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The Impact of Online Teaching and Learning on Pre-Service Teachers

by

Marcia Gail Shervey

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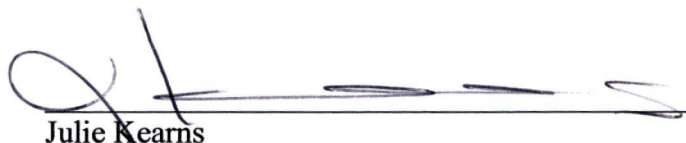
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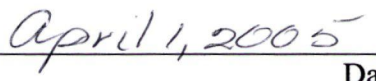
Supervisor, Dr. S. Crichton
Graduate Division of Educational Research



Dr. G. Kopp
Graduate Division of Educational Research



Julie Kearns
Faculty of Social Work



Date

ABSTRACT

This qualitative case study analyzes the experiences of nine pre-service teachers at the University of Calgary in Calgary, Alberta, Canada who, during the winter of 2004, participated as online learners and teachers in a course-based distributed learning experience. Data gathered from surveys, interviews and archived course artifacts is analyzed using a frame and code approach. Six frames, informed by a literature review of online teaching competencies, are used for this research: Interpersonal Skills, Management Skills, Communication Skills, Technical Skills, Pedagogy and Instructional Design. This research confirms that training pre-service teachers to teach online can significantly impact their understandings of distributed learning and the practice of online teaching and presents an effective alternative to current models for training online teachers. The results of this study support the need for teacher education programs to provide online teaching and learning experiences for pre-service teachers.

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CHAPTER ONE

INTRODUCTION

Few people could have imagined, even twenty years ago, that it would soon be possible for students to learn at their own pace, any time or anywhere, using electronic tools to support learning and facilitate communication with classmates, teachers and experts around the world (Miller & King, 2003). This new learning mode, facilitated by the Internet and known as online learning, has its roots in distance education, in which the student and teacher are geographically separate, but has adopted a learner-centred philosophy and allows students much greater flexibility and control over their learning than ever before (Maeroff, 2003; Miller & King, 2003; Oblinger & Maruyama, 1996). Currently, thousands of K-12 students in North America, the United Kingdom and Australia are enrolled in online learning courses (Brennan et al., 2001; Fording, 2004), and the numbers are growing every year.

By virtue of the flexibility of the online learning environment, the technology tools it employs to both deliver and support learning and the electronic communication it requires, it is clear that instruction in the online learning environment is different from traditional classroom instruction (Childs, 2004). Online teachers, therefore, must acquire unique skills, and there is a need to establish a clear e-pedagogy (Good, 2001; Palloff & Pratt, 2000; Salmon, 2000) as well as online teaching competencies (Anderson, Rourke, Garrison & Archer, 2001; Coppola, Hiltz & Rotter, 2001; Gold, 2001; Kemshal-Bell, 2001) in order to inform training programs and the professional development of online teachers. Currently, online teachers are drawn from the ranks of experienced classroom

teachers (Salmon, 2000), many of whom “were taught and learned to teach under a different paradigm of instruction and learning” (Stein , Schwan-Smith, & Silver, 1999, p. 237). For these teachers, the shift to online learning can be daunting; in fact, many who are unable to adopt online teaching techniques or are unwilling to relinquish to their students some control over learning may revert to traditional methods of teaching, thereby seriously limiting the potential of this new learning environment (Hansen & Salter, 1999; Stein et al., 1999; Vrasidas & Glass, 2004). For these reasons, alternative models for training and preparing online teachers must be investigated and explored.

In contrast to the traditional model of training experienced classroom teachers to teach online, this qualitative case study focuses on an innovative model for preparing pre-service teachers at the University of Calgary in Calgary, Alberta, Canada for online teaching. The goal of this study is to determine the impact of a course-based online teaching and learning experience on nine pre-service teacher participants’ understandings of the practice of online teaching. In the chapters that follow, you will hear the voices of these novice teachers as they experience online learning and teaching, most for the very first time. However, as the researcher in this study, I begin with a story of my own experience.

A Critical Incident

It cannot be known in advance whether the experiences to be had en route may outweigh the journey's end in the eventual importance and impressiveness. Nor can one know in advance whether the journey may change one utterly, in body or in mind.

H-G. Gadamer, 1992, as cited in Scott & Usher, 2002, p. 159

I first became an online learner six years ago. As the Teaching and Learning Coordinator at Chinook College, an upgrading high school within the Calgary Board of Education, I was responsible for leading the professional development of the staff of one hundred and fifty teachers and, in particular, for helping them to become familiar with the Information and Communication Technology Program of Studies, a newly mandated K-12 curriculum in Alberta. Meanwhile, and quite separately from my work, the online high school at Chinook College was in its infancy. Teachers who were excited about this new educational frontier were beginning to design and subsequently teach an ever-growing number of online high school courses. Somewhat reluctant but curious about this new phenomenon, I enrolled in the first e-PD¹ course, Teaching and Learning Online.

Although familiar to me now, the online learning environment was completely foreign to me at that time. I had a litany of complaints about this new way of learning.

¹ e-PD is the Calgary Board of Education's electronic professional development program, launched in 1999 to increase the number of online teachers who were able to deliver the online courses offered by the CBE.

First of all, it was isolating. I missed seeing the expressions on my classmates' faces. Online learning was also technologically frustrating. Although I was quite computer literate, I found that even simple tasks, like composing emails and attaching documents, took an extraordinarily long time and often didn't work at all. In addition, attempting to collaborate online rather than meeting face-to-face or using the telephone made some of the activities seem contrived. Moreover, the online course seemed too random and unstructured. Used to teacher-directed activities that followed a linear pattern toward a learning objective, this environment offered me too many choices. I longed for someone to tell me what I was supposed to do and when. Slowly, however, I found myself drawn to the computer each evening to read what others were saying and to compose and re-compose my responses to them. As a learner, I cherished the freedom I had to control and pace my own learning. As a teacher, I watched and was intrigued by the online teacher's role, no longer transmitting knowledge but guiding and facilitating learning.

When asked, two years later, to design, develop and teach an online course to introduce teachers to the ICT Program of Studies and help them infuse technology into their classroom teaching practice, I was excited by the potential of online professional development as an alternative to face-to-face workshops, and so I accepted the challenge. I quickly realized that designing an online course required much more attention to detail and the ability to use hyper-linked resources to create multiple pathways for learning, skills that were not part of my face-to-face classroom repertoire. The course was part of an Alberta Learning research study and was delivered to two separate groups: a remote group, totally online, and a central group, able to come together for three face-to-face meetings during the six-week course term. The results of the study pointed out an

enormous difference in the experiences of the two groups. The central group had a strong sense of community, owing in great part to their face-to-face encounters. The remote group, however, did not. In retrospect, I realize that I began the project without any knowledge of either how to build an online community or why community building is significant in online learning. As a result, I had reverted to tried and true classroom teaching techniques that did not translate well in the online world.

I share my experience in moving to online teaching and learning in order to illustrate how difficult it is to make the transition from the face-to-face classroom to the online classroom. It is not impossible but requires extensive training and practice in order to develop the unique skills required to both design and teach online. The focus of this research is to determine the impact of learning and teaching online on pre-service teachers' understandings of those unique competencies as well as the challenges facing online teachers.

When CBe-learn², the Calgary Board of Education's online high school where I worked at the time, agreed to partner with the University of Calgary to offer pre-service teachers an e-practicum experience during the winter of 2004, I knew I wanted to be involved. I wondered what would happen if novice teachers were given the opportunity to experience online learning and teaching as part of their teacher education program rather than later in their teaching careers as had been my experience. Some of my

² Originally developed and administered by Chinook College, now known as the Calgary Board of Education's Chinook Learning Services.

colleagues said that it was pointless to teach new teachers to teach online until they had more classroom experience. I wondered if that were true.

This research is a case study of the experience of nine Bachelor of Education students at the University of Calgary who, during the winter of 2004, chose to take a new course designed to orient them to the world of online learning and teaching. My intent is to describe and interpret the experiences of these novice teachers as they move away from the familiarity of the face-to-face classroom into the new environment of the online classroom and, given the backdrop of my own experience, determine the impact of these experiences on these pre-service teachers' understandings of not only the challenges of the online environment but also what this new learning environment asks of its teachers.

This thesis is comprised of five chapters. Chapter Two presents a comprehensive literature review, framed by the concepts of distance learning, distributed learning, online learning, online teaching and pre-service teacher preparation for technology integration. Chapter Three describes the research design and procedures employed as well as the development of the codes and frames used for data analysis. Chapter Four presents the results of the data analysis and Chapter Five discusses recommendations for further study and presents a summary of the research study.

CHAPTER TWO

LITERATURE REVIEW

Overview

Online learning, using Internet-based technologies to both deliver and support learning, has grown explosively in K-12 education in the past five years. Not surprisingly, significant research in the field of online learning has accompanied its growth. While many educational researchers (Coppola, Hiltz, & Rotter, 2001; Gold, 2001; Harasim, 1987; Miller & King, 2003; Oblinger & Maruyama, 1996; Palloff & Pratt, 2000) have written of the potential of this new learning environment to bring about significant transformation in teaching and learning, others (Brennan, 2003; Good, 2001; Kemshal-Bell, 2001) are investigating the emergence of a distinct e-pedagogy and attempting to clarify what the online learning environment asks of both learners and teachers. This chapter offers a critical review of current literature regarding the evolution and growth of K-12 online learning, the roles, responsibilities and competencies of the online teacher, professional development models currently in place to train teachers to do this work as well as an examination of pre-service teacher training in the area of online learning. Six key concepts guide this review. Firstly, several constructs which are critical to this thesis, such as *distance education*, *distributed learning*, *online learning*, *e-learning* and *virtual learning*, are defined and clarified through an examination of the history of distance education. Secondly, the growth of online learning at the K-12 level as well as the transformational potential that this new environment offers is examined and discussed. Thirdly, the emergence of a distinct e-pedagogy is discussed and analyzed

with regard to the significance it plays in designing online teacher training programs.

Fourthly, current thinking from the literature regarding the roles and responsibilities of the online teacher is examined while exploring the competencies of an effective online teacher. Fifthly, current professional development models for training online teachers are examined and discussed. Finally, teacher education at the pre-service level in the area of online learning is examined and discussed.

The following questions limit the scope of this literature review:

1. What are the unique characteristics of the online teaching and learning environment?
2. What are the knowledge, skills, attitudes and competencies required to teach online?
3. How effective are the current professional development models for training online teachers?
4. What does the literature reveal about training pre-service teachers to teach online?

Theoretical Framework

Distance Education

Distance education, originally characterized by a geographical separation of the teacher and student and the use of some form of technology to facilitate the student's learning, was the forerunner to online learning (The Council on Alberta Teaching Standards, 2002). An explanation of the evolution of distance education and the developments in technology that supported its progression will serve to illustrate the

distinctions between the terms *distance education* and *distributed learning* and to clarify the terms *online learning*, *virtual learning* and *e-learning*.

During the 1920s, Canada's distance education programs grew in response to the need for schooling for rural students who were unable to attend school and became a nationwide system by the 1930s (Smith, 2000). In early distance education programs, print-based packages were mailed to students and subsequently sent back and marked by teachers. This correspondence model remained the status quo until the 1960s when distance learning was enhanced by the use of audiocassettes as well as radio and television programming. Because the rural population of Canada declined during the mid-twentieth century, the need for distance education also declined. However, it has enjoyed a renaissance since the mid 1980s due to the advent of computer-mediated communication. This kind of communication can be *asynchronous*³, which allows students and teachers to communicate at different times, or *synchronous*⁴ which requires students and teachers to communicate with each other at the same time (Smith, 2000). Although still geographically separated from the teacher, today's distance education students benefit from a wide variety of technologies that enhance and enable their

³ Examples of asynchronous computer-mediated communication include bulletin boards and email where messages are posted or sent and then later responded to by classmates or the teacher.

⁴ Synchronous computer-mediated communication is facilitated by tools, such as 'chat', that allow online participants to meet in a chat room at a specific time. The chat may be totally text-based or may be enhanced by audio capabilities that allow the participants to hear and speak to each other, but is considered to be synchronous communication because it takes place in 'real' time.

distance learning, including email, phone, fax and asynchronous and synchronous computer-mediated learning technologies.

Distributed Learning

Distributed learning represents a more recent form of distance education and is further characterized by (Oblinger & Maruyama, 1996):

- The delivery of content and the facilitation of learning through the use of a number of interactive technologies, including computer-mediated communication
- A learner-centered philosophy
- A dispersed student population
- A tendency to integrate face-to-face components, such as classrooms, libraries or labs, with online components
- A 'pull' model of learning where the student has more control over his or her learning than the teacher does

Distributed learning embraces a learner-centred philosophy that allows students to take control of their own learning in an environment that has broken the barriers and constraints of time and space (Maeroff, 2003). This form of learning can be delivered wholly online, using the Internet and a number of information and communication technologies including synchronous and asynchronous communication tools as well as phone and fax, and is also referred to as online learning, e-learning or virtual learning. In addition, distributed learning may take the form of *hybrid* or *blended* learning experiences that combine both online and face-to-face components. Whether offered entirely online or in a hybrid or blended format, this new distance education option is

based on a learner-centred philosophy wherein the teacher, as a member of a collaborative teaching team, is the facilitator and mentor and the student is an independent learner with direct access to resources and increased interaction with other students (Harasim, Hiltz, Teles, & Turoff, 1995).

Online Learning

Historical Perspective

During the 1970s, instructional technology tools began to appear in university classrooms, and technology components were added to existing distance education offerings (Ensminger & Surry, 2002). However, it was the widespread access to and use of the Internet during the 1990s that broke open the barriers of time and space and enabled online learning. The Internet has brought a dizzying collection of resources to teachers' and students' fingertips and made instantaneous global communication with colleagues, classmates, teachers and experts a reality. In fact, online learning owes much of its rapid growth and popularity to the fact that the Internet has become readily accessible to millions of people around the world (Black, 2002).

Definitions of online learning abound in the literature (Goodyear, Salmon, Spector, Steeples & Tickner, 2001; Miller & King, 2003; Palloff & Pratt, 2001), but it is comprehensively defined by the course authoring software company, Blackboard⁵, as 'an

⁵ Course authoring software, such as Blackboard, WebCT and Desire2Learn, is used to create online learning courses which may include web pages, online discussion tools, private email and other tools to facilitate the delivery of course content and communication between the students and the teacher in a secure and bounded online environment.

approach to teaching and learning that utilizes Internet technologies to communicate and collaborate in an educational context. This includes technology that supplements traditional classroom training with web-based components and learning environments where the educational process is experienced online' (Blackboard, n.d.). Similarly, Salmon (2004) uses the term to refer to a full spectrum of distributed learning opportunities, from hybrid to fully online, wherein "the teacher, instructor, tutor, facilitator – or e-moderator- is operating in the electronic environment along with his or her students, the participants" (p. viii). For the purposes of this thesis, the term **online learning** will be used to refer to the full spectrum of learning opportunities which embrace the learner-centred philosophy of distributed learning and employ digital networks to deliver and support learning (Advisory Committee for Online Learning, 2001).

K-12 Online Learning

The K-12 online learning movement began during the 1990s, and currently numerous school districts across Canada and the United States offer online education through public, charter and private schools (Alberta Online Consortium, n.d.; Clark, 2001). For school boards facing deepening budget cuts, online learning offers an appealing, creative and often cost-effective solution for providing quality education for all. Online learning can allow school districts to provide equal access to a range of curriculum options and opportunities for students in rural or disadvantaged areas, add value to existing school programs, draw back students who have left the public school system and provide a competitive alternative choice within the public education system (Winograd, 2002).

Today, it is estimated that there are 12,000 online courses offered in Canada (Brennan et al., 2001) and although no current national statistics are available for K-12 online schools, the Alberta Online Consortium currently lists nineteen online K-12 schools functioning in this province alone (Alberta Online Consortium, n.d). In the United States, there are currently approximately 3,000,000 online students, 50,000 of whom are enrolled in K-12 online courses (Brennan et al., 2001). According to Susan Patrick, Director of the U.S. Department of Education's Office of Educational Technology, there are currently 2,400 publicly funded state, district and charter online schools in 37 states and the numbers are increasing every year (Fording, 2004). The United Kingdom and Australia, seen as leaders in this field along with Canada and the U.S., are also witnessing similar growth. K-12 online learning, in North America and indeed globally, is evolving and growing.

Potential for Transformation

Educator, scientist and researcher, John Seely Brown (2000) sees the Internet as enabling a potentially transformational learning environment and enthusiastically entreats educators to "construct a medium that enables all young people to become engaged in their ideal way of learning" (p. 12). In fact, this potential transformation seems to address the expectations of today's students whom Tapscott, an educational futurist, describes as the Net Generation or those who were, in 1999, between the ages of two and twenty-two (Tapscott, 1998). These students' expectations for a new way of learning include enhanced responsibilities and interactivity. Seely Brown (2000) describes the digital learner as a student who learns through a process of navigation, discovery, judgement and action. He refers to these learners as '*bricoleurs*', students who are able to navigate

complex information sources and employ higher level thinking skills, such as judgement and evaluation, in choosing what they need in order to synthesize something they see as important. It is predicted that these technology-using learners will shape the new paradigm as learning shifts from “instruction to construction and discovery, from teacher-centred to learner-centred, from absorbing material to learning how to navigate and how to learn, from school to lifelong learning, from one-size-fits-all to customized learning, from learning as torture to learning as fun and from teacher as transmitter to teacher as facilitator” (Tapscott, 1998, p. 142-149). This vision of the potential for change inherent in technology-enhanced learning environments is echoed by the International Society for Technology in Education’s description of the characteristics of traditional learning environments versus the strategies associated with new learning environments (ISTE, 2002) as shown in the table below:

Table 1

Learning Environments

Traditional Learning Environments	New Learning Environments
Teacher-centred instruction	Student-centred learning
Single-sense stimulation	Multi-sensory stimulation
Single-path progression	Multi-path progression
Single media	Multimedia
Isolated work	Collaborative work
Information delivery	Information exchange
Passive learning	Active/exploratory/inquiry-based learning
Factual, knowledge-based learning	Critical thinking and informed decision making
Reactive response	Proactive/planned action
Isolated, artificial context	Authentic, real-world context

In these ideal learning environments, the student is an active participant in his or her learning and engages in critical thinking and informed decision making through

information exchange and collaboration with other students. Learning experiences are designed to engage and motivate the learner through exploratory or inquiry-based learning activities that have a real-world context. Students are stimulated by a variety of media and can customize their progression through the learning materials to suit their learning style and desired pace. In the new learning environments, students can tap into a wealth of resources and interact and collaborate with other learners as they progress through well-designed learning activities guided by the teacher, a facilitator of learning.

Online learning has the potential to support such a rich and effective learning environment for today's students. For the learner, there are numerous advantages to learning online, including access to a readily available, democratic environment that provides the learner with choice over when to participate, allows time for reflection and shifts authority and control from the teacher to the student (Salmon, 2004). In addition, Harasim (1987) lists six advantages of online learning over face-to-face learning:

- Increased interaction
- Access to group knowledge and support
- A democratic environment
- Greater user control over learning
- Motivation
- Text-based communication

The tools available to the online learner also provide a number of advantages. Asynchronous tools, such as online bulletin boards, facilitate collaboration and interaction. Students can take the time to reflect on important concepts and issues and subsequently participate in text-based discussions by making postings to the online

bulletin board. Once complete, online discussions are archived within the course, giving learners the added ability to record, search and organize messages for future reference. Miller & King (2003) state that the use of online bulletin boards in this way provides greater potential for students' thoughtful analysis thus enhancing knowledge building and collaboration.

Another advantage for the online learner is the ability to access a wide variety of learning resources as needed. This facilitates a 'pull' model of learning (Oblinger & Maruyama, 1996) which allows the student a much greater degree of control as opposed to a 'push' model where the teacher determines which resources and content students need and pushes or delivers them at the same time for all learners. The Web, according to Seely Brown (2000), is a two-way medium, and is the first that truly accommodates multiple intelligences, thus allowing students to match their own particular learning style to the media used for learning.

From the student's perspective, the flexibility of the environment and, thus, the opportunity it provides them to control and pace their own learning, is its most appealing characteristic. This is evidenced by the results of a 2002 study of adult vocational education students conducted by the National Centre for Vocational Education (Cashion & Palmieri, 2002) in which the online students listed flexibility as the most significant component in a quality learning experience online. In fact, online students may value the flexibility of online learning so much that, in course evaluations, they often rate an online course more highly than it deserves based on its convenience rather than on the quality of the learning experience (Brooks, 2003).

