubrium, 2008, p 15)

Constructionism is explained more fully in section 2.3.2 of the next section and underpins all aspects of this study as the underlying epistemology. This is linked with the community of practice learning theory used in the e-learning aspects of this study (section 4.2.2.1 in Phase 1 and 5.2.2.3 in Phase 2 of the research). Constructionism is at the core of the learning, teaching and research dimensions of this study as is outlined in the next section which covers the specific Scholarship of Teaching and Learning approach used in this study.

2.4 SCHOLARSHIP OF TEACHING AND LEARNING APPROACH

The research approach used in this study is based on Boyer's (1990) notion of the SoTL and has been conceptualised in this study as consisting of three overlapping activities of learning, teaching and research. According to Martin, Benjamin, Prosser, and Trigwell (1999), the SoTL involves: engagement with the existing knowledge on teaching and learning; self-reflection on teaching and learning in one's discipline; and public sharing of ideas about teaching and learning within the discipline. These three areas relate to my professional development as: a *learner* of e-learning through engagement with existing

knowledge; a *teacher*, through putting this learning into practice in two phases of pedagogical inquiry in the SEEP programme and reflecting on this teaching and learning; and finally as a *researcher,* through presenting the findings of my teaching and learning to other professionals within the field of e-learning (public sharing of ideas within the discipline). The approach used in this study can thus be illustrated as involving three intersecting activities of *teaching, learning* and *research*, as outlined in Figure 2-1 below.

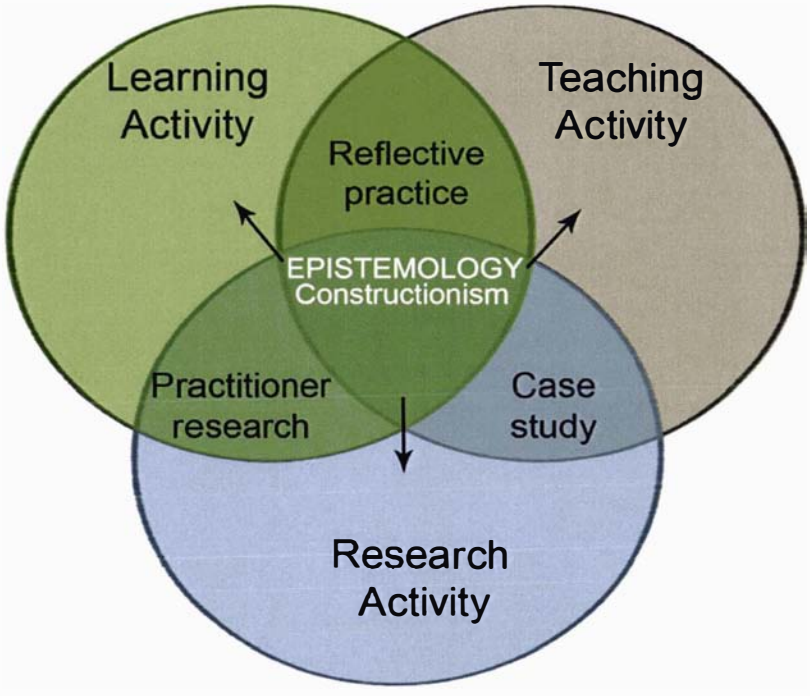


Figure 2-1: The three activities of learning, teaching and research

At the core of the study, where all three activities of teaching, learning and research overlap, the underlying epistemology of constructionism (see 2.4.1) is located. At the intersection between the spheres of activity, the various research approaches that were used in this study are located, which include reflective practice (see 2.4.2), practitioner research (see 2.4.3), and the case study approach (see 2.4.4).

The SoTL approach (Boyer, 1990) initially developed as a result of breaking free from the traditional teaching-research distinction to define, in more creative ways, what it means to be a scholar (Campbell, 1991). Boyer (1990) expanded the view of

scholarship, which traditionally was just seen as the scientific *discovery* of new knowledge, to include three other equally important areas: the scholarship of *integration* (fitting one's own research, or the research of others, into larger intellectual patterns), the scholarship of *application* (bringing knowledge to bear in addressing significant societal issues), and the scholarship of *teaching* (not only transmitting knowledge, but transforming and extending it as well). This latter view of the scholarship of teaching challenges the barrier between teaching and research, and forms the basis of the approach used in this study. Shulman (2000) illustrated this emerging view by distinguishing between *scholarly teaching* and *a scholarship of teaching*. He saw scholarly teaching as teaching that is well grounded in the sources and resources appropriate to the field, whereas the scholarship of teaching is when our work as teachers becomes public, peer-reviewed, critiqued and exchanged with other members of our professional communities so they, in turn, can build on the work.

Huber and Hutchings (2005) see contemporary teaching as being complicated in ways they argue were not the case in earlier periods given the new technologies and pedagogies. They see this as bringing "challenges and even frustrations but also unprecedented waves of innovation and experimentation (which) is where the scholarship of teaching and learning enters the scene, as a response to shifting conditions" (p. xi) of teaching. As Brown and Adler (2008) indicate, it is through sharing case studies that educators who are committed to inquiry and innovation can participate in an ongoing process of creating, using and re-mixing teaching practices and approaches. This is currently possible through the online Teaching and Learning Commons (http://commons.carnegiefoundation.org/) hosted by the Carnegie Foundation for the Advancement of Teaching. Educators from all over the world can post their own examples of researched practice and participate in an ongoing conversation with others about these cases.

For Shulman (2000), the significant benefits of, and justification for, a SoTL are linked to what he called: (a) professionalism — our responsibility in higher education to our discipline, or professional field; (b) pragmatism — our role as educators and responsibilities to our students; and (c) policy — our contributions to legislatures, boards and the developing market for higher education. This justification of the three 'p's resonates with the research approach in this study, where 'professionalism' links to

the professional development or *learning* activity, 'pragmatism' links to the *teaching* activity and 'policy' is formed as an outcome of the *research* activity.

Huber and Hutchings (2005) identify four core practices that make up the SoTL: "framing questions, gathering and exploring evidence, trying out and refining new insights in the classroom, and going public with what has been learned in ways that others can build on" (p. 20). These practices are at the core of this research, where the question around e-learning practice frames the three activities of learning (exploring evidence), teaching (trying out), and research (going public). As such, the research becomes real and immediate, with the purpose not only of improving practice but also of building knowledge that is then made public for critical review and evaluation, as well as for others to use.

According to Huber and Hutchings (2005), "the scholarship of teaching and learning is often messy rather than neatly linear, engaged rather than disinterested, and highly personal in its impact" (p. 26). These dimensions of research inevitably raise questions around quality of the research, and it is important to translate these questions into characteristics of quality that are consistent with this genre of research, so that it is judged on its own terms. For Diamond (1999, cited in Huber and Hutchings, 2005) the standards that constitute scholarly work include: a high level of discipline-related expertise; breaks new ground or is innovative; can be replicated, documented, peer reviewed; and has significance or impact. Huber and Hutchings (2005, p.103) go on to add the following standards for a quality SoTL: clear goals, adequate preparation, appropriate methods, significant results, effective presentation, and reflective critique.

The notion of reflective critique outlined by Huber and Hutchings (2005) is similar to that previously identified by Schon (1995) who suggested that if teaching was to be seen as a form of scholarship, then the practice had to be seen to generate new knowledge and that the process whereby that occurred was through being critically reflective. Similarly Trigwell, Martin, Benjamin & Prosser (2000) see critical reflection as being one of the four dimensions of a SoTL approach which includes: "being informed about the literature and/or knowledge of teaching and learning in a discipline; focusing on student learning and on teaching, rather than mainly on teaching alone; reflection on the literature, one' s own context and the relations between the two; and

communication" (p 163). They use this four dimensional model to differentiate between teachers who are less and more engaged in SoTL. Teachers less engaged in SoTL are described as: tending to use informal theories of teaching in their practice; being more teacher than student focused; engaging in very little reflection on what they do in teaching, and where they do, reflect on their teaching rather than student learning; and keeping their teaching as a private activity. They contrast this with a description of teachers more engaged with SoTL as: seeking to understand teaching by using literature; investigating their own teaching; reflecting on their teaching and seeing it from the students' perspective; formally communicating issues around their practice with peers. Critical reflection is thus one of the key dimensions and standards of using the SoTL approach.

In terms of meeting these standards, the SoTL approach used in this research focused specifically on ensuring a sound underlying *epistemology* to form the theoretical basis of the study, and appropriate *research methods* and practices in all activities and phases of the research. The epistemology and research methods can be conceptualised as being located at the intersections of the teaching, learning and research activities of the study as follows:

- The *epistemology*, located at the core or centre of the overall study, provides the fundamental orientation, paradigm or theory of knowledge for all three activities of teaching, learning and research, which for this study is that of *constructionism;*
- The *research methods*, located at the areas of overlap between the teaching, learning and research activities, involve a *practitioner research approach*, *reflective practice* and the use of *case studies.*

The next sections outline the epistemology of constructionism that lies at the core of all three activities and is followed by a description of the research methods of practitioner research, reflective practice and case studies.

2.4.1 Epistemology — Constructionism

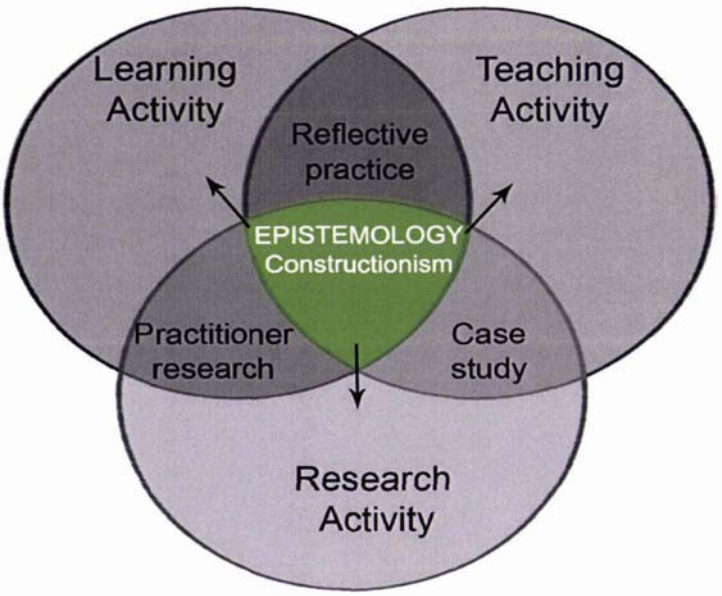


Figure 2-2: The epistemology of constructionism

In order to ensure clear goals and adequate preparation for the research, a common epistemology was established at the core of the overall study. This resulted in consistency, continuity and congruence within and between the three activities of teaching, learning and research. This is illustrated in the Figure 2.2 above, where the epistemology of contructionism (Papert, 1991) is represented as being located at the intersection of the teaching, learning and research activities. Constructio***n***ism can be seen to have its roots in both constructi***v***ism, where knowledge is actively constructed by individuals through interacting with the world (Piaget, 1966), and social constructivism, where constructions of knowledge are defined through consensus between people in a social group (Piaget, 1966; Vygotsky & Cole, 1978). As outlined in the theoretical background in the next chapter, constructio***n***ism draws from constructi***v***ism and social constructivism the notion that learning is a result of social reconstruction rather than transmission of knowledge. It extends this into the idea that learning is most effective when part of an activity the learner experiences is constructing or making a meaningful product (Papert, 1991).

This distinction and definition of constructionism as 'learning-by-making' is explained by Papert (1991) as follows:

> Constructionism — the N word as opposed to the V word — shares constructivism's connotation of learning as 'building knowledge structures' irrespective of the circumstances of the learning. It then adds the idea that this happens especially felicitously in a context where the learner is consciously engaged in constructing a public entity, whether it's a sand castle on the beach or a theory of the universe. (p. 1)

In comparing Piaget's theory of constructivism with Vygotsky's theory of social constructivism and Papert's notion of constructionism, Ackermann (2001) notes that Papert's constructionism is more situated than Piaget's constructivism and more pragmatic than Vygotsky's socio-constructivism. They are all 'constructivists' in that they view knowledge as a personal experience to be constantly reconstructed through interaction with the world and others, and not merely a commodity to be transmitted and re-applied. But whereas for Piaget, constructing knowledge was a process of moving from concrete to formal or abstract thinking to generate rules, and Vygotsky's understanding was that knowledge developed through interaction with others within the zone of proximal development, Papert's view is that knowledge is 'doing' in a context which continually changes (Ackermann, 2001). For Papert, the role of context, uses and media were central to teaching and learning, and in rethinking education in the digital age he argued that learning happens *in–situ* and that "ideas get formed and transformed when expressed through different media, when actualised in particular contexts, when worked out by individual minds" (Ackermann, 2004, p. 17).

As the core epistemology, constructionism influenced all three activities of teaching, learning and research within this study. In terms of the *teaching*, the SEEP programme is based on the pedagogical principle that learning is an interactive, social and contextualised experience. The design of the programme is that of a CoP approach rather than direct instruction oriented pedagogy (see chapter 4). Students interacting within the three levels of study (foundation level, professional level and internship level) co-construct knowledge within the changing context of special education and educational psychology. Learning occurs through authentic 'real-life' casework and assignments. Developing the e-learning component in the SEEP programme to afford a CoP approach that was aligned with a constructionist epistemology became the core focus of the case studies in the first two phases of the study (see 2.4). This involved shifting from the prescribed technology for the e-learning environment (*WebCT*), which was found to aligned with an instructional pedagogy, to using an alternate technology

(*Moodle*) that purported to be designed and developed to support a "social constructionist pedagogy" (Dougiamas, 2007). This is described in detail in chapters 4 and 5 of the thesis, where case studies 1 and 2 are presented.

Both the *learning* and *research* activities of this study also followed a constructionist approach in the sense that my own professional development in the field of e-learning involved constructing knowledge through interacting with other practitioners, becoming immersed in the literature, and engaging in dialogue with colleagues about the rapid and ongoing changes in e-learning technology and pedagogy in order to put it into practice in my teaching. The research outputs involved ongoing documentation of case study reports of implementing and evaluating various e-learning environments. These were shared as public entities for peer review and were to be passed on for others to use, as outlined in the chapters on the three phases of this study.

Hence constructionism, as the underlying epistemology of this study, afforded a continuity and congruence within and between the three elements of teaching, learning and research. This helped to ensure a clear and consistent orientation for each phase of the research and was linked to the use of appropriate research methods, which, as represented in Figure 2-1, were located at the intersections between the teaching, research and learning activities. Reflective practice, practitioner research and the case study approach were the three research methods used at the points where the teaching, learning and research activities overlapped. It is these three methods that will be explained in the next sections.

2.4.2 Reflective Practice

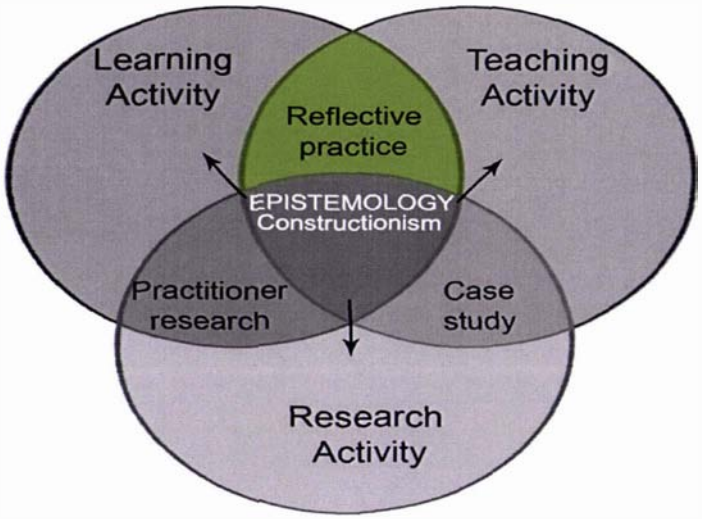


Figure 2-3: Reflective practice

Tuckman, (1999) notes that the choice of research methods must emerge from the needs of the research itself. The primary aim of this research was to examine the relationship between pedagogy, technology and context in e-learning environments. As this involved the three activities of teaching, learning and research within a SoTL approach, three interrelated research methods were used that were deemed consistent with this approach. These were reflective practice, practitioner research and the case study approach.

Reflecting on practice is a key element of the SoTL and as indicated in Figure 2-3 above, this formed the basis of the intersection of the *learning* and *teaching* activities. New insights gained from the professional development learning activities around e-learning informed the teaching activities, and this in turn impacted on the research activity.

In terms of reflection on practice, Schön (1983) introduced the notion of a "varied topography of professional practice" and suggested that "there is a high, hard ground where practitioners can make effective use of research-based theory and technique, and there is a swampy lowland where situations are confusing 'messes' incapable of technical solution" (pp. 42-43). This metaphor of the swampy lowland is an appropriate way to view the newly evolving and rapidly changing world of e-learning where

existing theory and technique appropriate for the high, hard ground are no longer useful. Critical reflective practice becomes an essential element in wading through the messy swamp of e-learning where values, ethics and practices become more complex. In this study, critical reflection was particularly useful at the intersection of the teaching and learning activities, where 'reflection on' professional development activities influenced and informed 'reflection in' my teaching practice, which included using different teaching approaches with different forms of technology. This process was then reciprocal, as the reflections from teaching practice provided the need and direction for further professional development. This critical reflection 'on' and 'in' learning and teaching activities were then presented to the wider community of e-learning practitioners as part of the research activities for relateability of findings (Dadds, 2004).

Brookfield (1998) suggests that critically reflective teachers are constantly researching the assumptions that frame their work and that they view their work through four complementary lenses: "the lens of our own autobiographies as learners of reflective practice, the lens of learners' eyes, the lens of colleagues' perceptions, and the lens of theoretical, philosophical, and research literature" (p. 197). In this study, the various lenses that were used to examine the e-learning environment included that of academic colleagues who co-taught on the programme, student-participants from all levels of the programme of study, colleagues in the wider community of e-learning and the lens of literature and related research. This was done in an attempt to 'stand outside of practice' and see what to do from a wider perspective (Brookfield, 1998).

Reflective practice was challenging in that it required continued open-mindedness and being receptive to the views of both the students and professional colleagues. The self-reflection, critique and public sharing were at times draining as it meant continual uncertainty and change. The necessary energy came from a sustained curiosity about emerging technologies, new understanding about the way we learn and a sincere desire to improve practice for the students I taught and the students that they in turn teach.

2.4.3 Practitioner Research

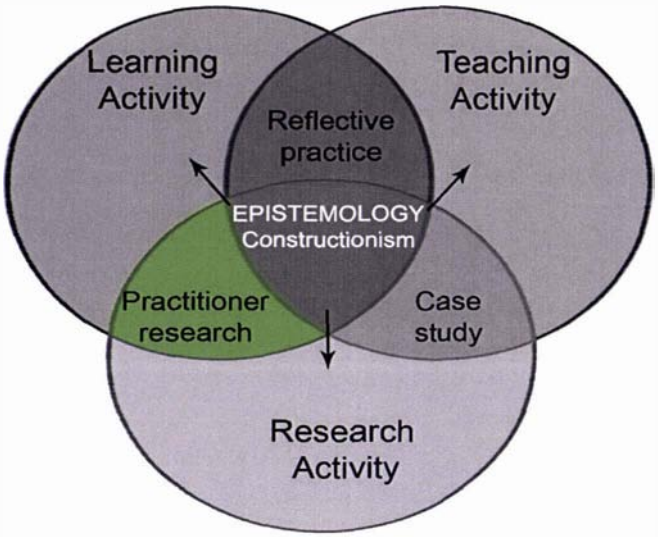


Figure 2-4: Practitioner research

Linked to reflective practice was a practitioner research orientation, which offered the potential to grapple with new knowledge and understandings about e-learning, put that new knowledge to practical use and, most importantly, share the results of that application with others (Dadds, 2004). Practitioner research occurred at the intersection of the learning and research activities of the scholarship of learning and research model indicated in Figure 2-4 above. As Loughran (2005) points out, this form of self-study has become an important vehicle for teacher educators to research the complex nature of teaching and learning about their own teaching.

Improvement of my teaching practice was one aim within the practitioner research approach adopted, but a second aim was to ensure that new insights were subject to public peer validation and that findings were relateable. According to Dadds (2004), sharing research practice that other professionals in the field can relate to provides validity, relevance and value. Findings need to be "interrogated, critiqued and validated by the professional community for it to be accorded the status of verified knowledge" (p. 5) and the professional dialogue becomes the necessary objective balance to the subjective passion of the practitioner dimension. Both the dialogue and passion were interwoven in this study, through the research and learning activities.

The *research activity* of this study involved public presentations of my research, collaboration on joint research projects with other professionals, participation within CoPs and engaging in dialogue and debate about these in the public arena. The *learning activity* involved my own professional development through being a student in courses on e-learning, participating in workshops, reviewing the literature in the field, attending conferences and networking with other practitioners. These are presented in detail in chapters four, five and six of the thesis and show the three progressive phases of learning about and researching e-learning theory and practice.

Researching new teaching technologies and examining how they align with learning theory and pedagogical practice has resonance both for my domain of interest (special education), and my teaching practice (web-based postgraduate papers in special education). The domain of special education in general focuses on adapting teaching methods, tools, content and approaches to accommodate learners with diverse and specialised learning needs. My mode of teaching postgraduate special education papers in the SEEP programme is predominantly through e-learning environments. Thus a practitioner researcher approach enabled me to extend my domain knowledge of adapting teaching approaches as well as my e-learning teaching practice over three successive phases.

Learning about the design and implementation of e-learning approaches was evident in Phase 1 of the study (chapter four) where tensions of misalignment between pedagogy and technology arose between the existing e-learning technology prescribed by the university and the particular pedagogy used in the SEEP programme. In Phase 2 of the study (chapter five), an alternative technology was used to better align pedagogy and technology but contextual issues of teaching online within the SEEP programme arose. In Phase 3 of the study an e-learning alignment guide focusing on technology, pedagogy and context was developed as a tool for e-learning educators to use when designing e-learning environments.

Located within the broader practitioner research approach, these three phases involved aspects of an action research process as a form of practitioner research to the extent that each phase involved the study of a social situation with a view to improving the quality of action within it (Elliot, 1991). For Kemmis and McTaggart, (1982), action research is

a method that enables practitioners to live with the complexity of real experience while, at the same time, striving for concrete improvement. They see this as a way of managing complex situations critically and practically, which was central to this research. Schmuck, (2006) defines action research as a form of self-reflective inquiry in which teachers collaborate to study and improve their own practices. Through action research teachers systematically gather evidence on the most appropriate methods for teaching within the context of their own teaching environment. This recognises that each context is different and it is necessary to adjust practices appropriately (Robinson & Lai, 2006). It requires the use of data to inform teachers about their own practice and students' learning. Robinson and Lai (2006) describe this process as linking teachers' understanding of their own theories to an evaluation of their practice in order to make changes as necessary.

Practitioner research then adopts a "continuing questioning and interpreting process, rather than fixing closure on research questions and conclusions at the beginning and end of a single action research cycle" (Dadds, 2004, p. 6). Questions posed at the outset of Phase 1 of the research framed the first case study, and findings from this determined a new focus for Case Study 2 in Phase 2. These findings again raised further questions, which pointed the way for the next phase of research. Understanding grew through ongoing phases of applying theory in practice through reflection 'on' and 'in' action within the specific case studies.

2.4.4 Case Study

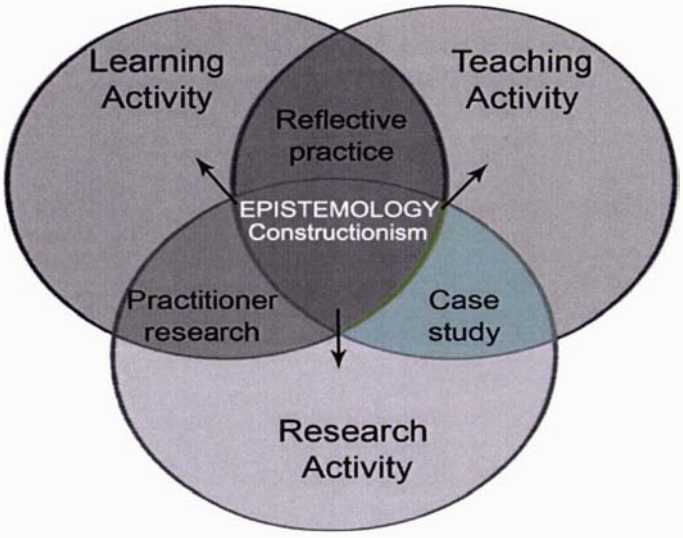


Figure 2-5: Case study

Two case studies were used in Phase 1 and Phase 2 of this research. This qualitative research method was used as it sits well within the overall constructionist epistemology of the study and is based on the philosophical assumption that reality is constructed by individuals interacting with their social worlds (Merriam, 1998). According to Merriam (1998), this method attempts to "understand and explain the meaning of social phenomena with as little disruption of the natural setting as possible" (p.5), and has the following components: understanding of the phenomenon from the participants' perspectives; the central role of participant researcher in data collection and analysis; a fieldwork focus; and use of an inductive reasoning approach. The case study approach offers the most appropriate framework within which to develop an in depth understanding of people and their actions, in a setting that is both unique and limited (Merriman, 1988), and the subjectivity of the researcher is to be viewed as a resource to be leveraged rather than a source of unwanted bias and invalidity that must be minimised. For Stake (1995), the value of the case study approach is that it offers the potential for "the study of the particularity and complexity of a single case, coming to understand its activity within important circumstances" (p xi).

According to Stake (2000), case studies have become one of the most common ways to do qualitative inquiry. As the approach is holistic it fits well within a qualitative

research paradigm that views social phenomena and human dilemmas as situational and influenced by a variety of interrelated events, issues and factors. The case study approach involves examination of diverse issues and contexts rather than seeking a single cause of events as in more positivist research approaches. This aligns well with this research study where a number of different elements relating to pedagogy, technology and context were integral to the investigation.

Berg (2004) defines the case study as a methodological approach which incorporates a number of data gathering measures. He sees the benefits of this approach as opening the way for discoveries and serving as 'the breeding ground for insights and even hypotheses that may be pursued in subsequent studies" (p. 258). This was appropriate for this study which used multiple data gathering methods and where the insight from the first phase led to the second phase of investigation.

For Yin (2003) case studies have significant benefits and are the preferred strategy to use when "how" or "why" questions are being posed. This occurs when the investigator has little control over events and/or when the focus is on contemporary phenomenon within real-life contexts. A case study approach then was well suited for this study where the research questions focused on how technology and pedagogy are best aligned in a particular e-learning context.

The two case studies in this research are conceptualised as being located at the intersection of the teaching and research phases of the overall SoTL process. The intention in using case studies here was to investigate different forms of e-learning within a particular context and situation, and as such may be considered to be instances of what Stake (1995) defines as an *instrumental case study* where "a particular case is examined to provide insight into an issue or refinement of theory" (p.237). According to Stake (1995), issues that arise in instrumental case studies are not simple and clean, but "intricately wired to political, social, historical and especially personal contexts" (p. 17). Issues within the two case studies in this research were intricately linked around areas of pedagogy, technology and context.

Whereas in positivist research, the quality of a study is judged on the basis of validity, reliability and generalisability of the data, the focus in qualitative research is more on

the trustworthiness of the insights generated around the issues raised (Dadds, 2004). Different data sources were used in each of the two case studies in this research to address the trustworthiness of the issues raised. These data sources along with the settings and participants within each case study are described in chapters four and five of the teaching activity of the SoTL approach.

For Lincoln and Guba (1985) trustworthiness in qualitative research is related to four key concepts: (a) *credibility* (appropriateness and accuracy of the data sources and interpretations); (b) *transferability* (representativeness through providing a rich, contextualised, description of the phenomenon of interest); (c) *confirmability* (making the research process transparent); and (d) *dependability* (observed through sound record-keeping procedures). Triangulation of data (using a variety of different data sources) and member checking (soliciting feedback from participants) are two additional methods considered to ensure quality research (Merriam, 1998; Meyers & Sylvester, 2006). These concepts were incorporated in this study through the use of a variety of sources of data including student and lecturer e-learning activity and student and lecturer perceptions and evaluations.

Two concerns Berg (2004) raises regarding the use of case studies are objectivity and generalisability. Ensuring objectivity, according to Berg (2004), lies in the skill of the investigator to articulate the procedures used in the case study for others to replicate and corroborate. Generalisability lies in the ability of the investigator to adequately suggest explanations for the outcomes being investigated and the possible application of these to similar situations.

These issues of quality outlined above of credibility, transferability, confirmability, dependability, objectivity and generalisability were addressed in this study through: detailed and contextualised descriptions and accounts of the procedures used in each of the phases and the outcomes of each of the case studies; validation of the data by respondents; triangulation of data using a range of different data sources; and co-constructing explanations for the outcomes through public presentation and discussion of the investigation and the findings.

For Eisner (1991, cited in Hoepfl, 1997), the 'quality' is determined by the extent to which the research has *coherence* (makes sense and is supported by the data), *consensus* (is consistent with the interpretations of the reader) and *instrumental utility* (usefulness in understanding a situation that is otherwise confusing). The value of qualitative research is that it "allows the reviewer to anticipate the future, not in the predictive sense of the word, but as a kind of road map or guide which call our attention to aspects of the situation or place we might otherwise miss" (Eisner, 1991, cited in Hoepfl, 1997, p. 57). The metaphor of the map or guide was a core outcome in Phase 3 of this study and grew out of the findings of the two case studies in Phases 1 and 2. This is outlined in chapter six where a guide for e-learning based on the insights drawn from the two case studies is developed.

A natural outcome of the two case studies was the mapping of new dimensions or directions within the particular context and individualised situation of the SEEP e-learning programmes, rather than arriving at generalised predictive theories. The value of this is acknowledged by Flyvbjerg (2001) who argues that "social science has in the final instance nothing else to offer than concrete, context-dependent knowledge, and the case study is especially well suited to produce this knowledge" (p. 72). For Flyvbjerg (2001), context independent knowledge and associated predictive rules allow for only lower levels of human learning. In this argument, predictive theories would be inadequate for all three activities of teaching, research and learning. The use of case studies can achieve higher level learning in all three activities. In *teaching* this occurs where students move beyond low level facts and rule-based knowledge to achieve competence as practitioners when placed in real case situations of internships or fieldwork. In *research* this occurs where case studies provide the real-life situation with its "nuanced view of reality, including the view that human behaviour cannot be meaningfully understood as simply the rule-governed acts found at the lowest levels of the learning process, and in much theory" (Flyvbjerg, 2001, p.72). In *learning,* if high level skills are required then "concrete, context-dependent experience is just as central as professional learning than any other skills" (Flyvbjerg, 2001, p.72). Thus, the value of qualitative research, and the case study in particular, is that it helps map new insights in particular contexts and allows us to move from lower to higher levels of learning in all three activities of learning, teaching and research.

While the case study method was well suited to the intersection of the teaching and research phases, combining research with teaching involves specific ethical requirements to be considered. As Denscombe (1998) points out, negotiating case study participation may be a difficult part of the process of research as it has ethical considerations with regard to documents, people and settings. Ethical considerations include giving participants information about the process and genuine choice about whether to be involved in a study or not (Mertens & McLaughlin, 2004). These considerations are discussed in the next section.

2.4.5 Ethical Considerations

The complexity of the researcher and participant role in the SoTL approach required an ethical framework to guide the process. While Huber and Hutchings (2005) suggest that ongoing improvement of teaching will only be possible when the intellectual work of teaching and learning is captured and represented in ways that others can expand on, they caution that in publicly sharing the findings "the confidentiality of student work — an important source of evidence in the SoTL — must be protected" (p.19). It was thus necessary to fully inform potential participants about the research aims and the process of protecting their privacy. Informed consent was also necessary as there could have been perceived issues of power (Robinson & Lai, 2006), given that participants were part of an ongoing teaching programme and online CoP where the researcher was both teacher and co-ordinator. Permission to conduct the study, gaining ethical approval and informed consent as well as ensuring privacy, confidentiality and protecting participants from possible harm (Denzin, 2000; Lincoln & Guba, 1985) were all part of the ethical process used in this research as outlined below.

Permission to conduct the study within the SEEP programme

Permission to conduct the study within the SEEP programme was obtained from the overall co-ordinator of the educational psychology programme and head of school. Permission to use an alternative Learning Management System (LMS) than that used by the university in Phase 2 of the project was obtained from the Pro-Vice Chancellor of the College of Education and the head of school.

Gaining Ethical Approval

The research was conducted in accordance with Massey University Code of Ethical Conduct for Teaching and Research involving Human Subjects. The study was approved for Phase 1 by Massey University Human Ethics Committee, Albany Campus (MUHEC 02/007), and the approval extended for Phase 2 (see Appendix B for MUHEC Approval Letter).

Gaining Informed Consent

At the start of each course for each year, potential participants in the study who were students within the SEEP programme were given verbal and written information about the research component that ran alongside their e-learning coursework. The participants were provided with information sheets (see Appendix C) and consent forms (see Appendix D). The information sheet outlined the aims and procedure of the research, how information would be used, and the rights of participants in the project. Students who wished to participate returned the consent form to a research assistant and these were only made available to the researcher once the students had completed their course. In this way the researcher and lecturers were unaware of which students were participating in the research and the researcher had access to the data (in the form of their evaluations and online contributions) only after completion of the programme.

Ensuring Privacy, Confidentiality and Protection from Possible Harm

All recipients were informed of their right to withdraw at any time during the research process and to seek clarification about the study. Students willing to participate in the research provided written consent to complete an online questionnaire and for their online coursework to be used anonymously as data for analysis. All students were assured that their participation in the research was entirely voluntary and independent of their coursework. Their consent forms were collected and kept by a research assistant and only given to the researcher at the end of their academic course. Those students who declined to participate did not have their course postings included in the data. (Only *one* student over the two phases of research declined to participate and this data was removed from the overall analysis).

Confidentiality of information was ensured in that all data provided by the students was analysed and presented in a way that could not identify individual contributions. As

individuals could not be identified, their privacy was protected. Given the guaranteed confidentiality of the data being used and the positive orientation of the research (to improve practice), potential harm to participants was prevented. Voluntary participation was assured by emphasising the separation of the coursework from research work. Any perceived pressure to participate was allayed by the fact that the lecturers and researcher were unaware of who the participants were for the duration of their coursework. In this way all efforts were taken to ensure that the teaching and learning relationship was not adversely affected by the research.

Having presented the overall SoTL approach used in this study, including the epistemology, research methods and ethical procedures, the rest of this chapter details the three activities of teaching, learning and research within the three phases.

2.5 THREE PHASES OF THE STUDY

The three overlapping activities of teaching, learning and research covered three phases or research cycles and were integrated in a SoTL approach as illustrated in Figure 2-6 below.

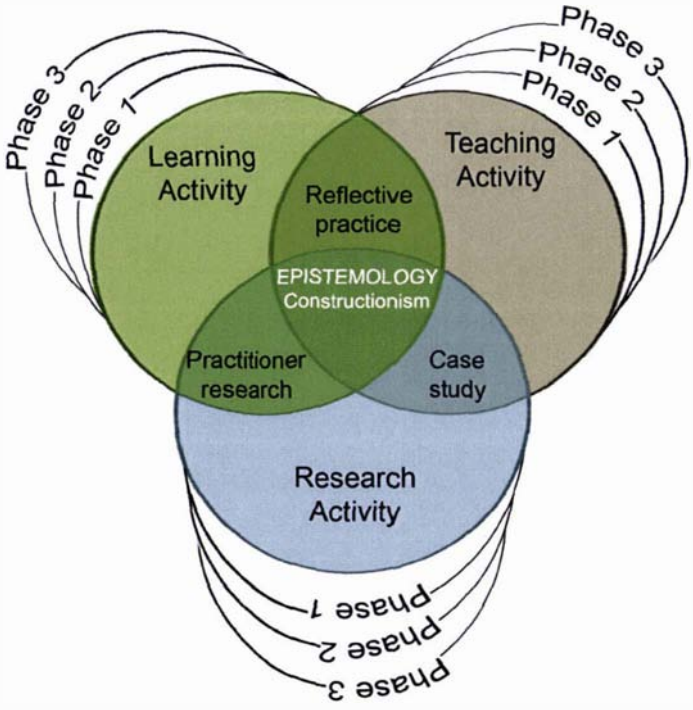


Figure 2-6: The three phases of the study

The three activities of *learning, research* and *teaching* were developed successively over three phases or cycles.

The *learning activities* involved engaging as an 'e-learner', taking formal education courses on aspects of flexible learning and LMSs, participating in online learning communities as a student and then mentor, and collaborating on national and international projects relating to e-learning.

The *teaching activities* involved the application of theory to practice as an 'e-teacher', where I was able to put into practice the theory I had learned. This required me to push the institutional boundaries to facilitate a CoP pedagogical approach in the SEEP programme. Different LMSs were trialled to achieve alignment between the learning objectives and technological tools.

The *research activities* involved presentations on e-learning at symposia and conferences and writing journal articles and papers, thus inviting peer review, debate and ongoing engagement with other practitioners. Participating in national and international research projects and submitting research outcomes to a critical reference group, afforded the opportunity for the relevance of my ideas and practices to be gauged to the extent that they were perceived by others to resonate and be well grounded in a collective understanding of current practice. Presenting research findings was a form of triangulation as it provided another source of feedback on data by those outside of the immediate phases of research. The three phases of the research are outlined and illustrated below.

2.5.1 Phase 1

Phase 1 of this study involved all three activities of *learning, teaching,* and *research.* The focus of Phase 1 was to pilot the use of a CoP approach for e-learning in the SEEP programme. The learning, teaching and research activities centred around the use of *WebCT* as the LMS used by the university and a CoP approach to e-learning pedagogy. The three activities of Phase 1 of the study are represented in Figure 2-7 and described below.

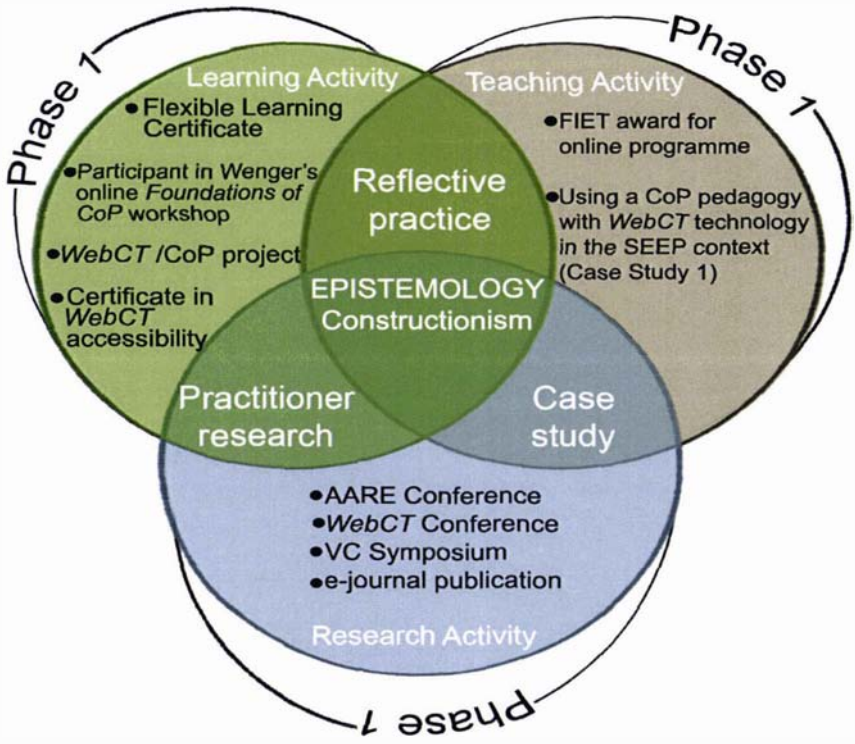


Figure 2-7: Phase 1 of the study

The *Learning Activity* in Phase 1 involved the need to have greater understanding and insight into e-learning in general and the possibilities of using a CoP approach using *WebCT*. Hence, *learning* in Phase 1 involved: (1) completing a *Certificate in Flexible Learning and Teaching* at Massey University to gain an overview of the field of flexible and distance learning; (2) participating in a seven-week online *Foundations of Communities of Practice* (CoP) workshop [http://www.cpsquare.org/edu/foundations/] with Etienne Wenger to learn about the CoP approach and personally experience being in a CoP of online learning; (3) collaborating in an international project on identifying the strengths and weaknesses of using *WebCT* as a LMS for developing an online CoP; (4) completing an international online training course run by *WebCT* on accessibility issues, which provided insight both from a design perspective and from a special education orientation of using *WebCT*. These four activities, along with a literature review on e-learning and CoPs, provided the insight needed to embark on the teaching activity of

Phase 1.

The *Teaching Activity* in Phase 1 came about through winning a Massey University FIET (Fund for Innovation and Excellence in Teaching) award to pilot a CoP approach to teaching the SEEP programme online. This teaching project became Case Study 1 in the research and is documented in detail in the next chapter (see chapter 4.3). *WebCT* was the technology used in this phase, as it was the LMS provided by the university. Support and training for using *WebCT* was available within the university. The teaching activity involved consultation with other teaching staff on the SEEP programme to design and develop the programme and evaluate the results. The focus of this pilot was on the relationship between the technology and pedagogy and, in particular, it explored whether a CoP approach could be integrated into the existing LMS and if so, to what extent. The results of this evaluation led to the research activity of this phase.

The *Research Activity* in Phase 1 involved documentation of the findings of Case Study 1 and presenting these in a way that they were open to debate and scrutiny by other practitioners in the field. Case Study 1 research was presented at the American Association for Research in Education (AARE) (Mentis & Ryba, 2001a) and *WebCT* conferences (Mentis, Ryba, & Annan, 2002b) for international peer review. Concurrent with this, an invited presentation was delivered at the Massey University Vice Chancellor's symposium (Mentis & Ryba, 2001b) for review and discussion with colleagues at the university. The culmination of the research activity for this phase was acceptance of a publication in an international peer-reviewed journal (Mentis, Ryba, & Annan, 2002a) documenting the CoP approach to e-learning using *WebCT* in the SEEP programme.

The outcome of the *learning, teaching* and *research* activities of Phase 1 highlighted the tensions and opportunities that emerged in terms of a misalignment of technology and pedagogy, and resulted in a Phase 2 trial using an alternate LMS technology.

2.5.2 Phase 2

Phase 2 of this study involved *learning, teaching,* and *research* using an alternate LMS called *Moodle*. The focus of this phase was to investigate whether there was a better

alignment between *Moodle* and the CoP approach used in the SEEP programme. The three activities of Phase 2 are represented in Figure 2-8 and described below.

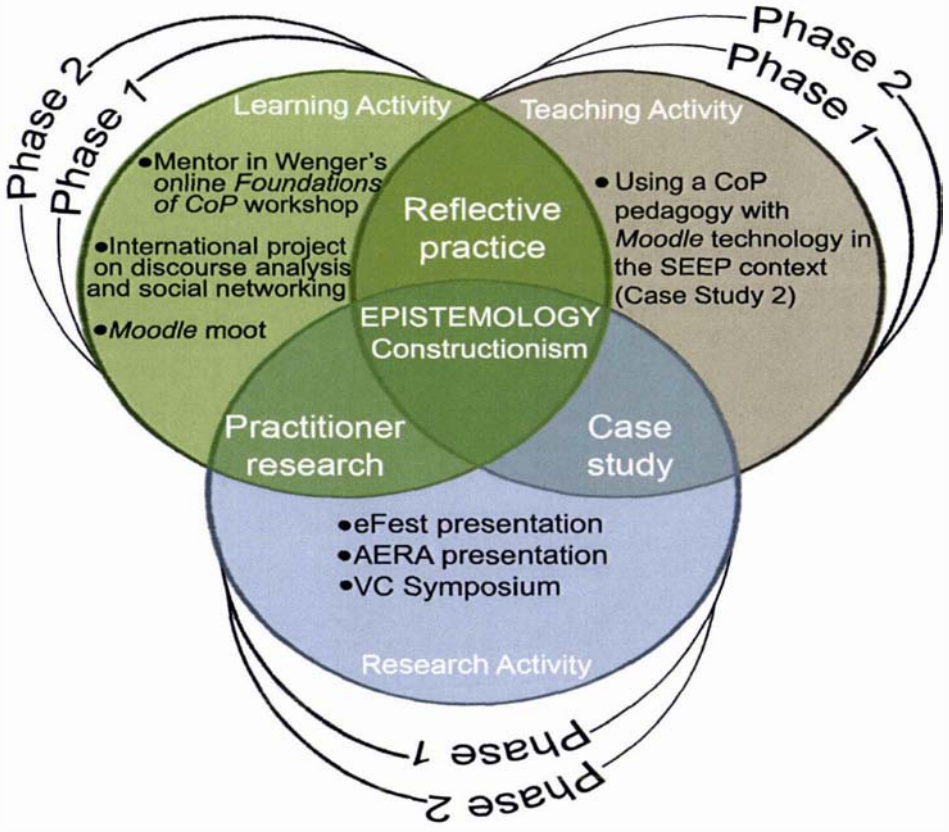


Figure 2-8: Phase 2 of the study

Given both the possibilities and tensions that arose from Phase 1, the focus in Phase 2 was on piloting the use of an alternate LMS with a view to seeing if this was better aligned with a CoP approach for e-learning in the SEEP programme.

The *Learning Activity* in Phase 2 was an outcome of Phase 1 as I was invited to participate as a mentor in a second year of Wenger's seven-week *Foundations of Communities of Practice* workshop. This involved sharing expertise with other participants in the international online CoP. This proved valuable learning for me on how to facilitate online discussion and develope effective CoPs. A further learning activity involved a collaborative project on the use of discourse analysis to analyse meaningful learning of participants in the online workshops. The project team

comprised academics, researchers and consultants from three different countries working with a parallel project team that was investigating the use of social network analysis with the same cohort of participants. Collaboration on this project provided valuable understanding about deeper approaches to analysing online discourse and interaction. Further learning on the use of *Moodle* as a LMS occurred through attendance at *Moodle* moots, discussion and collaboration with other practitioners using *Moodle*, and exploring the network of open-source supporters of *Moodle*. This provided the learning necessary to embark on the teaching activity of Phase 2.

The *Teaching Activity* in Phase 2 involved Case Study 2. Here, the focus was on piloting the use of *Moodle* — as an alternative LMS to *WebCT* — to develop and design an e-learning environment for the SEEP programme based on a CoP model. This involved collaborating with others in the teaching programme to assess whether the social constructionist design of *Moodle* provided a more socially interactive and collaborative learning environment. Details on the design and development of the *Moodle* environment are described as Case Study 2 in chapter 5.

The *Research Activity* or products for Phase 2 involved presentation of two papers at research conferences — one national (Mentis, 2004) and one international (joint publication) (Thomson, Stuckey, Lipscomb, & Mentis, 2005) as well as a presentation at the University Vice Chancellor's symposium (Mentis & Edwards, 2005) on distance learning. These outputs enabled public sharing of ideas with other practitioners within the wider CoP and university, and the feedback and insights from these enabled further work to be done in Phase 3.

2.5.3 Phase 3

Phase 3 of this study involved *learning, teaching* and *research activities* that charted the shifts in technology, pedagogy and context dimensions of e-learning in order to highlight the importance of alignment between these three. Given the tensions that arose from both Case Study 1 and Case Study 2 with a misalignment of technology and pedagogy, the focus in Phase 3 was on developing an e-learning alignment guide (eLAG) that could be used for navigating the changing technology and pedagogy in different e-learning contexts in order to make decisions about how to create better

learning environments. The three activities of Phase 3 are represented in Figure 2-9 and described below.

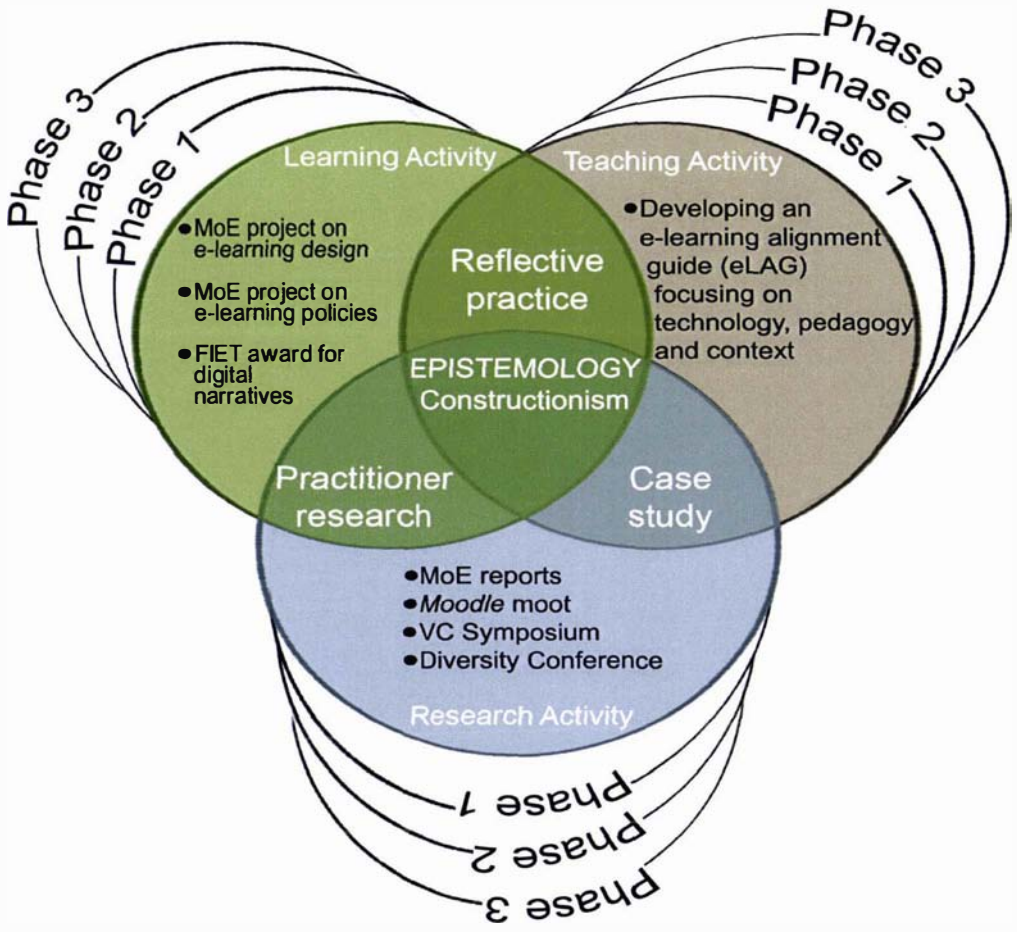


Figure 2-9: Phase 3 of the study

The *Learning Activity* in Phase 3 involved participating with colleagues in two joint projects both funded by the New Zealand Ministry of Education Tertiary Education Fund. The first project involved contribution to an analysis of e-learning policies internationally and this provided a broad framework in which to locate my own practice and subsequently analyse the findings from the two case studies. The second project focused more specially on designing and developing effective online courses using new Web 2.0 technologies. This provided insight and experience into new developments in technology and the implications for online teaching. A second FIET (Fund for Innovation and Excellence in Teaching) award was won in order to learn more about using Web 2.0 technologies – in particular developing digital narratives – in e-learning environments. The insights and experience from these learning activities would serve to

support ongoing development of the SEEP programme and provide the background knowledge for mapping the e-learning terrain in the teaching activity of this phase.

The *Teaching Activity* in Phase 3 involved mapping out the shifts relating to the technology, pedagogy and context zones of e-learning in order to highlight the complex interrelationship between them and the importance of alignment. Reflection on both previous phases of research resulted in the development in this phase of an eLAG, which showed changes within each of the zones of e-learning. The purpose of this was to offer practitioners a tool to analyse the zones of technology, pedagogy and context when designing e-learning environments. This contribution to the field arose out of reflection on both Phase 1 and Phase 2 of the research — in particular the two case studies.

The *Research Activity* in Phase 3 involved documenting e-learning developments and presenting findings on the application and implications of using new technologies. These included: two ministry projects (Anderson, Brown, Murray, Simpson, & Mentis, 2006; Frielick & Mentis, 2006); presentations at local (Frielick, Mentis, Gould, Morgan, & Chester, 2006a; Frielick, Mentis, & Ross, 2005) and international conferences (Mentis, 2007a); community presentations within the university (Mentis, 2006a, 2006b) and the wider school community (Mentis, 2007c) and a publication in an international journal (Mentis, 2007b). These outputs reflect the collaboration with peers on projects that underpinned the development of the eLAG within this phase of the study. The eLAG is then presented as part of the wider commons for critique and sharing. These outputs are presented in detail in chapter 6.

The eLAG is applied retrospectively to the two case studies in Phase 1 and Phase 2 to show the potential value of this tool. This discussion is presented in chapter 7 of the thesis along with the conclusions and limitations of this study and recommendations for future research.

2.6 CHAPTER SUMMARY

This chapter began with a presentation of the research questions and discussion of the issues that set the direction for this e-learning journey. The journey was based on a

SoTL approach (Boyer, 1990), which was illustrated in this chapter as three intersecting activities of *teaching, learning* and *research*. Various dimensions of the SoTL approach used in this study were described, including the underlying epistemology and research methods used, which were located at the intersections of the three activities of teaching, learning and research. The epistemology of contructionism and the research methods of reflective practice, practitioner research and case studies were discussed. The ethical considerations of the overall research process were outlined and finally an overview of the three successive phases of the research study was presented .

Throughout the three phases of the study, an iterative analysis of the literature occurred which provided an incremental overview of the theoretical terrain through which my journey traversed. This was conceptualised metaphorically as a theoretical 'compass' that provided direction for the three phases of the study. The four quadrants of the compass include technology, pedagogy, context and critique and include an analysis of the literature within each. This theoretical 'compass' is presented in the next chapter.

CHAPTER THREE:
THE THEORETICAL TERRAIN

Someone who loves practice without theory is like the sailor who boards ship without a rudder and compass and never knows where she may cast.
(Leonardo da Vinci, n.d.)

3.1 INTRODUCTION AND CHAPTER OVERVIEW

This chapter follows on from the description of the research journey and provides an overview of the broader theoretical terrain that informed my explorations. The literature selected here includes sources that have been subjected to the traditional academic processes of peer review and publication, as well as new modes of academic discourse such as e-journals, websites, wikis and blogs which reflects the constant updating, changing and development in the field, and raises tensions with trying to capture the emerging theoretical terrain in a static chapter. For this reason, the thesis is structured in such a way that discussion of the research literature is distributed across the whole study as well as being the focus of this particular chapter, thus emphasising the notion of a research journey that uncovers new information and ideas as they become relevant to specific aspects of practice.

The first section of this chapter provides an overview of the theory in e-learning which sets the context for the next sections which are structured as a metaphorical 'compass' The 'compass' highlights key aspects of the literature that provided direction for my journey through the three phases of research. The four quadrants of the 'compass' are the areas of technology, pedagogy, context and critiques. At the centre of the 'compass', key research areas are identified from a meta-analysis of literature and research in e-learning. The structure of this chapter is illustrated diagrammatically in Figure 3-1.

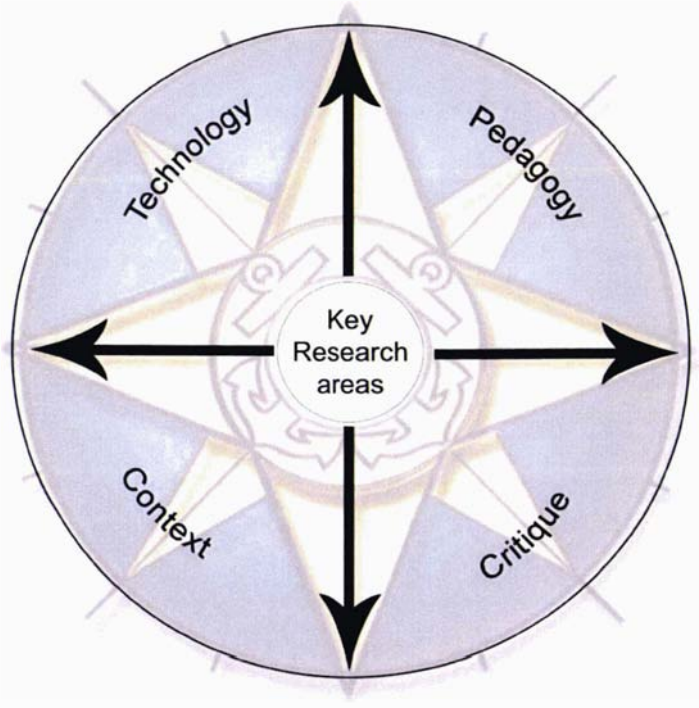


Figure 3-1: The four quadrants of the e-learning 'compass'

The first section of this chapter provides an overview of theory in e-learning which provides a background context within which to introduce the metaphor of the 'compass' used within this chapter. This is followed by a discussion of *key research areas* that informs this study. This is represented as being at the centre of the 'compass'. The first quadrant of the e-learning 'compass' focuses on e-learning *technology* and outlines the evolution of the tools used to teach online. This evolution covers the shift from the first wave of e-learning of Web 1.0 technology to the second wave of Web 2.0 e-learning. This evolution is mirrored in Phases 1 and 2 of my study. The second quadrant of the 'compass' provides an overview of e-learning *pedagogy* as it pertains to this study. Various theories of learning are presented along with the shift from instructionism to social constructivism, constructionism and connectivism. A discussion on CoPs is presented as this is the underlying pedagogical approach of both Phase 1 and 2 of this study. The third quadrant of the 'compass' outlines the e-learning *context* and covers issues relating to the teaching institution and broader areas within the discipline of study. The final section focuses on *critiques* as the fourth quadrant of my e-learning 'compass' and provides the critical perspective for this study. This points to the rationale for this research that focuses on how the interrelated areas of technology, pedagogy and context affect e-learning practice.

3.2 OVERVIEW OF THEORY IN E-LEARNING

This section discusses the relationship of general learning theory to research and practice in the specific area of e-learning as it relates to this study. Given the SoTL approach adopted in the present study, the discussion of learning and learning theory is infused throughout; here, an overview is provided that indicates where and how theory is used in subsequent chapters of the thesis. Equally, given the focus of the study on the relationships between technology, pedagogy and context, this section considers how the literature on learning theory may be used to analyse the phenomenon of technology-enhanced learning environments.

Mayes and de Freitas (2004) posit that "there are really no models of e-learning *per se* – only e-enhancements of models of learning" (p 4). Similarly, Kehrwald (2008) states that through the use of technology, 'e-flavours' of more general learning theories are made possible. Nichols' (2003) view is that e-learning does not replace general theories of education but rather "e-learning creates new possibilities for applying established educational and interpersonal theories" (pg 9). For Nichols (2003) it is essential that these established theoretical underpinnings of e-learning are explored and debated for the practice to continue to evolve. He stresses the importance of going beyond mere presentation of e-learning practice and exposing the theories underlying the practice. He contends that "unless attention is given to e-learning theory, e-learning practice cannot develop fully" (p 1).

Throughout this study, attention is given to exposing the theory that underpins the e-learning practice. Literature relating to e-learning theory is presented at the start of the e-learning journey, during each phase, and at the conclusion. At the start of the journey a theoretical 'compass' is used to chart the theoretical direction taken. This is presented in this chapter (see section 3.3) and focuses on the four quadrants of technology, pedagogy, context and critiques. During Phase 1 (chapter 4) and Phase 2 (chapter 5) of the journey, pedagogy, technology and context are revisited as part of the SoTL approach. At the end of the e-learning journey the theory is again revisited in detail to draw conclusions from the results of the two phases and this culminates in the development of an eLearning Alignment Guide (eLAG) – a tool for e-learning designers

to use when considering 'e-enhancements' of various learning theories. Both the 'compass', outlined in this chapter at the outset of the e-learning journey, and the eLAG, outlined in Chapter 6 (section 6.3.2) at the closure of the e-learning journey, expose the theory that underpins the e-learning practice in this study – highlighting the 'e-flavours' of learning theories.

The exploration of the 'e-flavours' of learning theories is central to this study given the research question which focuses on examining the relationship between technology and pedagogy within the SEEP context over a six-year period. The technology or 'e-enhancement' used in this study included two different LMSs – *WebCT* in Phase 1 (chapter 4) and *Moodle* in Phase 2 (chapter 5) of the study. This technology was used to provide the 'e-flavour' to a CoP theory of learning in the SEEP programme.

The introduction to the literature relating to 'e-enhancements', outlined in the technology quadrant of the 'compass' (section 3.2.2) in this chapter, sets the direction for navigating the technology terrain in this study. This discussion focuses on defining e-learning, goes on to explore the different pedagogic roots embedded in different LMSs and outlines the rationale for changing from *WebCT* in Phase 1 to *Moodle* in Phase 2 due to *Moodle's* underlying constructionist learning design. The literature on 'e-enhancements' is again revisited in Phase 3 in the discussion of the technology zone of the eLAG (section 6.3.2.1). This discussion covers issues and questions relating to: whether technology in itself is intrinsically 'good', 'bad' or value free (Bates, 2005; Nichols, 2005); whether different technologies offer particular affordances for different learning and teaching approaches (Dron 2006b); whether or not using technology produces a 'significant difference' in learning when compared with not using it (Bates & Poole, 2003; Russel, 2001); how technology makes learning 'different' (Oblinger & Hawkins, 2006); and what the reciprocal relationship is between technology and learners/teachers (McLuhan, 1965). The evolution of 'e-enhancing' tools from the printing press to the wireless network (Bates, 2005) is also outlined and aligned with a parallel shift to incorporate both print literacy and digital literacy (Baggott, 2006; Downes, 2002; Thomas, 2007) in teaching and learning approaches. The development of computers from traditional non-networked systems using Web 1.0 software through to networked computers using Web 2.0 tools is aligned with a change in pedagogy from models focusing on information transfer (downloading documents) to information co-

creation (online interaction and sharing).'e-Enhancement', as outlined in the eLAG (section 6.3.2.2) can align with transmission models of learning such as behaviourism and instructionism as well as the more interactive, social constructivist theories of learning (Attwell, 2006; Murray, 2007).

The social constructivist theories of learning are initially introduced in the pedagogy quadrant of the 'compass' (section 3.2.3) outlined in this chapter, which sets the direction for a discussion on the CoP approach used within the SEEP programme for Phase 1 and Phase 2 of this study. This is linked to the underlying epistemology of constructionism which was outlined in the previous chapter (see 2.3.1). Constructionism, as defined by Papert (1991) involves learning-by-doing, or building knowledge structures in a context. Learning in this model is situated and pragmatic (Ackermann, 2001). Constructionism is at the core of both the teaching and research within this study. In terms of teaching, the SEEP programme provided students with interactive, social and contextualised learning experiences using students' authentic 'real-life' casework, class forum debates on ethical issues within their professional practice and sharing of reflective journals on their practice. In terms of the SoTL research, my e-learning, research and teaching involved co-constructing knowledge through interacting with other practitioners, applying this in practice and then sharing outcomes as a public entity.

A constructionist epistemology aligns with a CoP (Wenger, 1998) pedagogical approach used for the e-learning environment. The literature relating to a CoP approach is introduced in the pedagogy quadrant of the 'compass' in this chapter (section 3.2.3) and then explored in detail in Phase 1 (section 4.2.2.1) and Phase 2 (section 5.2.2.3). As outlined in these sections, a CoP approach is located within socio-cultural theories of learning. Providing the 'e-flavour' to this theory of learning is addressed in Phase 3, where a continuum of learning theories is explored and aligned with different technology and contexts in the eLAG (section 6.3.2.2).

As described in the eLAG, a socio-cultural approach focuses on learning as being subjective and constructed by individuals within social contexts. Knowledge is seen to result from a co-construction of information between individuals (Jonassen & Kwon, 2001; Tam, 2000; Vrasidas, 2000; Vygotsky, 1978). Learning, knowledge construction

and identity are developed through social interactions within an authentic community of practice (Wenger, 1998) which in this study involved a community of Special Education and Educational Psychology practitioners.

In terms of using technology to support a socio-cultural and CoP approach to learning, Feenberg (1999) stresses the importance of facilitating dialogue between students and the active involvement of the teacher. He believes that the social impact of technology depends on how the technology is designed and used, and alerts us to the danger when introducing new educational technology of configuring it in a way that closes off the process of intellectual exchange. As Feenberg (1999) states, "there is something about dialogue, and the active involvement of the teacher, that is fundamental to the educational process and that must be woven into the design of any new instructional tool" (para 5).

Feenberg (1999) goes on to state that how we design our new technologies is still an open question and that the choice of design will determine which benefits and which limitations we end up with. "Indeed, that choice will decide who the "we" are that peoples the educational institutions of the future, since our models of computerized instruction will define the future identities and roles of students and teachers" (para 5). Feenberg (1991) argues for a Critical Theory of Technology (CTT) to articulate and critique the underlying values inherent in modern technology, as technology, he claims, is not neutral. The debate on whether technology is neutral or can influence pedagogy goes to the heart of the 'e-enhancement' of learning theories discussion and is a key concern for Goldberg and Reimer (2006). They present three divergent perspectives on online distance education: techno-utopianism – which sees all technology as progress irrespective of difficulties encountered; CTT which foregrounds how technology shapes and influences pedagogy; and 'postmodernism' that recognises the complexities involved in the technology-pedagogy relationship. This study follows the progression of these perspectives through the three Phases. As will become clear to the reader, Phase 1 outcomes indicated that *WebCT* technology was not 'neutral' and did not align well with a CoP learning theory, which led to the use of *Moodle* in Phase 2 which afforded a social constructivist approach. This then culminated in the development of the eLAG in Phase 3 which allowed for an exploration of the complex relationship of 'e-enhancing' learning theory. The position taken in this study is that technology, pedagogy and

context need to be aligned for effective e-learning and the eLAG developed in Phase 3 provides a tool to explore this alignment. The position that is revisited through the three phases of this study is that foregrounding technology (at the expense of pedagogy) leads to techno-centricism, foregrounding pedagogy (at the expense of technology) is anachronistic, and ignoring context leads to inauthentic learning environment.

The literature used throughout this thesis to explore this position with regards to the 'e-enhancement' of learning theories is drawn primarily from conventional scholarly sources such as published books and journal, but where relevant, in terms of highlighting approaches currently used in a digital information era (Mitchell, 2007), reference is made to informal sources such as blogs, wikis and open-source resource material. These contribute to the overall landscape of e-learning which, as outlined in the eLAG includes the more informal collaborative information resources. Both sources are included in the discussion of the theory as both contributed to the e-learning practice and terrain of this study. This is set out more fully in the following sections of theoretical 'compass', which sets a particular course in navigating the technology, pedagogy and context terrains of this study.

3.3 THE COMPASS

The notion of a 'compass' links with the theme of a research journey (outlined in chapter 2) and the e-learning 'alignment guide' that emerges from my research (described in chapter 6). These navigational metaphors are particularly relevant in a field such as e-learning, where there is much hype about the potential of new digital technologies to revolutionise teaching and learning in higher education while at the same time, much confusion about how best to actualise this potential. 'Guides' and 'compasses' are useful for both research and practice, especially when the field is in the early stages of development. As Conole and Oliver (2007) point out, the development of e-learning research is no different from the development of research in other fields, which follow similar patterns and phases of growth:

1. Pre-subject area — no evidence of the area or perceived need or interest
2. Beginnings — individuals begin to research or ask new questions or issues arise that are triggered by some event or catalyst.
3. Emergence — more researchers begin to work in the area and a community begins to develop.

4. Diversification — the area starts to mature and different schools of thought emerge and the area begins to align or take place alongside more established areas.
5. Establishment — the area becomes recognised in its own right with a defined community, experts, associated journals and conferences, perceived of as 'respected' research with associated professional status, courses and career routes. (p12).

Conole and Oliver (2007) argue that e-learning research currently sits between stages three and four, based on their view of the eclectic nature of e-learning research which covers a broad range of topics and issues but which is not yet a rigorously defined or established area. This timeline has some parallels with the research journey traversed in this study, which began with questions about the use of e-learning in my own pedagogy. As I became more familiar with the rapidly growing body of research literature I became more aware of and connected to the emerging e-learning research community. Through the case studies and grappling with the issues raised I then developed my own theoretical compass as a way of making sense of the diverse theoretical terrain which characterises the current state of the field. The terrain is characterised by 'jargon' terms that could be confusing as new concepts rapidly emerge. There are many glossaries available on the internet that provide good definitions of new terms for example, ("CyberMedia Creations: eLearning glossary," 2008). Where relevant however, important new terminology is defined in the text of this chapter, and a glossary of the key terms used in this thesis is included as Appendix A.

The theoretical terrain is not only diverse, but also vast in size, scope and complexity. In parallel with the exponential growth of the Internet across the globe, there has been a literal explosion of websites, online articles, blogs and more traditional academic forms of research publications over the last decade. An entire PhD could be devoted to a review of the e-learning literature (and even then it would probably be obsolete within a year or two). Bates (2005) quotes Harold Wilson as once saying that: 'a week is a long time in politics' but goes on to suggest that "ten years is an eternity in educational technology" (p. ix). In the past decade, the explosion of participation in e-learning has generated a plethora of themes and topics — for example the International Association for Development of the Information Society (IADIS) 2007 and 2008 conferences on e-learning calls for papers on any of 87 sub-topics in the following areas: Organisational Strategy and Management Issues; Technological Issues; e-Learning Curriculum

Development Issues; Instructional Design Issues; e-Learning Delivery Issues; e-Learning Research Methods and Approaches; and e-Skills and Information Literacy for Learning ("IADIS – International Association for Development of the Information Society," 2008). A 'compass' becomes a very useful tool for navigating through this sea of themes.

A basic search for 'e-learning journals' or 'review of e-learning literature' yields hundreds of library and other websites listing references and sources, and there is little or no way of ranking these in terms of scholarly credibility. Compounding this is the overwhelming number of websites and individual blogs on e-learning topics (the so-called 'edublogger' community). For example *Stephen's Web* — the website of the prominent e-learning philosopher and theorist Stephen Downes (Downes, n.d.) — contains lists of information about the evolution of e-learning from 1997 onwards, covering much of the ground relevant to this study. Although much of Downes' work is not published in academic journals, he is rated by peers as a leading authority in the field, evidenced by his regular invitations to deliver conference keynotes at international conferences on e-learning and the readership of his daily blog. This raises questions about the validation and use of different sources of information. The sources for this discussion of the theoretical terrain will be confined to books and articles published in peer-review journals, although reference will be made to websites and blogs where appropriate and where the authors have some legitimacy and standing in the field due to their other publications or prominence in the area of e-learning.

This chapter is thus an attempt to steer a path through the vast terrain and highlight the navigational markers that were relevant to this study. Starting with an overview of the key research areas in e-learning in general, these are narrowed down to issues relating to e-learning technology, pedagogy and context as these three zones became central to my research question.

3.3.1 Key Research Areas in e-Learning

A recent meta-analysis by Abrami et al (2006) is a useful entry-point into this vast landscape. This analysis is focused on research in Canada which has a reputation as a world-leader in the field of e-learning (Moran & Rumble, 2004). Although there are

some variations across countries, the technological and pedagogical issues in e-learning in Canada highlight important trends that are relevant for New Zealand and other countries. This meta-analysis provides a reference point for a broad discussion of these issues, since it covers a comprehensive amount of data and serves as the central compass point in relation to other sections of this chapter.

Abrami et al (2006) reviewed 1,146 articles from the year 2000 onwards. A wide range of sources and document types were covered to ensure that the arguments surrounding e-learning were well-represented. The key findings that are relevant to the present study are that:

1. e-Learning has the potential to transform learning, but there is limited empirical research to assess the benefits.
2. Post-secondary education would benefit from a national plan to assess the impact of e-learning initiatives.
3. It is important that instructional design match the goals and potential of e-learning.
4. Research is needed to determine the feasibility and effectiveness of such things as learning objects and multimedia applications.
5. Properly implemented computer mediated communication can enrich the learning environment; and help reduce low motivation and feelings of isolation in distance learners.
6. e-Learning appears to be more effective in distance education, where technology use is required than in face-to-face instructional settings.

The first point above raises the issue of research and methodology. This is addressed in Chapter 2 of this thesis, and links with Anderson's (2006b) response to the question of whether empirical research is the appropriate vehicle to assess the benefits of e-learning. As Anderson (2006) argues, the empirical search for "what works" implies that the particular intervention will work regardless of the context in which it is used. However, from a more qualitative point of view it is clear that there are many educational contexts, each of which are influenced by multiple cultural, economic, individual, discipline and other variables. Education — whether face-to-face or online — does not take place in a controlled experimental environment. Research approaches that seek to

examine causal effects of one variable while keeping others constant disregard the emergent complexity of any learning context.

The second point introduces the strategic dimension of the national context for e-learning. An overarching national strategy for e-learning development is important, because higher education is publicly funded and e-learning is expensive. The costs of e-learning development cannot be met from the typical university budget and some kind of national policy framework is essential for equitable allocation of resources, maintaining quality, and monitoring the effectiveness of new developments. In addition, national frameworks are vital to the process of embedding e-learning in the mainstream of educational activity. Because practical and experimental knowledge of e-learning is often scattered within and across institutions, even successful practices have limited impact and visibility. Such dissemination processes are national priorities in many OECD countries ("OECD - E-learning in Tertiary Education: Where do We Stand," 2005).

In this area there have been significant developments in New Zealand tertiary education. The establishment of the E-Learning Advisory Group (advising the Minister of Education) in 2000 led to the Interim Tertiary (e)Learning Framework in 2004, with the associated funding mechanisms of the Tertiary (e)Learning Research Fund (TeLRF) and e-Learning Collaborative Development Fund (eCDF).

The eCDF in particular had a significant impact on national e-learning development and $28 million was allocated to 36 projects over the period between 2004 and 2007 with the overall aim of increasing collaboration between institutions and sharing of project findings across the sector ("Te Pane Takiao," 2008). My own involvement in one TeLRF (Anderson et al., 2006) and one eCDF project (Frielick, Mentis, Gould, Morgan, & Chester, 2006b) had an influence on my own e-learning development and has helped develop my research approach (explained in chapters 4, 5 and 6). While the overall impact of the eCDF is yet to be assessed it seems clear that without this initiative most tertiary institutions in New Zealand would be some way behind the rest of the world.

The third finding of Abrami et al (2006) emphasises the importance of matching instructional design with the goals and potential of e-learning. While this may seem like educational common sense, it must be noted that the early phases of e-learning were characterised by the twin assumptions that new digital technologies were like a magical tool that would instantly solve all kinds of educational problems and that money thrown at new technology in sufficient quantities would lead to vastly improved learning outcomes for students (Cross, 2004). However the 'dotcom boom' of the late 90s soon gave way to the 'dotcom crash' of the early 2000s (Williams & Goldberg, 2005), and the emphasis now in funding is on obtaining a return on investment, which is paralleled by an educational focus on sound educational design and evaluation.

My educational design in e-learning (as outlined in the previous chapter) is grounded in a constructionist epistemology (Papert, 1991) and a theory of learning that emphasises collaboration, inquiry and co-construction of knowledge in a CoP (Wenger, 2006). A traditional notion of formulaic and tightly-prescribed 'instructional design' does not sit comfortably with this perspective, although constructivist notions of education are not incompatible with instructional design (Duffy & Jonassen, 1992). As the journey through the three research phases unfolds, I describe in more detail an approach to the design of an e-learning environment that facilitates the implementation of this constructionist epistemology within a CoP.

The fourth finding of the Abrami et al (2006) study is that research is needed to determine the effectiveness of learning objects and multimedia applications. This area became a minor focus in Phase 3 of the present study (outlined in chapter 6) with the development of digital narratives for the SEEP programme. As with other areas of e-learning there is a large amount of literature on this topic (Littlejohn, 2003; McGreal, 2004; Polsani, 2003; Wiley, 2002), and while a detailed discussion of these texts is outside the scope of this thesis, it is important to briefly note the key points that are relevant for this study. These concern both the problems with learning objects and their undoubted potential for enhancing learning and teaching.

The main problem with learning objects is the 're-useability paradox' (Wiley, 2003), where in order to create a digital resource that can be reused in many different courses and learning contexts, it is necessary to decontextualise the learning object as far as

possible. This is because a learning object that is not tied into any specific learning context has a greater chance of 'fitting' into many more 'instructional contexts'. Conversely, the more that a learning object is linked to a specific context, the less the opportunity for re-use in another context. A paradox arises because of the current shift to constructivist approaches to learning that emphasise the importance of context, situatedness and the social mediations that shape learning. Thus the simple piecing together of decontextualised educational resources does not produce a meaningful context for learning. While economically sensible, the drive towards decontextualisation may actually be counterproductive from the standpoint of student learning (Wiley 2003).

The potential of learning objects lies in the extent to which digital resources can be created in a cost-effective way, freely shared, and embedded in the social interactions that characterise constructivist approaches to learning. The early phase of e-learning development of learning objects and the 'dotcom-boom' focus on the 'learning object economy' was supposed to generate significant business through the licensing and sale of digital learning resources (Polsani, 2003). However the new technologies of 'Web 2.0' and the emerging 'open content' movement in higher education have challenged these assumptions. These tensions and opportunities are revisited in the final chapter of this study.

The first four points discussed above are key areas of e-learning research that although important, are not central to the concerns of this study, which is more aligned with points five and six of the Abrami et al (2006) meta-analysis. These concern the potential of e-learning to enrich the learning environment and the effectiveness of e-learning in distance education. As will be shown in my own SoTL journey there is evidence that the introduction of e-learning has enriched the social interactions amongst students and helped reduce feelings of isolation. This became more evident with the increasing alignment between pedagogy, technology and context that developed with my learning and increasing awareness of how best to design an effective learning environment — a relationship that is at the centre of the present study.

The theoretical compass presented here and indeed the overall thrust of this study reflects this movement towards the wider questions that might guide the field of e-

learning into the fifth phase of Conole and Oliver's (2007) developmental stages outlined above. As they suggest, e-learning research raises a plethora of issues which can be grouped around four main themes – pedagogical, technical, organisational, and wider socio-cultural factors. The theoretical compass includes the first three of these and adds a critical perspective where some of the significant critiques of e-learning and information technology are discussed.

This approach is in line with emerging trends since there seems to be no consensus on the means, methods or epistemology that should guide e-learning research. An eclectic approach that attempts to draw out the significant findings from both complementary and contradictory sources of evidence is thus required (Anderson 2006). While there is a danger in being too eclectic — in that one might end up with an incoherent theoretical basis for research — casting a wider net does seem appropriate for the SoTL approach. The SoTL approach allows for a range of possible sources of evidence to inform practice — but also a consideration of the different areas involved when developing effective e-learning environments for students. The areas that are relevant for this study include technology, pedagogy and context, which are now discussed in relation to the four quadrants of the compass that serves as a guide to the theoretical terrain.

3.3.2 Technology Quadrant

In many ways the use of technology to assist learning is nothing new. Education has always adopted and modified available technologies for use in classrooms and also to extend the reach of education beyond the classroom walls. The history of educational technology is also littered with the fossils of over-hyped technology which promised much but under-delivered — for example, the promised potential of television, the slide show, videotape and computer-based training to transform and even revolutionise teaching (Levinson, 1997). Despite the large investment in these new technologies, there is the truism that a visitor time-travelling from 150 years ago would find that almost everything had changed significantly except for the interior of churches, school classrooms, and university lecture theatres (although now equipped with 'e-lecterns'). Traditional educational designs and assumptions seem to be remarkably immune to the disruptive potential of new technologies.

Although it might be too early to tell, the exception to this could be the networked computer and the associated concept of 'e-learning'. There are many definitions of the term 'e-learning' but for consistency I will use the one provided in the Abrami et al (2006) study discussed earlier: e-Learning is defined here as "the development of knowledge and skills through the use of information and communication technologies (ICTs) to support interactions for learning — interactions with content, with learning activities and tools, and with other people" (Rossiter, cited in Abrami et al., 2006 para 4). This definition has some key attributes that are relevant to this study. It focuses on the interactivity afforded by digital devices at the three levels of content, tools and social interactions between people. The 'e' in e-learning thus refers to electronic technologies that support interactivity, and the key question is whether these technologies can improve teaching and learning.

Bates (2000) argues that "new technologies such as the World Wide Web and multimedia have the potential to widen access to new learners, increase flexibility for 'traditional' students, and improve the quality of teaching by achieving higher levels, such as analysis, synthesis, problem solving, and decision making" (p.1). Bates goes on to map out in some detail the complex range of interrelated strategies around funding, change management, information technology infrastructure, staff and student support and development, and organisational restructuring that are required to fully realise this potential. As discussed earlier, the research evidence suggests that there is still some way to go before it can be convincingly stated that e-learning has lived up to its claims. Perhaps as Bates (2000) points out, this is because the kinds of fundamental changes required are "too rich, too drastic, or too threatening to the core values of many institutions" (p.5).

In many ways the specific technology that both enables e-learning and embodies these kinds of potentially disruptive changes is the ubiquitous Learning Management System (LMS), also known as the Course Management System (CMS), Learning Content Management System (LCMS), or Virtual Learning Environment (VLE). Since the adoption and experimentation with this particular technology is at the core of my scholarly approach to teaching and learning and central to the concerns of this study it would be useful to briefly trace its development, noting that the LMS itself is a phase in

a long history of evolutionary development in various forms of educational technology (Garrison & Anderson, 2003).

There are a number of key technologies that combine to create a LMS. Firstly there is the invention of the computer and the associated shift in the medium of information from atoms to bits (Negroponte, 1995). Secondly there is the invention of the Internet and the later development of the World Wide Web, which enables the information technology of the computer to also become a communication technology (Levinson, 1997). Thirdly and alongside the others, there are the operating system, database, interface, and other software technologies that enable the information and communication hardware to function as an 'e-learning platform' that supports learners' interaction with teachers, digital learning materials, and other students. When these three technologies are linked together with other information management systems in an institution (e.g. student information system), a LMS is created. One of the main aims in developing such systems is to make it 'easy' for teachers to create online courses without needing to know or understand the complex underlying technologies that make them work (Britain & Liber, 2004)

A comprehensive reference for the history of the LMS is the Wikipedia article on the subject ("History of virtual learning environments," 2008). While mindful of the problems of using an online collaborative encyclopedia as a primary source, it is recognised by leading writers in the field as an authoritative reference for tracing the evolution of this technology. According to the many hundreds of contributors to this article, development of information and communication technologies (ICTs) for teaching and learning gathered momentum as the Internet began to take hold on university campuses in the late 1980s and early 1990s. There were several pioneering systems that enabled remote interaction between teachers, students and course materials, with *FirstClass*, *TopClass*, *ILIAS*, and *COSE* prominent amongst the early prototypes.

In 1995 Murray Goldberg, a computer science professor at the University of British Columbia, obtained a $45,000 grant from the institution's Teaching and Learning Enhancement Fund and began work on Web Course Tools (*WebCT*). This would later be sold to a private company and be installed in hundreds of institutions across the

world, and used by 10 million students in 80 countries in 1995. In 2006 *WebCT* was acquired by its leading commercial rival *Blackboard* Inc. (that was developed at Cornell University in 1997 and later sold) and the *Blackboard/WebCT* system became the market leader. The first phase of the research in this study was carried out using *WebCT*.

The second phase of this study was conducted on an alternative to *WebCT/Blackboard* called *Moodle*. The name is an acronym for "Modular Object-Oriented Dynamic Learning Environment' and the system was created by Martin Dougiamas at Curtin University as part of his PhD in 1999 ("History of virtual learning environments," 2008), which aimed at developing a LMS that was based on the concepts of social constructionism. In 2001 Dougiamas released the programming code world-wide for free under an open-source licence and the resulting collaborative development effort from hundreds of programmers across the world saw *Moodle* rapidly become the leading contender to *Blackboard's* market dominance.

Blackboard/WebCT and *Moodle* are essentially similar in terms of underlying technology. They are sophisticated and complex computer software applications containing thousands of lines of programming code that enable transfer of information between databases and communication between learners through the network of interconnected digital devices called the internet. There are some significant differences however in terms of design and functionality in the systems which can either constrain or facilitate different approaches to learning and teaching. This point is explored in more detail in chapters 4 and 5, but at this stage it would be useful to outline the main features.

Firstly, *Blackboard/WebCT* is a proprietary technology owned by a private profit-making company that is accountable to its shareholders. The licensing of the software and associated support costs reap millions of dollars in annual fees from institutions. The programming code is copyrighted (and *Blackboard* are currently in a legal battle to enforce rights to a patent on the LMS software) and cannot be modified by clients to suit their own particular purposes. In order to remain profitable the company must ensure that the software is upgraded regularly and that clients continue to pay increased fees for the latest version. However this kind of approach tends to act against

technological innovation and possible improvements to learning since institutions are 'locked-in' to the company's view of what kinds of technology are most suited for learning and teaching, with very little opportunity for users of the system to influence and improve its development.

Moodle is an open-source system that is free to download, use and modify to suit different approaches and contexts. While *Moodle* businesses do sell services associated with the software (e.g. hosting and IT support, customisation, training, etc.) the programming code itself cannot be sold for commercial gain. The maintenance and development of the software is done in a distributed fashion, with hundreds of programmers and educational designers across the world contributing in various ways. This arguably provides a more optimal framework for technological innovation as the ongoing small improvements and enhancements by users of the system are built into each successive version of the software (Raymond, 2001).

Secondly, there are assumptions about learning that are embedded in the designs of the different systems. Most LMSs embody a particular worldview or pedagogy and assumptions about their intended uses (Coates, James, & Baldwin, 2005). In the case of *Blackboard*, "its pedagogic roots are firmly embedded in traditional American college soil, with a predominantly instructor-led pedagogical model" (Dron, 2006a). This pedagogical assumption places a heavy reliance on centralised control of the technology that does not allow for much flexibility or choice. In many ways these and other constraints are severe limitations on practitioners who are in a sense forced to adapt their pedagogy to the dictates of the LMS, rather than vice versa as educational common sense would suggest.

Moodle is based on a constructionist model (Dougiamas & Taylor, 2002) that accommodates a variety of pedagogical approaches. While there are still some constraints in terms of how courses can be designed, there is more flexibility than *Blackboard* and the open-source technology allows for unrestricted customisation of the software to suit specific contexts. As will be shown in chapter 5, the constructionist assumptions informing the *Moodle* technology suited the pedagogical approach used in this study.

In this first quadrant of the theoretical compass the central technology issue for most practitioners is the LMS and how best to use it for effective learning. For many lecturers there is no choice about which system to use and the technology to a large extent shapes and constrains the pedagogical possibilities. This point is discussed in more detail in the following sections but before moving on it is necessary to note an important and ongoing development in technology that has the potential to make the LMS obsolete.

This is the emergence of what has been called 'Web 2.0' and the associated concept of 'e-learning 2.0'. 'Web 2.0' is a controversial term, but it seems clear that the web itself is a dynamic and evolving medium that will pass through stages of development that could be labelled in various ways. According to O'Reilly (2005), who was influential in the development of the concept, Web 2.0 is a fundamental shift away from the stand-alone computer connected to the internet, towards the notion of the network as the platform that spans all connected devices. This allows for software to be delivered as a service that is continually updated and improved as more people consume and remix data from multiple sources. The user thus becomes a creator instead of a consumer of content, that generates more content as it is remixed by other users. This creates "network effects through an architecture of participation, going beyond the page metaphor of Web 1.0 to deliver rich user experiences" (O'Reilly, 2005, p. 17).

In other words, this technological development moves beyond the concept of static web pages that underpin the LMS design towards a much more interactive system where web pages are editable and content is created and shared by the users. Instead of a somewhat monolithic LMS, new technologies under the broad category of 'social software' such as wikis, blogs, podcasts, RSS, and social networking sites like *YouTube*, *Facebook* and *Flickr*, are now available for teachers as an alternative to the LMS which is the dominant technology of 'e-learning 1.0'. Downes (2006) defines 'e-learning 2.0' as the educational correlate of 'Web 2.0':

> The e-learning application, therefore, begins to look very much like a blogging tool. It represents one node in a web of content, connected to other nodes and content creation services used by other students. It becomes, not an institutional or corporate application, but a personal learning center, where content is reused and remixed according to the student's own needs and interests. It becomes, indeed, not a single application, but a collection of interoperating applications—an environment rather than a system. (Downes 2006, p. 2)

'e-Learning 2.0' then is an emergent concept that presents teachers with a radically different notion of education in which students will be technologically capable and creative, in many cases far more so than the teachers themselves. This raises some major challenges for the training and development of teachers to be able to use these emerging technologies effectively. There is evidence now that students are using technologies to support all aspects of learning and that their use of technologies for learning is intermingled with the use of these tools for social and leisure activities, and that a wide range of e-learning strategies are being used where students appropriate tools to meet their own needs (Conole, de Laat, Dillon, & Darby, 2008).

However there is little corresponding evidence that university academics are keeping up with technological evolution and preparing themselves for the challenge of 'educating the Net generation' (Oblinger & Oblinger, 2005), or that university managers are thinking about the policy and resource implications of this new trend. Mastering the basic technology of the LMS is possible with current levels of training and support but a significant shift in the technological infrastructure along with greatly increased levels of technical support seems to be required for the next phase in the development of digital technologies for learning (White, 2007).

This quadrant of the theoretical compass thus points towards an increasingly complex and uncertain technological future for teachers. It is not clear whether the LMS will survive the rapid evolution of 'Web 2.0' and other new technologies looming on the horizon (Shadbolt, Berners-Lee, & Hall, 2006). The limitations of the LMS are discussed in more detail as this research journey unfolds. But at this stage any further exploration of technology begins to blur into the pedagogical dimensions of e-learning and it is to this quadrant of the compass that the discussion now turns.

3.3.3 Pedagogy Quadrant

The reflex action in dealing with transformative new media is to replicate old forms within the new technology (McLuhan, cited in Garrison & Anderson, 2003). For example the first use of the new medium of the moving image was to film a stage play with a static camera. It took about twenty years of experimentation with the medium to

realise the new potential and create a new art form that we know today as the cinema. Likewise the first use of the internet for learning and teaching was the 'shovelware' approach of digitising lecture notes and course materials and putting them online for students to download (Fraser, 1999). Now however, as Garrison and Anderson (2003) point out, "we are challenged to go beyond these early adaptations and develop pedagogy that exploits the capacity for multimediated communications and effective storage and retrieval of very large quantities of information" (p.8). To a large extent the central themes and findings of the present study are a response to this challenge.

From my practitioner's perspective I believe that the main reason for the persistence of old forms within new technology is that underlying epistemologies are highly resistant to change. Epistemological issues are of central importance to the practice and scholarship of learning and teaching, because conceptions of knowledge and how humans acquire it affect the ways in which students are taught. When teachers understand different theories of knowledge and how they apply to the classroom, then "teachers will be able to make conscious choices of how they teach, how they represent knowledge, and how they assess what their students know, based on their epistemological beliefs" (Thayer-Bacon, 1997).

Any discussion of pedagogy is thus inevitably tied up with questions of epistemology. When applied to e-learning however, technology enters the equation, because the technology used for e-learning will either afford or constrain a specific pedagogical approach depending on what kinds of epistemological beliefs are built into the design of the LMS. As discussed earlier both *Blackboard/ WebCT* and *Moodle* are e-learning systems that can be used in various ways for education, but each system is built upon a different set of assumptions about knowledge and learning. Generally speaking these can be labelled as 'objectivist' and 'constructionist' epistemologies respectively. These different positions are revisited through Phase 1,2 and 3 of this study, and an outline is sketched here as part of the overall guide to the theoretical terrain.

To state that *Blackboard/WebCT* has an 'instructor-led pedagogical model' as Dron (2006) pointed out earlier, implies that an underlying epistemology of objectivism is built into the system. The main features of objectivism are that reality is assumed to exist independently of any human perception, and that there can be a corresponding and

measurable 'truth' within knowledge. When this epistemology is translated into a pedagogical approach, the form of education is characterised by instructionism or didactic, transmission model instruction where learners passively receive information and pass through a sequence of monitored assessment points that when passed, allow progression to the next level (Moallem, 2001). Although difficult to quantify, it seems reasonable to speculate that given that *Blackboard/WebCT* is informed by these kinds of assumptions a large proportion of e-learning in higher education uses this mode.

Moodle on the other hand embodies a social constructionist epistemology (Dougiamas & Taylor 2002). There is a close connection between social constructionism and the broader concept of constructivism. In constructivism there is no objective external reality since this is a construction of individual experience and perception, and hence there is no measureable objective 'truth' or source of knowledge. The emphasis in social constructionism is on the ways in which individuals construct knowledge in specific activities with specific objects in social situations, or how "ideas get formed and transformed when expressed through different media, when actualized in particular contexts, when worked out by individual minds. The emphasis shifts from universals to individual learners' conversation with their own favorite representations, artifacts, or objects-to-think with" (Ackerman 2001). When applied to pedagogy, the social constructionist approach focuses on collaboration, activities and critical reflection, and emphasises social interactions between learners as they make things in the real world (Papert, 1991).

This is not to say that all courses in *Moodle* automatically display a social constructionist pedagogy. Because of the prevalence of objectivist thinking it seems safe to assume (although again difficult to quantify) that a large proportion of the activity in courses across the world that use *Moodle* would be based on an objectivist, instructionist or transmission pedagogy (Britain & Liber, 2004). The system itself is sufficiently flexible to accommodate a traditional content-based course. As will be shown in the course of this e-learning journey the key question becomes one of alignment between pedagogy, technology and context, and to what extent a particular technology can provide for or afford different pedagogical approaches. The application of constructionism within the *Moodle* site will be revisited in chapter 5 of this thesis.

The development of networked computers has made constructivist pedagogy more visible and practicable in higher education settings (Bellefeuille, Martin, & Buck, 2005). Like the broader literature on e-learning discussed earlier, there is a wide range of research into the effectiveness of various forms of constructivist approaches to e-learning (Connolly & Stansfield, 2007; Felix, 2005; Oubenaissa-Giardina & Bhattacharya, 2007). In my own research journey into e-learning I found that the following different perspectives on e-learning pedagogy within a social constructivist framework were the most useful and influential for my own practice.

The first of these is the CoP approach, which was adopted in this study. In their literature review and synthesis of online CoPs, Lai, Pratt, Anderson, & Stigter (2006) conclude that research on online CoPs is a relatively new field of research. For this reason they took a broad, rather than a narrow, approach to selecting sources to include in their review and synthesis of the literature. They included both published and online publications, from New Zealand and overseas, from 2001 onwards, as well as seminal articles published prior to 2001. As with the Abrami et al (2006) e-learning meta-analysis referred to above, this literature review on online CoPs proved valuable as it highlighted the key themes relevant for this study. This review showed that there are few empirical studies of CoPs in designed or intentional learning environments (Squire & Johnson, 2000, cited in Lai et al., 2006) and also very few empirical studies on online CoPs that are directly related to teaching and learning (Koh & Kim, 2003, cited in Lai et al., 2006). From their synthesis of a wide range of sources, they highlight the following characteristics of a community of practice:

- 'practice' as the unifying feature of the community;
- relationships that are grounded in information exchange and knowledge creation;
- membership ranging from novices to old timers; and
- shared learning, which may also occur effectively at the boundaries/peripheries of the community (para. 3)

Of particular significance for this study is the link that is made in synthesising the literature between CoPs and effective professional development. The findings show that CoPs are central to effective teacher professional development and that this requires a shift in emphasis from formal training to learning in practice. They highlight how a CoP approach goes beyond "traditional 'one-shot' and 'face-to-face' models of event-based, expert-novice forms of professional development" and moves towards an approach

where teachers "act as co-producers of knowledge, which requires greater personal responsibility for professional growth" (Lai et al., 2006, para. 5). The review states that currently CoPs are only infrequently used for teacher professional development and it is in this gap in the research that this particular study is located. As the majority of students in the SEEP programme in this study are already practicing teachers or professionals, the model for their further postgraduate study was designed around an online CoP. For as Lai et al (2006) conclude 'the process of learning and the process of membership in a community of practice are inseparable" (para 4).

The term "communities of practice," was first coined by Lave and Wenger (1991) to capture the importance of activity in binding individuals to communities, and of communities in legitimising individual practices. "[Community does not] imply necessarily co-presence, a well-defined identifiable group, or socially visible boundaries. It does imply participation in an activity system about which participants share understandings concerning what they are doing and what that means in their lives and for their communities" (p. 98). The link between learning and practice and therefore the importance of situated and authentic learning is a key theme for this study. As Wenger (1998) points out:

> Communities of practice sprout everywhere—in the classroom as well as on the playground, officially or in the cracks. And in spite of curriculum, discipline, and exhortation, the learning that is most personally transformative turns out to be the learning that involves membership in these communities of practice. (p. 6)

There seem to be no clear criteria for the extent to which a group of learners in a formal tertiary educational setting can be called a 'community of practice' and the tension becomes even more apparent in the case of online learning. It is these tensions that provide the background for this study and will be revisited again in chapters 4 and 5 which focus on using an online CoP in a formal learning context.

Barab (2003) defines an online community as "a persistent, sustained [socio-technical] network of individuals who share and develop an over-lapping knowledge base, set of beliefs, values, history and experiences focused on a common practice and/or mutual enterprise" (p. 198). While this is a sound definition that is applicable to the concerns of this study, the key questions for an online CoP are whether relationships and trust can

be built online, and whether tacit knowledge and practice can be shared online. The findings of the present study show that the extent to which a CoP is achievable has some relationship to the degree of alignment between technology, pedagogy and context.

Another influential perspective on the idea of community in e-learning is Garrison and Anderson's (2003) model of communities of inquiry which provides a sound model for realising the potential of e-learning. Because the construction of knowledge by individuals is optimised within a social context that allows for choice, flexibility and a diversity of perspectives, it may be possible to create these kinds of learning environments using the affordances of networked information and communication technologies. To realise this however, the three key ingredients of social presence, cognitive presence and teacher presence must 'blend' together to create a rich and interactive community of inquiry where individuals construct meaningful knowledge in the context of specific disciplines and practices. As Garrison and Anderson (2003) state, the challenge is to implement this approach in different teaching contexts to "create a purposeful community of inquiry that integrates social, cognitive, and teaching presence in a way that will take full advantage of the unique properties of e-learning; those interactive properties that take learning well beyond the lecture hall and information assimilation" (p. 123).

Although there are some clear differences between the concepts of a CoP and a 'community of inquiry', both share a common ground in constructivist ways of knowing and the importance of social relationships in learning. In general then, a constructivist /social constructionist epistemology is supportive of pedagogical approaches that emphasise individual constructions of knowledge within a supportive community of learners. Increasingly the potential of technology to facilitate the kinds of interactions that can create online communities is being explored and implemented in higher education. The exploration of these pedagogical approaches supported by technology is a central concern of the present study. It is important to note in this area of the theoretical compass that an emerging epistemology may well prove more appropriate to the new technologies of 'Web 2.0' that are rapidly making their presence felt in higher education.

This emerging epistemology has been termed 'connectivism' by Siemens (2005) and 'connective knowledge' by Downes (2005a). Essentially the argument is that constructivism and social constructivism both assume that learning and knowledge reside within an individual (even though this is acquired and constructed in social contexts). However, networked information and communications technologies are suggesting that it is possible for learning and knowledge to occur in the infinite connectivity of databases and electronic networks that now constitute the global information society. As Siemens (2005) defines it:

> Connectivism is the integration of principles explored by chaos, network, and complexity and self-organization theories. Learning is a process that occurs within nebulous environments of shifting core elements – not entirely under the control of the individual. Learning (defined as actionable knowledge) can reside outside of ourselves (within an organization or a database), is focused on connecting specialized information sets, and the connections that enable us to learn more are more important than our current state of knowing. (para. 7)

While we have yet to see exactly how this may be elaborated into a coherent epistemology and a related pedagogy, there seems to be some resonance between this kind of thinking, emerging ideas about 'e-learning 2.0' and other notions such as personal learning environments. Some of the implications of connectivism are pursued in chapter 7.

This quadrant of the theoretical compass emphasised the importance of pedagogy in e-learning and introduced the theory relating to social constructivism, learning communities and CoPs (Wenger, 1998). This literature will be revisited in detail in chapters 4 and 5 which links the theory of CoPs to online applications in Phase 1 and Phase 2 of this study. As described in Phase 1 (section 4.2.2.1) the rationale for using a CoP approach was to bridge the gap between the formal learning institution and a real world context and to scaffold learning opportunities for students to develop their identities as members of the Special Education and Educational Psychology (SEEP) community. This was achieved through using authentic case-work and developing socially shared cognitions (Barab & Landa, 1997; Lave, 1993) on professional practice through online interaction with more experienced professionals. In chapter 4, figures 4.3 and 4.4 illustrate how the three critical dimensions of a CoP — the domain, community and practice — are technology-enhanced using *WebCT*. Chapter 5 extends this link between theory and practice to illustrate the better 'fit' when using *Moodle's* social

constructionist design (Dougiamas, 2007) to develop the online CoP (section 5.2.2.2 & section 5.2.2.3).

This quadrant concluded with a look to the future and the rise of connectivism in an increasingly digital and networked learning environment. The literature on connectivism (Siemens, 2004) will be revisited in detail in chapter 6 which links the theory relating to learning in the 21st century to the e-Learning Alignment Guide (section 6.3.2.2). Irrespective of whether the learning theory is social constructionism, CoPs or connectivism and the e-enhancement is a LMSs or Web 2.O software, the theme that remains constant throughout this thesis is that pedagogy and technology are interrelated and together inextricably linked with context within which they are located. It is to this contextual area of the theoretical terrain that the compass needle now points.

3.3.4 Context Quadrant

'Context' is a complex concept that has different meanings in educational theory, ranging from the specific features of the learning and teaching environment, to factors in different disciplines, institutions and systems that influence learning, and going beyond the educational setting to include social, economic and peolitical issues that impact on students, teachers and courses. This range of meanings makes it almost impossible to address all the contextual variables that may have an effect on a particular course of study. In terms of this quadrant of the compass the salient variables are the more immediate aspects of the learning environment within the institutional setting.

The importance of context came to the fore in higher education research with the early findings of the student learning research paradigm (Biggs, 1999) that developed the concept of surface and deep approaches to student learning (Marton & Säljo, 1976). Research carried out within this paradigm showed that the perception of the learning context was a significant factor in shaping the approach to learning that might be taken in a particular setting (Ramsden, 1979). This was an important insight since it showed the process of improving student learning was more effective when focused on the design and constructive alignment of the learning environment and not on remedial interventions aimed at the 'deficits' in students (Biggs 1996). Although much of this research predates the Internet, the contextual issues raised are still relevant. With the

increasing focus on context as a major factor in the quality of e-learning, the policies, infrastructure, systems and procedures which impact directly on student learning, and the particular features of the teaching and learning culture in academic departments that influence lecturers' conceptions of teaching, become key areas for enquiry and academic development in e-learning (Christie, 2003).

The introduction of e-learning adds another layer of complexity to these departmental and institutional contextual factors. As discussed earlier, there is the encounter with the LMS and its embedded epistemology that influences possible pedagogical approaches. Along with this, the technology of e-learning raises a set of issues around access to computers, support and development of skills for students and staff, and the institutional resources and policies that provide the IT infrastructure. In addition, the scope of the context of learning and teaching is now widened since learning can take place in other settings besides the confines of the lecture theatre and the institution, where students might be in the same 'class' but physically located in a variety of different cultural settings and geographical locations.

The research on approaches to student learning is related to other schools of thought that also emphasise the importance of context. Concepts such as situated learning (Lave & Wenger, 1991), cognitive apprenticeship (Brown, Collins, & Duguid, 1989b) and CoPs (Wenger, 1998), grounded in social constructivist notions of learning, have a common view that the process of learning is highly context-dependent. Effective learning is achieved by socially-mediated engagement in real world tasks where learning experiences are situated in an authentic context. In this respect the question of alignment between technology, pedagogy and context is a critical factor in developing the enabling learning environment that was required to support the CoP approach in this study.

However, beyond the immediate aspects of institutional context and the need to design authentic and engaging learning environments that support CoPs, the rapid development of Web 2.0 tools and their equally rapid uptake by the younger generation is creating yet another dimension of complexity in the context of learning and teaching in higher education. The presence of students on university campuses who have grown up with the internet—the so-called 'net generation'(Oblinger & Oblinger, 2005) or 'digital

natives'(Prensky, 2001) — will have major influences on the context of learning and teaching. The net generation are entering higher education equipped with skills in navigating vast amounts of digital information, producing their own content in the form of rich digital multimedia, and adept at 'bricolage' or the art of constructing meaningful artifacts from random bits and pieces of seemingly disconnected information (Brown, 1999). The implications are that a new form of reasoning that is quite different from linear, text-based classical thinking is required to engage this new generation of students, which has major implications for the design of courses, the organisation of content, and the assessment of learning (Brown, 2000).

The context of higher education thus becomes an important focus for research into e-learning through a SoTL. As Herz (2005) has noted, educators need to be keenly aware of the new possibilities offered by the tension between the old and new that arises with the changing context of learning and institutions, "the space between the offline and the online causes the most tension but also offers the most opportunities ... we need to create a context that combines the old and the new" (p. 38).

For Connole and Oliver (2007) the complexity of context is a key source of tension in e-learning research. This research points to the importance of having a greater awareness of its role and the need to find effective ways of mapping the complexity of context, which is explored in more depth in chapter 7 of this thesis. Echoing this perspective Seale states that "we need to understand the contexts in which learners, teachers and institutions are trying to use e-learning. By seeking to understand contexts we may better understand the relationship between learning and technology" (2008, p. 1).

This study seeks to understand not only the context of e-learning in a specific setting, but also the factors involved in the alignment of technology, pedagogy and context. However, e-learning also needs to be seen in a critical perspective, which is important both for ongoing growth in the field and as a necessary ingredient in the process of reflection that informs the scholarship of teaching and learning.

3.3.5 Critiques Quadrant

Any discussion of the theoretical terrain of e-learning would be incomplete without including some of the critiques of e-learning that have been sounded over the past two decades. Since it is important to understand where such critiques come from, it must firstly be noted that there is a pattern in organisational development whereby a technological advance that implies significant change to traditional practices tends to encounter strong resistance from staff. One of the earliest objections to e-learning from this perspective came from Noble (1998) who saw the introduction of e-learning as advancing the commodification of knowledge and the 'automization' of teaching, where the conversion of course materials to digital formats would make the role of the teacher redundant: "In short, the new technology of education, like the automation of other industries, robs faculty of their knowledge and skills, their control over their working lives, the product of their labor, and, ultimately, their means of livelihood" (para 8). Ongoing parallels have been drawn between traditionally-minded academics who resist the introduction of e-learning to the Luddites of the 19th century who fought against the introduction of mechanised modes of production because of the threat to their livelihood (Jefferies, Carsten-Stahl, & McRobb, 2007). As outlined earlier in this chapter (section 3.2) this study seeks to adopt a social constructionist approach to using technology to enhance learning. This approach foregrounds dialogue between students and the active involvement of the teacher is paramount (Feenberg, 1999). This approach is at odds with the notion of 'automising teaching'.

There is also criticism from academics who prefer not to engage in new approaches to learning and teaching because they are daunted by the perceived extra workload in doing e-learning (O'Neill, Singh, & O'Donoghue, 2004). On a deeper level Jaffee (1998) argues that e-learning is perceived as a threat to the professional identity of professors who see the lecture theatre as a 'sacred space' and e-learning as a radical departure from prevailing practice that is incongruous with their understanding of the essential nature of teaching and learning. This may well be true in an objectivist model of teaching as transmission of information, but as outlined earlier, the social constructionist approach is not aligned with the possible automation of teaching and

provides for a new conception of the role of the teacher as a facilitator of learning. However this set of critiques and others in a similar vein (Brabazon, 2002; Wertheim, 1999) do provide a counter-balance to some of the more evangelistic advocates for e-learning.