Online learning, however, is not without its challenges. Historically, it has been associated with high dropout rates at the post-secondary level (Carr, 2000). Although little data is available regarding retention rates in K-12 online courses, my own experience as an online high school teacher⁶ indicates that this is a problem at the secondary level as well. Research shows that students with solid written communication skills who are strongly self-directed and take responsibility for their own learning are more likely to be successful online learners (Miller & King, 2003); however, high school students who are attracted to online learning do not always possess or exhibit these characteristics. They may see online learning as an easier alternative and, without strong time management skills and/or self-directed tendencies, are very likely to drop out after an initial enthusiasm for the online option. Researchers note other negative factors including a lack of teacher feedback, feelings of isolation, technical frustration or confusion regarding expectations (Hara & Kling, 2000; Miller & King, 2003). Post-secondary online students who are more likely to drop out are those who choose online courses for the wrong reasons, miss the auditory stimulation of a face-to-face classroom, feel that they have insufficient support, have time and family constraints and/or lack the technical, writing and typing skills required by the environment (Murray, 2001 as cited in Brooks, 2003). Similarly, online vocational education students in Australia listed

⁶ My online experience (since 1998) has been as a learner, designer and teacher. In 2003-2004, I taught approximately 150 online students, of whom very few could be characterized as self-motivated, independent learners. In my experience, dropout rates in online high school courses ranged from 10% - 35%.

technical problems, lack of self-motivation, unsatisfactory assessment, lack of teacher response, confusion, poor materials, lack of support and lack of a help desk as drawbacks to the online learning environment (Cashion & Palmieri, 2002). Oppenheimer (2004) also cites technical frustrations as a major detractor for online learning although his data is mostly based on synchronous computer conferencing via interactive video rather than Internet-based technologies. As the technologies that support online learning evolve and improve and as students' connectivity and access improve, it is likely that technical frustrations will be minimized, but the role of the online teacher in providing support, the 'human touch', will continue to be of paramount importance in keeping online learners engaged and motivated.

The growth of K-12 online learning and its potential for the transformation of teaching and learning are enormous. This new learning paradigm, enabled by the Internet and computer-mediated communication, has much to offer school boards, parents and learners as an alternative or enhancement to the traditional face-to-face classroom. The literature reveals that online learning has the potential to provide flexible, collaborative, student-centred, multimedia-rich, authentic, quality learning experiences (Miller & King, 2003; Palloff & Pratt, 2001). However, the research also clearly reveals that the potential of online learning cannot be realized without a fundamental shift in not only the institution and the learner, but also the pedagogy and the teacher (Miller & King, 2003). Such a shift requires, in turn, new models for training online teachers who embrace innovation and change (Childs, 2004; Kemshal-Bell, 2001).

Online Teaching

e-Pedagogy

Pedagogy, defined by Australian researchers Brennan et al. (2001) as “a core of effective and traditional practices of teaching and training that have worked over time” (p. 24), underpins and strongly influences the way that learning experiences are both designed and delivered. Unfortunately, numerous studies and surveys reveal that, up to now, technology has often driven pedagogy in online teaching (Brennan et al., 2001; Miller & King, 2003). However, it is now becoming clear that the technology itself will not magically bring about a change in teaching or an improvement in student learning outcomes (Gold, 2001) nor will the adoption of traditional teaching practices, such as transmission-style teaching, be successful in the online environment. This was illustrated when, in the rush to put courses and programs online during the 1990s, existing face-to-face practices and content were often transferred to the Web and, as a result, met with limited success (Kemshah-Bell, 2001). The general consensus among researchers in this field is that, given the potential that online learning represents for the transformation of teaching and learning and the need for online teaching and learning to be collaborative and student-centred, a new *e-pedagogy* must be conceptualized and implemented (Brennan, 2003; Bonk, 2001; Coppola, Hiltz & Rotter, 2001; Good, 2001; Miller & King, 2003). As Australian researcher Roslin Brennan states in her 2003 study involving more than three hundred online teachers and students: “It is no longer acceptable to assume that the skills developed in face-to-face teaching can be instantly transferred to the online environment with either ease or good results. The practice of teaching has to be re-conceptualized” (p. 24).

What are the practices of online teaching that have been successful over time?

The literature points to the success of the *collaborative community approach* in facilitating students' online interactivity with the content, the teacher and each other (Brennan, 2003; Brennan et al., 2001; Miller & King, 2003; Palloff & Pratt, 2001). In fact, Good (2001) sees interaction as equally important to content in an online learning experience. To be successful in facilitating social interaction online, the teacher must establish a collaborative community of learners in which learners become more accountable and online teachers relinquish some control (Miller & King, 2003). According to Palloff & Pratt (2000), the following factors facilitate the development of an online community:

- Access to and familiarity with technology
- Flexible, student-centred procedures and policies
- Student participation and 'buy-in'
- Collaborative learning
- Metacognition, specifically reflection on learning

They maintain that students must feel comfortable and adept with the technology they are being asked to use and that providing a framework of clear but fairly loose and flexible ground rules will enhance their participation in the course. In addition, engaging students in collaborative learning, the cornerstone of online community building, assists them in achieving "deeper levels of knowledge generation through the creation of shared goals, shared explorations and a shared process of meaning-making" (Palloff & Pratt, 2000, p. 5). Finally, embedding reflective tasks and activities requires learners to think about not only the course material but also the role of technology in the learning process. For the

teacher, the shift to the collaborative community approach means “abdicating our tried and true techniques that may have served us well in the face-to-face classroom in favour of experimenting with techniques and assumptions” (Palloff & Pratt, 2000, p. 7).

This fundamental shift in pedagogical methodology and the re-conceptualization of teaching that Brennan (2003) calls for require “teachers and trainers who are both confident and comfortable with this new way of working” (Brennan et al., 2001, p. 51). Currently, online teacher training is focused on in-service teachers who often have many years of experience in the traditional classroom (Salmon, 2000). However, preparing for online teaching represents a massive shift in theory and practice for many of these teachers. It appears that the time has come for a new training model that introduces pre-service teachers, at a formative point in their teaching careers, to the emerging body of knowledge of effective online pedagogical practices, such as the collaborative community approach.

Online Teacher Roles

The complexity of the online teacher’s role has been likened to that of a pioneer teacher in a one-room schoolhouse (Anderson et al., 2001). With students working at their own pace and thus progressing through course content at different times, the online teacher, like the pioneer teacher, must guide students’ learning while creating and nurturing a sense of community in order to keep all learners engaged and motivated. Anderson et al. (2001) suggest an e-pedagogy model with three major components: cognitive presence, social presence and teaching presence. Teaching presence is further broken down to three major roles for online teachers: design and administration, facilitating discourse and direct instruction. Berge (1995) categorizes the roles of the

online teacher into four areas: pedagogical, social, managerial and technical.

Similarly, in their study of university professors who were learning to teach online, Coppola, Hiltz, & Rotter (2001) identify shifts in teachers' cognitive, affective and managerial roles as they struggled with facilitating learning in this new environment. In an extensive review of over three hundred articles, papers, presentations and books and a summary of sixty-seven of those, Kemshal-Bell (2001) categorizes the online teacher's roles into three main areas as well: technology, facilitation and management. These are similar to the online teacher roles as categorized by Gold (2001): organization, social and intellectual. While there is a certain amount of overlap in the categories delineated by these researchers, Anderson et al. (2001) have not specified a technical role for online teachers because they believe it will become less important as the technology continues to improve and evolve and as students become more able to solve technical problems themselves.

In their report, Goodyear et al. (2001) list a greater number of roles, including: content facilitator, technologist, designer, manager/administrator, process facilitator, advisor/counsellor, assessor and researcher. Of these, the role of process facilitator alone can be broken down further into twenty-three distinct competencies. Clearly, although there are some similarities between the roles of the face-to-face teacher and the online teacher and many skills that are transferable (Goodyear et al, 2001), the online teacher is also expected to take on new roles and use techniques that are unique to this environment. Effective online teachers are those who are willing to shift some control over learning to learners but, at the same time, provide structure, clear guidelines and expectations as well as effective and timely feedback and guidance. The effective online teacher must also be

a skilled e-moderator who is able to move online discussions from a superficial level to a deeper level of thinking and engagement (Australian Flexible Learning Framework, 2002; Rossman, 1999). In addition, the effective online teacher balances public and private communication modes, finds the right voice for online communication, knows how to deal with silence and is aware of when and where to stay in the background as a guide and facilitator of learning (Australian Flexible Learning Framework, 2002; Benfield, 2000). Most importantly, the effective online teacher must balance individualized or customized learning with collaboration and the nurturing of a community of learners online (Brennan, 2003). It is complex work indeed.

Online Teaching Competencies

Competence can be defined as “a state of being well qualified to perform an activity, task or job function” (Spector & de la Teja, 2001). Although Goodyear et al. (2001) express concern at reducing the complex roles of online teachers to lists of skills, the articulation of the demonstrable competencies required to teach online is critically important. Firstly, such competencies can be used to inform the design of online teacher training programs and professional development. Secondly, if, at some point in the future, online teachers require certification, competencies that are supported by the literature and the experiences of both practitioners and learners will be invaluable. In addition, detailing online teaching competencies can assist administrators in recruiting teaching staff and setting policies.

While descriptors of online teachers’ roles may seem similar to those of face-to-face teachers, delving deeper and describing specific online teacher competencies serves to illustrate the unique skills required to teach in this environment (Spector & de la Teja,

2001). Good (2001) describes the online teacher as one with multiple skills. He states that in addition to conventional pedagogy, the online teacher needs to be:

- aware of how people learn online
- aware of online pedagogical practices that work and why they are effective
- able to weave technology into learning experiences
- technologically fearless

Significant research in the area of online teacher competencies has been carried out in Australia where Kemshall-Bell's (2001) report for the New South Wales Department of Education and Training had, as one of its primary goals, the development of skill sets for the role of an online teacher. As background to the research study, a comprehensive literature review of online teacher competencies was initially summarized in three general categories: technical skills, facilitation skills and management skills. Because the research focused on competencies completely unique to the online teaching environment, those associated with content expertise and generic teaching skills were considered outside the realm of the study. After interviewing and surveying one hundred and eighteen online practitioners and thirty-seven online learners and comparing and contrasting results with the original literature review, the following practical skills or competencies emerged:

- Relating to learners
 - Engaging and motivating learners
 - Building rapport and establishing relationships with students
 - Building and nurturing online teams and communities
 - Maintaining a positive attitude to online teaching

- Managing the online learning environment
 - Managing time
 - Providing direction and support to students
 - Managing online discussions
 - Establishing and maintaining clear guidelines for online students
- Communicating effectively online
 - Using effective online questioning techniques
 - Listening to online learners
 - Providing effective online feedback
 - Using appropriate online dialogue
- Using online learning tools
 - Email
 - Web-based forums and/or bulletin boards
 - Synchronous tools, especially chat tools
 - HTML and simple web page development
 - The online learning management system
- Using effective online teaching methods
 - Determining effective online teaching strategies and using them effectively
 - Embracing an innovative approach to online teaching
 - Adapting online teaching strategies and content to meet individual learners' needs

In addition, the four skills that the surveys and literature agreed on as essential to the online teacher were:

- An ability to engage the online learner
- An ability to provide direction and support to learners
- An ability to build relationships with and between learners
- An ability to use email effectively

Competency in the area of instructional design was also considered outside the realm of the Kemshal-Bell (2001) study and is, therefore, not included in the list of competencies above. The researchers were cognisant of the fact that in many online schools, teachers are required to both design and deliver their courses, or they may be expected to customize online courses previously designed by other teachers. In some situations, online teachers may do this work in relative isolation whereas, in other settings, instructional designers and technicians provide support to teachers and work as a design team. However, Brennan et al. (2001) state that e-pedagogy is revealed and embedded not only in the delivery of online courses but also in their design. They maintain that unless changes occur in training teachers to design effective online learning experiences that are truly interactive, changes in their delivery are unlikely. Gold (2001) also sees the online designer as critical to the success of an online learning experience. He or she must design, within an environment rich in information, communication and collaboration, authentic tasks that encourage the learner to incorporate multiple perspectives through reflection. Guiding learners through these kinds of tasks in such an environment forces the teacher to move away from a transmission model of teaching and make the shift in pedagogy referred to earlier. The competency of the teacher as the

designer of collaborative, interactive and learner-centred online experiences is as critical as the teacher's skills in facilitating such a learning experience.

Online teachers' attitudes, such as technological fearlessness, open-mindedness toward online teaching, compassion, creativity and risk-taking, were mentioned repeatedly in the literature (Brennan, 2003; Brooks, 2003; Good, 2001; Kemshal-Bell, 2001; Schofield, Melville, Bennet, & Walsh, 2001), but were deemed to be critical in the interviews with practitioners in Kemshal-Bell's (2001) study and also incorporated in Good's (2001) definition of an e-pedagogue. This speaks to the need to incorporate these critical attitudes in describing the competencies required for teaching online as it appears that these personal characteristics play a significant role in the success of the online teacher.

The work of determining the profile of the effective online teacher and in specifying the competencies required is far from complete; in fact, it will more likely be ongoing as the environment evolves and as a clearer picture of e-pedagogy emerges. What is apparent, however, is that teaching online is fundamentally different than teaching in the traditional classroom (Brennan et al., 2001; Childs, 2004; Good, 2001; Miller & King, 2003); therefore, the particular competencies of the online teacher require specific and unique training. However, even with such training, this may represent a shift that many experienced in-service teachers find difficult to make.

Professional Development Models

Without well-trained, effective, competent and pedagogically strong online teachers, the potential for transformational teaching and learning represented by the online learning environment may never be realized. Numerous studies point to the need

for online teachers to 'learn the steps to a new dance' (Maeroff, 2003, p. 94) and for professional development which allows them to develop the skills and attributes necessary to be effective in the online environment (Cashion & Palmieri, 2002; Good, 2001; Kemshal-Bell, 2001; Miller & King, 2003).

Currently, online practitioners are almost exclusively drawn from the ranks of experienced, face-to-face teachers (Salmon, 2000). The literature describes a variety of professional development courses and programs, including structured professional development, web-based community building activities, volunteer teaching as well as conferences and mentoring, designed to train in-service teachers to become effective online teachers (Schofield et al., 2001). While many teachers successfully make the transition to online teaching, this model can be problematic. In North Carolina, for example, the Carolina On-Line Teachers' program takes eighteen months to complete and, as a result, in the 2000-2001 cohort, some teachers were forced to drop out due to the time constraints of balancing full-time teaching with the demands of the training program (Hannum, 2001). Other shorter training courses, from two to twelve weeks in duration, may not be adequate in preparing experienced face-to-face teachers to make the pedagogical shift required of them to teach online (Kearsley, 2004). Non-completion of professional development courses for online teaching is also a problem and occurs when teacher participants become overwhelmed, lack the requisite time management and technical skills and/or are not supported by their school administrators, colleagues and family (Kearsley).

In a qualitative case study of online educators from two rural school districts in Alberta, Canada, researchers gleaned information on the issues faced by online teachers,

the skills and knowledge required to be effective and the ongoing professional development required to support online teachers (Crichton & Childs, 2003). The teachers who were interviewed commented that they had had little or no training before beginning to teach online, echoing Palloff and Pratt's observation that most teachers have been prepared for teaching online by 'jumping in head first and learning' (Palloff & Pratt, 1999, as cited in Crichton & Childs, 2003). These teachers are representative of a larger group of self-motivated teachers who took the lead early on and pioneered online teaching during the late 1980s and early 1990s. They can be described as Innovators and Early Adopters (Rogers, 1995) and possess a number of important characteristics. Early Adopters are those who are open to innovation and willing to take significant risks because they see value and promise in the innovation. Their work in experimenting with innovation serves to move the innovation forward. Late Majority Adopters, on the other hand, are those who are more reticent to adopt innovations and more likely to wait until others have done the pioneering work and the innovation appears to be successful. These teachers are now expressing interest in online learning. Whereas Early Adopters were willing to dive into online learning with little or no training, these later adopters will require professional development that is significantly more supportive and purposeful.

The most significant concern when training experienced face-to-face teachers, who have completed many years in the traditional classroom, is their ability to make the pedagogical shift required to be effective in the online classroom and to truly understand the transformational potential of online teaching and learning. In fact, experienced classroom teachers' skills may not be useful or adaptable to the online environment at all (Brennan, 2003). These experienced practitioners are often concerned about their change

in roles, from teacher as transmitter of knowledge to teacher as facilitator and co-learner and may be nervous about giving up some of the control they have traditionally had in the classroom (Schofield et al., 2001). In addition, despite extensive professional development, it often becomes clear that not every teacher is suited for online teaching. Indeed, those who are particularly entertaining and engaging in the face-to-face classroom may not be effective in the online environment (Palloff & Pratt, 2001; Salmon, 2000).

Another challenge for in-service teachers who begin teaching online is that they may not have experienced, as teachers or as learners, learning environments in which the teacher guides student learning as a facilitator and resource provider. Studies of teacher learning, cited by Stein, Schwan-Smith & Silver (1999) suggest that teachers filter information about new ways of teaching through their own experiences as students. Unless experienced in-service teachers are trained in e-pedagogy and the specific competencies of the online teacher, they may revert to traditional teaching practices that spring from their own past experiences (Vrasidas & Glass, 2004).

The literature does, however, point to effective professional development strategies which may result in more positive professional development experiences for teachers who are currently learning to teach online as compared to those early adopters who had no structured training in the early days of online teaching (Childs, 2004). From the research of Schofield et al. (2001) come four primary sources of professional learning for online teachers:

- Learning by doing
- Learning by collaborating with colleagues

- Learning by participating in communities of practice
- Learning by participating in formal, off-the-job professional development

The need for prospective online teachers to immerse themselves, as online learners, in the environment and to learn by doing is critical to an online teaching training program (Childs, 2004; Crichton & LaBonte, 2003; Gold, 2001; Hansen & Salter, 1999; Salmon, 2000). Becoming an online learner allows a teacher to experience the environment firsthand and determine its complexity, benefits and compatibility with his or her own goals and philosophies (Surry, 2002). In terms of innovation adoption, teachers who have an opportunity to try out an innovation, such as online teaching and learning, are more likely to adopt it than those who do not have such an opportunity (Rogers, 1995). Those who begin teaching online without having experienced the environment as online learners, may attempt to re-create the face-to-face classroom and retreat to ways of teaching that are more comfortable and ingrained and, as a result, seriously limit the enormous potential of this innovative learning approach (Zuber-Skerrit, 1992, as cited in Hansen & Salter, 1999).

Crichton and Childs (2003) suggest that professional development for online educators should include three major components:

- Technology and Support
 - Application knowledge of software and delivery systems
 - Technical knowledge of software and delivery systems
 - Support for and in the online learning environment
- Online Pedagogy
 - Understanding online classroom management techniques

- Organizational skills
- Strategies for engaging and motivating learners
- Opportunities to Practice
 - Experience as an online learner before teaching online

As more research emerges on the topic of online professional development, the current model of training experienced in-service teachers to teach online will continue to evolve to overcome its challenges. Is this, however, the only way to train online teachers? The concept of introducing online teacher training into pre-service teacher education programs, as suggested in a number of research studies (Brennan et al., 2001; Childs, 2004; Kemshall-Bell, 2001) is an alternative model that merits further investigation and discussion.

Pre-Service Teachers

Pre-Service Teacher Training and Technology Integration

In response to the technological demands placed on new teachers, significant research has been focused on the topic of technology integration and pre-service teacher education programs (Moursund & Bielefeldt, 1999; Phillion, Johnson, & Lehman, 2003; Thomas, Larson, Clift, & Levin, 1996). There has been a movement away from standalone educational technology courses and a general recognition of the importance of teaching technology within a context (Wetzel & Strudler, 2002). Willis (1998 as cited in Bolick, 2002) points out that pre-service teachers become confident in their ability to integrate technology when they work with teachers who model effective uses of technology and in an environment that makes them responsible for their own learning. This is supported by other research that states that the three major factors impacting pre-

service teachers' use of technology are: access, training and context (Thomas et al., 1996). In response to the research, a number of changes have been made in integrating technology in North American pre-service teacher training programs, including:

- Technology integration courses in the context of particular disciplines (Bolick, 2002)
- Distance education course offerings to pre-service teachers to accommodate students in remote areas and also to model self-paced learning (Sanders, n.d.; The Council on Alberta Teaching Standards (COATS), 2002)
- Use of distance education technologies to link pre-service teachers with K-12 schools (Phillion et al., 2003)
- Accommodating pre-service teacher candidates in requesting technology-rich field placements (Wetzel & Strudler, 2002)

Although these examples represent significant changes, few institutions have taken the next step, offering online training in pre-service teacher education programs. In a recent survey of Canadian teacher education programs (Crichton & Childs, 2003), only St. Thomas University in New Brunswick reported offering an 'e-practicum' option to pre-service teachers although the University of British Columbia and York University reported using digital technologies to facilitate communication with host schools during practicum placements. Despite the growth of K-12 online learning and the potential for novice teachers to shift their thinking and adopt the student-centred pedagogy that is fundamental to online learning, very few university teacher education programs currently include an online practicum experience in their programs.