Other arguments proceed from a more educational perspective. For example Underwood (2004) criticises the e-learning community for not linking with the mainstream of educational research, and failing to create theoretical perspectives across disciplines. In the same vein Gardner and Galanouli (2004) point to a perceived lack of theoretical advance and question the anecdotal assumptions that computer technology has an automatic motivational effect that encourages higher learning. Mayes and de Freitas (2004) go even further and suggest that there are no unique models of e-learning as such, and that using educational technology is simply an add-on to traditional, mainstream pedagogy. Other critiques centre on the role of the LMS and whether it will be replaced by the social networking tools of web 2.0 and the concept of the personal learning environment (Mackintosh, 2007). All of these critiques are revisited in the final section of the thesis (chapter 6) where through an exploration of the e-Learning Alignment Guide mainstream pedagogy is aligned with e-learning technology thereby linking with underlying theoretical and research perspectives. The term 'blended learning' (Garrison and Vaughan, 2008) is suggested to integrate rather than separate the various aspects of technology-enhanced learning.

Another set of critiques is concerned with the cultural and political dimensions of e-learning and computer technology. This has already been suggested in the brief look at how both *Blackboard*/*WebCT* and *Moodle* reflect certain underlying assumptions about epistemology and pedagogy. On a deeper level however, the notion of the 'digital divide' (Cullen, 2001) is a prominent theme throughout the literature and it is surely important that all teachers be aware of the ways in which access to computers and information might privilege the views of certain groups and exclude others. It is also necessary to note that computing technology itself is not neutral and that the design of hardware and software is an expression of deeply embedded cultural values and assumptions. Bowers (2000) is perhaps at the forefront of this line of critique, and in a complex set of arguments urges educators to be aware of the differences between Western technologies and more ecologically sound cultures and how computing

technology affects thought and language patterns. This critique is revisited in chapter 6 in the e-Learning Alignment Guide where issues relating to the 'digital divide' are seen to be broader than just a distinction between 'digital immigrants' and 'digital natives' (Prensky, 2001; Jenkins, 2007).

Perhaps the most important area of critique centres around the distinction between the real and the virtual, and whether e-learning can actually provide the authentic and fully engaged learning setting created by embodied human beings interacting with each other 'face-to-face'. For Dreyfus (2001), interaction on the internet can never replicate the real community of shared physical presence. In analysing the potential of e-learning to truly educate, Dreyfus argues that at most e-learning can assist with the development of competence, but for more advanced levels of learning such as mastery, expertise, and practical wisdom the physical and embodied interaction of learners in the presence of experts is required, because:

> ...when we enter cyberspace and leave behind our animal-shaped, emotional, intuitive, situated, vulnerable, embodied selves, and thereby gain a remarkable new freedom never before available to human beings, we might, at the same time, necessarily lose some of our crucial capacities: our ability to make sense of things so as to distinguish the relevant from the irrelevant, our sense of the seriousness of success and failure that is necessary for learning, and our need to get a maximum grip on the world that gives us our sense of the reality of things (p. 6).

Dreyfus may have a point when one considers the anonymity of the public internet and the ability to project multiple identities through 'avatars' in internet spaces such as *Second Life*. However it is a central contention of this study that it is possible to engage students in the more advanced levels of learning when they participate in a constructionist e-learning environment, and that the three elements of pedagogy, technology and context are aligned in a way that facilitates the development of a CoP. The scholarly exploration of how to achieve this alignment in a particular learning/teaching setting is the subject of the ensuing chapters.

3.4 CHAPTER SUMMARY

This chapter provided a snapshot of the theoretical terrain covered in my e-learning journey. Because of the relatively early stage of development of the field and the vast range of literature, the metaphor of a compass was used to signify the possible

directions through the significant features of the e-learning territory. The compass situated the key research areas in relation to the following four quadrants: (1) technology; (2) pedagogy; (3) context; and (4) critiques.

The *technology* quadrant identified the LMS as the primary technology which would be encountered by most lecturers engaging in e-learning, and pointed to some possible shifts ahead with the growing development of 'Web 2.0' tools. The *pedagogy* quadrant drew attention to questions of epistemology, the relationship between pedagogy and LMSs, and to what extent a CoP approach could be considered as a framework for using e-learning in my own teaching.

The third quadrant emphasised the complexity of the *context* of e-learning, the requirement to include the context in any research process, and the idea that the alignment of technology, pedagogy and context is of central importance in developing theoretical understanding of the field. The fourth quadrant briefly outlined some of the significant *critiques* of e-learning within which this study is located.

With ongoing research and evaluation in the field, the notion of the compass might well develop into a 'GPS' system that will enable a more precise navigational guide for teachers embarking on e-learning journeys. At this stage however the compass will suffice as a 'guide' to the main features of the terrain, which is now explored in more detail as the journey moves through the three phases of the SoTL research.

CHAPTER FOUR:
PHASE 1 OF THE E-LEARNING JOURNEY

Learning is the engine of practice, and practice is the history of that learning. As a consequence, communities of practice have life cycles that reflect such a process. (Wenger, 1998, p. 96)

4.1 INTRODUCTION AND CHAPTER OVERVIEW

The previous chapters outlined my research journey and the theoretical terrain through which it traversed. The first chapter showed how the journey was based on a SoTL approach, and the second chapter outlined the theoretical 'compass' that guided my exploration of the e-learning terrain. The next three chapters cover the three phases of my journey. The research question that threads throughout all three phases and which informed my thinking and decisions, is as follows:

How do the interrelated areas of technology, pedagogy and context influence practice within a changing e-learning environment?

This chapter addresses that question in Phase 1 of the SoTL approach, by describing the three overlapping activities of *learning, teaching* and *research.*

The first section outlines my *learning activities*, which included participation in three professional development opportunities: to gain a deeper understanding of the theory and practice of e-learning; developing a CoP with an e-learning environment; and using *WebCT* as the CMS provided by the university for e-learning. The insights gained from these learning activities are presented as *learning outcomes* under the themes of context, pedagogy and technology in this section.

The next section outlines my *teaching activities,* which focus on Case Study 1. Here, a CoP approach to e-learning is designed for the SEEP programme using *WebCT.* Data from the participants' feedback as well as analysis of the online activities are presented to illustrate the perceived value of the pedagogy and technology used within the SEEP context. The findings from this phase are presented as *learning outcomes.* They show the perceived value of using a CoP approach along with some difficulties of integrating

this with the technology used. Recommendations are made for how to better align the technology with the pedagogical approach required for the particular context of the SEEP programmes of study.

Reflecting on these learning activities and engaging in practitioner research enabled me to generate a number of research outputs that were shared with the wider community in the *research activities*. These are documented in the final part of this chapter as the *research activities*. Publications and presentations that enabled peer review and sharing of findings are listed and discussed as the *research outputs* for this phase. The structure for this chapter is represented in Figure 4-1 below. (This figure first appeared in chapter 2 as Figure 2-7 as part of the discussion of the overall SoTL research journey. It is repeated here as Figure 4-1 to illustrate discussion on Phase 1 of the study)

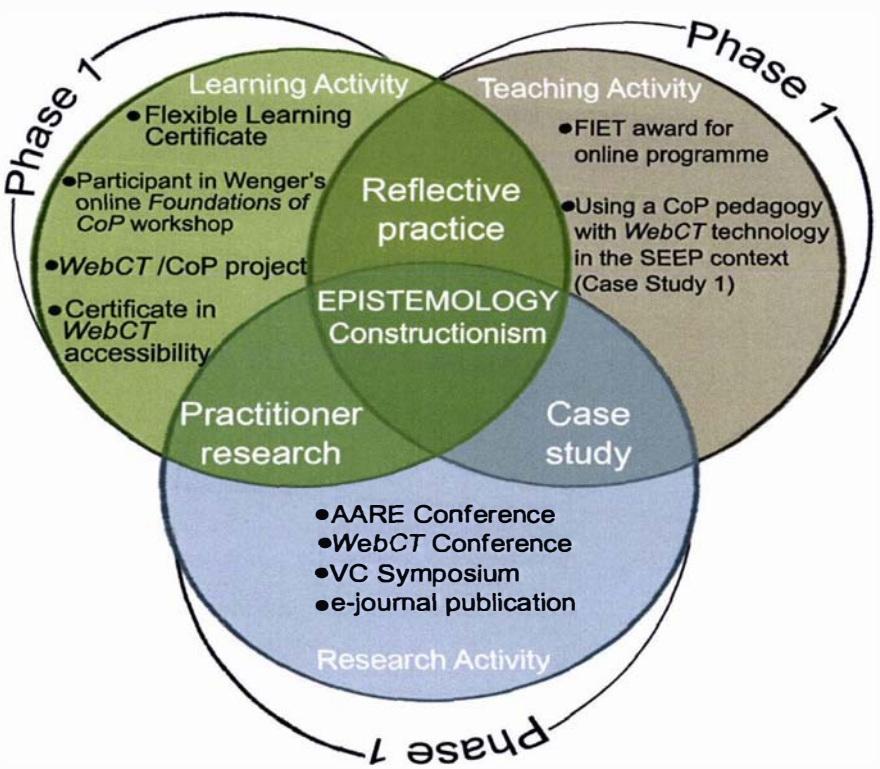


Figure 4-1: Phase 1 of the study

4.2 PHASE 1: LEARNING ACTIVITIES AND OUTCOMES

There were four significant learning activities that occurred during this phase: (1) completion of a *Flexible Learning Certificate in e-Learning* from Massey University; (2) participation in Etienne Wenger's international online *Foundations of Communities of Practice* workshop; (3) collaboration with others in an international research team on evaluating the tools in *WebCT* for CoP teaching; and (4) completion of a course in *WebCT* accessibility.

The insights gained and issues raised from the learning activities were summarised into the three themes relating to designing an e-learning environment, namely: (1) *pedagogy* — a CoP approach (2) *technology* — using *WebCT* as a LMS and; (3) *context* — using a CoP approach with the SEEP programme. The learning activities and outcomes are conceptualised as follows:

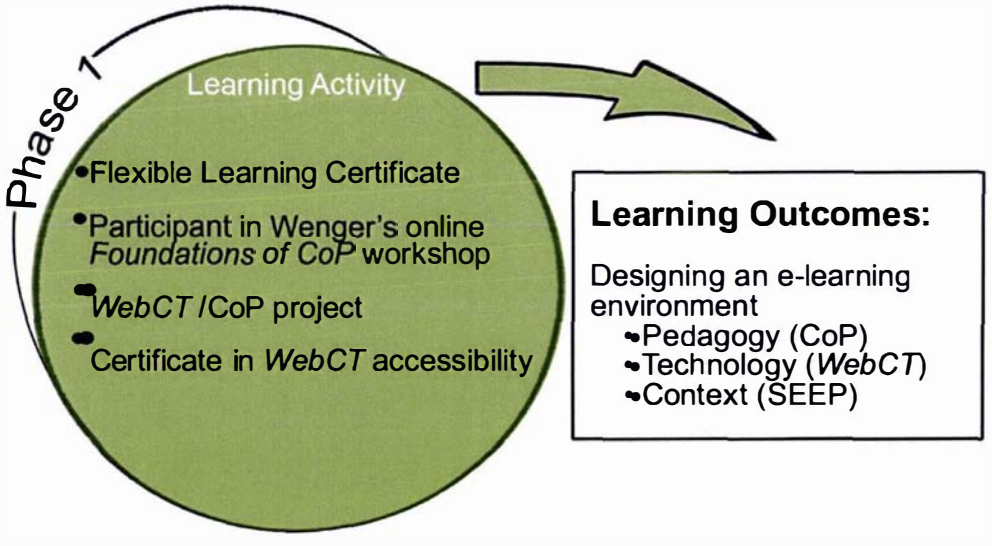


Figure 4-2: The learning activities and outcomes of Phase 1

4.2.1 Learning Activities in Phase 1

The learning activities for Phase 1 involved my own professional development in the theory and practice of e-learning and CoPs (Wenger, McDermott, & Snyder, 2002). My first learning activity was to complete a *Certificate in Flexible Learning and Teaching* at Massey University. These papers provided an overview and introduction into the

field of flexible learning and teaching and the principles and practices of online teaching as well as additional modules on the tools to support online teaching. Reflections on this professional development and on my current teaching practice raised pedagogical questions about learning, particularly the shifts in learning theory from instructionism to social constructivist learning, and the potential for using technology to support a more social constructivist approach.

This led me to focus on the potential of using a CoP (Wenger et al., 2002) approach as a model for effective online learning. This resulted in a literature search on CoPs. While the reading of scholarly texts provided a theoretical understanding of the concepts, I sought out the opportunity to have a more personal experiential understanding of linking CoPs to online learning. I thus enrolled as a participant in the *Foundations of Communities of Practice* workshop [http://www.cpsquare.org/edu/foundations/] run online by Etienne Wenger. This workshop was facilitated by and designed for practitioners using a CoP approach in their work. This was an intensive seven-week experience in which participants engaged in collaborative research and professional development activities on issues relating to themes within a CoP domain. The workshop was developed around Wenger et al's (2002) structural model for CoPs and consisted of a 'community' dimension for social interaction, the 'domain' aspect for discussion and debate around the common topic of interactive communities, and the 'practice' element where participants engaged in collaborative projects.

The aim of the collaborative research project I was involved in during this CoP workshop was to identify the strengths and weaknesses of using WebCT as a LMS for supporting an online community of practice. This project team consisted of six members from New Zealand, the United States and Australia and the aim was to identify which tools were available in *WebCT* that could support the 'domain', 'community' and 'practice' dimensions of an online CoP. This project contributed directly to my teaching activity, as *WebCT* was the e-learning environment adopted by Massey University for online teaching.

In terms of developing a greater understanding of *WebCT*, I completed an international online training course run by *WebCT* on accessibility issues, which covered aspects of design using *WebCT* to ensure accessibility for all learners. The course covered issues

relating to Internet barriers to students with disabilities, legal requirements of accessible design and evaluation of websites for compliance with accessible design. This provided professional development from a technical perspective on designing the CoP course.

4.2.2 Learning Outcomes in Phase 1

The learning outcomes included: an integration of the learning activities relating to e-learning theory; designing and developing a CoP; and using *WebCT* as an e-learning environment. These are summarised under the three themes of: pedagogy – a CoP approach; technology – using *WebCT* as the e-learning environment; and context – the SEEP programme, and are outlined below.

4.2.2.1 Pedagogy — a CoP approach

One of the most important needs in professional training is to ensure that the gap is bridged between university-based learning and real-world application. This is essential because the separation of learning from authentic use creates an incongruity in which students are learning content within the institutional culture of the university that they are unable to apply within real-life contexts (Barab & Landa, 1997; Brown, Collins, & Duguid, 1989a). In this study, one way to bridge this gap was thought to be through the creation of a CoP (Wenger et al., 2002) that could provide scaffolded opportunities for students to operate within socially interactive and reflective learning environments. It was considered that the medium of on-line learning could provide opportunities to develop interactive learning environments in which students could develop their identity as a member of the professional community while at the same time advancing their knowledge and skills.

Institutional e-learning arrangements can be problematic in so far as they restrict the formation of communities through requiring that skills be taught in isolation and out of context. The effect of this is that students have no sense of being within a community and that there is no process for making progress in learning through socially shared cognitions. According to Lave (1993), the main concern involves the competitive nature of many learning environments in which learning is treated as an individualistic activity rather than a shared enterprise. From this perspective, learning within contemporary life

has taken place within relatively alienated conditions. The effect of this is to diminish the identity of oneself to that of an isolated individual rather than as a member of a CoP. For Wenger (1991), the myth of the 'acquisition of information' and the myth of the 'individual learner' are both central to our culture. He sees these myths as being very powerful and largely dominating our current institutional pedagogical practice. He cites examples such as schools that set learning apart from social life, education programmes that are separate from actual practice, and teaching that involves lecturing and didactic training sessions. He believes that this is at odds with where learning naturally happens and that we are badly in need of a new theory of learning and knowing. He puts forward the notion of a CoP as a new way of understanding where learning happens.

As Wenger (2006) suggests, we are essentially social beings, and it is our participation in social communities and cultural practices that gives meaning to who we are, what we do, and understand what we know. He sees the lifelong learning needs of students being served by organising CoPs around their domain of study. From this perspective, the university is not the privileged locus of learning or a self-contained, closed world in which students acquire knowledge to be applied outside. Rather, it is part of a broader learning system. He sees schools and training programmes still having a role to play but more in the service of the learning that happens in the world (Wenger, 2006). Thus, for Wenger (2006), educational experiences need to be grounded in practice through participation in communities beyond the walls of the teaching institutions.
Wenger (1990) points out that:

> Knowledge does not exist by itself in the form of information, but . . . is part of the practice of specific socio-cultural communities, called here 'communities of practice'. Learning then is a matter of gaining a form of membership in these communities. This is achieved by a process of increasing participation, which is called here 'legitimate peripheral participation'. Thus learning is tantamount to becoming a certain kind of person. Visible objects such as artefacts, symbols, language and gestures, also belong to the practice of these communities. Therefore, seeing the cultural significance of these objects, something I call 'cultural transparency', requires access to the practices to which they belong. This in turn requires membership in the relevant communities. (para. 2)

The term 'communities' has been used in a variety of different contexts — learning communities, knowledge communities, e-communities, work communities, sporting communities, interest communities and communities of practice. A community is historically characterised by any group living in the same area or having interests, work

or practices in common. While the geographic assumption underlying this description may no longer be valid in a digital age, the commonality between members holds true. Communities can be small or large, co-located or online, where members interact over time, are held together by a common purpose and share a sense of history. CoPs have at their core that sense of commonality between the members and are sustained by the desire and need to share problems, experiences, insights, templates, tools, and effective practices.

CoPs, as defined by Wenger et al (2002) comprise a group of people bound together by concern for a common body of knowledge and a shared commitment to the establishment and furthering of the knowledge base and practices of the group. Through ongoing interaction with one another, community members develop interdependent relationships, extend their understanding, and construct new knowledge and practices, while preserving the standards set by their profession (Wenger et al., 2002).

For Wenger et al (2002), the combination and cultivation of the following three critical components of domain, community and practice constitute a CoP, and these can be described as follows: (1) *domain* — a shared area of inquiry, interest and competency that is developed through information sharing, meaning making and re-interpreting information within different contexts; (2) *community* — the relationships among members and the sense of belonging that is developed through having a common identity and affinity, forming relationships, and supporting each other; and (3) *practice* — the body of knowledge, methods, stories, cases, tools and documents that is developed through practitioners sharing the repertoire of resources, experiences and ways of addressing recurring problems in their practice.

Using a CoP as a pedagogical approach involves the application of three areas of domain, community and practice as the core of the learning environment. In this study these were linked to the related practices of situated learning, an apprenticeship model and social-constructivist learning theory. This is discussed below and is visually represented in Figure 4-3 below.

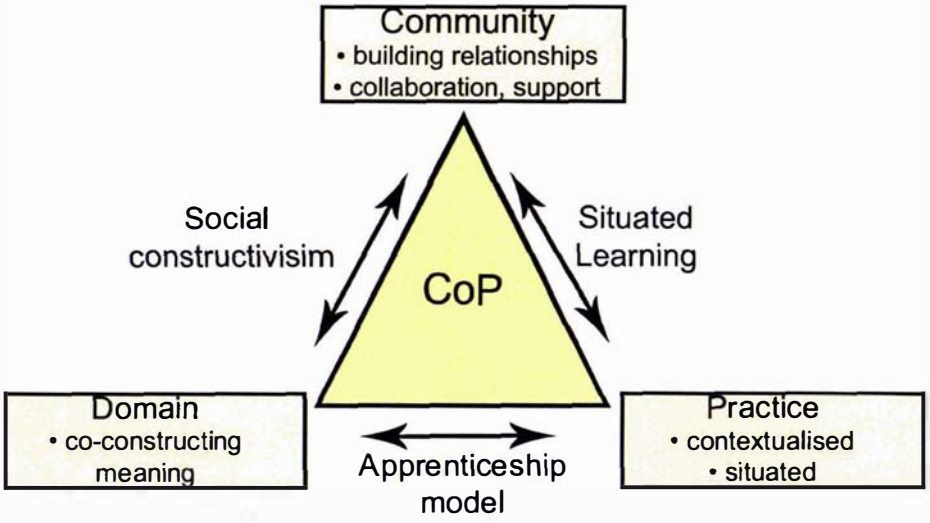


Figure 4-3: The CoP dimensions of domain, community and practice

Underpinning a CoP approach to learning are the concepts of situated learning, the apprenticeship model and social constructivist theory. The concept of *situated learning* originated from two separate but related fields of study. First, there are anthropological theories that have arisen from research concerned with contexts of daily living and working (Rogoff & Lave, 1984; Wenger, 1991). Second are theories that have arisen within educational contexts concerned with social practices and interactive teaching strategies to create better conditions for learning within classrooms (Brown & Campione, 1990; Curzon, Selby, & Ryba, 2000; Johnson, Johnson, Barlett, & Johnson, 1988). Much of this work has been inspired by a concern for creating realistic and interactive learning environments that promote socially shared cognitions within specific contexts and communities of practice. Along with providing task authenticity, such interactive models have ecological authenticity in that the tasks in which the learners are engaging are embedded in ongoing activities within the ecological niche where real-world practitioners function (Lave, 1993).

Lave (1988) argued that learning takes place as a function of the activity, context and culture in which it occurs. Learning is thus 'situated' within a definite social and cultural context, and domain of learning. This contrasts with most tertiary classroom-based learning activities in which knowledge is abstract and presented out of context. According to Lave, social interaction is a critical component of situated learning. Learners become involved in a CoP through which certain beliefs and behaviours are

acquired. At the outset, learners begin their journey at the periphery of this community and progress towards the centre as they become more active and engaged within the culture. They move from being a newcomer or novice towards assuming the role of expert or old-timer. Moreover, situated learning is usually not directly taught but is informal, occurring through active participation in working together with other people. These ideas are what Lave and Wenger (1991) referred to as the process of 'legitimate peripheral participation'. Such participation is socially interactive in nature, involving an apprenticeship or guided participation between 'newcomers' and 'old-timers'.

Drawing upon examples from different cultures, Lave (1988) shows how the *apprenticeship model* or guided participation is highly relevant to many forms of socially organised activities that have become accepted within western society as sites of learning (e.g. advocacy groups, community service clubs). These organisations guide their newcomers through a scaffolded sequence of learning steps so that they progress from the periphery to the centre of the activity. Within the organisation, certain values and beliefs are conveyed as a basis for guiding practice and influencing induction of the novice into the expert membership of the organisation.

The characteristics of interactive *apprenticeships* have been outlined by Rogoff (1990) as follows: (1) active in gathering information and practising skills; (2) structured by practices developed by the old-timers within the community; (3) involvement with more advanced apprentices; and (4) active learning in a community of fellow novices (such as fellow graduate students). Interaction with and observation of other novices provides challenge, support, collaborative solving of problems, and models of learning in progress.

The notion of guided experience within a cognitive apprenticeship corresponds to the concept of the zone of proximal development (ZPD) introduced by Vygotsky and Cole (1978). Vygotsky theorised that individual cognitive development is embedded in a sociocultural environment that provides tools for thinking and formation of partnerships. Students' interactions with others in the 'zone of proximal development' (ZPD) enable them to carry out cognitive processes jointly that are more advanced than would be possible independently, and that these shared problem-solving processes serve as a basis for subsequent independent efforts. Extending the concept of the ZPD,

(Mentis & Ryba, 2001a) have proposed a model for the 'collective ZPD'. This illustrates how a group of students can form an 'intellectual collective' in which there is potential for all members to advance their learning through guidance from more capable peers. Both participation and guidance are mutual efforts of students and their companions that can result in advances in learning for all participants.

Having analysed the underlying concepts of a CoP and the implications and value of it for learning and teaching, it was the aim of this phase of the research to design the online learning environment of the SEEP programme using a CoP pedagogical approach. The literature suggests that online frameworks have the potential to support a cognitive apprenticeship approach (Wang & Bonk, 2001) through modelling, mentoring and scaffolding of students. The aim in this study was to capitalise on the opportunities afforded by on-line environments to create an online CoP within the SEEP programme. The use of e-learning technology to do this is outlined in the next section.

4.2.2.2 Technology — Using WebCT as the CMS

The focus of this section is to outline the design of the e-learning CoP model used in the SEEP programme. The technology used was *WebCT (*described in chapter 3), which is an online proprietary virtual learning environment system, and the prescribed e-learning environment at Massey University.

The first part of this section describes the extent to which *WebCT* tools support the domain, community and practice dimensions of the online CoP, and the second part outlines how the tools were used to design a CoP in SEEP. This analysis draws on the findings of the research project I was involved in as part of the Wenger Foundations workshop described in the learning activities above. This project provided the basis for the selection of *WebCT* tools used in the SEEP programme.

The features and facilities that were available in *WebCT* to support the three dimensions of domain, community and practice within a CoP are outlined below and are visually represented in Figure 4-4 below.

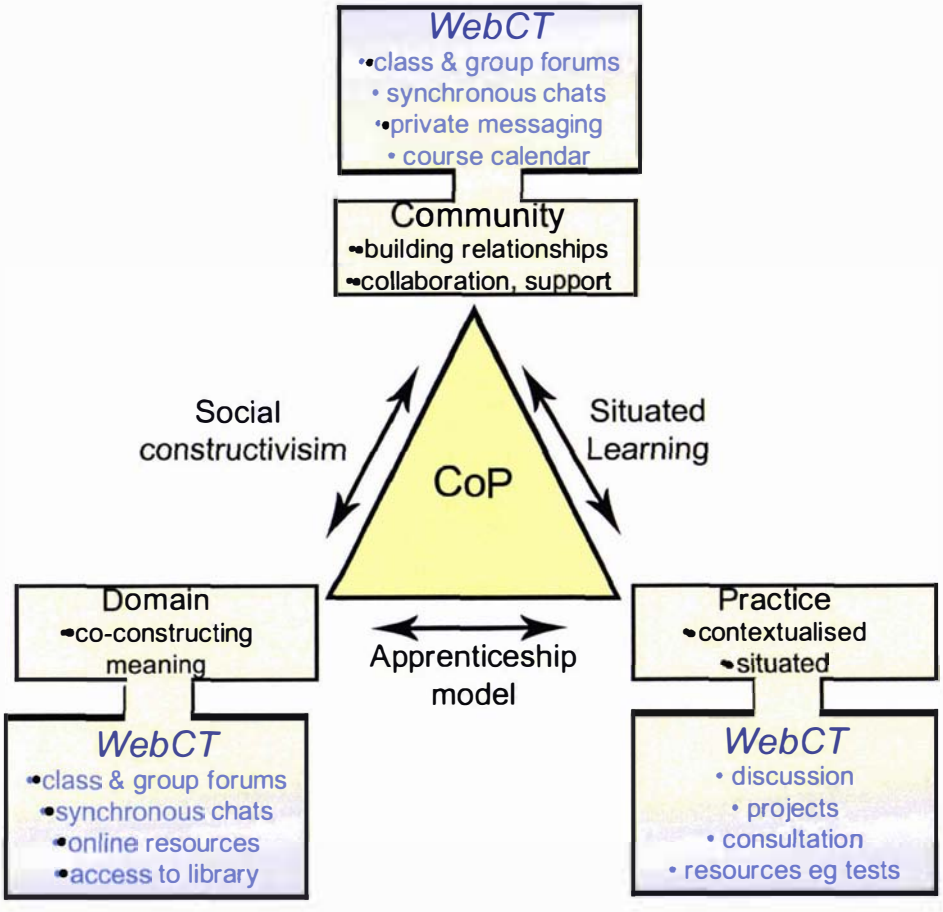


Figure 4-4: The CoP dimensions linked to *WebCT* tools

Within the *domain* dimension of a CoP environment, the following tools/features were available in *WebCT* to support interaction around knowledge and content building: asynchronous and synchronous discussions; tracking of read and unread messages; and search function for discussion threads. The following tools were *not* available, thus creating potential barriers to supporting domain activities of knowledge sharing: no facility to post documents or files; no facility to delete or edit messages; no facility to collaborate on a single document; and no resource directory or archiving function.

Within the *community* dimension of a CoP, the following features/tools were available to support cooperation, collaboration and a sense of belonging to a learning community: asynchronous and synchronous small group discussion; private email; facility to upload biographical/personal information; shared calendar for notices. The following facilities were *not* available in *WebCT* to support the community dimension of the CoP, thus

creating potential barriers to facilitating a sense of belonging: no facility to see who is online at any given moment; no facility for instant messaging on screen; no online photos with each message; no facility to poll or survey members within the community; no facility for participants to host different areas of the site independently.

Within the *practice* dimension of the CoP, the following features were available to support sharing of casework: asynchronous and synchronous small group discussion; folders for resources; and links to an onsite test library. The following facilities were *not* available to support the practice dimension, creating barriers to developing a shared understanding of casework: no notice board or announcement board; no facility to separate practice area from domain and community areas on the site. Having outlined the *WebCT* tools used, the next sections builds on this by linking to the SEEP programme.

4.2.2.3 Context — the SEEP Study Programme

This section provides some background information on the SEEP programme and then shows how this programme is constructed using a CoP orientation with *WebCT* technology.

The special education and educational psychology (SEEP) programmes at Massey University involves postgraduate students studying at a distance throughout the North and South Islands of New Zealand. Students start out at the *foundation level* — the postgraduate special education course (4 papers) and move into the *professional level* — the masters in educational psychology programme (4 papers) and finally on to the *internship level* — a practicum year as educational psychologists. There is a 'mixed mode' delivery of the programmes, involving a combination of online readings and study guides, attendance at face-to-face seminars on campus and participation in the online community.

The programmes operate as a professional community committed to the practice of educational psychology and special education within the social and cultural context of Aotearoa New Zealand. Considerable emphasis is placed on the creation of a socially

interactive and reflective learning environment in which students share their knowledge with one another. Students generally are practitioners working in education settings such as regular class teachers, resource teachers of learning and behaviour, special education advisers, private practitioners and behaviour support workers.

The orientation in the SEEP programmes is strongly influenced by the ecological theory of Bronfenbrenner (1979) and the social constructivism of Vygotsky and Cole (1978). The programme approach uses a contextualised and ecological situational analysis model (Annan, 2004; Ryba, 2003; Ryba, Pine, Mentis, & Bowler, 1999) In this approach, behaviour is seen as a function of ongoing interactions between individuals and the multiple environments within which they operate. While the programme is firmly based on the social and cultural context of life in Aotearoa New Zealand, it is informed by global advances in the profession. The guiding principles of the programme include:

- Collaborative and consultative practice
- Socially interactive and reflective thinking
- Professional and ethical practice
- Contextualised and evidence-based practice
- Inclusive philosophy and valuing of diversity
- Treaty of Waitangi and partnerships with Maori
- Constructive strength-based practice

(See Appendix E for the Competency Domains in the SEEP programme)

The orientation of the SEEP programme sits well with a CoP approach to learning given the philosophical base of both. The design of the *WebCT* online environment was an attempt to enhance and integrate these further. All participants at the three levels of the programme (foundation, professional and internship) were members of an open community site, but each had their own private discussion threads within the discussion forum for 'class' interaction. They also had their own folders with course-related documents that were private to the class. The community space was open to all current students from all three levels as well as past graduates of the course, supervisors, guests, and other practitioners from the broader community of special education practitioners. The intention of this design was to encourage collaboration, consultation and reflection not only within levels, but also between levels within the wider SEEP communities. It

was hoped that this would break the barrier between university-based learning and real-world application, as well as encouraging interaction between novice participants (at the foundation level of study), more experienced apprentices (at the internship level) and practitioners in the real world (alumni, supervisors, staff and guest 'experts'). The class environment required compulsory participation (in the form of assignments and discussions), while discussions in the community threads of the discussion forum were voluntary and open for participants to contribute as they chose.

Figure 4-5 below illustrates the final conception of how these two aspects of pedagogy (a CoP approach) and technology (using *WebCT* tools to support a CoP), were integrated with the context dimension (the SEEP programme structure of foundation level, professional level and internship level being part of a single community).

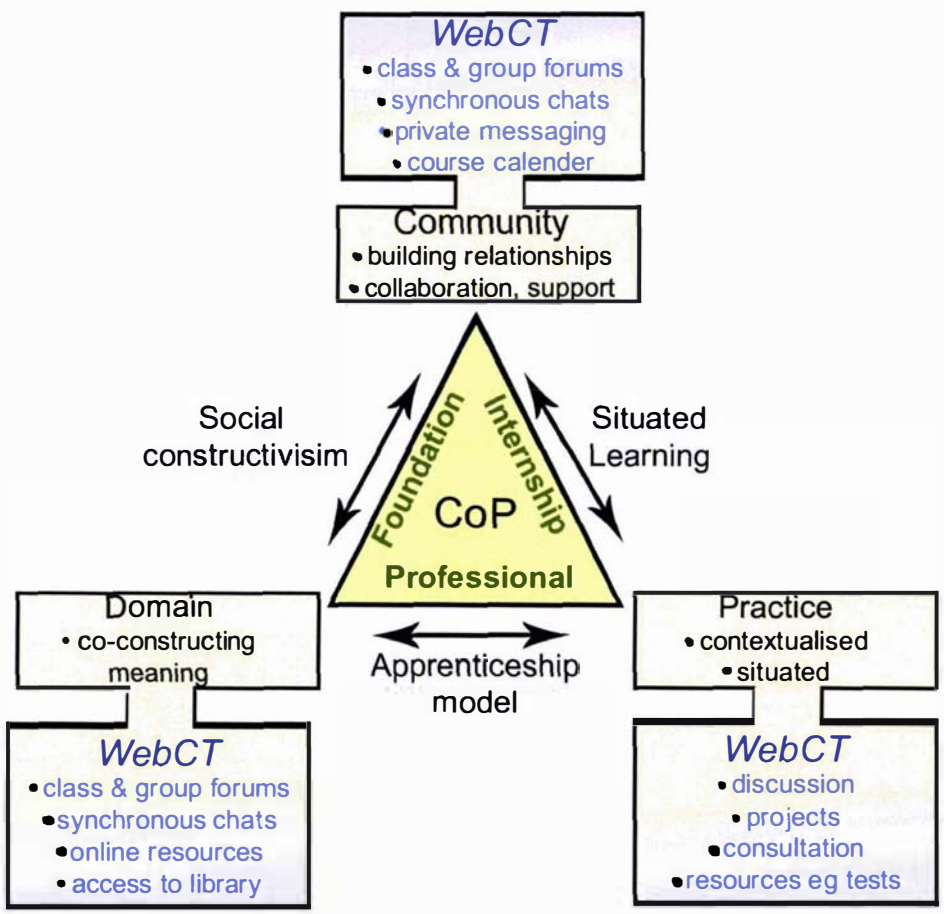


Figure 4-5: The CoP dimensions, *WebCT* tools and SEEP Programme

The three aspects of a CoP were linked with broader issues beyond the boundary of the class as follows: *domain* - links to websites, the library and other resources focusing on knowledge development within the field of special education & educational psychology; the *community* - links between all students across all levels, past students, supervisors, lecturers and outside guests within the field; and the *practice* – links to various contexts where students are located for work – which include schools, special schools, Ministry of Education Group Special Education, private practice, higher education institutions as well as other support or care-giving organisations. The aims of the e-learning site were to allow for: resource sharing and discussion around the *domain*; networking within and between programmes as a *community;* and application of a situated learning approach by linking assignments to real-life *practice.*

The course layout was the same for all three levels of SEEP and consisted of a community homepage with the following *WebCT* tools: discussion forum, chat room, calendar, email, links and folders. In addition, class photos were uploaded and although this was not specifically a *WebCT* tool, it was created to support the sense of belonging using a visual mode. The *WebCT* home page is presented in Figure 4-6 below:

Figure 4-6: *WebCT* home page

4.3 PHASE 1: TEACHING ACTIVITIES AND OUTCOMES

This section of the chapter outlines the *teaching activity* of Phase 1 of the study, which consists of a description of the use of a FIET award to embark on a case study investigation into the value, as perceived by the participants, of using *WebCT* to design a CoP approach within the SEEP programme. An analysis of the data constitutes the *teaching outcomes* for this phase of the study and is grouped into the themes of: (1) context – e-learning experience in SEEP; (2) technology – *WebCT* evaluation; and (3) Pedagogy – CoP issues of domain, community and practice. The rationale for this case study in Phase 1 is a response to the overall research question of how the interrelated areas of technology, pedagogy and context influence practice within an e-learning environment. This is outlined in Figure 4-7 below.

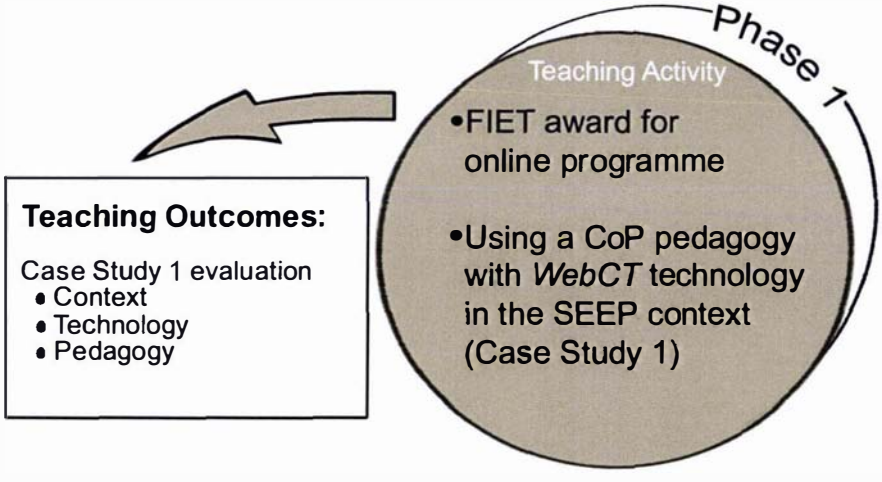


Figure 4-7: The teaching activities and outcomes of Phase 1

4.3.1 Teaching Activity — Case Study 1

As discussed in Chapter Two, both case studies are conceptually located at the intersection of the teaching and research phases of the SoTL research tradition followed in this study. Each case study illustrates different forms of e-learning.

Aim of Case Study 1

Having completed the professional development activities and gaining a better understanding of the two areas of CoP development and use of *WebCT*, I used the Massey University FIET award to focus on these two areas as part of my professional practice. This constituted Case Study 1 where the aim was to evaluate the implementation of a CoP approach using *WebCT* within the SEEP programme. In particular, the focus was to evaluate the extent to which the e-learning environment supported a CoP approach to teaching and learning, and the participants' perception of the effectiveness of this.

Participants in Case Study 1

Students entering the SEEP programme begin at the foundation level (special education programme) and this level had the largest number of students in the programme for this study (n= 56). The second level is the professional year (masters in educational psychology) and had a smaller cohort for this study (n = 28). The final internship level had the smallest group (n = 15). All students in the three levels agreed to be research participants (see Appendix C & D for the Participant Information Sheet and Consent Form). Although additional participants (staff and some alumni) were active on the community site, they were not included in the sample as the focus of the study was on current students' perceptions and practice of a CoP approach to e-learning.

Data collection

The data sources that were used to investigate the value of the CoP approach using *WebCT* enabled both a quantitative and qualitative analysis. These addressed the overall research question of how the interrelated areas of pedagogy and technology influenced practice within the SEEP e-learning environment. These data sources included:

- *Student questionnaire* (see Appendix F for the Student Questionnaire).

  The questionnaire was posted online at the end of the year to participants in all levels (n = 99). Completion of the questionnaire was voluntary and anonymous and 54 participants (53.46 %) completed the questionnaires. The questionnaire was divided into three sections focusing on students' perceptions of the value of the *WebCT* tools

(technology), e-learning experience (context) and CoP approach to learning (pedagogy). The quantitative data was gathered via the use of a 5-point likert-scale question (where 1 = not valuable/useful and 5 = very valuable/ useful). As Schmuck (2006) points out, rating scales within the questionnaires have the advantage of generating clear results for interpretation, but the disadvantage is lack of clarification of answers. This limitation was overcome by having open-ended questions follow each rating scale with an additional request to consider the positive and negative aspects of the overall e-learning environment. The qualitative feedback was coded according to the three themes of *WebCT* tools, e-learning context and CoP pedagogy.

- *Content analysis of the postings in the discussion forums.*

An analysis of the content of each message that was posted in the forums provided a deeper understanding of the actual practice as opposed to students' perceptions of participating within the e-learning environment. The analysis was based on Poole's (2000) study of student participation in discussion-oriented on-line courses where messages are coded into focus areas. Every fifth message of a total of 1286 messages over a period of 9 months was coded. These were then grouped into three phases — first phase (initial 400 messages), middle phase (400 - 800 messages) and end phase (800 - 1286 messages). The themes that emerged were:

- Technical — messages relating to using the technology and navigating the site
- Coursework — messages related to the course content, assignments and casework (domain and practice dimension of a CoP)
- Social — non-academic messages related to developing a sense of belonging, support and identity in the group (community dimension of a CoP)

Two readers coded these messages to ensure inter-rater reliability. Any discrepancy between raters was discussed until consensus was achieved. The outcomes of this case study is presented in the next section.

4.3.2 Teaching Outcomes — Case Study 1 Evaluation

For Phase 1, the underlying research question is about how the dimensions of technology, context and pedagogy interrelate specifically to support a CoP approach to e-learning. This provides the conceptual framework for analysing and evaluating teaching activity data from this case study. The analysis and evaluation was divided into

the three areas of (1) technology – the value of *WebCT* tools; (2) context – students' experiences of e-learning within the SEEP programme and (3) pedagogy – supporting the three elements of domain, community and practice within a CoP approach.

4.3.2.1 Technology — the Value of the WebCT Tools

The student questionnaire provided both quantitative and qualitative data on students' perceptions of the *WebCT* tools. The students' quantitative responses are presented in Table 4-1 below.

Table 4.1 **Students' Perceptions of the Value of *WebCT* tools (n = 54)**

	1- definitely not valuable	2 - not valuable	3 - neutral	4 - valuable	5 -very valuable	No response	Mean Rating
	Number (%)	Number (%)	Number (%)	Number (%)	Number (%)		
Course discussion	0 (0.0)	0 (0.0)	6 (11.1)	14 (25.9)	32 (59.2)	**2**	**4.5**
Chat room	4 (7.4)	2 (3.7)	16 (29.6)	14 (25.9)	16 (29.6)	**2**	**3.7**
Class photos	4 (7.4)	6 (11.1)	12 (22.2)	10 (18.5)	18 (33.3)	**4**	**3.7**
Cybrary	4 (7.4)	4 (7.4)	12 (22.2)	12 (22.2)	16 (29.3)	**6**	**3.6**
Folders	2 (3.7)	10 (18.5)	14 (25.9)	12 (22.2)	8 (14.8)	**8**	**3.3**
Links	6 (11.1)	8 (14.8)	8 (14.81)	12 (22.2)	6 (11.1)	**14**	**3.1**
Private email	12 (22.2)	10 (18.5)	10 (18.5)	10 (18.5)	8 (14.8)	**4**	**2.8**
Calendar	6 (11.1)	18 (33.3)	14 (25.9)	4 (7.4)	6 (11.1)	**6**	**2.7**

Results, when ranked by mean rating, indicate that the most valuable tools were perceived to be the communication tools — course discussion and chat room. This suggests that the most valued aspect of the online tools were those that enabled interaction, debate and dialogue between students. This is supported by the following qualitative comments by students:

- *I loved (forums) – very collaborative and useful to talk about our case studies*
- *It's great to realise that you are not on your own learning*
- *(Discussion is) great to run quick ideas past people and clarify matters*
- *Being geographically distant from the hub of activity, this is a great way to keep communicating.*

The next highest rating was for the class photo. It is interesting to note that this was not an existing *WebCT* tool. Having an online photo identity was highlighted as being of great value in the professional development workshop I attended so this was added as a 'workaround' to compensate for the lack of individual photos of online participants. Student satisfaction with the class photo suggests the importance of using a pictorial modality, and in particular participant photographs, in an online environment. The

effect is to strengthen a sense of identity and belonging to the community and increase the range of modalities that have come to be associated with online formats and expected by participants engaging in online interactions (Downes, 2002).

The cybrary (online library), folders and links tools all related to sharing of content – and these, while still overall positively received, were not seen to be as valuable as the tools enabling interaction and debate. It is the interactive dimension of communicating about content rather than the content acquisition that contributes to the formation of a vibrant and sustaining community (Hung & Chen, 2001).

Results indicating that students did not find the calendar or private email useful were qualified by their comments that indicated their preference for using private emails (home and work) rather than the *WebCT* emails and using their own time management system (diaries and year planners). This suggests that students have alternate means of using these functions rather than the fact that these tools are not useful.

Overall, the findings relating to technology suggested that the most valued *WebCT* tools are those that facilitate discussion and interaction, and that the tools allowing for content sharing are perceived less valuable. The pictorial modality has potential as indicated in the positive feedback on photo identification of participants. These findings suggested that future e-learning design for the SEEP context should maximise the tools that allow for interaction, collaboration and co-construction of meaning around content (rather than tools that allow for just content transfer) and also explore the use of multi-media.

4.3.2.2 Context — Student's Experiences of e-Learning

The student questionnaire provided both quantitative and qualitative data on students' experiences of e-learning. For the purposes of this questionnaire this included elements of what Chang (1999) referred to as emancipatory (convenient, efficient and autonomous) learning and what he called qualia (i.e. enjoyment, confidence and success) in learning. Table 4.2 shows the students' perceptions of their experiences of e-learning using *WebCT*. Notably, for 88% of students it was their first experience of e-learning.

Table 4.2 **Students' Perceptions of e-Learning in Case Study 1**

	1 strongly dis-agree	2 dis-agree	3 neutral	4 agree	5 strongly agree	No response	Mean rating
	Number (%)	Number (%)	Number (%)	Number (%)	Number (%)		
Access information at convenient times	0 (0)	4 (7.4)	0 (0)	6 (11.1)	38 (70.3)	**6**	**4.62**
More autonomy in accessing information	2 (3.7)	2 (3.7)	4 (7.4)	12 (22.2)	26 (48.1)	**8**	**4.26**
Flexibility enables exploration beyond course work	2 (3.7)	0 (0)	12 (22.2)	10 (18.5)	24 (44.4)	**6**	**4.12**
Satisfaction with this learning environment	0 (0)	4 (7.4)	14 (25.9)	14 (25.9)	16 (29.6)	**6**	**3.87**
The technology enhances learning	0 (0)	4 (7.4)	12 (22.2)	18 (33.3)	14 (25.9)	**6**	**3.87**
Confident using technology	0 (0)	4 (7.4)	12 (22.2)	18 (33.3)	12 (22.2)	**8**	**3.82**
Online is a good supplement to classes	0 (0)	4 (7.4)	16 (29.6)	10 (18.5)	16 (29.6)	**8**	**3.82**
Enjoyment in this learning environment	2 (3.7)	6 (11.1)	14 (25.9)	14 (25.9)	8 (14.8)	**10**	**3.45**
Asynchronous interactions allows time to reflect	6 (11.1)	8 (14.8)	10 (18.5)	8 (14.8)	16 (29.6)	**6**	**3.41**

The results outlined in Table 4-2 indicate that students' perceptions of the emancipatory elements of e-learning are overall positive. They found e-learning to be convenient and had autonomy and flexibility in accessing information and going beyond coursework. The qualia elements, while still overall positive were less so than the emancipatory elements, with students tending more towards being neutral about their enjoyment of this e-learning environment. These mixed responses are elaborated upon in the following qualitative comments by the students, where some of the difficulties and frustrations encountered were linked to the technology and the extent to which the technology enhanced or hindered communication and interaction:

- *Lack of nonverbals in the forum leads to misunderstandings and miscommunications*
- *Delays and multiple entries lead to confusion in the chatroom, but with practice this did improve*
- *We need more technical training – short cut tips, more demonstrations and written guidelines*

Hara and Kling (2002) warn that the communicative and technical capabilities required by students should never be understated, and they suggest the introduction of on-line orientation courses for students taking distance courses to help them understand the communicational complexities of asynchronous text-based communication. Linked to this is Poole's (2000) finding that because visual and verbal cues are absent from on-

line learning environments, it is common for groups to develop other ways of expressing their emotions and feelings which could include emoticons (computer keystrokes that resemble things like smiley faces). For Hung and Chen (2001), a facilitating infrastructure is one of the four key dimensions in establishing and sustaining on-line communities, and it would be these difficulties with technology and non-verbal communication that could potentially hinder the effectiveness of an online CoP.

4.3.2.3 Pedagogy — Supporting a CoP Approach

The third theme of data analysis in Case Study 1 relates to the extent to which the e-learning environment supports a CoP approach to learning. This is the third dimension (pedagogy) of the overarching research question that focuses on how the interrelated areas of technology, context and pedagogy influence practice within an e-learning environment. The data in this section has been analysed in terms of the following: (1) students' perceptions of whether the e-learning environment supports a CoP approach; (2) students' postings to see whether the content aligned with a CoP approach; (3) indicators of positive alignment and barriers to alignment with a CoP approach.

Student Perceptions

Table 4.3 shows quantitative data relating to student perceptions of whether the e-learning environment supported a CoP approach.

Table 4.3 **Students' Perceptions of a CoP Approach in Case Study 1**

	1- definitely not valuable	2- not valuable	3 - neutral	4- valuable	5-very valuable	No response	Mean Rating
	Number (%)	Number (%)	Number (%)	Number (%)	Number (%)		
Communicating with course colleagues	0(0)	4 (7.4)	2 (3.7)	10 (18.5)	32 (59.2)	**6**	**4.4**
Staying in touch between meetings	0 (0)	6 (11.1)	2 (3.7)	12 (22.2)	32 (59.2)	**2**	**4.3**
Communicating with course coordinators	0(0)	4 (7.4)	6 (11.1)	12 (22.2)	30 (55.5)	**2**	**4.3**
Gaining an awareness of professional issues	0 (0)	0 (0)	12 (22.2)	16 (29.6)	26(48.1)	**0**	**4.2**
Creating a sense of community	0 (0)	4 (7.4)	4 (7.4)	18 (33.3)	26 (48.1)	**2**	**4.2**
Checking domain understanding	0(0)	0 (0)	14 (25.9)	16 (29.6)	24 (44.4)	**0**	**4.1**
Actively participating in forums	0 (0)	0 (0)	10 (18.5)	22 (40.7)	20 (37.0)	**2**	**4.1**

Table 4.3 shows the extent to which students considered that the environment supported the domain (understanding of issues), community (staying in touch, communicating with co-ordinators and course colleagues) and practice (gaining an awareness of professional issues in the field) elements of a CoP. Results of this section of the survey show that more than half of the students rated all items relating to a CoP approach as valuable or very valuable. This is significant as these items form the key elements that contribute to designing e-learning according to a CoP approach. The usefulness of the domain (co-constructing meaning with others), community (feeling a sense of belonging) and practice (sharing work experiences) elements are reflected in the students' qualitative comments below:

- *It is a quick and wonderful way of staying in touch, getting to know each other, discussing issues, finding common interests, learning about other people's passions*
- *We should have more set group (chat room) tasks, as so much more than sharing of ideas flows from this – bonds are forged and friendships made*
- *I am able to ask for advice from classmates. Able to see and understand classmate's viewpoints and ways of thinking*
- *Getting encouraging emails kept triggering me into action*
- *Learning from others with different types of work experience is valuable*

While the findings relating to students' perceptions about the value of the CoP dimensions were positive, an analysis of the actual content of their postings was completed to see whether the content reflected the perceptions and over what periods of time.

Student Postings – Content Analysis

The content analysis elicited three types of posts — those relating to technology, those about coursework and cases (domain and practice issues) and those dealing with social interaction (community element). The results of the postings according to type and phase can be seen in Table 4.4.

Table 4.4 **Analysis of Discussion Postings by Phase and Type**

	Technical	Course-work (Domain / Practice)	Social (Community)
Initial phase	43%	26%	31%
Middle phase	14%	57%	29%
End phase	0%	70%	30%

In the initial phase, the majority of the 400 postings analysed were technical and the least number of postings were related to course-work. This changed over time where technical postings dropped to 14% in the middle phase and 0% in the end phase. Social postings stayed relatively the same in all three phases and course-work increased over time from being the least in the initial phase to the most in the end phase. These results suggest that students were initially inexperienced with the technology and were still learning about on-line learning. Postings relating to the domain and practice elements of a CoP increased over time, once students felt competent with regard to the technology aspects of communicating on-line. Social postings relating to developing a sense of belonging and supporting each other within a community was consistent throughout.

This analysis of the postings corresponded with Brown's (2001) model of the Time Triangles in Figure 4-8. This model uses a triangle to represent time on certain tasks. For students new to on-line learning, the large base of an upright triangle accounts for the time taken up becoming familiar with the technology, and the small peak at the top represents the limited time available for debating issues. As students become more experienced with technology, the triangle inverts and the peak becomes technology-related time, while the large base of the triangle represents time available for academic content and community building activities. Within this study, the more participants experienced technical difficulties (for example the communication tools of the chat room) the less time they spent on using these tools to interact online and hence the CoP model was compromised.

Figure 4-8: Time triangles

An analysis of the domain and practice postings showed queries relating to course assignments and resources, and notification about conferences and seminars across the country, as well as a significant number of postings that involved information sharing and help with relevant articles and resources. Advice for current case work and projects

was openly shared as the following posting in response to a student's query about her case-work on selective mutism illustrates:

- *I have worked with a six-year-old boy — who was a selective mute. A programme was given to me by (x) working in the communication strand at SES. The programme has been a success. So if you would like me to send you a copy of the programme — then just tell me and I will send it on.*

This highlights the importance of situated learning in strengthening the commonality and interdependence of the community. The issue of shared responsibility emerged, where students started taking some responsibility not just for their own learning but for others' learning too. Thus an 'intellectual collective' emerged within this community where the potential existed for all members to advance their learning through guidance from more capable peers within the zone of proximal development. This reinforces the notion that learning does not occur in isolation, but through involvement with more skilled practitioners and a community of fellow novices and classmates.

Two additional dimensions of the on-line programme in this phase included an on-line responsive feedback buddy (where two students paired up to provide each other with comments on assignments), and a cultural forum debate. Both generated a significant amount of postings and were found to be valuable in terms of both the domain and practice dimensions of the CoP, as indicated by the following student comment:

- *(The buddy system) is a great idea. R and I used a buddy feedback system for the first case study and it was really valuable to get another person's opinion. R would direct my thinking to an area which I hadn't covered, as well as ensuring there were no silly mistakes. Using a buddy also made me feel like I was on the right track with my work.*
- *Cultural competence is an interesting question and one that is very relevant. Our Manager for Maori has presented several lectures related to this at X University. She is a valuable resource person, a local Kuia, and has had many years of experience in education. I will discuss this question with her and bring back her perceptions on this question soon.*

The community dimension postings ranged from motivating others, arranging trips to and from block courses to more deep and personal postings relating to support for such things as a death in the family, a new job or moving home. These again suggest that strong bonds and a sense of belonging can develop within an on-line community as students share joys and sadness, and gain support from one another as they juggle everyday life events with ongoing learning.

- *Glad to hear you're back on board. I can't imagine the pain you're going through concerning (death in the family). Sounds good that you've been with your family - you've got to be surrounded by the ones you love at a time like this. Good luck with all your study you've now launched yourself back into. Take care - kia kaha.*

- *Great news about (new job). It certainly sounds as if you've chosen a new and exciting experience. Grabbing opportunities like changing jobs certainly moves one out of one's comfort zone and gets one all revved up about life all over again. Enjoy.*

- *I found that this has been the most intimate (if I can say that word) extramural class I have ever been involved with.*

Enablers and Barriers to Developing a CoP

The content analysis of the messages coded as coursework (domain and practice) and social (community) were further analysed to focus explicitly on factors indicating good alignment between the technology and a CoP pedagogical approach, and barriers to facilitating a CoP e-learning environment. Two readers coded these messages to ensure inter-rater reliability. Where there were discrepancies (2% of posts) between the raters, messages were discussed until consensus was achieved. The posts were grouped to show factors indicative of facilitating a CoP e-learning environment, and factors which served as barriers to a CoP developing.

For the *community* dimension, the following factors were identified as indicating positive alignment between the technology and development of a CoP pedagogy: getting to know people (through discussion posts) facilitates a sense of contact and involvement; finding out about others decreases the sense of studying in isolation; having people available to trouble shoot with acts as a support network; encouragement online is motivating; contributing (through posting any message) facilitates a sense of belonging. The following factors were indicators of barriers to developing a sense of community: an overwhelming number of posts were too time consuming to read; no responses to posts leave issues unresolved and a sense of being ignored; the limitation of written text does not capture the subtleties of conversation.

For the *domain* dimension, the following were indicators of positive alignment between the technology and development of a CoP: getting information quickly and at a convenient time; resources readily available to access; getting more than one

perspective and a variety of answers; consultation that is readily available. The following were indicators of barriers to domain development: questions were sometimes misunderstood; peer advice is not 'expert' advice, it is not 'supervision'; number of posts is 'information overload'.

For the *practice* dimension, the following were indicators of positive alignment between the technology and development of a CoP: being able to do assignments with others; getting resources and ideas to feed back into everyday work; checking you are on the right track for casework; gaining confidence in working on group projects/casework; giving and getting supervision and advice is mutually beneficial. The following were indicators of barriers to developing competence relating to practice: feeling vulnerable that casework questions, queries are quite public; concern over the distinction between 'peer feedback', 'consultation' and 'supervision'.

This analysis proved useful as it raised factors and issues that I needed to be mindful of when developing Phase 2 of the study. Within each of these dimensions there were indicators of positive alignment between the technology and development of a CoP and barriers, which need to be minimised in order to promote better alignment of technology and the development of a CoP pedagogical approach.

4.3.2.4 Overall Findings for the Teaching Activities and Outcomes

Within the context of teaching activities for Phase 1 of the research, the aim of Case Study 1 was to investigate students' perceptions and experiences concerning the value of using a CoP approach in designing an e-learning environment. The specific focus was on identifying the extent to which the e-learning environment and *WebCT* tools in particular, supported a CoP approach to teaching and learning in the SEEP programme. The participants' perceptions of the effectiveness of the approach and environment were identified using a questionnaire, supported by their comments and an analysis of their actual discussion posts. This analysis of participant experience links to the broader research question within which Case Study 1 is located – namely, how the interrelated areas of technology, pedagogy and context influence practice.

The data from Case Study 1 was analysed in terms of pedagogy (how valuable students found the CoP model for e-learning), the context (e-learning within SEEP) and the technology (*WebCT* tools). The findings showed that in terms of a CoP approach to pedagogy, student's perceptions were overall positive about the value of the dimensions of community (connecting with others), domain (co-constructing meaning around content) and practice (sharing professional case-work). Perceptions of e-learning within the context of the SEEP programme were also positive in terms of it providing convenience, flexibility and autonomy, but there were some barriers to enjoyment due to difficulties regarding the use of the technology and interpreting the affect in communication. In terms of the technology dimension, the most valued online tools for the SEEP participants were those that enabled interaction, debate and dialogue between students. These were perceived to be more valuable than the content sharing tools.

The communication and interaction tools were perceived as being most valuable, yet there was some difficulty in terms of interpreting online communication that does not accommodate non-verbal nuances. Therefore it was concluded that maximising the functionality of interactive tools would be an essential area for the SEEP e-learning environment. The potential of using more than one modality in an online environment to increase a sense of identity and belonging was evident in the positive perceptions of the use of class photos. However, the lack of flexibility within the design features of the *WebCT* environment did not afford the possibility of using multimedia or differentiating tools within and between SEEP programmes. The need for emoticons, photos and other modalities for collaborating and interacting that were intuitive and user-friendly, was identified, but again the technology does not readily permit their use.

The analysis of postings indicated that overcoming technical difficulties and inexperience led to time being taken from interacting around both the domain and community dimensions of the CoP. Given that a CoP design was rated by participants as being valuable, the need to provide initial technical support together with more intuitive tools was identified. The rationale behind this would be to increase competence and confidence in using the technology, thereby maximising postings relating to CoP activities and minimising those taken up with technical queries.

Thus the findings from the analysis of teaching activities and outcomes in this first phase (Case Study 1) suggested that, as the CoP approach was perceived to be valuable by learners within the SEEP programme, changes needed to be made regarding the technology in order to accommodate this CoP model. In order to better align the technology with a CoP approach, it was decided that the following technological changes would be important for the future development of the e-learning environment: more focus on communication tools and less on content transfer tools; use of the tools for shared problem solving and collaboration on a single document; use of pictures and visuals in the communication tools; use of photos to create a sense of belonging; provision of initial technical support to help students understand the communicational complexities of asynchronous text-based communication

It seemed clear from the analysis of student experiences in Phase 1 that there was some misalignment of the technology (which was oriented more towards information transfer) and pedagogy designed around a CoP approach (which is oriented towards social constructionism, collaboration and apprenticeship). This misalignment impacts on the core competencies developed and required through the SEEP programme. It was concluded that investigating alternate technologies could lead to a better alignment of the technology and pedagogy within the context of the SEEP programme. The goal was to shift the e-learning experience from a site designed to facilitate *reading* content to a site designed for *using* content (Feldstein & Masson, 2006) through interaction, debate and group work. This investigation and application is reported in the next chapter as part of Phase 2 (See 5.3).

4.4 PHASE 1: RESEARCH ACTIVITIES AND OUTCOMES

Within Phase 1 there were four *research activities* that linked to both the *learning activities* and *teaching activities* of this phase. As outlined below, these included: two international conference presentations; a session for colleagues within the university as part of the Vice Chancellors symposium; and an e-journal publication. These outcomes were part of the SoTL process of making teaching activities public for critical review and evaluation, as well as for others to use or develop if appropriate. Sharing findings permits others to participate in an ongoing process of 'creating, using and re-mixing' teaching practices and approaches (Brown & Adler, 2008; Huber & Hutchings, 2005).

The research activities and outcomes for Phase 1 are illustrated in Figure 4-9 below.

Research Outcomes for Phase 1:

Mentis, M., & Ryba, K. (2001). *Pushing the boundaries - Creating online learning communities.* Paper presented at the Massey University's Vice Chancellor's Symposium - Online Learning: Meeting the Challenge.

Mentis, M., & Ryba, K. (2001). *Creating authentic on-line communities of professional practice.* Paper presented at the Australian Association for Research in Education (AARE) Annual Conference.

Mentis, M., Ryba, K., & Annan, J. (2002). Creating authentic online communities of professional practice [Electronic Version]. *E-Journal of Instructional Science and Technology, 5* from http://www.usq.edu.au/electpub/e-jist/.

Mentis, M., Ryba, K., & Annan, J. (2002). *Creating online communities of professional practice.* Paper presented at the 4th Annual WebCT User Conference, Boston.

Mentis, M., Annan, J., & Ryba, K. (2003). *Communities of practice as a model for e-learning.* Paper presented at the Tertiary Education Research in New Zealand conference, Massey University, Palmerston North.

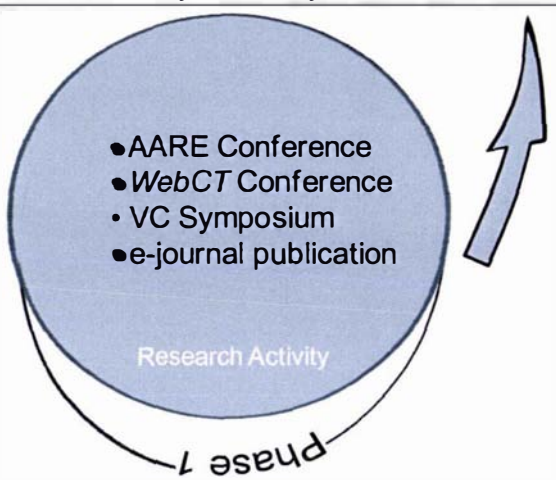


Figure 4-9: The research activities and outcomes of Phase 1

Presenting research activities and outcomes in public forums enhances the quality of the SoTL approach through ensuring that it has trustworthiness (Dadds, 2004). Trustworthiness is achieved to the extent that it is deemed by professionals, peers and experts to have: *credibility* (appropriate and accurate interpretation of the data); *transferability* (rich description that is replicable); *confirmability* (transparent process); and *dependability* (sound data sources) as outlined in section 2.3.4 of this study (Lincoln & Guba, 1985). Similarly, quality is determined through the extent to which the research findings are deemed to have *coherence* (makes sense); *consensus* (consistent interpretations) and *instrumental utility* (usefulness to others) as outlined by

Eisner (1991, cited in Hoepfl, 1997). These issues of quality are open for debate through the public presentations and discussion of research findings.

Consistent with a SOTL approach, the value of the research activities and outputs presented in this section lie in the opportunities they provided for me to collaborate with others, engage in peer review and invite feedback and discussion. Collaborating with experienced colleagues working in the e-learning and CoP area and receiving formative feedback was invaluable in terms of reflecting on my own practice and identifying the direction for Phase 2 SoTL research.

The research presentations were targeted at different audiences in order to invite a range of responses to the Phase 1 study. Research outcomes documenting the CoP approach used in the SEEP e-learning context were presented to practitioners in Australia (AARE conference) and New Zealand (TERNZ conference) thus enabling sharing and feedback on the study outside of the university. A short presentation at Massey University Vice Chancellor's Symposium enabled sharing of practice with colleagues 'at home' in the university. Publication of Phase 1 research in an international e-journal (eJIST) enabled wider critique of the work with an international audience. In terms of the technology dimension, presentation and networking at the international *WebCT* conference enabled discussion of the use of the tools in this study. This conference further provided the opportunity to learn from the research of others what the technology afforded in terms of e-learning approaches. Thus both local and international research activities for Phase 1 provided the opportunity to discuss with a wide range of people the strengths and limitations of the approach and point to ongoing research for Phase 2. The exchange of practice as part of the research activities and outcomes is central to the SoTL approach and provided closure for Phase 1 and a rationale and direction for Phase 2.

4.5 CHAPTER SUMMARY

This chapter reported on Phase 1 of my SoTL research journey which consisted of: (1) the *learning activities and outcomes*, including professional development in the theory and practice of e-learning, developing an online CoP and using *WebCT*; (2) the *teaching activities and outcomes*, including the design, implementation and evaluation of a CoP e-learning approach using *WebCT* in the SEEP programme; and (3) the *research*

activities and outcomes which involved the documentation and presentation of the learning and teaching outcomes for this phase for peer review and evaluation.

Phase 1 findings point to the value of using a CoP approach in e-learning and the importance of aligning the technology to suit the development of the domain, community and practice dimensions of the CoP. In terms of the overall research question of how the interrelated areas of technology, pedagogy and context influence practice, this phase of the research highlighted some tensions. The tensions raised relate to the need for the technology tools to better align with the CoP pedagogy in terms of increasing interaction and communication between learners in all three areas of domain, community and practice. The evaluation of the case study in Phase 1 in this chapter indicated that the SEEP programme was well aligned with a CoP pedagogical approach that involves a social constructionist and ecological orientation, and as such needs a technology that would support this. New advances in technology offer the potential to support this CoP approach (Gee, 2004; Papert, 1993; Quinn, 2005; Salmon, 2002). It is this alignment of a CoP pedagogy with an alternate technology that is the focus of Case Study 2 of Phase 2 in the next chapter.

CHAPTER FIVE:
PHASE 2 OF THE E-LEARNING JOURNEY

Faculty, students, administrators, and campus leaders are the agents of change ... Technologies, tools, and techniques are the instruments the agents have available to enable change in their realm of influence ... Roles, relationships, and perspectives change as the technologies empower the agents in new ways. (Barone, 2003)

5.1 INTRODUCTION AND CHAPTER OVERVIEW

The previous chapter described Phase 1 of the journey through a changing e-learning terrain. It showed that 'the map is not always the territory' when navigating an e-learning programme. It highlighted the perceived value of using a CoP pedagogy in the SEEP programme and exposed some of the difficulties relating to a misalignment of the technology with the pedagogical approach required. The tools used in *WebCT* in the standard format provided did not align easily with a CoP orientation in teaching and learning, and some adaptations were required.

The focus on alignment in Phase 1 links with the question that underpins this overall study, namely:

How do the interrelated areas of technology, pedagogy and context influence practice within a changing e-learning environment?

The focus of Phase 2 was to revisit this broad question and the issues that it raises, using an e-learning technology that purported to better support and align with the particular pedagogical context of the SEEP programmes of study. *Moodle*, the LMS used in this phase was designed to enable a social constructionist pedagogy (Dougiamas, 2007), thus offering the potential for better alignment with the CoP approach of the programmes being taught (see the next section for a detailed description of *Moodle*). With this alignment as the focus, the aim of Phase 2 of the study was to investigate the reciprocal influences of a new online technology and the CoP pedagogy within the context of the SEEP programmes of study.

The format for this chapter is similar to that adapted for Phase 1 and is structured around the three activities of the SoTL described in chapter 3. The outline for this chapter is presented in Figure 5-1 below. (This figure first appeared in chapter 2 as Figure 2-8 as part of the discussion of the overall SoTL research journey. It is repeated here as Figure 5-1 to illustrate discussion on Phase 2 of the study).

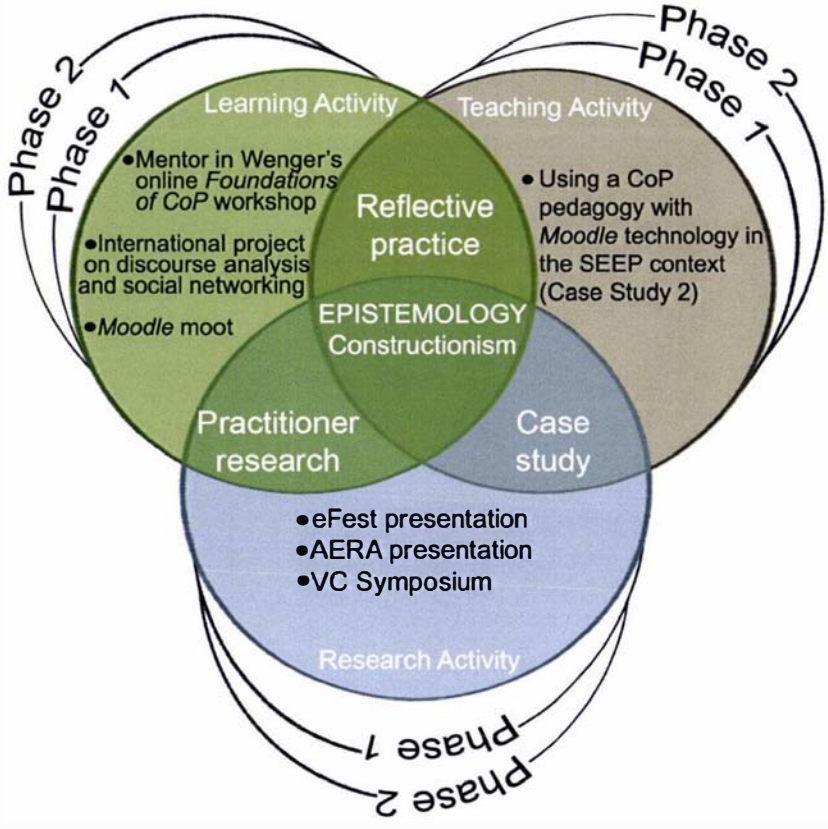


Figure 5-1: Phase 2 of the study

As illustrated in the diagram above, the first section outlines the *learning activities* of Phase 2, which included participation in three professional development activities. This learning focused on gaining a deeper understanding of using an online CoP approach, facilitating interaction between participants online, and designing a e-learning environment using *Moodle*. The insights gained from these learning activities are presented as *learning outcomes* under the themes of context, pedagogy and technology.

The next section outlines my *teaching activities,* which constitute Case Study 2. This focuses on the use of *Moodle* in designing a CoP e-learning approach for the SEEP programme. Background information on the case study is presented, followed by a detailed description of implementation and the issues raised. Data from the participants' feedback as well as analysis of the online activities using the new tools is presented. The findings from this phase again raise tensions and potentials for aligning pedagogy with technology and point the way forward towards a new mode of e-learning that accommodates a flexible approach using e-learning Web 2.0 tools. The insights from both the learning and teaching activities are documented in the publications and presentations of the *research activities* listed in the final part of this chapter.

5.2 PHASE 2: LEARNING ACTIVITIES AND OUTCOMES

There were three significant learning activities that occurred during Phase 2: (1) an invitation to return as a mentor in Etienne Wenger's international online *Foundations of Communities of Practice* workshop; (2) collaboration in an international research team focusing on discourse analysis and social network analysis of participants in an online CoP; and (3) participation at the *Moodle* Moot. My learning outcomes for Phase 2 involved the exploration of the context, technology and pedagogy dimensions of designing the SEEP e-learning environment. These learning activities and outcomes are represented in Figure 5-2 below.

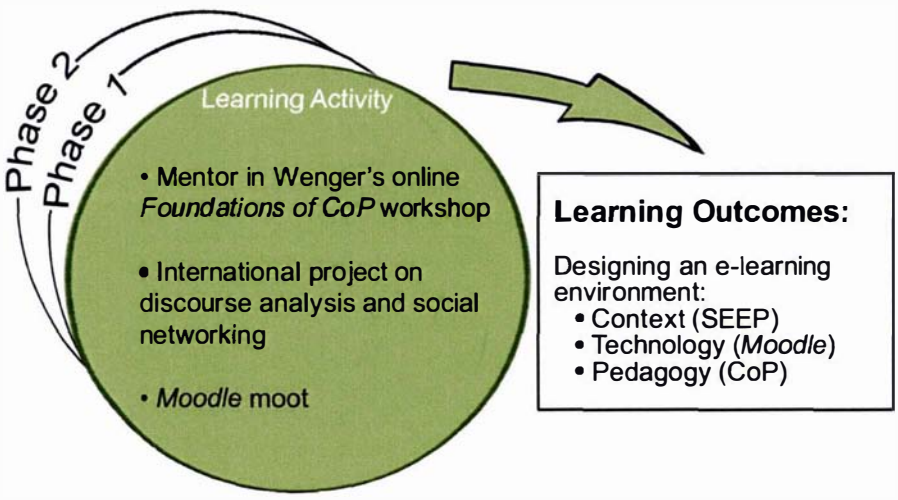


Figure 5-2: The learning activities and outcomes of Phase 2

5.2.1 Learning Activities in Phase 2

A significant form of professional development was made possible through being an invited mentor within Etienne Wenger's *Foundations of Communities of Practice* workshop [http://www.cpsquare.org/edu/foundations/]. As outlined in Phase 1, this is an international online workshop for practitioners working in the field of CoP development. As this was my second year of participating in this online community, I was able to experience, analyse and question the processes of designing and regulating an online CoP.

As detailed in chapter four, the workshop design included the social dimension of the *community*, the content or theory of the *domain,* and the application to *practice.* Participants initially engaged in socialisation online (community), then contributed to discussions hosted by Etienne Wenger as the 'thought leader' (domain) and then chose to join various groups where they shared scenarios, solved problems together and worked on projects (practice). Participants returned to the domain discussion forums to share insights gained and concluded the workshop in social activity and networking. Thus the workshop balanced the theoretical, practical and social aspects of learning about community by immersing the participants in an online CoP environment. As one of the mentors, I was able to observe the development and engagement of participants in the various aspects of the workshop. This provided great insight into both the products and the process of a well-designed online CoP, which I was able to carry over to my teaching practice as outlined in Case Study 2 below.

A second learning activity for me that arose out of my involvement with the *Foundations of Communities of Practice* workshop was collaboration with others in research on discourse analysis and social network analysis of the participants in the foundations workshop. The aim of this research was to analyse both the discourse within the domain activities and the various roles participants would adopt in discussing domain topics (Thomson et al., 2005). An analysis of both participant roles and the tools for discourse analysis provided insights that were invaluable for my own practice. Reflecting on how participants use different roles in different online contexts and

comparing different discourse analysis tools, highlighted for me the importance of matching tool for purpose.

The different roles that were identified, described and analysed in the research included: legitimate peripheral participant, active participant, facilitator, mentor, and thought leader (Thomson et al., 2005). Understanding these different roles of participants in online discussion forums enabled better facilitation of learning forums in my own teaching environment. The different models of discourse and content analysis that were reviewed as part of the workshop research included: Gunawardena, Lowe, and Anderson's five phase constructionist model; Henri's five dimensions model; Garrison's five stage critical thinking model; Mason's indicators of critical thinking; and Brookfield's five-phase model of critical thinking of adult education (Thomson et al., 2005). A comparison of these models provided the necessary background learning to select an appropriate tool for the content analysis within my teaching practice as described in Case Study 2. As indicated in the workshop research, there are "different horses for different discourses" (Thomson et al., 2005, p. 8). My learning activity within the SoTL approach used in this phase aimed to get a broad overview and practical understanding of the various models, to inform my choice of content analysis tool for the teaching activity of this phase.

A related outcome of the *Foundations of Communities of Practice* workshop that contributed to the current study was the investigation of the potential value of participants being aware of the analysis of their discourse for self-reflection. It was found in the workshop research that providing information as formative feedback to participants about the analysis of their posts enhanced meaningful learning. This approach was then used in my teaching activities in Phase 2 of the current study, where both summative and formative feedback was given to students about their posts, with the intention of enhancing their discussion and facilitating a more meaningful learning experience. This is detailed in Case Study 2 in the next section.

The third learning activity within Phase 2 was participation at the *Moodle* Moot where I was able to network with other practitioners who use *Moodle*, debate various approaches using *Moodle*, discuss implementation issues and gain advice from

experienced e-learning designers. These skills enabled me to design and develop a *Moodle* CoP learning environment for the SEEP programme of study as outlined below.

5.2.2 Learning Outcomes in Phase 2

The insights gained and issues raised from the learning activities outlined above, coupled with a continued literature review, contributed to my growing understanding of the three dimensions of designing an e-learning environment: (1) context — e-learning for the SEEP study programmes; (2) technology — using *Moodle* as a LMS; and (3) pedagogy — using a CoP approach. These constitute the *learning outcomes* for Phase 2 and will be explored in the next sections.

5.2.2.1 Context — The SEEP Study Programmes

As Feldstein and Masson (2006) argue, it goes without saying that not all classrooms in the physical world look the same. An environment that is appropriate for teaching physics is set up differently from one designed to teach art history. While most of the time the affordances that different spaces offer are taken for granted, they are critical factors for teaching and learning. They go on to point out that the situation is starkly different in most virtual learning spaces where the typical LMS provides an environment that is fairly generic. "Our virtual classrooms may be getting smarter, but they are still pretty much one-size-fits-all. They aren't especially tailored to teach particular subjects to particular students in a particular way" (Feldstein & Masson, 2006, p. 22).

The rationale for using an alternative LMS in Phase 2 was based on the need to metaphorically 'unbolt the chairs' of the generic virtual classroom and find a good fit between the LMS and the teaching programme. The context of the SEEP programme required a shift from a 'one-size-fits-all' environment to a more situated and authentic approach using a CoP framework. The danger of a 'one-size-fits-all' LMS is misalignment between the tools, teaching approaches, and the context of the learning environment. According to Milne (2007), some LMSs are better suited to a teaching approach that focuses on a transmission model of content consumption. Here the tools are used for content delivery and student learning is assessed through online quizzing

and related forms of assessment which measure the accuracy in reproducing the delivered content. The tools used in the Phase 1 case study of my teaching activities set up some barriers to moving beyond content consumption and creating a learning environment where meaning is co-constructed through students' active engagement in problem solving, debating, collaborating and sharing research.

The underlying competency domains of the SEEP programme include dimensions such as collaborative consultation, programme evaluation, reflective and ethical practice, and understanding school organisations and systems (see Appendix E). These competencies require students to be able to interact with each other, collaborate on shared documents, problem solve cases together, debate ethical issues and conceptualise problems within an ecological systems level framework.

An ecological approach, based on the theories of Bronfenbrenner (1979), requires practitioners to focus on more than just the individual 'problem' and to locate the individual within a context of intersecting systems. In this approach, it is the role of the practitioner to bring their professional knowledge to any given situation in order to co-construct meaning with others given the multiple layers and perspectives that might impact on the situation. This shift from a historically decontextualised and individualised way of practising to an ecological approach that acknowledges the complexities of analysing systems in consultation with others, is consistent with the theories and practices of special education and educational psychology in New Zealand (Ryba, Annan, & Mentis, 2001). The SEEP programme is designed around this ecological perspective and as such requires a teaching and learning environment that supports interaction, co-construction of meaning, debate and sharing of resources.

My experience in the *Foundations of Communities of Practice* workshop reinforced the view that a CoP approach to pedagogy could support a programme located within an ecological and social constructionist context. The three CoP dimensions of domain (theory), community (social interaction) and practice (application) enable the co-construction of meaning through collaboration in practice. This ensures that practice is well situated within specific contexts, is dynamic, flexible and multi-dimensional. The challenge lay in 'unbolting the chairs' of the virtual classroom and finding the right

technology to align with this context and pedagogy. This process is outlined in the next section.

5.2.2.2 Technology — Using Moodle as a LMS

My participation in the *Moodle* Moot as part of the learning activity of the SoTL led to the decision to adopt *Moodle* as the LMS for creating a CoP in this Phase. The justification for using *Moodle* was based on three sources: (1) comparative studies of LMSs; (2) the widespread adoption of *Moodle* at other tertiary institutions and the open source option; and (3) the overall design of *Moodle*, based on a social constructionist approach. These are outlined below.

Comparative Studies

There are numerous comparative studies between LMSs. Findings from these comparisons informed the decision to select *Moodle* for Phase 2 of this research. Specific and detailed comparisons of *WebCT* and *Moodle* LMS are available from a variety of sources including: such as Edu-tools, which compares various LMSs according to selected criteria ("EduTools,"); the evaluation tool, generated by the Commonwealth of Learning (CoL) ("LMS Evaluation Tool User Guide,"); and the feature comparison by Cole (2005), who contrasts the commercial systems of *Blackboard* and *WebCT* with *Moodle* and shows how in a feature-for-feature comparison *Moodle* has all the tools of *WebCT,* but in addition has reflective and collaborative tools such as self-assessment and peer assessment features, journals, wikis and glossaries. *Moodle* fares particularly well in studies comparing open source LMSs both internationally (Graf & Beate, 2002) and within New Zealand, as evidenced in the New Zealand Open Source Virtual Learning Environment (NZOSVLE) project ("NZ Open Source VLE Project,"). The aim of the NZOSVLE project was to research, evaluate and then select an open source learning management system that was comparable with proprietary systems. The project selected *Moodle* as the core virtual learning environment after technical and pedagogical evaluation of a number of open source systems. As stated in the evaluation report:

> Educational institutions need more flexibility and control over their e-learning environments to enable different schools, programmes, courses, or instructors to select and deploy the most appropriate e-learning tools suited to the pedagogy. Interoperability standards and modular, extendable architectures hold the

> promise of delivering the desired flexibility and ensuring greater future proofing in a technology environment that is fast evolving. (Wyles, 2004, para. 9)

Adoption of *Moodle* and Open Source Software at Other Tertiary Institutions

Open source means that there are no licensing costs and that the software is available for modification by users and developers. The open source ethos of *Moodle* ensures ongoing innovation and development, as well as increasing robustness and scalability. *Moodle* has a large and active global developer community who are both using the system, and developing new features and enhancements. These are accessible continually on the Moodle.org site, along with advice for new users and developers. According to Cole (2005), the "three advantages — open source, social constructionism, and community - make *Moodle* unique in the LMS space" (p. 6).

A number of distance education providers have changed and selected *Moodle* as their LMS – for example the Open University in the UK with over 180,000 online students and more recently Athabasca University in Canada (also known as Canada's Open University). The adoption of *Moodle* by these large universities and the open source nature of the software has implications for all *Moodle* users. As indicated in the Open University report, the development of *Moodle* applications, along with involvement of the *Moodle* open source community was seen as "giving our students a great advantage in e-learning. Plus, the innovations added by the OU will be available to the entire *Moodle* community. It's a two-way creative street", (eGovmonitor, Nov, 2005). Martin Dougiamas, the *Moodle* founder and lead developer responded:

> By joining our community [the OU] are recognising the great value of the open source paradigm and the power of a social constructionist approach to both learning and development. At the same time, as one of the largest, oldest and most respected practitioners of distance education in the world they bring resources and experience that will give *Moodle* development a tremendous boost in the coming years. (eGovmonitor, Nov, 2005, para 6)

Selection of *Moodle* by Athabasca University was based on it being open source but offering the same tools as commercial software and also being intuitive for students to use. Dr. Derek Briton, of the *Moodle* evaluation committee, indicated that *Moodle*'s

great strength was "that it provides all the functionality and features of sophisticated, expensive, learning management systems, but it has a user-friendly, intuitive interface that requires only a gentle learning curve (and) student reviews of *Moodle* were exceedingly positive" (Athabasca News Room, March 2006, para. 3)

Moodle has been evolving since 1999 and currently (August 2007) there are 23,151 registered *Moodle* sites from 173 countries, in over 70 languages (see http://*Moodle*.org/sites/) – including Maori. New Zealand has over 100 sites listed including universities, polytechnics and schools.

Moodle design

As outlined in chapter 3, *Moodle* (an acronym for Modular Object-Oriented Dynamic Learning Environment) was designed by Martin Dougiamas, a former *WebCT* administrator at Curtin University with postgraduate degrees in Computer Science and Education. He developed it as a tool for improving processes within communities of reflective inquiry (Dougiamas & Taylor, 2003). It is a free, open source software package based on social constructionist pedagogy, that enables educators to create effective online learning communities. Most LMSs are built around tool sets (not pedagogy) and most commercial systems are tool-centred. *Moodle* is learning-centred, based on the social constructionist view that learning is best facilitated when students are actively involved in the social process of constructing knowledge.

Moodle's social constructionist learning design differs from other e-learning systems as follows:

> The first indication is in the interface. While tool-centric CMS systems give you a list of tools as the interface, *Moodle* builds the tools into an interface that makes the learning task central. You can organize your *Moodle* course by week, by topic, or by a social arrangement. Additionally, while other CMSs support a content model that encourages instructors to upload a lot of static content, *Moodle* focuses on tools for discussion and sharing artifacts. So the focus isn't on delivering information, it's on sharing ideas and engaging in the construction of knowledge. *Moodle*'s design philosophy makes this a uniquely teacher-friendly package that represents the first generation of educational tools that are truly useful. (Cole, 2005, p. 5)

Dougiamas (2007) explains his design of *Moodle* as being one that promotes 'constructed behaviour' in online discussion forums. Constructed behaviour as he sees it is the middle road between 'separate' and 'connected' behaviour as follows:

> Separate behaviour is when someone tries to remain 'objective' and 'factual', and tends to defend their own ideas using logic to find holes in their opponent's ideas. Connected behaviour is a more empathic approach that accepts subjectivity, trying to listen and ask questions in an effort to understand the other point of view. Constructed behaviour is when a person is sensitive to both of these approaches and is able to choose either of them as appropriate to the current situation. In general, a healthy amount of connected behaviour within an online learning community is a very powerful stimulant for learning by bringing people closer together and promoting deeper reflection and re-examination of their existing beliefs. (Dougiamas, 2007, para.4)

The flexibility within *Moodle*, the ongoing development and innovation in the global developer community, and the flexibility afforded to individual designers all enabled adaptations of the technology to fit pedagogy, as outlined below.

5.2.2.3 Pedagogy — A CoP Approach

Involvement in the *Foundations of Communities of Practice* workshop, as part of my learning activities, provided the knowledge and experience necessary to design the online CoP for this phase of the research. Care was taken to integrate the theoretical (domain), practical (practice) and social (community) elements of the CoP. This was done by using the social constructionist tools that *Moodle* offered as well as the overall site design between and within courses.

The structure followed the Wenger workshop design in terms of the shift in focus. Initially the focus was on *community* development in the initial face-to-face block course. This progressed to a *domain* focus through interaction in the forums and on to a *practice* focus through group and individual project assignments out in the field. The focus finally shifted back to the *domain* through personal and community reflection on insights gained on domain issues in individual journals and forums.

The SEEP programme progressed through three stages— from the foundation stage of the postgraduate special education papers, on to the professional stage of the Masters in educational psychology and finally on to the internship stage of intern psychologists. Participants in all three stages of the programme could interact, communicate and share resources in the *community* section of the site. The individual papers for each stages had their *private paper* spaces, which other groups could not access. The progression

through the stages and the shared *community /home* space are represented as an unfolding spiral that appears on the homepage as follows:

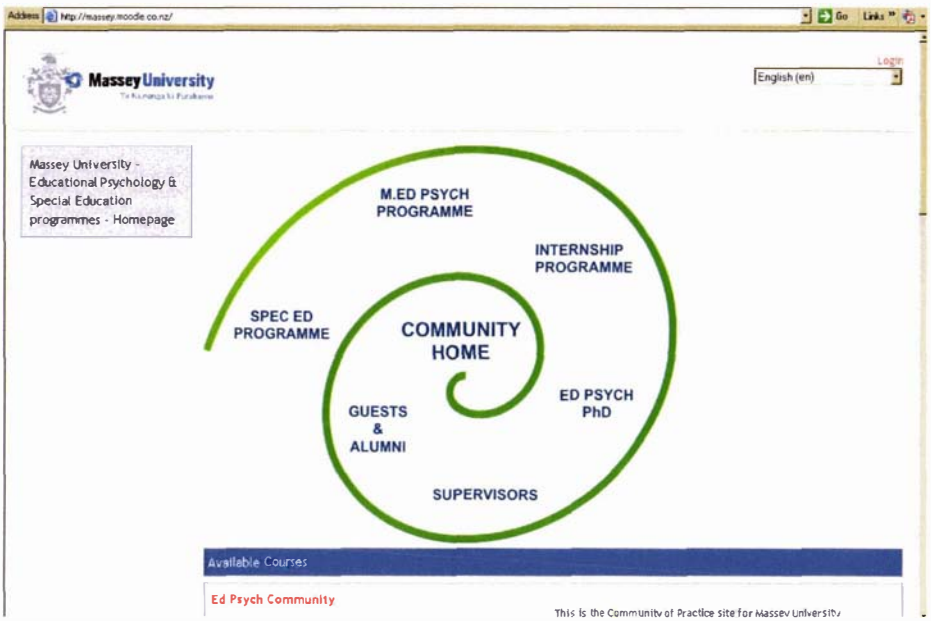


Figure 5-3: The *Moodle* homepage for the SEEP e-learning environment

Within each year *Moodle* tools were used in a way that would facilitate the CoP approach — where *domain* issues focused on knowledge creation and information sharing; *community* issues on interconnecting, socialising and networking; and *practice* issues on the application of knowledge, problem solving and collaborating within authentic real-world work contexts. The CoP approach was facilitated through the course layout, the use of specific tools and the structuring of the courses as follows:

Course Layout

The *topic layout* was used for each programme site where different 'blocks' (or modular object-oriented learning areas) were selected by individual lecturers according to programme needs as follows:

- *Special Ed* (the foundation stage) was designed around the themes and assignments in the course (number of full time and part-time staff involved = 4),
- *MEdPsych* (the professional stage) was designed around the on-campus sessions (number of staff involved = 3),
- *internship* (final stage of the SEEP programme) was designed for resource and information sharing (number of staff involved = 3).

- *community sites* (all the above including supervisors of interns and invited guests and 'experts') was designed for resource and information sharing

Blocks were added, updated or deleted as needed by lecturers who all had designer access. All sites were shared by all lecturers promoting team-teaching and discussion around course development, design and content. There was core consistency in logos and overall design, but individual paper flexibility in choice of tools and blocks. This differed from the use of technology in Phase 1 which only enabled a design around course tools and content management and did not allow teachers to manipulate blocks or align the structure of the e-learning environment to fit the course structure or the CoP approach. In the Phase 1 case study, the technology determined the learning design. In this phase, the site was aligned with the themes of courses thus using technology to support learning.

Moodle Tools

The Moodle tools can be grouped into four areas: participant, communication, activities, and resources. Each of these was used to support a CoP approach to pedagogy as follows:

Participant tools:

 Profiles  Groups 

Online users

- The *Profiles* tool in Moodle allowed for photographs of all participants and short CVs to be created with links to personal pictures or websites that could be easily updated. The photos of participants then appeared in all postings thus facilitating a visual, personal connection to each posted message within the discussion forums. The participants' profile pages became a 'Yellow Pages' for all groups. This facilitated the *community* dimension of the CoP.
- 'Online-user' information is the facility to see who is online at any given time. This allowed for a sense of synchronous connectivity enabling instant messaging between participants. It encouraged interaction and networking within the *community* dimension.
- Logs of student activity enabled a detailed record of participation to be used for both formative and summative feedback, thus identifying any difficulties the student

might be having and enabling student progress to be monitored. Logs facilitated the *domain* dimension where teaching was tailored to meet individual student needs.

This differed from Phase 1 technology which did not allow for photos on posts, did not provide individual logs of student activity and did not have the login-as-student feature. While student homepages were made available in Phase 1, participants did not use them.

Communication Tools:

 Forums  Chat room 

Messages 

News

- Discussion forum options that were used included 'teacher-led', 'student-led' and 'general'. The 'teacher-led' forums were primarily topics initiated by teachers around *domain* issues, 'student-led' forums simulated personal blogs; and 'general' facilitated co-construction of *domain* and *practice* knowledge with topics introduced by 'experienced' as well as 'novice' participants in the community.
- The subscription feature ensured that students were alerted by email as soon as new posts occurred which they accessed from their email update, and latest news gave them an update of past activity (facilitating connection to the *community*).
- The peer rating and comments facility on the forums enabled them to be constructed as assignments where peers could provide both quantitative ratings and qualitative comments as formative and summative feedback, thus facilitating co-construction of meaning and enhanced *domain* discussion.

This differed from Phase 1 technology which did not have features for 'latest news', html editing, instant messaging or ratings of forums by teacher or students.

Activity Tools:

 Assignment  Journal  Wiki  Quiz ? Choice

- Assignments were linked to students' everyday practice in their authentic work context and, with permission these were made available for other students to view and were loaded into an alumni database. This integrated the *practice* dimension

with the *community* and *domain* dimension of sharing knowledge that is applied in the field with others in the community. Thus shared resources developed over time for alumni to use.

- Journals were used in the foundation level for reflection on practice. Ongoing formative feedback was given to students by a more experienced practitioner in the field, which strengthened the *domain* dimension through interaction between novice and experience practitioner.
- Wikis were used for a collaborative group project whereby students were able to work on the same document, thus co-constructing meaning. All groups had access to the other groups' projects, thus again sharing resources as part of the *domain, practice* and *community* dimensions.
- A class poll, quiz and 'choice' tool was used for students to voice their opinions, vote on and compare ideas around controversial topics and ethical issues, thus strengthening the *domain* dimension of deep learning.

This differed from Phase 1 technology which did not have collaborative tools such as wikis, journals or 'choice' tools and did not allow for peer rating of these tools.

Resource Tools:

 Glossary  Resources  Calendar

- The glossary tool allows participants to create and maintain a list of definitions, like a dictionary. This can be searched or browsed as well as peer rated. It was used in this phase as an assignment tool whereby students each contributed an entry to build up a glossary of domain terms. These were peer and lecturer rated with comments added, thus enabling ongoing discussion linked to the entry (facilitating *domain* and *community* dimensions of co-constructing and sharing of resources)
- Resource links (text pages, web pages) were made to various Massey University websites (for example, research ethics, the library, student accommodation, APA referencing sites, academic writing site, student services etc) and outside organisations (for example, the New Zealand Psychological Society, inclusive education organisations) as well as links to useful journals, past projects and the educational psychology test library for ordering tests online (facilitating closer links

to the real world *community* of educational psychology and special education *practice*)

- Calendar — block course details and interesting conferences were noted on the shared calendar as well as a fun cartoon of the week on special education issues (facilitating individual and *community* planning)

This again differed from Phase 1 technology which did not have the collaborative glossary tool or the range of options in the resource tool. This limited the extent to which a CoP pedagogical approach could be designed online.

Course Structure

In addition to the course layout and specific *Moodle* tools outlined above, the structure of each course was individually designed to be used in a particular way that facilitated a CoP pedagogy. For example, the course on *Assessment and Individualised Programme Planning* involved four topics designed to facilitate within the domain dimension a shift from conceptual/declarative knowledge to performance/procedural knowledge and then to metacognitive, reflective knowledge (Feuerstein, 1980; Sternberg, 2003) as follows:

Topic One: "Knowing about"

The first domain topic and related practice assignment was called "Knowing about Assessment". Within this topic, students were required to individually research topics and post glossary entries (conceptual/declarative knowledge). They were then required to add to, and commented on, each other's entries, linking this to their practice. In this way the glossary became a dynamic and shared class resource, which was authentically situated within the students' professional contexts. Each entry become a springboard for ongoing discussion and debate and was opened to the wider community for comment, thus co-constructing meaning around the domain of practice

Topic Two: "Interacting & debating"

The second domain topic and related practice assignment was called "Interacting: Assessing Assessment". This topic required more abstract cognitive levels of comprehension, analysis and synthesis and was linked to the CoP dimension of *community*. The task set for this level was to use the wiki collaborative authoring tool to work in groups to evaluate an aspect of the course that required an understanding of

the ethical issues involved. Students were required in their groups to think critically, debate the issues and support their answers with reference to the literature. Each member could continually add to the same group document, expand and/or change the content. Old versions were never deleted and could be restored if needed. Once completed, the group assignments were again made open to the whole class to benefit from the shared resource (co-constructing within the domain of practice and community sharing).

Topic Three: "Applying in Practice"

The third domain topic and related practice assignment was called "Applying: Assessment in Practice". This topic required performance/procedural knowledge and was integrated with the CoP principle of *practice*. The assignment required students to put theory into practice through a research project within their regular work environment in schools as practicing teachers, RTLBs (Resource Teachers of Learning and Behaviour), support workers or TAs (Teacher Aides). This assignment involved authentic and situated learning (Barab, Squire, & Dueber, 2000; Lave, 1993; Lave & Wenger, 1991) and built on the previous two topics/levels of co-constructing meaning around the knowledge domain.

Topic Four: "Reflecting on Practice"

The final domain topic and related practice assignment was called "Reflecting on Assessment". This topic required meta-cognition (thinking about thinking, reflecting on practice) and was integrated with the CoP principle of identity development. This assignment encouraged the shift from peripheral to central participation in the CoP where students reflected in their online journals on their learning goals and achievements and attached artefacts to support their reflections. Through this self-reflection students commented on their roles within the CoP and outlined their professional development plan for future learning. This served as a kind of e-portfolio for students where they could self assess, plan and monitor their professional practice.

This structure of the special education paper on assessment was presented online in the *Moodle* topic blocks as illustrated in Figure 5-4.

Figure 5-4: The course page for the special education paper

This section has shown how the personal insights gained from the SoTL *learning activities* of participating in workshops and engaging in ongoing research on CoPs and *Moodle* resulted in the *learning outcomes* that contributed to the exploration of the context, technology and pedagogy dimension of designing an e-learning environment. The context involved a re-investigation of the SEEP programme, the technology involved using *Moodle* as the LMS, and the pedagogy involved using a CoP approach. This leads on to the next section which involves the evaluation of the use of *Moodle* as the technology to facilitate a CoP pedagogy within the context of the SEEP programmes. This involves Case Study 2 in the *teaching activity*, which is explored in the next section.

5.3 PHASE 2: TEACHING ACTIVITIES AND OUTCOMES

This section outlines the teaching activities that form the case study for Phase 2 of the research. This evaluates the use of a CoP pedagogical approach using *Moodle* within the SEEP programme of study. The data collection used in documenting the participants' experiences and perceptions within Case Study 2 is described. An analysis of this data constitutes the *teaching outcomes* for this phase. As in the previous chapters, these are grouped into three themes which focus on: (1) the context — e-learning experiences in the SEEP Case Study 2; (2) technology — *Moodle* evaluation; and (3) Pedagogy — CoP issues of domain, community and practice. These themes help represent the Phase 2 response to the overall research question of how the interrelated areas of technology, pedagogy and context influence practice within an e-learning environment (Figure 5-5 below). This is followed by a discussion of the findings together with conclusions and recommendations for Phase 3.

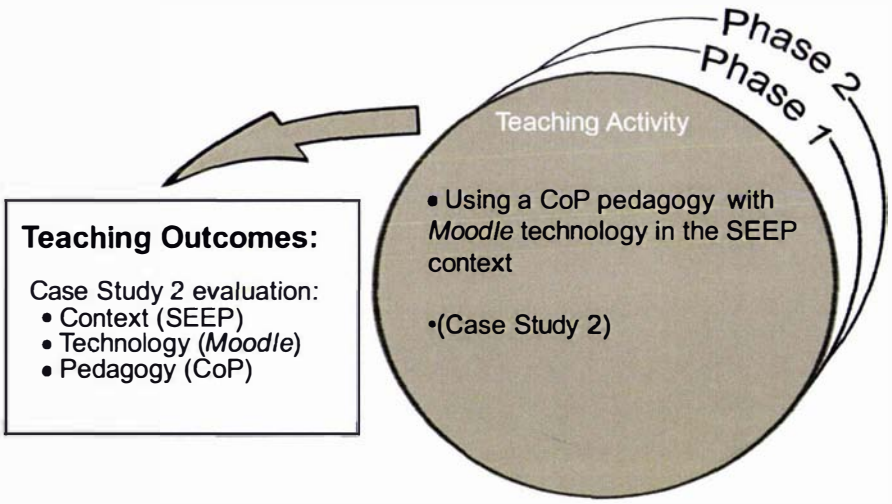


Figure 5-5: The teaching activities and outcomes of Phase 2

5.3.1 Teaching Activity — Case Study 2

Aim of Case Study 2

The focus of the teaching activity in Phase 2 was to evaluate the use of an alternate technology that had the potential to support a social constructionist approach to e-learning and allow more flexibility in aligning with a CoP orientation of the teaching

programmes. Rather than trying to force a fit, as in Case Study 1, there was an intentional shift from a technology which constrained pedagogy to a technology that purported to afford a specific pedagogical approach. This pedagogical approach involved active interaction on the part of the students. The model of e-learning where content, produced by publishers, is organized and structured into courses, and consumed by students, is turned on its head where, as Feldstein and Masson (2006) describe, "insofar as there is content, it is used rather than read" (p. 22). A social constructionist approach, which allowed for content to be 'used' rather than 'read', was seen to be consistent with the CoP orientation within the SEEP programme.

Participants in Case Study 2

As outlined in Phase 1, the SEEP programme progresses from the foundation year — PGDipEd(Special Ed) into the professional year — MEdPsych and then the internship year — PGCertEdPsych, with student numbers decreasing over the three levels. The number of students and levels of use of the e-learning environment differed across these years according to Massey's approach of web-enhanced, web- supported and web-based e-learning as follows: (1) In the foundation year the two **special education** compulsory papers are web-based. All but one of the 52 students in this group volunteered to be participants in the Case Study 2 research; (2) The ***MEdPsych*** programme is web-based with *compulsory* participation and *some* course-work, assignments and communication online. The full cohort of 25 students in this programme volunteered to be included in the research; (3) The **internship** year is web-supported with *compulsory* participation for class participation but no assignments online. The full cohort of 21 students in this programme volunteered to be participants in Case Study 2; (4) The **alumni, supervisors and guests** involvement is web-enhanced with voluntary participation for resource sharing and discussion. It comprised 165 members, made up of current students, past students, supervisors and guests. Only the online activity was recorded for this group.

Data Collection

The data collected in Case Study 2 enabled both a quantitative and qualitative analysis. Data from multiple sources was collected ensuring triangulation. These sources included the following:

- *Student questionnaires* (see Appendix F for the Student Questionnaire) A revised version of this Phase 1 questionnaire was used with the tools changed on the questionnaire to reflect the changes from *WebCT* to *Moodle*. The questionnaire was posted online for students to answer on completion of the programme. Completion of the questionnaire was voluntary and anonymous. The questionnaire was designed to elicit students' quantitative and qualitative responses to the pedagogy and technology of using the *Moodle* LMS to facilitate an online CoP.

- *Programme co-ordinators and lecturer feedback.* All four academic staff involved in co-ordinating and teaching in the SEEP programmes, excluding the researcher, provided written reflective feedback on their experiences. As all staff had experience of working with different LMSs and had a theoretical understanding of the CoP approach, feedback from them was designed to elicit their perceptions of both pedagogy and technology. This was based on open-ended questions (see Appendix G for the staff questionnaire for Phase 2).

- *Discussion Forum responses.* Students' responses from all discussion forums were archived for analysis on completion of the programme. These included general discussion threads in both the community and class forums – where posts were self-initiated and voluntary as well as assignment discussion threads that were compulsory and structured for grading purposes. A distinct advantage of using archived transcripts for case study research is that it reduces participants' reactions to the presence of the researcher (Lee, Carter-Wells, Glaeser, Ivers & Street, 2006).

- *Students' journal records.* Students were required to record their reflections in their online journals throughout the year. At the entry level of the special education programme this involved setting learning goals and reflecting on these as the programme continued. In the educational psychology papers this involved designing a professional development plan. These reflections were archived for analysis on completion of the programme.

- *Online activity.* Student participation in class and community courses was logged. This data set included differentiating between online activity consisting of both student hits (reading discussions and accessing information or resources) and posts

(contributing to discussions and uploading resources). Online participation was monitored over a six month period to provide a snap-shot of interactivity and use of the site across the different pedagogical components of the programme.

5.3.2 Teaching Outcomes — Case Study 2 Evaluation

The conceptual framework for the analysis of the data was the alignment of pedagogy with technology within an online CoP. The data used in the analysis consisted of student feedback, academic staff feedback, online activity and discussion posting analysis. The student and academic staff feedback was gathered via a voluntary anonymous evaluation questionnaire on completion of the course and had a return rate for the three programmes as follows: special education (72%); educational psychology (60%); and internship (81%). All academic staff provided feedback. All data was analysed in a similar way to Case Study 1 in terms of the same three themes: (1) context — students' experience of e-learning in the SEEP programme; (2) technology — the value of the *Moodle* tools; and (3) pedagogy — developing an online CoP with respect to the three elements of domain, community and practice.

5.3.2.1 Context — The SEEP Programme Evaluation

The student questionnaire (see Appendix F) provided both quantitative and qualitative data on students' prior experience of working online, level of expertise with e-learning, use of computers and the technical adequacy of their computers. Students who had experience of e-learning, using different LMSs were in addition asked to compare these and provide overall general feedback regarding issues of autonomy, flexibility and accessibility in using this site. Some questions called for yes/no or true/false responses (for example, is this your first experience of studying online?) and some questions used a rating scale from very useful to not at all useful (for example, how useful was this online learning environment in terms of facilitating efficient and convenient communication with the course coordinators?).

Initial analysis of the data indicated overall positive findings, and hence a secondary analyses was done to summarise the presentation by grouping all positive ratings ('yes',

'useful' and 'very useful' responses) and all negative, neutral or no responses. The percentages for each of these two groups are presented in Table 5.1 below.