Training Pre-Service Teachers to Teach Online

The call for online teacher training at the pre-service level is beginning to be heard in the literature. In fact, one of the recommendations in the Kemshall-Bell (2001) study is that “the needs of new full-time and part-time teachers be addressed by incorporating online teaching and learning into initial teacher education” (p. 8). Ann Thompson (2003), editor for the *Journal of Computing in Teacher Education* and a faculty member at Iowa State University, also believes strongly in the need for teacher education programs to include “high-quality distance education and technology experiences in their programs” (p. 98). She states that all colleges and teacher education programs “should be thinking about the need for teacher preparation in the expanding field of distance learning” (Thompson, 2003, p. 98). Indeed, some American universities have begun to move in this direction. For example, Northern State University in South Dakota selects pre-service high school teachers to teach in the secondary distance education program that is housed within the university. Using two-way video and audio technologies, they complete their field placements by teaching advanced courses for students in rural areas. The College of Education at Iowa State University is also planning distant student teaching experiences through their new Iowa Virtual Academy. Student teachers there will complete both a traditional and online practicum (Thompson). The teacher education experience is a powerful force in altering novice teachers’ beliefs based on their previous educational experiences (Russell, McPherson, & Martin, 2001; Steffy, Wolfe, Pasch & Enz, 2000) and thus represents an ideal opportunity for pre-service teachers to learn about and experience educational innovations such as online learning.

Conclusion

Online learning has the potential to fundamentally transform the way that teachers teach and learners learn. Whether it is provided solely at a distance or in distributed learning settings, online learning is based on a learner-centred philosophy and can provide an inclusive, democratic environment that allows students access to an enormous variety of resources as well as the ability to control and pace their own learning. Computer-mediated learning technologies, which are rapidly becoming more sophisticated and user-friendly, can facilitate collaboration and interaction and allow online learning communities to develop and flourish while also supporting customized, individualized learning.

However, moving from the theoretical potential of this environment, and the ideology on which it is based, to actual practice is a significant challenge that cannot be accomplished without effective, well-trained online teachers whose competencies are distinct from those required to teach in a traditional classroom (Miller & King, 2003). At present, most online teachers are recruited from the ranks of in-service teachers who have had many years of experience in the traditional classroom and, possibly, many years of transmission-style teaching (Brennan et al., 2001; Salmon, 2004). Attempts by seasoned classroom teachers to re-create their face-to-face classrooms in the online learning environment have been revealed in the literature to be ineffective and may, in fact, limit the potential of the online learning paradigm.

One solution to fulfilling the growing need for K-12 online teachers who are able to make the pedagogical shift required is to embed online teaching and learning practicum experiences within pre-service teacher education programs. As identified in

this chapter, there is a need for, but few examples of, this new model for training online teachers. The focus of this research is to develop an understanding of the impact of embedding online teaching and learning experiences in teacher education programs by examining the impact of a course-based online teaching and learning experience on pre-service teachers at the University of Calgary.

CHAPTER THREE

METHODOLOGY

Overview

The focus of this research is to develop an understanding of an innovative program which, as revealed in Chapter Two's literature review, represents the leading edge in both training online teachers and pre-service teacher education: a course-based online teaching and learning experience offered to pre-service teachers at the University of Calgary in Calgary, Alberta, Canada during the winter term of 2004. Chapter Three describes the methods and procedures used to address the research questions of this study:

What is the impact of the online teaching and learning experience in the course Special Topics: Distributed Learning on pre-service teachers' understandings of the practice of teaching online?

In particular, what is the impact on their understandings of :

- a. the unique skills and competencies required of an online teacher?
- b. the unique challenges faced by online teachers?

There are three sections in this chapter. The first includes a description of and rationale for the research design, the research questions and the role of the researcher. The second section addresses the research procedures, including the context of the study, the selection of the population, the characteristics of the participants and the methods used for data collection and analysis. The third section describes the process of determining the frames and codes used for data analysis, as discussed in Chapter Four.

Section A: Research Design

The goal of this research study is to describe and interpret the experiences of nine pre-service teachers in Special Topics: Distributed Learning, an elective course offered for the first time during the winter semester of 2004 and to determine the impact of this experience on their understandings of the competencies and challenges of online teaching. The thirteen-week course, offered during the final semester of a two-year Bachelor of Education program at the University of Calgary, involved both an online component and a practicum component in which the pre-service teachers were partnered with experienced online teachers at the Calgary Board of Education's online high school, CBe-learn⁷.

In an attempt to provide a holistic account of the experience of these pre-service teachers, a qualitative case study (Merriam, 1998) research design utilizing frame and code analysis (Goffman, 1974) for data analysis was chosen. Although it is not a typical ethnography, the design includes several elements of ethnographical methodology, and so it can also be considered quasi-ethnographical (Goetz & Le Compte, 1984). A rationale for the design of the study and a description of the terms *qualitative*, *case study*, *ethnography* and *quasi-ethnography* follow. A detailed description of the frames and codes used for data analysis are contained in Section C of this chapter.

⁷ CBe-learn is the Calgary Board of Education's online school. Originally part of the CBE's upgrading high school, Chinook Learning Services, it became a full-fledged online high school in 2002 and added an online junior high school in September, 2004.

Qualitative research is “...an umbrella concept covering several forms of inquiry that help us understand and explain the meaning of social phenomena with as little disruption of the natural setting as possible” (Merriam, 1998, p.5). This study fulfills six characteristics that categorize it as qualitative in nature: the researcher’s fundamental philosophical stance, the instruments used for gathering data, the use of fieldwork, the inductive reasoning approach it employs, the use of rich description and the flexible and iterative nature of the study (Merriam). Firstly, in designing this particular study, my primary interest was in understanding how the pre-service teacher participants made sense of the experience of both learning online and teaching alongside in-service online teachers; in other words, I wanted to determine the impact of this experience in the context in which it happened. Secondly, data was collected using surveys, interviews, course artifacts and the students’ final projects, and therefore the data collection process involved fieldwork at CBe-learn, the University of Calgary and in the online component of the course. Thirdly, as there have been very few instances of this kind of innovative program for pre-service teachers, my interest was, and still is, in building theory to explain the data gathered in the course of the study rather than in testing established theory. Fourthly, this research study is descriptive in nature, using the participants’ voices, quotes and artifacts to illustrate the impact of this experience on their understandings of the practice of online teachers. Finally, the qualitative research design provided the flexibility to allow for changes and revisions to the methodology as the course evolved and the data was analyzed. As Stake (1995) points out, “the researcher makes a flexible list of questions, progressively redefines issues and seizes opportunities

to learn the unexpected” (p. 29). For all of the reasons mentioned above, a qualitative research design was deemed appropriate.

This study is further categorized as a case study as it can be described as “an intensive, holistic description and analysis of a single instance, phenomenon or social unit” (Merriam, 1998, p. 27). There are several reasons for choosing a case study approach to this particular research. Firstly, the case being investigated is a single unit, clearly bounded by the finite time available for data collection and observation as well as the finite number of participants (Merriam, 1998; Stake, 1995). The Special Topics: Distributed Learning course is also an innovative program and its inaugural term was a unique event. As Stake (1995) suggests, “An innovative program may be a case” (p.2). Secondly, as the researcher, my interest was and still is in the process or the impact of this experience rather than on the outcomes or products of the students’ learning (Stake, 1995). My own immersion in the course, along with the students, was critical to making observations and chronicling the students’ feelings, questions and reactions throughout their experience. Finally, this is indeed an innovative program; in fact, as the literature review in Chapter Two reveals, only three similar programs have been located in North America to date. Moreover, what this particular case reveals about the phenomenon of training pre-service teachers to teach online may demonstrate the need for pre-service teachers to have online teaching and learning experiences during their teacher education programs and may serve to inform pre-service education programs that may include similar courses or e-practicum experiences in the future. By virtue of the bounded and unique nature of this case and my overriding interest in answering “how” and “why” questions through immersion in the experience, the case study approach is appropriate.

“Ethnographies recreate for the reader the shared beliefs, practices, artifacts, folk knowledge and behaviours of some group of people” (Goetz & Le Compte, 1984, p. 2). Therefore, to the extent that this study is a re-creation of what happened and how the participants behaved in the context of their online learning and teaching experience, it is ethnographical in nature (Merriam, 1998; Scott & Usher, 1996). The design of this study incorporates several other elements of ethnography: the variety of methods used to collect the data, the reliance on observation and field notes for data collection, the small, bounded nature of the phenomenon (Goetz & Le Compte, 1984) and the interest in preserving the uniqueness of the case and not in generalizing to the larger population (Scott & Usher). However, because the Special Topics course and, thus, the participants’ experience, was limited to thirteen weeks, the study cannot be considered long term nor was it exclusively focused on the interactions and social structure of the group. For these reasons, the design of this research study is further categorized as quasi-ethnography (Goetz & Le Compte).

Research Questions

The main research question and sub-questions are as follows:

What is the impact of the online teaching and learning experience in the course Special Topics: Distributed Learning on pre-service teachers’ understandings of the practice of teaching online?

In particular, what is the impact on their understandings of :

- a. the unique skills and competencies required of an online teacher?
- b. the unique challenges faced by online teachers?

Ethics and Consent

The rights of the participants who were involved in this study were protected by:

- the ethics proposal approved by the Conjoint Faculties Research Ethics Board on February 6, 2004 (Appendix A)
- the ethics proposal approved by the Specialist, Accountability Services/System Support of the Calgary Board of Education on April 27, 2004 (Appendix B)

The pre-service teacher participants as well as their partner teachers and the administration at CBe-learn were asked to sign consent forms (Appendix C) which explained the goals and purposes of the study, the anonymous nature of their responses and their right to withdraw from the study at any time.

Confidentiality and Anonymity

To ensure confidentiality and anonymity, the data collected during this research study was secured on a home office computer and also on a laptop used for fieldwork. All electronic data were password protected. As stipulated by the ethics application approved by the University of Calgary, all field notes, files and electronic interview files will be dealt with appropriately upon defence of this thesis. The pre-service teacher participants were assigned pseudonyms (eg. Participant A). Also, issues of Freedom of Information and Privacy (FOIP) were recognized and honoured. CBe-learn and the Calgary Board of Education agreed to the use of their names in this study.

Researcher's Role: Participant-Observer

In designing a research study, the researcher must make many choices, including the degree to which to participate, the extent of expertise to reveal and whether to

approach the study from a neutral or evaluative stance (Stake, 1995). For this research study, I chose the role of participant-observer in order to observe every phase of the Special Topics course firsthand and subsequently present a holistic, non-evaluative account of the participants' experiences. The role of participant-observer is described by Merriam (1998) as "a schizophrenic activity in that the researcher usually participates but not to the extent of becoming totally absorbed in the activity" (p. 103). In this role, the researcher participates alongside the research subjects in order to understand the nuances of their experiences. While his or her purposes for doing the research are stated at the outset, the goals of the research evolve during the fieldwork (Scott & Usher, 1996). In this role, the participant-observer researcher is involved in many of the activities of the group and assumes some level of responsibility, but his or her role as researcher is well known to the group (Merriam). In this study, I participated in the students' online course by monitoring the discussions, responding to questions and sharing my online teaching and learning expertise. Along with the CBe-learn partner teachers, I also participated in some of the face-to-face technology workshops that were part of the Special Topics course. At the end of the course, I attended the students' final presentations and conducted a focus group interview with the group as a whole.

Of course, it is important to recognize that the account of the participant observer, who makes decisions about the design of the study, the methodology and what to watch and record, presents a particular perspective of the phenomenon to be studied (Scott & Usher, 1996). This is greatly influenced by the researcher's background, values and prior knowledge. For this reason, it is important to acknowledge the previous experience and knowledge that I bring to this research study and to incorporate the element of reflexivity,

the recognition of the researcher's values and experience, which is central to interpretive analysis. In fact, according to Scott & Usher (1995), "reflexivity is no longer seen as a problem but as a resource. It helps us to recognise that we ourselves are a part of rather than apart from the world constructed through research" (p. 35).

With respect to this research study, my experience in the areas of professional development, online teaching and learning and web-based instructional design is relevant to this study and gives me privileged access to the field and data. In 1997, after twenty-two years as a classroom English as a Second Language teacher, I took on the position of Teaching and Learning Coordinator at an upgrading high school in the Calgary Board of Education. My role was to initiate, implement and coordinate professional development activities for a staff of approximately one hundred and fifty high school teachers. I had the opportunity to connect teachers with current educational research and spent a significant amount of time working with teachers to help them implement the Information and Communication Technologies (ICT) Program of Studies which had, at that time, been newly mandated by Alberta Learning, the ministry responsible for education in the province. In 1998, an online high school program was beginning to emerge in my school. After taking two introductory online courses, I was asked to design, develop and teach an online professional development course for Alberta Learning on the topic of infusing technology in classroom practice, with a major focus on the aforementioned ICT Program of Studies. In addition, I was also involved in designing and developing another online

professional development course, e-Designer, offered as one of a number of the e-PD⁸ courses offered by the Calgary Board of Education. It was at this point, in 2001, that I began teaching online professional development courses to teachers. In 2003, I joined the CBE's online high school, CBe-learn, as the Online Editor, responsible for the professional development and training of online teaching staff and also as an online teacher, teaching Career and Life Management, a mandated high school course. My role as the liaison between the instructor and participants in the Special Topics course and the partner teachers and administration at CBe-learn was one of many projects I took on during 2003-2004 and involved facilitating communication between the student teachers, their partner teachers, the course instructor and the System Principal and Assistant Principal at CBe-learn. My experiences as an online learner, teacher, designer and staff developer have spanned six years during which I have witnessed incredible changes in innovative practices and technological advances in the field of online learning. As a result, I have developed not only a unique perspective on the complexities, challenges and advantages of learning and teaching in the online environment, but also a passionate interest in optimizing the potential for educational reform in what I consider to be a exciting new frontier in education.

⁸ e-PD refers to a program of online professional development courses offered to teachers through Innovative Learning Services at the Calgary Board of Education. The courses range from a series of online teaching and learning courses to other online courses in a number of curriculum areas.

Section B: Research Procedures

Population Selection and Characteristics

Once the Special Topics: Distributed Learning course had been chosen as the unique, bounded case for this research study, it was critical to decide who and how many of the participants to study. Because it was initially impossible to predict the number and composition of the class group or even if there would be enough registrations to warrant running the course, this decision was made after the students had registered in December of 2003. This interactive, developmental style of population selection is characteristic of ethnography and, thus, appropriate to this study (Goetz & LeCompte, 1984). Many current educational ethnographers choose groups that are subsets of larger groups (Goetz & LeCompte), and, in fact, the pre-service teacher participants in the Distributed Learning course formed a subset of the much larger group of more than four hundred second-year pre-service teachers in the University of Calgary's Bachelor of Education Master of Teaching Program. To understand the general characteristics of this group, it is important to understand the philosophy of the University of Calgary's B. Ed. Master of Teaching program and to describe the profile of the MT (Master of Teaching) student.

The MT program is based on the philosophy that "learning to become a teacher requires experiences which are learner-focused, inquiry-based and field-oriented" (University of Calgary, 2003, p. 2). Students are graded on a credit/non-credit basis, and the program is organized around the following thematic units (University of Calgary, 2003, p. 4):

- Year One: Semester 1: Learners & Learning and Teachers and Teaching
 Semester 2: Curriculum Studies and Curriculum Contexts

- Year Two: Semester 3: Praxis

Semester 4: Integration

Although it is inaccurate to describe all MT students as possessing similar personal characteristics, all MT students at the University of Calgary come to the program having completed an undergraduate degree and are generally between the ages of twenty and thirty although there are a number of older students as well. These students tend to have high grade point averages as entrance to the program is highly competitive and limited to an average annual intake of approximately four hundred students.

The fourth semester of the MT program in which the Distributed Learning course is situated, is an integration of theory and practice:

The students focus on case studies on the ethics of teaching, issues and problems in educational practice and further their study in areas of special interest. There are no formal field experiences during this semester. However, students must complete a major inquiry project that may involve action research in a school or community/workplace site. This inquiry project will focus on a topic of interest to the student and of value to the field site. (University of Calgary, 2003, p. 7)

The Special Topics: Distributed Learning course was offered in the fourth semester so that students could learn the theory of online teaching and also have the opportunity to experience the online environment both as learners and teachers. By registering in the Distributed Learning course, the students indicated that online teaching and learning was an area of interest or curiosity to them. In order to capture the idiosyncrasies and characteristics of this group as a subset of the larger population of second-year, pre-

service teachers (Goetz & Le Compte, 1984), all ten students who registered were included in the study. After one week into the term, one of the students was offered a job and withdrew from the course, completing the requirements for the program independently. The other nine students agreed to be subjects of the study and subsequently completed the thirteen-week course. They can be considered a ‘unique sample’ (Merriam, 1998), chosen because of the interest in online teaching and learning that they indicated by choosing to participate in the first occurrence of the Special Topics: Distributed Learning course. Detailed demographic information about the participants is represented in Table 2 below. The data that describes their technical capabilities, online experience and comfort with electronic communication was collected from responses to the entry survey (Appendix D).

Table 2

Participants’ Demographic Information

Interviewee	Subject Area	Technical Capability	Online Experience	Comfort with electronic Communication
Participant A	CTS	Confident Explorer	None	Somewhat comfortable
Participant B	English	Confident Explorer	None	Extremely comfortable
Participant C	Social Studies	Confident Explorer	None	Somewhat comfortable
Participant D	Math	Enthusiastic Beginner	None	Not at all comfortable
Participant E	Science	Confident Explorer	Yes - hybrid courses using WebCT and Blackboard	Quite comfortable
Participant F	Social Studies	Enthusiastic Beginner	Yes – some experience using online for both	Quite comfortable

			teaching and learning	
Participant G	English	Confident Explorer	None	Quite comfortable
Participant H	CTS	Enthusiastic Beginner	None	Somewhat comfortable
Participant I	Phys. Ed.	Confident Explorer	Yes – one course	Somewhat comfortable

In addition, one of the pre-service teachers, (Participant F), had the opportunity to teach online as a summer school instructor for Social Studies 10 and 13 with CBe-learn during the summer term of 2004. This provided a unique opportunity to further investigate the impact of this course-based experience on one participant's online teaching practice and is referenced in the discussion and recommendations in Chapter Five.

The selection of subjects for this research represents a limitation to this study that must be acknowledged. It is possible that the students who chose to take the Distributed Learning course were more open-minded about technology and thus more willing to make the pedagogical leap required to teach in the online environment. Their willingness to try a new course in the last semester of their teacher education program and to immerse themselves in an unfamiliar learning and teaching environment speaks to an attitude of risk-taking that may not be representative of the other pre-service teachers in their cohort but which was revealed in the literature to be characteristic of effective online teachers.

The Special Topics: Distributed Learning Course

In order to situate this research study and clarify its context, it is important to understand the purpose and the structure of the Special Topics: Distributed Learning course that was offered from January to April of 2004. The goal of the course was to

offer pre-service teachers an opportunity to experience the online learning environment as a learner, teacher and designer and to use these experiences as the basis for an inquiry project, a major course assignment. One component of the course was a web-based course, using Blackboard as the learning management system, in which the students were expected to participate as learners and facilitators of various online discussions. The course was, in fact, a hybrid or blended online learning experience as several face-to-face sessions were held at the University of Calgary so that the students could participate in hands-on technology workshops to supplement their technical knowledge and assist them in the development of learning objects. On January 19, 2004, the students met with the CBe-learn online teachers who had volunteered to be partner teachers, and partnerships were set up according to the students' subject area interests and areas of expertise. Over the course of the subsequent weeks, the pre-service teachers and their partner teachers collaborated to design and develop online learning objects⁹ for high school courses in a number of curriculum areas, including Science, Math, English Language Arts, Social Studies, Career and Technology Studies and Physical Education. As resources for this project, the students had access to in-house technical expertise at both the University of Calgary and CBe-learn. These online learning objects provided a rich source of data for

⁹ An online learning object can be defined as "any digital object or media asset that is an independent and self-standing unit of learning content predisposed to reuse in multiple instructional contexts" (University of Melbourne, n.d.)

this study and are referenced in the analysis of the data in Chapter Four. A description of the students' learning objects can be found in Table 3 below:

Table 3

Online Learning Objects

Participant	Subject Area	Learning Object Description
Participant A	CTS	Creating a Newsletter Using Microsoft Word (series of linked web pages with activities and links to URLs for newsletter resources and examples; culminating assignment: production of a digital newsletter)
Participant B	English	To Kill a Mockingbird Website (hyper-linked town map and nine assignments on character analysis as well as historical and controversial elements of the novel)
Participant C	Social Studies	Canadian Identity Online Assignment (hyper-linked map with resources and background information about Canadian identity; activities to guide students in defining and describing their own Canadian identity)
Participant D	Math	Digital Hockey Pool Using Spreadsheets (digital summative assessment tool requiring students to create a hockey pool using spreadsheet technology for data and calculations)
Participant E	Biology	Mitosis/Meiosis Multimedia Object (multimedia Flash movie demonstrating the steps in the biological processes of mitosis in comparison to meiosis)
Participant F	English	Media Awareness Website (interactive website with links to Internet resources and activities demonstrating the power of advertising and media; choice of seven assignments designed to promote critical thinking)
Participant G	English	E-Newspaper on Controversies (variety of collaborative online activities including research, case studies, interviews, panel discussions, role plays and jigsaw tasks, using Wiki technology; collaborative e-

		newspaper as culminating assignment)
Participant H	CTS	Promotional Website for CBe-learn's Get Back on Track Program (website to promote CBe-learn's 'Get Back on Track' online program for marginalized students)
Participant I	Physical Education	Heart Rate Monitor Study (website with links to URLs and Internet resources to support students' use of heart rate monitors; interactive components designed to collect data and feedback from students)

In addition, the students were required to write an Inquiry Project paper that was intended to reflect their understandings of online teaching and learning. In summary, the components of the Special Topics: Distributed Learning course consisted of:

- Inquiry Project Paper
- Online Participation
- Content Development
 - Development of a subject-specific learning object
 - Development of a lesson or activity using the learning object
 - Development of an assessment item to determine learner understanding of the lesson/activity

For the purposes of this study, the following terms will be used to refer to the components of the Special Topics course from which data was collected:

- The Blackboard Course – the pre-service teachers' University of Calgary online course which provided archived discussion postings from weekly discussions and in which the researcher participated as participant-observer

- The Learning Objects – the pre-service teacher’s Content Development projects that involved the design and development of online learning objects, in partnership with partner online teachers at CBe-learn, the Calgary Board of Education’s online high school. These learning objects were presented to the class and the researcher, as a participant-observer, in April of 2004.

As mentioned in the literature review in Chapter Two, the Special Topics: Distributed Learning course was developed and taught by Dr. Susan Crichton of the University of Calgary and its design was based on the results of previous research with online practitioners in two rural Alberta school districts (Crichton & Childs, 2003).

Data Collection and Analysis Methods

Because the goal of case study research is to present a holistic and comprehensive description of the phenomenon being studied, the case study researcher relies on a variety of data collection strategies which most often include interviews, observation and document analysis (Merriam, 1998; Stake, 1995). As Merriam (1998) points out, “Understanding the case in its totality, as well as the intensive, holistic description and analysis characteristics of a case study, mandates both breadth and depth of data collection” (p. 134).

Goetz and Le Compte (1984) also include interviews, observation as well as the analysis of artifacts and documents among the data collection strategies of the ethnographer and stress that the methods chosen at the outset of an ethnographic study are reviewed and often revised in response to the data which surfaces during the course of the study. Similarly, Stake (1995) suggests a fluid, responsive method of data collection and states that, “the more qualitative approach usually means finding good moments to

reveal the unique complexity of the case” (p. 63). The variety of data collection methods used in this study is in keeping with the traditions of qualitative case study research and quasi-ethnography (Goetz & Le Compte, 1984; Merriam, 1998; Stake, 1995). The research design can be further categorized as a mixed methods design because data was collected from surveys which were analyzed qualitatively rather than numerically, as well as archived course artifacts, the students’ learning objects, the researcher’s field notes and a semi-structured focus group interview. This data is supplemented by an unstructured interview with one of the participants at the conclusion of her online summer school teaching experience, referenced in detail in Chapter Five.

I obtained permission from Dr. Crichton to survey and interview the students in the course and was also given permission to access and participate in the Blackboard course. On January 12, 2004, the nine pre-service teachers completed an entry survey (Appendix D) during their first class of the Distributed Learning course. The purpose of the survey was twofold: to determine demographic information about the participants and to establish a baseline measure of their initial conceptions and understandings of the practice of teaching and learning online. The survey was comprised of several multiple-choice and open-ended questions that were intended to probe the participants’ knowledge, values and experiences as online learners or teachers. Other questions focused on demographic information regarding comfort with electronic communication and gender. Two ‘devil’s advocate’ questions were also included on controversial issues in the field of online learning and teaching (Goetz & Le Compte, 1984).

As participant-observer in the online component of the course, I monitored the discussions and posted messages where I felt my expertise could be helpful to the

students or where I wanted to probe their understanding more deeply. These observations were recorded as field notes. Because of the archiving capability of the Blackboard learning management system, it was also possible to save the online discussions for further analysis once the course was over.

In March of 2003, the data collected from the entry surveys was initially analysed in order to inform the questions to be included in the exit survey (Appendix E). The research questions were then narrowed and revised to reflect the focus on online teaching rather than online learning. As a result, some entry survey questions referring to online learning were not included on the exit survey. Where it was deemed important to gather information about the students' changes in understanding from the beginning of the course to the end, questions were stated identically in the entry and exit surveys. When it became apparent that a consistent theme on the entry survey responses was the pre-service teachers' concerns about building rapport with students online, a question about rapport building was added to the exit survey. The exit surveys were given to the participants two weeks before the end of the course so that they would be completed in time to inform the questions for the focus group interview. The format of the exit survey was similar to the entry survey, including a variety of questions: value, knowledge, experiential and devil's-advocate, in both multiple-choice and open-ended formats.

In order to prepare the questions for the focus group interview on March 29, 2004, the entry surveys and the completed exit surveys were examined for emerging themes. In view of the fact that the pre-service teachers had had little opportunity to actually teach in their partner teachers' online courses, the interview questions focused on their perceptions of online teaching from their vantage point as online learners and from their

experiences observing online courses and designing learning objects with their partner teachers. The categories that emerged for inclusion in the focus group questions were:

- Advantages and challenges of learning and teaching online
- Interaction with students online
- Expectations for the course
- Improvements to the course
- Role of the online teacher
- Effect of the course experience on future teaching practice

Six general questions along with additional probing questions (Appendix F) were used as an interview guide and were addressed as they came up during the course of the discussion. This could be classified as a non-standardized interview (Goetz & Le Compte, 1984) or a semi-structured interview (Merriam, 1998) that facilitates an informal atmosphere and seeks to capture the participants' feelings, opinions and observations as they are revealed through the discussion. One of the CBe-learn partner teachers also attended the focus group interview and posed the questions while I took notes and made observations. In addition, the two-hour discussion was recorded using digital audio.

In addition to the data gathered from the pre-service teachers before, during and after the Special Topics course, one participant was interviewed for a second time when she completed a summer school term as an online teacher with CBe-learn. The questions for this unstructured interview (Appendix G), conducted on August 16, 2004 with Participant F, were based in part on her responses to both the entrance and exit surveys and on comments she made during the focus group interview. The point of the interview was to determine the aspects of online teaching for which she felt prepared and

unprepared as a result of her experience in the Distributed Learning course. Her experience also provides a valuable insight and perspective on the question, “Is it necessary to have classroom teaching experience before teaching online?” which was also included on the entry and exit surveys. This two-hour interview was also recorded using digital audio.

Data was analyzed using Goffman’s (1974) approach to frame and code analysis that is discussed further in Section C of this chapter. In order to edit and categorize the audio clips, the digital audio data was clipped using audio editing software (Cool Edit Pro and Adobe Audition 1.5) and then organized into frames and codes. The audio files from both the focus group interview and the single participant interview were edited for extraneous content such as introductions, interruptions and informal conversations that were not relevant to the research. The process of recording and editing digital audio data is described by Crichton and Childs (2004) as a method that

...allows the researcher to hear the intonation, passion, pauses and inflections throughout the analysis process. It reduces the impact that the transcription process has on the content, noting that often the transcribing is not done by the principal researcher due to time or cost considerations and that the process itself flattens the rich three dimensional quality of the original statements into a two-dimensional, flat text format. (p. 5)

Once the audio clips were coded appropriately, a selection of clips that evidenced the finalized frames and codes for this research were transcribed and included in this thesis. This method was chosen because the clipping and coding of digital audio files in this manner allows the researcher to keep the participants’ voices intact while the clips are

organized and coded. It also helps to insure against misinterpretation and honours the authentic voices of the participants throughout the process of data analysis (Crichton & Childs).

Section C: Development of Frames and Codes

Similar to the process of collecting data, the development of frames and codes in a qualitative research study is dynamic and iterative (Goffman, 1974; Merriam, 1998). The frame is defined as the "...principle of organization which governs the subjective meanings we assign to social events" and the code as "...a device which informs and patterns all events that fall within the boundaries of its application" (Goffman, 1974, p. 7-8, 11). A frame suggests a broad category and codes are the labels assigned to events that are part of the category defined by the frame. The initial frames and codes for a qualitative research study are first informed by a review of the literature which situates the study in the knowledge base of the field (Merriam, 1998) and are later, throughout the data analysis process, modified and revised in response to the data that emerges and are further informed by the experience of the researcher.

In the initial planning for this research, six frames and fourteen corresponding codes were developed based on my previous experience as an online learner and teacher, a review of documents provided by the University of Calgary about the Master of Teaching Program and an initial review of the literature (Anderson et al., 2001; Coppola et al., 2001; Good, 2001; Kearsley & Blomeyer, 2004; Palloff & Pratt, 2000; Salmon, 2004). These frames and codes informed the questions included in the entry survey and are outlined below in Table 4.

Table 4

Initial Frames and Codes – Online Teaching Competencies

FRAME & REFERENCES	CODE	EXPLANATION
Beliefs (Good 2001; Coppola et al., 2001)	<ul style="list-style-type: none"> ○ Learner-centred philosophy ○ Constructivist approach 	Belief that learners construct their own meaning and that the online teacher has a different role (facilitator) rather than purveyor of knowledge; belief that students learn best when they have control over their own learning; belief that people learn from each other; learning is not a solitary activity
Technology (Anderson et al., 2001; Salmon, 2004)	<ul style="list-style-type: none"> ○ Skill and ease with LMS ○ Knowledge of web design ○ Fearless attitude 	An effective online teacher is able to navigate the learning management system with ease and make optimal use of online tools to maximize learning; able to create engaging, effective online learning materials
Facilitation (Kearsley & Blomeyer, 2004; Salmon, 2004)	<ul style="list-style-type: none"> ○ Strong social online presence ○ Skilled in facilitating online interaction and discourse 	It's important for online teachers to not only recognize their changed role as facilitator of learning but also know how to effectively facilitate online
Management (Palloff & Pratt, 2000; Salmon, 2004)	<ul style="list-style-type: none"> ○ Well-organized ○ Monitors and facilitates student progress through the course 	The effective online teacher is well-organized and is able to manage emails, discussions, chats; manages the online course and students' progress through it
Communication (Kearsley & Blomeyer,	<ul style="list-style-type: none"> ○ Comfortable with electronic communication 	Online teachers need to be comfortable with electronic communication

2004; Palloff & Pratt, 2000; Salmon, 2004)	<ul style="list-style-type: none"> ○ Establishes tone of mutual respect ○ Frequent, responsive feedback 	and able to build a rapport with their students without visual cues or body language; the tone of mutual respect and safety is established through the teachers' communication with the class
Content (Wiley, 2002)	<ul style="list-style-type: none"> ○ Content expertise ○ Passion for subject area 	Effective online teachers are subject matter experts who communicate passion for the subject through electronic media

The initial analysis of the entry and exit surveys combined with my own online teaching and learning experience and a more comprehensive review of the literature resulted in six frames: *Interpersonal Skills, Management Skills, Communication Skills, Technology Skills, Pedagogy and Instructional Design*. In addition, the original codes were revised to reflect the two parts of the refined research question: Online Teaching Competencies and Online Teaching Challenges. For each of the six frames, a corresponding Online Teaching Competency code was assigned in order to capture the students' understandings of the specific knowledge, skills and attitudes required to be an effective online teacher. An Online Teaching Challenge code also corresponds to each frame in order to capture what the pre-service teachers perceived as challenges or barriers to teaching online.

As suggested by a comprehensive Australian study reviewed in the literature (Kemshal-Bell, 2001), I decided to focus on teaching competencies that are unique to the online environment; therefore, the original *Content* frame was not included in the final frames, as it is assumed that all teachers, in the face-to-face classroom as well as the online classroom, must have content area expertise in order to be effective. The

Instructional Design frame was added in order to reflect the significance of design in the work of the online teacher as revealed in the literature review in Chapter Two (Brennan et al., 2001; Gold, 2001). In addition, the design and development of digital learning objects represented a significant portion of the Distributed Learning students' course and practicum work; therefore, their comments and thoughts on the competencies required for not only online teaching but also web-based design are relevant to this study.

Table 5 outlines the revised frames and codes that were used for the analysis of the entry and exit surveys as well as course artifacts, online discussions, the focus group interview and the interview with Participant F who went on to teach online in summer school. These frames and codes were influenced by my personal experience in online teaching and learning, the literature review, in particular the online teacher competencies that emerged in the Kemshal-Bell (2001) study, and by the data from the entry and exit survey results.

Table 5

Final version of frames and codes

FRAME & REFERENCES	CODE	GENERAL DESCRIPTION
Interpersonal Skills (Brennan, 2003; Brennan et al., 2001; Coppola et al., 2001; Gold, 2001; Goodyear et al., 2001; ISTE, 2002; Kearsley & Blomeyer, 2004; Kemshal-Bell, 2001; Miller & King, 2003; Palloff & Pratt, 2000; Schofield et al., 2001)	Online Teaching Competency: Relating to Learners	<ul style="list-style-type: none"> Engaging and motivating learners Building rapport, nurturing community and encouraging collaboration Maintaining a positive attitude to online teaching
	Online Teaching Challenge: Rapport & Motivation	<ul style="list-style-type: none"> Establishing personal relationships without face-to-face contact or visual cues Keeping students motivated and on task
Management Skills (Anderson et al., 2001; Berge, 1995; Brennan, 2003; Coppola et al., 2001; Hansen & Salter, 1999; Kearsley & Blomeyer, 2004; Palloff & Pratt, 2000; Spector & La Teja, 2001)	Online Teaching Competency: Managing the Online Learning Environment	<ul style="list-style-type: none"> Managing time Providing direction, support and clear guidelines Managing online discussions Monitoring student progress
	Online Teaching Challenge: Assessing Student Progress	<ul style="list-style-type: none"> Assessing student learning Guiding and monitoring student progress
Communication Skills (Anderson et al., 2001; Berge, 1995; Brooks, 2003; Cashion & Palmieri, 2002; Coghlan, 2001, Kemshal-Bell, 2001, Salmon, 2004)	Online Teaching Competency: Communicating Effectively Online	<ul style="list-style-type: none"> Using effective online questioning and online dialogue strategies Providing effective feedback
	Online Teaching Challenge: Online Communication	<ul style="list-style-type: none"> Communicating effectively online without face-to-face contact
Technical Skills (Anderson et al., 2001; Berge, 1995; Good, 2001; Goodyear et al.,	Online Teaching Competency: Using Online Learning Tools	<ul style="list-style-type: none"> Email, discussion boards, HTML, chat, web page development, multimedia Troubleshooting Technological fearlessness

2001; Kemshal-Bell, 2001; Miller & King, 2003; Palloff & Pratt, 2000)	Online Teaching Challenge: Technology	<ul style="list-style-type: none"> ○ Maintaining ongoing technological knowledge and skills
Pedagogy (Australian Flexible Learning Framework, 2002; Brennan et al., 2001; Brooks, 2003; Hansen & Salter, 1999; Kemshal-Bell, 2001; Miller & King, 2003; Oblinger & Maryuma, 1996; Palloff & Pratt, 2000)	Online Teaching Competency: Using Effective Online Teaching Methods	<ul style="list-style-type: none"> ○ Determining and using effective teaching methods ○ Facilitating and guiding learning ○ Maintaining an open-minded, risk-taking attitude
	Online Teaching Challenge: Learner Diversity	<ul style="list-style-type: none"> ○ Meeting diverse learner needs and learning styles
Instructional Design (Anderson et al., 2001; Gold, 2001; Kearsley & Blomeyer, 2004; Kemshal-Bell, 2001; Miller & King, 2003)	Online Teaching Competency: Designing Effective Online Learning Experiences	<ul style="list-style-type: none"> ○ Translating curriculum content to online without replicating face-to-face classroom (i.e. providing clear instructions, chunking content) ○ Designing and developing engaging and motivating tasks and activities
	Online Teaching Challenge: Preparation and Time	<ul style="list-style-type: none"> ○ Managing time required to design digital learning objects and online course materials

Summary

The design of this research study is a qualitative case study, influenced by elements of ethnography. The aim of the study is to address the question, “What is the impact of the online teaching and learning experiences in the Special Topics: Distributed Learning course on pre-service teachers’ understandings of online teaching challenges

and competencies?” As a bounded phenomenon, the experience of nine Master of Teaching students at the University of Calgary during the winter semester of 2004 provides a unique case study. The data collected from entry and exit surveys, interviews, archived artifacts from the online component of the course and the pre-service teachers’ learning objects provided the basis for a rich description of the participants’ experience as online learners and teachers and the impact on their understandings of what it means to be an online teacher. The initial frames and codes informed the entry survey questions. Based on the data gathered from these initial surveys, the literature review and my online teaching and learning experience, the frames and codes were revised. The final version of the frames and codes, presented in Table 5, ties directly to the two main components of the research question: Online Teaching Competencies and Online Teaching Challenges. Analysis of the entry and exit survey data as well as artifacts from the online course and the focus group interview confirmed the relevance of these frames and codes. Chapter Four describes and provides support from the pre-service teacher participants for the frames and codes used in this research.

CHAPTER FOUR

RESEARCH RESULTS

Overview

The subject of Chapter Four is the analysis of the data collected, a process described by Merriam (1998) as “consolidating, reducing and interpreting what people have said and what the researcher has seen and read – it is the process of making meaning” (Merriam, 1998, p. 178). In this study, the entry and exit surveys, field notes, observations, archived online discussions and the focus group interview as well as the digital learning objects developed by the pre-service teacher participants provide rich sources of data for analysis.

This chapter is divided into two sections. In Section A, working descriptions of the frames and codes developed for this research (Table 5) are expanded, and coded evidence from the various data sources described above as well as evidence from the literature are analyzed and interpreted with respect to the original research questions. In Section B, a summary of the research and a discussion of the impact of this experience on the pre-service teacher participants are presented.

Section A: Frames and Codes for this Research

The purpose of this study is to determine the impact of a course-based teaching and learning experience on pre-service teachers’ understandings of online teaching challenges and competencies. It is critical at this point to establish what is meant by the term *impact*, a primary filter for sorting and analyzing the data. For the purposes of this study, impact refers to the participants’ professional growth in terms of what they knew,

understood and were able to do as online teachers at the conclusion, as compared to the outset, of their experience in the Special Topics course. The use of quotes, survey responses, discussion postings and examples from the learning objects is meant to allow the participants' voices to be heard and make transparent to the reader the individual and group processes through which they made sense of their experience. The impact of the pre-service teachers' experiences as online teachers and learners is further examined in Chapter Five in terms of its influence on their plans for their future teaching practices.

Six frames and twelve corresponding codes (Table 5) were used to categorize and subsequently analyze the data with respect to the two research sub-questions; therefore, an Online Teaching Competency code and an Online Teaching Challenge code correspond to each frame. They are described in detail below and supported with evidence from both the literature and the data collected during this study. The patterns or regularities that emerged from the categorisation and analysis of the data form the description of the impact of this experience on the participants and lead to the research conclusions and discussion in Chapter Five.

Frame: Interpersonal Skills

Interpersonal skills can be described quite simply as people skills. They include an individual's ability to relate to others and to establish and maintain meaningful personal relationships. People who have strong interpersonal skills "understand, interact and relate well with others" (Bar-On, 1997, p. 38,39). The concept that online teachers require well-developed interpersonal skills is supported by a number of researchers, including Kearsley and Blomeyer (2004) who maintain that effective online teachers "enjoy one-on-one interactions" with their students (p. 49). In the Kemshal-Bell study

(2001), the ability to build relationships with and between learners is listed as one of four essential skills for online teaching. This frame also corresponds to what Berge (1995) describes as the social role of the online teacher, “promoting human relationships, developing group cohesiveness, maintaining the group as a unit and in other ways, helping members to work together in a mutual cause” (p.2). From the perspective of the pre-service teacher participants, this is also evidenced by the comment that “the people skills are still just as important in online as in face-to-face” (Participant I, April, 2004).

Code: Online Teaching Competency – Relating to Learners

Relating to Learners refers to the online teacher’s ability to engage and motivate learners, create and nurture an online community, encourage collaboration, establish relationships and maintain a positive attitude toward online learning. An online teacher who is competent in relating to learners creates a socially meaningful environment that is centred on the learner rather than the content (Gold, 2001).

At the outset of the Special Topics: Distributed Learning course, the pre-service teachers did not mention engaging and motivating learners as online teaching competencies; however, at the end of the course, they seemed much more aware of the teacher’s role in engagement and motivation in the online environment. One participant, as evidenced in the comment below, noted the importance of creating a learner-centred environment, which is also fundamental to the “new learning environments” described by the International Society for Technology in Education (International Society for Technology in Education (ISTE), 2002, p. 10).

A lot of the literature emphasizes that you really do begin with the student and the student’s needs and really get a sense of who that student is, like what grade they

are or what they like to do, all kinds of outside information and go from there and build it outwards instead of having something that you've built to these specifications and then try to apply it to someone else. (Participant B, April, 2004)

In presenting their digital learning objects, designed and developed as the central project for this course, several of the pre-service teachers mentioned that student engagement and motivation were key concerns during the design process. This is evidenced by Participant F's comment on the motivating power of learner choice in process and product:

I realized when I was developing content that I would have to give the students choice for them to be motivated. With me, I think quality learning is about student motivation. So, I designed seven lessons and I gave them an opportunity to choose one out of the seven lessons to do and I found that they were more motivated as a consequence of the choices involved. (Participant F, April, 2004)

Most of the learning objects were purposefully designed to engage learners by including authentic, relevant and personal activities and assignments. For example, one of the pre-service teachers stated that she tried to keep the technology simple while concentrating on designing an activity that allowed learners to reflect their own views of Canadian identity. Another expressed interest in revising her learning object to allow learners more choice in the kinds of sports pools they could create. Participant F's comment in the focus group interview summarizes her interest in using online tools to facilitate

engagement and interaction rather than entertainment. She stated, “Like V-Class¹⁰, you know, interaction between people, giving people opportunities to discuss, opportunities to have a say in things and not just visual, you know, output, intellectual output. I’m just not into the graphics that much anymore” (Participant F, April, 2004).