Table 5.1 **Students' Experiences of e-Learning in Case Study 2**

Student responses relating to e-learning, computer use, *Moodle*	**Spec Ed**		***MEdPsych***		**Intern**	
	Percent positive rating	*Percent negative neutral or no response*	*Percent positive rating*	*Percent negative neutral or no response*	*Percent positive rating*	*Percent negative neutral or no response*
• Students who had prior experience of studying online	61	39	60	40	100	0
• Students' perceptions of their level of expertise in using computers to support their learning	90	10	100	0	100	0
• Adequacy of students' computer facilities and Internet speed to support their learning	80	20	100	0	100	0
• Students' who have used a different LMS than *Moodle* in previous or current study	66	34	80	20	100	0
• Preference for using *Moodle* over *WebCT* among students who were able to compare	100	0	90	10	90	10
• Students wanting to continue to be part of the e-learning community after completion of their course	83	17	90	10	89	11
• Students who found the e-learning site to be efficient and convenient in communicating with lecturers	100	0	90	10	90	10
• Students who found the e-learning site useful in terms of autonomy and flexibility of learning (anytime-anywhere)	90	10	100	0	88	12

The data shows that students across all programmes felt confident and competent in e-learning within *Moodle*. The majority had prior experience of working online, were positive about both their expertise in using computers and their computer facilities to support their learning. Thus the technical aspect of e-learning did not pose any difficulties. The qualitative comments, however, showed that this sense of competence grew over time as these comments suggest:

- *It is really interesting to me that, at the start of the paper, I was wishing there was no e-learning content and that we simply had hard copies of materials. Now, I genuinely wish that all my papers were like this. (SpecEd)*

- *I found it to be a steep learning curve - many 'firsts' for me - first time for online learning, first teaching project, first postgraduate course! There were some pressured times but I am sure that it was the support created by the collaborative online learning environment that got me through the tough parts. (SpecEd)*

For students who were in a position to compare, there was a marked preference for using *Moodle* as opposed to any other LMSs or distance learning approaches they had used in previous years or were currently using in other papers. This is evident in these comments:

- *I have done WebCT and web supported courses before and found them unsatisfactory. An extra-mural for 23 years, it has been a long lonely road, with only vacation courses to look forward to for that feeling of community.... but this e-community of practice is a far superior way of bringing teaching, learning and supporting learners together in a real "virtual" community. (MEdPsych)*
- *I found Moodle useful and user friendly. Technology often has its hitches but there were few if any of these involving the Moodle tools. It made e-learning far easier than before. (Spec Ed)*
- *I love working in the Moodle environment, and am disappointed that none of my other papers work in it. I feel its value multiplies with use as does its potential as a professional learning community. (Spec Ed)*
- *Moodle has been a fantastic experience. I have been involved with some online activities before but not to this scale or professionalism. (Intern)*
- *Am finding I really appreciate Moodle, and the online environment even more, now I have experienced my other papers, or should I say lack of it. I feel really disconnected in the other papers, as there is no interaction. (MEdPsych)*

Overall, students experienced the e-learning site as useful in terms of access to lecturers, anytime-anywhere learning and the ability to co-construct meaning and interact with each other.

- *The amount of replies people submitted and the quality has been truly astounding. A true highlight has been the interaction from people around the globe and the insights into each others educational environments, influences and frustrations. The instant availability of Moodle is also appealing as is its function as a resource when I'm researching or debating with workmates. (SpecEd)*
- *Even though I'm living in Myanmar, I still had the opportunity to study. It was very convenient, I could access it when I wanted to. It suited my learning style. (Spec Ed)*
- *This has been the most profoundly inspiring period of study in my life to date. I wish to thank you all (student group members) for the depth of thinking you have gone to in this discussion, and say without this feedback and feedforward I would never have got to this level of understanding. Powerful method of getting us to do the critical thinking. I always enjoy these times on the*

computer. I look forward to reading your summaries and using this learning in my teaching. (Spec Ed)

- *It's great to be able to ask questions of everyone simultaneously. Online means it's all recorded and you can go back and reread. (MEdPsych)*
- *There is so much more interaction than a normal taught paper, and thus a "deeper" learning experience, which is essential in postgraduate study. I would go as far to say that this learning environment and the way it has been structured has taught me more than any paper I attempted in five years of undergraduate study. (Spec Ed)*

Concerns appeared to be related to time commitments, lack of non-verbal cues in online interaction and technical issues. For example, when asked for the weaknesses of the SEEP online environment, students responded as follows:

- *Keeping up with the postings (Spec Ed)*
- *Group collaboration can be difficult online when you cannot see people's reactions (MEdPsych)*
- *Slow Internet at home (Spec Ed)*
- *It does require a lot of time to upskill into this environment (Spec Ed)*

It is interesting to note that the majority of students across all three levels wanted to continue their participation in the online environment after completion of their formal course work. This suggests the potential value of an online CoP to extend learning and interaction into informal life-long and life-wide learning. However, tensions can arise around the mismatch between the fixed boundaries of formal learning and the dynamic nature of a CoP. This raises further questions for ongoing research in Phase 3 around the notion of extending flexible learning beyond the boundaries of formal courses.

5.3.2.2 Technology — Evaluation of Moodle tools

Both students and academic staff were asked to evaluate the tools used in the *Moodle* environment. An analysis of this data is presented below:

Student evaluation of Moodle tools

Having participated for a year in the *Moodle* e-learning environment, students were asked to give their perception of the usefulness of the individual *Moodle* tools. Students rated whether they found the tools to be very useful, useful, neither, not useful, or not at all useful or whether they did not use the tool or were unsure of what the tool was. An analysis of the findings again showed that the majority of responses were rated very

useful and useful, and so the remaining categories (negative, neutral, no use or unsure) were grouped together to summarise the findings. These are illustrated in Table 5.2 below.

Table 5.2 **Students' Perception of the Effectiveness of the *Moodle* Tools**

Summary of findings of students' use of the following tools		**Spec Ed**		***MEdPsych***		**Intern**	
		Percent positive rating	*Percent negative neutral, not used or unsure*	*Percent positive rating*	*Percent negative neutral, not used or unsure*	*Percent positive rating*	*Percent negative neutral, not used or unsure*
Evaluation of Individual tools	• Participants	97	3	57	43	56	44
	• Forums	98	2	100	0	88	12
	• IM/email	81	19	90	10	n/a	
	• Glossary	97	3	60	40	n/a	
	• Wikis	82	8	n/a		n/a	
	• Journals	88	2	n/a		n/a	

Students' perceptions of the *Moodle* tools were evaluated according to their use within each of the programmes. As a web-based course the foundation group experienced a broader range of tools including the more Web 2.0 (social networking) tools of glossaries, wikis and journals. The web-supported and web-enhanced courses of the professional level and intern level used mainly the interactive communication tools of forums and email.

The data shows consistent overall positive evaluations of the *Moodle* tools, which is in contrast to Phase 1 findings using *WebCT,* where there were tensions using aspects of the technology. The insights gained from Phase 1 findings of the value of interactive communication tools have been used as a basis to maximise what the *Moodle* tools offer in this area. Whereas in Phase 1 there were no visuals or photos in the postings and/or profiles, these features in *Moodle* were positively perceived by students, along with the 'user-friendly' format and overall purpose of the forums as indicated in the following comments:

- *I think having the profiles and photos of each participant is invaluable, especially for those overseas unable to make the contact courses.. (Spec Ed)*
- *Entries are threaded in Moodle in a way that makes sense. (Spec Ed)*
- *The forum was my life-line. I felt part of a community, connected to people with whom I had things in common. (MEdPsych)*

Students' comments consistently reflected their perceptions of the value of learning through interaction via group assignments that required debate and dialogue. This was consistent with findings in Phase 1 of this research. Comments in this phase included the following:

- *This was a great assignment and a valid example of groups of people constructing their knowledge and also articulating the praxis — marrying the theory of our texts and the research with how it translates into practice in the educational sites we are involved in. (Spec Ed)*
- *What a neat way to do a paper. I am amazed about the passion that people have with their writing. I have learnt more in this semester about special needs and planning than I have in the 4 1/2 years of teaching. Still loving reading all the posts, there's just so much collective knowledge and experience in this on-line group I feel privileged to be a part of it. (SpecEd)*
- *Many of the reading from others have enable me to see things differently. (MEdPsych)*

However, again consistent with the findings of Phase I, the quantity and perceived depth of the forums did cause concern.

- *The content and volume of postings can be overwhelming. (MEdPsych)*
- *There is a risk that the forum is seen as being for hardcore theoretical discussion and therefore participants only join in when they have the time and energy to engage at this level. (Intern)*

Particularly relevant for this phase of the research was the use of tools more aligned with social networking Web 2.0 tools, which were not included in Case Study I. These included the journal, wikis and glossary. The glossary was used in both the foundation and professional years as databases where students could upload resources or information for sharing, rating and engaging in discussions around the domain of practice. This was a compulsory assignment for the foundation level and voluntary for the professional level. It was positively perceived in the foundation level as indicated by these student responses:

- *Glossary stands out for me because it was the first time I've ever done an assignment like this. We have produced an amazing resource made up of the collective knowledge, wisdom and interests of the group. It will continue to be used and appreciated in my work in the future.*
- *I enjoyed writing my glossary entry, it suited me somehow and I love having the glossary terms for reference. I think that is one of the most worthwhile course requirements I have ever had to do. It really is so useful to have, it is such a gold mine.*

The journals and wikis were introduced to the foundation special ed group as part of their web-based programme. These tools were used for group collaboration on a single document and for their online self-reflections. The feedback relating to these tools reveals the potential to facilitate those aspects of learning that are both social (wiki) and self-reflective (journal). As the students' responses below indicate, these tools enable learning to be linked more closely to the authentic, situated and problematic areas of professional practice. This is the kind of professional practice that Schön (1983) refers to as the "swampy lowland" which is 'messier' than the text-book topography of professional practice. It is also where values and ethics of the real world are complex and critical. Supportive interaction, together with challenges to personal ideas and identity that come with debating issues in a CoP, is essential for participants to move from what Wenger (1999) describes as 'novice' to 'expert' through critical self reflection. This was made possible through the use of the interactive wiki tool and self-reflective journal tool as illustrated in these student comments:

- *I found the discipline of doing the journals throughout the paper valuable for me as an opportunity to think about putting theory into practice and it did spill over into other aspects of my work life. (SpecEd)*
- *The journal is the section of the paper that I have enjoyed the most. I have liked the opportunity to be honest and open and I have felt that there has been no judgment attached to what I have written or what I have thought. It has made me stop and think about how this paper, reading material and experiences affect me. (SpecEd)*

What became apparent was the extent to which students felt that their learning extended to their work and professional practice in the field. Students requested to keep the resources that they and others had contributed in the online environment during the course for their future use in practice. This again raised tensions and questions that would contribute to the ongoing research in Phase 3 around the boundaries between formal and informal ongoing learning, and the extent to which e-learning environments can be personalised to encourage life-long learning within a CoP.

Academic Staff Evaluation of Moodle Tools

Students' perceptions provide an essential perspective when evaluating an e-learning environment. The other crucial group of participants to consider when assessing technology and pedagogy for online CoP design is the teaching and administrative staff involved. There were five lecturers (three of whom were co-ordinators of the various year levels within the programme) involved in the study, as well as one administrative

support staff member. Four academic staff (all except the researcher) completed an anonymous open-ended questionnaire (see Appendix G) at the completion of the programme. All four staff members: (1) had some experience of using online environments to support their teaching prior to using *Moodle;* (2) rated themselves as being adequate or experienced users of computers to support their teaching; and (3) had experience of using both *WebCT* and *Moodle.* One staff member also had experience using Blackboard as a LMS.

An analysis of their feedback indicated that all staff rated *Moodle* as their preferred LMS to support their online teaching. They found it to be more 'user friendly' and intuitive, reliable and flexible to suit individual needs as suggested in the following comments (comments not attributed to maintain participant confidentiality):

- *The ease of use means that more frequent contact can be made with students.*
- *Participant editing options allow individuals to adapt the environment to suit their particular circumstances and tools for posting are as good as word!*
- *Posting course materials and engaging in professional discussion is actually easier using Moodle than it is using email.*
- *Moodle provides tools for student collaboration and development of a knowledge network. For example, the wiki and the class glossary provide collaborative activities. It is more in keeping with our constructivist approach to creating socially interactive and reflective learning environments.*

When asked to list the positive aspects of using *Moodle*, staff responses related to both technical and pedagogical issues. They agreed on the ease of navigating the site as well as the flexibility of designing according to need, as the following comments indicate:

- *Moodle proved to be efficient and effective for both delivery of content and, more importantly, facilitating the learning experience — I had many positive comments from students.*
- *The layout facilitates group cohesion and encourages group interaction.*
- *Contributions from the class are easily accessible and monitored — the data reports on usage are especially helpful as you can see who is accessing information and contributing.*
- *Students and teachers could use their own forums in which to develop and share their ideas, information, links, photos etc. on their research project.*

When asked to list the negative aspects of using *Moodle*, staff comments focused on the amount of information generated in the site and some technical difficulties:

- *The volume of contributions can be time demanding in terms of reading and monitoring class participation.*
- *Editing can be a little cumbersome but still much easier to use than WebCT.*

When comparing *WebCT* (used in Phase 1 of the study) and *Moodle* (used in Phase 2), staff unanimously preferred *Moodle*. The responses related to design and navigation issues as well as the 'fit' between the technology and teaching approach, as indicated below:

- *WebCT was designed as an online instructional system whereas Moodle is designed to facilitate interactive learning with shared tools.*
- *I have used WebCT as both a student and as a member of staff. Interaction online is easy and efficient with Moodle (while) WebCT is clunky, slow, not user friendly, frequently lost messages I was typing, and is not very intuitive.*
- *The WebCT was imposed rather than selected and course had to fit it into the programme rather than the other way around.*

The data reinforces the importance of alignment between pedagogy and technology and points the way forward for further research in Phase 3.

5.3.2.3 Pedagogy — CoP: Domain, Community and Practice

The third theme of the data analysis in Case Study 2 relates to students' perceptions of the effectiveness of using a CoP approach. The overall positive and negative percentages are summarised in Table 5.3 below.

Table 5.3 **Students' Perceptions of a CoP Approach in Case Study 2**

Student responses relating to e-CoP issues – domain, community, and practice	**Spec Ed**		**MEdPsych**		**Intern**	
	Percent positive rating	*Percent negative or neutral*	*Percent positive rating*	*Percent negative or neutral*	*Percent positive rating*	*Percent negative or neutral*
The site is useful in generating, accessing and debating information (Domain)	77	23	77	23	55	45
The site is useful for sharing perspectives and knowledge (Domain)	100	0	88	12	77	23
The site is useful for getting to know each other better (Community)	74	26	55	45	66	34
The site is useful in creating a sense of belonging to a community of practitioners (Community)	75	25	88	12	88	12
The site is useful in gaining awareness of professional practice issues (Practice)	87	13	75	25	88	12
The site is useful to understand the role of an MEdPsych/Spec Ed practitioner (Practice)	65	35	44	56	89	11

Table 5.3 shows students' perceptions of the effectiveness of the e-learning environment in facilitating an online CoP, and the extent to which it supports the dimensions of domain, community and practice. As with the previous analysis of data from this questionnaire, the students' positive perceptions (very useful, useful) of the usefulness of the site are grouped together and the neutral or negative perceptions (neutral, not useful, not at all useful) responses are grouped to provide a succinct summary of findings. These are outlined in Table 5.3 with their qualifying comments below.

Student perceptions overall were positive, but much more mixed than previously. Their comments below suggest all three dimensions of domain, community and practice were facilitated in this online CoP. In terms of domain issues, students reported the following positive elements:

- *Connection to a wide community of learners/educators in* special education, *developing a theoretical base, expanding knowledge in theory and using in practice. (Spec Ed)*
- *Feedback from others, information gained from others. (MEdPsych)*
- *I found the readings easy to read but what gave them deeper meaning and understanding was the opportunity to read other people's views and reflections enabling me to see things through a different light. (SpecEd)*

In terms of the community dimension, students reported the following examples of social interaction, development of a sense of identity, and connection with others in the community:

- *This learning environment fostered collaboration and also encouraged social interaction (getting the news of honeymoon, engagement and new baby). (Spec Ed)*
- *I'd be struggling to meet the criteria if studying alone, extramurally. This way there is always someone to ask, very close at hand. I feel connected with the people in the community and I do not feel isolated. (Sped Ed)*
- *The knowledge that there was an easy way to communicate quickly with other course members — whether to ask a question or share a resource or clarification of assignment work. (MEdPsych)*
- *Its funny how you can feel as though you know people after a web experience like this! (Intern)*

Students felt the e-learning environment provided opportunity within an online CoP to consider application of knowledge to practice, for example:

- *I have gained extensive knowledge surrounding the special education sector, its structure, context and current services through working in a collaborative e-*

learning environment alongside professionals who practice in a range of diverse educational levels and sectors. (Spec Ed)

- *Sharing ideas and thoughts facilitates greater practical understanding of an issue and confidence through belonging to a community of practice. (Intern)*

While the *domain* and *community* aspects were overall positively perceived across the three course levels, improving the dimension of *practice* with the online CoP was an area for further exploration within the Phase 3 research. Again this raised a challenge to develop further links to authentic, situated, life experiences.

Online activity

Students' perceptions were one data source. An analysis of online activity provided another lens through which to evaluate the effectiveness of the online CoP environment and, in the process, to triangulate data.

The logs of online student participation were analysed each month over an eight-month period for all three courses (foundation/special ed, professional/educational psychology and interns) as well as for the community site (non coursework) where all groups plus guests, supervisors and alumni had access to resources and discussion forums. For the community site the total hits (views and posts) were logged. For the individual course sites, both *view* (accessing the site to read) and *posts* (accessing the site to post or contribute) were logged. This illustrates both dimensions of learning – accessing information ('learning as lurking') and actively creating meaning or contributing to discussion and course-work through posting ('learning through doing'). These are presented in Table 5.4 below.

The data shows more views than posts in all courses and relatively consistent activity within courses across all months, except for increases in activity in months when online group assignments were due, and decreases over the July holiday period between semesters. Not surprisingly, the amount of online activity is consistent with the purpose and function of the sites. More activity was logged in the fully web-based course of Spec Ed, which had the most participants (51), less activity in the partially web-based course of the MEdPsych (25 participants), and least in the web-supported course of the internship (21 participants).

Table 5.4 **Online Activity for the Community Site and Course Related Sites**

	Community site	Course-related student views and posts					
	Alumni & current users (165 participants)	Special Ed (51 participants)		MEdPsych (25 participants)		Interns (21participants)	
		Views	Posts	Views	Posts	Views	Posts
May	642	12371	3117	514	29	514	29
June	768	9730	531	573	58	573	58
July	367	6907	488	313	11	313	11
August	1014	2054	196	488	60	488	60
September	942	16082	1253	295	46	295	46
October	664	16084	2438	208	18	208	18
November	566	10168	1123	332	5	332	5
December	607	4262	260	330	36	330	36

It is interesting to note that the community site – which is not course-related and primarily used for voluntary resource sharing between all courses as well as with alumni — showed consistent activity. This goes to the heart of an online CoP, where learning is extended beyond the formal course structure, and extends into the community through discussion and resource sharing around practice. There were no extrinsic motivators (grades, assignments, lecturers) for participation in this area of the site, yet consistent and ongoing participation was recorded over the period of 8 months as indicated in Table 5.4 above. Furthermore the majority of students wanted to continue to be part of the e-learning community after completion of their course (special ed 83%, MEdPsych 90% and interns 89%). Together, this data points to the value of further research in Phase 3 relating to (a) the opportunity to further remove boundaries between course levels; and (b) the possibility to link with the broader community so as to situate formal and informal learning within authentic contexts.

Content analysis data

An additional source of data was collected to assess the value of providing participants with feedback on their discussion content in order to facilitate meaningful learning. This relates to the domain dimension of the CoP where the intention was to encourage deep and reflective domain discussion in the forums. The rationale for this arose out of my second learning activity in Phase 2 (described above), which involved a collaborative research project with co-researchers in Australia and USA (Thomson et al., 2005). This

pointed to the value of providing participants with feedback on their roles and content analysis in discussion forums.

In the special education course there were six discussion forums linked to the six content domains of the course, and students engaged in discussion around these domain topics. The course facilitator posed questions for students to debate in these forums. Students were required to read each other's posts and analyse the content according to a content analysis tool designed to match the goals of the task. Students then used the drop-down rating tool as well as *Moodle's* comment tool to provide formative feedback to their peers on their discussion content. The criteria for the rating included the extent to which the content of the post demonstrated the levels of: domain knowledge; application of concepts to practice; and evaluation of the topic domain.

Analysis of the data of the students' discussion post ratings showed that the majority of initial posts in all six topic domains scored relatively poorly (below 3 out of a total of 5) suggesting that there was room for improvement in terms of discussion posts showing domain knowledge, application of concepts to practice and evaluation of the topic domain. However, the final discussion posts across all 51 students in the paper were peer-rated and also lecturer-moderated as being above 3 (1 person scoring 3; 3 people scoring 5; and 47 students scoring 4 out of 5). This shows a shift in the quality of the students' level of discussion. This data reinforces the finding that formative feedback by peers within a CoP on the content of the discussion posts, using relevant content analysis tools, has the potential to enhance learning. This is achieved through deeper reflection on the content of messages posted which can then facilitate more meaningful discussion on domain topics.

5.3.2.4 Overall Findings for Teaching Activities and Outcomes

While online learning offers opportunities to reconceptualise pedagogical processes, the focus needs to be on determining how to link the technology with teaching and learning practices. As Ehrmann (1995, cited in Bender, 2003, p. 193) states: "without asking hard questions about learning, technology remains an unguided missile". Asking the hard questions about learning in this Phase 2 of the study involved investigating the extent to which technology could be aligned with a pedagogy that supported a CoP

approach. Phase 1 research highlighted some barriers created due to misalignment of technology and pedagogy within a particular educational context, and the resulting effects of this relatively unguided missile. Technology driven e-learning without sound research can quite easily lead to what Oppenheimer (2004) calls 'e-lusions' — the traps that many educators fall prey to in their adoption and implementation of new technology just for the sake of it being new. Phase 1 research highlighted these difficulties of forcing pedagogy to fit new technology, which was the rationale for using an alternate LMS in Phase 2 that afforded a more flexible alignment of tools with diverse aspects of programmes within an integrated CoP model.

Findings from the analysis of the data from the Phase 2 case study in the *Teaching Activity* showed that the new LMS and e-learning design met the desired goals of this phase of the programme. These included:

- A more flexible alignment of tools with different components of the programme, as evidenced in: (1) the design of the programmes; (2) the quantitative and qualitative questionnaire responses of students; (3) the qualitative feedback of staff; and (4) the improved discussion around domain topics in the forums. Triangulation of these data sets showed positive results and illustrated the extent to which these tools met both the learning and teaching needs.

- Accommodation of a CoP approach, as evidenced in the description of the alignment of the tools with the domain, community and practice elements of a CoP. Feedback from students and academic staff illustrated the perceived usefulness of this approach and logs of online activity showed consistent use across all courses as well as the community site.

- Rich discourse in the domain discussion forums as evidenced by the content analysis of discussion posts and student feedback.

Overall there was a more coherent alignment of pedagogy and technology with *Moodle* that was not evident in Phase 1, particularly with regard to the development of an online CoP model for e-learning. *Moodle* provided flexibility to adapt and customise the e-learning environment and this was especially evident with the tools of the wiki, glossary

and journal. The new LMS enabled pictures and images to be linked to posts and profiles of participants thus enhancing the social dimension — where participants got to know each other better and feel more comfortable networking on both a professional and personal level. Tools such as the wiki and glossary allowed for collaborative problem solving on shared documents to enhance interaction in the domain and practice area. Ratings on the discussion forum tool allowed for reflection and peer feedback on the domain area.

The site was structured to allow within and between course interaction. Between course interaction enabled novice entry-level practitioners, as legitimate peripheral participants, to interact and share resources with more experienced active participants and 'thought leaders' or facilitators of the various courses. Within courses there was opportunity for debate around domain issues within the forums, application of theory to practice in group projects, and development of a sense of community through resource sharing and networking. These findings point to the potential in future research for using additional social software tools within *Moodle* such as RSS, blogs and podcasting.

Students reported being actively engaged in learning when using *Moodle*. Those who had previous or current experience in using other LMSs preferred the *Moodle* e-learning environment. Student feedback revealed that this community-centred, constructionist approach to e-learning, with authentic assessment practices, supported their learning within a CoP approach. Content analysis of student discussion forums showed the potential of the social interactive features of rating and commenting on forums as part of formative feedback to enhance discussion and facilitate meaningful learning within an interactive online CoP.

Overall, the results show a positive outcome in terms of aligning technology with specific pedagogy within a particular teaching and learning context. While these positive findings in this Phase 2 of the research addressed the concerns and difficulties raised in Phase 1 of the research, they highlighted additional tensions and raised further questions for ongoing research in the area of e-learning — with regard to pedagogy, technology and context.

For example, findings from Phase 2 indicate a possible mismatch between the relatively fixed boundaries of a formal learning context and the relatively dynamic features of a naturally occurring CoP. The features of a CoP that create potential tension when used as a model for formal learning, are linked to the voluntary, flexible and informal nature of participation in a CoP and the changeable, unpredictable and natural life-span of a CoP (Chang, 1999; Mitchell, 2007; Stuckey, 2001). While the online CoP model presented here had notable benefits in terms of an alternative design for e-learning environments, tensions did arise relating to the course limits and static assignment structure of a formal course. The request by students for ongoing access and participation (as is consistent in CoPs) and their desire to continue in a less structured format was at odds with formal requirements of a university course. The flexibility within the community area of the e-learning site, as opposed to the more formal paper areas, was designed to ameliorate some of these tensions. This does not however address the underlying questions that arise when considering the value of using online CoPs to meet authentic life-long and life-wide learning needs of students and the misalignment of these with formal courses.

The findings from the two case studies indicate that a CoP approach to online learning could potentially reduce some of the tension that has existed between more constructionist inquiry-based approaches to learning and the more traditionally instructionist, linear, hierarchical approaches in some formal learning institutions. The potential for new e-learning technologies to break down the boundaries between formal courses and inquiry-based forms of learning has implications for the teacher, the learner and the institution.

The 'disruptive' potential of new e-learning technologies is explored further in Phase 3 of this research, presented in the next chapter. Chapter 6 focuses on developing an e-learning guide to navigate changes in e-learning. These changes relate to how education manages the move into a digital age, what this means for the teacher and learner and what the implications are in terms of aligning pedagogy and technology. Phase 3 of this personal research journey focuses on re-thinking education in a networked world, where information is available at the click of a 'google search', knowledge is co-created online within social networks, and learning is becoming at the same time more personalised and more globally connected.

Phase 1 of the research outlined the tensions of introducing a CoP pedagogy in a formal institution with technology designed predominantly for instructionism. Phase 2 explored the potential of aligning an alternative technology designed around social constructionist principles with a CoP pedagogy. The reciprocal relationship between technology, pedagogy and context will be examined more fully in Phase 3 where a guide to navigate current and future e-learning changes will be designed. There is always the danger of using new tools in 'old' ways, such as becoming more efficient at teaching an outmoded curriculum or pedagogy (Bosco, 2006). New technologies provide the opportunity to disengage from a 'one size fits all' curricula and pedagogy. Aligned with the right pedagogy and context, new technologies afford a responsiveness to individual differences among learners in a way envisioned by many educational reformers of the past, but generally achieved only in a limited fashion. It is this opportunity for individualised learning within a connected world using Web 2.0 tools and a CoP approach that will be further explored in Phase 3 of this research. The development of the guide in Phase 3 was a result of the integration of the research activities and outcomes of Phase 2, outlined in the next section.

5.4 PHASE 2: RESEARCH ACTIVITIES AND OUTCOMES

Within the research activity of Phase 2, there were three research outputs that linked to both the learning activity and teaching activity of this phase. As outlined below, these included: (1) a national conference presentation on content analysis and deep learning in an online CoP (Mentis, 2004); (2) a collaborative journal article on discourse analysis and role adoption in an online CoP (Thomson et al., 2005); and (3) an invited presentation at the Vice Chancellor's Symposium on an e-learning CoP.

As suggested in section 4.4, presenting research activities and outcomes in public forums enhances the quality of the SoTL approach through ensuring that it has trustworthiness (Dadds, 2004). Trustworthiness is achieved to the extent that it is deemed by professionals, peers and experts to have: *credibility* (appropriate and accurate interpretation of the data); *transferability* (rich description that is replicable); *confirmability* (transparent process); and *dependability* (sound data sources) as outlined in section 2.3.4 of this study (Lincoln & Guba, 1985). Similarly, quality is determined

through the extent to which the research findings are deemed to have *coherence* (makes sense); *consensus* (consistent interpretations) and *instrumental utility* (usefulness to others) as outlined by Eisner (1991, cited in Hoepfl, 1997). These issues of quality are open for debate through the public presentations and discussion of research findings.

These research outputs and activities for Phase 2 are illustrated in Figure 5.6

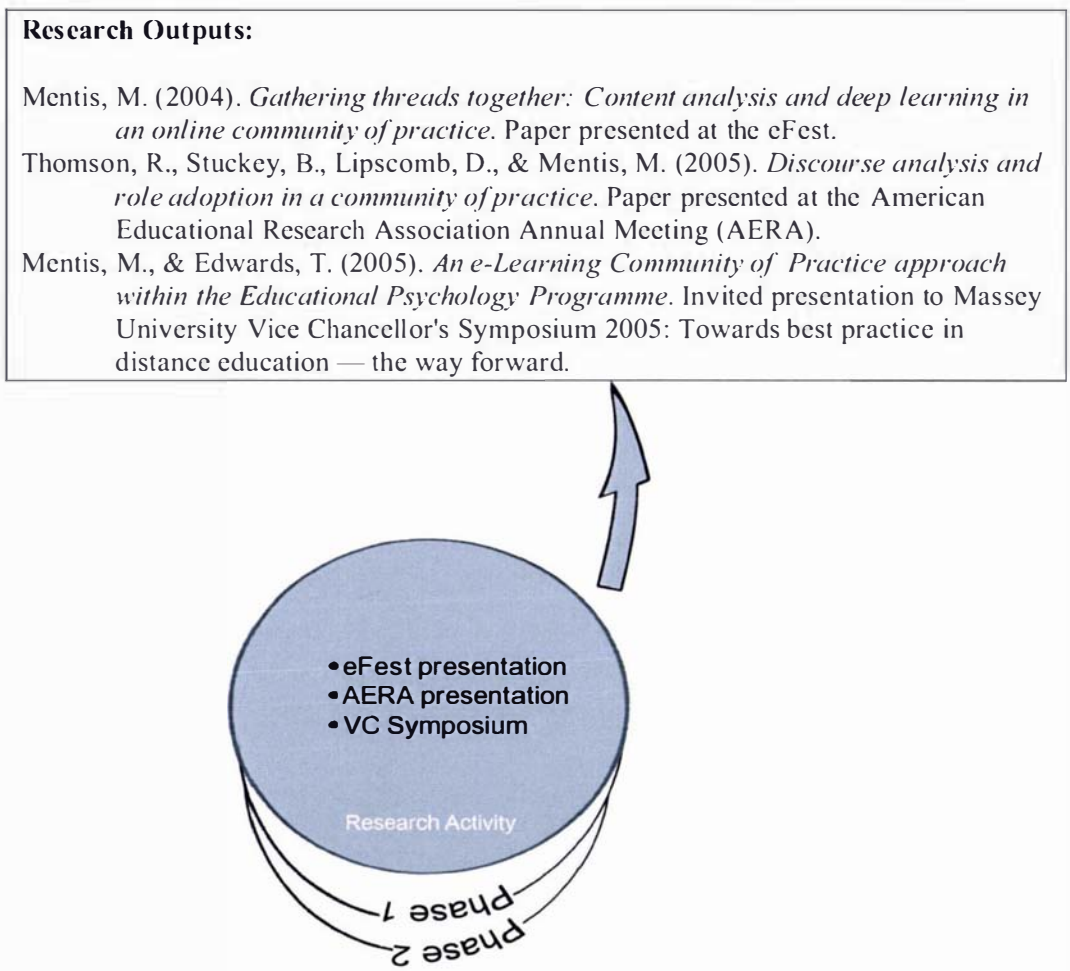


Figure 5-6: The research activities and outcomes of Phase 2

Consistent with a SoTL approach, the research activities and outputs presented in this section provided me with an opportunity to collaborate with others, engage in peer review and invite feedback and discussion. Collaborating with experienced colleagues in the field and receiving formative feedback, provided useful data for reflection on my own practice and led to the conceptualisation and design of an e-learning alignment guide in Phase 3 — outlined in the next chapter.

The research outputs outlined above, were aimed at different audiences which afforded me the opportunity of engaging in debate with a range of practitioners to address the overarching research question of how the interrelated areas of context, pedagogy and technology influence practice in a changing e-learning environment. The outputs relating to *pedagogy* included the two presentations on content and discourse analysis. The first, presented locally at eFest, provided an opportunity to talk about content analysis within the Massey project in this phase. The focus for discussion in this presentation was on the potential value of content analysis as a form of formative feedback used by peers to enhance learning. The second, presented internationally at AERA, provided me the opportunity to work within an international team and develop my understanding and skills in discourse analysis. The findings presented at this conference included the importance of matching the discourse analysis tools to suit the context and the value of providing the analysis of the discourse to the participants in the CoP. Both these presentations extended the discussion around how best to facilitate deep interaction and learning about domain topics within online CoPs. The third output involved an invited presentation to the Massey University Vice Chancellor's symposium to discuss innovations and best practice within the university community. This enabled debate with colleagues on the teaching staff across different faculties and administrative support areas on the viability of using alternative technologies and pedagogies within the university context.

These research activities and outputs were linked to both the learning activities and teaching activities in Phase 2. Through practitioner research my collaboration on the international research team on discourse & social network analysis of participants in the *Foundations of Communities of Practice workshop,* provided me with an opportunity to co-construct meaning with others outside of my context, to learn about e-learning, and put that new knowledge to practical use in my own teaching (Loughran, 2005). The presentations at the conferences and symposium on e-learning enabled me share the results of my teaching innovations and application with others in the professional community to critique and validate (Dadds, 2004).

5.5 CHAPTER SUMMARY

This chapter outlined Phase 2 of my SoTL research including: (1) my *learning activity and outcomes*, where participation in three professional development activities resulted in: gaining a deeper understanding of using a CoP approach online, facilitating meaningful discussion in domain forums, and designing an e-learning environment with new technology; (2) my *teaching activity and outcomes* which involved the evaluation of *Moodle* in designing a CoP e-learning approach for the SEEP programme in Case Study 2; and (3) my *research activity and outcomes* which involved the documentation and presentation of the learning and teaching outcomes for this phase.

Phase 2 findings pointed towards an alignment of pedagogy and technology, flexibility of *Moodle* technology to integrate new Web 2.0 tools, and increased engagement of students and staff in enriched online discussions. Thus, using the alternative LMS resulted in better alignment of technology, pedagogy and context within the SEEP programme.

While the overall outcomes were positive, Phase 2 research highlighted additional tensions and questions around technology, pedagogy and content, relating to: blurring of the boundary between formal and informal learning; management of the ongoing changes of e-learning technology; and the design of e-learning environments that allow for learning to be tailored to meet the individual's needs while still increasing connectivity and interaction between learners.

As the terrain keeps changing in the e-learning landscape any map or guide for traversing the terrain needs to accommodate this change. Learners are changing, the context is always different, and technology keeps improving (Barab, King, & Gray, 2004; Bosco, 2006; Downes, 2007; Oblinger & Oblinger, 2005; Siemens, 2006c). This poses a key question relating to how an e-learning educator can accommodate this continual change. It is these questions and tensions that provided the impetus for Phase 3 of this research study.

CHAPTER SIX:
PHASE 3 OF THE E-LEARNING JOURNEY

Our time is a time for crossing barriers, for erasing old categories, for probing around. When two seemingly disparate elements are imaginatively poised, put in apposition in new and unique ways, startling discoveries often result.
(McLuhan & Fiore, 1967, p. 10)

6.1 INTRODUCTION AND CHAPTER OVERVIEW

The previous two chapters have described Phase 1 and Phase 2 of my research journey through a changing e-learning terrain. In the case study in each phase, the tensions relating to a misalignment of technology and pedagogy for a particular context have been highlighted. Case Study 1 in Phase 1 illustrated the mismatch of using an e-learning environment largely designed for content management with a CoP approach to teaching. This led to the Case Study 2 trial in Phase 2 of a LMS designed around social constructionist approaches. This trial overcame some of the constraints identified in Phase 1, but raised additional tensions and missed opportunities relating to e-learning in a digital age where both the technology and the institutional demands restrict pedagogy. The three elements of pedagogy, technology and context were still not easily aligned.

The tensions and opportunities that were identified in Phases 1 and 2 of the research formed the basis for Phase 3. Phase 3 focuses on the development of an e-learning alignment guide (eLAG) aimed at reducing the tensions and maximising the opportunities that were identified in Case Study 1 and 2. The eLAG is presented and explained in this chapter. The rationale for designing the guide is to provide some pointers, indicators or signposts that might assist educators to navigate the changing and complex terrain of e-learning and teaching. While a 'map' is relevant for a stable terrain, a guide or set of signposts is more appropriate for a shifting terrain. Based on the findings from the previous two research phases, this guide aims to provide a response to the key research question that threaded through each phase of this study, namely:

How do the interrelated areas of technology, pedagogy and context influence practice within a changing e-learning environment?

The guide developed out of an integration of the insights gained during the first two phases of research. Its purpose is to provide some direction and answers for teachers working within a SoTL approach to the following questions:

- What is the relationship between technology, pedagogy and context in e-learning?
- What are the implications of using different technologies and pedagogies for the teacher and learner?
- How do we align technology, pedagogy and context to enhance e-learning?

The structure of this chapter is the same as the previous two chapters and covers the Phase 3 activities of *learning, teaching* and *research* based on the SoTL approach (Huber & Hutchings, 2005) outlined in chapter three. The first section on *learning activity* provides an overview of my professional development and involvement in three collaborative research projects. It outlines the insights I gained in the areas of *context* (in terms of e-learning policies and practices), *technology* (using social software and Web 2.0 technologies for e-learning design), and *pedagogy* (implications of new technology for teaching and learning). Using a reflective practitioner approach, these insights were integrated with findings from the previous two research phases and this led to the development of the eLAG — the e-learning alignment guide, which is presented in detail in the *teaching activity* section of this chapter. The eLAG focuses on the three e-learning zones of technology, pedagogy and context. Various elements within each of these zones are described and located on a change continuum, thus illustrating the changing e-learning terrain and the importance of alignment of the three zones. The *research activity* is presented in the final section and details the research outputs from this phase that were shared with other professionals in the field to be critiqued and validated.

The outline for this chapter is presented in Figure 6-1 below. (This figure first appeared in chapter 2 as Figure 2-9 as part of the discussion of the overall SoTL research journey. It is repeated here as Figure 6-1 to illustrate discussion on Phase 3 of the study).

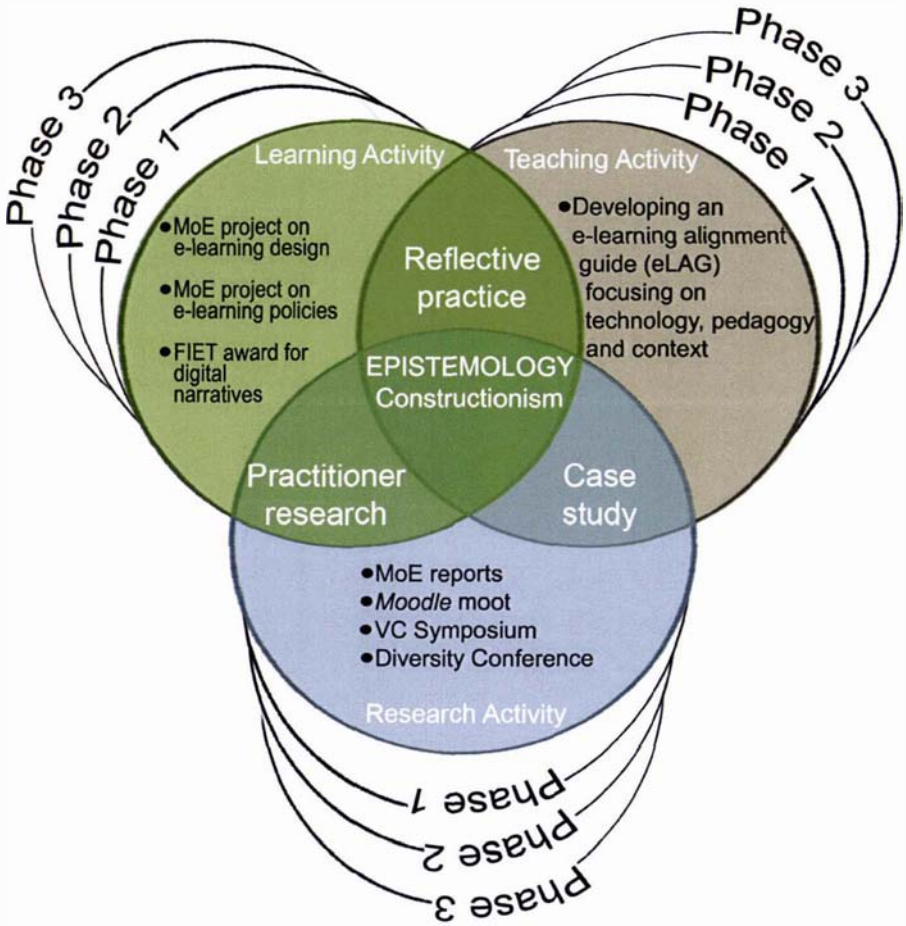


Figure 6-1: Phase 3 of the study

6.2 PHASE 3: LEARNING ACTIVITIES AND OUTCOMES

There were three significant research projects that contributed to my *learning activity and outputs*. These included: (1) invited participation in a project that was funded by the NZ Ministry of Education Tertiary Education e-learning Collaborative Development Fund (eCDF) to design and develop an e-learning course on using Web 2.0 technologies; (2) invited participation in a project funded by the New Zealand Ministry of Education Tertiary Education Teaching and e-learning Research Fund (TeLRF) to research e-learning policy internationally and locally; and (3) initiation of a project funded by Massey University to create digital narratives as part of the online learning environment in the SEEP programme. These learning activities and outcomes for this phase of the study are outlined below and illustrated in Figure 6-2.

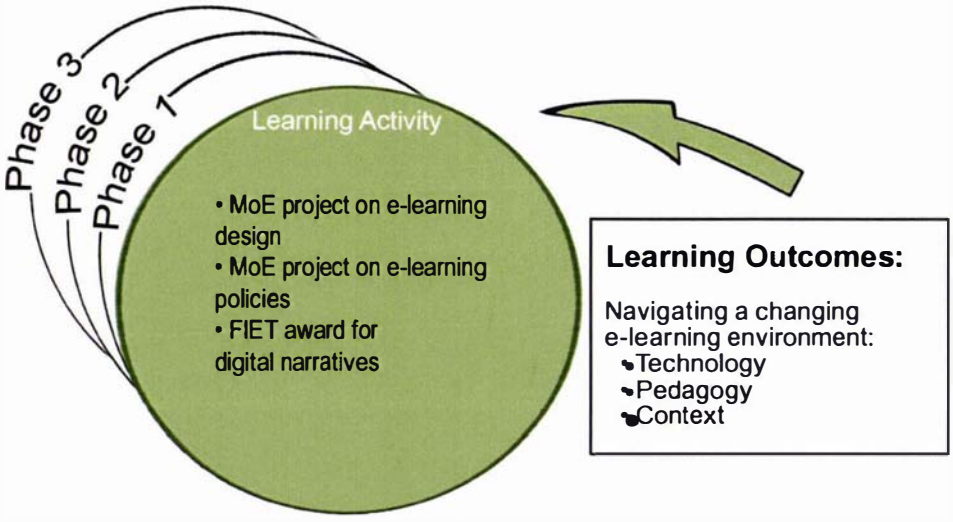


Figure 6-2: The learning activities and outcomes of Phase 3

6.2.1 Learning Activities in Phase 3

The first collaborative project within my Phase 3 *learning activity* was an invitation to be part of a Ministry of Education funded project on e-learning policies won by a colleague at Massey University (Anderson et al, 2006). This project was funded by the Tertiary Education Teaching and eLearning Research Fund (TeLRF), 2006, and the focus was on analysing e-learning policies nationally and internationally (see section 6.2.2.1 for more detail). This provided me with a valuable opportunity to reflect on the tensions and issues that arose from my Phase 1 and Phase 2 research and located these now within a broader framework of policy and practice. Researching global and local definitions, policies and practices relating to e-learning helped to provide 'the bigger picture'. It also gave me retrospective insight on the past two case studies and encouraged me to focus on my future practice in terms of developing an eLAG during this phase of the research.

The second collaborative project of my Phase 3 *learning activities* was an invitation to be part of a project funded by the Tertiary Education eLearning Collaborative Development Fund (eCDF), 2005 and the focus was to develop a Certificate in e-Learning Design and Development (CeLDD). This involved developing an e-learning course to integrate Web 2.0 technologies with sound pedagogical practice (see section

6.2.2.2 for more detail). My involvement in this research project contributed to my personal professional development in the area of new e-learning technologies and social networking tools such as blogs, wikis, RSS, podcasts and mobile learning. For me, the research highlighted the potential of using these new technologies and the implications for pedagogy in the digital age. The project provided insight into the need for careful alignment of the three elements of technology, pedagogy and context when using new technologies.

The third project of my Phase 3 *learning activity* was winning a Massey University FIET (Fund for Innovation and Excellence in Teaching) award to develop digital narratives (digital resources that use a story-telling methodology) for the SEEP programme. This project focused on developing teaching and learning resources for the online learning environment in the SEEP programme (see section 6.2.2.3). The value of this project was to provide contextualised experience of using Web 2.0 technologies and approaches within my specific domain of practice.

To summarise, the first project in the Phase 3 *learning activity* provided insight into e-learning pedagogy. The second project provided skills and expertise in using new technologies, and the third learning project provided the opportunity to use new technology and pedagogy within the context of the SEEP programme. This development and evolution of these skills and insights are outlined in the next section on Phase 3 learning outcomes.

6.2.2 Learning Outcomes in Phase 3

The three collaborative projects were invaluable as personal learning activities in this phase of the research as they provided insights that contributed directly to the development of a guide for navigating an ever-changing terrain of e-learning. A number of themes were identified across all these projects that influenced my professional practice. Following a structure similar to the previous two phases, these have been documented in this phase as *learning outcomes* and have been organised according to the themes of: *context* of e-learning, including tensions relating to definitions, policy and practice of e-learning; *pedagogy*, in particular emerging e-learning practice and the

implications for teachers and learners of using new technologies; and *technology*, especially social networking tools.

6.2.2.1 Context — Tensions Relating to Definitions of e-Learning

The Tertiary (e)Learning Research Fund (TeLRF) project (Anderson et al., 2006) examined documentary evidence of e-learning policy throughout Australia, Europe, Canada, the United States, the United Kingdom and the more developed Asian nations. This international policy text comparison found that both within and across national borders there is no generally accepted definition of e-learning. Conceptions of e-learning are very loose, ranging from overly narrow to very broad, to the extent that even a variety of spellings of the term exist. Linked to this was the finding that there is little linkage of e-learning policy documents with the rich and long tradition of the distance education literature or with non-formal and life-long learning initiatives. These findings suggest that there is no consensus about the e-learning terrain nor what constitutes effective pedagogy or policy on e-learning practice. There are multiple approaches to the implementation of e-learning within existing educational frameworks.

For example, analysis of policy documents in the United Kingdom shows an emphasis on the connection between pedagogy and technology in a new blended approach to learning and teaching. There is more emphasis on a learner-centred model for education, but an acknowledgement of the need to resolve issues of national infrastructure to support and enable this learner-centred approach (Anderson et al., 2006, p, 13). Similarly in the United States, the vision for e-learning 2010-2020 focuses on new investment in technology infrastructure that will allow U.S. colleges and universities to create environments where e-learning is more sensitive to workplace realities and more attuned to creating a nation of learners equipped with essential, highly developed learning tools (Anderson et al., 2006, p. 19). Analysis of Canadian policy documents suggested a return to a focus on core features of education such as excellence in teaching quality, high levels of student support, affordability, and ready access to post-secondary education. This places e-learning alongside other methods of learning (Anderson et al., 2006, p. 27).

The implications of such themes for this study highlighted the need to locate e-learning within a broader context of learning, to align it with existing epistemologies and

pedagogies, and to embed it within broader institutional and environmental contexts. This provided the basis for the development of the *context* dimension of the eLAG that is presented in detail in Section 6.3 of this chapter. The other two dimensions of the guide are pedagogy and technology, which are discussed below.

6.2.2.2 Pedagogy — Emerging e-Learning Practice

In a majority of policy documents reviewed within the TeLRF project, there was an indication of a shift towards personalising learning and adopting a learner-centred approach (Anderson et al., 2006) where the student becomes the driver of their own learning. This theme of differentiating teaching according to the needs of different learners, individualising the learning process and using social networking tools to customise learning, had resonated strongly with my own professional practice in designing the SEEP online learning site. It was also an important focus of the CeLDD (Certificate in e-Learning Design and Development) research project.

In the Ministry of Education funded CeLDD project on developing a Certificate in e-Learning Design (Frielick & Mentis, 2006) we initially surveyed school students and staff from three different sectors in tertiary training — a university, a polytechnic and a private training provider in Auckland, New Zealand — to identify baseline learning experiences and needs. The findings indicated a gap between students' experiences of learning through interaction with technology *outside* of formal schooling settings as 'digital natives' (Prensky, 2001) and what tertiary training institutions were offering in terms of their use of technology. The findings of this study showed how tertiary teaching is perceived as being located in 'e-learning 1.0', where technology is used to reinforce transmission mode learning that is content focused. In contrast, technology use in everyday life included more Web 2.0 approaches where learners actively collaborate within a more informal learning approach using social networking tools. The rationale for the CeLDD project was to provide professional development on ways to incorporate more social software or 'e-learning Web 2.0' approaches in tertiary teaching. Using Web 2.0 tools in e-learning design was seen to be one way to bridge the gap between current provision and what a new generation of 'digital natives' students might be more familiar with when moving into tertiary level learning (Frielick et al., 2006b). The research findings from the pilot cohort of participants on the CeLDD course illustrated the potential of using social networking tools such as blogs, wikis,

RSS and podcasts in moving towards more differentiated forms of tertiary teaching, as well as linking formal and informal approaches to learning.

As can be seen from the above discussion, there is a need to more adequately consider the range of pedagogical approaches and how different approaches in teaching and learning might be better aligned with different forms of technology. With these concerns in mind, the eLAG was created to link the technical with the pedagogical components (presented in Section 6.3 of this chapter). The final dimension of the guide involves technology and my professional development relating to this dimension is outlined below.

6.2.2.3 Technology - Social Networking Tools

My work in the SEEP programme, together with the research projects (the FIET project in particular), enabled me to rethink the conceptual basis of the learning community and how to best represent this within the online environment. Inevitably, this led me to make a shift from using a LMS that was primarily concerned with content acquisition (*WebCT*) to one that was more in accord with social constructivist principles of community building (*Moodle*). This enabled the shift from 'information' (content learning) to 'conversation' (co-constructive learning), or from a more 'closed' to 'open' e-learning environment using the social networking tools of glossaries, wikis, journals and forums. Web 2.0 tools have the added potential to allow personalised learning environments (PLEs) to be developed where learning is differentiated according to individual needs and learning plans. The FIET project enabled further exploration of this approach through the creation of digital narratives to be used in this programme. These narratives are to be used in the online environment as springboards for discussions, and as a resource for sharing professional practice and research experiences. The use of new technology enables the e-learning environment to be continually updated using text, audio and visual media and adapted to suit individual learning needs.

As discussed in earlier chapters, the tensions that arose within this programme related to the misalignment of designing for a differentiated e-learning experience within an institutional context governed by fixed policies and practices. Such practices require conformity in the use of the technology used for programmes, modes of assessment of

students and completion time frames for papers. The tension arises due to espoused theory of 'individualising' the learning environment and actual institutional practice of standardisation and homogeneity for 'quality assurance' purposes.

Reflecting on how these tensions might be resolved constitutes part of the rationale for the development of an eLAG, discussed in the next section. There are some who believe that the expansion of distributed learning might force traditional institutions to review their educational programs and learner support (Bates, 2005), and others (Downes, 2007; Siemens, 2007a) who point to how the increasing use of online social networking sites and e-learning communities of inquiry and practice challenge the traditional institutional structure of higher education.

This section has outlined my *learning activities and outputs* in Phase 3. These contributed to my *teaching activity* in this phase, which was to chart the shifts in the three e-learning zones of technology, pedagogy and context in order to highlight the importance of alignment between these three zones. This resulted in the development of an eLAG for educators and designers to use when navigating the e-learning terrain. This guide provides a perspective in response to the overarching research question of how the areas of technology, pedagogy and practice are interrelated and changing and how this then influences practice. The eLAG is presented below, in the *teaching activity* section of Phase 3.

6.3 PHASE 3: TEACHING ACTIVITIES AND OUTCOMES

While the *teaching activity* in Phase 1 and Phase 2 described the two case studies relating to the online teaching in the SEEP programmes, the *teaching activity* in this phase relates to my professional practice of developing a navigational guide for traversing the e-learning terrain. This guide was a result of findings from both Phase 1 and Phase 2 where, in both case studies, opportunities and tensions were highlighted relating to the dynamic interaction of the three zones of technology, pedagogy and context. This section focuses on the three zones, outlining the trends that exist within each area. Charting these provides a deeper understanding of how to navigate each zone and hence enable a more effective alignment between them. This is intended to bring

congruence to the e-learning environment and allow for effective learning opportunities to be actualised.