In the focus group interview, Participant H voiced concerns about the wholly-online approach and indicated a preference for a hybrid or blended approach. In contrast to the other participants, he mentioned that having a teacher physically on site rather than exclusively online would be a motivating factor for students.

I’m more of a proponent of the hybrid approach. I think someone needs to be on site ideally with the students as a resource, as a mentor. The word ‘mentor’ is going to create havoc in some of the traditionalists’ minds because that takes away what their role has been up to this point, but it’s good to have that on-hand physical resource when you run into a roadblock. And also as a motivating factor, you know, sort of show me where you are, where you are at. (Participant H, April, 2004)

The pre-service teachers’ completed learning objects demonstrated their understanding of the importance of engaging and motivating online learners. Most were designed to engage learners by incorporating student choice and relevant, authentic tasks. However, because they were not able to deliver or teach their learning objects, it was

¹⁰ V-Class is a software program that allows synchronous (real time) online communication. Through the use of headsets with microphones the teacher and students can communicate orally as well as through text.

difficult for them to measure the students' levels of engagement, and this was a source of frustration, as evidenced by Participant A's comment:

Basically, we looked at it from a distance. I didn't have a chance to really contact the students, talk to them, what they're supposed to do, feedback, so I don't think...More or less, this whole four months was just like content development. That's how I feel about it. (Participant A, April, 2004)

The second component of the *Relating to Learners* code, nurturing and encouraging community and collaboration online, is well supported as a critical online teaching competency in the literature reviewed in Chapter Two (Anderson et al., 2001; Brennan, 2003; Brennan et al., 2001; Goodyear et al., 2001; Hansen & Salter, 1999; Miller & King, 2003; Palloff & Pratt, 2000). Although the pre-service teacher participants made no mention of this competency in the entry survey responses, the online discussions or the focus group interview, three of the pre-service teachers showed a keen interest in the skills of nurturing community and encouraging collaboration at the end of their online teaching and learning experience. In fact, Participant G, who described herself in the entry survey as a collaborative teacher, mentioned in both the exit survey and the presentation of her learning object that she had struggled with the use of asynchronous communication to support collaborative learning. Her learning object, which included a student e-newspaper, peer editing, panel discussions, interviews and a jigsaw assignment, had a strong collaborative focus. Reflecting the findings of Cashion and Palmieri (2002) in their survey of online learners and teachers, another pre-service teacher pointed out the importance of establishing an atmosphere of trust and mutual respect in order to nurture an online community. She said that "in order to build an

asynchronous learning or communication community, the participants need to be comfortable to open up themselves (*sic*); therefore, synchronous conversations are necessary which help building trust among the members” (Participant A, February, 2004). Another participant made a similar connection between synchronous communication and online collaboration:

Collaboration online could occur over teleconferencing – I don’t think teleconferencing is the right term, but you talk and see one another on your screen. I feel that computers should not excuse or enable those who do not want to interact with others (a negative characteristic of computers). Students need to develop social skills and face fears in healthy ways. Technology can and should hold them accountable. (Participant H, February, 2004)

Among the group members themselves, there was a strong sense of community as evidenced by their active participation and camaraderie in the Blackboard course. This may have been due to the hybrid nature of the course and the opportunities the participants had to meet face-to-face as well as online. However, although several participants experimented with the use of online learning tools to facilitate collaboration within their learning objects, most seemed unaware of the significance of online community and the strategies an online teacher would need to both establish and nurture such a community of learners.

The third component of this code, building rapport and establishing relationships with online learners, was of great interest and a source of much discussion among the pre-service teacher participants. At the beginning of the Special Topics course, Participant B commented that in the online learning environment “social relationships

can still be formed (with a little more work)", but that "the social dynamic is completely different when you meet someone and work with them online" (Participant B, January, 2004). This is an excellent example of the tension that the pre-service teachers, most of whom were completely new to online learning, were able to articulate early on in their online teaching and learning experience. They acknowledged the importance of establishing rapport with online students but wondered how and if the teacher could make it happen without actually seeing the students. In the entry survey responses, most of the participants indicated their concern about the lack of face-to-face, one-to-one or personal contact, the anonymity of teachers and students in the online environment and the lack of a social interaction component. In the exit surveys, although many of these concerns still existed, several participants seemed to have found answers to their own questions and were able to suggest strategies to help online teachers build rapport and establish relationships with learners. This was illustrated in Participant I's exit survey comment that "the more you interact online with students, the better you are able to build rapport" (Participant I, April, 2004). This strategy of significant teacher participation in synchronous conversation and asynchronous discussions is revealed in the literature as critical to building rapport with online learners (Brooks, 2003) and was also articulated by Participant F:

I think that building rapport online means that you are almost constantly online and that you respond promptly to all emails and messages. You have to reply to all your students when they are engaged in the material and discussions.

(Participant F, April, 2004)

With respect to building rapport and establishing relationships with students, Participant H saw little difference between the roles of an online teacher and a traditional teacher while Participant F viewed the role of an online teacher as completely different:

Online learning is drastically different from face-to-face classroom learning because it places a lot of emphasis on the teacher's ability to encourage social relationships whereas in the traditional classroom the social interaction between the students grows quite naturally without teacher intervention. (Participant F, April, 2004)

These contrasting views are consistent with the difference in opinions expressed by some researchers in this field who believe that online teaching looks different although it doesn't fundamentally change from face-to-face classroom teaching (Anderson et al., 2001) and others who believe that the practice of teaching online has to be completely re-conceptualised (Brennan, 2003; Gold, 2001). The ability of the online teacher, however, to build relationships with and between learners is considered, by many researchers, to be critical to success in this new learning environment (Coppola et al., 2001; Goodyear et al., 2001; Gold, 2001; Kearsley & Blomeyer, 2004; Kemshal-Bell, 2001).

In terms of their understanding of building rapport with online learners, the impact of this course-based online teaching and learning experience can be seen in the pre-teachers' shift from wondering how online teachers could possibly establish rapport with their learners to suggesting concrete strategies for making it happen.

The fourth component of this code, an open-minded attitude toward and interest in online learning, represents critically important personal characteristics of the effective online teacher (Schofield et al., 2001). In fact, one of the recommendations of the

Kemshal-Bell study (2001) in Australia calls for further research on the extent to which a teacher's attitude can facilitate effective online teaching and learning. Initially, most of the pre-service teachers had reservations about what they had perceived as the impersonal nature of online learning, the isolation of the learner, the lack of face-to-face contact and the difficulty in building rapport with learners. By the end of the course, although most were excited about the possibilities of online teaching and learning, three of the pre-service teachers remained somewhat hesitant about online learning in subjects such as science and math but were open to the use of a hybrid approach for these subject areas:

It has to be something that works for you. If you need that flexibility, that's great and it works for students, but I think if you're making the decision and it doesn't matter, those aren't the things you're keeping in mind, then, for science, I would say you're probably better off in a traditional classroom but do online learning for another area. (Participant E, April, 2004)

The other participants, however, generally agreed that they would recommend online learning to others. For example, when asked if she believed a student could have a quality educational experience online, Participant I stated, "I'd say 'Yes' right off" (Participant I, April, 2004).

In the focus group interview, several participants indicated their attitudes toward online learning in their comments about the online courses they had observed at the partner school, CBe-learn. These were online high school courses, both live and archived, to which the pre-service teachers were given access and the freedom to explore. They commented that they had found the online assignments in the CBe-learn courses to

be visually stimulating and had appreciated the variety of tools and resources available to the online learner as well as the flexibility of learning online. They also saw the time to reflect before posting in an asynchronous discussion as a distinct advantage over the spontaneous interactions typical in a traditional classroom. Although some favoured the hybrid approach, most of the participants seemed to have a generally positive attitude toward online learning at the end of their experience in the Special Topics course.

In summary, the pre-service teachers demonstrated, in a variety of ways, the impact of this experience on their understandings of an online teacher's role in relating to learners. These include a heightened awareness of the importance of engaging and motivating learners, efforts to incorporate choice and relevant, authentic tasks in their learning objects, suggested strategies for establishing rapport with online learners and open-minded, positive attitudes toward online learning.

Code: Online Teaching Challenge – Rapport and Motivation

It is not surprising that the pre-service teachers viewed motivating and establishing rapport with learners as a major challenge facing online teachers. In my experience as an online teacher, it is a subject of ongoing discussion among experienced online teachers who feel responsible for motivating students they rarely, if ever, meet in person. Experienced classroom teachers who are now teaching online and who have never had to deal with significant retention issues in the traditional classroom are often shocked at the extent of the dropout problem in online learning and unsure of how to address it.

At the outset of the course, the pre-service teachers were very concerned that the online environment itself would make it impossible to establish rapport with students and

therefore keep them motivated to learn online. At the same time, however, they were aware of the importance of social interaction and the personal touch in an environment that “can be impersonal, can turn into routine” (Participant B, January, 2004). This comment reflects the pre-service teachers’ early concerns that learning while sitting at a computer can become drudgery when there is no face-to-face contact with the teacher or with other students. The literature, however, reveals that, although this is a common misconception, students can establish strong relationships with each other and with their teacher in well-designed, well-facilitated online learning experiences (Palloff & Pratt, 2001; Salmon, 2004).

From the pre-service teachers’ responses on the entry surveys, it is clear that they did not perceive the online learning environment to be conducive to building rapport with learners and keeping them motivated. These concerns led to a rather animated discussion in the e-pedagogy topic (March, 2004) where the participants’ struggle with this challenge was evidenced by an initial question, “What are the motivation methods that we can use in online classrooms? We cannot always assume that every student are (*sic*) eager learners” (Participant A, March, 2004). This was followed by a number of suggestions, mostly focused on instructional design strategies rather than pedagogy:

Attention spans are short by nature and breaking up material into smaller segments is key. However, just breaking up material is not sufficient. It has to grab the students’ attention whether it’s online or not. Students can be just as unmotivated and reserved when sitting right in front of instruction as they can when sat behind a screen. The way we present the material determines the degree of engagement. (Participant H, March, 2004)

At the end of the course, concerns about this challenge were still very much in evidence. In fact, one participant expressed a sense of hopelessness about building rapport with online learners without some face-to-face contact and stated that, “despite technological advancements, computers cannot duplicate real, face-to-face interaction. The physical proximity between students and teachers is not achieved through online instruction” (Participant H, April, 2004). Others repeated their concerns about the suitability of online learning for certain learners and a decreased sense of community in the online classroom, and commented that “some students require face-to-face contact to better their learning” (Participant F, April, 2004) and also that “there is a little bit less of a sense of community in the online world” (Participant E, April, 2004).

The challenge of establishing rapport with online learners, as articulated by the pre-service teacher participants in this study, reflects a very real issue for online teachers. Although it was raised and discussed throughout the Special Topics course, establishing rapport and relationships with online students was viewed as an ongoing challenge. One pre-service teacher suggested more dialogue with their partner teachers as a possible solution for addressing this teaching challenge and said, “I know that I get gung-ho and then the energy wears down. Perhaps our coaching colleagues can point us in the right direction regarding motivation strategies?” (Participant B, March, 2004). This suggestion and others for improving the Distributed Learning course are discussed further in Chapter Five.

Frame: Management Skills

Managing online learners and their learning processes requires the ability to manage time, provide clear guidelines and monitor, support and assess learners’ progress

through their learning experience (Berge, 1995; Brennan, 2003; Coppola et al., 2001; Kemshal-Bell, 2001). A number of researchers have delineated a management role for the online teacher in addition to their facilitative, pedagogical and technical roles (Anderson et al., 2001; Berge, 1995; Coppola et al., 2001). From the learner's perspective, an instructor's inability to effectively manage the online environment can result in confusion, lack of support and unsatisfactory assessment-major deterrents to a quality online learning experience (Cashion & Palmieri, 2002). Although these skills appear to be similar to those required in the traditional classroom, they are not completely transferable. Brennan (2003) points out that "teachers have to institute new management practices and students have to manage their time in a highly self-regulated way" (p. 41). Clearly, online teaching requires unique and well-developed management skills.

Code: Online Teaching Competency - Managing the Online Environment

The significant components of this code include managing time, providing guidelines, direction and support to learners, managing online discussions and monitoring and assessing student progress (Anderson et al., 2001; Kemshal-Bell, 2001).

For any teacher, but particularly an online teacher, time management is a critical skill. In the online environment, where learners have more control over their learning and considerable flexibility in the pace of their learning, an online teacher must be able to manage personal timelines and, at the same time, monitor those of the students. At the outset of the Special Topics course, the pre-service teachers made no comments about time management as a competency for online teaching. In the exit survey responses, only one participant pointed out that "online teachers need to be very organized and focused. They will be teaching in cyberspace and it is essential that they have the ability to

effectively manage their time” (Participant F, April, 2004). The lack of attention to the time management competency may be due to the fact that, while significantly involved in designing learning objects for online courses, the pre-service teachers were observers rather than active teachers in their partner teachers’ courses at CBe-learn. As a result, they did not experience enormous volumes of email and assignments nor did they manage multiple online discussions - tasks that require significant organizational and time management skills. The pre-service teachers were, however, cognisant of the increased time required of the online teacher. Participant B’s comment that online teaching is “a twenty-four hour, seven day a week experience” (January, 2004) indicates her awareness, early on in the course, that online teaching demands significant time and effort. In fact, Kearsley and Blomeyer (2004) warn that, “burnout in online teaching is likely to be a bigger concern because of the extra workload” (p. 50). Although the pre-service teacher participants did not mention time management as a critical online teaching competency, they viewed the time required to prepare for and teach online as a significant challenge. This is discussed further in the final code in this chapter, *Preparation and Time*.

A second component of managing the online environment is the teacher’s role in creating a framework within which students can work and progress through their online learning experience (Hansen & Salter, 1999; Kemshal-Bell, 2001; Palloff & Pratt, 2000). Several responses on the entry surveys indicated that the pre-service teachers saw the online teacher’s availability for learner support as crucial. This may be related to their initial concerns about the lack of face-to-face contact and the possibility that online students could feel isolated. At the end of the course, the teacher’s supportive role was

mentioned again by several participants who said that the online teacher “gives students the support they need to learn material” (Participant C, April, 2004) and “supports learners and helps learners to focus and control their learning” (Participant A, April, 2004). Participant H’s perception of how online learner support is different than in the traditional classroom is evidenced by the following comment: “The online environment is a collaborative effort, one which is supportive and encouraging. Traditional teaching often brings secrecy and reservation” (April, 2004).

In the process of designing online learning objects, the participants also demonstrated their awareness of the need for clear instructions to support and guide online learners. For example, Participant A struggled with designing a learning object to support and provide clarity for both random and linear learners. Participant D provided a checklist within her learning object so that learners could keep track of the parts of the assignment as they completed them. When presenting their learning objects to the class, others commented that they had thought and re-thought where to put instructions and how to make them clear for all learners.

Although the pre-service teachers designed their learning objects to provide clear instructions and were aware of the significance of the online teacher in supporting learners, only one mentioned the use of guidelines for course participation as a strategy. Participant D said that, “I think that to get some discussion there may be a small mark that students get within the outline for participation in classroom discussion” (February, 2004). The importance of providing clear guidelines regarding behaviour, feedback, communication and assessment, which serve to support and guide the learner, is also supported in the literature (Hansen & Salter, 1999; Palloff & Pratt, 2000). In fact,

Palloff & Pratt note that, “participation guidelines in an online course are critical to its successful outcome” (p. 5). The fact that providing course guidelines to encourage participation and provide support was not mentioned by the pre-service teachers in this study may be due to their focus on designing discrete learning objects rather than planning and developing an entire online course.

The third component of the online teacher’s management role is to facilitate or moderate online discussions. According to Berge (1995), this involves keeping discussions on track, contributing expertise and knowledge where appropriate and necessary, relating the discussion to the course content and acting as a peacekeeper, at times. During asynchronous and synchronous discussions, the online teacher must provide time for reflection, participate without dominating discussions, archive and organize postings, establish ground rules and be aware of cultural differences among learners (Spector & de la Teja, 2001). While only one entry survey response commented on the teacher’s role in managing online discussions, a number of exit survey responses noted that the online teacher “encourages conversation and keeps students on task” (Participant C, April, 2004) and “facilitates class discussions” (Participant E, April, 2004). Participant D, who expressed concern about the difficulty of group discussions in math, also suggested that “discussion could arise by having a topic question every week that students would respond to in the discussion room” (Participant D, February, 2004) as a strategy for encouraging student participation in online discussions.

In addition to discussing online moderating, the pre-service teachers also had the opportunity to manage weekly discussions in the Blackboard course. They were expected to initiate and moderate weekly discussions on specific topics, such as content

development, asynchronous and synchronous communication and assessment. The course instructor was present in the discussions, adding comments, questions and expertise where appropriate and necessary. In most cases, the facilitators or moderators used thought-provoking questions to initiate the discussions, such as “What do you think is important in an online lesson? Does it differ from traditional lessons or do some of the same ideas carry over?” (Participant C, February, 2004) and “As a team member of a distributed learning group, can you choose your role to only be a designer or facilitator or does it have to be both? What are the qualities of a good designer/facilitator?” (Participant A, January, 2004). However, although the assigned moderators were present as contributors to the discussions, they generally did not use probing questions to move the discussions to a deeper level or work to keep them on track.

It is interesting to note that while several participants used the term ‘facilitator’ to describe the role of moderating or managing online discussions, it was used by others to refer to the teacher’s role in supporting students, helping them to succeed at completing the course requirements, keeping them on task and helping them to focus and control their learning. This indicates some confusion about what it means to facilitate or guide online learning. As this is a vital concept in e-pedagogy (Anderson et al., 2001; Miller & King, 2003; Palloff & Pratt, 2001), more extensive discussion about online facilitation in general as well as specific strategies for facilitating or moderating online discussions would be helpful for these pre-service teachers. This is addressed in more detail in Chapter Five.

A fourth and final component of the online management competency is monitoring and assessing student progress which involves establishing guidelines for

assessment and helping students to progress through the learning process (Kemshal-Bell, 2001). Goodyear et al. (2001) describe 'Assessor' as a separate role that requires the teacher to use online tools to assess learning outcomes, distribute marks for student work and deal with ethical issues such as cheating. In the entry surveys, little mention was made of this competency although one participant was concerned about how to assess student learning without visual cues and noted that not seeing the students would make "determining if they really understand" difficult (Participant E, January, 2004). In the Blackboard course, however, the postings in an entire online discussion devoted to this topic illustrated the pre-service teachers' attempts to make sense of concepts such as online testing:

One thing that I instantly thought of is that they obviously write every exam as open book...(A CBe-learn teacher) accounts for this by making the questions on exams a little more in depth. I wonder how this affects students when they go to the diploma and don't have their books to rely on...there is a lot to consider with test creation online. (Participant E, March, 2004)

They also addressed the possibilities for incorporating formative assessment in online learning as evidenced by Participant A's statement that "online assessment is an ongoing process even more often than in the face-to-face classroom" (Participant A, March, 2004) and contemplated the use of online tools and instructional design to facilitate it, as evidenced by the comment below:

I also think online teachers may consider having more little assignments to go with units for students do not learn sequentially as in the f2f classroom; therefore, each unit with little activity (*sic*) would encourage students to practice the concept

that they learn from that unit. This would provide more opportunities to assess students. (Participant A, March, 2004)

In the focus group interview, Participant I's concerns about online assessment were evidenced in her questions, "How do you get to assess them? Especially if it's online, you never see them. How do you know where they're starting? How do you know when they end?" (Participant I, April, 2004). Participant H again indicated the appeal of the hybrid approach rather than the wholly online approach for monitoring student progress:

I know that online's progressed enough now that these students that aren't working, getting enough accomplished at specific points in the class schedule, the teacher's gonna (*sic*) pick up on that and, you know, where are you, where are you, where are you, but that being said, I think the hybrid approach is the way to go. (Participant I, April, 2004)

Responses on the exit surveys showed that the pre-service teachers were well aware of the online teacher's role in monitoring student progress. They understood the delicate balance between the students' need for flexibility and control over their learning and the teacher's need to establish benchmark dates for assignments, an issue that challenges even experienced teachers, now teaching online, who have been accustomed to having more control over how and when students learned in the traditional classroom. This was noted by Participant B who said, "As an online teacher, however, it would be my responsibility to make sure everyone was aware of their own progress, sometimes in relation to other students, sometimes in relation to their own timeline" (Participant B, April, 2004). Participant I noted that the role of the online teacher in assessment is "to keep track of each student's progress in the course or lack of progress" and also

suggested “posting due dates and responding to students’ questions and facilitating any changes that may be needed” (April, 2004) as a teaching strategy.

The participants’ learning objects also showed evidence of their desire to understand how an online teacher effectively monitors and evaluates student learning. For example, Participant E investigated incorporating feedback on student learning into a Flash¹¹ movie while Participant D designed her learning object as a summative assessment tool.

The role of the online teacher in managing the online environment was one of considerable interest for the pre-service teachers in this study. The impact of this experience is evidenced in their comments about the significance of this competency as well as in the assessment tools they designed for their learning objects and in their work as e-moderators, although more time and practice would be required in order for these participants to become adept online discussion facilitators. Through their experiences in this course as online learners, teachers and designers, it appears that the pre-service teacher participants were able to answer many of their own questions about managing the online environment and developed some effective online teaching strategies; however, monitoring and assessing student progress remained a significant challenge, as discussed below.

Code: Online Teaching Challenge – Assessing Student Progress

Assessing and monitoring student learning online was a consistent theme throughout the pre-service teachers’ responses and comments on the entry and exit

¹¹ Flash is a multimedia software program that can produce digital ‘movies’ with animation, text and sound.

surveys, the focus group interview, the Blackboard discussions and the presentation of their learning objects. Participants' comments early on in the course reflected their disbelief that a teacher could evaluate student learning without actually seeing the learners face-to-face. For example, Participant C said, "I found that in the classroom I could often tell from student's expressions and body language if they were understanding (*sic*) concepts. With online, you have to rely on student's willingness to 'speak up'. Students don't always do that" (January, 2004). During the Blackboard discussion on assessment, the participants were anxious to discuss how assessment online differed from assessment in the traditional classroom, as evidenced by Participant A's comment that she was "very interested that you have mentioned about the assessment strategies. What are the differences on (*sic*) assessment on student learning online compared to the face-to-face classroom?" (March, 2004). The pre-service teachers' persistent concerns about online testing and cheating, a significant issue for online teachers in the field, were illustrated in the following comment:

Exams are online and therefore obviously open book. Teachers must find ways to challenge the students to think yet prepare them for the diploma where they will not have their textbooks in front of them. Also, it is challenging to gauge understanding of where they are in terms of their knowledge because you don't know who is actually completing the assignment or exam. (Participant E, March, 2004)

Participant F also questioned the feasibility of revising course materials in response to students' learning needs:

In an online environment, it is more difficult to assess the students until the assignments are marked because so much online material is pre-determined and already designed and packaged for the web. I can alter a traditional classroom assignment based on instinct, but I can't do this in an online course easily (April, 2004).

She repeated, at the end of the course, the same concern that was expressed in entry surveys about assessing student learning:

A teacher in a traditional classroom is able to discern revealing details of her students with a glance whereas an online teacher does not have this method of connecting to a student. It becomes more difficult for an online teacher to determine whether her students are engaged with the material when it is first introduced. It also becomes more difficult for an online teacher to know whether a student is personally enthusiastic with learning (Participant F, April, 2004).

In my online teaching experience, monitoring and assessing student learning is a significant challenge for experienced online teachers as well, so it is not surprising that it would emerge as a challenge for the pre-service teachers in this study. To truly understand what is involved in monitoring and assessing student progress online, the pre-service teachers would need to follow and guide students through an online learning experience and become familiar and comfortable with online assessment tools and strategies. This suggestion for improving the Special Topics: Distributed Learning course is discussed in Chapter Five.

Frame: Communication Skills

Successful human communication results in the transmission of information and feelings verbally or non-verbally thereby evoking understanding and facilitating social relationships (Barber, 1998). In the online environment where there are no visual cues and communication is most often text based, the online teacher must be adept in electronic communication, a different skill than prose writing (Cashion & Palmieri, 2002), so as to minimize misunderstanding. The significance of effective online communication as a teaching competency is well supported in the literature (Brooks, 2003, Coghlan, 2001; Kemshal-Bell, 2001). In fact, Brooks (2003) points out that “one of the leading factors that lessen the distance between instructors and students is the amount of communication that is conducted” (p. 2). From the student’s perspective, the significance of establishing rapport with the teacher in order to facilitate online communication is evidenced by Participant C’s comment:

I’ve learned that it is important to the success of the student to be able to communicate with the online instructor. It would be easy to ignore a teacher online so a student has to be able to have a relationship with the teacher so that they would want to communicate with them. (Participant C, April, 2004)

Code: Online Teaching Competency – Communicating Effectively Online

Online communication requires teachers to concentrate “on clarity and regularity” (Brennan, 2003, p. 42). It also requires the ability to use questions and online dialogue effectively in order to probe and extend student understanding as well as the ability to provide effective feedback in order to keep students motivated and engaged (Anderson et al., 2001; Goodyear et al., 2001; Kemshal-Bell, 2001).

In the online environment, the use of thought-provoking and probing questions allows the online teacher to guide students to deeper levels of understanding of the concepts and skills being taught (Berge, 1995; Cashion & Palmieri, 2002). Although the pre-service teacher participants did not mention this skill specifically in their survey responses or discussions, they did discuss the need for the online teacher to be able to communicate clearly in text. This is evidenced by the comment that the online teacher “definitely needs to have written communication skills. In an asynchronous environment, responding to emails can take time, so I think it is important that both teachers and students are able to clearly state their point” (Participant E, April, 2004) and that “because it is hard to read tone and ‘body language’ over email or discussion groups, it is important to be direct and clear in all communications” (Participant B, April, 2004).

The second component of the online communication competency is the ability to provide timely and positive feedback - a critical skill for online teachers (Brennan, 2003; Coppola et al., 2001; Goodyear et al., 2001). In fact, as Salmon (2004) notes, “supportive, formative feedback is motivational and will contribute to modification of participants’ thinking” (p. 40). There was an awareness of this skill among the participants early on in the Special Topics course, as evidenced by Participant A’s comment that the online teacher should “provide prompt responses and give directions” (January, 2004). By the end of the course, however, there was a focus on not only timely but also supportive and positive feedback to learners:

You have to be positive about their responses and guide them to a deeper critical analysis without being harsh. You have to be aware at all times that there are

people reading the responses and you don't want to hurt or neglect a student through your words. (Participant F, April, 2004)

As moderators and contributors in their own online discussions, the pre-service teachers demonstrated this skill through comments such as, "I can definitely see your point about students not participating very much in the asynchronous environment" (Participant D, February, 2004) and "I think you 'hit the tail on the hammer' (*sic*). Online learning, especially within an asynchronous forum, requires a student of maturity and commitment" (Participant H, February, 2004). It is clear in the Blackboard discussions that most of the pre-service teacher participants attempted to emulate the positive, formative feedback they received from the instructor and thus demonstrated their awareness of this as an important online teaching skill.

At the end of the course, the pre-service teacher participants demonstrated the impact of their teaching and learning experience in their attempts to provide positive and supportive feedback to their classmates, and although they did not mention teaching strategies such as online questioning and online dialogue which the literature reveals to be critically important online communication skills, they were aware of the need for the online teacher's communication to be clear, frequent and positive.

Code: Online Teaching Challenge – Online Communication

In view of the fact that five of the nine pre-service teachers felt either uncomfortable or somewhat comfortable with electronic communication, it is not surprising that, early on in the course, they were concerned about communicating with students online. This is evidenced by Participant E's comment that "not seeing the students – harder to read emotions etc., getting to know them personally will be

challenging. Determining if they really understand (*sic*)” (Participant E, January, 2004). In the Blackboard discussion on synchronous and asynchronous communication, the time required for communication in the online environment was viewed as a frustrating aspect of online teaching, as evidenced by the comment below:

When trying to work within a time frame, asynchronous communication requires hours and or days of flexibility, but it is one of those, you never know if the other person is online so do you wait to see and do nothing or do you just come back when you remember to check and have wasted even more time difference. It is very easy to see how timelines can be broken and assignments can go undone if lost or not properly attached the first time round. (Participant I, February, 2004)

In the exit surveys, however, the pre-service teachers’ responses showed that they had moved from a general awareness of the challenges of electronic communication to more specific concerns, including the need for the teacher to make “a conscious effort to stay connected to all his or her students” (Participant F, February, 2004) through clear and frequent communication.

In articulating online communication as an ongoing challenge, the pre-service teachers demonstrated a heightened awareness that although the discrete skills can be taught and practiced, communicating effectively online does not come naturally to all online teachers (Australian Flexible Learning Framework, 2002; Coghlan, 2001).

Frame: Technical Skills

Despite the fact that current literature on online teaching places significant emphasis on e-pedagogy rather than on technology (Good, 2001; Miller & King, 2003), an online teacher’s knowledge of and ability to use online learning tools and to

troubleshoot technical problems are critical skills. In fact, practitioners in a 2001 study in Australia nominated ‘technical ability’, a generic term which includes troubleshooting and the ability to use email, discussion boards and chat, as the fourth most important skill for an online teacher (Kemshal-Bell, 2001). While some researchers disagree about the need to delineate a separate technical role for online teachers (Anderson et al., 2001; Berge, 1995; Goodyear et al., 2001), most agree that technical skills are important. Online instructors need to be “knowledgeable about the technology in use and comfortable enough with it to assist a student should difficulty be encountered” (Palloff & Pratt, 2000, p. 4). In addition, online teachers who are comfortable with the technology used in their courses can alleviate learners’ frustrations and deal with technical problems as they arise (Miller & King, 2003). In order to fully support their learners, Good (2001) suggests that online teachers must strive to be “autonomous explorers – engaged with technology and able to solve their own problems and look out for new opportunities as things change and develop” (p. 172).

Code: Online Teaching Competency – Using Online Learning Tools

This code comprises a number of discrete skills and personal characteristics. As revealed in Chapter Two, these include the ability to use online learning tools such as email and discussion boards for asynchronous communication, chat for synchronous communication as well as tools for web development (Kemshal-Bell, 2001). The ability to troubleshoot technical problems (Miller & King, 2003) and an attitude of technological fearlessness (Good, 2001) are also important components of this code.

In response to the entry survey question regarding comfort level with technology (Appendix D), three of the nine pre-service teacher participants classified themselves as

Enthusiastic Beginners and six as Confident Explorers. Although none described themselves as technology experts, they were able to not only navigate and participate in the Blackboard course with few technical difficulties, but also collaborate and troubleshoot technical problems, such as those encountered in downloading the software for a synchronous chat session.

In addition, most participants' responses on the exit survey indicated that rather than feeling overwhelmed by web development tools, they were exhilarated by the possibilities, as evidenced by the following comments:

They are not as hard as they seem and they barely seem like work because so many different tools can be used. This makes up for the challenge of learning about the new tools; however, as long as you know basically what you can do with them, I bet the students will rally and show the true uses of them. This was my favourite part of the work, and I hope to continue forward with this sort of work. I am continually thinking of doing more. (Participant G, April, 2004)

I learnt how to create I-movies, use Flash design versus Dreamweaver. Creating a digital movie was a lot of fun. I realized the need for storyboarding. Plus using WebCT and V-Class was a great experience because it demonstrated the possible communication pathways. I have a newfound appreciation for technology and all of its possibilities. (Participant I, April, 2004)

In designing and developing their learning objects, the pre-service teachers worked through the inevitable technical problems and bridged gaps in their knowledge by consulting with experts at the university and the partner school, CBe-learn. For example, Participant H who described himself as an Enthusiastic Beginner was able to create a

simple but effective website to promote an online program for marginalized high school students. Participant E mastered the elements of Flash needed to animate her learning object without becoming overwhelmed by the complexity of the software program. In general, all the pre-service teacher participants demonstrated growth in their ability to use online learning tools with a focus on using technology to enhance student learning.

The second component of this code, the ability to troubleshoot technical problems and issues, was raised and discussed by the participants in the Blackboard course:

I think it takes a certain amount of comfort on the computer because you are using a variety of tools and you want to make sure they work for students. Also, if students are having problems, they may come to you and I think it would almost be an acquired skill to become a good trouble-shooter. (Participant E, March, 2004)

Although not described as a pivotal role for online teachers, the pre-service teachers viewed “dealing with technological difficulties when it decides to break down” (Participant B, January, 2004) as an online teaching competency as well as a significant challenge.

The fact that coping with technological problems did not seem to overwhelm the pre-service teachers in this study may be due to their positive attitudes toward technology, the third component of the *Using Online Learning Tools* code. As revealed in the literature review in Chapter Two, personal characteristics, such as technological fearlessness, play a critical role in the success of online teachers (Brennan, 2003; Brooks, 2003; Good, 2001; Kemshal-Bell, 2001; Schofield et al., 2001). Although not explicitly

mentioned in the entry survey responses, this open-minded attitude toward technology was evidenced in the Blackboard discussions where the pre-service teachers expressed interest in learning about new tools and platforms:

OLDaily (online newsletter) mentioned an alternative to the textual blogs in the form of the Laszlo Sound Blox. I think it would be much more engaging to include this as part of the online content but will it take more technological resources such as a faster computer and connection to access this type of technology? Is anyone interested in installing this onto their website? I am ready for a go at it. Is anyone with me? (Participant F, February, 2004)

They also expressed an interest in learning about other computer platforms as evidenced by Participant F's request, "Can you teach us more about the Mac world?" (Participant F, February, 2004).

In exit survey responses, a number of participants mentioned the need for online teachers to be open minded toward and unafraid of technology as evidenced by Participant F's comment that "technology is always changing and a teacher who is too comfortable and established within a certain routine will become disoriented in a changing environment" (April, 2004). It was, however, in the design and development of their learning objects that the pre-service teachers most clearly demonstrated this attitude. Although their technology skills and levels of comfort varied, all were open to the possibilities provided by the various web development tools to which they were introduced. The pre-service teachers' technological fearlessness was equally evident to the instructor who said, during the focus group interview, "I can't get over you guys...your capacity for ambiguity...Every time something has been thrown at you,

instead of saying, ‘Are you out of your mind? You’ve gone, ‘Oh, okay’ – you’ve just done it. You’ve thought about it; you’ve incorporated it” (Course Instructor, April, 2004).

Code: Online Teaching Challenge – Technology

Despite the pre-service teachers’ open-minded attitudes toward technology and their willingness to take risks, technology was revealed, particularly in exit survey responses and Blackboard discussions, as an ongoing online teaching challenge. In the entry survey responses, concerns centred on “learning how the system works and maintaining expectations” (Participant I, January, 2004) and “ensuring my computer knowledge – technology is high enough so I do not hinder student development” (Participant H, January, 2004). By the end of the course, however, the participants pointed out the challenges of the time required to keep up with technology and the difficulty of balancing technology with pedagogy. In the exit survey responses they were much more aware that there were “so many options for designing and creating software” (Participant I, April, 2004) but had time to become familiar with only a few programs. They noted that, during the course, they had “not enough knowledge of all the different software” (Participant D, April, 2004) and needed to know more about the software programs in order to get “a grasp of what can actually occur” (Participant H, April, 2004). In addition, Participant F commented on the difficulty of concentrating on both technology and e-pedagogy principles at the same time:

I found it very difficult to focus on learning the technology and learning about the online theory at the same time. At times, it seemed like these were two separate

elements and that the technology was getting in the way of developing lessons that would be compatible with the curriculum. (Participant F, April, 2004)

The impact of this experience on the pre-service teacher participants was also evident in the nature of the technological teaching challenges they posed to each other later on in the course. For example, in the Blackboard discussion on asynchronous and synchronous communication, the issue of balancing the use of these two forms of online communication was raised by one participant who stated that “there must be ways of using various synchronous and asynchronous technologies in the same course. This would work in a university setting, such as our class, where we’ll be trying V-Class out while using Blackboard as usual, but would using various technologies work with a high school course? Would the logistics of it just be too much?” (Participant B, March, 2004). She was also concerned about providing students with contingency plans for technological problems as evidenced by the following comment: “What kinds of alternative plans or back-up plans should we have in place when designing online components or learning objects? What other resources can we rely on in contingency situations?” (March, 2004).

Throughout the Special Topics course, the pre-service teachers viewed technology as an ongoing challenge for the online teacher; however, their perception of the nature of the challenge of technology changed during their online learning and teaching experiences. As their initial concerns about learning about software and the learning management system subsided, they began to focus on the challenge of using technology appropriately in order to enhance student learning. Participant C’s comment that “what this course has taught me is there has to be a learning purpose behind that technology.

It's not just the fancy thing that sings and puts the music and whistles, whatever. You need to keep that focus in mind" (Participant C, April, 2004) indicates the significant professional growth in the participants' understanding of the use of technology that took place during their experiences as online teachers and learners.

Frame: Pedagogy

The literature reviewed in Chapter Two clearly supports the concept that online teaching is fundamentally different than traditional classroom teaching (Childs, 2004; Good, 2001) and, as such, requires teachers to make significant pedagogical changes including relinquishing some control over learning to students (Hansen & Salter, 1999) and facilitating or guiding learning rather than transmitting knowledge (Australian Flexible Learning Framework, 2002; Palloff & Pratt, 2000). This frame comprises knowledge, skills and attitudes: the knowledge of how online learners learn and which teaching strategies to employ (Good, 2001), the skill of facilitating learning rather than transmitting knowledge (Miller & King, 2003) and the adoption of an open-minded, risk-taking attitude toward innovative teaching practices (Kemshall-Bell, 2001). As Palloff and Pratt (2000) point out, "It means abdicating our tried and true techniques that may have served us well in the face-to-face classroom in favour of experimenting with techniques and assumptions" (p.7).

Code: Online Teaching Competency – Determining Effective Teaching Methods

This code has three main components: determining and using effective teaching methods, facilitating and guiding learning and adopting an open-minded, risk-taking attitude toward innovative teaching strategies.

Electronic pedagogy, or the “art of teaching online” (Palloff & Pratt, 2000, p.3) requires online teachers to be familiar with a variety of instructional techniques or methods, such as problem-based learning, collaborative learning or peer evaluation (Kearsley & Blomeyer, 2004) and to have the ability to customize the learning process and choose teaching strategies that work for a variety of learners. In the entry survey responses, the pre-service teachers did not mention any specific teaching strategies for this new learning environment although a concern was expressed to “not let technology take the place of authentic learning” (Participant B, January, 2004). This comment echoes the research results of Brennan et al. (2001) who found that technology has, in many cases up to now, driven pedagogy in online teaching. Participant B’s response indicates that she was aware, early on in this experience, of the importance of staying focused on pedagogy and not becoming overwhelmed or distracted by technology.

Later on in the course, however, the participants showed a greater awareness of the need to use a variety of teaching strategies for customizing learning and also cited learning theories with which they had become familiar earlier in their Master of Teaching program. This is evidenced by the following online discussion posting:

Online education can be compared with guided discovery teaching style and Howard Gardner’s Multiple Intelligences theory in that the learning is student-focused and the students can learn in multiple pathways depending on the links and support options open to them. (Participant I, March, 2004)

Some participants disagreed about whether e-pedagogy is unique or, in fact, similar to conventional pedagogy, as evidenced by the following comments:

It is similar to a classroom face-to-face setting only you are no longer mediating between students and their physical environment. You have to take into consideration the computer and the students, capabilities of your audience and flexibility in the lesson planning and action. (Participant I, March, 2004)

Teaching in a traditional classroom and online are very different. I can't define the exact differences yet but it is a new dimension of teaching that is proving very challenging to learn. I hope that the e-skills are emerging as I am learning. (Participant F, March, 2004)

The latter comment reflects the reality, as revealed in the literature, that e-pedagogy is not yet clear and distinct, but is evolving (Miller & King, 2003).

Another comment revealed the students' understanding that the online teacher needs to develop a repertoire of effective teaching strategies, including those involving new online tools, such as V-Class, a synchronous tool that allows teachers and students to communicate both textually and orally:

I loved V-Class and would love the opportunity to teach with it. I think like any medium, the teacher would still need to change things up now and again. Always use different tools and let the students see different styles of instruction. I think students may be motivated if they got to guide some of the discussion, maybe have mini presentations or something on there to show off their own work and sort of teach the others without being moderator. (Participant E, March, 2004)

In their online discussion on e-pedagogy, the pre-service teachers' comments tended to focus on technical and communication skills or instructional design. This is understandable due to the fact that most of their time in the course was spent designing

rather than teaching. However, in designing and developing their learning objects for this course, the participants clearly demonstrated their understanding of online pedagogy by using a variety of instructional strategies including direct instruction, collaborative learning and problem-based learning. In most cases, the online design work provided an opportunity for these novice teachers to put into practice many of the learning theories about which they had previously learned, to experiment with new strategies to appeal to a variety of learners and learning styles or to expand on the traditional instructional strategies used previously to teach the same content in the face-to-face classroom.