In this section of the *teaching activity* of Phase 3, the rationale for and background to the development of an eLAG are first presented. Here, the concepts of 'alignment' and 'guide' are discussed. This is followed by a detailed description of the eLAG, which constitutes the *teaching outcome* for this phase of the research. Each of the three areas of context, pedagogy and technology are charted on a continuum to illustrate the changes within each area and the implications of this for e-learning. This is illustrated in Figure 6.3 below:

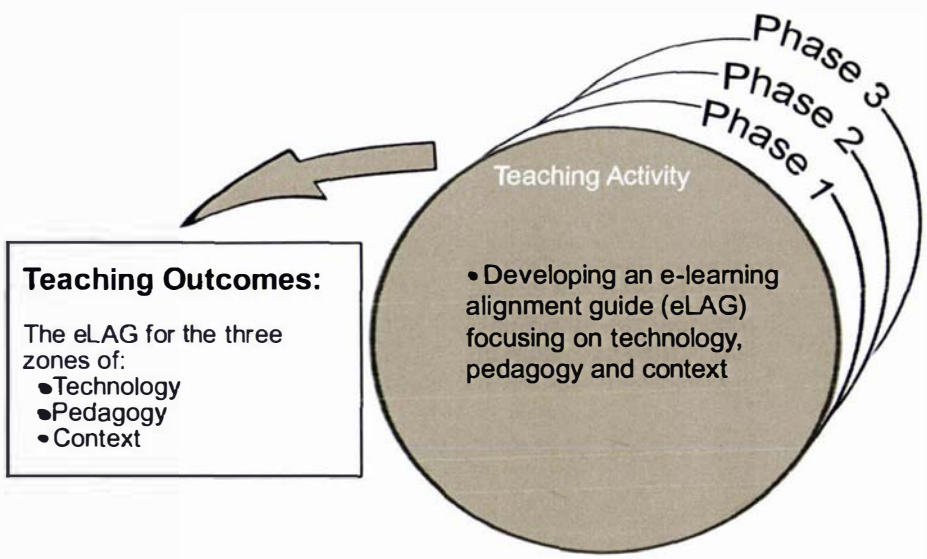


Figure 6.3: The teaching activities and outcomes of Phase 3

6.3.1 Teaching Activity — Developing an Alignment Guide for e-Learning

This section outlines the rationale and background to developing an e-learning alignment guide. It highlights the need for such a navigational tool and describes the conceptualisation of both the terms 'alignment' and 'guide'.

The rationale behind developing an eLAG within the teaching activity of Phase 3, was to make sense of the tensions and opportunities that arose out of the findings of the two previous phases of e-learning practice. The intention of the alignment guide conceptualised here is to outline the signposts, landmarks or indicators in the three e-

learning zones of technology, pedagogy and context, in order to show the changes that occur within them. It is envisaged as a tool to enable alignment of these three interrelated e-learning zones. It offers e-learning teachers and designers a perspective on navigating the e-learning topography and hence a perspective on the research question that guides this study on the alignment of the various dimension of e-learning. The eLAG, as a navigational tool, provides some guidance when traversing the shifting and complex dimensions of e-learning.

Having identified the rationale for developing the eLAG as a guide for representing the alignment of the three zones of context, pedagogy and technology in designing e-learning environments, the next section outlines the background to the conceptualisation. This involves a discussion of both 'alignment' and 'guide'.

The concept of 'alignment' used in the eLAG is a development and extension of Biggs' notion of constructive alignment (Biggs, 1996). Biggs identifies two areas that he sees as important in higher educational practice — constructivist learning theory and instructional design. For Biggs (1999), constructivist learning theory relates to pedagogical approaches that focus on the learner actively creating meaning, as opposed to more traditional theories of learning that focuses on knowledge being transmitted by teachers. Instructional design literature is seen as emphasising the need for consistency between the objectives and assessment in a course of study. In integrating these two areas, Biggs (1999) talks of 'constructive alignment' where constructivism becomes a framework to guide decision-making about teaching and learning to enable learners to construct meaning, and alignment focuses on the consistency and integration of learning objectives, teaching activities and assessment. The two core components of constructive alignment thus incorporate the view that learning engages students in constructing meaning from what they do, and that teaching involves providing consistency between activities, outcomes and assessment.

While Biggs' (1999) concept of constructive alignment focuses on learning (in particular ensuring consistency between the three elements of teaching, learning and assessment), 'alignment' in the eLAG is extended to focus on the three elements of technology, pedagogy and context, and their interrelationship in e-learning. As suggested in the two previous research phases, a misalignment of pedagogy with

technology or context results in tensions and missed opportunities. Mapping these three elements of e-learning, and describing effective consistency and alignment between them, is the aim of the eLAG.

The notions of alignment and consistency can be likened to what John and Sutherland (2005) call *affordance*. With respect to technology, they see affordance as the potentialities offered by ICT tools to "shape, urge, and constrain particular uses" (John & Sutherland, 2005, p. 409). They highlight the importance of focusing on the design of an application and in particular the sorts of choices it offers as well as those which it does not. This involves exploring the relationship between the software, the hardware and the learning process as well as uncovering the sorts of pedagogical implications resulting from that relationship. In discussing this relationship, they emphasise the need to be cautious when describing the affordances of new technologies and even more cautious about assuming that a given medium or technology will automatically afford particular learning outcomes. As they point out, "it is the relationship between the pedagogy within a subject area (the practice in the setting), the subject domain and its culture (the ecology of the setting) and the technology (the tool within the setting) that is crucial to engendering quality learning" (John & Sutherland, 2005, p. 409). This explanation of affordance resonates with the concept of alignment in the eLAG which also focuses on three dimensions of technology (tools), pedagogy (practice) and context (ecology).

Ellaway and Begg (2005) posit that technology can fundamentally shape the learning environment as well as the expectations and actions of teachers and learners. They point out that many higher education institutions now using LMSs such as *WebCT* or *Blackboard* have very little control or adaptability in terms of managing e-learning programmes beyond what comes 'out of the box'. They state that if the programme fits the available heuristics of the LMSs, then "all's well and good". If not, then the learning environment is not *aligned* and is potentially disruptive and counterproductive (Ellaway & Begg, 2005). Misalignment and the issue of control is a key feature of the eLAG — in particular the link between LMSs (technology) and programmes (pedagogy).

Similarly, Dron (2006) highlights issues of control and constraint where institutions are required to align with the software rather than vice versa. For example, he points out

that some of the most widely used LMSs (such as *Blackboard* and *WebCT*) have a predominantly instructor-led pedagogical model with the standard organisational unit being the 'course', a name that the system itself does not allow to be changed or diversified. He points out that while some systems (such as *Moodle*) avoid this trap, "even the best of the monolithic LMS systems will to some extent dictate behaviour when taken up at an institutional level — and the larger will influence the smaller" (Dron, 2006a, p. 5). While this example again refers to the LMS as the vehicle for control, it also hints at the wider institutional or contextual influence and that alignment of this area is central to the development of the eLAG. Context provides relevance and authenticity of learning, and these need to be aligned, as outlined by Wenger (1999).

For Wenger (1999), the issue of alignment is one of the most important aspects of education for the world we live in. He sees *educational alignment* as relating to the authenticity of learning activities and the extent to which they are relevant for everyday life. He contends that educational design must engage learning communities in activities that have consequences beyond their boundaries so that students may learn what it takes to become effective in the world (Wenger, 1999). His view is that learning communities offer opportunities to explore alignment through breaking down boundaries between formal and informal learning and allowing for exploration of multiple memberships or different identities through an apprenticeship model. Aligning learning not only with formal programmes, but also with informal, everyday situations offers opportunities as well as difficulties, and these are discussed in the context section of the eLAG.

The concept of 'alignment' for the development of the eLAG in this phase of the research, incorporates the theories outlined above. These can be integrated into the three areas of pedagogy, technology and context where: (1) in terms of *pedagogy*, "constructive alignment" (Biggs, 1996) relates to what students do to construct meaning and what the teacher does to align objectives, activities and assessment; (2) in terms of *technology*, alignment relates to the affordances offered by the tool or medium (John & Sutherland, 2005) and the controls and constraints due to both proximal (software design) and distal (institutional determinants) factors or technology (Dron, 2006a; Ellaway & Begg, 2005); and (3) in terms of *context*, alignment relates to the broader culture, systems and ecology of the particular institution and how these interrelate within the wider domain of practice (Wenger, 1999).

Just as the term 'alignment', as used in the eLAG, is associated with a number of supporting theories, so too has the term 'guide' been carefully considered in terms of the related connotations and meanings associated with it.

As with the 'alignment' theories, the connotations and meanings of 'guide' can also be grouped in terms of their links to technology, pedagogy and context dimensions, as follows: (1) in terms of *technology*, 'guide' has metaphorical links to the computer design industry, where an 'alignment guide' is a term for many industry standard computer applications. For example, graphic web images and other multimedia productions have built in alignment guides which provide the parameters within which particular designs are created; (2) in terms of *context*, the metaphor selected here is that of a travel guidebook or tour guide, providing travellers who are unfamiliar with a context, location or terrain with an overview of the key features of the terrain without being too prescriptive. This allows travellers the freedom to do their own exploration within the safety of recommended guidelines; and (3) in terms of *pedagogy*, the 'guide on the side' is often contrasted with the 'sage on the stage' approach to teaching, where 'guide' emphasises a move away from didactic instruction to that of facilitating learning, putting learners in control and the teacher becoming more of a 'backseat' driver through the learning terrain.

Thus, 'guide' is a term with varied connotations and meanings relating to technology, context and pedagogy. It connotes efficient infrastructure, support, advice, safe exploration, facilitating learning and providing reliable and timely information to people who need it. It is this dynamic and flexible orientation that is intended in its use in the eLAG. As the e-learning terrain is characterised by change and uncertainty, the term 'guide' suggests informed exploration of the terrain rather than following prescriptive and fixed directions.

Having outlined the rationale for the development of the eLAG, as well as explaining the terms 'alignment' and 'guide', the next section provides a detailed description of the eLAG — outlining the shifts in the e-learning zones of context, technology and pedagogy.

6.3.2 Teaching Outcomes — The e-Learning Alignment Guide (eLAG)

The eLAG consists of the three zones of the e-learning environment — technology, pedagogy and context and, within each zone various layers that impact on practice. The zones and layers have been mapped along a continuum from a more *traditional, homogenous and formal* orientation towards an *emergent, diverse and informal* orientation, in order to illustrate the trends, shifts and currents that have occurred within e-learning over time.

The eLAG is conceptualised as a dynamic tool in the sense that it can be used to plot alignment between and within zones when designing or reflecting on e-learning environments. It may be extended as new technological, pedagogical and contextual elements emerge, and adapted by adding or changing layers. It can also be highly individualised to suit particular teaching or learning contexts. It serves as a resource or tool to analyse, discuss, navigate or critique the ever-changing terrain of e-learning environments. Hyper-linking of terms on the eLAG would enable it to become a 'cybrary' or online data base of information and research findings, allowing the guide to be used as a resource framework for teaching, researching or reflection on practice. The three zones of the eLAG, technology, pedagogy and context, will be outlined in the next sections.

6.3.2.1 The Technology Zone of the eLAG

It has been argued that technology itself is neither good nor bad, rather it is the way in which it is used that matters (Bates, 2005; Nichols, 2005). There are counter arguments that technology can never be value neutral and that particular technologies have specific affordances that might encourage certain approaches and discourage others (Dron, 2006b; Feldstein & Masson, 2006). There have been studies to show that technology has no significant effect on learning (Russell, 2001), and counter studies that claim the opposite, and go on to specify what these effects might be (Bates & Poole, 2003; Oblinger & Hawkins, 2006). These various arguments provide a backdrop to this section which focuses on the question of whether technology matters in terms of teaching and learning, and if so, how, and the extent to which this necessitates a revision of pedagogical assumptions.

The question as to whether and how the use of technology influences learning has been an ongoing debate as each new tool has emerged — especially in terms of the so-called 'no significant difference' phenomenon. This phenomenon refers to a body of research and literature comparing learning with or without various forms of technology, and posits that there is no significant difference to student learning outcomes. The conclusion drawn from these studies is that all other things being equal, there is no statistically significant difference in learning whether it is face-to-face or online (Russell, 2001). This argument produced a response of 'significant difference' articles that showed greater achievement in technology-mediated instruction (Bates & Poole, 2003; Oblinger & Hawkins, 2006 ; Russell, 2001).

The lack of consensus and continued debate as to whether there is, or is not a significant difference when comparing student learning with and without technology, is probably due to difficulties with the research question itself. Oblinger (2006) suggests that, in order to get an answer to whether technology makes a difference or not, we need to ask, difference in what? And for Bates and Pool (2003), a more useful question would be one that identifies the kinds of learning that different media facilitate best and under what conditions. For example, the educational value of television is not merely to replicate a lecture (where there would be no significant difference in learning outcomes), but to provide learning experiences beyond teacher talk such as documentary material or complex animations. Using technology merely to replicate practice without an understanding of how it might change pedagogy results in wasted teaching and learning opportunities, and unhelpful research.

The issue then, is not so much whether using technology produces a significant difference, but rather whether we are using technology to do the same things, or taking advantage of the unique capabilities of the technology to do things differently (Oblinger & Hawkins, 2006). In effect, tensions arise when *new* technologies are used in *old* ways. As McCluhan (1965) points out, a new medium is often initially used to support old practices. For example the first movies were filmed plays and the first use of Internet was for mail. It is the educator's challenge to go beyond using new media to teach in old ways and develop pedagogical approaches that maximise the potential of the new technology.

New tools, such as the Internet and networked computers, are no better or worse than old tools, such as print, but they are fundamentally different. As Bates (2005) posits, we need to understand these differences and the appropriate context for using them. The criteria for using technology should not be its novelty but its appropriateness for a particular teaching and learning context. McLuhan's (1965) well known adage that 'we shape our tools, and then our tools shape us', highlights the reciprocal relationship between technology and its users. He suggests that there is always a dynamic interplay between the two and that this varies in different contexts and is continually changing. This is illustrated in Figure 6-4 below which presents the technology zone of the eLAG.

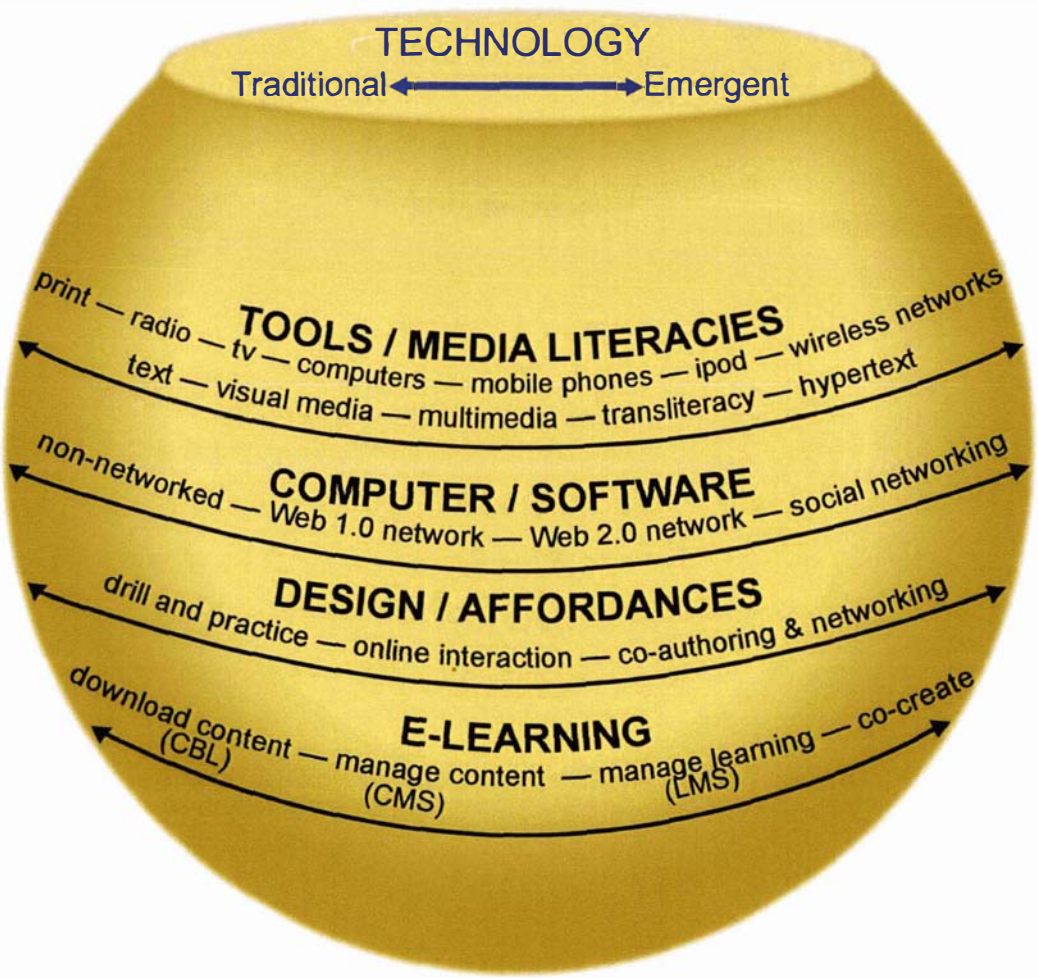


Figure 6-4: The technology zone of the eLAG

The technology zone has been shown on a continuum from what can be referred to as 'traditional' to 'emergent' in terms of both product (tools) and process (use) of e-learning. This continuum can be applied along a number of different layers including: tools and media, computer hardware and software, affordances and design orientations, media literacies, and e-learning approaches.

The technology zone of the eLAG, illustrated above, shows a shift from traditional to emergent tools along the horizontal continuum, and charts this shift for the various layers within the technology zone. Tensions and opportunities emerge within and between these layers to the extent that they are misaligned or aligned. Each of the layers is discussed below:

Tools & Media

The evolution of technology used for teaching and learning is illustrated above on a continuum from the traditional tools on the left such as the printing press, to the emergent wireless networks on the right. This progression starts with the invention of the printing press in the fourteenth century and continues on to the introduction of the postal service and then the telephone, both of which had an impact on distance education. It develops further in the twentieth century with the introduction of radio broadcasts in the 1920s, film in the 1930s and television in the 1950s, which again influenced, in varying degrees, the practice of teaching and learning. However, the rate of these technological changes was, as Bates (2005) points out, relatively sedate compared with the rapid acceleration of technology after 1980. First there was the introduction of non-networked computer based learning, then networked computer use and, subsequently, advances which today include the world wide web, search engines such as Google, mobile phones, learning objects, wireless networks and virtual reality learning sites (Bates, 2005).

New technologies do not necessarily replace old technologies but rather they subtly change how and when we use them, as a broader range of choice becomes available to educators. This increasing choice goes from the more traditional forms of media on the left of the continuum, such as reading print and books, to 'reading' movies and images and communicating via mobile phones, email, the web and social networking tools on

the right. The continuum now spans the ability to read hardcopy text and digital and cyber-literacy in using online multimedia. The issue that arises is that for education to benefit from these shifts, skills in 'transliteracy' are needed. This involves shifting between and communicating through diverse media, including: books on the traditional end of the continuum *and* wikis on the emergent end; oral narration at the traditional end *and* podcasting at the emergent end; note-taking at the traditional end *and* uploading video clips to the web at the emergent end of the continuum. Print literacy was adequate for a pre-digital society but in a 'transliterate' society it is argued that there is a need to be cognisant of many kinds of media and communication from face-to-face discussions to online chat forums, and from books to online hypertext (Downes, 2002).

The continuum of media literacy now extends from what is characterised as being linear, ordered, text-based and physical to more networked, chaotic, web-based and virtual approaches. New literacies do not necessarily replace the old and, contrary to popular belief, technology has put new emphasis on reading and writing. Teenagers who could not read well were nevertheless able to participate in social conversations among peers a generation ago. Currently however, there is so much written communication (through text messaging, downloading information, networking online and online chat), that being able to read and write has become a social imperative (Baggott, 2006). There is pressure now to read in all aspects of communication and daily living such as shopping, socialising or working.

New tools and technology add new dimensions to what it means to be literate. As Williams (cited in Baggott, 2006) points out, literacy will come to mean knowing how to choose between print, image, video, sound and all the potential combinations of these. For Downes (2002), the 'new literacy' is one that requires a different way of thinking and a different complexity. He argues that in this new way of thinking there will no longer be the need to codify knowledge into sentences and a new way of learning will emerge with more effective and efficient modes of memory and recall. The new literacy might well be a capacity to move beyond the limits of text and engage in different ways. For example a shift from text based approaches of organising information which tends to be linear, logical, hierarchical and categorical to 'webbed' approaches that are more synchronous, spontaneous, holistic and interconnected (e.g.

Google searching and linking). Transliteracy then becomes the ability to read, write and interact across a range of platforms, tools and media including print, TV, radio and film, to text, blogging, podcasting, *YouTube* sharing and using other digital social networks (Thomas, 2007).

So, if we accept that technology influences our approach to literacy, then the questions that e-learning educators have to consider at the first level of the technology zone include: which tools and media are appropriate to use in which contexts; what literacies are needed for individuals to become confident and competent users of new technologies.

These issues relate to the overarching research question of how technology influences e-learning practice. The tools most often used in the e-learning context are computers, and the next section traces the shifts along the computer continuum looking at the implications of these shifts.

Computers/ Software — Web 1.0 to Web 2.0.

The second level of the technology zone illustrates the evolution of computers and software on a continuum from the traditional non-networked or stand alone computers on the left through to Web 1.0 networked systems and then the emergent Web 2.0 or social networking systems on the right hand side of the continuum. The use of non-networked computers for education involved independent learning using the computer for information downloads, drill and practice and word-processed documents. Networked computers saw the introduction of Web 1.0, which allowed for interaction between users through the use of emails and then the development of LMSs (for example *WebCT*, *Blackboard* etc). Later developments saw the emergence of technologies known as Web 2.0 or social software, which enable users to create information online as well as share this with others, engage in conversation and co-create knowledge.

As Downes (2005) describes, the shift from Web 1.0 to Web 2.0 technology has been a shift from the web being a medium in which information is transmitted and consumed, to an environment in which content is created, shared, remixed and passed along. A

useful example to illustrate the difference between Web 1.0 and Web 2.0 is a comparison between an online encyclopaedia, where the user is able to download information, and wikipedia, a web-based, free encyclopaedia written and edited collaboratively by anyone with Internet access. Whereas Web 1.0 is about downloading content, Web 2.0 allows for conversation and constructing knowledge. Web 1.0 is read-only while Web 2.0 is read and write. Web 1.0 provides access to information where Web 2.0 provides access to networked communities.

Web 2.0 or social software tools that have a potentially significant impact on learning include: *blogs*, or personal online journals combining chronological entries with text, images and hyperlinks to which readers can respond by leaving comments; *wikis*, or collaborative online authoring tools allowing multiple authors to add or edit content; *podcasts,* or pre-recorded audio or video files that can be subscribed to and downloaded at any convenient time; RSS *feeds* or subscriptions to blogs, podcasts or web links; *video sharing* websites like *YouTube* where users can upload, view, and share video clips that can be rated and commented on by viewers worldwide; *photo sharing* sites like *Flickr*; *folksonomy sites*, like del.icio.us where content can be shared through a collaborative book-marking system know as tagging (non-hierarchical classification of content through keywords); *social networking sites* like *Facebook*, where individuals can join online communities to interact and share interests; and *virtual worlds* like *Second Life*, where users can create their own avatar (screen character) and interact in online realities. These tools have the potential for learners to design their own learning space and develop the content and commentary they choose with feedback and interaction from anyone, anywhere, anytime. This affords differentiated learning environments which can be designed by each individual in terms of what they choose to network about, who they choose to network with, when and how.

The emergence of these Web 2.0 tools highlights the shifts that have occurred in technology in terms of the possibilities they afford for teaching and learning, but at the same time these shifts raise tensions relating to the difficulties of using informal and self-authoring tools in formal teaching contexts where the curriculum and programmes are prescribed. Different technologies afford or can be designed for different teaching and learning experiences as outlined below.

Design/affordances

The third level of the technology zone illustrates the shifts from traditional tools on the left side of the continuum that afford a drill and practice approach to teaching and learning, to emergent tools on the right that support social networking and self directed learning.

McLuhan's (1965) maxim that 'the medium is the message' is useful when considering what different media afford. The continuum shifts from where the medium allows for the message to be *one-way* (transmission mode teaching that is monological), to *two-way* (interactive, dialogical teaching and learning) or *multiple-way* (networked, multi-conversational learning). For example, print-based learning is *one-way* communication as the message cannot be changed and moves from the author to the reader, or the teacher to the learner. This may be contrasted with individual postings to a discussion forum in a web-based course where users interact with each other in *two-way* communication between teacher and learner or learners. Collaboration on a single document (for example a wiki), or hyperlinking within a blog, where potentially limitless users can respond anytime, anywhere, allows for *multiple* networked communication. Such communication moves in multiple and unpredicted directions between learners and teachers, allowing for opportunities to extend beyond the immediate or prescribed learning parameters.

The extent to which the tools on the continuum are available at any time and used appropriately for a particular learning environment, influences the alignment of technology and pedagogy. The continuum ranges from tools that afford a drill and practice, behaviourist approach to learning, through to online interaction and collaboration in networked learning environments more aligned with constructivist and co-constructivist learning approaches. Emergent technologies afford a co-authoring of content and participation in various online social networks and learning communities through the use of tools like wikis, blogs and podcasts. This is more compatible with a flexible and systems level approach to learning.

While more traditional tools on the continuum afford an approach compatible with downloading primarily text or image-based content, emergent tools are designed for communicating with others using not just words and images, but through video, simulations, multimedia and in virtual realities. The key point here is the recognition that learning is dynamic and not restricted to static content. e-Learning in a digital age provides challenges for traditional practices of print-based literacy as well as transmission mode, one-way, content delivery as outlined below.

e-Learning

The fifth level of the technology zone illustrates how shifts in the previous levels of media and media literacy, hardware and software developments, and affordances of tools, impact on e-learning. These shifts show how different tools are appropriate for different learning environments. Non-networked computer learning is situated on the 'traditional' of the continuum, and is mainly limited to downloading content, whereas moving along the continuum, with networked computers, possibilities emerge for whole courses to be put online through LMSs (eg *WebCT*, *Blackboard*, *Moodle*) which offer the potential for online anytime-anywhere interaction and discussion between course participants. Within this approach, content and organisation of learning is still very much teacher or institution controlled and managed. On the 'emergent' end of the continuum, social software and Web 2.0 tools afford a learning environment where students can move from 'information' to 'conversation' to co-create content through the 'read-write web'. This enables them to move towards managing and controlling their own content and process of learning and network globally with others, sharing their interests and expertise. The shift here is that learners can be instantly networked with the rest of the world through publishing their creations as follows: anyone with a keyboard can be an instant author (via a blog); anyone with a camera can be a 'published' photographer or commentator (uploading photos to *Flicker* or videos to *YouTube*). The challenge here for educators is how to identify and maximise the value in using these tools, and minimise what is not. Rather than rejecting new technology as in the cases of banning mobile phones from educational settings or penalising the use of wikipedia as a referencing or resource tool, the potential that new tools offer and the appropriateness for different e-learning contexts could be explored, and the tools used for these purposes.

e-Learning involves any or all aspects along this continuum. Depending on the dynamic interplay of the tools, design and literacy, different kinds of learning are afforded. Maximising the full potential of each and using each when appropriate, is the challenge for the educator. Using a LMS to store lecture notes for students to retrieve (as in Phase 1 of this research) is not markedly different from traditional distance education. However, designing a LMS for distance students to interact both synchronously and asynchronously through chat rooms and discussion forums, to collaborate on group wikis, to share resources in glossaries, to link to RSS feeds, to listen to podcasts and to view videoclips, provides a qualitatively different learning experience afforded by the technology (as in Phase 2 of this research).

While many educators acknowledge what the shift to Web 2.0 e-learning affords (Attwell, 2006; Begg, Ellaway, Dewhurst, & Macleod, 2007; Downes, 2005b; Murray, 2007), there is still significant tension in formal learning contexts related to actualising these. These tensions concern issues of control of learning – both in terms of content and process. With Web 2.0 technology, learners can access and share content beyond what the teacher or institution provides through online articles, websites, blogs, wikis and social tagging tools. But possibly the most significant affordance with Web 2.0 tools is the potential for learners to contribute and publish through their own blogs, discussion forums, photo-sharing or social spaces, thus breaking down the barrier between creators and consumers, and between formal, structured classes and informal life-wide learning. Learners can choose their own tools to configure their learning through selecting, managing and creating both the content and process. The essence of Web 2.0 learning is the social connection of people via a shared object they create — be that an article, a photo, a blog or video. Learning occurs through distributed, collaborative, object-oriented discussion. Learners are, according to this view, as much content-makers as content-takers.

While technology permits a shift towards teaching for diversity, tensions for teachers and learners emerge. There are missed and misused opportunities when it comes to integrating new technology and pedagogy. It is the contention of this thesis that what needs to happen is not a rejection of old teaching practices for new, nor a use of new technologies in either old or new ways just for their novelty, but rather a deeper

understanding of how different pedagogies align with different technologies and in what contexts these technologies and pedagogies are appropriate to use. Finally, consistent with a SoTL approach, there is a need to continually advance our understanding of how teaching and learning might change with new emerging technology, for the benefit of learners.

This section has focused in detail on the technology zone of the eLAG, and as such provided the first part of the response to the underlying research question in this study. The research question relates to how the interrelated areas of technology, pedagogy and context influence practice in a changing e-learning environment. Thus far, this chapter has shown how the technology zone is shifting by charting various dimensions on a continuum of change. It has highlighted the importance of aligning this changing technology with appropriate pedagogy. In particular, it has shown how alignment involves reflection on specific areas of technology (as the questions in the table below illustrate) for each e-learning experience, and linkage of these with the next two zones of the eLAG, namely, pedagogy and context, presented in the next sections.

Table 6.1 **Guide for Navigating the Technology Zone in e-Learning Design**

The following questions are a guide for navigating the *technology zone* in e-learning design:
• Which media or tools along the continuum are most appropriate?
• What media literacies are needed to use these tools/media?
• Where is the computer/software located on the continuum from Web 1.0 to Web 2.0.?
• What design and affordances does the technology used offer?
• What kind of e-learning is aligned with this technology?
• Other?

6.3.2.2 The Pedagogy Zone of the eLAG

While changes in technology have the potential to significantly affect learning through a more open and flexible learning environment, pedagogical practices are often resistant to change. A key tension here is when new tools are used in old ways, and consequently

a lack of meaningful change is attributed to the new technology rather than the old pedagogy. In order to actualise the full potential of the technology, an 'aligned' pedagogical approach is needed as outlined in Figure 6-5 below. Paralleling the shifts in the technology zone explored above, the shifts in pedagogy show a movement from practices promoting 'homogeneity' to more open systems where 'diversity' is facilitated and learning is located within personalised authentic life-long and life-wide contexts.

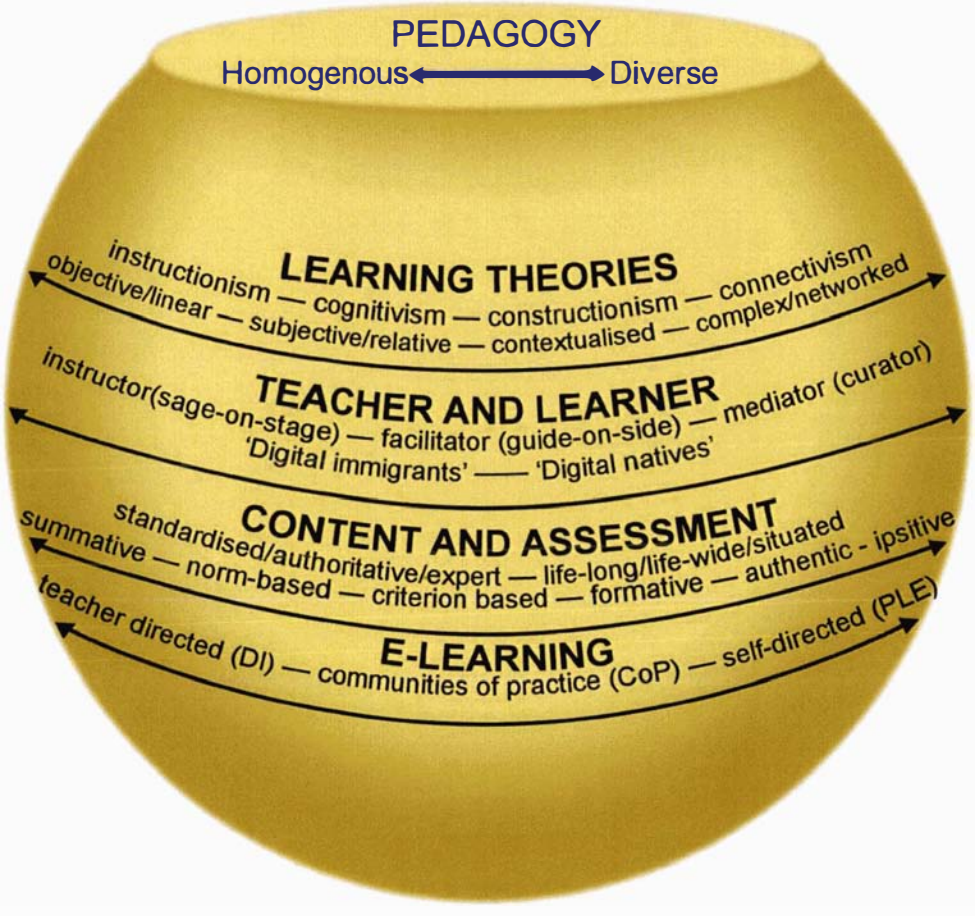


Figure 6-5: The pedagogy zone of the eLAG

The pedagogy zone can be viewed as consisting of a number of different layers — moving from a meta-level of learning theory to the more practical implications of what these mean for the teacher, learner, content, assessment and e-learning environments.

Theories of learning

The first level of the pedagogy zone of Figure 6-5 above illustrates the progression of educational theory or models from the traditional, more homogenous approaches on the left of the continuum to the more emergent, open and diverse approaches on the right of the continuum. In terms of educational theory or models, a continuum can be traced in our understanding of what constitutes learning from the early stages of behaviourism through cognitivism and constructionism, to what Siemens (2004) calls 'connectivism'. This continuum is an adaptation of the work done by Conole et al. (2005) and spans our conceptions of knowledge as objective entities that need to be transferred to the learner by an 'expert' teacher on the one end, to a view that knowledge is subjective and mediated through interaction in contextualised settings. This view in turn has developed to the point where knowledge is seen as chaotic, complex and residing in ever-changing networks (Brown, 2000; Downes, 2005b; Siemens, 2004; Wenmoth, 2006) that are co-created by individual learners through interaction with each other.

Behaviourism and early cognitivism, with links to an objectivist, positivist tradition has, according to Biggs (1996), traditionally been the espoused theory of higher education teaching in the past and is still the dominant theory-in-use. This approach (Biggs, 1996) is based on a dualism between knower and known where knowledge is seen to exist independently of the knower and understanding is the process of coming to know that which already exists. Knowledge is decontextualised, so that it can be learned, assessed and applied more or less independently of particular contexts. Teaching in this model is a matter of transmitting knowledge, and learning is receiving it accurately, storing it, and using it appropriately.

As Laurillard (2003) puts it, "if you were to believe that teaching is about imparting knowledge, then the main requirement of the lecturer would be the possession of that knowledge. For some time, this has been the prevailing view of university teaching, and therefore academics are appointed on the basis of their qualifications in subject matter knowledge" (p 13). However, if teaching is not just about imparting information and learning is not just about acquiring knowledge, then what is it, how different is academic learning from everyday acquisition of information, and what are the implications of this for e-learning?

A response to these issues lies in a shift from the traditional transmission model and the dualism of positivist approaches on the continuum to more constructivist approaches where learning is seen as qualitative as well as quantitative, with the learner central to the creation of meaning, rather than or in addition to the teacher. Active engagement of the learner rather than passive reception of given knowledge is, as Laurillard (2005a) points out, consistent with the cognitive theories of learning of Piaget and Bruner. The cognitivist orientation therefore can be seen to co-exist alongside more recent social constructivist theories of learning, where context and social interaction become important. For Vygotsky, learning occurs in particular social settings through interaction with significant others within the 'zone of proximal development' (Vygotsky & Cole, 1978). Additional learning theories that align with the social constructivist approach of Vygotsky include: Papert's constructionist approach; Lave and Wenger's view that learning is contextualised; Wenger's CoP framework; Illich's learning webs; Knowles' authentic and experiential learning; Senge's holistic systems approach; and Bateson's emergent theory (Laurillard, 2005; Papert, 1993; Senge, 1990; Wenger, 2006).

For Siemens (2004), both cognitivism and constructivism are theories of learning that derive from a predominantly physical as opposed to digital era. They align with a pedagogy that fits with transmitting information to learners (cognitivism) or facilitating interaction, collaboration and discussion (constructivism), and are not easily aligned in a digital era. He suggests that contemporary learning is not limited to behavioural systems, or to cognitivist construction of knowledge, but involves collaborating and co-creating knowledge using various forms of social networking technology. Learning in the 21st century calls for a new theory according to Siemens (2006), and he offers what he calls *connectivism.* Siemens (2004) lists the following as the key principles of connectivism: learning and knowledge rest in diversity of opinions; learning is a process of connecting specialised nodes or information sources; learning may reside in non-human appliances; capacity to know more is more critical than what is currently known; nurturing and maintaining connections is needed to facilitate continual learning; the ability to see connections between fields, ideas, and concepts is a core skill; currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities; decision-making is itself a learning process. Choosing what to learn and the meaning of

incoming information is always seen through the lens of a shifting reality (Siemens, 2006a).

For Siemens, our ability to learn what we need for tomorrow is more important than what we know today. This learning, understanding and knowledge acquisition comes through networking with others using the tools of the digital era. Siemen's approach resonates with the work of other writers and practitioners in the field of e-learning (Downes, 2007; Prensky, 2001; Weigel, 2002; Wenmoth, 2006). For example, emerging educational technologies are demanding a new pedagogy for what is sometimes referred to as a "neomillenial" learning style (Dee, 2006). This style of learning is more interactive, immersive and collaborative than traditional lecturing styles afford. It develops as learners engage with digital media that allow for their involvement in virtual environments, the expression of personal opinions, and debate on global issues in shared Internet spaces.

If the continuum of learning theory is mapped on to the previous continuum relating to technology, then behaviourism and positivism on the one end align with print-based literacies using Web 1.0 computers to download content. On the opposite end of the continuum, connectivism aligns with transliteracy which is needed for multimedia use of Web 2.0 social networking tools to co-create learning environments. In moving from theory to practice, different pedagogies require different teaching, learning, curriculum and assessment orientations as discussed below.

Teacher and Learner

The second level of the pedagogy zone illustrates a range of teaching approaches on the continuum from a transmission model focused on instructional training or the 'sage on the stage' approach, to the facilitation mode of 'guide on the side' or Feuerstein's mediation approach (Mentis & Dunn-Bernstein, 2007). Pedagogy has shifted in the digital age to more open conceptualisations of teachers as digital designers or what Siemens (2007) suggests is a 'curator' style, which involves a combination of the 'expert' sage and the guide.

> A curatorial teacher acknowledges the autonomy of learners, yet understands the frustration of exploring unknown territories without a map. A curator is an expert learner. Instead of dispensing knowledge, he creates spaces in which

> knowledge can be created, explored, and connected. While curators understand their field very well, they don't adhere to traditional in-class teacher-centric power structures. A curator balances the freedom of individual learners with the thoughtful interpretation of the subject being explored. While learners are free to explore, they encounter displays, concepts, and artifacts representative of the discipline. Their freedom to explore is unbounded. But when they engage with subject matter, the key concepts of a discipline are transparently reflected through the curatorial actions of the teacher. (Siemens, 2007a)

The role of the teacher as mentor (Mitchell, 2007), guide, designer or curator of the learning experience aligns well with the changing role of the learner. This role has shifted from the passive student engaged in downloading information to the self-directed learner who is comfortable with all the media and technologies of the digital age, and an active and collaborative member of a community of learners.

It has been suggested that today's students learn differently and can easily feel disconnected from an education system that was designed for another time (Owens, 2007; Prensky, 2001). As Owens (2007) points out, the digital generation takes in and responds to rapidly transmitted sights and sounds. As such, students are: (1) hyper-communicators — using a variety of technology such as land phones, cell phones, iPods, PDAs, email, the Internet and instant messaging (IM) to stay in constant touch with their peers and to access information immediately; (2) multi-taskers — simultaneously watching TV, searching the Internet, downloading music and communicating face-to-face; and (3) goal oriented — pursuing multiple goals at the same time.

In coining the term 'digital natives', Prensky (2001) warned that today's students are no longer the people our educational system was designed to teach. Spending their entire lives surrounded by and using all the tools of the digital age, students now think and process information in fundamentally different ways from their predecessors. The characteristics that he outlines for the 'digital natives' include: receiving information rapidly; parallel processing and multi-tasking; preferring graphics before text; preferring random access (like hypertext); and functioning best when networked. Growing up on the 'twitch speed' of video games and MTV, they are used to the instantaneity of hypertext, downloaded music, phones in their pockets, a library on their laptops and IM. They have little patience for lectures, step-by-step logic, and 'tell-test'

instruction (Prensky, 2001).

While Prensky's notion that a digital divide is occurring between the 'immigrants' and 'natives' is useful in differentiating learners, there is some disagreement about whether this is a generational or age distinction (Jenkins, 2007). There are many young learners who have a very shallow understanding of technology, and older learners with a sound comprehension of the technology landscape (Siemens, 2007b). The 'digital natives' analogy implies that digital skills are uniformly possessed by all members of the younger generation whereas in reality there is unequal access to the technologies and cultural practices out of which these skills emerge (Jenkins, 2007). The digital divide then is perhaps more accurately interpreted in term of a mindset — for example within the academic arena between those teachers who have an 'Internet-mindedness' (knowledge and skills relating to e-learning) and those who do not (Nichols, 2006).

Content and Assessment

Just as the role of the teacher and learner shifts to accommodate new approaches in the digital age, so do content or subject matter and assessment processes come under scrutiny. Two relevant factors impacting on decisions about content are the rapid growth of knowledge and the 'long tail' phenomenon of diversification. As Gonzalez (2004, cited in Siemens, 2004) points out, half of what is known today was not known 10 years ago as the amount of knowledge in the world has doubled in the past 10 years and is doubling every 18 months according to the American Society of Training and Documentation (ASTD). So, what constitutes relevant content for any discipline or course becomes debatable, and as Siemens (2006) suggests, content becomes more a conduit for conversation or interaction than an end in itself.

The 'long tail' phenomenon has implications for education in terms of what constitutes information, knowledge or content worthy of inclusion within the various curricula of current education systems. Anderson (2006) describes the 'long tail' as the phenomenon where culture and business is seen to be increasingly shifting away from focusing on a few standardised and most popular products and markets (the height of the production tail) towards the accommodation of many, diverse and relatively small niches in the tail of production. As the costs of production and distribution fall, especially online, there is

now less need to lump products and consumers into one-size-fits-all containers (Anderson, 2006a). Within this orientation, standard or popular texts no longer need to be the norm for accessing information. Online facilities exist to access diverse, often less popular or mainstream information. This allows for specific, individualised, niche and contextualised information to be accessed in addition to the popular and mainstream content, thus allowing diversification and choice regarding what information to access.

As Weller (2007) points out, education approaches that are 'pre-long tail' focus on content as most significant — imparting the same information to everyone. But, where there is immediate access to diverse content, then the effort goes into creating and supporting activities around that content. Uniformity in terms of knowledge acquisition is not as important as critical judgement and debate around diverse opinions. In the 'long tail' world, users are accustomed to a diversity of resources as they seek out alternative perspectives rather than just accepting the popular choices.

> If the blockbuster is dead (or at least not as significant as it was), then the Fordist model of distance education course production needs revising. There has been talk of a post-Fordist model for a long time, but I think we haven't really changed the model fundamentally. In a long tail world lots of small population courses might be the way to go, which means the economics of course production and presentation need to change, for example to a more flexible model built around aggregation (Weller, 2007b).

These shifts in judgments about relevant content have implications for how learning is assessed. They raise tensions around traditional closed forms of assessment such as norm-based summative approaches. In contrast, they could be better aligned with open and interactive forms such as formative assessment, criterion-based approaches and peer or CoP moderated methods. If assessment practices are to be aligned with differentiated learning environments, then portfolios and ipsative assessments would seem more appropriate as they accommodate diversity and individualised learning.

The move from homogenous to more diverse pedagogies raises questions around the separation between formal and informal learning. Recognition of different forms of knowledge and skills gained outside of school or formal training institutions (Green, Facer, Rudd, Dillon, & Humphreys, 2005) align well with a more divergent approach to pedagogy. While formal learning may be individual and highly organised, the rest of life is more social and unpredictable. An alignment with this suggests a shift to

networked approaches to learning and accreditation, where learners are active co-creators of their life-long learning experience rather than passive consumers as outlined in the next section.

e-Learning

e-Learning can be aligned with tools and pedagogies across the continuum. On the teacher directed side, e-learning is characterised by downloading information, whereas the learner-directed end of the continuum is characterised by diverse learning opportunities within communities of learners/practice and personalised learning environments using social networking Web 2.0 tools.

A Personalised Learning Environment (PLE) can be described as a space for learning that goes beyond the classroom, a space where learning belongs to the student rather than the institution, and is highly personalisable (Murray, 2007). In traditional forms of learning, the teacher or institution has control over the choice and management of the content and the assessment of learning. Learning in this sense is like a 'walled garden' which is outside the context of the learner's everyday life, environment and informal learning. Personalised learning environments reverse the process and put the learner at the centre (Attwell, 2006). A personalised learning environment is where the tools and, to varying degrees, the choice of content for any particular subject area belong to the student and the boundary between formal learning and informal everyday learning is removed. The content 'stays' with the student after formal classes end to be added to and extended in both life-wide (everyday authentic informal learning contexts) and life-long experiences.

Many different examples of what PLEs might look like have been surfacing in the 'blogosphere', with ePortfolios suggested as one way to bridge the formal and informal learning environments (Barrett & Wilkerson, 2004; Weller, 2007a). Key to the notion of the PLE are the elements of connectivity and networking with others. The interaction between learners and teachers around content is critical to personalised learning and so the choice of who to network with is as important as what to network about. It is here that the role of teachers as guides, curators or more experienced mentors becomes relevant. Different PLEs then become networked with each other in a web of interaction

through the affordance of 'folksonomies', 'tagging' and Web 2.0 activities such as blogging, video and image sharing, RSS feeds, *Skype*, and online databases.

According to Martin (2007), PLEs can be conceptualised as environments where individuals access, aggregate, configure and manipulate digital artifacts of their ongoing learning experiences. It is "a combination of the formal and informal tools and processes we use to gather information, reflect on it and do something with it, which is essentially what we mean when we talk about learning" (Martin, 2007). The characteristics of the PLE design may be achieved using a combination of existing devices (laptops, mobile phones, portable media devices), applications (newsreaders, instant messaging clients, browsers, calendars) and services (social bookmark services, weblogs, wikis) (Atwell, 2007).

However, the important issue around developing PLEs is not technical but philosophical, ethical and pedagogical in that PLEs are a potential model for opening the walled gardens of the educational institutions to outside worlds (Attwell, 2006). This type of learning has significant tensions and issues for institutional learning contexts, from managing content to assessing and accrediting learning. The extent to which PLEs can align effectively with traditional teaching institutions and the tensions that arise will be covered in the section on the context zone of e-learning.

This section has focused in detail on the pedagogy zone of the eLAG and as such provided the second part of the response to the underlying research question in this study. The research question is how the interrelated areas of technology, pedagogy and context influence practice in a changing e-learning environment. This chapter has outlined the shifts in *pedagogy* by charting various approaches on a continuum from homogenous to diverse. It has highlighted the importance of aligning the various pedagogical approaches with specific types of technology. These pedagogical approaches as outlined on the eLAG are summarised in the five questions in Table 12 below. Applying these questions, and others a designer might have, to any particular e-learning situation will help to align pedagogy with elements of the context zone of the eLAG outlined in the next section.

Table 6.2 **Guide for Navigating the Pedagogy Zone in e-Learning Design**

The following questions are a guide for navigating the *pedagogy zone* in e-learning design:

- Which learning theory along the continuum aligns with the technology and context?
- What are the implications for the teacher and learner?
- How is the content and assessment aligned?
- What kind of e-learning is aligned with these pedagogies?
- Other?

6.3.2.3 The Context Zone of the eLAG

As outlined above, educational practices that have a set curriculum, norm or standards based assessments and prescribed lesson agendas are often misaligned with an orientation that celebrates a difference in learners and learning. If diversity is to be valued in education then the 'one size fits all' approach to learning might not be the most appropriate for a 21st century of globalisation. The transmission mode of teaching might have aligned well with the industrial era of the past, but it raises tensions and constraints in current times where change and diversity are the only constants. According to Gilbert (2005), the industrial-age 'assembly-line' metaphor does not fit within a knowledge-age context, which involves systems, networks, multiple possibilities, multiple connections and multiple pathways.

While shifts can be traced in both technology and pedagogy that have significant potential to disrupt or change traditional ways of teaching and learning, it seems that for educational institutions the 'business-as-usual' format of classes and lectures, projects and exams, and tightly prescribed content and curricula still dominates. As Snowden puts it, "one of the great challenges is going to be to allow a co-evolution of the capability of Web 2.0 tools with the needs of organizations" (2007, para. 3).

In this section, issues relating to that co-evolution and alignment of context with pedagogy and technology will be explored. Context in this section refers to community characteristics, institutional characteristics of policies and practices, and discipline

specific characteristics, only in so far as they relate to specific learning and teaching programmes. The impact of context on both the technology and learning zones of the eLAG is illustrated below. These shifts in context range from formal to informal and can be considered in a number of different layers as outlined below.

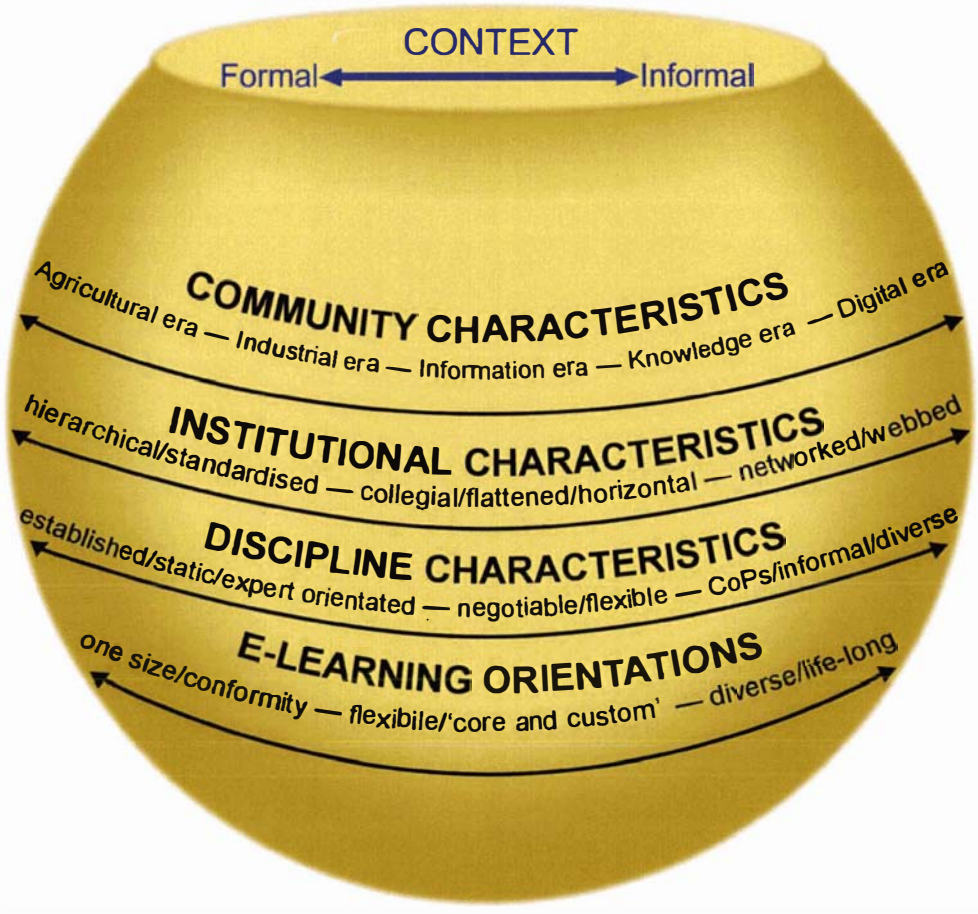


Figure 6-6: The context zone of the eLAG

Community characteristics

Although formal education (for example the scholastic training of monks, the craft guilds of the Middle Ages, the philosophers academies in Ancient Greek and Roman times, and the earlier esoteric schools of many tribal cultures) has existed since the dawn of civilisation, it is only since the Industrial Revolution that a formal system of *mass* education has appeared. This can be seen to parallel the transition from an agrarian to an industrial society, where the characteristics of the mass education system of standardisation and uniformity aligned well to a factory assembly line context of the industrial era. However, with shifts in technology and pedagogy to increasing

availability and immediacy of information through electronic media in the 'information era' and the development of more interactive pedagogies, the relevance of that traditional 'lockstep curriculum' of mass education is questioned. According to Snowden (2007), we are at a critical moment in the history of institutions where the accumulated momentum of technological and pedagogical change is now placing significant pressure on the institutional context to transform itself into something more appropriate for communities within the 'knowledge era' of the 21st century.

Institutional characteristics

The stability and consistency of institutional structures in education are both its strength and its weakness. The strength is evident in their endurance, but the weakness is becoming increasingly apparent in their inflexibility to adapt to changing times. The industrial and information eras saw the rise of the large educational institutions based on a hierarchical structure, that suited the prevailing emphasis on scientific and empirical modes of knowledge and, increasingly, management efficiency. Within this structure, centralised and standardised systems emerged for managing teaching and learning, the legitimacy of knowledge, and the evaluation and progress of teachers and learners (Howley & Harnett, 1992). In a knowledge society, however, a more flattened and horizontal approach is argued to be better aligned with new technologies and pedagogies that facilitate organic networks of knowledge management through online interactions and connections (Hinton, 2007).