The second component of this code, facilitation of learning, was a central theme throughout the survey responses, online discussions and the focus group interview, indicating that the participants were well aware of the need for an online teacher to facilitate or guide learning rather than transmit knowledge. Even in the entry survey responses, two participants commented that the teacher needs to be “flexible enough to facilitate any student who signs up for the course” (Participant A, January, 2004) and should “facilitate a learning experience by setting it up and guiding students through” (Participant B, January, 2004). However, the pre-service teachers also articulated the tension they perceived regarding the teacher’s role as a facilitator of learning. While they seemed aware that the teacher’s role needed to change from ‘sage on the stage’ to ‘guide on the side’, they were unsure of how to design learning objects that would bring about such a shift. This was illustrated by Participant B who asked, “How can I design and implement a learning object for Secondary English Language Arts that does not simply replicate the text-based transmission of information?” (March, 2004). Later on, in the focus group interview, there was a general consensus on the facilitative nature of the

online teacher's role, as evidenced by the following comment about successful online learners:

You can let them define their own learning, almost guide it, and then you can check in with them online as well and I think that can be extremely successful granted that the student is motivated enough to be doing what they need to be doing consistently throughout the course. (Participant H, April, 2004)

In the exit survey responses, several participants mentioned the role of the teacher as a facilitator although, as mentioned earlier in this chapter, there was some confusion about what the term 'facilitate' means in the context of online learning. Some defined facilitation as encouraging students and keeping them on task whereas others saw facilitation as a skill primarily used for moderating and managing online discussions.

The third component of the code, *Determining Effective Teaching Methods*, focuses on the significance of developing or possessing a risk-taking attitude that allows the online teacher the freedom to employ innovative teaching strategies. The significance of such an attitude, for an online teacher, was addressed in Chapter Two and is also supported in the literature (Australian Flexible Learning Framework, 2002; Brooks, 2003; Kemshal-Bell, 2001; Palloff & Pratt, 2000). The pre-service teachers stated in the entry survey responses that an online teacher needs to be "open to new avenues and methods and open-minded to different possibilities" (Participant I, January, 2004) and pointed out in the exit survey responses as well that an online teacher should be keen, flexible, "open to new ways of learning" (Participant D, April, 2004) and "willing to face new challenges and opportunities without trepidation. Online teachers need to be fearless" (Participant F, April, 2004). In the focus group interview, Participant G reiterated the need for online

teachers to move out of their comfort zone and experiment with new instructional strategies and stated that “staying in your safety area means that you don’t grow” (Participant G, March, 2004). The pre-service teacher participants demonstrated their own risk-taking attitudes in the design and development of their learning objects. For example, Participant G experimented with a variety of student-centred instructional strategies and an innovative technology in an attempt to incorporate online collaboration. As evidenced by their comments throughout the course and the design work on their learning objects, it is clear that these pre-service teachers were not averse to taking risks or experimenting with instructional strategies. This is in contrast to many in-service teachers who become online teachers but may not have had exposure to a variety of teaching and learning models, such as collaborative learning, inquiry-based learning and problem-based learning and who may be resistant to trying new techniques and strategies (Miller & King, 2003). The impact of this course-based online teaching and learning experience on the pre-service teachers’ understandings about pedagogy were summarized by Participant F who said:

When I began this course, I thought that the technical aspect of online learning would overshadow the pedagogy. I was wrong. The most important role we have as educators, be it in online or otherwise, is to make certain that we create lesson plans that focus on having students reach a desired outcome. (Participant F, March, 2004)

Code: Online Teaching Challenge – Learner Diversity

In terms of online teaching challenges, addressing learner diversity was a consistent theme throughout the Special Projects course. In the entry survey responses,

participants commented that an online teacher, without seeing students face-to-face, must “still try to accommodate individual learning needs and challenges”(Participant A, January, 2004) and felt the online teacher would need to give students “options to suit their individual needs” (Participant C, January, 2004). In the focus group interview, the appeal of the hybrid model, in-which online and face-to-face instruction are blended, as one solution for addressing learner diversity, particularly in math and science, was raised by Participant D who said,

The only problem I think that I have, especially with math, is that there’s so many different ways to solve problems in math and I see online learning as just that one way of solving that problem. That’s where I think a hybrid class can come in handy. (Participant D, March, 2004)

In their online discussions, two participants suggested concrete strategies and a sense of hopefulness regarding the potential to customize learning in the online environment. Participant B suggested “teachers should incorporate some metacognition (*sic*) exercises at the beginning of online classes. Just to get the students thinking about what kinds of learners they are and whether they need more or less structure to their learning time”(Participant B, February, 2004). The possibility of revising existing content to reflect learners’ needs was appealing to Participant I who stated that she thought it was hard “to know ahead of time what the student will end up needing; therefore, by having an already existing template, it is more than possible to modify the content as they go along” (Participant I, February, 2004). These comments demonstrate the pre-service teachers’ commitment to student-centred learning, the central philosophy of distributed and online learning (Oblinger & Maruyama, 1996).

Other students articulated their struggle to differentiate learning within the design of their learning objects:

It was also difficult to include Multiple Intelligence theory in my design. The online lessons could be created for visual learners but I would be compromising a lot of the online resources for something that could be read as a text file. It is more difficult to individualize online lessons for students. I can change the pacing but to change the lessons for certain students would require more drastic measures. Online learning is a lengthy and carefully designed process and therefore it is much more challenging to incorporate spontaneity in the middle of a session. (Participant F, April, 2004)

Although the pre-service teachers expressed concerns about how to customize online learning, their completed learning objects demonstrated the impact of this course on their ability to individualize and differentiate learning. For example, Participants B and F purposefully designed their learning objects to allow students to choose the manner through which they represented their learning and to appeal to both visual and kinaesthetic learning styles. The pre-service teachers' understandings of the potential for customizing learning and their demonstrated ability to design online learning objects to address diverse learner needs illustrates the professional growth they experienced during the Special Topics course.

Frame: Instructional Design

Instructional design can be defined as “the systematic process of translating principles of learning and instruction into plans for instructional materials and activities” (Instructional Technology Global Resource Network, n.d.) and generally involves the

design and development of instructional materials as determined by a needs analysis and followed by the implementation and evaluation of the instruction. Anderson et al. (2001) maintain that the process of designing meaningful and effective learning experiences in the online environment is usually more extensive and time-consuming than designing for the traditional classroom. This is due to the transparency of the environment and the fact that an online designer must think through each step in designing not only the activities and the content, but also in providing the overall structure, learning scaffolds, assessment strategies, mechanisms to monitor student progress, clear navigation and opportunities for interaction (Anderson et al., 2001; Goodyear et al., 2001). The online designer must also select the appropriate media and weave in technology so that students are “learning with rather than from technology” (Good, 2001, p.173). Gold (2001) suggests “the difficulty of online instruction is not in the transfer of knowledge but in creating the most apt learning environments for students to acquire this knowledge” (p. 42). In recognition of the significance of the task of designing online instruction, a number of researchers describe this role as distinct from the social, facilitative and pedagogical roles of the online teacher (Anderson et al., 2001; Gold, 2001). At the end of their experience in the Special Topics course, the pre-service teacher participants in this study also recognized the complexity of online instructional design, as evidenced by the comment below:

There were many factors that needed to be integrated into the design of my learning object. I had to consider the subject matter, grade level, number of students enrolled, time constraints, and my own limited knowledge of software and hardware. I had to design an object that conveyed a concept that was tied to

the Alberta Program of Studies for the grade and subject I chose. I had to cull resources from the Internet, including rubrics and graphics – and gain permission for using these resources. I had to make sure I knew how to access the information I was asking students to work with. I wanted to be sure to value the time and effort that students put into learning how to use and manipulate new technology. Even though technology wasn't the main learning outcome of my learning object, I wanted to be sure to find a way to assess student learning of technology in tandem with student learning of the concept I was presenting.

(Participant B, April, 2004)

Code: Online Teaching Competency – Designing Meaningful Learning

Experiences

The work of designing worthwhile online learning content and tasks is primarily a pre-course activity versus the in-course work of facilitation (Goodyear et al., 2001).

This code is comprised of two main components which represent important tasks in this pre-course work: 1) adapting and developing curriculum content for the online environment and 2) designing learning experiences that are motivating and engaging

The first component involves building curriculum materials for use in the online environment and may also include re-purposing materials used in the traditional classroom or found in a digital repository¹². At the beginning of the Special Topics

¹² An online learning repository is a centralized database used to house digital learning objects, created using multimedia but also in text format, which can be re-purposed in whole or in part and integrated into online course materials.

course, the participants stated that the role of the online designer is to “ensure material is clear, concise and interesting” (Participant H, January, 2004) and to “create a strong and clear learning environment” (Participant G, January, 2004). At the beginning of their course experience, participants could describe, in broad terms, the online designer’s role, but only one pre-service teacher commented on more discrete online design tasks such as the need to “set a goal of the online subject he/she is going to facilitate. Break down the subject further into small products that allow students to accomplish (*sic*) sequentially or horizontally” (Participant A, January, 2004). A more extensive definition of this competency appears in this exit survey response:

She is also the gatekeeper or the filter of the information. I think that it is vital that she evaluates the online information and alters it so that it becomes comprehensible to her students. I feel that an online teacher is also responsible for creating content that complements the online material in ways that will broaden her students’ understanding of the curriculum material. (Participant F, April, 2004)

The comment below illustrates the pre-service teachers’ newfound appreciation for the complexity of this work as well as confidence in their ability to do it:

I really had no clue what a learning object was before I took the course. I spent a lot of time online, looking in the repositories and trying to come up with a plan regarding what kind of object I wanted to build. I now know that, as an instructional designer, or online teacher, I wouldn’t really be responsible for

conceptualizing, designing and integrating the learning object myself. There are other professionals who have the expertise to translate ideas into objects. But it is very reassuring to know that, if I did in fact have to create my own learning object in the future – and now that I’ve done it so, I’m hooked, I have the knowledge and the resources to do it. (Participant B, April, 2004)

Participant A commented on the importance of including clear outcomes and goals in the design of instruction and pointed out that “if you don’t give them a goal or objective, why they learn this and how they learn it and after they learn it, how they apply it in the future or in their environment, if they don’t see that kind of meaning, they won’t engage” (Participant A, March, 2004). The significance of making the course outcomes explicit to learners is also documented by Anderson et al. (2001).

In the Blackboard discussions, several of the participants mentioned other concrete design strategies, such as chunking content into manageable units, as evidenced by the following comment: “I also think that e-peds (*sic*) need to be able to break down information into smaller units for themselves. You’re right; it needs to be a mix of many mediums” (Participant H, February, 2004). Participant C commented on the increased complexity of online design due to the fact that students have more control over how they approach and pace their learning and stated that “because students are free to go in a non-linear format, I think an online teacher must be more prepared than a traditional teacher and must look at the outcomes and work backwards to create the lessons” (Participant C, February, 2004). Others asked fundamental design questions, such as, “What is important? How do I want the learner to access it and what steps are needed as opposed to optional support? Also, there are the options of media or mediums that the course can

use (*sic*)”(Participant I, February, 2004). In general, the pre-service teacher participants seemed to become much more aware of the complexities of online design and, due to their work in designing and developing learning objects, were able to articulate a number of online design strategies and skills, such as chunking content and creating multiple pathways.

The second component of this code is the skill of designing learning experiences that are motivating and engaging. In entry survey responses, statements such as, “create lessons that are clear and create different options for learners” (Participant C, January, 2004) and “provide variety of resources to appeal to the wide range of students” (Participant E, January, 2004), illustrate the pre-service teachers’ interest in clarity and variety in online course design but say little about designing for engagement and motivation. Later on in the course, however, several students who had originally been attracted to the flashier side of online design expressed their rationale for choosing or not choosing to include multimedia in their learning objects, as evidenced by the following online discussion posting:

As I learn more about learning objects, I feel that the flash, the glitz, and glamour of a website is less important. Originally, I had wanted to learn as much about the graphics program and the flashy design but as I start to seriously think about the learning objectives and outcomes, I realize that online lesson planning is not about the animations. It isn’t about entertaining students; it’s about teaching them. For me, this requires a mental readjustment of the Internet as a hobby mentality! Animations have to somehow complement the learning. (Participant F, February, 2004)

Participant B rejected the use of animation in her learning object “simply because it won’t further student learning of any concept in the novel I’m working with” (Participant B, February, 2004) while Participant H chose to use more audio and visual components because “it captivates the attention, whereas heavy text sites or lessons can be deterring” (Participant H, February, 2004). These comments indicate the effect of this online teaching and learning experience in dispelling the common misconception that online learners are primarily engaged and motivated by graphics and multimedia alone.

The clearest indicator, however, of the impact of this course on pre-service teachers’ understandings of the competency of online design was in the learning objects they designed and developed for the Special Topics course. Participant E, for example, chose a concept that she knew was difficult for students and subsequently created a multimedia movie to engage their interest and make the concept clear. Participant F was conscious of the power of student choice when she designed and developed a unit of study that allowed students to choose from seven possible assignments. When asked to describe what was important in her learning object, Participant I said that she “wanted to motivate students to stay active and to maximize the time they spend on fitness” (Participant I, April, 2004). Participant C worked to engage learners by designing a learner-centred object that allowed students to make sense of their own Canadian identity. Participant B deliberately avoided a text-heavy English Language Arts learning object by using her own artwork in an effort to motivate and engage students. These examples provide clear evidence of the impact that this course-based online teaching and learning experience had on what these pre-service teachers’ online design skills, knowledge and attitudes.

Code: Online Teaching Challenge – Preparation and Time

Although, in the entry survey responses, only one participant referred to the “twenty-four, seven day a week experience” (Participant B, January, 2004) of online teaching, the preparation and time required for this work was voiced as a significant challenge throughout the Special Topics course. This was expressed by several students in their online discussions and in the exit survey responses, such as those cited below:

I did not know that designing and developing online learning objects is very time consuming. I have to make learning objects self-explanatory and in detail for I do not have the opportunity to explain to the learners face-to-face. (Participant A, March, 2004)

With more experience, I am beginning to see that online development requires a lot of pre-planning and questioning of the learning material and its delivery. I think it is much more sophisticated than just putting print material on the web. (Participant F, February, 2004)

I can see that there is a lot of planning that goes into the preparation of the course than perhaps in a traditional setting – although I think this may be a generalization because a lot of teachers in traditional settings do a lot of preparation as well. (Participant G, March, 2004)

The extra workload involved in both the design and delivery of online instruction is well documented in the literature (Kearsley & Blomeyer, 2004; Kemshal-Bell, 2001; Miller and King, 2003) and represents a significant challenge for online teachers. As a result of their hands-on experience as online designers, the pre-service teachers involved in this study were excited about online teaching and design but, at the same time, well aware of

the increase in workload and time required to be effective in this new learning environment.

Section B: Summary

The purpose of this chapter is to analyze the data gathered in this research study and attempt to make meaning of the pre-service teachers' experiences as online learners and teachers in the Special Topics course. What evidence of the impact of this experience can be seen in the data? To what extent did they demonstrate the online teaching competencies as revealed in and supported by the current literature that was examined in Chapter Two? In order to remain consistent with the definition of the term impact, as explained earlier in this chapter, a description of the extent to which the pre-service teachers were impacted or influenced by this experience must include a description of their expanded, enhanced or changed knowledge, skills and attitudes with regard to online teaching. In terms of knowledge, the data reveals that, at the end of their experience in the Special Topics course, the pre-service teachers appeared to understand a great deal about the practice of online teaching, including the changed role of the teacher and various strategies for motivating and establishing rapport with students without the benefit of visual cues. They appeared to recognize the unique nature of electronic communication and the need for an online teacher to provide not only clear and frequent but also positive feedback to online students. They seemed to understand the highly complex role of web-based instructional design and most worked carefully and in great detail to design and develop engaging, student-centred learning objects. Finally, they demonstrated some understanding of the emerging field of e-pedagogy.

In terms of skills, the pre-service teachers, who came to the course with some expertise in electronic communication but little experience with online learning, were greatly affected by their experience as online teachers and learners. Their learning objects illustrated their abilities to create authentic, student-centred tasks with clear instructions and navigational paths as well as their willingness to make mistakes and take risks along the way. Within the thirteen-week time frame of the Special Topics course, the pre-service teacher participants began to learn and had the opportunity to practice the skill of moderating online discussions although the art of online dialogue and online questioning can take years to master. In the process of creating their learning objects, the pre-service teachers demonstrated their newfound abilities to use the web-based tools within the online Blackboard course as well as a variety of multimedia software programs, with which most had previously been unfamiliar.

The pre-service teachers' attitudes were also impacted by their experience in this course. Many expressed a changed attitude toward the use of graphics and flashy technology in online design. Even those who, at the end of this experience, favoured the hybrid approach over the wholly online approach appeared to be open-minded and positive about the potential of this new learning environment. In designing and developing their learning objects they demonstrated technological fearlessness and risk-taking as they chose to experiment with new instructional strategies and web-based tools. By virtue of the fact that these novice teachers chose to take the Special Topics: Distributed Learning course from among many other choices, it is likely that most of them brought open-minded, risk-taking attitudes with them. However, at least three of the participants who came to the course with great reservations about online learning finished

with positive attitudes toward the new learning environment to which they had been introduced.

In terms of online teaching challenges, the pre-service teachers involved in this case study recognized and wrestled with many of the significant challenges faced by online teachers in the field. These include establishing rapport and communicating with students without seeing them face-to-face, monitoring and assessing student progress, keeping technical skills sharp and up-to-date, using technology to effectively enhance student learning, addressing learner diversity online and coping with the amount of time required for the complex and time-consuming task of online design. The Special Topics course provided the pre-service teachers an opportunity to experience some of these challenges and to discuss solutions among themselves as well as with their partner teachers.

This is not to say that the participants learned all that there is to know about the practice of online teaching. Within the timeframe of a thirteen-week course, that would be impossible. However, they were greatly impacted by their experience as online teachers and learners and their collaboration with their partner teachers at CBe-learn. A discussion of the influence of this course experience on the pre-service teachers' future teaching practices as well as recommendations for improvements to the course and suggestions for further research are addressed in Chapter Five.

CHAPTER FIVE

CONCLUSION AND DISCUSSION

This research study springs from a fundamental question: How are pre-service teachers' understandings of online teaching challenges and competencies impacted by their online learning and teaching experience in the Special Topics: Distributed Learning course? The results, as discussed in Chapter Four, confirm that the experience of both learning and teaching online had a significant impact on the participants' online teaching knowledge, skills and attitudes. This research argues that, in order to be effective in the online learning environment, teachers must understand e-pedagogy, learn unique skills, adopt positive attitudes toward technology and function as facilitators of learning. The results of this study confirm that preparing pre-service teachers to teach online can significantly impact their understandings of these unique online teaching competencies and also raise their awareness of new ways of incorporating technology in their teaching practices. Most importantly, the results support the need for online teacher training to become embedded in existing pre-service teacher education programs.

In this chapter, there are four sections. In Section A, the impact of this experience on the pre-service teachers' future teaching practices is discussed. In Section B, one participant's online field experience, subsequent to the study, is presented and discussed. Recommendations for the Special Topics course and for future research initiatives are presented in Section C, followed by a summary in Section D and final concluding remarks.

Section A: Further Impact

The frames and codes used in the analysis of the data in Chapter Four focus on online teaching competencies and challenges and provide a framework for interpreting the pre-service teachers' experiences as online learners and teachers. Although it is impossible to predict exactly how this experience will affect the future practices of these novice teachers, they were asked, on the exit survey and in the focus group discussion, about the impact of this experience on their classroom teaching practice and the use of technology in learning in the future. Their comments reveal the significance of this experience in shaping their future teaching practices as well as a sense of confidence and excitement as they anticipate moving from pre-service preparation to the real world of teaching. For most, the Special Topics course experience opened their eyes to learning options and alternatives that they had not known existed. As a result, many of the pre-service teachers said that they planned to incorporate more multi-media and technology into their teaching practices by investigating and using web resources, creating class web pages for communication with parents, creating online modules, using learning object repositories and setting up hybrid online classrooms to supplement face-to-face teaching. In addition to their plans to incorporate more technology, several of the participants articulated the effect of this experience on their ability to differentiate instruction and to focus on individual students, a skill they saw as equally valuable in the face-to-face classroom. As Participant F said, "I am designing lessons with a conscious awareness of how the individual rather than the class would respond" (April, 2004). As a result of this experience, most participants agreed that they were not only more aware of and comfortable with technology tools and the possibilities they present but also how

technology can link to and support curriculum outcomes. Whether or not these novice teachers are able to use technology in the ways they envision remains to be seen and will be strongly influenced by the teaching contexts in which they find themselves in the next few years. The potential for this as a further research initiative is discussed in Section C of this chapter.

Section B: A Field Experience

After the conclusion of this research study in April of 2004, and as a result of her experience in the Special Topics course, one of the pre-service teacher participants was hired to teach two online courses in the CBe-learn's 2004 summer high school program. This serendipitous turn of events presented an opportunity to investigate the impact of the Special Topics experience on not only this particular pre-service teacher's understandings but also on the day-to-day practice of teaching online. In August of 2004, at the conclusion of her eleven-week online teaching experience, Participant F shared her thoughts and concerns in an informal, unstructured interview (Appendix G).

When asked what she found surprising about teaching online, Participant F stated that the experience had caused her to change her earlier belief that it was impossible to evaluate a student's learning without face-to-face contact. By using online learning assessment and communication tools, Participant F felt she was able to effectively evaluate her students' learning and their growth from the beginning of the course to the end. When asked what she had learned about online teaching competencies, she referred to online management and communication skills. In terms of day-to-day management, the need for organizational strategies was of paramount importance. Participant F also indicated that she had to be concrete about her expectations for student participation and

extremely persistent in staying in touch with students and keeping them motivated which was much more time consuming than she had anticipated. In terms of communication, she quickly found it necessary to put in place guidelines for communication and feedback and re-iterated the significance of strong communication skills, as pointed out in the *Communication Skills* frame in Chapter Four of this thesis. She realized through teaching an entire online course that she was able to hear from all the students, even those who might be inhibited in a face-to-face environment. In addition, she found herself more focused on the students' work than on their physical presence, as might be the case in a traditional classroom. She acquired important communication and organizational skills that allowed her to stay connected to her students, keep track of their progress and follow through with individual students as needed. By teaching an entire course online, Participant F built on her experience in the Special Topics course. As a result of her work as an online teacher which involved doing research, finding resources, enhancing the course content, monitoring student progress, clarifying misconceptions and attempting to keep students motivated, she gained a clearer understanding of the role of the teacher as facilitator.

Participant F was not overwhelmed by the technology involved in her online teaching experience; in fact, she enjoyed troubleshooting to help her students solve computer problems and attributed her comfort level with technology to her experience in the Special Topics course. She also stated that the experience of designing a learning object had helped her in understanding the structure and navigation of the courses she was teaching. Although there wasn't time during the summer school term, she stated that, given enough time, she wouldn't hesitate to create animations and multimedia

learning objects to add to her courses, attributing her confidence to the experience gained from designing a digital learning object.

However, teaching high school students online had its disadvantages as well. As suggested by the research results in Chapter Four, Participant F found that moderating discussions and chats was “not as easy as it looks” (August, 2004). In addition, she found that online students demanded immediate feedback and that the work was exhausting, time consuming and often isolating.

Participant F’s comment that, “I will be a much better teacher as a result of this” (August, 2004), speaks to her perception of the impact of the Special Topics course and this online teaching experience on her future teaching practice. She was intrigued with the emphasis on time management skills in the online courses she taught and plans to implement student work plans that require students to plan out and control how they will complete their course work, in her high school teaching practice. She also plans to use hyper-linked resources with her students and enhance student learning by incorporating online tasks and assignments. For Participant F, the Special Topics course certainly prepared her to cope with the technological aspects of online teaching; however, she recommended that the course include more hands-on online teaching experience in order for pre-service teachers to become comfortable as facilitators and gain the organizational and communication skills that are so critical for teaching online. She also suggested that more time be spent on specific e-moderation skills, particularly the use of synchronous communication tools.

Section C: Recommendations

Although, as mentioned in Chapter Three, this case study was not intended to be evaluative in nature, the pre-service teacher participants shared many positive comments about the Special Topics: Distributed Learning course as well as constructive suggestions for improving it. For most of the participants, this was a valuable learning experience. In fact, one pre-service teacher suggested that this course, a combination of “creative thought with methodology, a rarity” (Participant H, April, 2004), should be offered at the beginning of the Master of Teaching program rather than in the last semester. Another stated, “I really feel it has opened up another door I never knew was there” (Participant E, April, 2004), and yet another said that she felt she had learned more in the thirteen-week Special Topics: Distributed Learning course than in the entire two years of the Master of Teaching Program (Participant B, April, 2004). One participant enthusiastically articulated her newfound confidence about online teaching and the advantage she perceived she had received as a result of this experience:

You’ve got the theory behind you; you’ve got the doors open so you’re not scared to use the technology because you’ve been introduced to it; you’ve got a network of people who are your support, and you’ve also had the advantage of seeing or borrowing or being given an online course...and seeing what works and doesn’t work. (Participant I, April, 2004)

During the focus group interview, the participants also made several constructive suggestions for improving this course-based online teaching and learning experience, including extending the course over two semesters so that pre-service teachers would have an opportunity to first observe other online teachers, then design online learning

objects and finally teach and evaluate their learning objects once students had used them. Other suggestions included incorporating information about the Province of Alberta's Information and Communication Technology Program of Studies, providing opportunities to analyze a variety of online courses and more hands-on online teaching time. In addition, it appears from the analysis of the data in Chapter Four that the pre-service teachers would benefit from more opportunities to talk with their partner teachers about such challenges as engaging learners and using online assessment tools.

The data presented in Chapter Four also suggests some gaps in the pre-service teachers' understandings of the practice of online teaching as compared with the competencies revealed in the literature. These could be addressed through revisions to the Special Topics: Distributed Learning course content. Firstly, some clarification is needed regarding what is meant by online facilitation. Although the pre-service teachers were able to talk about the online teacher's facilitative role, they did not demonstrate the specific skills required to be effective online discussion facilitators or e-moderators. These include the ability to use effective online questioning strategies in order to move discussions to a deeper level, pace discussions, use humour and handle conflict (Salmon, 2004). As suggested by the participants in the focus group discussion, this requires not only explicit teaching and modelling of these skills but also the opportunity to practice in both the Special Topics Blackboard course and as a practicum teacher in the partner school's online courses.

Secondly, although the literature reveals the significance of creating and sustaining an online community (Palloff & Pratt, 2000), the data reveals that the pre-service teachers spent little time discussing, reading about or practicing these skills.

Other pedagogical topics might include incorporating collaboration or inquiry-based learning in online course design. How is it done? What does it look like? Why is it important? As suggested by several participants' exit survey responses, an opportunity to analyze and discuss online courses that employ a variety of methodologies would add significantly to their understanding of e-pedagogy.

The results from this case study also indicate the need for continued research in the field of online teacher training. Firstly, and most importantly, I recommend a longitudinal study of some or all of these novice teachers in order to determine the long-term impact of this experience in shaping their classroom teaching practice, their use of technology in learning and the extent to which they are able to put into practice the ideas and dreams articulated at the conclusion of the Special Topics: Distributed Learning course. A second possibility for continued research arises from both the literature reviewed in Chapter Two (Brennan, 2003; Brooks, 2003; Good, 2001; Kemshal-Bell, 2001; Schofield et al., 2001) and the research results in Chapter Four where teachers' attitudes were revealed as critical to online teaching. Further research into the attitudes that contribute to a teacher's ability to be successful in the online environment would significantly add to the knowledge base in this field. A third possibility is for continued research into the online teaching competencies presented in this research study and represented by the frames and codes used for the analysis of the data in Chapter Four. These competencies are based on those suggested by an extensive literature review and interviews with online students and practitioners in Australia (Kemshal-Bell, 2001) but were revised based on the literature review and data analysis in this case study research. As suggested in Chapter Two, continued investigation and analysis of the competencies

required for online teaching is critical for online school administrators, professional developers and for the very real possibility of online teaching accreditation in the future.

Section D: Summary

The secret is the teacher. This statement, which is also the title of an Australian study of online learning and teaching (Cashion & Palmieri, 2002), is as true in the online environment as in any other teaching and learning setting. Early on in the evolution of online learning many, including myself, feared that the computer would replace the teacher. It is now, however, abundantly clear that it is through the work of teachers who embrace new ways of teaching and learning, and not through technological wizardry, that the transformational potential of online learning can be realized (Gold, 2001). As Palloff and Pratt (2001) state, these are teachers who demonstrate the “willingness to learn, willingness to surrender some control over class design and teaching style, ability to collaborate with peers, willingness to change their traditional role, ability to build a support system, patience with technology and ability to learn from others” (p. 23).

Early on in my research, a colleague responded to the prospect of training pre-service teachers to teach online by stating a bold opinion: “You can’t teach online until you’ve taught in the classroom”. That statement has remained at the back of my mind as I observed and attempted to analyze and interpret the experiences of the nine Master of Teaching students who took part in the inaugural session of the University of Calgary’s Special Topics: Distributed Learning course. Can pre-service teachers learn to teach online without having worked as face-to-face classroom teachers? In view of the positive results of this study, I believe that they can. Online teaching and learning experiences in pre-service teacher education programs can provide novice teachers with opportunities to

weave technology into learning, to function as learning facilitators and to design blended or fully online learning experiences for their students. Moreover, their distributed learning knowledge and skills can spill over into and transform the face-to-face classroom as well.

Conclusion

The explosion of information and communication technologies in every facet of our lives has changed not only the way we live and work, but also the way we learn. As Black (2002) states, “Just as the internal combustion engine changed the world, the World Wide Web has forever changed the way in which we teach our students at all educational levels” (p.1).

Today’s students, comfortable with digital tools and accustomed to multiprocessing, constant connectivity and discovery learning, come to school with a different mindset than students of earlier generations (Oblinger & Maruyama, 1996). In order to be prepared to participate fully and effectively in a knowledge-based economy, they must be adept in information navigation – the ability to use digital tools for communication as well as to access and make use of vast stores of information. Teachers of the twenty-first century must, therefore, acquire the knowledge, skills and attitudes to provide these students with the best possibilities for learning.

Teacher education programs, charged with preparing today’s teachers to teach the students of tomorrow, face numerous challenges, including:

the gap in education classes between what is taught and how it is taught, the tension between academic rigour and relevance, the level of support for self-

directed and reflective learning and the extent of a genuine partnership between schools and universities. (Russell et al., 2001, p. 51)

In addition, students now entering teacher preparation programs come with increasing familiarity with digital tools and distance learning, and will likely participate in some form of distance teaching during their careers (Thompson, 2003). Clearly, the experiences, needs and expectations of today's learners, prospective teacher education students and society itself, point to the need for pre-service teacher education programs to bridge the gap between how teachers are currently prepared for teaching and what they will face when they become full-fledged teachers.

This study presents a successful model for embedding online teaching and learning experiences in pre-service teacher preparation—opportunities for novice teachers to challenge their assumptions about teaching by experiencing alternatives, such as distributed learning, that reflect the needs and expectations of the students they will teach. The transformational nature of these experiences is evidenced by the comment of my colleague, new to online teaching, who said, “I may not teach completely online forever, but when I return to the classroom, I’ll never teach the same way again”.

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APPENDIX A: UNIVERSITY OF CALGARY ETHICS APPROVAL



UNIVERSITY OF
CALGARY

CERTIFICATION OF INSTITUTIONAL ETHICS REVIEW

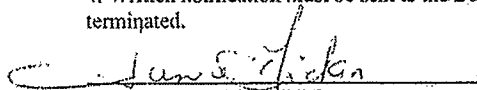
This is to certify that the Conjoint Faculties Research Ethics Board at the University of Calgary has examined the following research proposal and found the proposed research involving human subjects to be in accordance with University of Calgary Guidelines and the Tri-Council Policy Statement on *"Ethical Conduct in Research Using Human Subjects"*. This form and accompanying letter constitute the Certification of Institutional Ethics Review.

File no: CE101-3810
 Applicant(s): Susan E. Crichton
 Marcia Gail Shervey
 Department: Education, Faculty of
 Project Title: Distributed Learning - A Pre-service Perspective
 Sponsor (if applicable):

Restrictions:

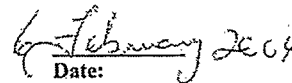
This Certification is subject to the following conditions:

1. Approval is granted only for the project and purposes described in the application.
2. Any modifications to the authorized protocol must be submitted to the Chair, Conjoint Faculties Research Ethics Board for approval.
3. A progress report must be submitted 12 months from the date of this Certification, and should provide the expected completion date for the project.
4. Written notification must be sent to the Board when the project is complete or terminated.



Janice Dickin, Ph.D., LL.B.,
Chair

Conjoint Faculties Research Ethics Board


Date:

Distribution: (1) Applicant, (2) Supervisor (if applicable), (3) Chair, Department/Faculty Research Ethics Committee, (4) Sponsor, (5) Conjoint Faculties Research Ethics Board (6) Research Services.

APPENDIX B: CALGARY BOARD OF EDUCATION ETHICS APPROVAL



Calgary Board of Education

Building a Collaborative Learning Community

ACCOUNTABILITY SERVICES

Education Centre Building

515 Macleod Trail S.E., Calgary, Alberta T2G 2L9 Telephone: (403) 294-8763 Fax: (403) 294-6434

April 27, 2004

Ms. Gail Shervey
3600-16 Avenue SW
Calgary, Alberta T3H 4N6

Dear Gail

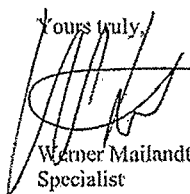
I am pleased to confirm that the Calgary Board of Education has granted permission for you to conduct the study "Distributed Learning: A Pre-Service Perspective".

This approval granted indicates that as a School Board we have no ethical concerns with your study. The final decision of participation rests with the school administration, teachers, students and parents involved. This letter does not obligate participation by anyone associated with the Calgary Board of Education.

Please present this letter to Calgary Board of Education personnel when requesting access to teachers and students. This approval does not include access to school records.

I wish you success in your study and would appreciate a copy of any material that you subsequently publish.

Yours truly,



Werner Mailandt
Specialist
Accountability Services/System Support

APPENDIX C: PARTICIPANT CONSENT FORM

Research Project Title: Distributed Learning: A Pre-service Perspective

Investigator(s): Dr. Susan Crichton and Ms Gail Shervey

This consent form, a copy of which has been given to you, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

- 1. This research project will be investigating the current challenges, professional development issues, pre-service training and actual practice of teachers working in distributed learning environments. You have been selected because of your involvement in the Master of Teaching (MT) course, Distributed Learning: Teaching and Learning Online. The information you provide will be used to inform the further development and refinement of a distributed learning course for the Master of Teaching students at the University of Calgary.*
- 2. The researchers (Susan and Gail) will follow your actions and interactions through the course, Distributed Learning: Teaching and Learning Online during the Winter semester 2004. We will ask questions as the course progresses and we will read your discussion postings within the Blackboard*

and WEB CT course environment. You may be asked to participate in a follow-up, online focus group which will include other distributed learning teachers and the researchers.

3. *All responses and interactions used in writing up the research will be anonymous.*
4. *At any point during the research you are free to withdraw from the as your participation is voluntary.*
5. *Your confidentiality will be maintained. Group discussions may be recorded, but the tapes will be destroyed once they have been analyzed. Commentary from the discussions will be downloaded and analyzed. Once the research is complete, these files will be deleted. The only people who will have access to the raw data will be the two principal researchers and a graduate research assistant.*
6. *All participants in the research will receive a copy of the findings and a final copy of published article.*

Your signature on this form indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the investigators, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation. If you have further questions concerning matters related to this research, please contact:

Dr. Susan Crichton

(403) 220-7522

If you have any questions or issues concerning this project that are not related to the specifics of the research, you may also contact the Research Services Office at 220-3782 and ask for Mrs. Patricia Evans.

Participant's Signature

Date

Investigator and/or Delegate's Signature

Date

Witness' Signature

Date

A copy of this consent form has been given to you to keep for your records and reference.

APPENDIX D: ENTRY SURVEY

<h2 style="margin: 0;">ENTRY SURVEY</h2>	Special Projects: Distributed Learning
Name:	Technology Self-Rating (circle one) <div style="text-align: center;"> Enthusiastic Beginner Confident Explorer Reluctant User </div>
Previous Practicum Placements:	Interest in Distributed Learning (use the back if you need more space to write)
Tell us an interesting detail about your life...	
1. Have you taken an online course before? <div style="margin-left: 40px;"> a. Yes b. No </div>	If yes, how many?
2. What do you think are the advantages of online learning?	
3. What do you think are the disadvantages of online learning?	
4. What does an effective online teacher do?	

5. What do you think would be the unique challenges for teachers who teach online?
6. What will be your greatest challenge as an online teacher?
7. How prepared do you feel to teach online? a. Extremely well-prepared b. Well-prepared c. Somewhat prepared d. Not at all prepared Please explain your response:
8. How comfortable do you feel communicating electronically? a. Extremely comfortable b. Quite comfortable c. Somewhat comfortable d. Not at all comfortable Please explain your response:
9. In what ways do you see online teaching as different from face-to-face classroom

teaching?	
10. In what ways do you see online teaching as similar to face-to-face classroom teaching?	
11. The experience of learning online is fundamental to learning to teach online. a. Strongly agree b. Agree c. Neutral d. Disagree e. Strongly disagree	Please explain your response:
12. What is your response to this statement? “It’s not possible to be effective as an online teacher until you have had experience as a face-to-face classroom teacher.”	

APPENDIX E: EXIT SURVEY

SPECIAL PROJECTS – DISTRIBUTED LEARNING

EXIT SURVEY

Completion of this exit survey is an important part of the research that is being carried out on your experience on this course. Your responses to the Intake Survey are attached for your convenience. You may want to refer to them in order to see how you responded to the questions that were asked at the outset of the course. It is not mandatory that you refer back to your previous responses; they are provided to assist you in recalling how you responded initially.

You have been a participant learner in the Special Projects: Distributed Learning course and also an observer in CBe-Learn online courses. **Please respond to the following questions based on what you have learned through those experiences.**

1. What are the advantages of online learning?
2. What are the disadvantages of online learning?
3. What are the roles of the online teacher?
4. What are the roles of the online student?

5. What does an effective online teacher do?
6. What are the unique challenges of the online teacher? Please cite a specific example that comes from what you have observed or learned in this course.
7. How prepared do you now feel to teach online?
 - Extremely well-prepared
 - Well-prepared
 - Somewhat prepared
 - Not prepared at all
8. How comfortable do you now feel about communicating electronically?
9. Based on what you have observed and learned, how do you see online teaching as different from f2f classroom teaching?
10. How do you see online teaching as similar to f2f classroom teaching?
11. The experience of learning online is fundamental to learning to teach online.
 - Strongly agree
 - Agree
 - Neutral
 - Disagree

- Strongly disagree

Please explain your response.

12. What is your response to this statement now?

“It’s not possible to be effective as an online teacher until you have had experience as a face-to-face classroom teacher.”

13. What effect, if any, do you think this experience and your knowledge of distributed learning will have on your classroom teaching practice?

14. What have you learned about how online teachers build rapport with their students?

You have spent some time in this course designing and developing digital learning objects. Please respond to the following questions in terms of this part of the Distributed Learning course.

15. What do you now know about designing and developing digital learning objects that you didn’t realize before?

16. What were some of the challenges you faced in doing this work?

17. How comfortable do you now feel about designing and developing digital learning objects?

18. In terms of your original expectations of this course, did the course meet your expectations? Please explain why or why not.

APPENDIX F: FOCUS GROUP QUESTIONS

FOCUS GROUP QUESTIONS

Good morning. Thank you all for joining us this morning and for helping me with the research that will form the basis of my thesis project. I'm really grateful for your participation.

I've brought a colleague with me from CBe-learn. She is an online math teacher and a highly skilled and experienced f2f classroom teacher as well. Debbie has just finished her MSc and has been involved in qualitative research like this before. So, she's going to help me this morning.

Here's how it's going to work....we've got some questions for you and we'd like to finish before noon, so we'll keep the process moving along. Debbie will be asking the questions and I will be listening, watching and taking notes. I will likely have some questions to ask you that come out of your conversation as well. Feel free to talk to each other; you don't have to address Debbie with each of your answers. If we're moving on to the next question and you still have something to say, please make sure that you stop us and take the time to add your thoughts, ideas or even further questions.

Please make sure that you use a voice loud enough to be picked up by the video – your teacher voice would be great! Does anybody have any questions about the process?

1. We're going to start with a broad, philosophical question that will lead us into our discussion about your experience this term with online learning and teaching. Think

about your most fundamental beliefs. How might you define the term – quality learning? (What are the attributes or characteristics of it? What might constitute a quality learning experience?)

When people find out that you've had this experience with online learning and teaching, they will likely ask you questions about that. What would you say to a parent who asks you whether a child can have a 'quality learning' experience online?

2. At the beginning of the course, many of you indicated that you weren't sure how online learning could support a variety of learner needs (eg, learning disabilities, gifted learners, kinesthetic learners, varied learning styles). Now that you've had some experience with distributed or online learning, do you hold the same point of view?

3. At the beginning of the course, many of you had concerns about the lack of personal contact, social interaction and face-to-face contact in the online learning environment. What are your thoughts about that now?

4. In the exit surveys, most of you said you felt well-prepared to teach online now. What was it about your experience in this course that has made you feel more prepared to teach online?

5. What impact has this experience had on your understanding of teaching and learning with technology?

6. If the university were to run this course again, what would you suggest could be improved or changed?

Other Questions:

Some of you mentioned that knowledge of 'online pedagogy' was important. What does 'online pedagogy' mean to you?

If you found yourself with a f2f classroom job next year, what would you share with colleagues about distributed learning?

Is online learning for everyone? Why or why not?

Is online teaching for everyone? Why or why not?

What would you say is the most important thing you will take away from this experience?

At the beginning of the course, many of you were unsure about the effectiveness of online learning. What do you think about that now?

Appendix G: Unstructured Interview Questions

INTERVIEW QUESTIONS (PARTICIPANT F)

1. You were originally concerned about not being to judge how students were learning because you couldn't see them. How do you feel about that now after having taught online in summer school?
2. You commented earlier that 'learning about the technology means learning about the students as well'. Can you explain that?
3. After your experience in the Distributed Learning course, how prepared were you to teach online? What surprised you?
4. What do you think the online environment asks of its teachers that is different than in the classroom?
5. In terms of your time, how much did you have to commit when you were teaching online? How did you manage your time?
6. What might you do differently if you were given another chance to teach the same online courses again?
7. What will you take from this experience into your face-to-face teaching practice?
8. How did you feel about the technology involved in your online teaching experience?
9. How did what you learned about online design impact your experience as an online teacher?