Biggs (1999) sees the managerial model and quantitative framework of institutional control of universities as often operating at the expense of a more learning-focused orientation. Tensions arise, for Biggs, when administrative convenience wins over educational considerations. Higher education then becomes a system driven by administration over education. This is a result of 'large' institutional policies and practices influencing 'small' programmes and papers. Teaching, assessment and reporting of student performance in standardised, quantitative terms operates at the expense of an exploration of qualitative and differentiated teaching, learning and assessment practices. Just as the form of a physical building constrains the types of rooms that can be created in them, and the rooms themselves determine the internal features and furniture, so too in education does the 'shape' of institutional policies

determine practice (Dron, 2006b). This is true for physical, organisational and virtual educational environments. The 'shape' of the physical classroom influences the kinds of learning that occur there. For example, lecture halls with podiums for teacher-talk and student note-takings may be contrasted with computer lounges for self-directed and collaborative inquiry-based learning.

McClintock (1970, cited in Monahan, 2002) suggests that "designs for classrooms not only tell us much about the didactic means that were used in them; they also reveal the essence of the pedagogy that directed the educative efforts of past times" (para. 2). Classrooms with neat rows suggest a pedagogy or "tacit curriculum" of discipline and conformity, whereas more open spaces reflect flexibility and self-discovery. Monahan (2002) contends that as with physical classrooms, online learning spaces can also restrict or allow for certain learning possibilities. The 'shape' of online learning environments influence learning activities, for example, *WebCT*'s content management design compared with *Moodle*'s social constructivist design. Moreover, the 'shape' of the organisational system influences the choices that are possible for individual teachers. For example, an examination board's requirement to adjust grades according to a normal distribution curve aligns well with a summative, individual, lecturer-assessed grading system. However, this might not be as easily aligned with formative, group, peer or ipsative assessment practices, or web approaches that use online learning portfolios linked to individual student learning goals that extend beyond formal course-work.

Within Figure 6-6 the institutional characteristics of the continuum swing from formal hierarchical, centralised and standardised systems, through to inclusive and democratic forms of participatory decision making in flattened and collaborative management styles, to the networked and webbed characteristics of informal networks such as CoPs. Different institutional characteristics support certain types of pedagogy and technology use, and are a barrier to others. For example, an organisational paradigm that emphasises hierarchy and 'top-down' control in terms of the systems used for time-tabling courses, selecting curriculum content and evaluating student progress and subject content, is at odds with a learning approach supporting diversity and self-directed learning in a networked learning community.

Discipline characteristics

Just as the range of institutional characteristics influences learning, so too can discipline specific characteristics determine pedagogy and technology. Some areas (for example those requiring standardisation and rote recall of information) tend to align more with the conventional end of the continuum where information is passed on to students in a relatively static way. A more didactic pedagogy and e-learning technology that facilitates content management aligns well with this approach. Other areas (for example those requiring debate of issues or individualised problem solutions) align more with the flexible end of the continuum where creativity and diversity are encouraged and learning is facilitated more through collaboration within communities of learners or communities of practice. Social constructivist pedagogies and technologies that afford networking and co-creation of content are better aligned with this orientation.

The discipline characteristics in this research study have been aligned with a CoP orientation. The SEEP programme consisted of students entering at the foundation level of special education as novices in the community and as they advance through the course to the professional and then internship years they move towards being more experienced practitioners. The competency domains of the wider educational psychology field serve as the knowledge or domain, while the fieldwork links with practice and the support and scaffolding of more experienced students, supervisors and lecturer all serve as the community dimensions of the CoP orientation.

As outlined in both Phase 1 and 2, the pedagogy of the SEEP programme involved social constructivism including assignment and activities involving: debates on ethical dilemmas; interactive forums on issues arising from the readings; collaborative glossary entries; sharing of resources; and supporting case-work. The technology needed to support these learning activities included a LMS that afforded some use of Web 2.0 technologies such as wikis, glossaries, RSS feeds, video and podcasts, and reflective journals. This locates the discipline characteristics on the right side of the context continuum. There are set competencies but within each the range of applications and interpretations are negotiable and flexible. Support for learning is within a CoP approach.

e-Learning orientations

Mitchell (2007) describes the e-learning landscape and information literacy focus of academic institutions in terms such as: accredited, age-specific, authoritative, reputable, scholarly and structured. This is contrasted with the learning landscape of many students' personal information experience which she describes as creative, diverse, fast, global, immediate, informal, innovative, media-rich and motivating (Mitchell, 2007). While dichotomies are not always helpful or accurate, this distinction can be mapped onto the continuum outlined previously in the context zone of the eLAG (Figure 6-6) and raises tensions that need consideration in the design of e-learning environments. Mitchell's analysis highlights again the distinction between the formal institutional approach where commercial, copyrighted, peer-refereed and published material is considered essential for selecting and cataloguing information and content, whereas at the informal end of the continuum many students' personal information experience is "characteristically diverse, fast, free, global, immediate and informal, involving media-rich, multimodal and somewhat muddy interactions. It is open, opinionated, participatory, personalised and very public. Resources are shared, tagged and generative" (Mitchell, 2007, p.3). For Mitchell, the difference between these two lies in issues of power and control. A move to the more informal requires significant risk taking, which she claims is not the common terrain of academic institutions as it is perceived as lowering standards.

These tensions raise ongoing questions for educators as to the ways in which institutional systems can or should engage with new technologies and approaches. Social software offers great potential for learners to create their own learning networks, yet these networks will only involve 'learning' to the extent that participants have an aligned view of that learning. As Dron (2006) points out, to avoid "the wisdom of crowds becoming the stupidity of mobs", it is important to "build systems and processes in which the structures that develop are capable of being pedagogically sound and supportive of learning communities" (p. 4).

In terms of e-learning orientations, the continuum thus shifts between a standardised 'one-size-fits-all' approach on the formal end through to an orientation that values diversity and networking for life-long and life-wide learning on the other. Between

these two extremes sits an orientation that can be described as 'core and custom'(Anderson et al, 2006), where 'core' constitutes the standardised and prescribed formula for e-learning and alongside that 'custom' allows for opportunities to be more flexible and individualised as appropriate.

This section of the eLAG has identified shifts relating to various levels of context and these are summarised in the following questions. Applying these questions and additional questions that designers choose to include under 'other?' to any particular e-learning situation will help in aligning various elements of the pedagogy and technology zone within a given context. This serves to address the overall research question in terms of showing the importance of aligning context with pedagogy and technology in designing e-learning environments.

Table 6.3 **Guide for Navigating the Context Zone in e-Learning Design**

The following questions are a guide for navigating the *context zone* in e-learning design:

- What are the community characteristics of this e-learning environment?
- What are the institutional characteristics of this e-learning environment?
- What are the characteristics of the discipline within which this e-learning environment is located?
- What are the implications in terms of values and orientation for e-learning within this context?
- Other?

6.4 PHASE 3: RESEARCH ACTIVITIES AND OUTCOMES

The *research activity* of Phase 3 informed and was informed by both the *learning* and *teaching* activities of this phase of the study. These included a number of different collaborative research projects that were then presented as *research outputs* including journal publications, community lectures, ministry reports, and conference presentations as indicated in Figure 6-7 below.

Research Outputs for Phase 3:

Anderson, B., Brown, M., Murray, F., Simpson, M., & Mentis, M. (2006). *Global Picture, local lessons: E-learning policy and accessibility. Final Report.* Wellington, New Zealand: Ministry of Education.

Frielick, S., Mentis, M., & Ross, A. (2005). *The Certificate in e-Learning Design and Development (CELDD): A Community of practice action research framework for curriculum development.* Paper presented at the eFest.

Frielick, S., Mentis, M., Gould, I., Morgan, G., & Chester, F. (2006). *Social Software in Moodle: The Certificate in e-Learning Design & Development (CeLDD), .* Paper presented at the Moodle Moot - New Zealand.

Frielick, S., Mentis, M., Gould, I., Morgan, G., & Chester, F. (2006). *Social software in Moodle: The certificate in e-learning design & development (CeLDD).* Paper presented at the 2006 Moodle Moot.

Mentis, M. (2006). *Information as conversation: using social networking tools in e-learning.* Paper presented at the Massey University Vice Chancellor's Symposium. Putting the e into Learning: enhancing student outcomes through the contribution of e-Learning.

Mentis, M. (2006). *Wikis & glossaries in the special education online teaching programme.* Paper presented at the e-Learning lunchbox series for College of Education.

Mentis, M. (2007). *Different technologies for differentiated education: Social networks, identity and diversity in e-learning.* Paper presented at the Seventh International Conference on Diversity in Organisations, Communities and Nations.

Mentis, M. (2007). *From bricks to clicks: Education for the ne(x)t generation.* Paper presented at the Community Seminar series for College of Education.

Mentis, M., Kearney, A., Bevan-Brown, J., & Carroll-Lind, J. (Writer) (2007). Digital Narratives on Inclusion: a teaching resource within the special education programme and inclusive research cluster: FIET (Fund for Innovation and Excellence in Teaching) award.

Mentis, M. (2007). Different Technologies for Differentiated Education: Social networks, Identity and Diversity in e-learning. *The International Journal of Diversity in Organisations, Communities and Nations, 7* (3), 85-93.

Figure 6-7: The research activities and outcomes of Phase 3

The value of these research activities and outputs lies in the opportunities they provided for me to collaborate with others, engage in peer review and invite feedback and discussion. Collaborating with experienced colleagues in the field and receiving formative feedback from them and other practitioners provided useful data for reflection on my own practice and the conceptualisation and design of the eLAG.

The collaborative research projects and outputs were aimed at different audiences, which afforded me the opportunity of engaging in debate with a range of practitioners to address the overarching research question of how the interrelated areas of context, pedagogy and technology influence practice in a changing e-learning environment. The outputs relating to *context* included the two reports for the Ministry of Education funded projects, and these focused on the broader issues relating to e-learning policy and design. The outputs relating to *technology* involved presentations at two conferences on e-learning — eFest (2005) and *Moodle* Moot (2006) — and enabled discussion of using social software in e-learning design. The outputs relating to *pedagogy* involved invited presentations at three community related events: (1) Massey University's Vice Chancellor's Symposium (2006); (2) Massey University's College of Education professional development sessions (2006); and (3) School of Education Community Lecture series (2007), as well as a paper presentation at the Diversity Conference in Amsterdam (2007) and a resulting journal article. These enabled discussion and reflection around integrating sound pedagogy with appropriate technology, and in particular, the usefulness of the eLAG.

The rationale for designing the eLAG was to provide some pointers, indicators or signposts that might assist educators to navigate the changing and complex terrain of e-learning and teaching. In particular it is a tool for e-learning designers to analyse their own practice with a view to effectively aligning the three zones of technology, pedagogy and context given the changes within each. The research activities and outputs presented in this section describe the background and development of the eLAG. The contribution that this section makes is to provide research documents for others to critique or use when considering the value of the eLAG in response to the question of how the interrelated areas of technology, pedagogy and learning influence practice within a changing e-learning environment. This is consistent with the

requirement to disseminate knowledge in a SoTL approach (Huber & Hutchings, 2005; Hutchings, 2002).

6.5 CHAPTER SUMMARY

This chapter has described and analysed Phase 3 of my SoTL research including: (1) my *learning activity and outcomes*; (2) my *teaching activity and outcomes*; and (3) my *research activities and outcomes*. As with the previous two phases of this research, all three aspects contributed to providing a perspective on the overall research question that threaded throughout this study, namely:

> *How do the interrelated areas of technology, pedagogy and context influence practice within a changing e-learning environment?*

In response to this question, this chapter has presented the learning, teaching and research that centred around developing an eLAG. The eLAG is presented as a navigational guide to chart the changing aspects of technology, pedagogy and context in order to facilitate alignment of these. The eLAG provides some pointers, indicators or signposts that might assist educators to navigate the changing and complex terrain of e-learning and teaching.

Section one of the chapter outlined my *learning activities and outcomes* and described the three collaborative projects I was involved in. These focused on e-learning policy nationally and internationally (context), e-learning design using new social software (technology), and e-learning within the SEEP programme (pedagogy). The learning outcomes from these provided insight into the importance of alignment between context, pedagogy and technology, and this provided the basis for the teaching activity.

Section two of the chapter outlined my *teaching activity and outcomes*, which involved the development of an eLAG. This mapped the shifting terrain of e-learning within the zones of technology, pedagogy and context. Within each zone a continuum of change was elaborated for a number of dimensions. The dimensions for consideration in the *technology* zone included: tools and media literacy, computers and software, design affordances, and e-learning orientations. These were mapped on the change continuum from 'traditional' at one end, to 'emergent' at the other. In the pedagogy zone, the

dimensions included: learning theories, the role of teacher and learner, content and assessment practices, and e-learning orientation. These were mapped on the change continuum from 'homogeneity' on the one end to 'diversity' on the other. The context zone dimensions included: community characteristics; institutional characteristics; discipline specific characteristics; and e-learning orientations. These were plotted on a continuum from the 'formal' to 'informal'. Presenting these zones on a continuum of change enables teachers or designers of e-learning to consider how to effectively align the various elements within each zone according to their specific teaching context.

Section three of this chapter outlined my *research activities and outcomes* for this phase, which included dissemination of my learning within a SoTL approach, through community lectures, ministry reports, conference presentations and journal articles. These were grouped according to context, pedagogy and technology. Documentation of these enabled peer review and invited feedback and discussion with other practitioners, academics and researchers within the e-learning community development on the value of the eLAG.

The next and concluding chapter of the thesis is an integration of the previous chapters — showing how the eLAG designed in this Phase 3 can be applied to both case studies in Phase 1 and Phase 2. The implications of this, and the overall strengths and limitations of the three phases are discussed, together with recommendations for further research.

CHAPTER SEVEN:
THE JOURNEY REVISITED

You cannot step twice into the same river, for other waters are continually flowing on.
Heraclitus, 500 B.C.

7.1 INTRODUCTION AND CHAPTER OVERVIEW

This final chapter of the thesis provides the conclusions and insights from the overall research journey. The chapter begins by revisiting the research question, drawing conclusions from each phase of the study and highlighting its implications. The three phases are then integrated in this chapter by applying the eLAG, developed in Phase 3, to the case studies in Phase 1 and Phase 2. This demonstrates the applicability of the guide as an outcome of the research. There follows a discussion of the overall significance of the study and the original contribution that it makes to e-learning practice. The three scenarios outlined in the introduction to this thesis in chapter 1 are revisited and analysed using the eLAG to show three examples of e-learning alignment in the area of special education. Finally, the limitations of the study are identified and recommendations are made for further research within the areas of e-learning technology, pedagogy and context.

7.2 CONCLUSIONS AND IMPLICATIONS

The purpose of this study was to investigate the interrelationship between technology, pedagogy and context in e-learning. I set out as a teacher, learner and researcher to explore the potential of e-learning to change the way we teach and learn, and charted the personal changes I experienced along this journey over six years. My e-learning journey was based on a SoTL approach (Boyer, 1990; Huber & Hutchings, 2005; Hutchings, 2002) and involved three activities (teaching, learning and research) over three phases. The overarching question for all three phases and three activities was:

> *How do the interrelated areas of technology, pedagogy and context influence practice within a changing e-learning environment?*

The focus on the *technology* aspect of the research question arose out of a personal and

professional challenge of having to teach postgraduate education papers online. With e-learning described as a 'disruptive technology' (Garrison & Anderson, 2003), and having the potential to change the way we teach and learn (Laurillard, 2005a), the research focus expanded to examine the relationship between *pedagogy* and *technology*. This complex relationship between the use of new technologies and teaching in distance education is frequently misunderstood, particularly at the post-school level (Kirkwood & Price, 2006). Given also that teaching and learning can never be context-free (Flyvbjerg, 2001), the third aspect of the research question concerned the *context* of the e-learning environment. This focus on technology, pedagogy and context threaded through all three phases of activities (learning activity, teaching activity and research activity) of the study.

In Phase 1 of the research (as presented in chapter 4) the e-learning *technology* of *WebCT* was used to support a CoP (Wenger, 1998) based *pedagogy* within the *context* of the SEEP programme at Massey University (Mentis & Ryba, 2001a). My learning activity in this phase involved participating in workshops to gain a deeper understanding of: (1) the theory and practice of e-learning; (2) the development of a CoP approach within e-learning; and, (3) the use of *WebCT* as a LMS. This provided the professional development necessary for the teaching activity of this phase, which involved the design and implementation of a CoP e-learning environment using *WebCT* in the SEEP programme. The findings from the case study evaluation of this teaching activity highlighted the difficulties of aligning a technology oriented towards information transfer with a CoP approach to pedagogy within a programme context oriented towards social constructionism (Papert, 1991). In keeping with the SoTL commitment to document and disseminate the process of researching teaching and learning (Huber & Hutchings, 2005), the findings were presented as outputs of the research activity of this phase. These presentations enabled public debate and formative feedback on Phase 1, which in turn informed Phase 2 of the study.

In Phase 2 of the study (as presented in chapter 5), *Moodle* (Dougiamas, 2007) was selected as an alternative *technology* to be used to support the CoP *pedagogy* within the *context* of the SEEP programme at Massey University. The rationale for this was to move away from a 'force-fit' approach between technology and pedagogy (Feldstein & Masson, 2006) and select a LMS designed to enable a more social constructionist

approach to teaching and learning. My learning activity in Phase 2 involved three main components: (1) professional development to gain a deeper understanding of using a CoP approach online; (2) facilitating interaction between participants online (Thomson et al., 2005); and, (3) designing an e-learning environment using *Moodle*. This informed the teaching activity in Phase 2 which focused on the application and implementation of *Moodle* in designing a CoP e-learning approach that was better aligned with the competencies of the SEEP programme (Ryba et al., 2001). Findings from the case study evaluation of the teaching activity in this phase showed a coherent alignment of pedagogy and technology that was not evident in Phase 1. However, additional issues arose including a tension between the relatively fixed boundaries of a formal learning context and the dynamic features of a naturally occurring CoP (Chang, 1999; Mitchell, 2007; Stuckey, 2001). Consistent with the SoTL approach (Huber & Hutchings, 2005), the research was documented in the research activity of this phase, which consisted of paper presentations internationally and locally. This provided opportunities for peer review, formative feedback and discussion of the Phase 2 research, which in turn influenced the direction of Phase 3 towards the development of a tool to consider alignment between the three areas of technology, pedagogy and context in e-learning.

In Phase 3 of the research (as presented in chapter 6), an eLAG was developed in order to chart the changing e-learning terrain and offer a tool for practitioners to use to help navigate this changing terrain. This constituted the third phase response to the question of how the interrelated areas of technology, pedagogy and context influence e-learning practice.

Because the e-learning terrain keeps changing, any map or guide for traversing the terrain has to accommodate this change. To do so, it needs to focus on the range of teaching and learning approaches and changing contextual factors, together with a technology that keeps improving (Barab et al., 2004; Bosco, 2006; Downes, 2007; Oblinger & Oblinger, 2005; Siemens, 2006c). Thus, the final phase of the study focused on developing a guide that charts the changes within the areas of context, pedagogy and technology. My learning activity in Phase 3 involved: (1) analysing e-learning policies and practices; (2) assessing social software and Web 2.0 technologies for e-learning design; and, (3) developing digital resources for teaching and learning. This informed the teaching activity of Phase 3 which resulted in the development of the eLAG. The

eLAG plots the shifting terrain of e-learning along a change continuum in three zones: (1) from 'traditional' to 'emergent' tools in the *technology* zone; (2) from 'homogenous' to 'diverse' teaching in the *pedagogy* zone; and (3) from a 'formal' to 'informal' orientation in the *context* zone. Consistent with a SoTL approach, the research activity of Phase 3 involved public presentations of Phase 3 findings through community lectures, reports, conferences and journal articles. Public presentations resulted in feedback and discussion with other practitioners, academics and researchers within the e-learning community. In turn, these inform the ongoing development of the eLAG.

Taken together, the three activities of learning, teaching and research, within each of the three phases provided a progressive and cumulative response to the research question. Phase 1 highlighted the tensions relating to a misalignment between a technology designed for content management and a pedagogy oriented towards social constructionism. This concurs with what other researchers have found in terms of the difficulties inherent in having very little control over adapting or managing 'out of the box' e-learning technologies (Ellaway & Begg, 2005) that do not automatically or intrinsically afford a particular learning orientation (John & Sutherland, 2005). Phase 2 focused on designing an e-learning environment with better alignment between pedagogy and technology, but again tensions arose to do with the integration of the fluid and dynamic dimensions of a CoP within a formal institutional context. The extent to which a CoP approach can be used within formal institutions for the purposes of supporting student-learning remains an ongoing issue. The structure and organisation of formal teaching institutions do not align easily with CoPs that are intrinsically informal and self-determining and which "evolve with a group around their particular needs and for purposes that they value as meaningful" (Barab, 2003, p. 199). The tensions that were identified in Phase 1 and 2 from a misalignment between technology, pedagogy and context became the rationale for the final stage of Phase 3 where a guide was developed in order to map alignment within and between the zones of e-learning practice.

The next section of this chapter integrates these three phases of the research by applying the eLAG developed in Phase 3 to the case studies in the teaching activities of Phase 1 and Phase 2. This illustrates the application and value of the eLAG in identifying

alignment of the three zones of technology pedagogy and context in e-learning environments.

7.2.1 Applying the eLAG to Case Study 1 in Phase 1

Figures 7-1 to 7-3 below show the application of the eLAG to Case Study 1 of the teaching activity in Phase 1 (as detailed in Chapter 4). Case Study 1 is analysed below according to each of the three zones of technology, pedagogy and context in order to illustrate the application of the eLAG continuum for each of these zones.

The application of the eLAG for the *technology* zone for Case Study 1 is represented in Figure 7-1 below. Within this zone, a marker indicates where on the continuum from 'traditional' (on the left) to 'emergent' (on the right) the various dimensions of the technology used in Case Study 1, Phase 1 are located.

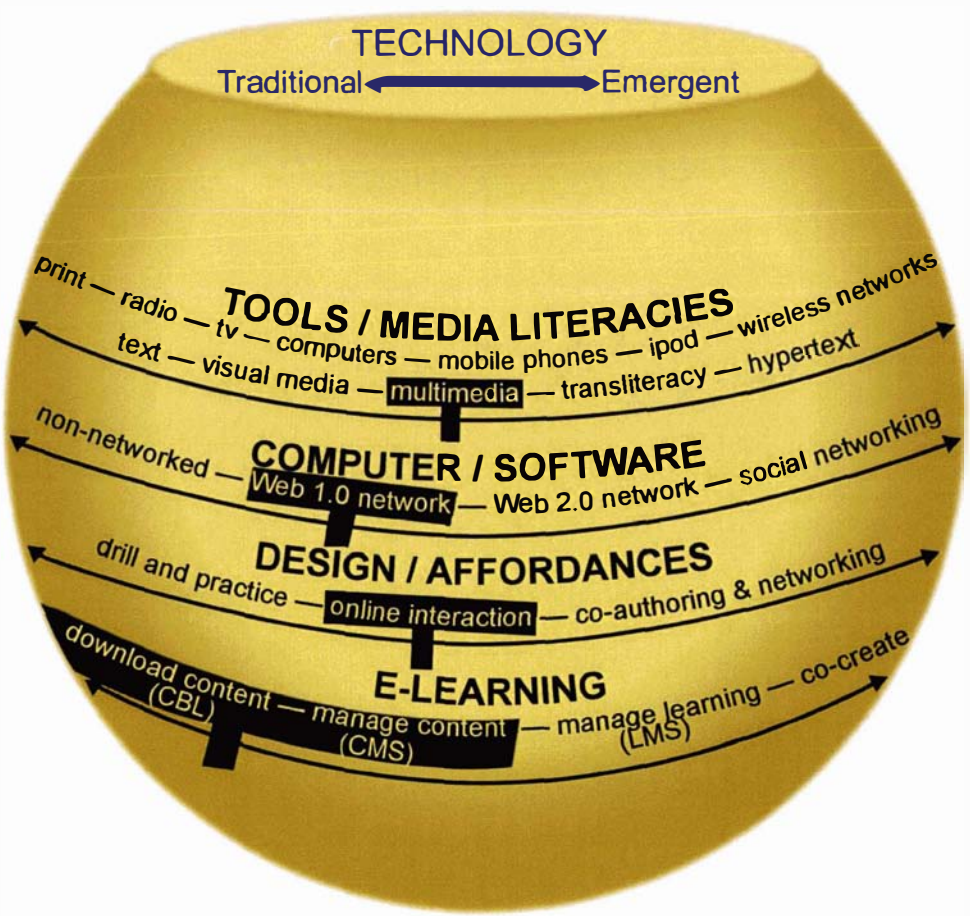


Figure 7-1: Locating Case Study 1 technology on the eLAG

As indicated in the figure above, the *tools and media* for Case Study 1 were primarily multimedia. These included print-based readings, study guides and journal articles sent to students as hard copies. These were replicated online as documents in folders. In addition, websites were hyperlinked as supplementary information resources. The *computer software* was the prescribed LMS which in this case was *WebCT*. In terms of eLAG, this is identified as Web 1.0 technology which, while *affording* some online interaction in the form of discussion forums, was mostly *designed* for content management and delivery. *e-Learning* using this technology involved downloading and managing online content discussion. Hence, the overall technology zone, in Case Study 1, can be located left of the centre on the continuum, indicating a broadly 'traditional' orientation, as outlined in Figure 7-1.

The application of the eLAG *pedagogy* zone to Case Study 1 is represented in Figure 7-2 below.

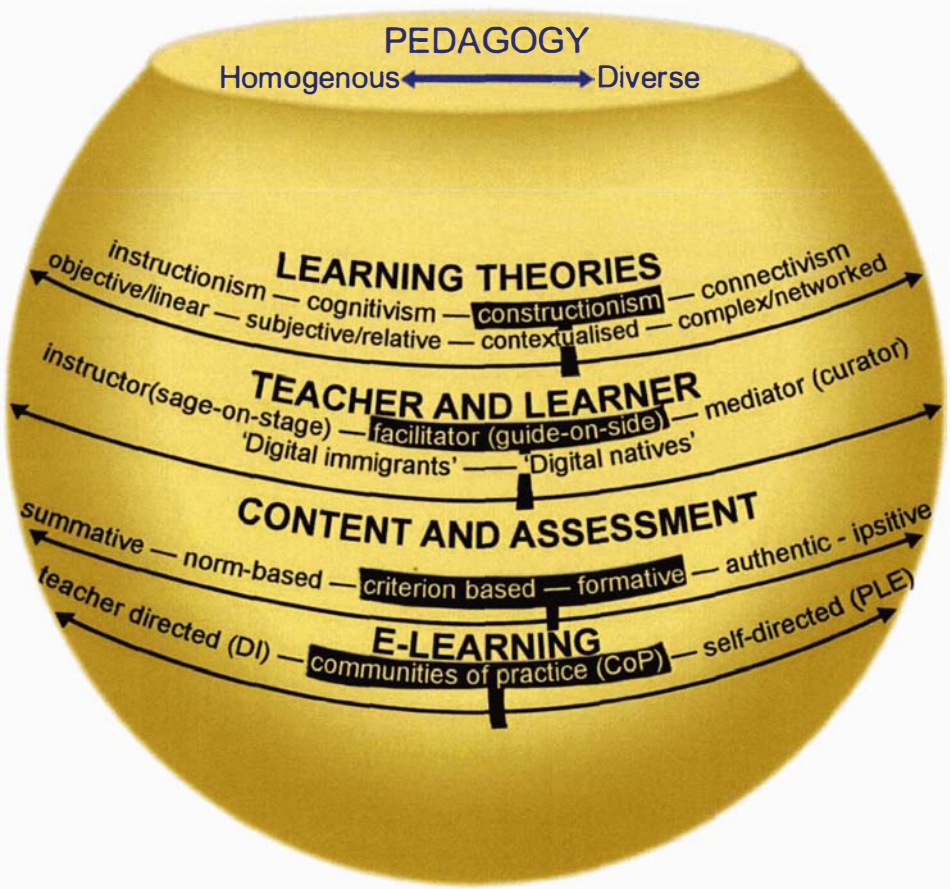


Figure 7-2: Locating Case Study 1 pedagogy on the eLAG

Within this zone, a marker indicates where on the continuum, from 'homogenous' on the left to 'diverse' on the right, the various dimensions within the pedagogy zone used in Case Study 1 are located. The *learning theory* in this case was based on social constructionism. *Teaching* involved facilitation of learner interaction with peers to co-construct meaning and to apply this within the learners' authentic work contexts. The *content* included both prescribed readings and situated learning experiences, which enabled criterion-based and formative *assessment* of coursework. The *e-learning orientation* was based on a CoP approach so that a network of participants with ranging levels of experience would have the opportunity to communicate within and between courses in the site. Thus, the overall pedagogy zone as indicated in Figure 7-2 above may be broadly located from the centre to right end of the continuum indicating an orientation towards 'diversity'.

The application of the eLAG *context* zone to Case Study 1 is represented in Figure 7-3 below.

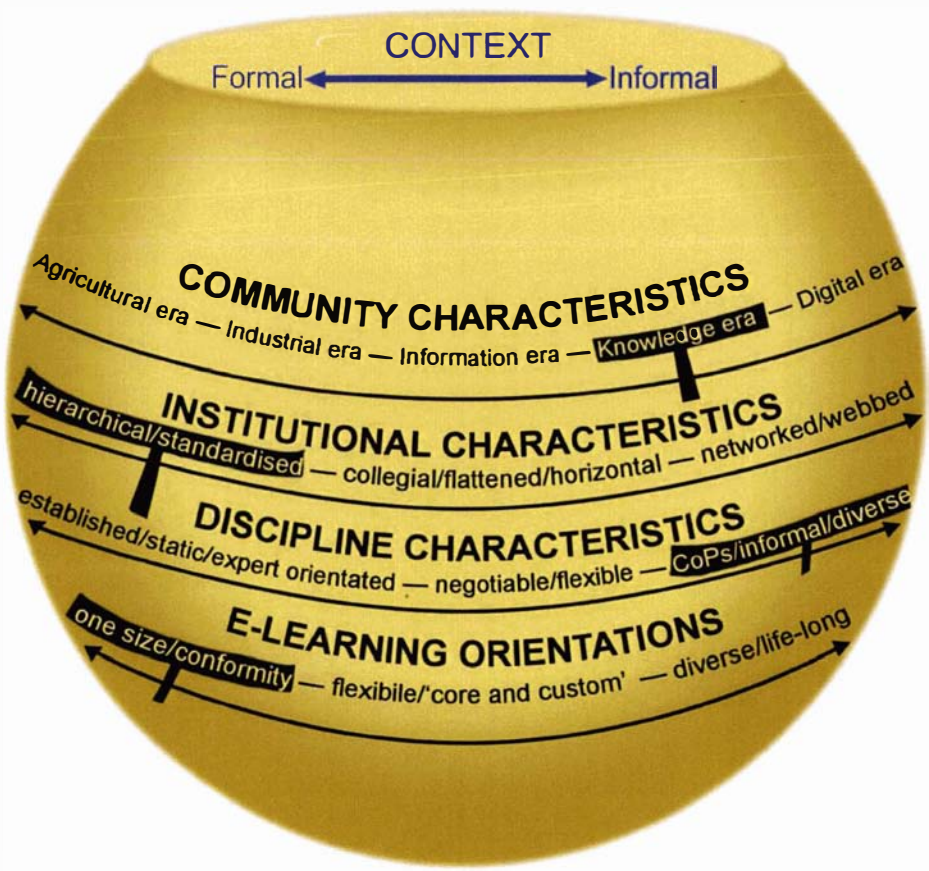


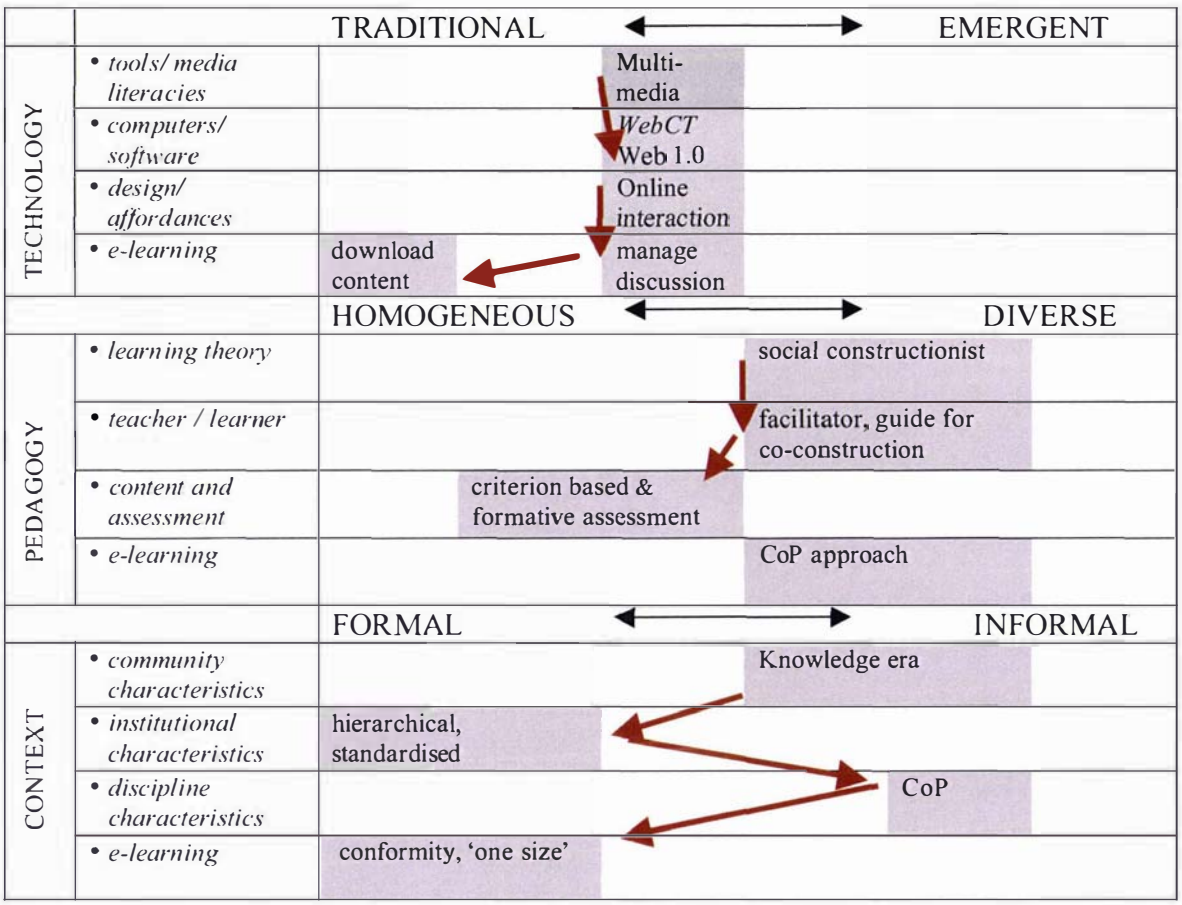
Figure 7-3: Locating Case Study 1 context on the eLAG

Within this zone, a marker indicates where on the continuum, from 'formal' on the left to 'informal' on the right, the various dimensions used in Case Study 1 are located. As indicated on this guide, there was misalignment both *within* the zone and *between* this zone and the previous two. The SEEP programme is located towards the 'informal' end of the context continuum as *the community characteristics* align with those of the information or knowledge age (Ryba et al., 1999). The *discipline characteristics* of the SEEP programme are based on a CoP orientation to practice (Mentis & Ryba, 2001a). However, these two dimensions were misaligned with the *institutional dimensions* which tended to the 'formal' end of the continuum with hierarchical, standardised practices relating to enrolment, grading, course duration and structure. The resultant *e-learning orientation*, as prescribed within the institutional context, was at the 'formal' end of the continuum with all e-learning following a standardised 'one size' approach advocated by the university.

These three zones for Case Study 1 of Phase 1 are summarised and integrated in tabular form to highlight the alignment between zones (see Table 6.4 below). Although summarising the data in tabular form does, to some extent, over-simplify the e-learning experience, it nevertheless helps to show the misalignment between the pedagogy zone (which is located towards the 'diverse' end of the continuum), and the technology and context zones (which are located towards the 'traditional' and 'formal' end of their respective continua).

This skewed alignment in Case Study 1 produced frustrations and missed opportunities as outlined in the conclusions of chapter 4 in Phase 1, and led to the use of alternative technology in Phase 2.

Table 6.4 Locating Case Study 1 on the eLAG



7.2.2 Applying the eLAG to Case Study 2 in Phase 2

Figures 7-4 to 7-6 below show the eLAG applied to the three zones of technology, pedagogy and context for Case Study 2 in Phase 2 teaching activity (detailed in chapter 5). As with Case Study 1, each zone is represented diagrammatically on the eLAG and then a summary table is presented integrating the three zones to show alignment.

For Case Study 2, approval was gained to shift from the LMS used by the university to trial an alternate *technology* that was purported to better align with the pedagogy of the SEEP programme. This is illustrated in Figure 7-4 below. A marker indicates on the continuum from 'traditional' to 'emergent' where the various dimensions of the technology used in Case Study 2 are located. The *tools and media* used in this case required multimedia literacy — ranging from print-based and visual material in the

form of journal articles and websites to video, photo images and sound in the form of podcasts. *Moodle* LMS *software* was used as it supported a social constructionist orientation (Dougiamas, 2007) and the use of Web 2.0 tools such as blogs, wikis, glossaries, and RSS feeds. This *afforded* more online interaction and co-authoring and the *e-learning* orientation facilitated an approach where learning was managed and meaning co-constructed. Hence the overall technology zone as outlined in the table below shifted towards the more open and 'emergent' end at the right of the continuum.

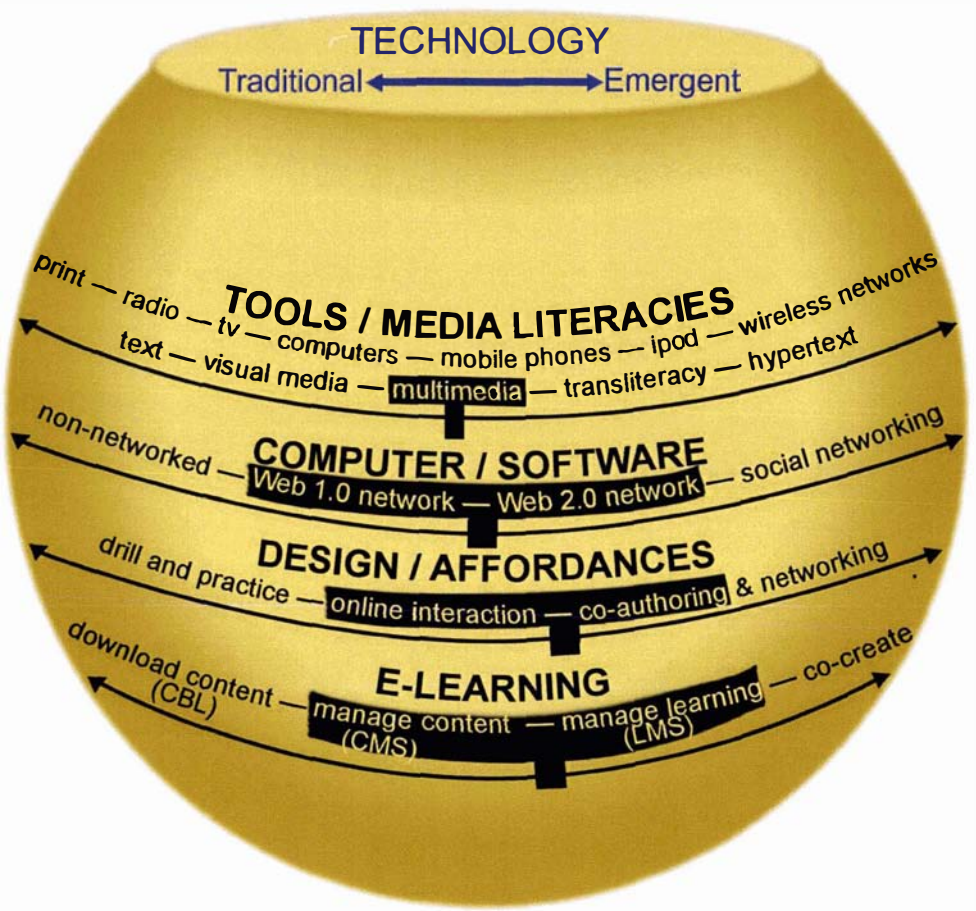


Figure 7-4: Locating Case Study 2 technology on the eLAG

The technology zone aligned well with the *pedagogy zone* for Case Study 2 as represented in Figure 7-5. The pedagogy was the same as in the previous case study and was *theoretically* based on an interactive orientation to learning where the teacher focus was on facilitating learner interactions to co-construct meaning and apply this to the particular work context. The *content*, as before, incorporated both prescribed domain information and encouraged application of this to authentic work situations. *Assessment*

practices included both formative and criterion-based. The *e-learning orientation* was that of a CoP approach with networks within and across different levels of the SEEP programme. Thus the overall pedagogy zone tended towards the 'diverse' end of the continuum, which for this phase was well aligned with the technology selected to support this course.

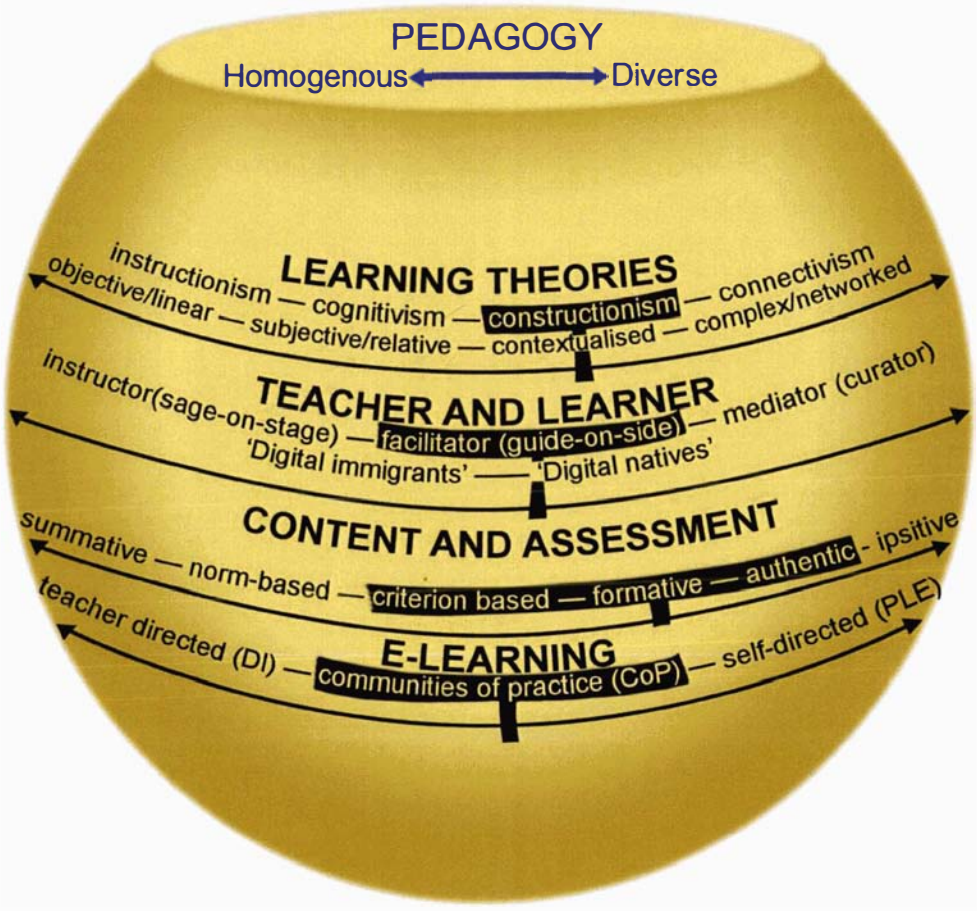


Figure 7-5: Locating Case Study 2 pedagogy on the eLAG

Tensions were apparent in aligning the technology and pedagogy zones with the *context zone* as illustrated in Figure 7-3. The *community* and *discipline* characteristics tended towards the 'informal' end of the continuum aligned with the characteristics of the information age and a CoP orientation to practice. However, this was at odds with both the *institutional* and *e-learning orientations* which were at the 'formal', standardised and static ends of the continuum. While this could be accommodated to a certain extent in this e-learning situation, it highlighted the potential problems that might exist if both

pedagogy and technology were to shift to the more 'emergent' end of the continuum but still located within a formal and traditional context of the current academic institutions.

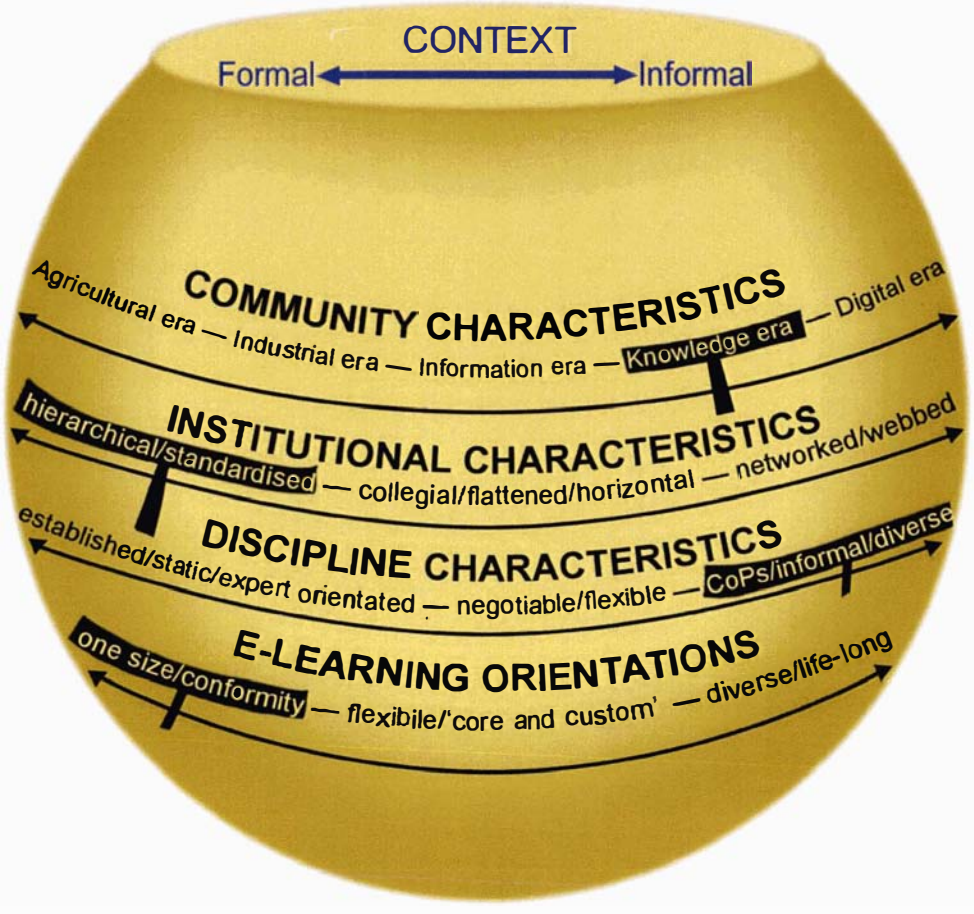


Figure 7-3: Locating Case Study 2 context on the eLAG

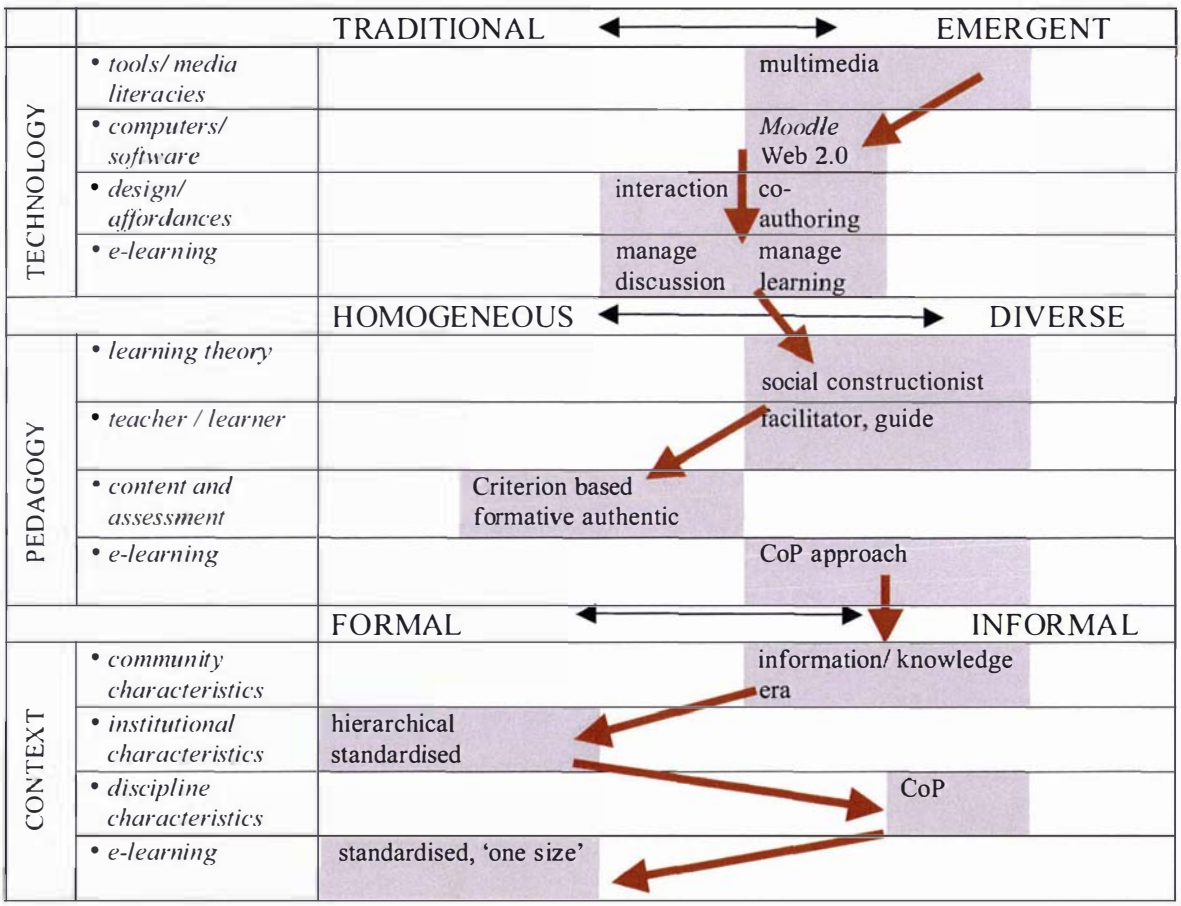
Kirkwood and Price (2006) point to the legacy of using an 'industrial model' of distance education. Here, attention is focused on the construction of materials rather than on the processes of learning. This gives preference to the one-way flow of information and ideas from 'expert' teachers to learners, with only limited opportunities for dialogue to take place. Questions are raised whether the largely transmissive (and for students, solitary and passive) nature of this form of education remains appropriate in increasingly networked societies. Similarly, Privateer (1999) contends that what often passes as innovative use of instructional technologies is generally a combination of 18th century models of learning with 19th century notions of organisational management, neither of which are adequate for contemporary e-learning. He believes that effective higher education institutions need to adapt the essentially administrative approach of

managing learning to accommodate the potential that new instructional technology affords.

As with the previous case study, the alignment of the three zones for Case Study 2 of Phase 2 is displayed in Table 6.5 below.

Table 6.5 Locating Case Study 2 on the eLAG

Table 16: Locating Case Study 2 on the eLAG



As with Case Study 1, the summary presented above in Table 6.5 provides a 'snapshot' of alignment for the three zones for Case Study 2. While this shows a static profile and perhaps oversimplifies the complexity of the e-learning environment in the actual case study, it allows for a quick gauge of alignment in order for a practitioner to see at a glance where potential tensions might be encountered.

The following section explains how eLAG can be applied in order to map the complexities of e-learning environments with the aim of assessing alignment. The

contribution of the eLAG is that it permits practitioners to consider appropriate alignment and plan to overcome the potential tensions of misalignment between technology, pedagogy and context in their own e-learning environments.

7.3 CONTRIBUTIONS TO E-LEARNING TEACHING AND RESEARCH

As part of the SoTL approach used in this study, the eLAG, along with the research outputs in each phase of this study, contributed to the growing body of knowledge around tertiary teaching and learning using new technologies. In this way it has become part of the 'teaching commons' or conceptual space where communities of educators can debate the merits of innovations in teaching and learning to meet the challenges of change. As Huber and Hutchings (2005) suggest, "moving teaching from private to community property ... is one of the most hopeful signs that the academy will be able to fulfil its changing teaching mission in the years to come" (p. 14).

Focusing on all three aspects of technology, pedagogy and context within a SoTL approach to e-learning in this study is constistent with Kirkwood and Price's (2006) advocacy of broadening professional development around e-learning. They critique approaches to continuing professional development (CPD) in e-learning that focus only on using ICT in teaching and learning and which do not "entail examining the impact of environmental changes upon the assumptions, goals, and strategies which underlie and shape an organisation's educational practices" (p. 1). They go on to propose that "professional development should focus upon the scholarship of teaching and learning, and must also reflect the wider organisational context within which ICT is managed and used" (Kirkwood & Price, 2006, p. 1).

Focusing on the three zones of technology, pedagogy and context within each of the three phases of the SoTL approach used in this study also reflects to some extent Goldberg and Riemer's (2006) view of how the history of online distance education has moved through three periods. The first was a period of initial euphoria of techno-positivism — where enthusiasm about the potential of technology was dominant. This gave way to a period of critical theory of technology — where the downsides of devaluing pedagogy surfaced. The final period of postmodernism highlights the complexities and contradictions inherent in using e-learning for distance education.

These periods are reflected in the three phases of this research. In Phase 1 of early enthusiastic adoption of the technology provided by the institution, I gave little prior examination to how this might align with the pedagogy of the programme in which I was teaching. Aligning the technology and pedagogy became the focus of Phase 2 which in turn raised issues relating to devaluing the context. This resulted in Phase 3 of the development of an eLAG focusing on the three zones of technology, pedagogy and context to show the complexities of considering all three dimensions independently as well as their interrelationship.

The three phases of this research show that through rigorous ongoing research, the initial 'euphoria' of techno-positivism (the orientation in Phase 1) can be balanced with critical pedagogical theory (the focus in Phase 2) in order to highlight the complexities of e-learning in distance education (the outcome of Phase 3 with the development of the eLAG). Using the metaphor of a high-speed train, Goldberg and Riemer (2006) encourage administrators, teachers and technicians to "stop and reflect on the destination, rather than simply marvel at the speeds at which we are traveling and the engine that powers our ride" (p. 166). They cite Feenberg's view that if we "resist simplistic appeals to managerial efficiency and focus our efforts on sustaining the dialogue that has always been at the heart of the educational experience, then technology holds great promise; if not, then we face a great threat" (Feenberg,1999, cited in Goldberg & Riemer, 2006, p. 166). The findings from each phase of this research, and in particular the eLAG in Phase 3, contribute to this dialogue on actualising the potential of e-learning.

The SoTL approach provided a useful structure for sustaining the dialogue, where each phase involved a public sharing of research insights that informed the next phase. Each of the three phases raised issues and questions that, once publicly debated, allowed for a progressively more detailed response to the overall research question of how the interrelated areas of technology, pedagogy and context influence practice within a changing e-learning environment. This culminated in the development of the eLAG as a tool to analyse the interrelationships of technology, pedagogy and context in order to better understand the potential and tensions of different e-learning environments.

The three vignettes that were outlined in the introduction in chapter one of this thesis can now be revisited using the eLAG to show its application in comparing the use of different technologies and pedagogies within the broader special education context. The three vignettes provide hypothetical examples of e-learning at the left, centre and right ends of the eLAG continuum. Locating each vignette on a summary table will provide an illustration of the continuum of change that eLAG provides in each of the three zones of technology, pedagogy and context.

7.3.1 Locating the Vignettes on the eLAG

This section provides an overview of using the tabular form of the eLAG to analyse and compare three e-learning approaches. The introduction in chapter 1 outlined three vignettes of learning within the area of special education. These three vignettes will now be located on the eLAG summary table to show the interrelated areas of technology, pedagogy and context within a changing e-learning environment. Each vignette illustrates a different e-learning approach within special education that can be located on the left, right and centre of the change continuum. Applying the eLAG to each vignette shows the shifting terrain within the technology, pedagogy and context zones and illustrates alignment between these zones for the three different approaches to e-learning in special education.

> ***Vignette 1*:**
>
> Vignette 1 in chapter 1 introduced Samantha, a primary school teacher living on a farm outside of town. Samantha has taken a year's break from her teaching to further her studies in special education. Her e-learning involves: reading her course handbook and set texts that she received in the mail; downloading additional journal articles using the internet; typing her assignments on her computer; printing assignments to send to her lecturer and waiting for these to be returned with feedback in the mail.

An eLAG analysis, as outlined in Table 6.6 below, locates Samantha's e-learning on the left of the eLAG continuum aligned with a 'traditional' technology, a pedagogy that supports 'homogeneity' within a 'formal' special education learning context.

Samantha's e-learning within the *technology zone* is considered 'traditional' in that it involves: (1) print-based media literacy in her reading of set text; (2) Web 1.0 use of the computer to download journal information for her independent learning; (3) a design or medium that affords a 'one way', 'monological' or transmission model approach of information transfer from teacher/text book; and (4) an e-learning experience which is teacher/institution controlled and managed.

The *pedagogy zone* of Samantha's e-learning is located at the end of the continuum aligned with 'homogeneity' through: (1) an implicit cognitive theory of learning whereby Samantha gains new knowledge and information through the reading of her set texts and articles; (2) an instructional approach to teaching where information is selected by an 'expert' teacher; (3) formal assessment of prescribed content through summative marking of essay assignments; and (4) an e-learning approach that is teacher directed where Samantha downloads the information she needs to meet the predefined criteria for essay writing.

The *context zone* of Samantha's e-learning is aligned with the 'formal' end of the change continuum and is characterised by: (1) what Kirkwood and Price (2006) refer to as the 'Industrial Model' of distance education with its hierarchical structure; (2) a centralised and standardised institutional system for managing Samantha's enrolment, course requirements, course content, assessment and accreditation; (3) a discipline where there is a clearly defined, static, established body of knowledge; (4) an e-learning landscape that foregrounds peer-refereed journal articles and published textbook material as Samantha's core learning experience.

Vignette 2:

Vignette 2 in chapter one outlined Paula's engagement in part-time postgraduate extramural study in a special education programme. Being part of the online class using a LMS, Paula is able to interact from a distance with classmates synchronously in the chat room and asynchronously in the discussion forums, provide online formative feedback and peer rating for her fellow students on their assignments, collaborate on a shared assignment in the wiki space, listen to a

virtual lecture online and make reflections in her online journal.

An eLAG analysis, as outlined in Table 6.6 below, locates Paula's experience of the e-learning technology, pedagogy and context as being aligned in the middle of the eLAG continuum. Paula's experience of the *technology zone* involves: (1) multimedia literacy in her interaction through visual and auditory modalities in the LMS; (2) use of Web 2.0 tools such as discussion forums, chat rooms and wiki spaces within the password protected LMS environment; (3) design or medium that affords a two way dialogue between Paula and her class mates; and (4) an e-learning experience that is teacher/institution initiated and facilitated, but allows for flexibility and learning to be managed through the LMS.

The *pedagogy zone* is aligned with technology in the centre of the eLAG continuum and involves: (1) an implicit learning theory that sees knowledge as being co-constructed through interaction with others in the class around assignments and reading; (2) a teacher as facilitator or 'guide on the side' approach where interaction and collaborative group work is mediated; (3) situated learning that involves group collaboration, and assessment that is both summative and formative involving peer marking as well as self reflection in Paula's journal entries; and (4) an e-learning approach that is active, diverse and relatively flexible consisting of a community of learners.

Paula's e-learning within the *context zone* is also aligned within the centre of the eLAG continuum and is characterised by: (1) a community approach characterised by the information age; (2) a collegial and horizontal learning environment within a LMS that is controlled and designed *with* learners; (3) a discipline where the domain knowledge is negotiated and constructed within a community of learners; (4) an e-learning landscape that provides some flexibility within the standardised LMS.

Vignette 3:

Vignette 3 in chapter 1 outlined Grant's experience of e-learning as a special needs teacher at a rural intermediate school who, despite his isolated work place, is part of a worldwide community of special education practitioners. He networks with others in the field through his use of Web 2.0 technologies. He regularly

updates his skills and knowledge via his personalized e-learning space in his e-portfolio. Using Web 2.0 tools such as his blog, video-*Skype* and wiki spaces, he shares documents, debates issues and collaborates with others nationally and internationally. He keeps up to date with current research practice and literature by subscribing through his RSS feeds to blogs, journal articles and podcasts of current lectures and talks. He shares his digital narratives of his work environment through *Flickr*.

An eLAG analysis, as outlined in Table 6.6 below, locates Grant's e-learning experience on the right end of the eLAG continuum aligned with an 'emergent' technology, a pedagogy focusing on 'diversity' within an 'informal' context. His experience in the *technology zone* involves: (1) 'transliteracy' (Downes, 2002) in his use of diverse media and text, hypertext, visual and auditory modalities; (2) the use of Web 2.0 tools such as blogs, wikis, RSS, *Skype*, podcasts and *Flickr* in a public online environment with open access; (3) the design or medium that affords multiple networked conversations between Grant and anyone on the internet who chooses to respond and interact; and (4) an e-learning experience that is self-initiated and designed, and allows for anytime, anywhere interaction through social networking.

The *pedagogy zone* facilitates 'diversity' through: (1) an implicit learning theory for the digital age that sees knowledge as residing in the connections, discussions, interactions and collaboration between people, which is linked to 'connectivism' (Siemens, 2004); (2) a 'neomillenial' learning style (Dee, 2006) that is interactive, immersive and collaborative; (3) learning through commenting on authentic experiences, expressing personal opinions, and debating globally with others in shared internet spaces and through commentaries in blogs ; and (4) an e-learning approach which for Grant is self-directed, open, opinionated, participatory, networked, collaborative and very public (Hinton, 2007).

Grant's e-learning experience of the *context zone* is located on the 'informal' end of the change continuum aligned with: (1) community characteristics of the digital era; (2) informal learning communities that are networked, interactive and collaborative through personalised learning spaces; (3) a discipline that centres around a natural, spontaneous and authentic CoP; (4) an e-learning landscape that is diverse, life-long and life-wide.

These three different vignettes of e-learning in the area of special education are compared in Table 6.6 below. They represent three distinct areas of the eLAG change continuum and approaches to e-learning as follows: Samantha, who is learning *about* special education; Paula, who is learning *to be* a special education practitioner; and Grant, who is learning *as* a special education practitioner.

Table 6.6 Locating the three vignettes of e-learning on the eLAG

		TRADITIONAL ◄——► EMERGENT		
		Samantha learning 'about'	***Paula learning ' to be'***	***Grant learning 'as'***
TECHNOLOGY	• *tools/ media literacies*	print based media	multimedia visual and auditory	transliteracy diverse modalities
	• *computers/ software*	'private' Web 1.0	'protected' LMS	'public' Web 2.0
	• *design/ affordances*	monological individual learning	dialogical collaboration	conversational co-authoring
	• *e-learning*	download content	managed learning	social networking self-directed
		HOMOGENOUS ◄——►		**DIVERSE**
		Samantha learning 'about'	***Paula learning ' to be'***	***Grant learning 'as'***
PEDAGOGY	• *learning theory*	cognitivism	social constructivism	connectivism
	• *teacher / learner*	'sage on stage' transmission	'guide on side'/ co-constructed	networked/ collaborative
	• *content and assessment*	prescribed content summative assessment	collaborative summative/formative	situated/ authentic ipsative assessment
	• *e-learning*	teacher directed	community of learners	self directed PLEs
		FORMAL ◄——►		**INFORMAL**
		Samantha learning 'about'	***Paula learning ' to be'***	***Grant learning 'as'***
CONTEXT	• *community characteristics*	'Industrial Model'	knowledge/ information	digital
	• *institutional characteristics*	hierarchical/ standardised	horizontal/ collegial	networked/ 'webbed'
	• *discipline characteristics*	established/ static	negotiated/ co-constructed	CoP
	• *e-learning*	standardised/ conforming	flexible	diverse life-long & life-wide

In summary, the analysis of Vignette 1 of Samantha's learning shows how more formal approaches to e-learning support a uni-directional (teacher to student) transmission-mode and monological pedagogical style where the approach used by teachers and learners aligns with information transfer using Web 1.0 technology. In Vignette 2 of

Paula's learning, shifts to networked technology align with an e-learning approach which accommodates learner interaction within a closed, password-protected environment of the LMS. This allows for bi-directional (teacher to student, student to student) dialogical learning but is largely driven by the institution and teacher through the use of software prescribed by the institution and course content structured by the teacher. In Vignette 3, a public, multi-directional (co-authoring) networked approach to e-learning is illustrated in Grant's learning. Emerging tools such as blogs, wikis, podcasts and other social networking tools and folksonomies of Web 2.0 align with a more informal, self-directed and conversational approach to pedagogy and knowledge management.

These vignettes serve to further consolidate the conclusions drawn from the three phases of this study and provide an overall response to the research question on how e-learning involves a complex interlinking of pedagogy, technology and context. The eLAG developed in Phase 3 provides a way of considering alignment of these zones when designing e-learning environments.

7.4 LIMITATIONS OF THE STUDY

The limitations of the study can be linked to different aspects of the research process and product. These are presented as tensions that emerged due to the SoTL approach used, challenges encountered within each of the three phases, and finally limitations relating to e-learning research in general.

7.4.1 Limitations Relating to the SoTL Approach

The SoTL approach used in this study raised tensions, questions and limitations due to the combined role of teacher-learner-researcher within an individual journey of inquiry. These limitations are outlined within this section.

Tensions relating to the combined teacher role, learner role and researcher role arose when what I was teaching was also the domain area of my learning as well as my research focus. The boundary between what was student work and research data tended to blur when online teaching and learning interactions became potential data sources for

analysis. This raised questions relating to *power* and *authenticity*. In terms of power, the question arose as to whether students felt truly safe to refuse to have their data included in the study when the request was from those who they might perceive as having power or an ongoing influence in their future study or CoP. In terms of authenticity, the question arose as to whether students could be truly authentic, spontaneous and natural in their online participation knowing that their interaction could be analysed as part of the future research project.

These issues of power and authenticity relating to possible role conflict in using the SoTL approach were raised in the ethics section in chapter 2. As outlined in the ethics section, informed consent was considered to be particularly critical in the use of the SoTL approach. The University Ethics Committee approved the ethical procedures used in this study, which included: gaining permission to use student work anonymously; collecting data only after completion of the course; gaining permission through an independent assistant so that all lecturers involved in the SEEP programme were unaware of which students had agreed to their data being used in the future research component; and discussing with the students the value of the SoTL approach for their own teaching, research and learning. Notwithstanding, limitations existed to the extent that the SoTL approach raises questions relating to: (1) how 'informed' student consent can be when it is linked to students' future research and learning; (2) who 'owns' the information that starts out as student learning and becomes research data; and (3) the extent to which the student-teacher relationship results in bias or more deeply informs the research practice (Hutchings, 2002).

Additional 'researcher-teacher-learner' role tensions that can be seen as limitations in using the SoTL approach include that of the *public versus private* as well as the issue of *benefits and risks*. The public versus private issue related to the SoTL emphasis on 'going public' and "documenting and representing our work as teachers and our student's learning, in ways that can be peer reviewed and built upon" (Hutchings, 2002, p. 12). What is often unclear is where the boundary lies between public research and private student learning and who decides on this boundary. It is interesting to note that this tension can be viewed from the broader contextual lens of this study where, consistent with learning at the more 'informal' end of the eLAG continuum, new technologies afford a much more public arena for learning in general and for debating

and sharing research knowledge. Perhaps the issue of privacy within traditional research is based on an out-of-date model of research practice (Hutchings, 2002). Linked to this is the notion that it might be more helpful to consider students as co-researchers in the SoTL approach, with a shared commitment to improving their learning, rather than as 'research subjects' or participants. This would steer the focus to the benefits for teaching rather than the risks of research.

The *benefits and risks* limitation or dilemma in this study related to the tension between teacher-researcher role and learner-researcher role, where insights that were gained in the learner-researcher role resulted in changes to teaching. In learning more about particular e-learning approaches, decisions were made to bring about changes to the online environment and course design because it was the best judgment of those involved that these changes would benefit the students and programmes. However, it is only after implementation and analysis of these changes that the benefits can be verified by the teacher-researcher. This was evident in the change of the technology used in Phase 1 and Phase 2 of this study. As a result of my professional development, I introduced a new LMS for the online learning environment which was not supported by the IT services of the university. This posed a potential risk to students and staff working within the programme. According to Hutchings (2002), balancing the benefits and risks is inevitable in following an inquiry research approach within SoTL and it is through developing confidence and competence that the benefits of the teaching activities will outweigh the risks. This was the approach taken within each phase of this study through ensuring that the research activity was informed by both the learning and research activities.

A final limitation within the SoTL approach in this study related to the individualised aspects of the researcher-teacher-learner journey. As stated at the outset and re-iterated throughout this thesis, this was a personal journey of inquiry through the e-learning landscape. The extent to which any findings generated from this individual journey are generalisable, are debatable. But, as Dadd (2004) indicates, practitioner research of this kind does not focus on generalisations in the same way as more conventional, positivist approaches do, but rather focuses on developing informed approaches for improving practice. This kind of research approach or journey is concerned more with "a sensitive and self-critical subjective perspective and not with the aspiration to unattainable

objectivity" (Stenhouse, 1975, cited in Dadds, 2004, p. 3). Thus, the focus was not on generalisable and objective 'truths' or theories, but rather on a sustained curiosity about effectively implementing new e-learning approaches within a particular context. It involved generating new knowledge, and, more importantly, linking that to practice and making it public with the intention of inviting ongoing debate with other practitioner researchers who might be able to relate to this from the perspectives of their particular contexts. So, the shift was from 'generalisability' of findings to 'relateablity' as outlined by Dadds (2004) below:

> In accepting the mantle, as researchers, of professional communicators in a more public arena . . . we seek to share our research stories with others so that colleagues can, if appropriate, engage with them and relate them to their own work. In this sense, the notion of relateability becomes more appropriate for practitioner research than the traditional research concept of generalisability. This is how the influence of the small-scale, particular project, shared across the profession, can work its way into the larger fabric. (p. 3)

7.4.1 Limitations Relating to the Three Phases

Limitations identified within Phase 1 of the study related to using a transmission model e-learning technology to facilitate a CoP approach to learning. The design of the LMS did not easily align with a course oriented towards social constructionism, collaboration and apprenticeship. This finding was identified through: (1) a survey of student perceptions of the effectiveness of the e-learning environment to support a CoP approach; and (2) analysis of student discussion postings. While these two sources of data supported the finding of misalignment between technology, pedagogy and context, and both are widely used approaches for evaluating online learning (Johnson et al., 1988; Milne & White, 2005), the focus was nonetheless limited to student perceptions and posts. Support for using student evaluations (Marsh, 2007) relate to their being multi-dimensional, reliable and stable, relatively valid and unaffected by a variety of potential biases, and as such "are seen to be useful by faculty, students and administrators" (p.372).

While student evaluations provide rich, reliable and valid data, they are still only one perspective. This limitation in Phase 1 was addressed in Phase 2 where the views of staff involved in the project were also included, thus enabling triangulation of data sources in Phase 2 with student and staff perceptions as well as analysis of discussion

post. This provided more data sources for analysing the effectiveness of how the alignment concerns were addressed in Phase 2.

The goal in Phase 2 was to shift the e-learning experience from one that facilitated *reading* content to one designed for *using* content (Feldstein & Masson, 2006). The extent to which this was achieved through using a different e-learning technology was evaluated by both student *and* teaching staff involved in the programme (Milne & White, 2005). Thus the two limitations of Phase 1 (misalignment of technology and pedagogy, and lack of triangulation of data) were addressed in Phase 2. While greater alignment was achieved between the technology and CoP pedagogy, a misalignment with context was again identified in Phase 2 indicating a continued limitation relating to using a CoP approach in e-learning. This limitation was due to the tension of attempting to facilitate a CoP, which aligns with an informal and self-directed approach, within the formal and structured learning establishment of a university. Additional tensions arose relating to the use of more 'disruptive' and flexible technologies within traditional and standardised structures of the universities. These limitations of to how to align emergent technologies and a CoP pedagogy within a traditional and formal university context led to the development of the eLAG in Phase 3. The aim of this was to provide a guide to consider alignment between technology, pedagogy and context in e-learning.

While the eLAG guide developed in Phase 3 has the potential to be a quick and easy tool for practitioners, it has limitations. The strength of the guide is the 'screening' it provides, whereby practitioners can summarise and integrate significant amounts of data about their e-learning environment to provide a profile of alignment. The limitation of this 'snapshot' profile, however, is the potential for complex e-learning environments to be overly simplified. In summarising and categorising e-learning orientations, the multifaceted and unique aspects of the individual environment could be compromised.

Another limitation lies in the choice of the dimensions identified within each zone. These represent the perspective of one practitioner-researcher and might not be generally representative of the most important dimensions to consider in each of the three zones of technology, pedagogy and context. To overcome this limitation and consistent with the SoTL approach, public debate on the eLAG was conducted to get formative feedback on the selected dimensions. In addition, the eLAG continuum has

been presented and described as being open-ended and dynamic, in order to allow practitioners to include dimensions that they consider important on the continuum and delete existing ones, as appropriate for their e-learning situation. No one area is considered fixed or more valuable than another on the eLAG, rather the value and usefulness of the tool is to gauge appropriate alignment for particular e-learning environments.

7.4.2 Limitations Relating to e-Learning Research

The final area to be discussed under limitations of this study relates to research into e-learning in general and the format for presenting the findings of this study. There are a number of tensions that arise which are, arguably, unique to e-learning research. The e-learning landscape does not stay static and as pointed out in chapter 3, the sheer volume, diversity and rapid growth of e-learning literature, research and technology makes it difficult to keep current. Within the time frame of this research project alone, the rapid development of networked technologies has seen the emergence of Web 2.0 and the explosion of social networking tools (for example *Facebook, MySpace* and *YouTube*). The corresponding shift to open-source initiatives (for example *Wikieducator a*nd the *Cape Town Open Education Declaration)* in higher education, questions the business model approach of paying to learn. In terms of keeping up to date with new Web 2.0 technologies, unless one is actively blogging, harvesting RSS feeds and participating in social book-marking (e.g. sharing internet resources and sites using *del.ic.io.us* or *Ning*), then the currency, relevance, and audience for one's research could be limited.

Contradictions arise in using a static, solitary and stand-alone written PhD to describe new social networking approaches that afford fluid and collaborative ways of conducting research and presenting findings. A print-based thesis in e-learning runs the risk of being obsolete by the time it is completed and at least in the short term, lacks the publicly visible and collaborative debate around issues and findings. For similar reasons, numerous e-learning journals are now online only with quick publication time-lines and many e-learning practitioners and researchers prefer the more immediate engagement with their network of colleagues and researchers through the use of blogs (Downes, n.d.; Siemens, n.d.; Wenmoth, n.d.). They use these for scholarly

communication rather than, or in addition to, the more traditional outlets for publishing their work. This suggests a possible change of direction for future research in e-learning and raises the question of whether the current form of the PhD for e-learning will have any currency in the future. For example Ward and West (2008) explore the usefulness of a PhD candidate's blog as an intrinsic and examinable component of the PhD because it makes visible the "messy" process of evolving thinking as the research progresses. Similarly Morgan and Ryan (2003) give an account of an open-state archive (where documents and progress are posted in an online data-base) for postgraduate supervision. This resonates with the eLAG continuum, outlined in chapter 6, which shows a shift to the right end of the continuum characterised by change and diversity with flexible, open, informal and collaborative approaches to sharing and debating knowledge (Gilbert, 2005; O'Neill, 2007; Owens, 2007). The traditional individual PhD approach could be claimed to be misaligned to the collaborative and connected approach where "information gathering is now organized through dispersed networks of people, services and technologies . . . (and) . . . there is less emphasis on knowing the truth, and more on networked intelligence" (Rennie & Mason, 2004, p. 48).

Even the use of the term e-learning is becoming increasingly problematic. The concept of 'blended learning' (Garrison & Vaughan, 2008) is perhaps more educationally useful currently than 'e-learning', because it changes the focus from the technology to an integration and mix of modes that can be flexibly customised to different contexts and learner needs. Defined as "the thoughtful fusion of face-to-face and online learning experiences", blended learning "is a fundamental redesign that transforms the structure of, and approach to, teaching and learning" (Garrison & Vaughan, 2008, p. 5).

Thus the limitation and tensions that emerged in this study due to the use of the SoTL approach, the limitations encountered within each of the three phases, the challenges relating to appropriate presentation of research findings, and finally the need to reconceptualise and redesign e-learning, point the way forward to further research and future e-learning journeys.

7.5 FUTURE E-LEARNING JOURNEYS

As stated throughout this thesis, many new e-learning opportunities are afforded by emerging technologies. But the extent to which these opportunities are actualised depends on resolving some of the limitations, challenges and tensions outlined in the section above. One focus for future research lies in the ongoing exploration of how to effectively align the technology, pedagogy and context zones of e-learning, particularly for the new social networking tools of the digital age.

If, as Boyd (2007) claims, "new social technologies have altered the underlying architecture of social interaction and information distribution" (p. 1) and learners are regularly using these technologies at home for socialisation and learning, then what implications does this have for formal learning contexts? Similarly, if Prensky (2001) is correct when he claims that "today's students are no longer the people our educational system was designed to teach" (p.1), then current educational institutions need to examine the alignment of their programmes with new technologies and the expectations of learners. How this is achieved becomes a legitimate and necessary focus for future research.

Key issues arise relating to overcoming the tensions that exist in using emergent technologies and pedagogies that are open, situated and networked within formal educational contexts. These are outlined below as potential specific directions for future e-learning research and are grouped according to the three zones of technology, pedagogy and context.

7.5.1 Future Research Relating to the Technology Zone

Potential future research areas relating to the *technology* zone include investigations into the practice and value of using social networking tools in order to develop individualised yet networked and interactive e-learning spaces. Questions arise as to whether there is a role in formal educational contexts for technologies that are currently prevalent in the wider social context, and if so, how competence and quality in using

them can be assured. If students select to use different learning tools as part of their personalised learning spaces, professional development and technical support for an institution and for educators would be extremely complex, and the cost of this would most likely be passed on to the individual (Weller, 2007a). The need for technical support could diminish as academics and students become more familiar with emergent technologies, but given the pace of technological change it is equally likely that the need for adequate support will always be there. In addition, the ongoing proliferation of technology options for learning might necessitate some form of institutional quality control, which could clash with the open and flexible ethos of social networking. Future research focusing on the tensions of using and evaluating emergent technology would be valuable given the potential of new social networking technology to blur the boundaries between formal and informal learning.

7.5.2 Future Research Relating to the Pedagogy Zone

Similarly in the *pedagogy* zone, future research into the alignment of different teaching and learning approaches with emergent e-learning tools would be useful. For example, traditional teaching methods used for text based or 'face-to-face' learning situations might not align well with new Web 2.0 technologies such as mobile phones, podcasts, blogs or wikis in teaching and learning (Downes, 2002; Gee, 2004; Laurillard, 2005; O'Neill, 2007; O'Reilly, 2005; Oblinger & Oblinger, 2005; Siemens, 2006b). More recently, the emergence of virtual worlds such as *Second Life* as a 'place' for learning raises additional pedagogical questions. Over 100 educational institutions currently have established virtual campuses in *Second Life*, for example Harvard University's Second Life law class, where student groups develop an argument for presentation at a virtual court room with other students acting as the judges (Zhang, 2007). The Horizon Report (2007 edition) forecasts the widespread use of virtual worlds in higher education by 2010 (Joly, 2007). This suggests the need for ongoing research into (1) how to maximise the social networking capability and visual elements of the virtual world and (2) understand the role of identity in an educational context where students interact with each other and the lecturer through their online character or avatar.

Research into online identity within Web 2.0 social networking environments in general would be valuable. In particular, if learning were to move to more public spaces such as

wikis or blogs, what tensions might arise for teachers and learners who prefer the 'safety' of password protected learning environments with defined boundaries and a known audience with whom to explore and debate ideas? Networked e-learning environments that are accessible to all, anytime, anywhere have the following four characteristics, as outlined by Boyd (2007) which could pose potential pedagogical challenges: (1)'persistence' — where what you say online, stays online, irrespective of whether you have moved on in time, age, maturity or views; (2)'searchability' — where what you say online can be traced and retrieved by anyone, anytime; (3)'invisible audiences' — who can respond asynchronously, anonymously and out of context; and (4)'replicability' — where 'copy and paste' can become common practice making it difficult to determine the original source, or whether content was co-created or even doctored.

Related to this fourth characteristic of replicability is the issue of copyright, where as the web opens up, more collaborative content is created (e.g. wikipedia), and information is used and re-used by multiple users simultaneously. Rennie and Mason (2004) call for a re-conceptualising of the assessment of online assignments rather than the development and use of software detection systems to identify 'cut and pasted' parts of assignments. They believe it is "a disturbing paradox that higher education is becoming increasingly draconian about students plagiarising on assignments when the ability to find and re-purpose information is one of the very e-learning skills that is increasingly valued elsewhere" (Rennie & Mason, 2004, p. 8). The issue of who authors, owns and distributes information — 'copyright' in some instances has moved into 'copyleft', 'open source' or creative commons options online.

The open-source era raises questions for higher education institutions with regard to information ownership, such as whether knowledge is 'free' and available to all or has to be paid for by learners. A rapidly growing community of contributors advocate open content as the future of education to the extent that there is now already vast free and open collections of educational resources content, for example at http://wikieducator.org. Related to this issue would be research into how, in higher education, we can optimise educational resources for search engines and become more active in blogging and RSS distribution of learning materials to optimise content. In the area of knowledge management, it seems that education is far behind the commercial

sector in terms of using social networking tools to find resources, evaluate them and make effective use of them (Breck, 2008).

The role of the teacher or university academic as well as that of the student or learner in a digital era, are important areas for future research. As Kirkwood and Price (2006) point out, many young people entering higher education have grown up with ICT and are hardly aware of the pre-Internet era, exhibiting an 'information-age mindset' (Frand, 2000). Jones (2002) claims there is "an Internet generation gap between professors and students in terms of their Internet usage, interests or abilities" (p. 9). Teachers are no longer the main gatekeepers for information in their area of expertise and this challenges the nature of a university academic's role. Correspondingly, the challenge for learners is to document their informal and self-directed learning in meaningful ways and the extent to which social networking technologies such as e-portfolios can assist with this will need to be the focus of ongoing research (Beetham, 2005). Students will need skills to cope with the sheer quantity of information that is available, but also the skills to identify the good quality 'bits'. The psychologist Lewis (1999, cited in Rennie & Mason, 2004) proposed the term 'Information Fatigue Syndrome' to describe the stress caused by information overload due to being connected to overwhelming, pervasive and persistent new sources of information. This explosion makes it harder to sift out the overabundance of low quality information, or what (Skenk, 1997) calls 'data smog'. Although Neil Postman's advice that "students develop built-in, shockproof crap detectors as basic equipment in their survival kits" (Postman & Weingartner, 1969, p. 218) was written pre-Web 2.0, it remains one of the most critical skills for learners in the digital era. Being able to manage both the vast amounts of information and constructing meaning from this information, are key skills in the digital era. A valuable research focus would therefore be on the role of teachers and learners in managing quality and quantity in the digital era.

Finally in the pedagogy zone, future research around terminology relating to 'learning' in the digital era would be valuable. 'Learning' is currently linked to a seemingly endless list of prefixes: e-; online-; distance-; web-; m-; virtual-; lifelong-; life-wide-; personalised-; individualised-; networked-; and others. Research into the added value of what each of these prefixes purports to offer 'learning' is needed. While each term might foreground a particular aspect of either the technology or pedagogy, the

significance of each might well be dependent on the particular context that it is located in. The term 'blended' learning might be useful here. Inherent in this term is the notion of combining or merging approaches of teaching and learning to best suit the context. As noted by Garrison and Vaughan (2008), blended learning is a simple concept but a challenging practice where "the fusion of real and virtual experiences creates unique communities of inquiry that are accessible regardless of time and location" (p 30). As Wilson (2005) suggests, "as well as blending media/pedagogy/context etc, what blended learning typically does is blend learning time and non-learning time (whatever that is) over time. Blended learning magnifies the need to treat learning as a process rather than an event" (para 7). This 'process' could well lie in the blurring (or blending) of formal and informal learning contexts; traditional and emergent learning technologies; and homogenous and diverse learning approaches. It might well be that in the blending, all prefixes are dropped and it became just 'learning'. However, as suggested by Wilson (2005), if we drop the blended terminology, we lose the concept of doing something different and "we will also lose the impetus for change, and the potential to construct better models to support that change" (para. 8).

7.5.3 Future Research Relating to the Context Zone

The impetus for change outlined above links with the *context* zone, and the final area of potential future research that emerged from this study. The question of how to facilitate change and the construction of better models to support that change within university institutions, offer valuable future research questions. As Freire (2008) suggests, "the irruption of the new internet in universities does not modify only learning models. Organisational models are also challenged causing some acute crisis in institutions" (p.1). The adage that 'it is harder to change a university than to move a cemetery' suggests that academics are notoriously slow to change their practice (Dee, 2006; Weigel, 2002). Freire suggests a number of 'bottlenecks' and fears for university-wide adoption of Web 2.0 technologies: (1) rejection by the users — where due to existing Web 1.0 tools that are available, users are reluctant and fearful of new software; (2) a culture of aversion to innovation and entrepreneurship — where "bureaucracy, governance, procedures for decision-making and inertia in large institutions are in many cases the worst environment for inside innovation and entrepreneurship" (Freire, 2008, p. 4); (3) the implicit criticism of the traditional model of knowledge production and

education on which universities are based; (4) the need for control and power by IT departments which is at odds with a Web 2.0 approach; and, linked to this, (5) issues of reliability, security, governance, compliance and privacy.

These 'bottlenecks' and barriers link to some of the challenges that arose out of Freire (2008) research and relate to how to align more diverse pedagogical approaches and emergent technologies within an institutional structure that has inflexible and formal regulations relating to such elements as times for study, assessment requirements and accreditation procedures and so forth. A future research focus here would be to investigate "the ways in which e-learning both requires and promotes organisational change" (Beetham, 2005, p. 86).

In short, the recommendations for future research that arose from this study would provide a clearer direction for traversing the e-learning terrain in terms of integrating and aligning all aspects of e-learning technology, pedagogy and context.

7.6 CHAPTER SUMMARY

This final chapter of the thesis has provided conclusions and insights from the overall research journey. The chapter began by revisiting the research question of *how the interrelated areas of technology, pedagogy and context influence practice within a changing e-learning environment.* This interrelationship was discussed in terms of the findings from each of the three phase of the study. The three phases were then integrated using the eLAG, developed in Phase 3, to analyse the two case studies carried out in Phase 1 and Phase 2. Developing the eLAG and applying it to practice illustrated the overall significance of the study and the original contribution that it makes to e-learning design. Three scenarios were then analysed using the eLAG to provide concrete examples of how the guide might ideally inform practice. These three scenarios provided three distinct e-learning approaches to special education and, when plotted on the eLAG, they showed alignment within the zones of technology, pedagogy and context. Finally, the limitations of the study were identified and recommendations made for further research.

It is the contention of this thesis that e-learning research and practice that foregrounds *technology* is techno-centric; focusing only on *pedagogy* without considering appropriate technology is anachronistic; and ignoring the *context* within which the technology and pedagogy is located is mechanistic. This view was reinforced through each of the three phases of my research journey.

My journey began with the question of how best to design an e-learning environment within the SEEP programme. Responding to this question required a somewhat risky exploration of new e-learning terrain within Massey University. In order to be prudent about the risks I adopted a SoTL approach to ensure that my teaching activities were informed by my own learning activities and in turn evaluated through my research activities. A theoretical compass guided me through all three phases. This compass integrated the significant e-learning literature in the quadrants of technology, pedagogy, context and critiques.

The first phase of the journey involved designing a CoP approach to e-learning within the *WebCT* environment. Acknowledging the tensions that arose from a misalignment of technology and pedagogy led to the Phase 2 study of a CoP e-learning approach using *Moodle*. The importance of alignment of technology, pedagogy and context led to the Phase 3 development of the eLAG. The eLAG enabled a profile of alignment to be developed when analysing an e-learning environment. This tool allows practitioners to analyse the changes that occur within the zones of technology, pedagogy and context in order to align these zones appropriately and thereby enhance e-learning.

My research journey relating to this particular study is at an end, but the findings from the three phases of research will assist me in ongoing teaching and learning as well as contribute to the global commons of e-learning research. The theoretical compass that pointed the direction for each phase of this research, and the eLAG that I developed as a result of the overall study will guide me in developing a more effective e-learning environment within the SEEP programme and in my ongoing practice within a changing e-learning terrain.

The contributions that I offer to fellow e-learning travellers are the outcomes of my SoTL research as well as the eLAG as a tool to analyse alignment in designing effective

e-learning environments. As the increasing pace of change in technology and society forces the university to reconsider it's role in the new digital Web 2.0 world, ongoing research into e-learning is critical. This study has shown that both a SoTL approach and the use of the eLAG can make a positive contribution to informing e-learning teaching and research.

The findings of this thesis suggest that ongoing research into alignment is a way to actualise the potential of e-learning in higher education. For e-learning to change the way we teach and learn for the better, then effective alignment of technology, pedagogy and context is needed. And this study has shown that both a SoTL approach and the use of the eLAG can point the way to creating effective e-learning environments in higher education in the digital age.

As the e-learning terrain constantly changes, the old 'maps' and 'charts' of teaching and learning are no longer valid for this *terra incognita.* As teachers in higher education we need to explore the challenges and opportunities that new technologies provide and the implications of these for changing pedagogy and contexts. e-Learning in the digital age can lead to unchartered places and new territories which require risk taking to bring about change. We need to be mindful however, that we are guided in taking these risks. The eLAG and SoTL research approach proved to be valuable 'guides' in taking risks in this e-learning journey into uncharted areas. As Hawkins (2007) states, "the only way to take no risks at all is not to sail the seas that need to be sailed" (p. 71).

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APPENDICES

APPENDIX A:

Glossary of e-Learning Terms as used in this Study

Term	Description of the term as used in this study with links to literature where relevant.
• *affordances*	The potential and opportunities offered by digital tools and media to shape or constrain particular pedagogical uses (John & Sutherland, 2005)
• *alignment*	The extent to which there is consistency and congruence between various elements (such as technology, pedagogy and context) in e-learning
• *blended learning*	Teaching and learning that combines online and face-to-face approaches using information and communication technologies (Garrison & Vaughan, 2008)
• *blog*	A personal online journal of chronological entries of text, images, and hyperlinks to which readers can respond by leaving comments
• *blogosphere*	The collective term for all blogs in a community or social network
• *community of practice (CoP)*	A group of people with a shared concern for a common body of knowledge and a commitment to furthering the knowledge base and practices of the group. A CoP involves the three dimensions of domain (area of interest), community (social interactions/ relationships) and practice (shared activities) (Wenger, 1998)
• *constructionism*	An epistemology that defines learning as being most effective when people are actively making things in the real world — 'learning-by-making' (Papert, 1991)
• *constructivism*	An epistemology that defines learning as constructing meaning from current knowledge structures
• *context*	The ecology of the setting and its culture – which for this study includes institutional and discipline related factors
• *creative commons copyright /* • *'copyleft license'*	The Creative Commons (CC) is a non-profit organization which reforms copyright laws to permit the free use, alteration and distribution by others of copyrighted creative works through licenses known as creative commons licenses or "copyleft license"
• *digital age*	The present day — showing a shift away from the production of physical goods (the industrial age) to the manipulation of information via computers (also called the Information age or Knowledge age)
• *digital narratives*	Using tools or technology to create learning resources involving stories

• ***distance learning***	Education for learners who are not physically on site
• ***eLAG — e-learning alignment guide***	The guide developed in this study to align the three zones of technology, pedagogy and context in -learning
• ***e-learning***	Learning that is enabled or supported by the use of digital tools / information and communication technologies (Abrami et al., 2006)
• ***flexible learning***	Learning that provides increased choice, convenience, and personalisation to suit the learner's needs
• ***LMS — learning management system***	Computer software tools designed to manage learning
• ***life-long and life wide learning***	Learning activities that occur throughout all aspects of life
• ***mobile learning***	Learning across locations using portable technologies and mobile devices.
• ***open source***	
• ***pedagogy***	The principles and practices of teaching and learning (in this study related to the SEEP programme)
• ***PLE —personalised learning environment***	An online learning space belonging to the student rather than the institution, highly individualised and networked using Web 2.0 technology.
• ***podcast***	A digital-media file distributed over the Internet using RSS for playback on portable media players and computers
• ***RSS — really simple syndication***	Subscriptions to blogs, podcasts or web links
• ***SoTL — scholarship of teaching and learning***	Scholarly inquiry into student learning which advances the practice of teaching by sharing this research publicly (Huber & Hutchings, 2005; Hutchings, 2002)
• ***SEEP***	Special Education and Educational Psychology Programmes at Massey University (Ryba, Pine, Mentis, & Bowler, 1999)
• ***social constructivism***	An epistemology that defines learning as occurring through social interaction and language usage, and thus is a shared, rather than an individual, experience (Vygotsky & Cole, 1978)
• ***social networking***	Communities of people who share interests and activities and interact using web-based software to chat, email, video, file sharing, blog, discussion groups
• ***technology***	The digital tools used for e-learning
• ***Web 2.0***	The use of new Internet technology and web design to network, socialise, interact, share information and collaborate online (Downes, 2006)
• ***wiki***	Collaborative online authoring tools allowing multiple authors to add or edit content;

APPENDIX B:

Massey University Human Ethics Committee – Ethical Approval

Massey University

Office of the Principal
Massey University
Albany Campus
Private Bag 102 904,
North Shore MSC,
Auckland,
New Zealand
Principal: 64 9 443 9799 ext 9517
Campus Registrar: 64 9 443 9799 ext 9516
Facsimile: 64 9 414 0814

10 April 2002

Mandia Mentis
C/o Associate-Professor Ken Ryba
Learning & Teaching, College of Education
Massey University
Albany

Dear Mandia

HUMAN ETHICS APPROVAL APPLICATION – MUAHEC 02/007
"Developing an Online Learning Community in Special Education"

Thank you for your application. It has been fully considered, and approved by the Massey University, Albany Campus, Human Ethics Committee.

If you make any significant departure from the Application as approved then you should return this project to the Human Ethics Committee, Albany Campus, for further consideration and approval.

Yours sincerely

Associate-Professor Kerry Chamberlain
Chairperson,
Human Ethics Committee
Albany Campus

CC Associate-Professor Ken Ryba
Learning & Teaching, College of Education;
Dr Matthew Thomas, School of Aviation
Massey University
Albany

Te Kunenga ki Purehuroa

APPENDIX C:

Participant Information Sheet

Department of Learning and Teaching
Private Bag 102 904, NSMC
Auckland, New Zealand

INFORMATION SHEET
DEVELOPING AN ON-LINE LEARNING COMMUNITY

I am currently undertaking research as part of my PhD within the Department of Learning and Teaching at Massey University. The focus of this research is on the creation of on-line learning communities within the *WebCT* component of the Special Education and Educational Psychology programmes. The aim of the research project is to investigate teaching and learning practices that facilitate on-line learning opportunities for students to develop an identity as a member of the professional community as well as advance their knowledge and skills.

This information sheet is to provide you with an overview of the research and invite you to consider participating in this project. The research project will run alongside the *WebCT* component of your course, and your participation in the research is voluntary and independent of your participation in *WebCT* coursework, or any assessment procedure associated with your study.

As part of your course, you will have the opportunity of using the *WebCT* environment to access course information as well as resources such as the Massey library, web links, on-line journals and the Global School Psychology Network. In addition to accessing resources and information, the email and discussion forum features of *WebCT* enable you to work on assignments collaboratively, and be part of a socially interactive and reflective community of learners. The *WebCT* programme has been designed to allow you to participate in an additional on-line *Special Education community* which links students from the PG.DipEd(Special Ed), MEdPsych and PGDipEdPsych as well as past students of the PGDipEdPsych courses, and practicing Educational Psychologists. The purpose of this is to encourage collaboration, consultation and reflection within courses and between courses within the wider Special Education and Educational Psychology communities. (See attached diagram for an overview of the on-line learning environments).

The research dimension of the *WebCT* programme will be an analysis of the on-

line learning environment at the end of the course. The purpose of the analysis will be to assess the dimensions of the course that facilitated the development of an on line community. The data for analysis will include postings to the *WebCT* environment and an evaluation questionnaire at the end of the course. Your participation in the research will be to complete the evaluation questionnaire and consent to your postings to the *WebCT* environment to be used in the final data analysis at the end of the course. Your decision to participate is voluntary, and entirely independent of your coursework and assessment. Your course co-ordinators/lecturers will not be aware of your decision as the consent forms will be kept by the research assistant until the end of your course. At the end of the course, all those who have consented will have their *WebCT* postings and evaluation forms included for data analysis. All data (postings and questionnaires) will be treated confidentially and used anonymously and only for the purposes of this research. You will be given access to a summary of the findings of the study when it is completed.

In considering whether you wish to participate it should be noted that you have the following rights:

- to decline to participate
- to refuse to answer any particular question
- to withdraw from the study up until the end of the course
- to ask any questions about the study at any time during participation
- to provide information on the understanding that your name will not be used
- to be given access to a summary of the findings of the study when it is concluded.

The researcher and supervisors'contact numbers are listed below. You are welcome to make contact with them if you have any questions or would like further information. Thank you for considering to participate in this project.

Researcher:
Mandia Mentis
Department of Learning & Teaching
Massey University (Albany)
Tel: (09) 443 9700 Ext 9841
Email: M.Mentis@massey.ac.nz

Supervisor:
Associate Professor Ken Ryba
Department of Learning & Teaching
Massey University (Albany)
Tel: (09) 443 9606
Email: K.A.Ryba@massey.ac.nz

APPENDIX D:

Participant Consent Form

Department of Learning and Teaching
Private Bag 102 904, NSMC
Auckland, New Zealand

CONSENT FORM
CREATING ONLINE LEARNING COMMUNITIES

I have read the Information Sheet and have had the details of the study explained to me. My questions have been answered to my satisfaction, and I understand that I may ask further questions at any time.

I understand I have the right to withdraw from the study at any time and to decline to answer any questions.

I agree to provide information to the researchers on the understanding that my name will not be used without my permission.

Signed: _____

Name: _____

Date: _____

APPENDIX E:

Competency Domains in the SEEP Programme

Special Education and Educational Psychology Programme
College of Education, Albany Campus, Auckland.

Competency Domains

DOMAINS OF COMPETENCE	SKILLS AND KNOWLEDGE
1. Consultation and Collaboration	Knowledge of consultation models and methods and their application to particular situations. Effective collaboration with others in planning and decision-making processes at the individual, group, and systems levels.
2. Assessment Procedures	Ability to ensure that data-based decision-making permeates every aspect of professional practice. Knowledge of varied models and methods of assessment that yield information useful in identifying strengths and needs, in understanding problems, and in measuring progress. Systematic collection and analysis of relevant information.
3. Problem-Solving Methods and Decision-Making	Knowledge of collaborative methods of problem-solving. Well-established problem-solving methods to provide direction in fieldwork and to address professional issues as they arise in professional practice.
4. Intervention	Ability to ensure that interventions are guided by evidence-based analyses. Demonstration of effectiveness of interventions through measurement of outcomes in relation to objectives set.
5. Reflective and Ethical Practice	Commitment to on-going professional development. Adherence to ethical principles in all aspects of work. Practice within the parameters set out in the New Zealand Psychological Society's *Code of Ethics for Psychologists Working in Aotearoa/New Zealand* (2002).
6. Research/ Programme Evaluation	Knowledge of research, statistics, and evaluation methods. Ability to co-construct research procedures that are aligned with the sense-making processes of participants. Ability to evaluate research, translate research into practice, and understand research design and statistics in sufficient depth to plan and conduct investigations and programme evaluations

7. Diversity	Knowledge of individual differences, abilities, and disabilities and of the potential influence of biological, social, cultural, ethnic, experiential, socio-economic, gender-related, and linguistic factors in development and learning. Demonstration of the sensitivity and skills needed to work collaboratively with diverse groups of people who understand the world in different ways.
8. Bi-cultural issues/ Treaty of Waitangi	Understanding required to honour the principles of the Treaty of Waitangi (1840). Development of skill and knowledge that support practitioners to work effectively with Maori. Collaboration, throughout all phases of fieldwork, with Maori who define and determine issues to be addressed, co-construct methods of understanding situations and interventions.
9. School Systems Organisation and Policy Development	Knowledge of general education, special education, and other educational and related services. Understanding of schools and other settings as systems. Ability to facilitate policies and practices that create and maintain safe, supportive, and effective learning environments for children and others.
10. Developmental Processes and Issues	Knowledge of human development processes and ability to incorporate this information into analyses or understandings of situations encountered.
11. Learning and Teaching	Ability to apply knowledge of theory and research in learning and teaching to the development of educational systemsAbility to identify applicable assessment and intervention methods for specific contexts
12. Knowledge Management	Skills and knowledge required to access and manage online information and to evaluate the usefulness of this information. Technical and writing skills to allow information technology to be used efficiently. Ability to carry out effective and respectful interactions with others via the Internet.

APPENDIX F:

Student Questionnaire

Evaluation of the Online Community of Practice

Course: _____ Date: _____

A: Usage
Please answer the questions by placing a circle around your response.

Was this your first experience using online learning/WebCT?	Yes No
Rate your level of expertise in using computers to support your learning	Novice Competent Expert
Rate the technical adequacy of your computer to support your online learning	Inadequate Adequate Excellent
How frequently did you read messages/info in WebCT?	Never Monthly Weekly Daily
How frequently did you post messages in WebCT	Never Monthly Weekly Daily

Comments:
_____
_____

B: Value of WebCT tools
Please indicate how **valuable** you found the following WebCT tools by circling the number on a five point scale where 1 = not very useful, and 5 = very useful.
If you did not use the tool, indicate with a **X**, If you are unsure what the tool is, indicate with a **?**

Tool	Icon	X ?	Rating Scale 1 2 3 4 5 not .....very usefu useful	Tool	Icon	X ?	Rating Scale 1 2 3 4 5 not .....very usefu useful
Whos Who			1 2 3 4 5	Chat room			1 2 3 4 5
Calendar			1 2 3 4 5	Private Email			1 2 3 4 5
Cybrary			1 2 3 4 5	Discussion Forum Community			1 2 3 4 5
Links			1 2 3 4 5	Discussion Forum **SpecEd class**			1 2 3 4.5
Special Ed Folder			1 2 3 4 5	Discussion Forum **Small gps**			1 2 3 4. 5

C. Value of online learning/Community of Practice

Please indicate how valuable you found the following aspects of the online environment by circling the number on a five point scale where 1 = not valuable and 5 = very valuable.

Statement	Rating Scale 1 2 3 4 5 not .... very valuable valuable	Statement	Rating Scale 1 2 3 4 5 not ... very valuable valuable
Getting information on the course & assignments	1 2 3 4 5	Accessing (potentially infinite) information from the web	1 2 3 4 5
Working collaboratively with peers to construct meaning	1 2 3 4 5	Helping and supporting others	1 2 3 4 5
Learning more about how to do casework	1 2 3 4 5	Experienced practitioners guiding newcomers into the Spec Ed/ Educational Psychology field	1 2 3 4 5
Having autonomy to access online learning at convenient times (anytime-anyplace learning)	1 2 3 4 5	Sharing perspectives and ways of thinking / Sharing knowledge and understanding	1 2 3 4 5
Efficient and convenient communication with the course coordinators	1 2 3 4 5	Exploring new ideas and concepts in the field of Spec Ed/ Ed Psych	1 2 3 4 5
Understanding the role of the Special Ed/ Educational Psych practitioner	1 2 3 4 5	Going beyond rote recall of information to deeper understanding & application of knowledge	1 2 3 4 5
Communicating with colleagues in the course to deepen understanding of issues	1 2 3 4 5	Having learning and assessment embedded within real life situations	1 2 3 4 5
Creating a sense of belonging to a community of practitioners	1 2 3 4 5	Developing skills and confidence to work as an Special Ed/ Ed Psych practitioner	1 2 3 4 5
Gaining awareness of professional issues	1 2 3 4 5	Having a common language to explore issues	1 2 3 4 5
A source of motivation and ongoing encouragement	1 2 3 4 5	Socialising with others in the group – sharing personal stories	1 2 3 4 5
Checking understanding of issues	1 2 3 4 5	Forming an identity within the educational psychology community	1 2 3 4 5

D. Networking with others:
Tick the communication tools you used most frequently to access or post messages about the following:

	General Community discussion	Special Ed class discussion	Small Discussion group	**Lecturer** Tutor/	Private Email	Chat
Messages on general Ed Psych/ Special Ed issues?						
Messages which were mostly social or personal in nature?						
Messages for improving practice?						
Messages on course-work/ assignments?						

E. Factors that facilitated or interfered with online Community of Practice participation:
Please tick the extent to which you agree or disagree with the following statements:

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Contributing online made me feel part of a community					
Online collaboration in group projects worked well					
Time & work commitments limited my participation					
We got to know each other better through online work					
Writing rather than speaking is a barrier to effective communication – I missed the human contact					
The online environment helped overcome the sense of isolation of distance study and practice					
I was inhibited to post knowing that my messages would be read by lecturers					
Delayed posting allowed for reflection and thinking before responding					
Knowing that I was being evaluated in other aspects of my course inhibited my online postings					
I don't type well enough to communicate clearly					

Meeting face to face (at classes) initially is important in facilitating later online participation					
The more familiar/confident I became with the skills/genre of online discussion, the more I posted					
The amount of information available in the online environment is overwhelming					
I'm reluctant to post messages online as they remain static, whereas my ideas might change overtime					
I prefer email to using WebCT					
The variety of opinions expressed online is useful					
Peer advice is not expert advice – we need more 'expert' advice online					
I felt good that I could help someone else online					
I felt vulnerable/exposed that my messages were public					
I prefer posting to small groups than community forum					
Overall the online environment facilitated my learning through being able to construct meaning with others					
Overall the online environment made me feel I was part of community					
Overall the online environment has contributed to my being a better practitioner/professional in the field					

F. Positive, Negative and Recommendations:

Please list the THREE most POSITIVE aspects of your online use of the WebCT Ed Psych CoP?

1._____

2._____

3._____

Please list the THREE most NEGATIVE aspects of your online use of the WebCT EdPsych CoP?

1._____

2._____

3._____

Please make RECOMMENDATIONS for improving the online learning environment.

Circle your response

Overall I feel that WebCT should continue to be used in Spec Ed/Ed Psych courses Yes No

I would like to continue to be part of the WebCT community environment in the future

Yes No

Thank you for completing the questionnaire!

APPENDIX G:

Staff Questionnaire

Online Learning Questionnaire for Staff

Please TICK √ your response to the questions below:

Was this your first experience of using an online environment to support your teaching?	Yes No
Rate your level of expertise in using computers to support your online teaching.	Experienced Adequate Novice
Which of the following online learning environments have you had experience of using in the past?	Moodle WebCT Blackboard Other _____
Which online learning environment do you prefer?	Moodle WebCT Blackboard Cannot compare

Please indicate your reasons for your choice in 4:

Please list your THREE most POSITIVE aspects of the site for online teaching (eg tools, learning outcomes for students etc)

Please list your THREE most NEGATIVE aspects of the site for online teaching

Please make RECOMMENDATIONS for improving online learning in your area.

Any other comments: