MAKING SENSE OF CONVERGING TECHNOLOGIES AND NEW MEDIA:

A STUDY OF DISTANCE EDUCATION COURSE DEVELOPERS

by

CATHERINE PATRICIA VAN SOEST

B.A., Simon Fraser University, 1983

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF ARTS

in
THE FACULTY OF GRADUATE STUDIES

Department of Educational Studies
(Adult Education)

We accept this thesis as conforming
to the required standard

THE UNIVERSITY OF BRITISH COLUMBIA

March 2000

© Catherine Patricia van Soest

In presenting this thesis in partial fulfilment of the requirements for an advanced degree at the University of British Columbia, I agree that the Library shall make it freely available for reference and study. I further agree that permission for extensive copying of this thesis for scholarly purposes may be granted by the head of my department or by his or her representatives. It is understood that copying or publication of this thesis for financial gain shall not be allowed without my written permission.

Department of Educational Studies

The University of British Columbia
Vancouver, Canada

Date April 13, 2000

DE-6 (2/88)

ABSTRACT

Distance Education, as it is practiced today in the Western world, is undergoing rapid change. This is no less true within the British Columbia distance education community. This change is due, in part, to the increasing speed of technological innovation, specifically in the convergence between broadcast, telecommunications, and data communications fields (Bates, 1994). Therefore, a research study was conducted to look at the phenomena of converging technologies and new media (CT/NM) and their impact on course development decisions in distance education for adult learners. Specifically, the purpose was to describe how selected distance education course developers were conceptualizing, or making sense, of CT/NM.

This study was conducted with eight distance education course developers from two education institutions in the Lower Mainland of British Columbia, Canada between May and June 1999. Five participants were from the Open Learning Agency and three were from University of British Columbia's Distance Education and Technology Unit (DE&T). A qualitative research methodology, based on an interpretive understanding and using participant interviews and document analysis, was applied.

Three conclusions emerged from the study. First, the course developers' practices were being affected by CT/NM and as a result, some new planning considerations and four new course development practices were emerging. The four practices were media and technologies replacement, hybrid course development, resource-based course development and structured information. Secondly, the course developers were applying an enhanced systems-based course development model and moving towards a new course development

paradigm, based on networked multimedia and using post-fordist production processes. The final conclusion was that there were six specific organizational issues that could enable or impede the success of CT/NM for the course developers in this study. These issues were roles, training and professional development, delivery systems, funding arrangements, intellectual property policies, and new opportunities. Overall, the course developers in this study were making sense of CT/NM within their practices pragmatically, in an incremental and evolutionary way.

Based on the conclusions from the study, three suggestions for further study were also provided.

TABLE OF CONTENTS

LIST OF TABLES

ACKNOWLEDGEMENTS

Studies such as this are not possible without the help of many people. First and foremost, I would also like to thank the participants in this study. Your generosity in sharing your experience, views, insights and time was truly remarkable and stands as a wonderful contribution to the community of adult and distance education practitioners. I learned so much from all of you.

I would like to thank my Thesis committee, Tom Sork (Chair), Dan Pratt, and Tony Bates for your interest in this topic and for the stimulating conversations we have had over the last year and a half. Writing a thesis is a journey over time and into new territory. You have truly made me think and have helped percolate many ideas. As a result of our conversations, I have even more questions than I had when I began this thesis. Your support and generosity of time have been very much appreciated.

This study would not have been possible without permission from the contexts where the course developers work. I'd like to thank Tony for his support in allowing me to invite participants from the Distance Education and Technology Unit at the University of British Columbia; and Don Black and the Ethics Committee at the Open Learning Agency for allowing me to invite some of our colleagues to participate.

While at the University of British Columbia in the Adult Education Program, I have had the benefit of excellent teachers in the courses I took. I learned a lot from everyone. I would also like to thank Ricki Goldman-Seagall for her inspirational teaching of qualitative research. I had the pleasure of taking two courses with Ricki, where we explored new dimensions in how we not only see the world, but how through technology we can attempt to make sense of it.

Finally, I would like to thank my parents, Pat and Kees, and sisters Margaret, Linda, and Chris (and family) for your encouragement and support as you have traveled this journey with me.

CHAPTER ONE

INTRODUCTION

Distance Education, as it is practiced today in the Western world, is undergoing rapid change. This is no less true within the British Columbia distance education community. This change is due, in part, to the increasing speed of technological innovation, specifically in the convergence between broadcast, telecommunications and data communications fields (Bates, 1994, p. 3). There are more technologies to choose from than ever before. The distinction that did exist between these technologies and the resulting media is becoming less recognizable (Witherspoon, 1997, p. 11). This evolution presents many challenges for British Columbia course developers working in distance education. They have to sort through these technological innovations and determine how best to make use of these in providing learning opportunities for adult learners.

Distance education is often defined as a situation where there is a physical separation between the teacher and the learner; and communication between teaching and learning is mediated through specific media and technology (Garrison, 1989, pp. 2-8; Keegan, 1993, p. 120; Verduin & Clark, 1991, pp. 8-12). As technology changes, the opportunities to apply new technologies and media to enable the distance education process grows. This is exciting. However, it is not without its challenges. After spending over ten years in the technology applications side of distance education, I have found that people involved in developing distance education courses often face a number of challenges in incorporating new technologies and media into their programs. This has stimulated my interest into how they make sense of these new technologies and media in

their course development practices. Therefore, I conducted a research study to look at the phenomena of converging technologies and new media (CT/NM) and their impact on course development decisions in distance education for adult learners. Specifically, the purpose of this research study was to describe how selected distance education course developers are conceptualizing CT/NM. How are CT/NM affecting their course development and delivery activities? What kinds of course development and delivery models are emerging as a result? What structures enable or impede their ability to take advantage of these? It is important to know how educators selected for this study are reacting to the changing landscape, and how they are conceptualizing the new opportunities for distance education delivery as provided through CT/NM. By talking with a select group of course developers, we will gain some insight as to how CT/NM are affecting distance education courses destined for use by adult learners.

The Context: Converging Technologies and Global Access

Technological convergence is a global phenomenon. It is also borderless. These two factors provide distance education course developers with both opportunities and threats. Courses can be developed for a world-wide audience and taken by learners anywhere willing to pay the course fees. Through the capabilities enabled by technological convergence, the opportunities for teaching and learning activities and designing course materials multiplies (Witherspoon, 1997, p. 12). As well, there is greater opportunity for partnerships, particularly with the private sector. This provides great opportunities for distance education providers. It also means that institutions outside a traditional college or

university region can attract new learners, multiply their teaching and learning activities and course materials, and set-up partnerships. Daniel (1996) agrees with this, stating

> With the modern technology of the World Wide Web it now seems possible to offer distance education throughout the globe, albeit only to the tiny fraction of the world's population that currently has access to this technology. Most people in the world have yet to make a telephone call. (p. 11)

For adult learners in the Western world, educational opportunities are opening up and providing new choices in how they can participate in their learning endeavors. As well, institutions can attract new learners from non-traditional markets.

The Significance of the Study: Capturing Change in Course Planning

Knowing that some adult learners have technology access and others do not, and knowing that technology is continually changing, where along the continuum of technological change should a course developer commit to? Paul (1990), in discussing the use of technology within open learning institutions, suggests that there can be "dangers in being 'first' in with technology" (p. 131). There needs to be "an appropriate balance between being on the 'cutting edge' and ensuring that its investment is secure" (p. 131). Pilot testing of new technology, he suggests, is necessary before moving forward to full adoption. Bates (1995) suggests in order to take advantage of a new technology, there is a need to address organizational issues with regard to teaching and technology support structures:

> The need to exploit an already existing technological infrastructure within an institution can be a major conservative influence limiting the application of new technologies. Thus if a heavy investment has already been made in a particular technology, with both capital equipment and permanent staff, it is likely that the head of department responsible for production in that area has a senior decision-making role, because of his or her control over a large budget. (p. 58)

Bates suggests that unless funds are shifted within the organization, it is very difficult to justify the move to a new technology (p. 58). The power structures already in place and in charge of a particular technology may block any move to change from the established technology to a new one.

Access to the equipment by learners may also prove to be a barrier. Collis (1996) states that there is still a technical division between television and video kinds of tele-learning and Internet tele-learning capabilities (p. 548). Until there is an affordable and portable computer capable of working in a variety of technological contexts, she says that it will be difficult to reap the benefits of tele-learning.

This opportunity to exploit new technologies is further complicated by the way these are applied in teaching and learning situations. Bates (1995) states:

> Unfortunately, though, it is common for educators and media specialists to carry over modes of design associated with an 'old' technology to a newer technology, even though the new technology may have inherent design advantages (or disadvantages) over the old technology. Thus professors often use television to relay lectures, rather than exploit television's presentational characteristics. There is therefore a need to reconsider the design of teaching and learning activities when technology is being used. (p. 9)

Thus, course developers are constantly in situations where they have to weigh a number of factors concerning converging technology, its evolution, its capabilities, its expense, and access that adult learners have before committing to a direction. This

presents both a dilemma and a challenge. By talking with distance educators involved in developing programs and courses for these times, I was able to capture a sense of how they were both coping with the opportunities and challenges in their course development practices that result from continuous, and sometimes dramatic, technological convergence.

Study Design

Using a qualitative research methodology, based on an interpretative understanding of reality, I interviewed eight course developers working in distance education, and developing programs, courses, and learning resources for adult learners. This study took place over a two month period, May - June 1999. The course developers were from the Open Learning Agency (OLA) and the University of British Columbia's Distance Education and Technology Unit (DE&T). They were selected as a result of their years of experience in using media and technologies in distance education and their experience with CT/NM-related course applications. Their stories and comments show how they are making sense of CT/NM in their practices and how they are developing courses to meet the needs of adult learners. Although this study is based on a small number of course developers, it attempts to provide an understanding of the directions that a selected group of educators are pursuing with regard to CT/NM.

Review of Proceeding Chapters

There are six chapters following this initial chapter. In Chapter Two, I will provide a review of current literature. The purpose of the review is to enable us to see what is happening in the distance education field and to use this as a basis to analyze the study results. In Chapter Three, I will present the methodology for obtaining the data for this

study. I will also provide greater detail on the criteria for selecting the course developers who participated in this study.

Chapter Four will contain background on the two contexts, OLA and DE&T, selected for this study. I will also introduce the participants involved in the study and their roles within their contexts.

In Chapter Five, I will provide the results from the study including the participants' course development models and views on CT/NM effects, emerging practices, and new course development considerations. Following in Chapter Six, there will be a discussion of these results and some possible explanations for the findings. I will also present my conclusions from this study. Finally, in Chapter Seven, some suggestions for further investigation into the effects of CT/NM on course development will be presented.

CHAPTER TWO

LITERATURE REVIEW

In this chapter, I will provide definitions of the terms used in this study. Following, there will be a discussion of technologies and media in society, the technology generations of distance education and how these have been evolving, and how distance education is being transformed by technological change. Finally, there will be a discussion of the current and emerging course development models used in distance education. To conclude this chapter, I will present a conceptual framework for distance education paradigms and suggest a method for analyzing the data collected in this study.

Defining Terms and Relationships

There are many terms used in this study that require some definition. First, we need to distinguish between the terms, medium and technology; and following, we need to define the terms, technological convergence and new media. Secondly, we need to understand the relationship between distance education, adult education and course development.

Distinguishing Between A Medium and A Technology

Often there is confusion between the terms, medium and technology. Sometimes these terms are used interchangeably and sometimes there is actual overlap between them. Bates (1995) provides a very useful definition for the purposes of this research study:

> The term medium is used...to describe a generic form of communication associated with particular ways of representing knowledge. Each medium not only has its own unique way of presenting knowledge, but also of organising it, often reflected in particular preferred formats or styles of presentation. A single medium such as television may be carried by several different delivery *technologies* (satellite, cable, video cassette, etc.). (pp. 29-31)

Bates states that there are five important media in education: direct human contact (face-to-face); text (including still graphics); audio; television; and computing (p. 31). The technologies associated with text include print and computers; while those associated with audio are cassettes, radio and telephone. Television has many technologies associated with it including "broadcasting; video cassettes; video discs; cable; satellite; fibre-optics; ITFS;[1] microwave;" and "videoconferencing." Computing also has a number of technologies associated: "computers; telephone; satellite; fiber-optics; ISDN;[2]" and "CD-ROM" (p. 30). However, Bates states that the "distinctions between media and technologies will become less meaningful as they become integrated into single machines or transmission systems" (p. 31). For example, he says it can be difficult to determine whether computing is a medium or a technology.

---

[1] ITFS stands for Instructional Television Fixed Service, which is a form of a terrestrial broadcast transmission system. This service is used primarily in the USA by educational institutions to provide a one-way, close-circuit television service to specially-equipped receive sites using broadcast frequencies not available to the general public (Bates, 1995, p. 63).

[2] ISDN stands for Integrated Services Digital Network, which allows voice and data to be carried within the same network digitally. Many educational institutions use ISDN-based connections for video conferencing.

Defining Technology Convergence and New Media

The key question that must be addressed for a study such as this is "What do people mean when they use the term 'technological convergence'?" Several authors (Bates, 1995, pp. 228-229; Burge & Roberts, 1998, p. 58; Collis, 1996, p. 544; Witherspoon, 1997, p. 11) have proposed definitions. These definitions generally characterize the phenomenon of technology convergence as a blending of computer communications, telecommunications, and television broadcasting. The effect of technology convergence is changing what we have known previously to be distinct services. Deregulation of the telephone and cable industries is changing the media that each of these industries is allowed to carry. Telephone companies can now deliver television, and cable companies can now carry voice and data communications.

Technological convergence is creating new competition in the marketplace and enabling new opportunities for distance education. New services, such as the recent move by both cable operators and telephone companies to provide Internet access, are becoming available and as a result of this competitive environment, costs of services may also be less.

As well, increased competition means that due to the variety of suppliers, distance education providers no longer have to build and provide their own services. For example, distance education organizations no longer have to provide their own audioconferencing or Internet services in order to provide interactive learning opportunities for learners at a distance. The greater choice of vendors means that services are available at a reasonable cost in the marketplace. If the cost provided by one vendor is too great, there is always another vendor ready to step in and provide a more justifiable price for service.

The convergence of technologies is affecting how content is developed, published and delivered (Tapscott, 1996, p. 219). It is creating a new media industry, which Tapscott suggests is the "engine of the new economy." He further states

> This convergence is changing all the rules. For example, things that cost money in the old economy are now available free. And things which were once free are costing money. (p. 219)

The role of publishers or producers changes in this new media paradigm (p. 225, p. 230). Readers or viewers, usually in a passive role in the old media paradigm, can now become their own publishers or producers by selecting the information they require from a variety of sources and customizing this to meet their preferences. This affects the way that mass media are developed and produced as "everyone potentially becomes a producer" (p. 324). The focus shifts from mass media to what Tapscott calls, "molecular media."

Definitions and Relationships

For the purposes of this study, it is useful to understand some of the definitions and relationships between key terms. Moore and Kearsley (1996) suggest that " 'Courses' are produced at all levels of distance education" (p. 4) and that there is sometimes confusion between the terms, course and program. "Sometimes 'program' will refer to audio or television programs that make up part of a course. Sometimes an institution, unit, consortium, or program will refer to its 'program' as a generic label to indicate its total offering of courses" (p. 4).

Selman and Dampier (1991) suggest that program planning is central to adult education. The term reflects "the process by which programs are researched and developed so as to meet the multitudinous learning needs and desires of adult learners" (p.

109). Distance education is one form of programming that is used to meet the needs of adult learners. Distance education "seeks to eliminate access barriers such as those imposed by geography and time constraints in order to increase participation" (p. 108). As a form of programming, distance education benefits both the learner and the institution which provides the program. Through distance education, a learner is able to meet his or her learning needs and an institution is able to carry out its mandate to provide educational opportunities for adult learners.

The result of a planning process is usually a fully-designed program (Selman and Dampier, 1991, p. 109). The design can be seen, but there is no way to know how the design was reached. "The decisions taken during the planning process by the planner can only be inferred from the final design" (p. 109).

While "program planning" is generally the term used in adult education, the term, "course development," is usually applied for the same kinds of activities in distance education. The leader of the course development process for a particular course or program is often known as the project manager (Bates, 2000, p. 67).[3] This role is usually performed by a senior course manager who has significant experience in designing and administering the course development process in a distance education environment. The project manager may be in charge of the development of one course as part of a distance education program. Alternatively, she or he could be in charge of a specific distance education program, comprised of several courses. Project managers in distance education generally have strong instructional development backgrounds, coupled with practical

[3] During the research phase of this thesis, I used an "in-press" edition of Tony Bates' book. However, when the published edition became available, the references were updated to reflect this.

experience in project management, course administration and delivery. A project manager of a course development team is not generally the content expert for the courses being developed in autonomous or dual mode distance education institutions. However, in some cases, the project manager sometimes takes on the role of content expert in addition to other development duties.

Technologies and Media in a Social Context

In this section, we will look at the social implications of communications technologies and media including how these impact on interaction; some effects of new technologies and media; and the potential transformative effects as a result of digitization. Following, there will be a discussion of the implications of communications technologies on adult education.

Communications Technologies: Social Implications

To successfully select the appropriate technology or medium, course developers must understand communications technologies and media in the social context. Lewis Mumford (1963) states:

> Communication between human beings begins with the immediate physiological expressions of personal contact, from the howlings and cooings and head-turnings of the infant to the more abstract gestures and signs and sounds out of which language, in its fulness, develops. With hieroglyphics, painting, drawing, the written alphabet, there grew up during the historic period a series of abstract forms of expression which deepened and made more reflective and pregnant the intercourse of men (i.e., sic). The lapse of time between expressions and reception had something of the effect that the arrest of action produced in making thought itself possible. (p. 239)

In this quotation, Mumford provides two key and opposite ideas: communication should be instantaneous and personal; and communication should be the result of reflective thought. Thus, over time, humans have invented communications media to express their abstract thoughts and to leave records for others. Mumford sees the difference between real-time interaction and delayed response time as a bridging of time and space (p. 239). He suggests that technological advances are bringing communications between individuals back to real-time, personal interaction, thus bridging factors of distance and time. He also suggests that the immediate meeting will be limited only by factors of energy, mechanical perfection, and accessibility. The mechanical perfection of a machine or a technology must have the capacity to complete the communications between individuals over space and time. The factors of energy and mechanical perfection would not be useful to individuals if they were not accessible. So, accessibility becomes very important.

Mumford states further that "*As with all instruments of multiplication the critical question is as to the function and quality of the object one is multiplying*" (p. 241).[4] Technology, as manipulated by humans, can be multiplied. Function and quality are important in that they provide a determination of requirements for the use of technology. Mumford adds another warning: "One is faced here with a magnified form of danger common to all inventions: a tendency to use them whether or not the occasion demands" (p. 240). He sees technological inventions, particularly communications technologies, as having greater dangers than benefits for society. However, in understanding how these technologies function, course developers can ensure that they apply technologies when they are best suited to the learning situation. They can also ensure that these are used

[4] The italics are Mumford's.

beneficially on every occasion for the good of many instead of for the benefit of those who control how they are used.

As Bates (1995) suggests, people often have difficulty adapting to new media and technologies (p. 9). This factor was also recognized by Marshall McLuhan in the 1960s when he looked at how new media changed the way content was presented. Logan (1995) interprets and summarizes Marshall McLuhan's work with regard to the counterintuitive nature of technologies and media and relates this to the increased use of computers:

> The effects of media are complex because of the vast energies they release, the wide scope of their impact, and their subliminal natures. It is therefore understandable that, frequently, their impacts are counterintuitive. Henry Ford thought that by making the Model T affordable, Americans would be able to enjoy the countryside; instead, the automobile destroyed much of the countryside. The counterintuitive effects of technology occur because their side effects overwhelm their intended or desired function. The increased access to information made possible by computers has flipped into information overload because the approach to the use of the computer is based on an industrial-age mentality and attitude. (p. 27)

New technologies and media often have the reverse effect than originally expected and therefore can be seen to be counterintuitive. Logan talks about information overload. Collis (1996) talks about "bottlenecks" on the "information highway" as a result of "traffic jams" (p. 543). In solving one problem, we often find another one in its place.

McLuhan suggests that there are four 'laws of media', which Logan (1995) interprets and summarizes as follows:

1. Every medium or technology enhances some human function.
2. In doing so, it obsolesces some former medium or technology which was used to achieve the function earlier.
3. In achieving its function, the new medium or technology retrieves some older form from the past.
4. When pushed far enough, the new medium or technology flips or reverses into a complementary form. (pp. 27-28)

For example, Logan illustrates how these laws of media apply to computers and the relationship of the computer's enhanced capabilities for education:

> Computers enhance the individual's access to information, "retrieve" the generalist's approach to processing information, and hence obsolesce the specialist or the expert. Computers retrieve individual learning and hence obsolesce mass education. The computer, if pushed far enough, will flip into information overload in which the quantity of information overwhelms the user and no pattern becomes discernible. The challenge facing schools and the workplace, therefore, is to provide context and relevance to information and "learning." (p. 29)

Logan makes a key point: how can we make effective use of computers to aid in learning given the overwhelming nature of information that can be accessed through computers? How can those planning programs and courses make best use of computers in the learning process? These are key questions that course developers need to address when designing for CT/NM environments.

In computing, particularly, startling changes are occurring. Tuller and Oblinger (1997-98) suggest that information technology is a transformation agent and will likely have the following effects:

> Advances in computing technologies, such as high-resolution displays, 3-D graphics and animation, handwriting and speech input, and natural language understanding will be used to improve the end-user interface, to facilitate personal interaction and customization with computers. (p. 38)

Tuller and Oblinger further suggest that due to increasing technological change, "two social forces will drive change: (1) the increase in the value of time, and (2) the recognition that information technology is a competitive differentiator" (p. 41). They see that information is becoming available on a global level:

> Information is being digitized. The significance is that the conversion of text, graphics, images, and video into bits gives information a digital passport to travel across global networks. Powerful new communications technologies are giving networks the bandwidth needed to handle rich but space-consuming content like video, MRI (magnetic resonance image) scans, or great works of art. Networks are developing the speed to support interaction, enabling two-way communication and collaboration. Together, digital content and high-speed networks make the once-improbable entirely possible. (p. 41)

Tuller and Oblinger seem to be echoing Mumford when they suggest that what could not be done previously is now attainable through technological change. New opportunities become possible such as digitization. Digitization is a direct outcome of technology convergence. The fact that radio and television spectrum and terrestrial telecommunications systems can be digitized enables much more opportunity for content to be delivered in many different forms. From minor bits of information to full courses and works of art, these artifacts are available at an instant across space and time. This may have a revolutionary effect on how we conceive of the transmission of content, ownership, and access by learners across borders.

Communications Technologies and Adult Education

Florini (1990), in discussing the use of communications technologies in adult education, states:

> in a society where information is increasingly a source of power, citizens in a democracy need to be literate about communications technology to maintain their independence and to avoid being manipulated by people who do not understand the technology. (p. 388)

Like Mumford, Florini sees that new communications-based technologies and media present both a threat and an opportunity. Although technology is value-neutral, -- that is,

it can not make decisions -- people can and do make decisions about how to use it. Florini suggests that communications technologies act as threats in that they can be used by some to manipulate others. However, she also states that communications technologies provide tremendous opportunities to develop new ways of providing educational opportunities for adults. Adult educators need to be aware of the new communications technologies and how to respond to them so that they can prepare adult learners in understanding their benefits and drawbacks. She states that communications technologies are having a transformative effect on adult education and as a result "our field faces the challenge of understanding, responding to, and directing the changes that communications technology makes possible in adult education" (p. 367).

This challenge is both personal and professional. To understand how to use communications technologies in adult education programs, adult educators, on a personal level, need practical experience with various technologies to know the "strengths, limitations, and implications" (p. 367), a similar idea presented by Anderson (1996, pp. 121-122). On a professional level, adult educators need to develop an understanding of the implications of communications technologies in the "social, economic, and political" (Florini, 1990, p. 367) realms and interpret how these will affect the adult education field.

However, Florini states that although communications technologies provide tremendous opportunities for delivering adult education programs, it is sometimes difficult to understand how to use these technologies effectively. She asks "what determines 'appropriate technology'? Which factors relate to 'cost-effectiveness'? How do you help ensure that communications technology is used in a 'humanly sensitive manner'?" (pp. 373-374). Florini's questions are valid. It is not possible to use technology effectively

unless a number of factors are examined to determine the appropriate selection for the learning situation concerned. She states that planning is required to provide answers to the questions she poses. It is not possible to select a technology to solve an educational problem unless the problem is known and understood within the context that it occurs.

Distance Education and Technology

Within distance education program delivery during the twentieth century, technology has played a prominent role (Bates, 1995, p. 28). Each new technological wave seems to have an impact on how programs are developed and delivered to adults. In this section, we will look at the three generations of technology, as provided by Nipper. Following, we will look at how these technology generations have been applied in distance education, and discuss some emerging technological opportunities.

Third Generation Distance Education

Nipper (1989) provides a framework for viewing how technology has been used in distance education over time. He suggests that there are three generations of distance education: "the terms first, second, and third generation distance learning refer to three models of distance education, which are linked historically to the development of production, distribution, and communications technologies" (p. 63). The first generation of distance education is characterized by correspondence teaching. This type of distance education is provided through "written or printed material" (p. 63). Nipper states that

> First generation distance learning has in fact been practised throughout the history of Western civilization, but it expanded in terms of quantitative efficiency when, by the end of the nineteenth century, new printing techniques and railway system made possible the production and distribution of teaching materials in large quantities to geographically dispersed learner groups. Learner-teacher and teacher-learner feedback processes were slow, sparse, and mostly restricted to the periods when the learners submit scheduled assignments. (p. 63)

With second generation distance education, multi-media teaching elements such as "broadcast media, cassettes, and – to some degree – computers" have been combined with the traditional correspondence teaching material. This generation of distance education began during the 1960s; however, the feedback process between the learner and the distance education provider remained very much the same as in the first generation.

Both these generations of distance education capitalized on "the production and distribution of teaching/learning materials to learners." However, interaction with and between learners was largely marginal or non-existent. Nipper suggests that this might have been because interaction systems were not all that "available outside of laboratories" (p. 63). Thus, those working in distance education focused on the use of one- or two-way communications systems as the technology delivery media. But Nipper finds this an inadequate explanation. While there has been a great availability of one-way and two-way communications systems, there has been a very low priority given for communication. This has benefited the "educationally already privileged learners, and has to a certain extent 'expelled' the educationally or socially weak learner" (p. 64).

For Nipper, "Noisy learners are active and creative learners" (p. 71). Since there has been limited communication in traditional distance education between the learners and

those who have developed the material, and there has been virtually no communication between the learners, there is no learning in the sense in which it occurs in the classroom.

Nipper sees learning as a social process; however, he says that distance education has always been the opposite of this. Distance education is authoritarian "as it imposes text or broadcast material upon learners as if the learning material comprises the eternal truth about the given subject" (p. 65). He also finds that distance education is non-interactive and "isolates learners from each other" (p. 65). Without communication as part of the learning process, the social and cognitive aspects of learning are lost. Learning becomes individual. Thus, for first and second generation distance education, "the media available and the communication processes...imply a specific approach to distance teaching and learning processes" (p. 64). Communication between the learner and the material takes place in the "approving or disapproving comments on the answers given by learners to the answers on the pre-printed assignments."

Nipper suggests that the learning situation is different for third generation distance education. He states that:

> *communication*, and learning as a social process, will be the key elements in the conceptual development of third generation models of distance learning. It is not possible to promote the notion of learning as a social process without access to interactive communication facilities. In this respect we are now technologically ready (or almost so) to make the move from first and second generation to third generation systems. (pp. 64-65)

Nipper suggests that the core technology employed for third generation distance education is computer conferencing. The idea is that through computer conferencing, adult learners will overcome more than just geographic distance. They will overcome "social distance" (p. 71) as well. Computer conferencing is an "open and democratic medium" and it "will

move the locus of control in distance education from the teacher and the teaching material to the group and the processes generated by the group" (p. 71). Course materials can become more dynamic as a result of employing this technology.

> Computer conferencing is likely to allow for much more openly structured curricula, thus not only reducing the production and storage costs that are traditionally associated with distance learning material, but also making possible much quicker updating and revision, and even individually tailored courses. In this respect, third generation distance education will be adjusted to the specific needs of the individual learner or learner group, something which is becoming increasingly important. (p. 71)

In Nipper's framework, it seems that he has presented similar themes to those presented by Florini and Mumford with regards to the concern for the use of communications technologies. There is a responsibility to ensure that the use of communications technologies enables a dialogue between message originators and receivers, or in education terms, between those in teaching roles and those in learning roles. There is the opportunity for reflection before sending messages to other learners, an idea important in Mumford's view of communication technologies. The goal of third generation distance education seems to be to open up a democratic use of communications technologies in distance education and to move away from the authoritarian use of one-way and two-way technologies. The transformative effect of a new medium, such as computer conferencing, and the possibilities for changing the way teaching and learning are provided over distance seems to fit with the first three steps of McLuhan's laws of media. Through computer conferencing, the social aspect of learning apparent in classroom learning is retrieved from the past.

Third Generation: Some Applications

Nipper's framework is useful for analyzing where distance education has been and where it is going in the Western world. Primarily, distance education has made use of the technology of print and this is still the case today. This fits with Nipper's description of first generation distance education. But other electronic technologies have also been used to provide direct instruction or to augment the print components, which fits into his concept of second generation distance education. For example, with the invention of radio, education for adult learners was provided over the air waves. In Canada, the National Farm Radio Forums developed by the Canadian Association for Adult Education (CAAE) in cooperation with the Canadian Federation of Agriculture were broadcast by CBC radio (Selman & Dampier, 1991, p. 51). In the United States, several universities and local public television stations provided educational courses into learners' homes (Knowles, 1977, p. 325). Television, too, had a big impact particularly in Britain and was reinforced by the development of the Open University (Bates, 1995, p. 66).

In British Columbia (B.C.), a number of educational institutions participated in the Hermes satellite trial in 1977-78, called the Satellite Tele-Education Project (STEP), which led to the ANIK-B satellite trials in 1979-80 (Forsythe, 1984, p. 61). The purpose of these trials was to test the use of satellite technology to deliver educational courses over distance. These trials were followed by the development of the Knowledge Network of the West Communications Authority in 1980. As an educational television broadcaster, Knowledge Network provided many telecourses developed by B.C. post-secondary

institutions or acquired through consortiums[5] as well as many general education programs. These courses and programs were provided in a variety of ways: pre-taped general education programs; pre-taped telecourses; and "live" telecourses with two-way, voice communications by telephone (Forsythe, 1984, p. 62).

Although portability and independence remain key instructional design strategies within distance education course development, there is evidence of the communicative nature of Nipper's third generation distance education in B.C. beginning during the middle to late 1980s. Telephone tutoring was -- and still is -- being provided by many B.C. distance education providers to enable social interaction and course support between the learner and his or her tutor. However, connecting learners together during courses has been more difficult. Many distance education providers have made use of audioconferencing as a way of connecting learners (Robertson, 1986, p. 288). Audioconferencing, although place independent, requires that the tutor or instructor and learners have access to a telephone at a specific time. As well, it means that learners have to be at the same stage in their course in order to get the most out of the sessions. Thus, the use of audioconferencing has an impact on the independent study nature of most distance education courses.

In the early 1990s, two-way videoconferencing became a reality for many B.C. post-secondary institutions. Funded through Skills Now Innovations grants from the Ministry of Education, Skills, and Training, several institutions invested in the infrastructure to enable videoconferencing for course delivery between their campuses and

[5] The Knowledge Network also broadcast several telecourses licensed by the Open Learning Institute (OLI) from the British Open University. This could be viewed as a move towards globally accessible, borderless media.

between institutions (Forer, 1996, April, p. iii; Soules, 1996, October, p. 1; University College of the Cariboo, 1995, June, p. preface). Most of the institutions selecting videoconferencing as a delivery model were interested in extending their main campus offerings to the regional campuses, such as the videoconference pilot project developed by Malaspina University-College (Soules, 1996, p. 1). Some institutions such as the University of Victoria and University College of the Fraser Valley participated in inter-institutional course delivery (Forer, 1996, p. 1). With current videoconferencing room-based systems, learners may have the social opportunities to learn with others over distance; however, it still means that they have to be at a specific place and time in order to participate. Since these systems are normally accessible at the campus only, videoconferencing is less flexible for learners than audioconferencing.

At about the same time, OLA began to use the First Class computer conferencing system for course delivery (Bates, 1995, pp. 216-217) and made its system available on a fee for service basis to University College of the Fraser Valley (Bradshaw & O'Brien, 1997, p. 3). However, those slow to get on board with computer conferencing through systems such as First Class have been able to take advantage of technological change. Since 1995, the World Wide Web (Web) has become a significant factor in the promise for ubiquitous, global distance education course delivery (Collis, 1996, pp. 559-560). It can be considered to be the most important convergence-based innovation for distance education. Already, B.C. educational institutions have been taking advantage of it. University of British Columbia's Distance Education &Technology Unit (DE&T) has recently been using the Web to deliver graduate-level distance education courses

internationally (Bates, 1997, June 18-20, p. 3). Several B.C. universities and university-colleges are also making their course materials available through the Web. [6]

Emerging Opportunities

The opportunities provided as a result of the development of new media and technology are forcing a re-thinking of teaching and learning (Bates, 1996, December, p. 8; Dede, 1996, p. 5; Owston, 1997, p. 27). Most developments are taking place as a result of improved computing capability and a fundamental underlying assumption that collaboration between learners is important to facilitate higher order learning (Garrison, 1997, p. 5). Computer mediated communication (CMC) has been applied in recent times to stimulate collaborative learning (Harasim, 1989, p. 52; Harasim, Hiltz, Teles, & Turoff, 1995, p. 4; Hiltz 1993, p. 251). The idea that collaborative learning is a desirable requirement of teaching and learning over distance is being applied to new technological developments such as the Web. The Web provides a variety of tools that can be used in teaching and learning environments: graphical interface, asynchronous text-based conferencing, real-time chat, links to resources, videoconferencing, file transfer, and white boarding. In many senses, it is the result of convergence between graphics, text, audio, and video technologies. Because the Web provides a "rich, multisensory, interactive" (Owston, 1997, p. 30) environment, educators have the opportunity to develop course material to meet a diverse range of learning styles.

[6] See the Distributed Learning Course Directory (http://dlcd.ctt.bc.ca) developed by the Centre for Curriculum, Transfer, and Technology for a listing of the on-line courses available through the BC colleges, institutes and agency system.

Several institutions world-wide have begun to develop courses delivered via the Web. Many are the result of a single faculty member interested in providing his or her course in a new way (Bates, 1996, December, p. 11). However, Owston cautions, the Web, like any medium, is not an end in itself. The success of Web-delivered courses is related to how the pedagogical model is applied. He suggests that the Web lends itself well to collaborative constructivist course design, where participants can equally create pieces of content.

Garrison (1997) also suggests that the Web can be used effectively for constructivist-based learning environments through the application of Web-based conferencing systems. Computer conferencing delivered via the Web is transformed from a "single media (text) to a multimedia environment" (p. 4). For Garrison, learners can share "hypertext links and multimedia resources in their contributions to the computer conference (Woolley 1996)" (p. 4).

Dede (1996) suggests that these new forms of media and technologies are having a transformative effect on distance education. Distance education, for Dede, is normally applied to "overcome problems of scale (not enough learners in a single location) and scarcity (a specialized subject not locally available)" (p. 30). He suggests that traditional synchronous group distance education is presentation-based and replicates " 'teaching by telling' across barriers of distance and time" where as these new environments enable " 'learning-through-doing-environments' available at any place and any time" (p. 4). With access to resources through information networks and with interactive opportunities, distance education becomes something new. For Dede, distance education becomes

distributed learning, which enables access to resources and learning opportunities virtually anytime and anywhere.[7]

There is interest in the development of standards for structured information management systems to enable course materials to be re-used for a variety of formats. One of the emerging standards is Standard Generalized Markup Language (SGML) which allows for the organizing and tagging of items in documents,[8] through the application of "meta-tags." By creating the materials in a SGML framework, there is the potential to adapt the materials for a variety of delivery mediums. This means that course developers in the future may be able to avoid having to re-develop materials for each new medium that comes along. SGML also enables the exchange of materials between organizations following the same structured information management system standards.[9] New electronic publishing capabilities available through innovations such as these will enable the swapping of bits of learning material across networks between course developers, spurring an "educational object economy" (Morrison, 1998, May 1).

---

[7]Distributed learning can be defined as "a learner-centered approach to education, which integrates a number of technologies to enable opportunities for activities and interaction in both asynchronous and real-time modes. The model is based on a blending of a choice of appropriate technologies with aspects of campus-based delivery, open learning systems and distance education" (Institute for Academic Technology, University of North Carolina, cited by Bates, 2000, p. 27).

[8] See *A Guide to SGML (Standard Generalized Markup Language) and Its Role in Information Management* available through Arbortext's Web site for a more in depth description of SGML and how it works. Also see Charles Lowry and David Chestnut's article, "Managing Technology SGML and the Digital Libraries of Tomorrow." It is important to note that SGML is not a technology but as Lowry and Chestnut explain, a "set of guidelines for developing markup systems that computers can process efficiently" (paragraph 2) and "each SGML markup system has at its core a Document Type Definition (DTD) which describes in precise terms the markup to be used in describing the 'documents' in their respective domains" (paragraph 5). It is also an international standard (ISO 8879:1986).

[9] See IMS Global Learning Consortium, Inc.'s Web site (http://www.imsproject.org) for more information.

Systems and Development Models

In this section, we will take a look at the distance education systems. Following, there will be a discussion of industrial and post-industrial views of distance education and how these effect the production systems put into place.

Distance Education Systems

Rumble (1986) suggests that to understand how a particular distance education system operates, it is necessary to look at the model of education that underpins it. He uses the framework developed by Bertrand as a way of understanding distance education systems: institution-centered models, person-centered models and society-centered models. He modified this framework slightly in 1992 by changing person-centered to individual-centered models; and society-centered to community-centered models. I will combine these definitions here. The institution-centered model is focused on mass education, where learning is treated as "the processing, storage, and retrieval of new information" (1986, p. 24). These models operate to maximize effectiveness and efficiency. Within institution-centered models operating in distance education, there is a division between the course sub-system and the student sub-system (Rumble, 1992, p. 50). "The major output of the courses (i.e., sic) system – the materials – becomes an input into the central teaching/learning process. Inputs into the student subsystem are new students; outputs are dropouts and graduates" (1992, p. 50). In person- or individual-centered models, the focus is on the growth of the individual learner and the meaningfulness of the learning situation. There is a focus on the relationship between the tutor and learner, and

providing support and interaction. In some applications of this model, the learner may be directed through learning resources and experiences by the tutor; in other applications, the learner may be able to purchase tutoring services (1992, p. 49). The last model, society- or community-centered, is involved in bringing about change in society and changing social structures (1992, p. 50). The facilitator acts as a catalyst to get people involved in a group learning situation and solve local, community-based problems. The learners may also develop their own learning materials. Rumble suggests that most distance education activities provided by formal education institutions would fall under the institution-centered approach. The focus is on serving a large number of learners. Within an institution-centered system, there is also a division between course development and course delivery functions.

Development Models: Industrial and Post-Industrial

Peters (1996) has long argued that distance education is an industrialized form of teaching and learning (p. 51). Peters states that "conventional instruction is predominately *oral*, whereas distance education is predominantly technically mediated" (p. 51). He further states:

> Whereas in conventional face-to-face teaching situations the learners' and teachers' actions are predominantly determined by social norms, an intersubjectively shared everyday language, reciprocal behaviour expectations, the internalisation of roles and the goal of emancipation, it appears that in distance education these actions are predominantly determined by technical rules, a context-free language and the learning of qualifications and skills. (p. 52)

For Peters, the teaching and learning situation is altered between the teacher and learner in distance education. The focus of the teaching-learning process changes from the means of learning to the end product of the learning process, which is often a qualification or a skill.

In Peters' notion of the industrialization of distance education, he is concerned with the broader notion of the industrial society and the teaching and learning relationship. He sees distance education as a product of an industrial society and that the teaching-learning relationship that has developed in distance education is indicative of an industrial society. Peter's broader view of distance education as an industrialized form of teaching has been linked by some distance education authors with the "fordist" production processes associated with the development of traditional (print-based) distance education (Rumble, 1995, p. 12). The term, fordism, is derived from the production processes of Henry Ford and his contemporaries who developed an assembly line process for the mass manufacture of automobiles earlier in this century. In a 'fordist' model of production as applied to distance education, course materials are developed by specialists where there is a clear division of labour and lines of authority reinforced by a central management process or bureaucracy. The result is that the course becomes the end-product of a mass production process and is provided to large numbers of learners through an institution (Peters, 1993, p. 39). The teaching style presented in the course material is didactic and meant to guide the learner through the course content. The learner studies the course independently and is matched with a course "tutor" who, as a result of the structure of distance education delivery, would likely not have been part of the original development

team. Therefore, there is usually no connection between the learner who takes the course and the course team that developed it.

However, with the development of new technologies, this may be changing in some distance education institutions or for some distance education course applications. Garrison (1997) suggests that distance education, through new technologies such as computer conferencing, has moved into a post-industrial model of teaching and learning, based on the addition of interactive communications technologies and the "ideal of both personalised and collaborative learning" (p. 3). Garrison states that

> Collaborative learning has its roots in social contructivism. That is, establishing a social environment where critical discourse is valued and where learners and teachers are encouraged 'to develop theories and ideas of their own which challenge and test the limits of traditional sources of knowledge' (Brody 1995:138). (p. 5)

Collaboration, he suggests, is critical for higher-order learning and understanding. But this does not happen by just adding computer conferencing to a course. Collaboration must be facilitated by a skilled moderator. Computer conferencing also enables participants to engage in a democratic approach to the development of course related discourse. These concepts seem to fit with Nipper's idea that third generation distance education enables "noisy learners."

Courses developed to encompass post-industrial ideas concerning teaching and learning need new methods of production. Industrialized distance education and its acknowledged fordist development processes do not work with these post-industrial teaching and learning interests as illustrated by Garrison. The ideological foundation upon which these were built is structurally different and represents different world views. What

a post-industrial world view of distance education requires is a post-fordist production process. This new production process is characterized by democratization of the workplace (i.e., decentralized control and facilitation-style of management), highly skilled, participatory and collaborative teams, and flexible production methods to enable innovation and "dynamic structural adjustment" (Campion, 1996, pp. 43-45). Post-fordist organizations also have a "heavy dependence on information technologies," provide "customized products and services tailored and adapted to needs of individual clients," and have "global operations" (Bates, 2000, p. 40).

Implementing new technologies and media into an institution's delivery scheme is often difficult, particularly if the new technology is accompanied by a new world view with regard to teaching and learning (Garrison, 1997, p. 3) and results in new production requirements. Once a specific technological infrastructure has been put into place within a distance education delivery system or institution, it is very difficult to move from this technology to another (Bates 1995, p. 58; Collis 1996, p. 443). There is an expectation that the system put into place *is* the main delivery vehicle for an institution. The entire process for course development and delivery is focused on the capabilities of the infrastructure (i.e., technologies and media) installed. When other technologies are introduced, these are usually provided in addition to the main infrastructure, and not as a replacement. As a result, distance education course developers are usually caught between producing materials or deliveries that fit within the dominant infrastructure and those that do not. Collis (1996) poses the question,

> how willing is the institution to fundamentally reconsider its general choices of technology and media? Are the video broadcasts going to change to WWW pages because of an objective analysis of their various attributes? Probably not. (p. 443)

Taylor (1996) suggests that "to effect qualitative change in the teaching-learning process, it is necessary to generate qualitatively different teaching-learning environments, pedagogical practices and organisational infrastructures" (p. 4). However, often those with line responsibility for creating the programs are not at the table where the technology decisions are made. Once the commitment to a particular set of technologies and media is made within an educational institution, it becomes very difficult to change. This makes it difficult for course developers in distance education when they want to implement a new and innovative technologies and media system to enable the development and delivery of specific learning models.

Course Development and Delivery Models in Distance Education

Bates (1995) suggests that there are "two dominant instructional design models or paradigms in open and distance learning" (p. 48). These are the "remote classroom" model and the "front-end systems design" model. The remote classroom model resembles a traditional classroom, where technology enables delivery over distance, but the teaching process is the same as in a classroom. This model relies heavily on the interest of individual teachers who are interested in using technology to extend the classroom. However, the material provided to learners is also dependent on these individuals and therefore may be variable (Bates, 1995, p. 51). The front-end systems design model is different. The emphasis is on a systems approach to course development, specially

developed for distance teaching. Bates also suggests that a new paradigm is emerging, networked multimedia. This new paradigm uses computer networks to provide courses for globally accessible delivery.

In this section, I will describe and compare the systems-based course design models by Bates, and Moore and Kearsley. Following, there will be a description of Burge and Roberts' model as an example of a remote classroom model. Lastly, I will provide a description of the Networked Multimedia model and review examples of Web-based course development models developed by Porter and McGreal that seem to fit in with this emerging paradigm.

Front-End Systems Design Model

Bates (1995) describes a model of course development that is used by many autonomous distance teaching institutions: the front-end systems design model. The underlying philosophy for the application of this model is access to high quality education and consistent course materials for learners at a distance. The investment in the course development process occurs up front and enables the mass production of learning materials cost-effectively. A variety of specialists work in a team approach to develop each course. In general, there are four steps in this model as described by Bates (1995, p. 49):

1. Course Outline Developed
2. Selection of Media
3. Development/production of materials
4. Course Delivery

Course Outline Developed. This stage involves a project manager, subject experts, and an instructional designer. This group identifies the target audience for the course; how the course fits into the curriculum; the content required; and how the teaching will be delivered.

Selection of Media. In addition to the project manager, subject experts and instructional designer, Bates adds a media specialist here. He proposes ACTIONS as a comprehensive framework for technology selection and application:

> This framework comprises a set of questions that need to be answered, irrespective of the type of institution or distance teaching programme, to enable appropriate decisions to be made regarding the choice and application of different technologies; in other words, these questions need to be asked in any context; the answers though, will depend on the context. (pp. 35-36)

Bates outlines what ACTIONS stands for and provides questions for each item:

- **A**ccess: how accessible is a particular technology for learners? How flexible is it for a particular target group?
- **C**osts: what is the cost structure of each technology? What is the unit cost per learner?
- **T**eaching and learning: what kinds of learning are needed? What instructional approaches will best meet these needs? What are the best technologies for supporting this teaching and learning?
- **I**nteractivity and user-friendliness: what kind of interaction does this technology enable? How easy is it to use?
- **O**rganisational issues: what are the organisational requirements, and the barriers to be removed, before this technology can be used successfully? What changes in organisation need to be made?
- **N**ovelty: how new is this technology?
- **S**peed: how quickly can courses be mounted with this technology? How quickly can materials be changed? (pp. 1-2)

Although the ACTIONS model is presented within this description of the front-end systems design model, it is a neutral framework that is applicable to media and technologies selected for any course context.

Development/production of materials. In addition to the course team members identified in the selection of media stage, Bates adds the role of senior tutor and operations manager. The functions accomplished at this stage include: "copyright clearance, printing, audio production, video production, computer-based materials," and "tutorial arrangements" (p. 49).

Course Delivery. At this stage, Bates adds tutors and an exams officer to the course team, in addition to the ones listed in the previous stages. The activities to be considered here include warehouse requirements, packing of course materials, mailing and/or transmission of course materials, tutoring, library services, learner evaluation, and course evaluation.

Bates states that this front-end systems design model is generally applied to the development of courses using one-way delivery technologies, such as print and broadcast television (p. 50). The activities to produce the course materials resemble a sort of industrial process where there are divisions of labour between the various team members who put the courses together. He cautions, however, that this model presents an outline only. There may be more specialists involved in the development of the course since processes and practices within institutions may vary greatly.

Although the front-end systems design model has become a standard course development process within the autonomous distance teaching institutions, it has been

criticized for being inflexible. As well, it may not provide course materials in as learner-centered formats as other distance education planning models. Bates states that "with the move towards some of the more interactive technologies, the model becomes less accurate. Nevertheless, it is useful in indicating the nature of the process, and in particular for locating selection of media and technologies within the process" (p. 50). By less accurate, Bates means that the stages of development, team members involved, and the kinds of activities that are required may change as more interactive technologies are used. New technologies may require some new kinds of thinking and planning with regard to how these are applied within the course development and delivery process. With new interactive technologies, Bates notes that "a number of new distance teaching models become possible, such as knowledge building and resource-based mentoring" (p. 51).

Bates outlines the activities and personnel involved in the development of the front-end systems design model but he does not go into any great depth on how tasks are performed at each stage in the course development process. Instead, his purpose is to discuss media and technologies in depth, and the various attributes and capabilities these have for application in distance education.

A Systems Model for Distance Education

Moore & Kearsley (1996) present a similar model to the front-end systems design course development process outlined by Bates but with different categories for the activities involved in the course development and delivery process. They call their model, "A Systems Model for Distance Education" and suggest that this model "describes the main component processes and elements of a distance education institution, program, unit,

consortium, or course" (p. 8). They emphasize that distance education is not accomplished simply by adding technology delivery to traditional classroom delivery (p. 6). Instead, it must be approached systematically.

Moore & Kearsley's model is made up of five steps, which are interdependent:

- sources
- design
- delivery
- interaction
- learning environment.

Sources. Moore & Kearsley place learner needs, organization, theory/history, and philosophy as sources for gathering information on what is needed. The organization through its faculty decides what knowledge learners need based on the educational mission, philosophy, and history of the organization itself and within the country it resides. Most organizations also want to know what learners want to learn, but this is dependent on the organization's educational philosophy. Moore and Kearsley suggest that it is not possible to understand an organization or analyze its courses until there is an understanding of the educational philosophy applied in that particular environment.

Design. Moore and Kearsley include the elements of instructional design, media, program, and evaluation as part of the design step. They suggest that many kinds of design expertise are required and therefore most distance education courses are developed by course teams. Instructional designers and content experts work together to develop the content requirements. Specialists in media and graphic design are brought in to determine which parts of the course that "can most effectively be delivered by each particular medium" (p. 9). Media are important because they act as symbol systems and are

comprised of mediated messages between teacher and learner. Research and evaluation experts are brought into the team to determine the assessment strategies to measure learning and to assess all aspects of the course "to ensure that it works" (p. 9).

Delivery. In the delivery stage, Moore and Kearsley include print, audio/video recordings, radio/television, computer software, audioconferencing, videoconferencing, and computer networks. Moore and Kearsley state that "communication between a teacher or a teaching team, and the learner or learners" (p. 10) is important for "sufficient interaction with their instructors to allow an appropriate degree of exchange of ideas and information" (p. 11). Technology, as a distribution system, makes it possible to send the messages between teacher and learner over distance.

Interaction. Moore and Kearsley include the following elements in the interaction step: instructors, tutors, counselors, administrative staff, and other learners. Often in distance education, courses are developed for large numbers of learners. The course development team is not usually involved in providing the instruction to the learners enrolled in the course. Organizations assign an instructor or a tutor to provide individualized instruction and support with the course materials. A learner may also be in contact with other key support staff such as counselors and administrative staff. In addition, learners may be involved in interaction with other learners while taking a distance education course.

Interaction also occurs in the management and administration of distance education courses. Specifically, items such as assessing learners, tracking costs, assigning staff, and managing off-site instructors are some of the key requirements of successful course development and delivery.

Learning Environment. The final step is concerned with the learning environment. Moore and Kearsley include the following learning environments: workplace, home, classroom, and the learning centre. The design of any distance education course needs to take into account the setting for which it is being developed. The learner may need some time to get used to learning in a non-traditional environment and this needs to be a consideration of the course design.

Moore and Kearsley's model provides an interesting way to view course development in distance education. Whereas the front-end systems design model as described by Bates has been developed to enable mass development and distribution of high quality course materials, Moore and Kearsley's model provides the flexibility for design of both traditional, independent study distance education; and synchronous and asynchronous, remote classroom-based distance education, especially through teleconferencing technologies.

Moore and Kearsley's planning stages are similar to those provided by Bates. In their design phase, Moore and Kearsley include the elements of instructional design, media selection and content development, which is comparable to Bates' first three steps. Moore and Kearsley also include research and evaluation in this phase, whereas Bates includes evaluation in his fourth stage, course delivery. So, although there are differences between Moore and Kearsley's systems model and Bates' systems model, the same kinds of course development and delivery stages and activities occur and are provided in much the same sequence. Both models suggest a step-wise, linear approach to planning, although Moore and Kearsley suggest that their model is interactive between steps.

Top Ten Planning Questions

In *Classrooms with a Difference: Facilitating Learning on the Information Highway*, Burge and Roberts (1998) provide a comprehensive course planning model. They suggest that their model can be used for education and training programs destined for the information highway. The underlying assumption seems to be that by understanding the principles of adult learning, and how current and new technologies and media work, and by addressing planning in a comprehensive and interactive way, "learning professionals" (p. vii) will be able to successfully provide programs for learners on the information highway. The technologies that they advocate for use on the information highway are audio-, audio-graphic-, networked (computer)-, and compressed video-conferencing. Burge and Roberts state that

> We don't give you a linear prescription or flowchart for two reasons: (1) each planning context is different, and (2) a good planning process is a series of cycling around and back and forth between all the contextual factors. (p. 37)

Instead, they provide ten planning questions:

1. What are the learning needs?
2. What are the helping and hindering factors in the macro context?
3. Who is expected to participate? What are their characteristics?
4. What kinds of resources are available?
5. How will I get variety in learning activities?
6. Which mix of technologies will best support the learning?
7. How will the learners know what to do?
8. What will I do?
9. What kinds of problems might arise?
10. How will I know if things are working well? (p. 37)

Burge and Roberts state that "our questions match fairly closely with most models for program planning in adult education, especially one jointly published by Thomas Sork of

the University of British Columbia and Rosemary Caffarella of the University of Northern Colorado" (p. 37). Burge and Roberts align themselves with adult education and use distance education methods in the way that Selman and Dampier suggest, as tools for providing programs to learners at a distance.

Under "Question 6: Which mix of technologies will best support the learning?", Burge and Roberts suggest that there are "five key approaches" that seem to provide a linear progression of how to select the technology mix (p. 40). The first approach deals with the fact that "technology does not, in and of itself, promote learning." Whether a technology is useful in a learning situation, according to Burge and Roberts, will depend on how it is applied. It is important that course developers understand and manage the strengths and weaknesses of each technology so that they can provide the "ideal mix of learning strategies" (p. 40) to reach the learning outcomes desired.

Burge and Roberts suggest that the second approach is to think about how learning strategies "might be implemented in a variety of activities throughout the course," while for the third approach, "you use your knowledge of features, strengths and weaknesses of each technology to make a preliminary choice." Following, they suggest to check that the technology mix selected can be applied to "accommodate differences in learning styles." Finally, the technology mix should be reviewed with "some potential learners" or "a creative colleague" (p. 40).

While the systems-based models described by Bates and Moore and Kearsley provide a step-wise approach, Burge and Roberts provide a question-based model. Their approach is less process oriented, but contains many of the same considerations that Bates and Moore and Kearsley provide. Burge and Roberts' model is, however, focused on a

remote classroom application, where interactive technologies are used and where the instructor is interactively involved in the learning process with learners. Their model does not address the high volume and high quality production of print-based course materials.

Emerging Paradigm: Networked Multimedia

With the emergence of new technologies, Bates notes that a new distance education course model is developing, networked multimedia.[10] This paradigm has emerged with the development of the capabilities provided through the Internet and the Web. This paradigm has much in common with Bates' 1995 descriptions of future opportunities for a "global classroom" (pp. 233-234), "just in time" learning (p. 235), and "resource-based tutoring for accreditation" (p. 235). The networked multimedia model has the potential to be more of a commercial model, where learners pay for the services they require.

The networked multimedia paradigm is also evident in Burge and Roberts model. Their use of a variety of interactive technologies, concern with network learning and the teaching-learning and social behaviours required, and interest in both synchronous and asynchronous applications could be considered as representative of the planning considerations for the emerging paradigm.

A key component of the networked multimedia paradigm is a new production system for creating and storing digital content. Bates discusses the idea of an internal multimedia network infrastructure that was being planned at OLA in 1995. He suggests that:

[10] Conversation with Tony Bates, January 20, 1999.

> learning materials can be accessed and/or created in any format (video, audio, text, graphics, and any combination), and stored digitally. Course designers can access this material electronically, re-edit and re-create learning materials, store them, and export this learning material in a variety of formats (print, CD-ROM, or down-loaded to local workstations), depending on the learners' needs. (p. 240)

Following are two models useful for examining as examples of this emerging paradigm: Porter's Basic Questions for a Web-Based Course; and McGreal's World Wide Web Course Developers' Standards Guide. These models may be considered "second-level" models. Whereas the models from Bates, Moore and Kearsley and Burge and Roberts suggest processes to be followed or questions to be considered and contain a medium and technology selection stage, these models assume that the Web has already been selected as the medium/technology to use for course development and delivery.

Basic Questions for Developing a Web-Based Course. Porter (1997) provides an example of a networked multimedia program model for courses delivered via the Web. She states that

> the World Wide Web (WWW, Web) has become one of the most popular methods of disseminating distance learning programs. In fact, if learners and educators/trainers don't need face-to-face communication during the course, it is one of the best methods of providing information for learners. (p. 127)

For Porter, the Web allows learners to read, see, hear, and interact with the Web-based information; set their own learning pace; and interact with their instructor electronically as needed (p. 128). The Web is based on the concept of 'hypermedia' and 'chunking' information. Porter states that

> Information stored on a Web site can include hypermedia (such as video clips, animation, sound effects, music, voiceovers, photographs, drawings, and

> documents), hypertext (documents and static [nonmoving] graphics), and unlinked text or graphics. The prefix *hyper* simply means that the information has been designed to link that chunk of information with a related chunk of information. The benefit of the Web is the use of hypertext and hypermedia to link plain documents or multimedia information. (p. 127)

Porter provides a question-based model for the development of Web-based courses:

Administrative Questions

- Who needs access to everything on the Web site for this course?
- Who needs access only to some materials on this Web site?
- How will access be limited?
- Who will update the information on the Web site?
- Who will monitor and maintain the Web site?
- Who will maintain an archive, mirror site, or backup disk of information that has been used at this Web site?
- How long will the course's Web site be available? (pp. 132-136)

Course-design Questions

- What types of materials will be included on this Web site?
- How should the materials be linked?
- How often should the materials be updated?
- How will learners work with the information on this Web site?
- What other types of communication with learners will be necessary? (pp. 136-143)

Porter also provides an extensive question-based check list for Web site design (see pp. 152-153) and suggests that the Web pages should be evaluated by the learners throughout the course to ensure their usability and design are effective (p. 155). She makes the observation that "the Web is international" and therefore, a designer needs to "keep in mind the use of color, design, and nuances of language" (p. 145) that may signify different messages to different cultures.

World Wide Web Course Developer's Standards Guide. McGreal (1997) reports on a different approach to course development for Web delivered programs (p. 76). Based

on the outcomes from the East-West project,[11] a pilot project between four Canadian provinces to collaboratively develop an information technology distributed learning course for adult learners, McGreal provides a prescriptive model on collaborative Web course development. The model, entitled World Wide Web Course Developer's Standards Guide,

> has been created to provide World Wide Web course developers with a set of common standards and guidelines for publishing courses on line... This makes courses more interchangeable and usable among those who agree to develop to the accepted standards. (p. 77)

This model is based on learner-centered principles and asynchronous access, which enables interaction via the Web between the learner and course material, the learner and his or her instructor, and with peers.

Since this model is a guide to collaborative development between organizations, there is a 'policy' section to the model, which describes how the developer will be able to access the course development server and specific files. As well, there is a section on the "Ethical Use of Web Resources," which states that copyright permissions are required and that "advertising is NOT allowed on the course pages" (p. 77). In terms of the course development procedures, this model prescribes the role of the project manager who "is responsible for the coordination and organization of the job and for the ultimate completion of the project" (p. 78). This model has three main concerns:

- Organizational Structure of the Content
- Course and Module Organizational Pages
- Design and Technical Specification for the Developer

[11] The Open Learning Agency (OLA) participated in this project. Key OLA staff members involved in this project were also involved in the Open School Division's movement into structured information course development, which will be discussed later in this paper.

Under each concern, there are specific technical and structural requirements to enable the course to be developed in a standard way. A key feature of the model is the use of meta-tags: "to make Web sites easier to find by Search engines and indexing robots and to facilitate the use of new classification systems (General, Adult, etc.), general <META> tags MUST be employed on top pages" (p. 82). Whereas Porter provides questions to consider when developing a course Web site, this model provides prescriptive technical and structural standards for Web-based course development for use between organizations.

Comparative Framework

As presented in the literature review above, there are many aspects to consider when planning distance education courses for adult learners in an age of technological convergence. As technologies converge, there are more opportunities for providing exciting new ways to develop and deliver programming. Tuller and Oblinger present a number of emerging computing technologies and suggest that digitization is having a great impact on how we access media. They also talk about the change in the value of time as a result and that "information technology is a competitive differentiator" (p. 41). But as Mumford and Florini have cautioned, there is also great opportunity for technology to be used in ways that are not in the best interests of the learners. As Florini has suggested, adult educators need to understand the implications of communications on a social, economic, and political level. In addition, as McLuhan has expressed and Logan has interpreted, there are often unanticipated media effects as a result of technological change. What may seem like an advantage can turn out to be a disadvantage. As well, in applying a

new medium or technology, an attribute that was familiar in a past medium or technology form may come back.

Bates suggests that people often have difficulty in using new media and technologies effectively. They bring ideas of an existing technology or medium to a new one without evaluating the presentation capabilities of the new medium or technology. To help us sort through the effects of media and technologies, we can apply Bates' ACTIONS model. The ACTIONS model provides a framework to address the strengths and weakness of various media and technology. This set of criteria will be useful to us here as we explore how the course developers are making sense of CT/NM, what the effects are and what structures help or hinder their adoption and adaptation.

The effects of new media and technologies on society provides us with understandings of how evolving technology generations impact distance education course development. Notions of third generation distance education, post-industrial society, post-fordist production techniques, collaboration, and dialogue contrast with first and second generation distance education, industrial society, fordist production methods, and independent study. Bates has suggested that the key emerging program model in distance education is networked multimedia, which may be the essence of CT/NM. Based on the literature review above, a comparative framework between the front-end systems design paradigm, the remote classroom paradigm, and the emerging networked multimedia paradigm is proposed in Table 1.[12]

[12]Several authors have provided frameworks using technology generations including Lauzon and Moore (1989), Taylor (1996), Sherron and Boettcher (1997). The table presented above was not adapted from these; however, it has been informed by them.

Table 1

Distance Education Paradigm Characterizations

Paradigm Characterizations	Front-end Systems Design	Remote Classroom	Networked Multimedia
Technology Generation	First generation. Second generation. Some third generation.	Second generation. Some third generation.	Third generation.
World View	Industrial.	Industrial.	Post-industrial. Global.
Purpose/Ethical view	Access and quality.	Access.	Access and choice.
Operating System/Cultural Perspective	Institution-centered.	Institution-centered. Person-centered.	Person-centered. Society-centered.
Authority (Socio-Political)	Institution.	Instructor.	Learner and peers with course development group as 'proactive learning agents.'
Teaching and Learning Orientation	Instructionist. Didactic. Independent study. Autonomy. Portability.	Replication of classroom. Lecture or adult learning principles. Instructor-mediated. Regular schedule. Synchronous and asynchronous.	Constructivist. Collaborative learning; democratic. Learner-mediated. Learning modules. Portability. Asynchronous and synchronous.
Course Development Production System	Fordist. Supply-driven. Mass development. Consistent and systematic.	Instructor as producer. Supply-driven. Minor development. Instructor-dependent.	Post-fordist. Customization. Modular development. Granular; collaborative development standards.
Production Team	Specialists.	Instructor as developer.	Generalists with specialist skills.
Course Delivery	Mass delivery. Centralized. No/low noise.	Class delivery. Centralized; some distributed learning. Low/high noise.	On-demand. Distributed learning. High noise.
Learner support	Mediated by phone and mail.	Mediated by instructor or traditional services.	Mediated by computer technology - virtual.

In the first column of Table 1, paradigm characterizations, there are ten criteria. These criteria provide a way to view the distinctions between the three course development paradigms. From the Nipper's discussions, there are technology generations attributed to each course development paradigm. The criterion of world view comes from Peters' and Garrison's comments on industrial and post-industrial distance education. Purpose/ethical view criterion is derived from the descriptions of front-end systems design and remote classroom paradigms and their underlying purposes.

Rumble's description of the three operating systems and the different cultures is blended together and represents the next criterion, authority (socio-political). In terms of how the learner is involved in the course development team, this is derived partly from Rumble's organizational system descriptions and from descriptions of the two dominant course development paradigms.

The teaching and learning orientation criterion comes from the two dominant paradigms and from post-industrial and collaborative learning discussions provided by Garrison, Nipper, and Harasim et al. As well, the design specifications for Web-based courses as proposed by Porter informed the development of this criterion.

The next criterion, course development production system is derived from the discussions of the two dominant paradigms and also discussions by Rumble, Bates, Peters, and Campion concerning fordist and post-fordist development systems. As well, the discussion concerning SGML, learning objects, and McGreal's course development standards fits here. The production team and course delivery aspects are also informed by the same discussions. Nipper's discussion of "noise" in the system also influenced the course delivery criterion.

The final category, learner support, is derived from the dominant paradigms and the potential models, such as just in time training, as proposed by Bates.

The next column, front-end systems design paradigm is described. It is a typical distance education planning model. Front-end systems design is applicable to first generation technologies, such as print and other one-way broadcast technologies. It can also be applied to second generation technologies such as telephone interaction between an instructor or tutor and an independent study-based learner. Bates's description of the front-end systems design is similar to the systems-based approach taken by Moore and Kearsley. They suggest that the course should be planned up front.

As a paradigm, the systems approach can be characterized by the industrial view of teaching-learning relationships as suggested by Peters. The materials are largely didactic and provide instruction that a course team has developed. Learners study independently from their instructors or tutors. However, they have a lot of autonomy and can take their print-based course materials and ancillary media anywhere. To develop these course materials, an industrial or fordist process is employed, which is centralized and characterized by a team of specialists. The course development system is driven by the institution's need to provide a supply of courses. The fordist process ensures that the materials that are developed are consistent and systematic and have longevity. The courses are delivered to a mass audience and all the student functions are centralized. There is relatively little noise, in Nipper's sense. Learner support is provided by phone and mail.

Third generation technologies might also be part of this model, if teleconferencing applications, especially computer conferencing-based applications, are applied. However, since the focus of this model is on up-front planning, and output of high quality course

materials, the interactive components may in fact be a secondary consideration as part of course construction under this model.

In the third column, the remote classroom paradigm is described. It is characterized by the application of second and third generation technologies. While some applications of the remote classroom are not very interactive and can be thought of as using second generation technologies, Burge and Roberts' course development model represents the third generation form of a remote classroom model. This paradigm can also be considered to be industrial in terms of the world view, in that the traditional classroom delivery is the guiding premise for this model of distance education.

The remote classroom model is concerned with access and while it operates from within an institutional setting, there is also interest in a learner-centered approach. The instructor is the person in charge of the course and how it is delivered. In this way, the remote classroom can be very idiosyncratic. The instructor may develop his or her own course materials. She or he may also add other existing materials to the course.

In the remote classroom, the distance learners participate in a "class" setting. The course is delivered centrally by an instructor using one or a range of synchronous and asynchronous technologies. There may be a regular participation schedule in place, especially for the synchronous components of the course. Instructors are important in this model as content providers. They teach the course using the techniques they think work best. Some instructors might use lecture methods, while others might use an interactive approach based on adult learning principles and facilitation techniques. Distance education learning methods may also be applied such as print-based course materials and independent study time. Depending upon the instructor's personal teaching style and the

institutional operating perspective, there may be high noise or low noise with regard to interaction between the learner, instructor, other learners, and the institution.

Moore and Kearsley's systems-based model also promotes a remote classroom-style program through its suggested applications of synchronous and asynchronous teleconferencing technologies. However, since their model focuses on completing most of the planning up front, it seems to be more applicable to the front-end systems model. In this description of the remote classroom, the focus is on instructor autonomy in developing her or his course for delivery, and not on a course team approach. The instructor in this model both develops and delivers his or her course.

The final column describes the attributes of the emerging networked multimedia paradigm. This emerging paradigm is characterized by third generation technologies. It is post-industrial in terms of world view, with an emphasis on globalization. The purpose of this emerging paradigm is to provide learners with access and choice. Interest in nurturing both the learner and the community is a key aspect of the institutional operating system. This means that learners are very involved in the development of their learning. They work actively with course developers to develop learning to suit their needs. Teaching and learning is constructivist in orientation, with an emphasis on collaborative learning and democratic principles. Learning is provided in modules that are portable. A range of synchronous and asynchronous learning opportunities provided through interactive technologies are developed.

To achieve this type of course development, a post-fordist production system is proposed. This system would allow for the customization of course materials, by developing in a modular way and to a granular level, as can be accomplished through new

methodologies such as SGML. As McGreal has suggested, collaborative development standards would be required so that the desired course components could be pulled together for a customized learning experience. This emerging model may require a generalist production team, who also have some specialized skills.

The course could be delivered on-demand through distributed learning methods and support services mediated by computer technology and available virtually. There would be high noise as a result of the interactive and proactive approach taken by learners.

Burge and Roberts' model can also be applied as a networked multimedia model in that it provides a questions-based approach and represents the type of flexibility required in developing courses for the emerging paradigm. Their model also advocates "high" noise through its focus on adult learning principles and learning facilitation approach.

In summary, there are differences between the paradigms but there are some overlaps as well. However, each paradigm handles the criteria listed somewhat differently since each represents a different set of organizational and operational parameters. I will return to this conceptual framework in Chapter Six to determine whether a new course development paradigm is emerging for the course developers in this study.

In the next chapter, I present the methodology for conducting this study. The chapter includes sections on the research stance taken in this study, a detailed description of the research method, and finally, a discussion of the limitations of this study.

CHAPTER THREE

METHODOLOGY

To discover how some local distance education course developers are making sense of CT/NM, a qualitative research methodology, using ethnographic research techniques, was applied. This methodology is based upon an interpretive understanding of social reality. Denzin (1997) suggests that

> The ethnographic project has changed because the world that ethnography confronts has changed. Disjuncture and difference define this global, postmodern cultural economy we all live in (Appadurai, 1990, 1993). National boundaries and identities disappear...The new global cultural economy is shaped by new technologies, shifting systems of money, and media images that flow across old national borders. (p. xii)

The world has changed and with these changes, so too, have ethnographic research methods. The researcher is not a neutral bystander, but an active collaborator with those they seek to study (Denzin, 1997, p. 274). Knowledge is no longer considered as the "mirror of reality" but as social construction "where the focus is on the interpretation and negotiation of the meaning of the social world" (Kvale, 1996, p. 41). Kvale (1996) suggests that as a result of the "breakdown of the universal meta-narratives of legitimation, there is an emphasis on the local context, on the social and linguistic construction of perspectival reality where knowledge is validated through practice" (p. 42). Kvale contends that "knowledge is neither inside a person nor outside in the world, but exists in the relationship between person and world" (p. 44). Lincoln (1995) states that "research takes place in, and is addressed to, a community" and serves "the purposes of

the community in which it is carried out, rather than simply serving the community of knowledge producers and policymakers" (paragraph 15).

In the first part of this section, I will provide a description of how I conducted this study. Following, I will discuss the limitations of the study's design.

Conducting the Study

To describe how the research was conducted in this study, the following topics will be discussed in this section:

- the researcher role selected for this study;
- the profile of participants;
- the data collection and analysis methods; and
- the trustworthiness of the data.

Researcher Role. I describe my role as "being with" (Goldman-Segall, 1998, p. 265) the participants in this research study. The relationship between the researcher and researched is one of caring and neighbourliness (Denzin, 1997, p. 275). As the primary research instrument (Kvale, 1996, p. 125; Merriam, 1998, p. 7), my role was to talk with the study participants and analyze our conversations and their course materials. Following, my role was to assemble this information into a coherent framework.

The relationship between participant and researcher is a privileged one, crucial for the purposes of understanding and conducting the research study. As Denzin suggests, "a care-based ethical system" asks "the researcher to see other's situations as they feel and see them (Noddings, 1984, p. 24; Ryan, 1995, p. 148)" (p. 273) and "presumes a researcher who builds collaborative, reciprocal, trusting, and friendly relations with those

studied" (p. 275). As well, it is important for a researcher such as myself to recognize that there are both benefits and drawbacks for participants (Merriam, 1998, p. 214). Therefore, participants were informed of my role as the researcher, my biases concerning the study purpose, and my interests in the study. As well, I tried to be sensitive to the reciprocal needs that participants had during our interview sessions. Lather (1991) suggests that "reciprocity implies give and take, a mutual negotiation of meaning and power" and "reciprocity has long been recognized as a valuable aspect of fieldwork, for it has been found to create conditions that will generate rich data" (p. 57).

Profile of Participants. Using purposeful sampling strategies, eight course developers who are directly involved with distance education course development were identified and invited to participate in this study. The participants had the following in common:

- experience developing distance education courses and resources for adult learners;
- experience as a project manager of a course development team;
- experience with instructional design methodologies for credit and/or non-credit programs targeted for adult learners;
- experience and expertise with a range of technologies and media in distance education development and delivery such as print, video/audio tapes, television, and audio/video/computer conferencing;
- presently working for either OLA or UBC DE&T;
- recent experience in using CT/NM for distance education course delivery, especially in computer mediated communication and the Web.

Data Collection and Analysis. The data collection phase began in early May 1999 and was concluded by the third week of June 1999. Two forms of data were collected from participants:

- information from research interviews; and
- documentation such as course development documents, course materials, and/or course Web sites.

The primary source of data was provided from participant interviews. Since most course development is not conducted in a visible way, engaging the participants in interviews and reviewing their documents provided the richest sources of data. As suggested by Kvale (1996), interviews are useful for "studying people's understanding of the meanings in their lived world, describing their experiences and self-understanding, and clarifying and elaborating their own perspective on their lived world" (p. 105). He states that "the qualitative research interview is a construction site for knowledge. An interview is literally an *inter view*,[13] an interchange of views between two persons conversing about a theme of mutual interest" (p. 14).

I used a semi-structured interview process (Kvale, 1996, p. 124; Merriam 1998, p. 74). The questions were developed so there was a mix between questions asked of all participants and those that arose from the discussion with each participant. Since the purpose of the study was to surface new understandings of how course developers are making sense of new technologies and media within their practices, the methodology for the interview sessions had to enable this opportunity. The questions asked of each participant were:

[13] The italics are Kvale's.

1. For issues of confidentiality, how shall we identify you in this study? (What's your preference?)

2. How long have you worked in Distance Education? What's your current job title?

3. There are lots of new technologies – many are converging. How useful are these to your course development (planning) activities?
   - How might you make use of these? Can you describe any recent examples?
   - What was your role?
   - Who was involved? What were their roles?

4. Is the use of converging technologies and new media changing your approach to course development/program planning? If so, how?
   - If your planning process does not change, what are the issues concerning the use of converging technologies/new media for your programs?

5. Do you see new opportunities for your programs as a result of converging technologies/new media?
   - If so, what might these be?
   - If not, what structures enable or impede your ability to take advantage of these?

The first set of interviews took place face-to-face, on an individual basis, in the participant's office or in a nearby meeting room. Since the initial course developers did not have a preference as to how they would be identified in this study, I randomly assigned a letter of the alphabet as the identifier for each participant (e.g., "Participant A"). Later, I changed the letters to a pseudonyms (e.g., "Participant A" became "Alison") or used pseudonyms selected by the course developers.

A second interview session was arranged to review the information gathered during the first interview. I also arranged with each participant as to whether I could contact her or him for any follow-up questions.

I kept a record of the dates and duration of each interview. Most interview sessions lasted approximately one hour. In the case of three participants, the second interview sessions were less than an hour, with one lasting one half hour and the other two sessions lasting forty-five minutes.

The initial interview and follow-up interview with each participant were adequately spaced so that participants and I had time to reflect upon the information generated during these meetings. The spacing of interviews for six participants ranged from two weeks to four weeks; for the other two participants, the spacing between interviews was one week. This was due to the availability of the course developers involved. Due to time limitations for one participant, we met twice after our initial meeting for one half hour each time.

To test the applicability of the interview questions developed for this study, I tried the questions out with the first three participants. Since the questions seemed to be stimulating the conversation in the directions required for this study, no adjustment was made to them.

To capture the data developed with participants during the interviews, I recorded each interview using a micro audio cassette recorder. This was backed up by notes I made during the interviews with six participants. For interviews with two of the participants, the locations were not conducive to note taking. Therefore, notes were not taken during the sessions.

To provide a secondary source of data, participants were asked if they would be willing to provide documentation such as course planning materials, course modules, and study guides from their recent programs where they had used convergent-based technologies and new media. The materials that the participants provided were in either a

paper-based format or an electronic format (i.e., Web-based materials). I reviewed the documentation to determine how CT/NM were being used by these course developers and to get a sense of their planning considerations. Of the eight course developers, three provided materials (e.g., paper-based and/or electronic materials) at the conclusion of the first interview and these were reviewed with them at the second interview session. Four provided electronic materials following the second interview. They advised me that I could contact them further to discuss. An eighth planner suggested electronic course materials requiring password access. Although the request for a password was made, the department responsible for providing this access did not respond during the time frame for this study.

Following the first interview with each course developer, I transcribed the interview. The interview transcriptions became part of the study "data." This data was kept confidential in the raw format.

To analyze the data from the first interview with each participant, I assigned a number to each paragraph in the interview transcript and categorized the key concepts. To organize the concepts, I developed two main groupings:

- course development activities where the course developer suggested there was no impact on his or her practice as a result of CT/NM; and
- course development activities where there was an impact as a result of CT/NM.

I arranged the concepts synthesized from the various paragraphs under the two main groupings. Under each grouping, I assembled a set of sub-groupings. From the sub-groupings, a set of statements was developed, such as "Use of a Web browser to access

course materials is convenient for the learner and teacher." I entered the statements into a document as a summary of the interview.

I used the summary document in my second interview with each course developer. The purpose of the document was to enable each participant and I to discuss the responses from the first interview and to see if my interpretation matched his or hers. Where my interpretation on the summary document did not match the course developer's, I made changes to reflect her or his point of view.

I did not provide the interview transcript to the participants. In addition, although the summary document was used during the second interview, this was not left with the participants when the interview was concluded.

Following the second interviews, I began to assemble the course developers' statements and supporting data into categories. The categories of similar statements were grouped. From these groupings, categories began to emerge.

As the categories emerged, it became clear that these had much in common with the criteria in Bates' ACTIONS model. The ACTIONS criteria were applied to the groupings of statements as a framework for analyzing the study data.

As a final check, I provided participants with a draft copy of the research section of the study between December 1999 and February 2000. All eight participants returned their comments to me. Of the eight, I met with four in-person and reviewed their comments. The remaining four provided their comments by e-mail and/or phone and on the draft study copy I provided to them. All participants indicated that they agreed with how they were described and with the comments attributed to them. Where there were

changes, these were very minor in nature. As a result, I made some adjustments to the research section to accommodate the feedback from the study participants.[14]

Trustworthiness of Data. To ensure the trustworthiness of data in this study, I was guided by Lincoln and Guba (Lincoln, 1995) who have developed a set of criteria that is

> highly reflective of the commitment of inquiry to fairness (balance of stakeholder views), to the learning of respondents as much as to the learning of the researcher, to open and democratic sharing of knowledge rather than the concentration of inquiry knowledge in the hands of a privileged elite (paragraph 4)

I was also guided by Kvale who suggests that validity is a social construction (p. 229) and needs to be looked at in terms of "defensible knowledge claims" (p. 241). "Validity comes to depend on the quality of craftsmanship during the investigation, continually checking, questioning, and theoretically interpreting the findings" (p. 241).

I also applied some additional measures to ensure that the data collected during the study was trustworthy. As Miles and Huberman (1994) suggest, there are some strategies for obtaining 'stronger data' (p. 268). The strategies for stronger data include: "collected later, or after repeated contact; seen or reported first hand; observed behaviour, activities; field-worker is trusted; collected in an informal setting;" and "respondent is alone in the field" (p. 268). I also applied triangulation (i.e., the use of multiple sources, methods, and theoretical frames), which is a suggested method for strengthening the data generated within a study (see Lather, 1991, p. 67; Merriam, 1998, p. 204; Miles & Huberman, 1994, p. 263, pp. 266-276). By meeting with the course developers on two or three occasions

[14] See Appendix A: Record of Contact and Materials.

over a six month period, I was able to hear their stories and comments first hand, and gain some understanding of their working environments. I was also able to review their work first hand and see the kinds of courses and resources that they were developing.

In addition, I applied Geertz's notion of "thick description" (LeCompte & Preissle, 1993, p. 338; Merriam, 1998, p. 211). I have provided descriptions of the participants involved in this study and selections from their interviews so that readers would be able to gain an understanding of them.

Limitations of Design

The scope of this study is limited to understanding how the phenomena of CT/NM are impacting course development in distance education for adult learners, as described by the eight participants in this study. As well, this study is limited by the participants involved. The participants in this study had many aspects in common such as their backgrounds in instructional design, their working contexts (i.e., traditional, systems-based distance education settings), and their roles within the contexts. They represent a very focused sample group. In addition, the study is limited by the locations from which the study took place (i.e., two B.C. Lower Mainland post-secondary institutions, one of which is a single-mode, distance education provider and the other, which is a dual-mode educational institution).

This study is further limited by the interpretive research methodology I employed and the data generated by participants and myself, as the researcher. Also, the study's findings are relevant for the time in which they were collected (Geertz, 1992, p. 132). That is, the findings represent a moment in time at which the study was conducted.

Any research method has both strengths and weaknesses. In interpretive-based research methodologies, one of the key strengths is the ability of the researcher to participate interactively with the participants. This allowed me, as the primary research instrument, to be closer to the participants and their constructions of the social world, than if a research instrument was placed between us. The chances of creating rich, thick data and sharing, clarifying and collaborating meanings are greatly enhanced if the researcher is engaged directly with participants.

However, conducting interpretive-based research also means that the participants working directly with the researcher may not express their "truths." They may have told me what they thought I wanted to hear and not their understandings of their worlds and the phenomena being studied. They may have also held back some of their ideas for personal, organizational, strategic or intellectual reasons. Since I am an employee of one of the institutions involved, the Open Learning Agency, this may have affected the data I was able to collect both from the participants in my institution and from the participants at UBC DE&T.

Another interesting limitation is that participants may have reflected their working contexts back to me. So, rather than providing me with their individual views on how CT/NM are affecting their practices, the participants may have given me their "community" views. They may have described to me *how things are done* in their contexts, instead of *how their practices are actually affected* by CT/NM.

A further limitation is the time available for this study. The research phase of this study took place over a two month period (May - June 1999). Although it might have been desirable to interview more course developers, this was not possible during the time

available for this study. The lag time between inviting each course developer, conducting the interviews, and transcribing and analyzing the data took substantial time. Therefore, it was not possible to include additional course developers in this study.

In the next chapter, I will provide some background information on the course developers and the two distance education contexts selected for this study.

CHAPTER FOUR

UNDERSTANDING CONTEXTS

In this research study, I selected distance education course developers from two different contexts: the Open Learning Agency (OLA) and University of British Columbia (UBC). My intention was not to study the context within which these course developers worked, nor to compare these contexts. Rather, it was to gain an understanding of the issues that are facing local distance education course developers with the emergence of CT/NM. However, an explanation of the contexts is necessary so that readers understand the differences between these contexts and how the course developers are approaching their planning requirements. It is also important to understand who the course developers are. Knowing a bit about the course developers, their length of experience in distance education and their specializations can help readers understand the course developers' views. In addition, it is important to understand the role that each course developer plays in her or his context. These aspects will be discussed in this chapter.

The Contexts

The course developers involved in this study were from two contexts, OLA and UBC's Distance Education & Technology Unit (DE&T). In this section, I will present a brief description of each context so that readers have an understanding of the environments in which the course developers work.

Open Learning Agency

The Open Learning Agency (OLA) is a single mode (autonomous) institution developed to provide lifelong learning opportunities to British Columbians through distance education methodologies and telecommunication and information technologies.[15] Learners who take OLA courses might live in remote areas with limited or no access to their local educational institution. They might also live in B.C.'s Lower Mainland. Due to constraints such as work, raising a family, or looking after elderly parents, some learners may have chosen to study at a distance and have selected OLA through which to take their courses.

OLA was formed in 1988 as an amalgamation of the Open Learning Institute which began in 1978 and the Knowledge Network which began in 1980 (Open Learning Agency, 1997-98, p. 2). Currently, there are five program divisions: the Knowledge Network, which provides general education programming and programs accompanying secondary and post-secondary courses; the Open College (OC) which provides business and career-related college-level courses; the B.C. Open University (BCOU), which

---

[15] The mission statement for the Open Learning Agency is as follows:

> The Open Learning Agency (OLA) is a comprehensive, fully integrated, responsive, and flexible provider of educational and training services. It delivers the highest possible levels of education to the citizens of British Columbia. Furthermore, it serves other national and international markets on a for-profit basis. OLA provides quality learning at home, in communities, in schools, and in the workplace. It does this independently as well as in partnership with business and other educational and training organizations, utilizing appropriate technologies. OLA uses the best practices from business and education and is the benchmark for all other lifelong learning providers. Programs and services are provided through Open School, Open College, British Columbia Open University, Workplace Training Systems, Knowledge Network, the Canadian Learning Bank, and the International Credential Evaluation Service. (http://www.ola.bc.ca)

provides university courses in arts, sciences, business, and health; Workplace Training Systems, which provides customized training programs for public and private sector employers; and the Open School, which develops courses and resources for the kindergarten to grade 12 (K-12) system and also provides adult basic education courses. It became an operating division of OLA in 1997, when the Ministry of Education's Technology and Distance Education Branch was amalgamated with OLA.

OLA (through the BCOU) has worked together with UBC (through DE&T), Simon Fraser University and University of Victoria since 1979 to provide distance education courses (Bates, 2000, p. 168). This consortium has provided "an open access program enabling students to complete a full degree at a distance" (p. 168). Learners are able to take first and second year university courses from various institutions and complete their third and fourth year by distance. In this case, the BCOU grants the degree. Learners can also transfer their distance education course credits taken at an institution, such as UBC, to their home institution.

For many years, the consortium received a small amount of government funds to help foster collaborative development of courses. This helped the consortium to undertake joint planning for course development and ensure that duplicate courses were not developed individually by the participating institutions. As well, they could engage in joint planning for the marketing and coordination of the consortium's distance education programs. This funding was cut recently; however, the consortium partners are still continuing to work together.

OLA has some unique services to help students. It has a "credit bank" where learners who have credits from other institutions can apply these towards a degree at OLA

or its consortium partners. In addition, it has an International Credit Evaluation Service (ICES). This service provides people, mostly recent immigrants, who have not taken their education in Canada to receive documentation concerning the equivalent Canadian credential. With this information, they are more likely to be able to continue working in their field of choice.

OLA has an institutional system for developing courses. The institutional system is both a process and a set of structures, which includes a variety of skilled and knowledgeable personnel, course development process, various media production facilities, and an integrated course delivery and learner support system. Most courses are currently offered in a multiple media mode including print, video and/or audio tapes, and other media such as audioconferencing and on-line technologies where applicable.

Learners registered with BCOU and OC are considered part-time learners. In 1998/99, BCOU had 13,472 course enrollments (which represents a total of 7,802 learners) plus a further 2,744 international enrollments (www.ola.bc.ca/bcou).

BCOU's and OC's credit-based courses are provided on a continuous enrollment basis. This means that learners can register and begin their courses at anytime. Most learners study independently, although many courses have interactive components enabling learners to participate in peer-learning and social activities. There is also flexibility regarding when learners can complete their courses. BCOU and OC divisions of OLA have provided many courses by computer conferencing since 1994. In 1999, they moved into Web-based delivery (OLA, March 15, 1999). Currently, there are six university courses and four college courses delivered via the Web.[16]

[16] See www.ola.bc.ca/bcou and www.ola.bc.ca/bcoc for a listing of courses.

Decisions concerning the development of new courses, or the revision of existing courses, varies across OLA. In BCOU, the Associate Dean in a specific program area works in consultation with tutors, course designers, university service assistants and if appropriate, learners, to determine the courses to develop and revise. This information is provided to the Dean of the program area. The requests for course development often exceed the amount of funds available. As a result, the program areas have to determine their priorities. They make the final decisions concerning the programs to be developed or revised, and allocate the funds and staff time for approved projects.

OLA contracts qualified academics and other professionals, depending on their expertise and their field of practice, to participate as members of the course development teams. Generally, the roles of content expert and course writer are combined. In this combined role, the academic or professional works closely with the instructional designer assigned to the project.

OLA uses a tutor-based educational model. The tutors work on a part-time basis and are members of the Faculty Association of Open Learning Agency (FAOLA). There is a system for assigning tutors to courses, based on seniority, since there may be more than one tutor specializing in a particular discipline. As learners register for a particular course, they are assigned a specific tutor for the duration of that course. Tutors are responsible for providing learners with academic support, marking assignments, and assigning grades.

In Open School (OS), course development decisions are based on the requests from the K-12 system, especially from the nine regional distance education schools, and annual agreements with the Ministry of Education. OS collects information throughout the

year and then determines the courses to develop based on the demand and the resources available.

Adult learners are also served by OS. This occurs in two different ways. OS has an Adult Basic Education unit that provides courses directly to learners at a distance. These courses are offered by distance and lead to a general education diploma (GED). Like BCOU and OC, the Adult Basic Education unit has part-time tutors who provide learners with support, marking, and grading. OS also provides ABE courses and programs to a number of First Nations communities throughout B.C.

The second way that OS serves adult learners is through the K-12 system. OS has a mandate to develop distance education course materials for the B.C. K-12 system. The courses are developed in accordance with the Ministry of Education's integrated resource package guidelines for B.C. K-12 courses. In the K-12 system, OS does not provide the courses directly to learners. Instead, OS provides courses to the regional distance education schools and regular schools in B.C. They enroll learners in courses, and look after marking assignments, and assigning grades. Many adult learners enroll in OS-developed courses through their local distance education school.

Within OLA, OS has played a significant role with regard to new methodologies for course development and delivery. OS has adopted a SGML framework for developing its courses.[17] In Fall 1999, OS began delivering an on-line graduation program available to

[17] For an in depth look at OS's Structured Information/SGML-based course development, see Klassen P., Maxwell, J., and Norman, S. (1999), Structured Information and Course Development: An SGML/XML Framework for Open Learning; and Norman, S. & Nicholson, M. (1999), Designing in a Structured World: Instructional Design and Course Development within an SGML/Structured Information Environment – The Open School Experience. Both papers were presented at Ed-Media 1999 in Seattle, Washington, USA, June 1999.

schools, school districts, and the K-12 distance education system in B.C. This program is called *Open School Courses and Resources (OSCAR)*. There are fourteen courses in the program. The courses are also available to schools outside of B.C. On-line courses and accompanying learning resources are developed for both distance education and classroom-based learners.

OS provides a range of professional development learning opportunities for teachers, especially in the use of technology for educational delivery. In 1998, OS partnered with another educational institution to develop an innovative self-directed teacher professional development/post-baccalaureate information technology program for K-12 educators.

OLA is not a formal research institution. However, in OLA's legislation, there is a provision for conducting research into distance education. As a result, a number of applied research projects have been developed over the last number of years. The majority of these projects have been at the school (K-12) level and focused on the use of technology as an enhancement to classroom or independent study learning situations. Some examples include New Directions in Distance Learning (NDDL), a three year project that ran from 1995-1998 and was funded by the former Technology and Distance Education Branch in the Ministry of Education; Electronic Internship Program (1995-1996) and Wired Workpath (1997-1999), which were electronic mentoring programs for youth and funded by the Youth Initiatives Program, Human Resources Development Canada; and Career Studio/Studio 3 Project (1998-1999) funded in part by the Ministry of Education and Human Resources Development Canada to test the use of an interactive multimedia studio

in the delivery of professional development programs for career and personal planning teachers.[18]

In addition, OLA has participated in some high profile, nationally-funded research projects. In the early 1990s, OLA staff were heavily involved in a research project funded by CANARIE called Canadian Online Exploration and Collaborative Environment for Education (COECEE). Partners in the project included Simon Fraser University, and Science World among others.[19] OLA has also received funding from the Office of Learning Technologies (OLT), Human Resource Development Canada for research projects involved with adult learners and technology. In addition, OLA has been involved with DE&T's OLT-funded project, *Learning Through New Technologies: The Response of Adult Learners Project.*

University of British Columbia's Distance Education and Technology Unit

The University of British Columbia (UBC) is a dual mode institution. This means that UBC provides courses for both regular, classroom-based delivery and for distance education delivery. UBC has been providing distance education for fifty years (DE&T, 1999, May 3a). It has a special distance education department within the Faculty of Continuing Studies called Distance Education and Technology Unit (DE&T). DE&T acts as a service unit to various UBC faculties to enable them to provide their courses through

[18] See http://www.ola.bc.ca/careerstudio to find out more about the Career Studio Project.

[19] The other partners in the COECEE alliance no longer exist including MPR Teltech, Stentor Resources Centre, and the Ministry of Education's Education Technology Center.

distance education means.[20] DE&T has more than one hundred courses available for distance delivery and registers over four thousand students annually. It also works with external partners and clients to provide a range of distance education services.

DE&T has a number of staff involved in developing and delivering courses.[21] As a unit, it is made up of a similar distance education delivery structure as OLA. DE&T is comprised of the following sub-departments (DE&T, 1999, April 8):

- Contracts/Training
- Course Development and Instructional Design
- Production and Media
- Marketing/Administration
- Student Support Services

In addition, there are research associates who are involved in DE&T's research activities and visiting fellows and students from DE&T's external collaborations.

Faculties take responsibility for tutoring or instructing their courses delivered by distance education. The courses are provided over four terms, beginning September, November, January, and March. Plus, courses are available over the summer months. Not all courses are provided during each term.

---

[20] DE&T has a mission statement:

> The Distance Education and Technology (DE&T) unit of Continuing Studies develops and delivers programs, courses and learning materials for individual and institutional clients who require cost-effective, quality education delivered in flexible formats. Established as the Department of Extension at UBC in 1949, DE&T collaborates with UBC faculties and Continuing Studies program areas to serve local, national and international clients. (http://det.cstudies.ubc.ca/detsite/det.htm)

[21] DE&T is headed by Tony Bates, who has worked in the distance education field for thirty years and is internationally recognized as an authority on the use of technologies and media in distance education. He spent twenty years working at the British Open University (BOU), before joining the Open Learning Agency where he worked for five years. He joined DE&T in 1995.

UBC has an Advisory Committee on Distance Education. This committee is comprised of academics and administrators from across UBC. Its role is to adjudicate proposals provided by UBC faculties who apply for funds and staff resources to develop distance and distributed education courses. DE&T administers this process for the committee. It also helps the faculties to develop their proposals for submission and manages the funds and staff resources once the projects have been approved. The distance education funds and DE&T staff resources are limited and as a result, a limited number of proposals are funded.

The funding is allocated in blocks and loans (Bates, 1999, January 19, p. 2). In January 1999, the recommendations for funding included blocks for the "continuation of existing DE programs," and whole programs (twelve credits) to be developed for off-campus students. A portion of the funding was proposed for

> single 3- or 6-credit courses, or for pilot projects, for those faculties or departments that wish to explore new methods of off-campus delivery, or to extend existing campus-based technology projects to off-campus students, or for mixed mode courses, where some of the teaching is done on-campus, and the rest off-campus. (p. 2)

Loans are also available for "full-cost recovery projects."

The funding allocation process has five stages, which I have summarized as follows (Bates, 1999, January 19; DE&T, 1999, June 4a):

1. Faculties are invited to bid for the funds available through the distance education grant. Short proposals are submitted by interested academics or departments using a questionnaire developed by DE&T.

2. A full proposal, including budget, is created by a DE&T senior manager and the faculty member. At this stage, important factors are identified, such as course objectives, delivery modes, production requirements, timelines and resources.

3. The Advisory Committee on Distance Education adjudicates all proposals submitted according to a specific set of criteria. Some of the criteria include access for off-campus learners, number of learners, ability for learners to take a whole program by distance and "uses new teaching approaches/new technologies" (Bates, 1999, January 19, Appendix 1). The courses that are funded must be available for five years after the development phase is completed.

4. DE&T develops a letter of agreement with the academic departments who have had their project proposals selected for development. The letter of agreement is very detailed and covers items such as roles, responsibilities, revenue sharing, intellectual property ownership, and timelines.

5. Funded projects are tracked by DE&T project managers. They look after the projects in progress, projects completed, course enrollments, funds spent and remaining, and so on.

DE&T's director assigns the various funded projects to the project managers on staff. The plan for 1999/2000 was to develop ten new courses. Currently, there are eight areas that provide on-line courses including Adult Education, Civil Engineering, Dental Hygiene Completion Program, Educational Studies, Film Studies, Forestry, Geology, and Resource Management & Environmental Studies (DE&T, 1999, June 4b).

In addition to its internal service and its consortium work, DE&T partners with other organizations to develop and deliver courses. Recently, DE&T partnered with the Monterrey Institute of Technology (ITESM), Mexico to develop a post-graduate certificate program on technology-based distributed learning (Bates, 2000, p. 164). The program "is designed for professionals and UBC graduate students who wish to update their teaching skills" (University of British Columbia, Continuing Studies, 1999-2000, pp. 40-41). The program is delivered internationally via the Internet and learners participate with other learners, including ITESM graduate students and faculty members, in on-line discussions.

DE&T develops a range of projects with external partners and clients in the public and private sector on a local, national, and international basis (DE&T, 1999, July 13). The services available to external clients include:

- policy and systems development
- strategic planning
- needs assessment
- feasibility studies
- program design and development
- project management
- instructional design, course development, and production
- educational technology selection, design, and management
- program and course delivery
- evaluation

Recently, DE&T developed projects with Florida State, the American Productivity & Quality Centre and the State Higher Education Executive Officers Association, and the Open University of the Netherlands.

In January 1999, UBC signed an articulation agreement with Athabasca University, Alberta. This agreement provides for the "acceptance of transfer credits from UBC's Post-Graduate Certificate in Technology-Based Distributed Learning (Certificate) courses into Athabasca University's Master's of Distance Education (MDE) program" (DE&T, 1999, May 3b, paragraph 1) Learners who have successfully completed some or all of the technology-based learning courses offered through DE&T will be eligible for credit towards Athabasca's MDE program.

DE&T engages in research related to distance and distributed learning. DE&T has recently been involved in projects funded by the Office of Learning Technologies (OLT) and the Telelearning National Centres of Excellence (NCE- TeleLearning). As mentioned earlier, DE&T developed an OLT-funded research project called *Learning Through new*

Technologies: The Response of Adult Learners Project. DE&T has also developed a study for NCE-TeleLearning: Project 2.3 called *Assessing the Costs and Benefits of Telelearning: A Case Study from the University of British Columbia.* Both projects had multiple organizational partners involved.

Introducing Participants

There were eight course developers involved in this study. Five course developers were from OLA and three were from DE&T at UBC. The following is a brief introduction to the course developers from OLA and DE&T.[22]

Open Learning Agency (OLA)

Of the five course developers from OLA, three were from BCOU and two from OS. The BCOU course developers included Lulu, Gary, and Ingrid. Lulu has worked in distance education at BCOU for nineteen years as an instructional designer. She primarily develops Arts-based courses. In addition, Lulu has pioneered many technologies for use in distance education course delivery. Over the last four years, Lulu has focused on using the Web for delivering courses and has developed some of OLA's first applications in this new medium. She has also been active in using the Web to make educational resources available to the general public.

Gary began his career in distance education eleven years ago when he joined BCOU. Like Lulu, Gary's background is in instructional design. He recently developed an innovative Web-based program, in business skills, at the college level. Also like Lulu, he

[22] See Appendix B: Summary of Study Participants' Characteristics.

has been involved in experimenting with, and applying, new technologies in distance education courses, programs, and applied research projects. Gary has recently been working on a cross-organizational project to develop standards for course development, based on SGML.

Ingrid is a department manager with extensive experience as an instructor in both traditional classroom and distance education contexts. She has recently moved to BCOU from another B.C. educational institution where she pioneered distributed learning course delivery. She has sixteen years experience working in distance and distributed education environments.

The participants from OS were Farrah and Alison. Farrah has nine years experience in distance education as a project manager and instructional designer. She has been involved in a range of distance education development activities at university, college, adult basic education, and K-12 levels. Currently, Farrah is developing courses for the K-12 system. She has designed many courses using a range of technologies and media. Farrah routinely provides presentations and workshops on course development and instructional design nationally and internationally.

Alison is a department manager with twelve years experience in distance education. She recently joined OS from another B.C. post-secondary institution. Her expertise is in curriculum design for K-12, adult basic education, and teacher professional development. Alison spends most of her time in an applied research and development capacity, developing courses, and experimenting with new technologies and media to enhance learning opportunities for learners at all ages and capacities. She is also responsible for developing partnerships with other organizations.

Distance Education and Technology (DE&T)

The course developers from DE&T were Elaine, Henry, and Daniel. Elaine has been working in distance education for nine years. She has spent the last four years at UBC and the previous five years at another Canadian post-secondary institution. Currently, she is working as a project manager and instructional designer in DE&T. She works mainly on health-related courses and has recently been involved in the development of some internationally delivered courses.

Henry has been involved in distance education for twenty years. He also recently moved to UBC after spending many years at another post-secondary institution. His main role is to develop external projects and provide distance education consultancy and expertise. As well, Henry is involved in managing projects as part of DE&T's service to UBC faculties and developing distributed learning applications for on-campus course delivery.

The third member of DE&T interviewed was Daniel. He is a department manager with DE&T and has sixteen years experience in distance education. As a department manager, he has broad responsibilities for course development and also provides instructional design expertise across a range of subject areas. In addition, Daniel has been involved in the development of some internationally delivered courses.

Understanding Roles

I asked each course developer about her or his role in course development. Most participants identified themselves as project managers. For example, Elaine provided a description of her role:

> Elaine: In my case or in the case of my colleagues, we are actually project managing on a much more micro scale because we are project managing and doing all of the things as well. So, given that, our instructional development tasks also become part of our project management. At some point, we are not only worried about where the budget is being spent, who's doing what, where the author is, and whether the CD-ROM team has actually gotten together and started working, but we are also designing and doing instructional development with the author and with the other team members. So, it's sort of a two-fold hat.

Daniel and Henry provided similar explanations regarding to their roles in DE&T, although Daniel also has other duties as a department manager. As project managers, they have the responsibility to manage projects and act as instructional designers. Sometimes the project management role is shared with the faculty member involved in the project, which means that the DE&T course developers become co-project managers.

At OLA, the roles of the BCOU project managers had similarities and differences to those described by DE&T participants. Gary described his role in BCOU:

> Gary: Generally, program supervisors are project managers in the sense that they handle the budgets and the contracts. The instructional designers tend to be the focal point --the hub of the wheel in the actual people management of the course team. They are the center of the course team and they manage it. So, it's a combination.

Lulu provided a similar explanation of her role as a course developer in the BCOU. Both Gary and Lulu have the responsibility to manage course development once a BCOU

program area has made the decision to develop or revise a particular course. Gary and Lulu manage the project from a "micro" perspective. They are in charge of developing an instructionally sound course or series of courses as part of a program, and negotiating with team members to ensure that the project requirements are met. Like the DE&T course developers, Lulu and Gary are in charge of the people management aspect of the course development team. However, they do not have the responsibility for the project budget as the DE&T course developers do. This is probably due to the fact that Gary and Lulu do not belong to a specific program area, but work across BCOU program areas.

Farrah, working in OS, provided a similar example to Gary and Lulu:

> Farrah: My role is somewhat dual role in terms of project managing as well as providing a certain amount of instructional design expertise and consulting.

The project management roles described by Gary, Farrah, and Lulu were very similar. However, Farrah also had responsibility for the course development budget and made decisions on how the funds could be spent. In that way, her role was more like the DE&T course developers than Lulu and Gary.

Ingrid and Alison had different project management roles. Ingrid, in discussing one of the courses she was involved with, illuminated her role, and that of the instructional designer/project manager, in a recent BCOU course:

> Ingrid: The actual management of the project, once it got in to course development, shifted to the instructional designer. She looked after contacting the course writer and getting materials for him. I looked after doing the contract with him, what went into that, and negotiating what he would be paid for doing it. I looked after negotiating with the tutor association around the tutors. I looked after hiring the tutor. The instructional designer looked after the Web design.

Ingrid's description of her role was from a "macro" perspective. She had the responsibility of overseeing the project. However, once the decision was made concerning whether to develop the course, what it would be, and what it would look like, the project management moved to the instructional designer who acted as the project manager for the course development team.

Alison's role was different than Ingrid's. She said:

> Alison: My role is usually to get the money and come up with the big strategy.

Alison had great flexibility in determining the projects in which she would get involved. This was due to the nature of her role, which had a largely applied research and development focus. Also, since Alison was able to develop external partnerships and was developing teacher professional development programs, she had flexibility in determining the kinds of courses to develop.

Both Alison and Ingrid were department managers and had a number of duties in addition to overseeing the development of courses. They both had budget control for their projects and oversaw the project manager/instructional designer and course development team working on their courses.

From the discussion concerning the roles of the project managers and their level of project management responsibility, it was clear that some had responsibility for the course development team and the budget, while others only had responsibility for the course development team. Alison and Ingrid oversaw the development of courses in their program area and described their roles from a macro perspective. They were in charge of their overall course development budgets. Daniel, Elaine, Farrah, and Henry described

their project management roles at a more micro level than Alison and Ingrid. They also had budget control for their projects. Lulu and Gary also lead their course development teams as project managers but did not have direct budget control. However, they had strong working relationships with various department managers and program supervisors in the program areas and therefore had influence on how the course budget was spent.

Summary

The differences in context definitely influenced the participants' responses to my questions. OLA and DE&T, while both working in the distance education field, have different operating contexts. OLA, a special purpose institution, is dedicated to providing courses by distance education methods. It has special flexibility with regard to how it can provide courses to learners, especially with its continuous enrollment process and ability to provide credit bank services. The course tutors are part-time and provide support to learners as they register and begin their courses. OLA has recently began with providing courses through the Web.

DE&T acts as a service unit for UBC faculties. It administers course development projects on behalf of the Advisory Committee on Distance Education, a cross-faculty committee that adjudicates distance education course development proposals from UBC faculties. In this way, DE&T has the opportunity to act as a change agent, since it works with faculties to introduce them to new technologies. There is a clearly defined proposal and funding allocation process for faculties wanting to develop a distance education course. For funded proposals, DE&T's staff works in conjunction with the faculty member to develop the course. The faculty is responsible for providing the tutoring for the course

over its lifetime. Like OLA, DE&T is also able to offer learners some flexibility in when they enroll. DE&T has four terms during the regular school year within which learners can register for distance education courses, plus courses are available during the summer months.

The participants in this study have been introduced and their roles within their working contexts have been established. There are two levels of course developers participating in this study: department managers and instructional designers. Both groups act as project managers and have some differences in the roles they perform.

In Chapter Five, I will provide the results of the study, including the course developers' planning models and their views on CT/NM. Following, I will provide their views on emerging course development considerations.

CHAPTER FIVE

RESULTS

I began this research study with the question, "How are CT/NM affecting distance education course development for adult learners?" Based on my initial literature review and my own practical experience, it seemed that a number of changes were taking place and that a new model for course development and delivery was emerging. I was interested in finding out whether this might be considered representative of a post-fordist, third generation-based emerging model as proposed in Chapter Two.

As I ventured into each interview, I explained that based on my experience, many course developers face a number of challenges in making use of new technologies. However, as CT/NM are emerging, I felt that there would be even more challenges. I wanted to know how these two factors, CT/NM, were affecting their practices. The course developers involved in this study had similar and divergent views with regards to CT/NM, and the effects on their practices. The purpose of this chapter is to present those views, by looking first at the course developers' planning models and their perspectives on CT/NM. Following, I will present emerging course development considerations, including some new practices, as identified by the course developers.

Current Course Development Models

To find out whether CT/NM were affecting the course developers' practices, I felt it was important to understand how they normally approached course development. In this section, I will outline the course development models normally applied in the course

developers' contexts and provide an analysis of how their models fit within current distance education course development models.

Descriptions of Course Development

The DE&T course developers described the course development proposal process applied in their context. Their descriptions matched the proposal process administered by DE&T as outlined in Chapter Four. Through this process, faculties apply for funds to develop distance education courses. The cross-faculty Advisory Committee on Distance Education adjudicates the proposals from faculties and DE&T administers the successful proposals with the faculties. Within that model, an instructional plan is developed. Daniel talked about the instructional planning model used by DE&T:

> Daniel: In theory, we use this phased, structured, linear approach to development. We have phase one, where you develop a detailed outline of the course that has objectives, and lists some basic information such as who the learners are, the prerequisites and very basic outline information. That is fleshed out in phase two, where the actual course content is written. In phase three, we get a chance to review that material and make changes. In phase four, the course is delivered. Each one of those phases has to be – well at least phase one and phase two have to be approved by the academic department involved, so there's always academic approval there.

The phased approach that Daniel described was also similarly described by Elaine and Henry.

Elaine suggested that her own planning followed a systems-based approach. In talking about her recent experience in developing a globally accessible Web course, she said:

> Elaine: To say it's quasi-systematic, we really do try to use a relatively traditional instructional development model. No particular one. We tend to like to pull bits from all the various possibilities.

Elaine expressed that even though there might be a particular planning model followed, planning was a non-linear process. Although on a theoretical level there might be parts of the process that should be completed in a sequential order, in normal practice, this did not happen. There could be a number of processes operating at either the same time or in an overlapping way. Daniel and Henry also suggested similar ideas to Elaine's.

The DE&T course developers described the membership of the course development team operating in their context. This team normally consisted of the DE&T project manager, a faculty member, a Web programmer, and multimedia experts, if required. These members were usually in-house. Some course development activities were completed by external contractors, such as graphic artists, who were brought in at a later stage in the development cycle.

While DE&T's proposal process and instructional design model were explicit, OLA's course development activities varied between the divisions. The BCOU course developers described the course development process operating in their context. For example, Gary described the process in BCOU and OC:

> Cathy: With regard to regular print-based courses for BCOU and OC, is there an actual planning formula that's used?
>
> Gary: Yes, there is. It is only loosely adhered to. When it comes to a new course, you have to go through this process. Essentially, what it boils down to is a feasibility/needs assessment stage, from an instructional point of view, to identify who the audience is. Then, there's a planning stage, which is meant to identify the outcomes and a general outline.

Lulu and Ingrid described a similar planning process as Gary did. This process ended with a "course blueprint," or a project plan, which provided a detailed guide for the development of the course components.[23]

When asked about who was involved in the planning team, Lulu stated:

> Lulu: Usually the smallest "team" would be a course designer and a course writer. In the university, we usually call this role, "course writer," but it depends on the program area. In the college or in some of the ABE or technical courses that we've developed over the years, they would have a content expert and a writer so the role of "course writer" could be divided in two.

Lulu also suggested that a course consultant might be involved. Both the course writer and course consultant would be academics; however, the course consultant would likely be an academic with more seniority in the academic field than the course writer. In addition to the people that Lulu suggested, Ingrid added that there could be a senior tutor, a graphic artist, and media developers. As well, there would be input from BCOU staff involved in course delivery and student service activities. People acting in these roles would be brought into the team later.

Farrah presented her process for developing a course, which was similar to the model described by the BCOU course developers. I asked Farrah:

> Cathy: In terms of a planning process, is there one that you normally use? Is there a template or a heuristic that you normally use?
>
> Farrah: Yes. I've always applied a certain approach in terms of various types of instructional design plans that I've done over the years. They've always varied in terms of the detail. For me, it has been important to set the context: the overall instructional goal of why we are developing a particular

[23] The term, course blueprint, appears in DE&T's handbook, *Preparing Distance Education Courses: A Guide for Course Authors*. However, the DE&T course developers in this study did not use this terminology to describe their course plans.

> course. Then, focus right on the learners, who they are and their characteristics. Following, we go into content and outcome analyses. From there, we create topic outlines and determine whether or not we need three modules or four modules. A certain structure emerges. And then, we look specifically at the instructional strategies, and the methods by which learners are going to learn the content, whether they will be using case studies or labs or other activities. Also, the assessment is very key. It's very much tied into the outcomes.

Farrah suggested also that although course development followed a sequential process, it was holistic and interactive. Farrah's perspective was similar to that provided by the DE&T course developers, whereby planning was interactive between the development stages.

In terms of the course development team, Farrah suggested that it was desirable to have everyone together at the beginning of the process. This was so that the team would know about the project and be able to help with the design. In most cases, the key team members would be the project manager, teachers, course writers, and reviewers. Other roles related to the production stage of course development such as media developers, graphic artists, copyright people and copy editors would be brought in at a later stage.

Alison had a somewhat different view of the course development process than the other course developers. Instead of focusing on the steps or stages to completing a course as other course developers had done, she focused on bringing the entire team together and sharing expertise. She said:

> Alison: What I like to do is bring all of the people who are going to be involved in the project together from the technology angle, the media angle, the educational angle and even administrative assistants. I bring everybody together to plan because everyone has experience and expertise at something. Sure enough, if you miss somebody out, you'll miss something key. It's important for all folks who are going to be involved in a project to

> know up front what it's all about and for everybody to hear the same thing so that they can plan together. I think that's important.

Alison's view of the course development team was very broad and included all those who would be involved from beginning to end, rather than in stages as described by the other course developers. Alison's view might have also reflected the type of the work she was involved in, which had largely been of an applied research and development nature. Since most applied research and development projects are very complex to plan and may not follow a particular course development system, it makes sense to bring everyone together who could contribute to the planning requirements. Alison indicated that some other factors were also important in the course development process including budget, feasibility, expertise, and availability of technology. As well, she indicated that planning was developmental throughout a project. If some aspect of the project was not working, she suggested it was important to try something else.

Analysis of Course Development Models

There were similarities between the stages of planning and the composition of the course development team as described by most course developers. As noted earlier in this paper, DE&T and OLA have different decision-making processes when determining courses and programs to develop. However, at the course planning level, most course developers in this study described similar course planning or instructional design models. Farrah described the development of an instructional design plan which had similarities to that described by the DE&T course developers

had a project proposal to work from, the BCOU course developers had a "course blueprint," or project plan, to follow.

The planning strategies described by most course developers seemed to be conducted using traditional, systems-based methods, similar to the models put forward by Bates (1995) and Moore and Kearsley (1996) in Chapter Two. For example, in the front-end systems design model described by Bates, planning is conducted in four stages. Key staff are brought into the planning process at different stages, depending on their skills and expertise. This is similar to the stages described by most course developers. The roles for team members are defined and they participate in the course development activities when needed. This staged approach makes sense, particularly when developing many courses, while keeping a high level of quality and consistency in the course development and delivery system. Thus, there seems to be a systems-based course development model operating in each context.

Alison described a different process for developing a course. She was less step-wise in her approach to planning than the other course developers. Her approach seemed to be based on shared-expertise and facilitation. In this way, Alison's approach seemed to reflect the planning model presented by Burge and Roberts (1998). Alison also suggested that planning was developmental. Since many of her projects had an applied research and development focus, Alison had more flexibility to conduct planning in a different way.

Course Development, Converging Technologies, and New Media

After gaining some understanding of the course developers' descriptions of the planning models from their contexts, it is possible to look at how CT/NM are acting upon

their practices. CT/NM are not things that people commonly think about. Recognizing this and applying the definition provided by Collis (1996, p. 550), I used the Web as an example of CT/NM when I began each initial interview. Since the course developers selected for this study had experience in using the Web for course development and delivery in some measure, this example set the course of our conversations. In this section, there will be a discussion on how the course developers thought that their practices were being affected by CT/NM.

Course Developers' Views

When I asked about how CT/NM were affecting their practices, I received a range of responses from the course developers involved in the study. For example, Daniel told me that CT/NM had little impact on the instructional development process operating in his context:

> Daniel: Well, I don't think it's changed that much actually. At least not here. I don't sense that we've made a huge change in how we plan and design courses as the technologies have changed. The official model that we use is still the same now as it was when I started here, which is a fairly linear, typical instructional design model. We still have that in place. We've changed some of the words in it so that it does recognize in fact that we are using different technologies but the process is pretty much the same, at least on paper.

Daniel suggested, however, that CT/NM provided more opportunities to develop courses differently so that there might be an impact on what they looked like; however, this outcome did not change the planning approach used. Daniel also suggested that the impact of CT/NM was on the course delivery and support side:

> Daniel: It has an impact on the delivery and support requirement for the teaching side. With on-line delivery, there is much more emphasis on teaching. Whereas with print-based courses, I think there was a tendency for tutors to really treat them as independent study courses in the strict sense of the word where students were on their own for pretty well the whole course. They sent in assignments and got their marks. Some of them might phone for advice but there was very little on-going interaction and instructional support was all more or less contained in the package. Whereas with the on-line courses, our philosophy or approach is to have much more of an on-going input from the instructor in terms of computer conferencing and e-mail interaction between the students and instructor. It's a bigger commitment both in terms of time and the kind of instruction once the course is developed using on-line technologies.

In addition, Daniel suggested that there was an impact on the learner support side, particularly with technical delivery. Learners required passwords to the technical delivery system and some technical help, so this needed to be in place.

Daniel also suggested that the production requirements could become more flexible when the Web was used for course delivery. Course materials could be changed dynamically, if required.

Farrah suggested that part of the process of planning stayed the same regardless of the technologies used. She explained:

> Farrah: Overall, parts of the planning process stay the same no matter what technologies you are using. Every situation is different. Every project that you work on is different in terms of the learners and the technology that is being used as part of a course. But underlying it is a certain planning process that's consistent in terms of looking at the students and the content and whether outcomes have been identified, such as those from the Ministry of Education's integrated resource packages, or whether outcomes have to be created. But definitely the planning process up front is always key and what you plan will vary depending upon the technology at hand.

For Farrah, every project was different, but there was a consistency in how planning was approached. She further talked about the role of technology in her practice:

Farrah: Well, I guess for me, technology has always been a tool.

Cathy: It's just a tool?

Farrah: It's just a tool, yes. If you don't think about how you are actually going to use it, then it's almost useless.

Farrah's explanation concerning course development and technology showed that technology was a support to the learning process. She suggested that it was important to have a purpose for using a technology in a course so that it enhanced the teaching-learning process. She told me that her experience with various new technologies and media over the years had helped her in determining how to apply emerging technologies and media effectively.

I asked Gary what was happening with regard to new technologies in his context. He said:

> Gary: The principles that I tend to work under is that you try to choose the medium of expression that best suits the material to be covered. For instance, as we moved into the on-line environment,[24] which basically adds a conferencing component and not a whole lot else, the emphasis was on what parts of the course would benefit from discussions and conferences. As we moved to the Web, which is much more powerful, we built on the conferencing piece because that's incorporated within it. Then, we added whatever other capabilities that particular medium provides. In particular, I guess it's "user to computer" interaction as opposed to "person-to-person" interaction.

He said that BCOU was just concluding an experimental phase with regard to on-line, Web-based courses. As a result, there was great variation in the way courses were being developed for the Web.

---

[24] Gary's use of the term, "on-line," meant "computer conferencing," as opposed to Web-based on-line delivery.

Gary described a new process for course development occurring in his context. He was involved in a project to develop standards for identifying course content. This process would enable BCOU to use SGML as an underlying framework to organize course content as OS had done. I was curious about whether this would have an impact on the "blueprint" or instructional design plan:

> Cathy: As we move into these new technologies, do you see that process of getting to the blueprint changing?
>
> Gary: No. That process will remain the same.
>
> Cathy: So, really what we are talking about is a different production process?
>
> Gary: Correct, yes. At the point of the blueprint, it will remain the same.

Like Daniel and Farrah, Gary suggested that the process for developing the instructional design plan for a course was not impacted by the technology selected in their practices. However, following the development of the instructional design plan, there was an impact on the production requirements, as well as the teaching and support requirements.

Gary also made a very interesting point with regard to the application of SGML and the work that his colleagues in OS were doing. For Gary, SGML was not driving changes in course development and production. Rather, it was the people who saw the opportunity to apply this technical methodology to help with the instructional development process.

Elaine suggested that there were changes as a result of converging technologies, but no change in the planning process or how the technologies would be selected or applied.

> Elaine: I think there are changes. I'm not so sure that there's any real change in the way the technologies are being used. But I think there are changes in the way people are approaching the technologies. I'm very fond of a multiple media process anyway. I say that rather than multimedia because I'm not talking necessarily about animation or games or those kinds of things. What I have found is that as developers, we're having to spend more time teaching people about the basics of the various types of media and the recognition that certain media implies certain things in the classroom or in the distance classroom.

Elaine explained that she applied a multiple media approach in her practice. For Elaine, the changes in planning were related to the addition of a new medium or technology to the course development process. These changes were medium- and technology-specific. The medium that was chosen depended on what was to be taught and what media were required to meet this need.

Elaine also told me that getting people to see the possibilities of new technologies was a necessary step before they could use it. She said:

> Elaine: Slowly but surely people are changing. I think once we start to talk to them about what's available, they start to see the possibilities. Part of the problem we're facing is this little difference between thinking about what it is you want to do and recognizing that if you don't experience it or haven't experienced it, you can't dream it.

Elaine suggested that if people had not experienced how to use a particular technology, they might have difficulty seeing how it could be applied. As a project manager and instructional designer, part of her job was to help faculty understand the new possibilities brought about by technologies and how these might be combined effectively to provide learners with instructionally sound learning experiences. In this way, Elaine was acting in the role of a change agent.

Ingrid had a different view to the other planners. She suggested that it was not possible to take advantage of CT/NM without making structural changes within the institution. Ingrid said:

> Ingrid: It's not possible for institutions to respond to the stimulus of changing technologies without changing our collective agreements and administrative structures.

To take advantage of new opportunities brought about by technological change, Ingrid said that development and delivery processes and functions would need to be brought together. She explained:

> Ingrid: I could see, very easily here, using convergent computer conferencing and other technologies to create as well as to deliver courses. I think in almost all of these situations the traditional divide between development and delivery in distance education could be replaced by an on-going, interactive, development and delivery process. Ideally, for distributed education, there needs to be someone with the content expertise teamed with someone with the technology expertise.

It seems that Ingrid's idea of bringing development and delivery together is consistent with post-fordist thinking concerning work teams. The team members involved in development and delivery would work together in an on-going interactive relationship, and as a result, would be responsible for the course throughout its life cycle.

Alison expressed that there were significant changes to course development as a result of new technological options. While some considerations such as feasibility and budgets stayed the same, other planning considerations changed. She described a new course development process occurring in her context, where new and existing resources were being applied to meet learning outcomes:

> Alison: The real difference I see in the course development process is being able to define what the learning outcomes are and thinking about how various resources can be used, without necessarily having to write everything down in text. You can use a lot of video. If you have an instructor who's able to do a good job with computer conferencing and if your participants have got that kind of technology, then you can really lighten the load of the person writing the course by relying more on the instructor or the tutor to direct learners through those resources.

As a result of a greater number of technologies and new media, it is possible to select and re-use appropriate existing resources to meet the learning outcomes for a particular course or learning path. This course development method also enables a more learner-centered approach, whereby learners can select their preferred media. For Alison, the changes to the course development process were partly as a result of technological and human factors. If the technologies were available, course developers would incorporate them into their planning. If course developers had confidence that instructors could use new media and technologies effectively, they would incorporate these into new course offerings.

Alison also suggested that, as a result of on-going technological change, distance education courses and programs could be planned virtually between team members:

> Alison: Well, even within the planning process technologies have changed the fact that people don't all have to be in the same room to do the planning. So, we can talk about audioconferencing, videoconferencing and electronic mail in particular, and how those technologies have changed the need to bring everybody together in the same room for days at a time. Like work, we can do that individually in different places.

This meant that team members did not have to gather in-person over a number of days to plan the program. Instead, team members could engage in on-going planning virtually and cost-effectively, especially if team members were spread out over a great distance.

Lulu, in contrast to some of the course developers, suggested that CT/NM did have an effect on the outcome of the course blueprint because the technologies that were selected had an impact on planning. She explained:

> Lulu: I definitely think that there is an impact on the course blueprint. The reason is that in the course blueprint you are deciding what media you are going to use and in what way to deliver what parts of the course. You might say, "This part for resident care attendants, for example, really needs to be shown." So, the best way to do that might be in a video tape. "The learner needs to really be able to read critically and extract things from it." So, this part really needs to be in print and so on. That's decided right up front. It's one of the first things.
>
> Cathy: So that really does make an impact?
>
> Lulu: Absolutely.

For Lulu, the selection of technologies was integrated into the planning process at the beginning. She thought that new technologies would impact the course development decisions during the planning process.

New technologies to help learners are emerging. Lulu spoke about the opportunities that could emerge as a result of the new electronic commerce capabilities. Learners might have access to media in the future by paying a nominal fee to download an item through the Web. This meant that a tutor could suggest additional resources to learners to help meet their particular learning needs. As well, the emergence of electronic books (e-books) was going to enable the portability of course materials and enable instant updates as course information changed. She said:

> Lulu: For example, if there was an e-book that was in an 8 ½" by 11" format, let's say, with a white screen and really easy to read and really easy for the reader to flip around from section to section, you could send a learner all the course units, all the textbooks, a book of readings, the assignment file and the course manual, all as e-editions.[25] So, they could visit the Web for links and conferencing but then they could have all their other material essentially as print. But it wouldn't really be print. It wouldn't be on paper.

Lulu thought that the combination of electronic commerce and electronic books would allow learners to have more choice of media and access to resources suited to their specific needs. By applying new technologies and media, increased choice and access could be accomplished, and therefore would have an impact on how planning occurs.

Henry suggested that the development of the Web was more than a computing revolution, it was a communications revolution. His view was that the use of the Web in education was growing and this had to do with its interactivity and communications capabilities. Henry said:

> Henry: Certainly the Web is becoming so pervasive in education that I think we're all compelled to at least investigate the possibilities of it. I've been developing courses for the Web for about four years so I've got a fairly good feeling about what you can't do and what works well and what doesn't work quite as well. So that's a really important aspect of it. It does affect planning and it does affect your budgeting processes and all those kinds of things as well.

For Henry, there was an impact on the traditional distance education planning, in terms of the types of access and learning activities that could be applied. He talked about the changes that information technologies (IT) were having on distance education:

> Henry: One of the things that's helped distance education the most is the convergence and incorporation of IT. The old paradigm of the individual

[25] The term, e-edition, refers to an electronic version of a particular document available on-line in an agreed to e-book document format.

> learner in isolation with a limited connection to an instructor has now become the least positive way of providing a learning experience through distance. So now with the Web, it's collaborative learning and to actually implement more of the learner-centered approach that distance education and open learning have traditionally attempted to do.

Henry suggested that convergence and IT were opening up new kinds of access, enabling the movement towards a more learner-centered approach. As a result, the way distance education was being applied to meet learners' needs was changing and opening up a whole new range of possibilities.

Analysis of the Course Developers' Views

The course developers' views were varied. They showed different emphases as to whether CT/NM were affecting their practices. Daniel, Gary and Farrah focused on the development of the instructional design plan. CT/NM did not affect their instructional development practices. For them, the changes came after the development of the instructional design plan, in the production, delivery and support phases.

Elaine saw changes related to technologies occurring, but she did not see any real changes in how people were applying them. She applied technologies according to their capabilities and their strengths. Her planning methods remained within a systems-based distance education model. In this way, her approach was similar to Daniel, Farrah and Gary.

Alison, Lulu and Henry shared an optimism regarding changes brought about by converging technologies and new media. Alison suggested that even the way that course development was conducted was affected by technological change. Team members could

work at a distance by using interactive communications technologies. She also discussed developing a learning outcomes approach, using pre-produced educational resources, which would enable learner-centeredness. Lulu and Henry suggested new media would enable a more learner-centered approach than previously available for distance learners. As a result, there were changes to the course planning activities up front.

Ingrid's comments regarding CT/NM were provided from a macro course development perspective. She was concerned with the system changes required to take better advantage of new technologies.

As demonstrated through their comments, the course developers experienced CT/NM differently. As I will discuss in the next section, the course developers talked about some course development considerations that were emerging in their contexts. This provides some insight into the impacts of CT/NM on the course developers' practices.

Emerging Course Development Considerations

The course developers identified many aspects of CT/NM that illuminate how these interdependent factors are affecting their practices. By using Bates' ACTIONS framework, I will examine how CT/NM are affecting the course developers' practices. The course developers' responses fit into four categories within the ACTIONS framework: access, teaching and learning, interaction, and organizational issues.

Access

The course developers discussed access related to two factors: bandwidth and computer equipment; and ubiquitous access.

Bandwidth and Computer Equipment. Technology is changing constantly and with it, better computer systems and higher level of bandwidth are becoming available at lower costs. Some course developers suggested that it was important to develop courses for technological standards and capacity that would be available in the foreseeable future. In other words, it was important to look at the technological standards and level of capacity emerging. For programs where delivery was imminent, this meant setting some standards of access that would enable their learners to participate. With regard to the Web, this meant setting a standard of hypertext mark-up language (HTML) that most learners would likely be able to access. For example, Gary said:

> Gary: We've been very careful in all our Web courses to make them as accessible as possible. We're talking about a home user so, for instance, we standardized on the HTML 3.2 specification. If it doesn't meet that, then we have to find an alternative. Also, we want to make sure, say, for Web materials that everything is available in one way or another.

Gary was referring to the idea that if home users were not able to access course materials at the specified HTML standard, an alternative media might be required for the course materials. If the materials available on the Web were not accessible by learners, they could be sent in another medium and/or technology, such as print.

Gary talked about the need to develop courses for the widest possible audience. To enable this, some special factors needed to be taken into consideration. For example,

Gary suggested that there were special requirements when developing a course's Web site so that sight-disabled learners could see the course materials.

Henry suggested that there was a difference between developing technology-based courses for site-based learners and home-based learners. This situation presented challenges for course developers who developed for both learner groups. Henry said:

> Henry: One of the things about technologies is that you always have to keep your mind obviously on the user and what access the user has and what you might call the level of technology that the users have access to.

Learners located at suitably-equipped facilities could access what Henry called "large file" activities including animation, simulations, and virtual labs. Home learners generally had less access to high capacity bandwidth and high performance computers. However, they still required a rich learning experience. Henry suggested that course developers had to think creatively about how to develop rich, collaborative learning experiences for the home-based learners, given the levels of capacity they could access. With the increase in bandwidth capacity and the development of lower cost computers that had high quality presentation capabilities, Henry thought that this challenge would recede in the near future.

Elaine seemed to have a similar idea to Henry's when she discussed the technical design used in her Web-based courses. She said:

> Elaine: From a technical point of view, we're actually pretty much on the low end. But, what we've been doing with the Web site and the collaborative issues has been pushing the envelope. There's lots of other courses out there that are glitzy and fancy and have lots of animation and simulations. But, they don't get at the core of the content like we do or don't get at the critical thinking and analyses that we do.

Elaine had learners both locally and internationally and they had a mix of capabilities with regard to computers and bandwidth. Elaine's course team had developed the capabilities of the Web for course components they thought were most important.

Another method for providing learners with a rich learning experience is by making some course materials available in an alternate format. For example, Elaine suggested providing the Web-based course components on a CD-ROM. This would save learners from having to download large files over the Internet. She explained:

> Elaine: We have a CD-ROM for one of our courses because we did not want to have large download times. We felt that using the CD-ROM as a source and storage device made more sense. The CD-ROM goes to the students. They pop the CD into their machine, and they work through the various technologies, choices and things that are available to them. Although it's Web connected, it's all coming from the CD rather than from the server. So it's allowing them to work that way.

By using CD-ROM technology, learners, who were limited by factors such as the cost of using the Internet or limited bandwidth, could have access to the course Web site without having to be directly connected.

Ubiquitous Access. Several course developers emphasized the opportunities of using the Web to provide access to course material and learning resources. By using a Web browser, learners can access courses over the Internet from wherever they are. They do not need special software since what they require is available through the Internet. This means that whether learners are local or halfway around the world, all they need are the necessary levels of Internet access and appropriate Web browsers. As well, it means that instructors do not need to learn new software packages in order to teach on-line. Alison, for example, suggested:

> Alison: Whether the technologies themselves converge or not, it's kind of the user interface to the technologies. It makes it easier on people to just get their Netscape browser or their Explorer browser and be able to access streaming video or courses or conferences all through the same piece of software.

Alison's point is very important when considering access issues. If instructors and learners have access through the Web, and as a result, do not have to learn specific software, they would more likely take advantage of this capability for teaching and learning opportunities.

Since bandwidth is an issue, it is also important to keep Web site graphics simple. This is especially important for home-based learners and learners who live outside Canada in countries where the Internet access is paid for on a per-minute basis. A Web site can take a long time to load if there are many graphics. This can add to the cost of the learning experience if learners use a pay-per-use telecommunications system. Course developers need to address new issues such as how learners access networks and what the local variables might be when delivering courses on a global level. Daniel explained:

> Daniel: There is still an access issue and certainly, particularly when you are trying to develop for world markets, and trying to go into developing countries, it is not reasonable to expect that learners in those countries are going to have easy access to the Internet. Even locally in British Columbia and Canada, there is still a huge percentage of the population who don't have computers or Internet access. So, we're still struggling with that issue because as soon as you use a new technology you are denying access to some people. If we waited until everyone had access to the Internet, we wouldn't be doing anything for quite a long time.

The challenge facing course developers is providing courses for a level of Internet access that the majority of their learners are able to attain.

Teaching and Learning

From what the course developers described, there are some new course development strategies occurring and leading to new teaching and learning opportunities. A high amount of experimentation is occurring especially with regard to on-line Web-based delivery. This experimentation is leading to the development of a variety of new approaches for technology-based course development and delivery. I have called these approaches, "emerging practices," and they fall into four categories: media and technologies replacement; hybrid course development; resource-based course development; and structured information.

Media and Technologies Replacement. Daniel, Gary and Lulu mentioned the emerging practice of media and technologies replacement. In this practice, one core medium is substituted for another. Most traditional distance education materials are developed with text as the core medium and print as the core delivery technology. This means that most instruction is provided through the print component of the distance education course package. A typical course package would contain a study guide, course modules and ancillary print-based materials, textbooks, and other media. In the case of a media and technologies replacement practice, the text-based course materials that would normally be sent to learners in a print-based course package format are instead published in another medium. If the Web is used as an example, this means that the learner must go to the Web to get the core course material. Other ancillary media may be supplied as well and sent to the learner by mail. For example, Daniel explained:

> Daniel: You have to consider different technologies. But, having said that, before we were looking primarily at print-based courses with the possibility of added technologies, we now tend to be looking primarily at on-line technologies as the core and then the possibility of some supporting print or video or some other technologies. So, in a sense what's happened I think here and probably in other places is that print has been replaced by on-line technologies. So, the selection of technologies in theory is wider, but in practice, we've just substituted one for another as the core. Then, we've adapted the planning process to that technology.

Daniel's approach was pragmatic regarding how new technologies were used in his context.

Gary suggested an idea similar to Daniel's when he discussed the recent development of a certificate program in business skills for college-level learners. He described a situation where a few years earlier, the copyright on an existing program had run out and the program materials were no longer available. The department in charge of the program decided to develop a new version, using the Web. At the time of development, there were very few Web courses available to use as examples. As a result, no one on the course team knew what effective Web design should be. Gary explained:

> Gary: As the instructional designer for the project, I assembled a structure that I felt would work for these courses considering the audience, about the first-year college level. That's sort of a hands-on audience – people who you'd expect to be able to go through a lot of activity. So, I provided a template on how to develop the material so that it would keep the writing down to a minimum, provide as many activities as possible, make use of Web resources as much as possible and use discussion areas where appropriate.

Once the lessons were developed by the course writers and posted in the template, the course team began to see how it worked for Web-based course delivery.

Gary suggested that developing a course for the Web required some creative thinking about how to minimize the reading of material on the screen. If the Web was the core medium used for the delivery of a course, the development of the course had to incorporate the design needs and address the strengths of the Web. For example, the design should enable learners to engage in active learning. Computer-user interaction and peer-based interaction might be part of the design structure.

Daniel discussed the differences in the production requirements between print and Web-based courses. He suggested that the production process for Web-based courses was less linear than for print-based courses. It was difficult to make changes to course content once it had been published in a print format. In Web-based courses, however, the content could be developed and changed dynamically. This had both pros and cons. In discussing some recent Web-based courses Daniel had developed, he said:

> Daniel: You can do just in time delivery with Web-based instruction much more than you can do with desktop publishing. What that means also is that you can change things as the course is being taught. We do that a fair amount and that's probably not a good idea unless you've made some major mistakes. It does confuse students if one day it's on this page and the next day it's changed. Or, there are subtle changes that they don't notice right away. We don't recommend that, but sometimes we don't have any choice, because of deadlines. The production process changes in the sense that it's more fluid and there's more opportunity to make changes and to tweak things. The upside for Web-based courses is that we can add updates, new resources if find them.

As a replacement for print, the Web provides opportunities for the course development team to consider different production processes. A Web-based course does not have to be completely finished in the same way that a print-based course does. Course content can be dynamically added or changed while the course is in progress. However, if too many

changes are made to the Web pages during the course, this might be confusing for learners.

There may also be opportunities to adjust the course to meet the learners' needs while the course is being delivered. Daniel explained further:

> Daniel: What we've included in all Web courses is a book-marked database. Students can actually collaboratively develop this resource. If they find an interesting article, they can put it in the database and other students have access to it. That aspect is very useful where you're building the course as you go along. But the core should really stay the same. The core content ideally would be there at day one and not change substantially unless there was huge error made or you've left something out. And then you could have a more dynamic resource section that changes based on student input and instructor input and so on. Of course, the on-line discussion changes on a daily basis.

With Web-based courses, course developers can be engaged in both development and delivery activities at the same time. This is different than for print-based courses where many activities need to occur before the course content can be published. There is also the opportunity to add to the course dynamically, which is especially important for getting learners engaged in collaborative learning. However, although the Web allows dynamic changes, making changes may result in confusion for learners.

Since the Web is non-linear, a point made by most course developers, it opens up a whole new range of instructional possibilities. However, sometimes, people involved in course development are not looking at the Web as a medium that has different design considerations. For example, Gary discussed some Web courses he had seen and he warned about developing courses for the Web that were basically reproductions of print courses. He said:

> Gary: Other courses have been developed so that they have been essentially something of a reproduction. It's like taking a print course and putting it on the Web. It's reams of material that the learner is told to print out. There are some links and other things available. But, they're getting the print package except that they have to do the printing.

Lulu expressed a similar idea. She talked about unloading the printing of the course material to the student, rather than having it printed and sent to them. Especially with the non-linear, hyper-media approach to using the Web, providing all the course material on the Web might not be very efficient for learners.

> Lulu: There's a school of thought with Web development that you shouldn't have long Web pages and you shouldn't have a Web page that goes on screen, after screen, after screen. That means that a section of, say, Unit 3 might take up nine separate short Web pages. So, then the student has to visit all nine of them, click on each one, wait for it to open, print it out, and number the pages. Then, the student has to go to the next section and wait for the first page to load up and print it out. It's just so inefficient for the student. Whereas if we just sent all the material to the student as print, it comes well organized. It is printed on both sides, is three-hole-punched, and has separator tabs. This is very user-friendly for the student.
>
> Cathy: And get on-line to discuss.
>
> Lulu: Yes! And visit excellent related Web sites.

In the reproduction-based course application, the burden of printing is shifted from the course provider to the learner. This may not be very efficient, if there are many course pages to print.

Lulu suggested there was a misconception that print-based courses could be "migrated" to the Web. She said that the term, migration, needed to be defined. Migration implied that there was no change in how the content was presented between one medium and another. She said management tended to think of migration as a simple and inexpensive process. There was the assumption that material could be moved between

media without design changes. However, since each medium was different and had different ways of presenting content, Lulu felt that it was necessary to make design changes so that the content was displayed appropriately for a particular medium. She explained:

> Lulu: I think that "migrate" might be the wrong word because the folks who migrated from the East over the Rocky Mountains to the West arrived pretty much intact, pretty much the same folks that left. And I think that we really have to think about what "migration" means because when you are thinking of a different medium, you really have to think about structuring your material in a different way, really looking at the content in a different way.

Moving the core course content to the Web requires some new strategies to make the best use of what it can offer. Design is a critical issue for using the Web as a replacement for another core medium.

The key advantage of a media and technologies replacement practice, in the case of using the Web as a substitution for print, is that it enables a learner to access the course from any location that has Internet access and a Web browser. However, the chief drawback, depending upon the design of the course, is that learners have to read the material on the screen, or print out the pages or modules that they require.

Replacing one core medium for another means that the unique qualities of a specific medium must be taken into consideration in order for a course to successfully transform to a new medium. The course developers who made use of the media and technologies replacement model were not talking about reproducing print-based courses on the Web. Instead, the course developers were discussing how to use the Web effectively as a core delivery medium for their courses. In that context, they seemed to be saying it was not a design flaw to replace one technology with another as long as the

medium's unique qualities were taken into consideration, and course materials and activities were appropriately designed to work with the strengths of that medium.

Hybrid Course Development. Ingrid, Lulu, Gary and Elaine described an emerging practice that can be called a "hybrid." In hybrid course development, learning materials are provided in the medium most appropriate for a particular learning activity. For example, the Web portion of the course would contain the interactive, communications-related functions, virtual resource areas, and files that could be downloaded. Print components and other media not suited for Web delivery would be sent in a course package to learners.

Ingrid discussed a recent project where she was managing the revision of a set of courses. Her description seems to represent a hybrid course development practice. The copyright had run out on the video tapes that accompanied the print-based course components. Although the textbooks provided for the courses had useful, visual images, the course development team wanted to provide learners with an alternate source of images. By using the Web, the course development team was able to identify additional resources for learners. Ingrid explained:

> Ingrid: These are print courses which were originally created as having television materials in them, and these tapes became expensive because of copyright. And they're not being broadcast. The problem we were trying to solve was the textbooks have images in them but we wanted an alternate source of images for the learner. So, what we did was to take the print courses and add to them an on-line environment in which there was a seminar for discussion questions and also a set of resources that would lead to Web sites that had images. We tried to enrich the visuals for the course and also to provide some interaction through computer conferencing.

Ingrid expressed that a key reason for providing a print component for these courses was to keep the amount of reading on the Web to a minimum.

Lulu presented a similar idea to Ingrid's:

> Lulu: The Web is definitely being thought of as the way to go. We're working right now on developing hybrid courses that have Web components but that are not completely on the Web. So, we can put together these swell, hybrid packages where we send out a textbook, course units, audio tapes perhaps, and whatever--big wall maps. For a geography course, we send out a giant wall map that the learner can put up right over his desk so when he's working through the course and it says something about a particular town, he can just look up and see where it is. And we put the things on the Web that the Web is best suited for.

The comments made by both Ingrid and Lulu indicated that the Web was being used in addition to other useful media.

The DE&T course developers discussed their move into international program delivery, which seems to represent hybrid course development. They began developing a collaborative graduate certificate with another educational institution four years ago. DE&T and its partner institution decided to use the Web for course delivery. As a service department, DE&T does not generally develop courses on its own. As discussed in Chapter Four, DE&T usually develops courses in conjunction with UBC faculties or external clients. For this particular project, DE&T was taking on both course development, as project managers and content experts, and instructional delivery, which was not something that they normally did.

The lead time for the development of this course was short. This meant that the DE&T course developers had to employ a "just in time" planning strategy. Because they were using the Web and it was a new medium at the time, they had a number of new requirements. A key requirement was the need for a Web-based electronic delivery system so that the course could be provided over the Internet. They also had to determine how

they were going to design for Web-based delivery. In addition, DE&T's partner institution wanted to include some videoconferencing sessions.

In discussing this recent experience, Elaine suggested that there might be different, and additional, variables for course development as a result of moving to on-line delivery. For example, as discussed earlier in this paper, course developers needed to take into consideration how learners in different countries would be able to access the Internet. In some countries, learners must pay by the minute for their access. Therefore, the DE&T course developers suggested that there was a need to consider the way that learners access the Internet when designing courses for an international audience. Elaine explained:

> Elaine: We deliberately tried to create an on-line environment that was as free of downloading time as possible. Things that were appropriate in print, we put into print. Things that were appropriate on-line, we put on-line.

When Elaine described the appropriate use of print and the Web in the quotation above, it seemed that the media in the course were being used in combination and according to their strengths. Elaine also said:

> Elaine: Our content is pretty much delivered by Web site, print, and the absolute core of these series of courses is the on-line discussion. And then the international collaboration.

There is a sense that Elaine and her colleagues are using the Web in conjunction with other technology, print, and employing collaborative learning. Elaine's descriptions seem to represent a hybrid course development practice. As well, Elaine's description seems to have some commonality with an on-line course model identified by Mason (1998a, paragraph 23). Mason describes an "integrated" model containing activities and learning resources, and where the key component is the on-line discussion.

Hybrid course development is more than a media and technologies replacement practice. It is the Web plus equally important media. It is really a multiple media approach with the core medium being the Web. However, the Web is only used for what it is best at providing, including interactivity, communications, links to electronic resources, and more. The key advantage of the hybrid practice, as indicated by the course developers, is the opportunity for learners to participate with peers in collaborative learning experiences. This practice is representative of Nipper's third generation-based view where learning is a social activity. The tutor/instructor is important in the hybrid practice as a guide and/or facilitator for learners.

There was, however, a fine line between the media and technologies replacement practice and the hybrid course development practice. The difference seemed to be in the perceptions the course developers had regarding how they were making use of new technologies and media and the roles of the various media used.

The hybrid course development practice represents a creative way to bring together more common media forms with new ones to enhance the learning experience. It involves selecting a core medium and adding other equally important media. As a result, it is not an inexpensive way to provide courses; however, it provides for a range of learning styles and opportunities for collaboration with other learners.

Resource-Based Course Development. Alison spoke about a practice where a course could be developed by applying existing resources. This practice can be called resource-based course development because it has much in common with Bates' description of a resource-based tutoring model. This practice has the potential for maximum learner flexibility with regard to media choice.

Normally, in distance education course development, a course outline is developed as a first step in the planning process. The outline specifies the learning outcomes or objectives for the course. Following the development of the course outline, a content expert and/or course writer creates the bulk of the course content. In resource-based course development, this process changes. Instead of writing the course after the outline has been developed, pre-produced educational resources are found that meet specified learning outcomes. The course material is then written to fill gaps, which means that courses can be developed efficiently and cost-effectively, provided that the appropriate educational resources are available. By providing a variety of resources in different formats such as print, video or audio, learners can choose the media or technologies that best suits their learning styles. They can develop their own route or "pathway" to meet the specified learning outcomes. As well, with access to the Web, resources are available virtually. Alison described the process:

> Alison: The key thing is that you want to clearly plan what your course outline is, what your learning objectives are, what kinds of demonstration activities meet those objectives and then the filler can be text, it can be video, or it can be conferences that learners engage in on-line if you do more self-exploration. The traditional distance education course is very, very text-heavy. It can be difficult for learners to get through but it also doesn't allow you much flexibility in meeting different learning styles. Or in pace. So, if you have a lot of other kinds of technologies, then the learners themselves can find a pathway through all the information as long as the objectives and the assessment strategies all match each other.

Content already available in a video program, a textbook, or a CD-ROM may be identified as a resource that would meet specific learning outcomes. As well, this course development practice represents a shift away from text-heavy courses to a greater use of other media and technologies to meet learning needs. Resource-based course development

represents a potentially more learner-centered approach than the media and technologies replacement and the hybrid course development practices. If learners can select their own learning materials and the outcomes that they want to achieve, they have control over their learning requirements.

As an illustration of the resource-based course development practice, Alison talked about a recent collaboration between OLA and another post-secondary institution that resulted in a self-directed, post-baccalaureate program for teachers. The purpose of the program was for teachers to gain expertise in information technology. Instead of preparing a traditional, print-based independent study course, the design team found learning resources to meet the various identified outcomes. Learners were able to test their knowledge before moving on to the next learning outcome. They could select alternate media formats if desired. As well, learners could integrate the learning materials themselves according to the outcomes they wanted to achieve. They could also participate with other learners involved in the program. This type of program exemplified a multiple media approach in providing opportunities for learners to choose their preferred learning media or mode of participation.

The role that the instructor, or "mentor," took as part of the course delivery was a key factor in this resource-based course. Alison talked about the need for mentors work to with learners to help them make sense of the learning resources. Although the resources might be available and learners might be able to choose their own learning paths, they also needed to have a knowledgeable mentor they could contact for help.

Resource-based course development is a resource-rich method for developing and delivering courses. This practice represents a very learner-centered approach, since

learners can choose a preferred learning format from a group of selected resources. Alison did not discuss the cost of developing resource-based courses; however, there is potential for this emerging practice to be a cost-effective and quick method for developing courses, depending upon the availability of suitable learning resources. Course experts and writers can spend their time identifying suitable resources and writing the content that joins the course and the resources together, rather than spending time writing the entire course.

Structured Information. Lulu, Farrah, Gary, and Alison discussed an emerging practice called "structured information." This practice has much in common with resource-based course development and can be considered to be a leading edge variation. However, it is presented here as a separate practice because the participants identified it as different from resource-based course development. With the emergence of standards for identifying and tagging course content as discussed in Chapter Two, structured information may have the most significant impact on the traditional distance education course development paradigm. This practice is also related to the World Wide Web Course Developers Guide described by McGreal. However, rather than standardizing on HTML as provided in McGreal's model, this emerging practice uses SGML as the underlying framework.

Structured information refers to the relationship between content and structure in documents. By using SGML as a method for identifying content and for describing document structure, information can be structured in a document in a standardized way.

The goal of using SGML as an underlying framework for structured information-based course development is to provide consistency among the course components. Farrah said:

> Farrah: By using SGML as an underlying framework, we are able to look at all those steps in the planning process but in a very explicit manner and spend more time on that process, which I think is good.

SGML enables the development of an explicit planning process. Farrah described the process as follows:

1. Define learning outcomes and corresponding topic outline at the beginning of the process;
2. Identify learning resources and learner profiles;
3. Create activities and assessments; and
4. "Author" the course and output to the medium desired.

The first three steps of this process have much in common with resource-based course development. By identifying outcomes at the beginning of the process, there are two advantages. First, learners who can demonstrate that they meet the learning outcomes for a particular part of a course can move straight to the assessment stage. The second advantage is that resources that are already available to meet these outcomes can be applied, rather than having to write or develop all of the resources. Like resource-based course development, learning resources are identified and activities and assessments are created.

The last step, course authoring, is similar to most course development models. The difference is that in an SGML-based process, the presentation of the content is separate from the content itself. The content can be "published" in a variety of media and technologies such as the Web, CD-ROM, audio, or print, without having to re-create the content for each presentation medium. This also enables the content to be used for different learning purposes. Gary explained:

> Gary: Within a structured environment you have the possibility of re-purposing and re-using the same material. For example, you can call up a

little section that was written on how to use a comma for an English course. You can call the same piece up again in a Business course where you have a little piece on how to write a business case and need information on how to use commas. Plus, the other advantage is being able to output that same material into different media. You can output into print or to the Web or to a CD-ROM, or even audio through some sort of synthesis.

Cathy: So is that an advantage that you can take now?

Gary: I see it as a tremendous advantage because first of all it's going to create much greater efficiencies. We're going to be able to say, "Well, here's a section on how to use a comma and hey, there's another section over there on how to use a comma. But, this one is actually more clear and better written. So, we'll use this one." That way, we can also look at quality and go for the piece that has the quality we need.

The notion that content can be developed and used for multiple purposes, and developed for specifications to meet the profile of a specific learner group, is a key concept for a structured information practice. As a course is developed, content components are identified by special tags, called "meta-tags." The components are identified at a "granular" level, such as at the level of a paragraph or a page, rather than at the level of a journal article or book chapter. These components are entered into a database, which enable them to become retrievable "objects." Through this tagging, it is possible to search for the appropriate object to meet the required learning need. It also means that changes can be made dynamically across various materials. If a particular object becomes out of date, it can be replaced everywhere it appears electronically, whether in a document or on a Web page. Alison explained:

Alison: Because all the content actually "lives" in a database, you can display it in various ways. So, supposing a resource goes out of print, out of video production, or is not available for some reason. You want to change the resource. When you do it in a linear fashion, you have to read through the whole course, find out where this resource is, what it addresses and how many things refer back to it. Then, you have to go through and re-write all

> through the course. It's a mess. It's a long tedious process. In this process, however, you simply pull out of the database all references to this resource and change them all and then the course is done. The course is ready to go.

Updating traditional distance education courses is a very time-consuming process. Learning resources published in one medium or format are not generally transferable to another medium or format. It is, therefore, difficult to re-use the content in another format or make changes. If the content is tagged in SGML, it can be presented in a number of different media.

During my interviews with the course developers, most suggested that learners needed to select their preferred choice of media from which to learn. For example, I asked Lulu:

> Cathy: What do you think are the key issues as you are designing in new media?
>
> Lulu: Well, I guess what the best medium is for the content of the course. What's the best way to learn it? Can we provide optional ways of learning so the learner can choose? That's something that SGML is going to enable us to do. The learner can say, "Okay, I want this unit on the Web. But I want this other unit in print because I'm going to be sailing across the Pacific while I'm doing that one." Or, "I want this unit in audio because I'm going to be walking across Canada and I want to listen to it on audio tape." I think providing learners with different ways of gathering the materials is very good because people learn in different ways. And they learn different things when they're getting the materials in different ways too. We've always taken that into consideration but I think that as there are more technologies available to us, there are more options and you have to weigh all those options.

If a learner learns best from print, she or he should be able to have the course materials provided by print. Or, if the learner learns best from visual media, he or she should be able to select from these. By using the structured information approach, course developers should be able to provide learners with more choices in media formats in the future.

Although SGML may be a new option for course development, it may also reinforce the instructional design frameworks traditionally practiced in distance education. I asked Farrah whether using SGML provided a new planning process and she said:

> Farrah: I don't think it's a new process. I think SGML is a tool to help us do our planning stage. The model is based on various types of models that have existed, been documented and written about probably for a number of decades.
>
> Cathy: So, is it really more of a production process model?
>
> Farrah: It's definitely part of it when using SGML because it allows us to develop a very detailed instructional design plan.

Farrah explained further about the SGML-based instructional design plan and the activities occurring at each stage:

> Farrah: We are producing "products" at each stage technically. We're developing the content outline and the outcomes at the first stage. That definitely will become a product for teachers to use and that's a very valuable thing. In the past, we would never have done that. We would have produced a plan that was complete and that was geared for the team and for reviewers and teachers. We would use the plan to make sure that we had covered the outcomes and that there were guidelines for the writers.

As Farrah described, SGML was a tool to help with course development. She also discussed that the SGML process enabled the development of "products" at each stage. This meant that at each course development stage, there were course resources ready for immediate use. In the first course development stage, the course outline and outcomes were produced. These could be used by teachers or instructors as guides for their own instructional sessions. In the second course development stage, resources were identified to meet the learning outcomes for the course. At this point, teachers could use these resources with learners. In the third stage, assessments were produced, which teachers

could use with their learners. And finally, in the last stage, the course was authored in a specific medium or media. In the future, the instructor, teacher, or learner would decide in which medium or media they wanted the course.

Gary explained that SGML acts as a system controller. He suggested that:

> Gary: You can make a SGML system as flexible as you wish. The problem is how do you balance tight classification schemes, which allow you to find highly specified information quickly, with browse-ability?

An SGML system allows specific information to be found from amongst similarly identifiable information within a database system. If the SGML system becomes too flexible so that there are too many choices in how information is defined, there will be difficulties in finding the information needed.

The key difference between resource-based course development and the structured information practice is related to *how* the resources are identified. In resource-based course development, the resources are identified by a course development team or an instructor from a range of pre-existing learning resources. There is no change in the presentation format of the resource. It is taken as it is and some new course material may be developed to fill in the gaps. However, this practice uses existing distance education course development and production methods. In structured information, new and existing resources have to be specifically identified by meta-tags which enable the resources to become retrievable from within a database. These objects are stored separately from the presentation medium, and as a result can be output into different media and technologies such as the Web and print.

The structured information practice has much in common with both fordist and post-fordist production models. This practice is fordist in that, once the collaborative

standards development phase has concluded, the specific technological standards and production processes are set, such as tagging course content so that it might be used as part of the course development system. Course development team members follow the same structured standards and processes so that the courses are developed in a consistent and explicit manner. In this way, structured information is a centrally-managed process. If the content items are not appropriately tagged, it is difficult to author the course consistently.

The structured information practice also shows aspects of a post-fordist production process because the course development teams have the freedom to deliver the courses in a variety of media and "re-purpose learning objects." As with resource-based course development, there is the issue of cost-effectiveness and re-usability of learning material. In the future, learners may be able to select the learning materials they need from a course database in their preferred media formats.

Summary. The emerging practices can be summarized as follows in Table 2.

Table 2

Emerging Course Development Practices

Emerging Practice	Emphasis	Guiding Principles	Key Points
Media & Technologies Replacement	Substitution of core medium or technology used for course content delivery and communication.	One core medium or technology. Cost-effectiveness.	Print replaced by Web. Most course content is delivered via the Web and is easily accessible by learners. One core medium is applied and accompanied by ancillary media.
Hybrid Course Development	Multiple, equally important media used appropriately in the teaching-learning context to provide course content.	Appropriate use of media. Communication and collaboration.	The Web is used in conjunction with multiple media. Interactivity with peers and instructors and sharing locally and globally via the Web and e-mail are key components.
Resource-Based Course Development	Range of existing course content in a variety of media formats from which the learner can select to meet established learning outcomes.	Cost-effectiveness. Learning outcomes. Learner choice.	Existing learning resources are identified, applied, and re-used where possible. Learner engages in self-directed learning, follows established learning pathways, and has access to a learning mentor. Multiple media formats are provided.
Structured Information	Centrally-managed, explicit process for development of course content, which can be output to meet specified learner profiles and various preferred media formats. Variation of Resource-Based Course Development.	Consistency and standards. Cost-effectiveness. Separation of content from presentation formats. Learner Choice.	Standard Generalized Mark-up Language (SGML) is used. Re-purposing of content (i.e., learning objects). Content can be output into multiple products (i.e., course outlines, resource/learning outcomes guide) and multiple media formats. A learner profile is created so that resources can be applied to meet specific requirements for target learner groups.

Table 2 illustrates the four emerging practices that the course developers discussed in this section including media and technologies replacement; hybrid course development; resource-based course development; and structured information. The media and technologies replacement practice concerns the substitution of core media and/or technologies. One of the guiding principles of this practice is using one main medium or technology as the core content delivery vehicle. As a result, the replacement medium or technology applied must be easily accessible for learners. Cost-effectiveness is also a concern in this practice. Other ancillary media or technologies may be used to provide course content but not to the same level as the core delivery one.

Hybrid course development, in contrast to the media and technology replacement practice, uses a combination of appropriate media for the teaching-learning situation. For this practice, the emphasis is on providing multiple, equally important media to meet learners' needs. Communication and collaboration between learners, their peers, and instructors are important. As well, the communications capabilities of the Web and e-mail enable learners to share information locally and on a global level.

In the resource-based course development practice, the emphasis is on providing learners with a range of learning resources in a variety of media and technologies. By matching existing resources to learning outcomes and providing them with the ability to choose their preferred media, learners can engage in self-directed learning and develop their own pathways to meet established learning outcomes. This practice may shorten course development time, if the resources are readily available. The resources that meet a variety of learning outcomes can be used for a number of educational purposes, resulting in a cost-effective course development practice. Learning mentors are key to this course

practice. Learners can consult with their mentors, which ensures that they can meet learning outcomes successfully.

The final practice, structured information, is a variation of resource-based course development. The emphasis in this practice is on a centrally-managed, explicit course development process based on SGML. Course content is identified at different levels of granularity (e.g., paragraph, page, module, etc.) so that it can be retrieved from a database system and compiled, using a particular document structure, into a specific course or learning resource. It can also provide course outlines and resource guides linked to outcomes. In a similar fashion to resource-based course development, the structured information practice is based on re-using existing resources, once these are created and tagged within an SGML-based system.

In structured information, there has to be initial agreement on how content is identified so that it can be tagged for later extraction from a data base system. After that, there is a central management process that has to be followed. There is also a specified technological process for how the content is produced in various media. By developing learner profiles, it is possible to provide a set of course materials to meet the needs of a particular learner group and learners can choose from among resources and formats.

Interactivity

The course developers discussed the interactive opportunities provided through CT/NM. These opportunities related to the teaching role and how this changed from independent study-based distance education. Learners, too, would benefit by the

interactivity brought about through CT/NM, but they also had to be prepared for the new technology-based learning environments.

Teaching Role. Several course developers expressed that teaching or tutoring role became more pro-active for on-line distance education courses when compared with tutoring in traditional, independent study-based, distance education courses. For example, Alison explained:

> Alison: In the didactic model, you are always reading somebody else's ideas. You're not actually discussing your ideas and other people's ideas. There's no opportunity for the evolution of a conversation.
>
> Cathy: The idea of the evolutionary conversation would seem to me to be enhanced with convergent technologies and therefore in terms of planning, you're planning for a different mode of teaching and learning?
>
> Alison: Yes, yes. It changes teaching and learning quite dramatically. It becomes much more exploratory and much more facilitative.

Alison's view was that the teaching role became more proactive when moving to electronic, interactive technologies. At the same time, the teacher had to enable a learner-centered approach by taking on a more facilitative teaching role than in traditional, independent study-based, distance education.

Most course developers talked about the nature of on-line teaching and learning as a move to a more learner-centered approach than could be provided through traditional, independent study-based, distance education. For example, the interactive communication capabilities of the Web such as e-mail and chat functions enhanced the immediacy of the teaching-learning relationship. By using these interactive communications capabilities, most course developers also talked about the need for instructors or tutors to be able to help learners to develop collaborative learning capabilities. Henry suggested:

> Henry: A Web course can be completely programmed and linear and so on. But I'm talking about my perception of what a good Web course is. To me, a good Web course is one in which the learners have a great deal of input into the actual content directions that the course will take. To me, that's one of the key requirements for a very rich learning experience.

Henry brought up two ideas that other course developers had also discussed with me. The interactive capabilities of the Web were important for engaging learners in collaborative learning situations. There was also great value in having learners steer the directions of the course content. Learners could construct meaningful learning experiences by helping to focus the direction of the course content to meet their needs. This helped their ability to learn as discussed earlier in Nipper's view of collaborative social learning. The role of the teacher, instructor or tutor was critical in enabling learners to develop collaborative learning capabilities.

Some course developers suggested that the instructor or tutor in an on-line environment must be available on a regular basis to check and post messages. By getting feedback more immediately from tutors, Gary expressed that it would keep learners on schedule. He said:

> Gary: The "peer to peer" interaction is the piece that's been missing. That's certainly something that we brought right across into our Web environment as well. There are all sorts of advantages such as the turn around time on assignments. Learners can submit assignments electronically. The tutor gets them, marks them, and sends them back. There's no four-day delay through the postal system on both ends of that so, that's a tremendous saving. There's more immediate feedback from the learners' point of view. It also helps learners keep pace with their own schedules.

Some course developers suggested that there was a larger time commitment for tutors and instructors in on-line courses than in traditional independent-study courses. The time

commitment tended to be spread out over the week, as opposed to the traditional distance education tutoring model where the tutor had specific office hours. Some course developers also suggested the importance of establishing a turn-around time for answering learners' messages.

Preparing Learners. Ingrid discussed the multiple "interfaces" that learners experienced when they enrolled in an educational institution. The institution and the learner became involved in a relationship and this relationship had many facets. The institution itself was an educator, through its collective of instructors, staff, and services that the learner would become involved with. In discussing how technology affected the educator-learner relationship, Ingrid said:

> Ingrid: I think that the interface with the technology is important. It has an impact on the relationship the learner has with the institutional educator and that it's as important as the relationship with the content, which might be another interface. So, although the educator and the learner have an essential relationship in education, that relationship is filtered through the technology and problems with the technology will affect that relationship.

To Ingrid, the term "interface" meant the way in which the learner was in contact with the educational institution. She explained further:

> Ingrid: Dialogue between the learner and the institutional educator passes through the interface of a particular medium. There are multiple media used in distance education and in the teaching-learning relationship. The teaching-learning relationship occurs within a larger educator-learner relationship. The teaching-learning relationship is involved with mediation between the learner and instructor or instructional materials. It focuses on presentation of content and learning activities. Dialogues about the course's structure and pace, relevance and meaning of its content, and assessment of learning would be part of the teaching-learning relationship. These occur within the larger educator-learner relationship which also includes issues around access to the institution and certification that the educator provides and the learner is interested in attaining. Technology adds another dimension, or "interface" to the complex educator-learner relationship.

Ingrid's notion that the problems with technology would affect the relationship between the learner and the educator is very important. The technology has to work seamlessly and learners need to be prepared to use it. This is important because learners need to focus on the learning process and not the challenges of the technology.

Like Ingrid, some course developers were concerned with ensuring that learners were prepared for learning in the new environment. For example, I asked Henry:

> Cathy: If you are designing the production of course materials, how do you see the production process changing? Is there a change?
>
> Henry: There is a change, definitely because the Web aspect has to be taken into consideration very carefully. The user interface is critical, navigation is critical, and orientation is critical. So, there is some work on the learners' part to understand how it works before they can actually deal with it.

Henry also suggested that learners needed to have access to resources and orientation materials in a variety of formats to ensure that they understood how to use the environments effectively for learning. For example, these resources could be available on the Web, in print, and/or in video. By providing these orientation materials in a variety of formats, he expressed that there was a greater likelihood that individual learning styles could be addressed than if only one type of resource was used.

Rather than develop new student learning guides, Gary suggested providing access to those already available on the Web. The learner could then choose the one that worked best for him or her. He explained:

> Gary: We are trying to provide material for the learners that's going to help them in their studies generally. For instance, we were at one point contemplating developing a study guide to be available through the Web. However, a quick search on the Internet reveals that there's a million of them out there already so why re-invent the wheel? We have pointers to lists of hundreds of these study guides and recommendations on some good ones.

By using the resources of the Web, Gary's team was able to provide learners with choices of learning guides so that they could select one or more that would meet their needs.

As discussed earlier, most course developers saw collaboration as an important aspect for the learning process. In electronic environments, new tutoring models could be used that enhance opportunities for collaboration. For example, Elaine talked about the process she had been applying to bring participants towards successful on-line collaboration in Web-based courses. She said:

> Elaine: We do really start with small collaboration activities and move to larger ones in almost all of the examples. The learners are asked to start the collaboration at the very beginning and to build so their first assignment is to do preliminary work, their second one is to build on that and the third one is the final. We do, however, recognize that some people prefer not to work collaboratively in all areas. So, we try to have at least one of the assignments individual. We also get lots of requests from people who are already in teams, "We know that we are supposed to do the last assignment individually. Can we continue working with our team?"

In the process described by Elaine, learners were assigned progressively more collaborative activities. Beginning first with individual activities, learners were able to progress to small group and large group collaborations throughout the duration of the course. They could also add on-line resources dynamically to the course area, which could enable peer-based resource building and sharing.

The outcome of this method of bringing the learners towards collaboration is interesting. Elaine suggested that the collaborative activities fostered relationships that

extended beyond the duration of the course. Since the learners were participating from several different countries, the relationships that developed were from all over the world.

There may be different expectations for learners in on-line courses where collaborative learning methods are used. Elaine discussed student responsibilities in on-line courses:

> Elaine: The downside to this is that students have to be present. They can't just go off. We've had it happen where we've had people who have signed up for this course and then sent a note saying, "I'm off to Borneo for three weeks," as if somehow or other Borneo does not have Internet access and second of all, this course will just stop. And they can pick it up when they come back. In a traditional correspondence course, that is very true. No problem. You go off to Borneo for three weeks, your textbook will still be open to the same page when you get back. But with the international on-line collaborative process, it doesn't. They come back and discover that three weeks have passed. Three weeks of students, discussions, growth, and debate have gone on.

Elaine suggested that learners needed to continue to participate in their on-line courses even while traveling. There were two reasons for this: the course content would continue to grow through active collaboration between learners; and the Internet was ubiquitously available. If the core activity in the course was the on-line discussion, learners needed to follow and contribute to it. DE&T had set standards in terms of the information learners needed to know concerning computers, the Internet, and the Web prior to their registration in the on-line courses. Armed with this knowledge, Elaine felt that learners in on-line courses should be able to find access and equipment so that they could participate while they were away from home.

Like Elaine, Lulu indicated that participation in on-line courses was an important component for learners. I asked Lulu:

> Cathy: For our Web-based courses, do learners have to participate with others or can they still study independently?
>
> Lulu: If they are taking the Web version of the course, they have to interact for all the courses I can think of. I'm not sure it's true for every course. But for most, we are requiring that students participate in Web-based seminars or discussions and that they get marks for them. So, it's part of their course mark. It depends on how it is structured in each course. It's slightly different in each course. But for the courses I'm working on right now, there are only three written assignments that they have to submit to their tutor, but there are seven seminars that they have to participate in.

With the move to on-line, it seems that course developers at both OLA and DE&T have taken advantage of the capabilities for collaborative learning. This enables learners to interact with each other. This also means that the expectations that course developers have for on-line courses are different than independent study courses in terms of the kinds of assignments and activities they develop to gauge learners' success. Learners need to be prepared for the level of participation and collaboration required in an on-line course. They may also have a different type of responsibility as learners in on-line courses than learners have in traditional, independent-study courses.

Organizational Issues

Distance education is provided from within a system. This system is usually comprised of human and technical subsystems. As a result, there are many organizational issues to consider when applying new technologies and media within an established system. Established systems are difficult to change. Most systems are not flexible enough to adjust quickly to the changes required. As well, many people operating within these systems may not see the need for change. Thus, there are many organizational issues to consider when planning to apply CT/NM. To take full advantage of CT/NM, the course

developers identified a number of organizational issues related to roles, delivery systems, funding arrangements, intellectual property, and new opportunities.

Roles. As discussed in Chapter Two, traditional systems-based distance education course development has been defined as a system where there is a clear division of roles. With the move to CT/NM, most course developers indicated there were planning considerations with regard to the roles of team members. As new media-related applications were developed, some roles might change, since the skills required for a new medium change. Others might stay the same. From the discussions with the course developers, there seemed to be some common threads.

Some course developers suggested that technologies were becoming easy to use and that this might be leading to the blurring team members' roles. Daniel suggested that:

> Daniel: The applications to produce stuff for the Web are relatively easy to use. So, there is a sense that anybody can produce a Web course.

Web tools are becoming easier to use all the time and software companies are providing more products for the non-technical user. This means that a non-technical user can create Web sites and link Web resources by him- or herself. However, Daniel suggested that there was more to using the Web than just learning how to use the software tools. An understanding of the pedagogical skills and knowledge in regard to the use of media in the teaching-learning situation was an important factor. These skills and knowledge took time to develop. Thus, he felt that it was important to stipulate the roles of the team members because each member had specific expertise that contributed to the development of a course. In this way, Daniel's view was very pragmatic. The team members' roles were not changing as a result CT/NM; these roles needed to be more explicitly defined.

Elaine's view was very similar to Daniel's. Since DE&T worked in a service structure and had limited resources and defined timelines, it made practical sense to make use of the team members' talents effectively. The members of the team were specialists in their areas of expertise. Since technology was changing all the time, this made it difficult for everyone to develop the same level of expertise and still perform their normal roles within the team.

With CT/NM, new knowledge and skill sets may be required. Some course developers were concerned specifically with the skills and knowledge course writers would need. Writing for the Web, for example, requires an understanding of the non-linear, hypermedia format. To be able to write so that the content is provided appropriately for a non-linear medium can be difficult when compared to writing for a more linear, text-based medium.

Most course developers suggested that a part of their role was to work with the course authors and writers so that they could understand how to use new technologies in course development. For some course developers, this meant adding a new dimension to their role. They might become coaches or facilitators with those learning how to work within new technology and media environments. Farrah, in discussing the requirements for course writing within the SGML process explained:

> Farrah: Because we've been doing the course development ourselves during this last year, we're all learning how to do everything, using a hands-on approach. But in the future, we are going to be coaching a lot of people. Our knowledge is going to be about the whole SGML technology as a foundation.
>
> Cathy: That puts you in sort of a coaching/facilitation role? Adding to your role?

> Farrah: Yes, because we're going to have such a structured course development approach, with standards in place.

Everyone on the course development team needed to know how, for example, structured information and SGML work, the standards that were required for content development (i.e., meta-tagging of content), and, in particular, writers and content experts needed to know how to write for this new course development method.

Some skills may be very applicable and easily adaptable between media. For example, the DE&T course developers talked about a recent example where one of their colleagues had successfully made the transition from desktop publishing to Web publishing. They found that skills for desktop publishing and Web publishing were similar and that a shift of expertise from one medium to another was possible. Daniel explained:

> Daniel: Some people think of it as something different but I always felt that it was largely desktop publishing on the Web. So, if you have an understanding even though you can't do the same things on the Web as you can do in print -- there are more limitations -- but if you are talking about the way we use Web-based instruction, which is still heavily text-based, we're talking about the same kinds of concepts.

Some skills transition more directly from one medium to another and therefore some planning team members do not require a great change in their roles.

Several course developers discussed maintenance issues for Web courses and who might take care of these. For example, Henry talked specifically about Web-based courses as being "living matter." As living matter, the requirements for maintenance were quite different than for media published in fixed formats, such as CD-ROMs, textbooks and print-based course materials. Henry explained:

> Henry: I don't know a lot about what other people think about this but to me, a Web course is more of a "living matter" and the old "learn-ware" is more of a product. So, to my mind, a good Web course is a living entity of

> its own. But hopefully it will go beyond itself and expand itself and transform itself into something better than what it was.

Henry suggested that there was a need to keep Web courses as up to date as possible. As well, Web courses had the ability to grow dynamically and change as students and instructors collaborated in learning activities.

During the course delivery phase, some Web-based resources may no longer be available. However, the course's Web site may still be linked to these resources. This situation can pose difficulties for tutors and instructors. They may not be able to make changes such as fixing broken or unavailable Web links due to a lack of technical knowledge, or because it is not their role. There may be the need to create roles to fill the gaps that had developed as a result of the unique capabilities of a new medium. For example, when I asked Ingrid whether she saw new roles emerging, she said:

> Ingrid: I do see new roles emerging. I've been saying that there's a role for what I've been calling a "course minder," which has never been defined. It's someone who would monitor a course that's gone through a primary development phase and is being delivered, but still needs on-going maintenance.

Ingrid suggested that the course minder would bridge the gap between the tutor or instructor and the technical support help desk. The person in this role would also have some knowledge of the subject area and be able to find new Web-based resources to replace those that were no longer available.

Henry suggested another way to handle the problem of maintenance for Web-based courses. He felt that the course team should take care of the maintenance aspects of

the course as required. The responsibility for making this change would depend on what the change was and who had the knowledge to make the change within the course team.

> Cathy: Who would actually be doing the maintenance on the Web?
>
> Henry: Well, that's mixed. It can be the instructor, the original content developer. It can be the instructional designer or Web programmer or whoever -- an appropriate member of the team developing the course.

Both approaches to the maintenance issue are interesting. In Ingrid's example, she recognized that the course delivery system in her context did not have a mechanism to take care of Web maintenance. By adding a role to take care of this gap in the course delivery system, the gap would close. In fordist systems, there are clear divisions between roles and when there is a gap in the system, an additional role may be required to address this gap. Henry's approach was different. He suggested that Web maintenance should be handled within the course team, a notion illustrated in the post-fordist structure of working teams.

Ingrid suggested that there could be difficulty in involving staff members in new opportunities or special projects related to course development if this was not within the parameters of their job descriptions and collective agreements. There could be some very radical shifts in job requirements as technology changes. The challenge would be to make job descriptions and collective agreements flexible enough so that individuals and organizations could take advantage of opportunities enabled by technological change.

Training and Professional Development. Most course developers suggested that course team members, instructors and tutors should have access to training and professional development opportunities in how to use a new medium or technology. For

example, several course developers talked about the need for everyone on the team to understand how to use interactive technologies. If the team members, including the content experts, did not know how to make use of these technologies, it was unlikely that they would be able to design and deliver effective learning activities. As discussed earlier, Elaine suggested that if a person could not visualize how the technology might be used, she or he would have difficulty in applying it in a learning situation. Henry and Gary also discussed the need for course team members and instructors to know how to make use of technologies. In a similar vein, Lulu suggested that it was important to share experiences with new technologies among colleagues and other team members, rather than have everyone re-invent the wheel. As a result, some peer-based learning might occur.

Delivery Systems. Elaine and Daniel discussed the delivery systems that were being used in their context. DE&T had developed a customized, Web-based course authoring and delivery system that would enable learners to access on-line courses via the Internet from anywhere in the world. By building their own system, DE&T was able to incorporate the features they needed for Web-based course delivery. Elaine, however, cautioned that new systems took time to implement and support. If technical support was available, it might be desirable to develop a local system. However, it might not be practical given the expertise, time, and resources required.

The DE&T course developers had also looked at a range of commercial systems for course delivery. They had recently began using WebCT (http://www.webct.com), an UBC-developed, Web-based course authoring system. WebCT had also recently become a commercially-available system. Their developers and DE&T staff had been able to work together to add the features and functionality they required. This had allowed DE&T to

customize some capabilities for their needs and as a result, they were able to make use of the system and mount some courses quickly.

In addition to technical delivery systems, there may be physical distribution systems involved in on-line course delivery. Elaine discussed some recent challenges of shipping course materials to a learner in time for the start of the course. The course materials were shipped by ground, even though the learner lived in a remote North American location. The distribution of the course materials was handled in the same manner as if the learner had lived in the B.C. Lower Mainland. The service department providing the distribution did not recognize that a different process was required to get the material to the learner in a timely manner. This situation reflected a "gap" in the system, which DE&T had to address in order to get materials to learners on time. It can be difficult for course developers to predict the challenges that will come with new course delivery methods.

Funding Arrangements. While UBC's Advisory Committee on Distance Education has mechanisms in place within its course funding process for incorporating new technologies and thereby acting as a change agent, this is not the case for many funding sources. There may be unexpected barriers in funding arrangements as technology converges and new media emerge. There may be a lag between the new opportunity brought about by technology and the recognition of the value of the opportunity by the funding source. For example, Alison had recently been involved in providing a pilot program for disabled learners. Alison's team offered a business skills program by technology-based distance education methods. One of the initial barriers that the planning team had to deal with was the governance of pensions and grants and the established

eligibility criteria under which the disabled participants were qualified. There were restrictions as to how the pensions and grant funds could be spent and the activities that a person was allowed to participate in and retain her or his eligibility. Alison described the situation:

> Alison: These folks couldn't get a second phone line for their computer. Many of them of course couldn't afford a computer. Even for those that did, the fact that they were taking a program, even though it was a pilot project and designed to see what kinds of technologies were available, they ran the serious risk of having their living, their funding cut. The rule says that if you are good enough to go take a course, then you are well enough to go to school and sit in a classroom. If you are well enough to take a course, you're well enough to get a job. Well, that's not necessarily the case and what distance education and these technologies allow people to do is to participate in programs despite immobility, if the technology is available where they happen to be. So, there's a whole political-ethical issue: do we offer a program to people even though it does them a lot of good to be in a collaborative situation, from their home with e-mail, if it runs the risk that they're not going to have money to pay the rent and buy food. You worry about these kinds of things.

Fortunately, in this project, Alison's team was able to work within the funding restrictions so that the disabled learners could take part without harming their eligibility. However, this project demonstrated the need for system change with regard to funding arrangements, eligibility criteria, and new technologies.

Ingrid talked about the opportunities for learners to take credit-based, post-secondary courses anywhere as a result of CT/NM. This situation was stimulating educational institutions to work collaboratively. However, current government funding arrangements for most institutions, based on the number of full-time equivalent (FTE) students, had made it difficult for them to share learners between themselves. These funding arrangements could also make it difficult to share course development costs. As a

result, there was no incentive to collaboratively develop courses and share students. Ingrid said:

> Ingrid: Figuring out ways that work for different institutions to share learners or to share in the development costs is something that's a new challenge, I think, for the system.

New criteria for funding arrangements are required if institutions are to successfully collaborate in an age of technology convergence.

Intellectual Property. Several course developers talked about learners' contributions to on-line courses as an important component for using Web-based course delivery. However, there was not much discussion concerning learners' contributions and their ownership. Ingrid seemed to be the only course developer concerned with learners' intellectual property and how it should be handled by institutions. She suggested that several questions had arisen. If learners contributed their ideas and materials to the course, who owned their contributions? If they left their contributions for the next groups of learners, what impact might this have? These questions were currently unanswered. In this electronic age, it was important to look at intellectual property as it pertained to learners. Ingrid expressed that:

> Ingrid: We face immediate problems with intellectual property because the intellectual property for learners is never something that anybody has worried about. And even if we make stuff that learners have done available to other learners, we may have some issues around who owns that material and who owns that thinking. There are just a lot of issues.

If learners provide their content to the course, and this content becomes part of the course for the next offering or offerings of the course, who owns their content? Course developers and their institutions have to consider policies for intellectual property in new

media that includes learners. This is an issue that needs to be addressed as learners begin to develop and share their knowledge and leave this for successive learners in future course offerings.

New Opportunities. As a result of adopting various facets of CT/NM, most course developers suggested that new opportunities were opening up for their courses. For example, I asked Henry:

> Cathy: Do you see any new opportunities for the programs that you are developing as a result of this move to convergence?
>
> Henry: Yes. Particularly, I see reaching a wider audience and for internationalization.

Henry described two ideas that most course developers also discussed with me: access to new audiences; and opportunities for wider or global distribution of their courses and programs. As well, the course developers suggested how this could happen. As discussed earlier, partnering with other institutions to provide programs and courses collaboratively was one opportunity. This would extend the reach of each institution and also would enable the pooling of course development funds. Another opportunity was to partner with private sector organizations who had distribution mechanisms in place.

Ingrid suggested that as a result of CT/NM, some new education services might develop in the future. Education might become a service industry where those who could pay might be able to get more personalized educational support. For learners who could not afford a personalized service, they could engage in a self-service model of education and navigate their own way through educational offerings. She explained:

> Ingrid: One end of it, I suspect that education could become more of what would be called a service industry. For those who can afford it, a lot of support, guidance, mentoring, and coaching might be available, as well as more and more sophisticated materials – text materials in different environments and different technologies. Rather than thinking of texts as paper, I think we will see living texts in other technologies. But those are still removed from the learner. There's still the need for that role of teacher or coach or guide or mentor or educator, in the more narrow sense of educator, to support the learner's learning activities.

So, although learning materials might be available in a number of different media and technologies, there was still the need to have an educator, such as an instructor or a mentor, involved in the teaching-learning process. This meant that education professionals might find new roles emerging for themselves as learners began to take advantage of the learning opportunities available through new media and technology.

There may also be new ways to use learning resource materials created for distance delivery and therefore, a new market may develop. In the past, distance education materials may have been used primarily by distance education audiences. OS course developers suggested that there were opportunities for their distance education course materials to be used as mainstream learning resources by teachers in the regular school system. For example, I asked Farrah:

> Cathy: Do you think that now that we're moving into SGML-based course development opportunities that the client is going to shift from the learner to looking at what the teachers require to use with learners?
>
> Farrah: Yes, I think so. I think it's going to be a big thing to meet the needs of the regular schools. And that's a market that's new to us, so getting feedback from teachers will be really important as well. Or, to emphasize that we're there to provide support, too.

The planning associated for providing course materials and resources for a wider range of audiences becomes more complex. For Farrah and her colleagues, the challenge is to

develop course materials to meet the needs of different learner groups in distinctively different contexts. As well, there is the potential of a new role in supporting the educational needs of this new audience.

Summary of Research Results

Through using Bates' ACTIONS model as a framework for categorizing the data from course developers, emerging course development considerations were identified. These are summarized in Table 3.

Table 3

Emerging Course Development Considerations

Criteria	Categories	Characteristics
Access	Bandwidth/computer equipment.	Future planning. Standardization on technical specs. Site-based & home-based learners.
	Ubiquitous access.	Browser-based, global delivery systems. Minimal downloading time.
Teaching and Learning	Media and technologies replacement.	Substitution of core medium or technology for another.
	Hybrid course development.	Multiple, equally important media used appropriately.
	Resource-based course development.	Range of course content available in a variety of media and selected by the learner.
	Structured information.	Explicit course development process based on SGML for output into different media formats and learner profiles.
Interactivity	Teaching role.	Proactive. Collaborative learning activities. New time commitment. Understanding of new learning environments.
	Preparing learners.	Relationship of learner to teacher and institutional educator. Technology interface. Media choice. On-line collaboration/new responsibilities.
Organizational Issues	Roles.	Shifting roles/new expertise. Transferable skills. Emerging roles (gap filling). Flexible job descriptions/collective agreements.
	Training and professional development.	New technology/tools. Peer-based learning.
	Delivery systems.	Customized systems/local requirements. Commercial systems/ quick development. New delivery processes (gap filling).
	Funding arrangements.	Change agent. Funding policies.
	Intellectual property.	Learners' ownership.
	New opportunities.	Wider audience and internationalization. New education services. New markets.

Table 3 illustrates and summarizes the categories into which the emerging course development considerations for CT/NM can be placed. Four categories from Bates' ACTIONS Framework are represented: access, teaching and learning, interactivity and organizational issues.

With regard to access issues, two categories have emerged. These are bandwidth/computer equipment and ubiquitous access. Within bandwidth/computer equipment, three characteristics have emerged: future planning, the need to standardize on technical specifications, and the need to consider the differences in requirements for site-based and home-based learners. The other category, ubiquitous access, has a characteristic related to the use of Web browsers as an interface to global, electronic delivery systems. A second characteristic, minimum downloading time, have also emerged. Since there is no standard cost for accessing the Internet around the world, and some people pay for access on a per minute basis, resource downloading time must be kept to a minimum.

There are emerging considerations concerning teaching and learning. Four different course development practices have been identified from my discussions with the course developers. The first practice, media and technologies replacement, can be thought of as the substitution of one core medium or technology for another. This is slightly different for the second emerging practice, hybrid course development, where equally important and appropriate media and technology are combined. This could result in several media being used in the teaching-learning situation to address learners' different learning styles and needs. The third practice, resource-based course development, is different from the first two in that it makes use of existing learning resources to meet identified learning outcomes. As a result, there may be a number of learning resources

available in different media from which a learner can choose. In this practice, learner choice is a key factor. In the fourth and last practice, structured information, is a variation of resource-based course development. It uses SGML as the underlying framework for developing courses. It provides a structure for centralized, explicit, and uniform course development process and resource production.

There are new considerations with regard to the interactive requirements of the teaching and learning process. The teaching role becomes more proactive than in traditional, independent study mode courses. There is an expectation that learners will be able to participate in collaborative learning activities if they desire. This means that there is a new time commitment for those in teaching or tutoring roles and they may need to gain an understanding of the new learning environments. Learners, too, need to be prepared for the new learning environments and be able to work well with the technological interface provided. Any difficulties with that technological interface affects the learners' relationship with the teacher or tutor and the educational institution. By providing opportunities to develop their ability to collaborate with others on-line, learners may be able to adapt more readily to learning in a technology-based environment.

The course developers discussed a number of organizational issues, which I have categorized as follows: roles, training and professional development, delivery systems, funding arrangements, intellectual property, and new opportunities. With regard to roles and the course development team, emerging considerations include the shifting of roles within the team and the development of new expertise. Some roles may need to be defined or re-defined. Also, there is the consideration that some skills and knowledge are transferable and therefore, these must be identified when applying a new medium. Some

new roles are required to fill gaps within the course development and delivery system. A key consideration, thus, is that job descriptions and collective agreements need to become more flexible in order to take advantage of technological change.

Potential changes in the course team members' roles as a result of technological change also means that training and professional development issues must be addressed. This training may be best addressed through peer-based learning, since the expertise in CT/NM-related applications is emerging and not fully instituted.

An emerging consideration with regard to delivery systems is whether to develop one's own electronic course delivery system or whether to purchase a commercial one. Customized, locally developed systems usually address local requirements but may take additional time and expertise to develop. This contrasts with commercial systems, which have built-in course authoring capabilities. However, the commercial systems may not meet the instructional requirements needed by the course developers. Changes in course delivery may also require changes in the support systems. These changes may be related to things like physical delivery systems and the gaps that occur in their ability to provide services for new course delivery requirements.

The two categories, funding arrangements and intellectual property, relate to policy changes. New funding policies may be required as a result of changes brought about through CT/NM. Funding arrangements may have "change agent" effects, depending on how they are applied. Policies regarding learners' rights to their intellectual property may be required as learners share their knowledge and build learning materials, which may be used by successive learners.

The final category, new opportunities, relates to three factors: wider audiences and internationalization, new educational services, and new markets. To take advantage of these opportunities, course developers need to have appropriate organizational systems in place.

The course developers did not talk specifically nor substantially about activities directly related to Bates' ACTIONS criteria of cost, novelty or speed. Aspects of these criteria were captured within the other criteria used as a framework for analyzing the research results.

In Chapter Six, I will discuss the research results with regard to how the course developers have made sense of CT/NM in their practices.

CHAPTER SIX

DISCUSSION AND CONCLUSIONS

The course developers presented many interesting views concerning how CT/NM are affecting their practices. From the views they provided, it seems that CT/NM has had variable effects on most of their course development practices so far. As well, the effects of CT/NM were different for each participant. These differences seemed to depend on course developers' role in course development and their ability to influence change in their contexts. They conveyed that the course development activities affected most by CT/NM were in the production, delivery and support stages, and not as much in the instructional design phase. While there was no overall consensus on the effects of CT/NM, the course developers presented many planning considerations and four emerging practices. This evidence leads me to believe that the course developers' practices are being affected by CT/NM, to varying degrees.

At the beginning of this study, I asked three questions:[26]

1. How are CT/NM affecting current distance education course development practice for the participants involved in this study?
2. What kinds of course development and delivery models are emerging as a result?
3. What structures enable course developers to take advantage of CT/NM and which impede?

These questions will be discussed in light of the results illustrated in Chapter Five.

---

[26] See page 2.

Effects on Practice

Using Bates' ACTIONS framework as a data analysis tool, I found that there were two major effects on the course developers' practices. The first effect relates to the teaching and learning criterion, where four course development practices are emerging. These practices are media and technologies replacement, hybrid course development, resource-based course development and structured information. The fact that there are four emerging practices and only eight course developers in this study suggests that the results of applying CT/NM are not consistent between planners, even in the same context. This may mean that the course developers are experiencing CT/NM differently. This may also mean that there are multiple practices and different approaches as to how to make sense of the opportunities provided by CT/NM.

The second effect is that new course development considerations are emerging. These considerations relate to Bates' ACTIONS criteria of access, interactivity, and organizational issues. These seem to be consistent with the kinds of changes that might be expected when new technologies or media are applied for the teaching-learning situation. The considerations identified by the course developers have a bearing on how successfully new teaching-learning practices can be applied within distance or distributed learning applications.

Reasons for the two major effects of CT/NM on the course developers' practices can be attributed to a number of factors. These include the institutional systems they work in; their roles within those contexts; the pragmatic way they are adopting and adapting CT/NM; the newness of CT/NM and media/technologies effects; their awareness of trends in the distance education field; level of access and technology readiness; and interactivity

as a way to provide for learner-centeredness. These factors will be discussed in this section.

Institutional System. OLA and DE&T have similar distance education development and delivery systems, but with a key difference. OLA has an institution-wide infrastructure dedicated to distance education. DE&T, on the other hand, as a smaller distance education entity within a dual mode institution, provides a service to its faculty-based clients. It has greater flexibility within its service structure to change some of its organizational structures when needed.

OLA, as an autonomous, traditional distance education institution, is essentially fordist in its approach to course development. Courses are developed within a strong infrastructure based on a publishing paradigm, with staff who have specialist skills and knowledge. As a result, it is difficult to change the infrastructure and the way that specialist staff negotiate through the system. It is easier to apply improvements and efficiencies to the system, rather than to change the underlying infrastructure. For example, the move into the structured information course development is in many ways a refinement to the production system already in place. Its purpose is to enable quicker production through the efficient use of existing resources. Using existing content makes economic sense, particularly for an institution that has an electronic publishing-based infrastructure. To develop a structured information-based production system, new skills and knowledge are required. However, these new skills and knowledge are not developing as a result of the move to a new course development paradigm. Rather, they are required to enhance the existing system.

Whereas OLA can be considered to be like a publishing house, DE&T is a service. As a service, it has a clear structure in place. This structure provides consistency for DE&T's internal clients, which are drawn from across UBC's faculties. DE&T is also a custom design house, in that each course it develops is for a client, who will be responsible for providing the tutoring for the course. The material created for the course is developed for a specific use and there is no focus on the need to re-use the course material for other purposes.

DE&T has flexibility within itself; however, it is also bound by the regulations of UBC. UBC has many regulations for how learners can be served. Some of these regulations restrict the way that DE&T and faculties are able to provide courses through distance and distributed means.

Roles and Context. The institutional system has an effect on the context within which the course developers work and the roles they play. The role that each course developer has within her or his organization is an important factor with regard to how much change he or she can make. Ingrid and Alison, as department managers, had a greater opportunity to drive changes in the course development process than the course developers acting as project managers/instructional designers. Alison and Ingrid were able to make decisions on which courses to offer and the technologies and/or media to use. Daniel, too, was a department manager and although he did not elaborate on his role in this capacity, it is evident that he had influence on how courses would be developed. He was able to influence the components of the course development cycle, such as membership on the development team and the way that new media would be applied for course delivery.

The course developers acting as project managers and instructional designers have been in a more reactive mode than the department managers when it comes to the overall decisions concerning course development activities. Although they may be leading or acting as part of a project team, in some cases, they may also be provided with direction in the media and technologies they should use for course delivery. For example, the decision to provide courses on-line, using structured information development processes and Web-based delivery was made by OS management and not by the project managers/instructional designers.

The project managers/instructional designers were more involved in the instructional development aspects than the department managers. They provided more discussion concerning the instructional components. Their focus was very much on the requirements for designing sound instructional materials and activities for learners at a distance. Their ability to impact the overall development and delivery system in their contexts was variable. However, the courses they developed using CT/NM showed that what they are developing has or will have an impact on the way the courses are delivered. For example, project managers/instructional designers discussed how they would involve learners in collaborative on-line activities. This has significant design and delivery implications.

Pragmatic Adaptation and Adoption. The course developers exhibited some very pragmatic, and inventive, ways to work with CT/NM. Their approaches seem to fit with an observation that Farrell (1999) made in discussing the practical approach that OLA, Athabasca University, and Teleuniversite took when incorporating new technologies into

course delivery (p. 17). As each new technology wave has come along, these institutions have made practical use of the technologies that work for their purposes.

Working within their contexts, the course developers were able to participate in course development innovations. For the project managers/instructional designers, these innovations seemed to arise at the design level. For example, Gary discussed his development of a template to help the course writers understand how course material could be applied for Web-based delivery. Elaine suggested that she and her colleagues are "pushing the envelope" in the way they are applying media and technologies to get learners working together. As well, the course developers seemed more focused on pedagogy than technology, emphasizing that it is important to use the medium of expression that most appropriately suits the learning activity. In this way, they were pragmatic in how and when they added new technologies or media features and activities to the teaching-learning situation.

The project managers/instructional designers are most heavily involved in the instructional design and media production components of their courses; however, their impact on how the courses are actually delivered may be low. Decisions such as who might maintain Web-based courses once they are developed may be out of the project managers/instructional designers' control. So, although they can design these courses, they may not be able to influence how these are provided in terms of system support and how tutors conduct them.

For the department managers, innovations occurred in their decisions as to how programs would be developed and delivered. Ingrid, for example, talked about the

development of a hybrid practice and why this occurred. Alison discussed resource-based course development and how a variety of different media was employed.

The course developers in this study showed that practice change is incremental. They are adapting their planning practices to incorporate the opportunities brought about by CT/NM and adopting technologies and media where this makes sense. However, CT/NM are not impacting the overall approach that they normally apply for course development. Instead, CT/NM have provided course developers with more options, particularly in the course production and delivery phases. This seems to indicate that what is occurring in their course development practices as a result of CT/NM is incremental evolution and not revolution.

Most course developers suggested that new media and technologies have to be used appropriately and that a technology mix is needed to address different learning styles. This shows their pragmatic approach to technologies and media applications in the teaching-learning situation. It also reflects the same kinds of ideas provided by Bates, Moore and Kearsley, and Burge and Roberts concerning the need to look at the mix of technologies and evaluate the strengths and weaknesses of each. The project managers/instructional designers are adding in CT/NM capabilities as they become available and look as if they will aid the learning process. For example, they are using hypertext links, as suggested by Porter, to pull "chunks" of Web-based course material together. This makes it easier for learners who are reading the course material on a computer screen. This also enables learners with choices as to how they proceed through the course. They can select the links they want to open.

The course developers are providing learners with the opportunity to add hypertext links and resources to on-line courses, as suggested by Garrison. This allows learners to share the resources they have selected with others. In this way, learners can take responsibility for contributing to the course and for their own learning.

Newness of CT/NM and Media/Technologies Effects. Another factor is the newness of CT/NM and the fact that these are emerging. The results of applying CT/NM are not all that well known, particularly since there are variations in how these are applied. However, most course developers discussed that their experiences with technologies and media over a number of years were contributing to their understanding of how to apply emerging ones. For example, the use of the Web is very new. UBC has been offering courses over the last four years using the Web. OLA has been using the Web for four years for a variety of applications and began offering credit-based Web courses in March 1999. The course developers showed that they are discovering how they can use the Web effectively as it evolves for the teaching-learning situation. As they get more experience using the Web, they are trying new ways to apply its unique capabilities where it makes sense.

It is interesting to note that most course developers seemed to be looking at the Web as a discreet medium. Although many discussed using the Web for its unique capabilities, I did not get a sense that they saw the Web as convergence-based media. For instance, no one talked about the benefits of providing a course module that included audio files, video files, graphics, and text as part of one Web-based learning experience. However, this does not mean that this is not occurring. Rather, the course developers seemed to be seeing the technologies and media as separate entities and applying a

multiple media approach to meeting a particular learning situation. The Web might be one of the media applied. The course developers' approach could be due to the inherent limitations of networks and equipment that their students can access. If the course developers have to develop for audiences with varying capabilities in terms of technology and bandwidth, they have to make choices in terms of what they provide. This may reinforce the "separateness" of the technologies. Elaine provided the best explanation of this situation when she discussed using a "multiple media" approach rather than a "multimedia" one.

The way that the course developers saw the Web is an interesting result and warrants further exploration. When I began each interview, I used the Web as an example of a convergence-based medium. Each person seemed to discuss the use of the Web related to the specific functions they would apply in their courses. Some emphasized the importance of on-line discussions, which can also occur without the Web by using computer conferencing software and dial-in access to a host server. Others discussed how to design for the Web. Mostly, the course developers discussed using the Web "appropriately" as part of a range of media. So, it seems that the course developers did not share the same conceptions. They focused on the functions that they felt were most applicable within their courses and for their learners. In retrospect, it would have been very useful to have investigated this aspect with the course developers a little further since the Web has a wide range of functions useful for course delivery purposes.

As McLuhan and Login have discussed, new media forms have effects and impacts not immediately discovered. There are often unanticipated effects. The course developers did not identify specifically the unintended effects arising. However, in the case of the

Web, Daniel did discuss the need to be cautious in making too many changes to course material just because this is easy to do. We still do not know what the unanticipated effects of CT/NM are and how these will affect course development practices in the long run. Due to the variations within contexts and between contexts, it is difficult come up with a consensus of the unanticipated effects that can be expected.

McLuhan, Login, and Bates also suggest that people generally take their conceptions of the current media into the new media. In discussing CT/NM, it seemed that the course developers are also operating in both the current and new media simultaneously. This was particularly true in relation to course production requirements. For example, in the creation of distance education courses, some course developers described how the roles on the course development team might change, while others described how they should stay the same. However, when discussing the role of the tutor and instructor, some course developers described how the role was shifting from a reactive learning helper to a pro-active learning facilitator. So, there seems to be two things occurring. On the one hand, the approach to course development stays pretty much the same, no matter what media are applied. On the other hand, the way that the course is delivered changes. This role shift during the course delivery stages clearly indicates how CT/NM are effecting the relationship between the tutor or instructor and the learner in distance and distributed education. As a result, this affects how media are developed within the course.

Awareness of Trends. It is important to recognize that there are many aspects presented by the course developers as emerging planning considerations that are consistent with recent distance education literature, especially concerning the teaching-learning and

interactivity criteria. Many things that the course developers talked about concerning collaborative learning and facilitation over distance have been available in distance education and related literature over the last 10 years. Dede (1996), Garrison (1997), Harasim (1989), Harasim et al., (1995), Haughey and Anderson (1998), and Owston (1997) illustrate many of the same considerations for new computer-mediated environments cited as emerging considerations by course developers. For example, Haughey and Anderson suggest that there are three applications that support network learning: personal e-mail, class discussions via computer conferencing; and "finding and using print and multimedia resources on the World Wide Web" (p. 20). As well, many course developers were concerned with the way learners would access course materials on the Web, particularly with regard to the design and navigation components. Porter (1997) discussed these aspects in her planning approach to Web-based courses. In addition, the course developers were concerned with appropriate use of media and technologies, which has been addressed by Bates (1995), Moore and Kearsley (1996), and Burge and Roberts (1998) as discussed earlier in this study.

It is interesting to look at some of the examples of potential teaching and learning applications suggested by Bates in 1995. Bates discussed three possibilities for teaching and teaching: the global classroom; just in time training in the workplace; and resource-based tutoring for accreditation (pp. 233-236). The "global classroom" has much in common with the teaching and learning practices discussed by the DE&T planners. Bates describes access to experts world-wide, learners connected to networks, and asynchronous dialogue between learners and their peers. The DE&T course developers also described similar activities occurring in their globally accessible Web courses.

"Just in time training in the workplace" and "resource-based tutoring for accreditation" have much in common with resource-based course development discussed by Alison. In Alison's program, teachers, as learners involved in resource-based courses, have access to a mentor. This can be on demand, depending upon the relationship that the teacher has established with the mentor. Thus, there is a "just-in-time" factor. With regard to resource-based course development practice, the teachers can select the resources that they want to use to achieve their learning outcomes. As a result, they have autonomy to determine how they want to learn. Teachers can take the program formally and receive credit or they can take it for professional development purposes. In the future, they may be able to select resources to meet learning outcomes and receive credit for what they know as opposed to having to take the "program" to receive credit.

The work that the OLA course developers are doing with regard to structured information (SGML) course development and resource-based course development certainly fits with the view presented by Bates earlier in this paper for storing course materials digitally. The process for achieving what Bates suggested has changed, since technology has changed from 1995. However, the concept has not changed. OLA is continuing to pursue better ways to extract and re-use its content to provide for new learning opportunities.

Access and Technological Readiness. The course developers discussed access issues with regard to applying CT/NM in their course development practices. From their responses, it is clear that access remains one of the most important criteria for selecting technology to use within course delivery. The course developers are planning for the level of access that most learners will have. If their learners cannot access the course materials

through the technologies applied in the course, it does not make sense to use these technologies. There are new computing opportunities and features as Tuller and Oblinger have suggested; however, many of these features are not widely available at a cost that most learners can afford.

Technology readiness is a major factor for access. In the case of the course developers in this study, they were very pragmatic in applying technologies that learners could access and that would also provide the best "interface" for the media. For example, reading text-based course material on a computer screen can be difficult. The computer screen as an interface is not as user-friendly for reading as some learners may require and therefore, is not conducive for dense academic text. The computer, as a technology, can deliver different kinds of media; however, is not very useful for sustained reading activities. As the course developers in this study indicated, it is important to provide learners with course materials in appropriate media and technologies. Otherwise, learners will spend time trying to put the materials into formats more conducive to their learning situations. Or, they might abandon the materials altogether.

The portability of learning material is important for distance learners. This means that course developers have to be conscious of the type of computer equipment that learners can access. As Collis has suggested, the kinds of computers that learners have access to can limit what they are able to access. Until computers are portable and affordable, it is not likely that learners will be able to take their learning with them, as they can do with print-based materials. If learners do not have portable equipment, then it makes it difficult to access the course material while they are away from their computers. However, as Lulu has suggested, this may change with electronic book technology, as this

technology becomes more widely available at a reasonable cost. This notion of portability is not limited to the physical media. Portability, as suggested by Elaine, also refers to electronic access from any location equipped with the Internet and a computer.

Interactivity and Learner-Centeredness. All course developers in this study discussed that CT/NM are enabling interactive capabilities and learner-centeredness. While these are not linked specifically to CT/NM, it is clear that the use of interactive capabilities of the Web or computer conferencing systems has changed the way that courses are being developed and structured. The course developers are taking advantage of these interactive capabilities to enhance the learning experience and provide a sense of a learning community amongst their learners. As well, the course developers had great interest in using asynchronous communication, so that learners can participate at times convenient to them. What is interesting to note is that the course developers in this study all seemed to embrace the social aspect of learning, suggesting they believe, like Nipper, that this is an important part of learning. By providing opportunities for their learners to participate in on-line discussions and in fostering collaboration, it seemed that they were suggesting that the experience of learners in interactive, on-line courses may be more meaningful and therefore more helpful for the learning process than studying independently.

Both Elaine and Lulu indicated that learners had to participate in the on-line discussions and seminars as part of the course. Elaine suggested that learners should be able to participate from anywhere that has Internet access even while they were traveling. This is an interesting situation and raises some questions concerning learner-centeredness and the requirement to participate in the interactive portions of the course. Does this requirement limit the amount of learner-centeredness that a learner can expect in an on-

line course? Is participation in the course then limited by the access a learner has to the on-line discussions? These are interesting questions that are worth investigating in future studies.

It should be noted that interactive opportunities have always been provided in one form or another in distance education. In the past, though, it was difficult to provide interaction due to factors of cost, convenience, and access. The course developers in this study seemed to be concerned with looking for creative ways to maximize the access and technological capabilities that learners have. Elaine and Henry suggested that there is a difference in what could be designed for site-based learners with access to high capacity networks and powerful computers and for home-based learners, with limited bandwidth and less powerful computers. This challenges course developers who have to develop their courses for use by two or more audiences with differing capacities. Daniel, for example, discussed providing courses globally. Many learners do not have access to the kinds of technology that course developers want to use. Alternatives have to be developed, such as providing the course's Web site and relevant materials on CD-ROMs, as Elaine had done for learners with limited access to network bandwidth.

Emerging Course Development Model

In Chapter Two, I presented Table 1, which provided a comparative framework of three distance education paradigms: the two dominant distance education course development paradigms, front-end systems design and remote classroom; and a potential emerging paradigm, networked multimedia. This comparative framework was developed from the literature that was presented in Chapter Two. The results of this study indicate

that a new paradigm as presented in the comparative framework is not emerging for the course developers.[27] Instead, a number of practices have been emerging, which have aspects of both the systems-based and the remote classroom models.[28] As well, the findings show a different direction for the development of a new paradigm, based on real world experience. The course developers are adapting some aspects of the new emerging paradigm, with regard to the use of computers and networks and new delivery processes. In this way, they are moving towards the new paradigm.

By applying the categories as listed in Table 1, we can see how the results of the study support the finding that some new practices are emerging within the existing distance education paradigms, but at the same time, the course developers are moving towards the new paradigm. The categories are technology generation, world view, purpose/ethical view, operating system/cultural perspective, authority, teaching and learning orientation, course development production system, production team, course delivery, and learner support. These will be discussed here.

---

[27]The key indicator of whether or not a new paradigm is emerging for this group of course developers is that no one told me that one was. In fact, most course developers suggested course development processes and practices that seemed to be located within the systems-based paradigm.

[28]I make the distinction between the terms, "model" and "practice." I see a model as an ideal, an example that is both recognizable by its features and its application. A model is something that can be patterned, and although it might be adjustable, imitated or emulated, it is essentially something that is representative of a particular world view and way of doing things. In this way, I also see a model as representative of a paradigm.

A practice, on the other hand, is different. A practice is something that people perform, and work at to become proficient. A practice may also be based on a particular model that is in operation. The work that people do in a particular field may generate a recognizable model, as the practice is applied more and is recognized as different from other models in operation. In the case of the practices described by the course developers, these were quite new and everyone described her or his version a bit differently. In a sense, the different practices that are developing are indicative of the effects of new media and technologies and how these provide opportunities to create new thinking, methods, and outputs.

Technology Generation. The course developers are using third generation technologies, as defined by Nipper. They are actively applying information technologies, such as computer conferencing, to provide learners with social learning opportunities.

World View. The course developers showed clear interest in using the tools of the information society to provide learners with new, interactive learning experiences. There was also great interest in providing access, regardless of where the learners were located. In this way, the course developers showed that they have a post-industrial and global world view.

Purpose/Ethical View. The course developers seemed to view learners' access and choice as being very important. Access and quality are attributes of the front-end systems design model and access is an attribute of the remote classroom model. In this category, it seems that the course developers are interested in fostering choice, in addition to access.

Operating System/Cultural Perspective. As discussed earlier, Rumble suggests that there are different organizational approaches for providing educational opportunities to learners. In the case of both DE&T and OLA, the approach is from an institution-centered perspective. Courses are developed with the idea that they will be used for a number of years and by a large number of learners. Most course development takes place up-front. The courses have a standardized and consistent format, and are high quality in terms of their design and published look. The Web courses are also designed using the same kinds of systems as the traditional, publishing-based courses. However, they can be designed more quickly and more risks can be taken with providing the material on a more "just-in-time" basis, since the Web pages can be dynamically changed.

At the course delivery level in the Web-based courses described, there is clear evidence that person-centered models are in operation. By this, I mean that the course developers are interested in the growth of the individual learners and how to make the learning situation meaningful. This presents an interesting duality in that there seems to be two views operating. However, since most courses discussed by the course developers are offered on a credential-basis, the institutional system takes precedence because there are governance regulations in place that cannot be altered to meet the specific needs of each individual learner.

Authority (Socio-Political). The authority for course development rests within OLA and DE&T and its faculty partners. For the most part, learners are not directly involved in course development; however, they are able to contribute to the course while it is in progress and through post-course evaluations.

Teaching and Learning Orientation. The emerging practices described by the course developers showed a number of overlaps, particularly with regard to the instructional view, the interaction strategies, the interest in fostering learner-centeredness, portability and the choice of communication mode. These aspects will be discussed below.

Most instructional strategies described by the course developers were based in constructivism. There was great interest in getting learners involved in collaborative learning activities and sharing their knowledge. This was particularly evident in the media and technologies replacement and hybrid course development practices. In those practices, there was interest in providing learners with a range of media from which to learn and with on-line discussions and peer-based learning opportunities.

In the resource-based course described by Alison, learners had the opportunity to work independently, while keeping in touch with a mentor and other learners in their "class." They could select the resources and activities that would help them in their pursuit of knowledge. They also could participate with others involved in the program through collaborative learning activities. In this way, they were able to mediate their own learning requirements with the help of a mentor and choose their preferred learning pathways.

This similar kind of learner choice was provided through structured information course development practice. Although more of a new production practice, structured information course development methods may in the long run provide the ability to develop courses and learning opportunities dynamically. This will provide course developers, learners and instructors with the ability to develop customized learner-centered courses.

In all the practices, there seems to be the capability of developing courses in a modular way. However, learners cannot take modules independently of the course, develop their customized learning path, and apply for an outcomes-based credential (for a specific module) at this time. Everything is still contained within the capsule of the course paradigm.

As discussed in the previous section in this chapter, most course developers expressed interest in providing interactive and portable learning opportunities. The communications capabilities of the Web, as an example of a CT/NM, seemed to be enabling course developers to provide more interactive opportunities particularly between learners than other previous interactive communications systems.

Course Development Production Systems. In reviewing the descriptions concerning their practices, most course developers are using a traditional, systems-based distance education model. This model has many fordist features in terms of the production system applied. The instructional design plan still drives process, and the production process follows a fairly linear progression to get the course into the hands of the learner. The overall course development activities are still geared to developing a high quality course that has longevity, whether it is in print or on the Web. However, the course developers also showed that they are moving towards the adaptation of some post-fordist production processes. To summarize earlier discussions in this paper, fordist production is driven by a central body, divisions of labour, linear production process and specialist workers. A post-fordist model has a de-centralized structure, characterized by teams with both specialist and generalist skills and a non-linear, continuous, dynamic, production process.

Using the definitions of fordism and post-fordism presented above, the overall production model operating within both OLA and DE&T leans towards a fordist-style model. The courses that are produced by both groups are generally developed as part of a new or existing program of study. The program areas or faculties select the courses to develop and this ensures that there is a consistent and complete program of study. Learners benefit by having access to a complete program. If learners choose to take the full program and complete it, they are able to obtain a specific credential. The course production system is geared to developing courses to fit a particular institutional need – to provide a program of study for learners. The courses are developed for many learners, so it is important to ensure that they are consistent and systematic. In this way, the courses

are developed as part of a supply-based model, driven by the needs of the institution to provide a particular program of study.

Operating at the same time, however, is the recognition that learners should have more choice to select their own learning resources. This means that although there is still the institutional concern with providing a particular supply of courses that meet a particular program and credential for a large number of learners, there is also the idea that customization of learning opportunities is possible. The course developers discussed how they are building in opportunities for learners to add electronic resources in Web-based courses and thereby take part in building the course. This means that the full course is not built all at once and that each course offering becomes customized.

In the structured information course development practice, following a collaborative agreement process on the content standards that need to be put in place, there is more focus on the development of a comprehensive course development and delivery system than in the other practices. As Farrah had explained, this practice uses explicit planning steps and instructional design requirements. As a result, it acts as a reinforcement of traditional distance education design principles. It may be considered as fordist in application in that it is centrally controlled and tasks, such as the identification of content on a component basis, must be completed in a specific way and some special skills or knowledge are required.

However, the structured information practice has also some post-fordist aspects as well. Course content is developed in a modular way, and identified at a granular level. This content is placed in a central repository and can be re-used for various learning needs. As Farrah had also discussed, there are different levels of "products" that can be achieved

with this process such as course outlines and resource guides linked to learning outcomes. It can also be developed so that it can be provided in multiple formats such as in video, audio, and text. If course developers, learners or instructors can select their choice of media and pull together customized versions of learning modules, then mass customization becomes possible. It also enables the "instructor as producer" from the remote classroom paradigm to develop learning opportunities for her or his learners. Thus, the outcome of a fordist course development process may be an extremely flexible range of post-fordist delivery applications.

For a structured information process to work between organizations, collaborative content and technical development standards must be in place. Since structured information course development is so new, OLA course developers did not discuss how they were going to be working with other organizations to do this.[29]

With the practices identified by the course developers, there is a sense that there is a change in what is being produced. There is a shift from a tangible output, such as a course package that encapsulates a complete learning experience, to constructing what are essentially intangibles. There is more focus on developing an interactive learning experience, which has an abstract, ephemeral quality in that it is not something that can be touched in the same way as a course package. So, although the course production system for the practices identified by the course developers may work essentially the same as for

[29] OLA is involved in the IMS Global Learning Consortium, Inc.'s Developers' Group. This technical group is involved in developing collaborative standards for exchanging course material electronically between organizations.

traditional distance education course development, the types of outputs may be quite different.

Production Team. Most course developers described a fairly linear progression as to when team members would be brought into the course development process and what their roles were. This seems to fit with Bates' suggestion that systems-based distance education production is characterized by a division of labour; and with Moore and Kearsley's suggestion that there are specialists with unique skills involved in the production process. Some course developers' descriptions could be considered as representing a fordist production view in that they discussed the team members roles and how these should not overlap. They suggested that specialists are involved in the production process and that there is a separation of processes between members. As well, they identified the need to follow established procedures.

The items in the former paragraph seem to indicate that a fordist production approach is being applied. The department managers make the decision as to the course or program to develop and may specify the general technologies and media direction to be taken. The project manager/instructional designer looks after the course development team and the timelines. She or he also brings in the appropriate team members when required. With the changes in technology occurring at an incredible rate, it is unlikely that team members will have expertise in all kinds of emerging media. Therefore, some new specialization may occur to fill the "gap."

Some production team approaches described by the course developers seem to be also post-fordist in orientation. For example, Henry suggested that the maintenance tasks in Web-based courses would be taken care of within the course team by the person with

the skills and knowledge to make the change. As well, Daniel and Elaine described their roles as both course developers and tutors for their on-line courses. Alison discussed how she brought everyone involved into the planning process at the beginning. Some of the team continued into the delivery phase of her resource-based course application. These examples demonstrate more of a post-fordist production team approach than a fordist one since members of the course development team continued their involvement from development to delivery. In a post-fordist production mode, the team members might more likely have a range of generalist skills and knowledge, with expertise in specific areas. As a result, there may be a blurring of roles.

Course Delivery. As previously discussed, the course developers showed that they are advocating a learner-centered approach to course delivery. With the development of courses containing collaborative learning or on-line opportunities, learners are able to engage in social learning, which may make the learning experience more meaningful. In this way, there is "high noise," as suggested by Nipper. However, the course developers had different approaches to meet this requirement. For example, Alison discussed the need to provide learners with choice not only in terms of media but also in terms of how they might participate. Elaine and Lulu advocated a learner-centered approach but also suggested that learners had to participate in the on-line discussions provided in the course, as part of a learning community.

The course developers provided descriptions of the way that courses were or would be delivered using the Web. In most cases, they described a group-based approach to course delivery, which is like the remote classroom paradigm. The courses are provided as part of a centralized delivery system, as opposed to being available on-demand.

Learners register for Web-based courses just as they would for any regular distance education program. This means that the notion of "on-demand" learning as suggested as a feature of the emerging paradigm is not really in evidence, although with continuous enrollment, learners can begin at any time. For on-demand learning to occur, learners need to be able to access their learning interests when they need to, and have access to an educator to help them make sense of the resources. There is, however, some evidence that on-demand learning is occurring within Web-based course delivery described by the course developers. Learners are encouraged to contribute by providing links to electronic learning resources, which they can use within the course on-demand.

Student Support. In the descriptions provided by the course developers, learners are provided with support through mediated communication. The telephone has long been used with learners to provide support at a distance; however, now, learners are being supported more and more through e-mail and the Web. Most course developers talked about support, especially within the teaching-learning situation. Henry and Gary, for example, suggested that learners required access to a range of media resources to help them learn how to use new electronic learning environments effectively. Ingrid talked about the need to provide a good interface between the institution and the learner. Technology provides one of the interfaces. However, no one spent much time discussing how non-instructional support could or should be conducted. There is evidence of the support mechanisms available through the student handbooks provided by DE&T and OLA. These handbooks are provided in print, as well as electronically through their Web sites.

To summarize, then, the course developers in this study seem to be moving towards the emerging paradigm. However, what seems to be developing is an enhanced version of the system-based paradigm, which borrows the best from the remote classroom paradigm (i.e., as an adult education-based, learner-centered style of delivery) and takes advantage of CT/NM in some aspects of the production, delivery and support phases of course development. The practices described by the course developers have a mix of old and new production and media application processes, which indicates that their practices are being affected and incremental practice change is occurring. Since the effects described by each course developer are variable and no consensus was determined, it is not possible to say that a post-fordist, networked multimedia course development paradigm is in operation.

Structures

The distance education development, production, delivery, and support processes at UBC and OLA have taken many years to perfect. UBC's distance education unit, DE&T, has been in operation for fifty years. OLA has been in operation for twenty years. These are long periods of time in which many technologies have come and gone. The traditional, print-based correspondence model of distance education, enhanced by multiple media and interactive technologies, has been the stable model for all these years.

In Table 3, the course developers identified organizational issues that are affected by CT/NM. These issues relate to the structures operating within the distance education course development and delivery system and their flexibility to accommodate CT/NM. By looking at these issues, we can identify the structures that enable the course developers to

take advantage of CT/NM and those that impede. Table 4 provides a listing of the issues and structures.

Table 4

Organizational Structures

Organizational Issue	Enabling Structures	Impeding Structures
Roles	Flexible job descriptions	Rigid job descriptions
Training & Professional Development	On-going Peer-based	Lack of opportunity
Delivery Systems	Flexible systems suited to learners	Non-customizable systems (one size fits all)
Funding Arrangements	Change agents Partnerships	Outdated criteria
Intellectual Property (IP)	Recognition of IP in electronic environments and ownership especially for learners	Outdated IP policies
New Opportunities	Flexible course development and delivery system	Not able to transition course development and delivery system quickly to take advantage of new opportunities

The organizational issues provided in the table are roles, training and professional development, delivery systems, funding arrangements, intellectual property and new opportunities. I will discuss these issues here with regard to the enabling and impeding structures listed in the table.

Roles. The course developers discussed how some roles were changing as a result of CT/NM. This was particularly with regard to tutors and instructors, who have a more proactive role with learners in Web-based courses. Some also discussed the change in their roles, team members roles, or activities. Farrah suggested that her role would be changing to include coaching and facilitation for internal and external team members using

structured information course development. Ingrid was clear that job descriptions had to be flexible to enable CT/NM to be applied. Thus, the impeding structure would be a system of rigid job descriptions where course development and delivery team members were not able to make the changes required to apply CT/NM.

Training and Professional Development. The course developers discussed that new technologies and media take time to integrate. This means that course developers and their team members require time to look at technologies and media, assess their value for the teaching-learning process, and determine how these might be applied. They have on-going needs for training and professional development. Since CT/NM opportunities are new and emerging, there are not many people who have experience with these. Therefore, peer-based kinds of training and professional development may be most effective. If on-going training and professional development opportunities are not available, this may impede CT/NM from being successfully applied.

Delivery Systems. CT/NM effect the delivery systems for learners. The DE&T course developers discussed the types of delivery systems required to enable globally accessible, Web-based course delivery. These systems are both technical and physical, and have an effect on the design and the quality of the learning experience. There are really two options with regard to technical delivery systems. One is to build a local, customizable system that meets the teaching-learning needs desired and can accommodate changes required for different course applications. An alternative is to apply a commercial educational delivery system. With most educational delivery systems, the teaching-learning paradigm is implicit and represents a view of what that relationship should be. Commercial educational delivery systems need to have the flexibility to allow local customization for

specific course applications, including pedagogical aspects. The same goes for physical delivery systems. The organization can put in its own delivery system or use an external service that will meet its delivery needs. Thus, flexible delivery systems suited to learners' needs would enable the organization to take advantage of CT/NM, while non-customizable, "one-size fits all," delivery systems act as impeding structures.

Funding Arrangements. As we move into CT/NM, funding arrangements will change, since the basis or context upon which they were developed will change. The underlying criteria for assessing how the funding should be organized and dispersed will not match the new needs generated as a result of CT/NM. Traditional funding agencies will need to adjust their criteria to meet these new opportunities. For example, to enable pro-active change, DE&T, in conjunction with UBC's Advisory Committee on Distance Education, could be considered as having taken on the role of change agent. It works with faculties to build their course proposals, helps them to understand new technologies, and helps to organize and administer the funding process. As well, partnerships, particularly with non-traditional partners, provide the opportunity to explore new funding arrangements. Thus, change agency and partnerships are enabling structures. The impeding structures are outdated criteria, which do not recognize changes and opportunities occurring as a result of CT/NM.

Intellectual Property. Although Ingrid was the only course developer who discussed intellectual property, it is an important organizational issue as students and instructors create electronic content within the context of on-line courses. New policies are required that recognize intellectual property in on-line environments and how this will be handled at the student level within courses. The structures impeding this are the lack of

understanding of electronic environments and their impact; and outdated intellectual property policies.

New Opportunities. In order for OLA and DE&T to take advantage of new opportunities brought about by CT/NM, a flexible course development and delivery system needs to be in place. This system needs to be able to adapt quickly to the changing external environment and the new requirements that are developing. This system also has to recognize the differences between the audiences they serve, and the audiences they want to serve, in a global marketplace. In addition, OLA and DE&T need to look at the educational services that learners in a knowledge-based society could benefit from and move quickly to develop these. New opportunities will be impeded if the course development and delivery system is not able to transition itself quickly to take advantage of CT/NM.

Study Conclusions

This small, qualitative study has just scratched the surface of the issues and opportunities arising from CT/NM. Before providing my conclusions, it is important to review the limitations of this study. It presents a very focused sample group working in a specific educational situation at a very specific time (May to June 1999). As a sample group, the course developers have much in common. They work in similar distance education environments, engage in similar course development activities, have similar professional experience in course development for adult learners, and have similar experience with technologies and media within their practices. They work for publicly funded education institutions located within a short drive of each other: DE&T at the

University of British Columbia in Vancouver and OLA in Burnaby. They also live in British Columbia, Canada. As a result, there may be more homogeneity between members of this sample group than if the participants came from distance education contexts outside of British Columbia or Canada; performed other roles in the distance education milieu; or were from mainstream educational contexts.

My conclusions are therefore limited to this study and the time frame in which it was conducted and should not be seen to be generalized beyond. That said, this study has provided insight into the experiences of eight, long-time course developers working in distance education for adult learners. Readers may see some applicability between the experiences of these course developers and others working in similar course development contexts in long-standing, publicly funded distance education institutions and units.

After conducting this study and analyzing the information shared by the participants, I have arrived at three conclusions. My first conclusion is that the course developers' practices are being affected by CT/NM and as a result, some new planning considerations and four new course development practices are emerging. As discussed earlier in this chapter, there are a number of factors as to why these practice effects are emerging. A key factor can be attributed to the courses developers' current roles and course development practices, which, for the most part, are grounded within the institutional settings within which they work. Also, their responses to my questions, particularly concerning how they apply media and technologies within their practices, seem to indicate that they have engaged in similar kinds of course development activities within rather typical distance education environments. As well, they showed that they are using CT/NM pragmatically, adapting and adopting these where it makes sense. However,

it is important to recognize that people often take a current understanding of a medium or technology into a new one and try to make sense of how best to apply it. This also appears to be occurring with the course developers in this study and we can see this from the way in which they are approaching the Web.

Another important factor is that CT/NM are emerging and therefore, are new. This means that the course developers do not know all the effects at this time. While print-based independent study has been around for over one hundred years, Web-based course delivery, as an example, has only been available for a short period of time. From the course developers' descriptions, they showed that their applications with new technologies and media have a lot in common with current literature in the distance and distributed education fields. This is particularly evident in regard to literature on the teaching-learning situation and interactivity for distance learners. This shows that the course developers are aware of the trends in the distance education field.

Access and technology readiness also remain key factors that must be considered in developing courses using CT/NM for adult learners. The course developers discussed these factors and some methods of providing courses for audiences with differing access and technology capabilities.

There was not clear consensus, however, on how CT/NM were affecting the course developers' practices. The variation in approaches suggests to me that although CT/NM are having some effects, these are incremental and evolutionary. This may be related to the systematic approach that distance educators have had with regard to new technologies and how these are integrated into the distance education operational context. It may also be related to the differing conceptions that the course developers held as to

what constitutes a new medium or technology and whether they think that it will affect their course development practices more than any other previous medium or technology has. After implementing a number of media and technologies over the years, most course developers suggested that they had a methodology for applying new ones. They seem to be bringing their past experience into rationalizing how to make sense of a new medium or technology.

Secondly, I conclude that the course developers are applying an enhanced systems-based course development model and moving towards a new course development paradigm. This new paradigm is based on networked multimedia and uses post-fordist processes. Although I found that there were four emerging practices, there is not enough evidence to say that this new paradigm has developed and is operating at this time. Instead, most course developers described course development in terms of systems-based models. As well, many attributes of the remote classroom model were described as important factors in interactive delivery.

In addition, although the production model described by course developers leans towards a fordist model, there were post-fordist processes evident in the activities and outputs of the course delivery and support phases. This was evident in DE&T's Web-based courses where the course developers often take on both development and delivery roles; and in OLA's use of structured information and the way SGML is applied to enable course content to be assembled in a variety of media. This duality of applying both fordist and post-fordist methods seems to be in keeping with Jarvis (1996), who suggested that distance education institutions may need to continue to produce products for mass development and distribution, while adapting specialist, batch development for smaller

niche markets (p. 49). Thus, I find that there is evidence to support that an enhanced systems-based model is in operation, and at the same time, the course developers are moving towards a new paradigm based on post-fordist processes and networked multimedia.

My third conclusion is that beyond issues of access and technology, there are six specific organizational issues can enable or impede the success of CT/NM for the course developers in this study. These are roles, training and professional development, delivery systems, funding arrangements, intellectual property policies, and new opportunities. These issues are not easily overcome by the course developers themselves. They can only be resolved by making changes within the institutional system. To make change happen, several people across the institution would need to be involved and this can be very difficult to organize quickly.

In particular, new funding arrangements and new intellectual property policies are needed to address some of the changes occurring as a result of CT/NM. The premises upon which these arrangements and policies were built reflect a different time and set of circumstances that may no longer be applicable. Much of this may be driven by forces external to the institutions themselves and will require cultural changes.

Perhaps most critically, the flexibility of the course development and delivery system will affect how quickly organizations are able to take advantage of the new opportunities associated with CT/NM. Some course developers discussed the new opportunities they were considering or developing. However, no one in this study discussed in any significant capacity how competition would affect their institution or their course development activities. The distance and distributed education world is becoming

heavily populated with many players providing on-line, Web-based courses. The ubiquity of technology access is fueling the opportunities for institutions on a global basis and is therefore creating competition where none existed previously. Institutions are coming to the learner – and learners are demanding this--as opposed to the learner going to the institution. Institutions that are able to move quickly will likely become the sustaining players in the marketplace.

My overall impression at this point in the study is that the course developers are making sense of CT/NM pragmatically, in an incremental and evolutionary way. Given the leading edge course applications they are involved in and the rapid development of distributed learning occurring in the wider context of education, I find this very intriguing. When I began this study, I fully expected to find that CT/NM were profoundly affecting the course developers' practices and that a new distance education paradigm, based on networked multimedia and exhibiting post-fordist production approaches, was in operation. However, this is not what the course developers described was happening as a result of CT/NM. This raises some interesting questions pertaining to the nature of course development work itself and how much it is affected by things other than CT/NM.

The study results also indicate to me that a very interesting dichotomy is occurring between the course developers participating in this study who have a long history of working in distance education and have demonstrated pragmatic, sensible approaches to media and technologies application; and the mainstream educational environment, which is discovering how distributed learning can be used to reach on-campus and remote learners and is moving quickly to exploit this. This dichotomy is something that needs to be further

explored, particularly with regard to the emergence of public and private sector players within the competitive, borderless on-line education market.

In light of my conclusions from this study and the current interest in distributed learning in the wider educational context, I propose some suggestions for further research into the effects of CT/NM on distance and distributed education in the next chapter.

CHAPTER SEVEN

SUGGESTIONS FOR FURTHER STUDY

The study I conducted and described in this thesis focused on a small number of course developers working in two fairly traditional distance education contexts in the BC Lower Mainland. The study results indicate that although changes are taking place in the course developers' practices as a result of CT/NM, these are occurring pragmatically and incrementally. Thus, the course developers are engaged in evolutionary change. This is a very interesting result and I am not sure why this is occurring. To further understand this result, it would be useful to know if distance education course developers in other contexts are experiencing CT/NM in the same way. As well, it is important to look at the wider educational context. There is much activity occurring within this wider context, stimulated by the arrival of new technologies and convergence. The evolutionary view presented by the course developers in this study is in sharp contrast to the views of some educational leaders. They are encouraging their faculty members to become involved in applying technology to deliver their courses. These leaders suggest that new technological capabilities and global competition are revolutionizing education. Although the discussion of the wider context is somewhat outside the bounds of this study, it is important include this so that we can begin to understand the nature of this dichotomy.

To gain an understanding of the effects of CT/NM, I propose three suggestions for further study. First, I suggest the need to expand the current study I conducted here and why this is important. Following, I propose that we look at the movement of mainstream educators into distributed learning. Lastly, I suggest that it is important to know how

educational leaders are conceptualizing the changes resulting from the emergence of new technologies and a globally competitive education market. These suggestions for further study are interrelated. They would provide us with a more comprehensive view of the effects of CT/NM on the educational environment as a whole than if we based our understanding of CT/NM effects on the results of the study presented in this thesis.

Expand the Current Study Parameters

A key direction for further research would be to expand the study I developed in this thesis. The expanded study would include course developers from different distance education contexts. If we did conduct an expanded version of this study, would we find the same results? It would be useful to know if other course developers are experiencing the same evolutionary practice change as a result of CT/NM or whether they are experiencing different things.

Key to this further study would be to find out how other course developers are applying new media and technologies, such as the Web. What are their conceptions of it? Do they see the Web as a medium or media? As well, how are they applying on-line discussions in Web-based environments? How is this enhancing learner-centeredness? These are significant questions since, as I discussed in Chapter Six, the course developers did not seem to share the same conceptions. It will be important to find answers to these because the course developers' understandings have a bearing on how they apply the Web for course delivery.

Organized knowledge management systems will become increasingly important as distance education institutions move into providing customized learning experiences for

niche and mass audiences. As discussed in this paper, OLA has already moved in this direction through its foray into structured information. Kinney (Winter 98/99) suggests "an organization's future now rests on being able to create, capture, obtain, and leverage their knowledge" (paragraph 2). Course developers represent a major knowledge group within a distance education organization and through their work they have influence on how knowledge is developed, shared, and stored. Course developers as knowledge producers and organizers can help their organizations achieve a competitive advantage. Thus, we should also include the concept of knowledge management in a further study and how this affects the work of course developers.

For knowledge management to be effective, standards need to be in place so that content can be easily extracted and used for multiple purposes. Another aspect we could investigate in this expanded study is how course developers think that these content standards will affect their course development practices. Standards provide interoperability so that content can move across platforms, databases, and presentational formats (Barone and Luker, 1999, Nov/Dec, paragraph 24). As discussed earlier in this paper, OLA has developed a structured information course development practice that uses SGML as an underlying framework. Other standards are emerging too. XML, which stands for eXtensible Markup Language, is an adaptation of SGML. It is an emerging standard that is being used for Web-based delivery (Ballard, 1999, December, paragraph 2). Another emerging standard, Synchronized Multimedia Integration Language (SMIL), is based on XML and "choreographs the timing and layout of multiple live or recorded events, graphics, ads and text feeds into a single compelling presentation. SMIL can be used to deliver different presentations based upon the user's bandwidth and language preferences"

(Boyle and McIntire, 1999, November 22, paragraph 2). These standards have the potential to completely change how courseware is developed and delivered through computer networks to learners.

Given the increasing importance of knowledge management and emerging standards, how will course developers make sense of these within their understanding of how media are best applied for course development and delivery? How will these affect the development of a new post-fordist, networked multimedia model of course development? These are key questions for an expanded study into the effects of CT/NM on distance education course developers' practices.

Mainstream Educators and CT/NM

A second suggestion for further study has to do with the movement of mainstream educators into distributed learning. As discussed earlier in this paper, Dede suggests that distance education is being transformed by technology. As a result, it is emerging as distributed learning, which has developed rapidly with access to the Web and improved computer networking. Distributed learning is being applied by many public and private sector institutions and organizations as a way to provide courses and learning opportunities on campuses, in learning centres, and over distance. Many mainstream educators are discovering and applying distributed learning methods in their courses.

Oblinger and Maruyama (1996) suggest that a distributed learning environment "exists among a dispersed student population, is structured according to learner needs, and tends to integrate traditional institutional functions (e.g., classroom and library). Students and faculty may enter the learning environment at different times and from

different locations" (p. 6). They further suggest that there are three factors that change in distributed learning: "the role of the instructor and the concepts of place and time" (p. 6). A key feature of distributed learning is the ability for instructors to develop high quality, cost-effective customized environments for learners with different needs (Bates, 2000, p. 27). In order to provide successful distributed learning environments, "institutions must address both human and technological issues through planning, institutional support, and technology architecture" (Oblinger & Maruyama, 1996, p. 6).

Distributed learning is leading to an explosion of what Tapscott calls "molecular media." Bates (2000) suggests that "the ease of use or 'transparency' of technologies such as the World Wide Web and videoconferencing makes it much easier than in the past for faculty to develop technology-based learning materials and course delivery" (p. 59). He says that

> the most common approach to encouraging the use of technology, at least in universities in the United States and Canada, has been to provide individual faculty members with small grants that provide funding for a part-time graduate student and some equipment or software. (p. 59)

Faculty have much autonomy with regard to how and what they teach within their areas of specialization. Therefore, coupled with the way that they are being encouraged to experiment with and apply technology in their courses, Bates says that this is leading to a new course development model, which he calls the "Lone Ranger" approach (p. 60). In this approach, a faculty member, accompanied by a technologically-literate graduate student (i.e., "Tonto"), develops a course. Depending upon the skills of the graduate student, the time that the faculty member has, and the funds available, a course developed in this way may or may not get the attention it requires. Since most universities have

research mandates and faculty have autonomy in how they provide their courses, Bates suggests that this fits in with a "laissez-faire" approach (p. 60). Thus, providing small grants for this purpose allows a certain amount of experimentation.

Faculty who are new to distributed learning might not know how to use a medium such as the Web effectively. Bates suggests that

> Standard classroom materials, such as lecture notes, may be carried across to a Web site, without being adapted to the requirements of that medium. More important, the many unique features of the technology, such as links to other sites, or the opportunity for students to add their own contributions to the site, may not be exploited. (p. 61)

In addition, there may not be enough time or funding to finish the project properly. The course may "end up being a costly supplement to conventional teaching, merely increasing the instructors' (and students') workload" (p. 62).

While there are many examples of "home-grown" efforts, universities have been active in developing useful on-line tools designed specifically for educational environments. For example, the TeleLearning Network of Centres of Excellence (http://www.telelearn.ca), through a research team at Simon Fraser University, have developed "Virtual U," an on-line tool for collaborative learning. A second example is WebCT, which, as discussed earlier in this paper, was developed at UBC. It is an emerging Web course system that is being applied at many North American educational institutions. A number of colleges and university-colleges in B.C. have recently joined together and purchased a group license so that their faculty can use WebCT to develop distributed learning courses.

These new on-line and Web-based tools are making the development of distributed learning courses much easier to do and many mainstream educators are taking up the challenge. Since the instructional design framework is embedded in the software of tools such as WebCT, faculty who do not have course development experience can make use of this capability without having the help of an instructional designer. With these new tools, faculty, who are already knowledge producers, become, as Tapscott suggests, media producers and publishers as well.

The use of these kinds of course development tools by mainstream educators leads to some interesting questions. If faculty, as "lone rangers," can develop their own distributed learning courses, what does this mean for specialist distance education units? Just as importantly, what impact will course development systems, such as WebCT, which contain automated instructional design frameworks, have on distance education course developers?

As well, it would be useful to know how mainstream educators are making sense of CT/NM. Are they re-discovering things that have already been well documented as known technology effects and that are possibly an echo back to another time? Or, will they bring fresh insight, free of the paradigms of distance education, and help us all to move ahead? These are useful questions to examine as mainstream educators move into distributed learning and begin to use current and emerging tools and methods normally applied by distance education course developers and their teams.

Educational Leaders and CT/NM

The final area for further study that I am suggesting, and possibly the most complex, pertains to educational leaders and how they are making sense of CT/NM within their educational spheres. Many educational leaders have suggested that new technologies are fundamentally changing education and how it is provided. For example, Farquhar (1999), president of Carleton University, discusses the development of the "virtual institution" and suggests that "it will change transformationally what we do" (paragraph 6). He finds that

> The operation of higher education in cyberspace, the pursuit of learning and research via satellites and the internet, the 'virtual institution' – these are no longer subjects for speculation; they exist, they operate in Canada, and they are going to multiply and get better (not falter and fade away). The chief reason for this is free-market competition. There is money to be made through telelearning, there are entrepreneurs wanting to make it, and the fittest among them will survive – indeed, thrive. However, we're not there yet and the scene at present is chaotic. (paragraph 6)

Farquhar notes that whereas there are public sector examples of "virtual institutions" such as the British Open University and the Open Learning Agency, most institutions have delivered distance education using various technologies in many forms from their "campus bases" (paragraph 7). He suggests that the regular institution is not a "virtual institution" since a "virtual institution is a network of connections, not the extension of a place" (paragraph 7). Farquhar continues:

> Strategically, our universities must reinvent themselves as learner-driven rather than teacher-driven enterprises. This shift in perspective will lead to major redesign, redefinition and re-engineering of what we do, how we do it, how we organise and train for it, how we evaluate and reward it. It entails a reorientation of our value system and academic culture – an adjustment that will determine how and whether we can transform our institutions structurally and operationally to exploit, or even survive, the Information

> Age. We will look different, we will behave differently, we will accomplish different results; but these differences must relate to new academic goals, values and attitudes that must be strategically determined in light of what new technologies can now do for us. This is transformational change, not technological innovation; without the former, the latter won't save us. And it is my observation that, in general, Canadian colleges are farther along this path than are Canadian universities. (paragraph 11)

Farquhar further explains that "because the internet respects no boundaries, it alone demands an international perspective within Canadian colleges and universities" (paragraph 15) and internationalism "will be a critical determinant more immediately in the already evident process of sorting the post-secondary institutions into a multi-tiered 'system' of higher education. Internationalism is becoming a qualification for upper-tier membership" (paragraph 16).

Kershaw (1999, December) provides another example. He suggests that community colleges will have to compete and collaborate at the same time in the distributed learning world. He says that "distributed learning programs and courses are expensive to develop. If colleges are to fully deliver on distributed learning's promise of increased access and flexibility, then we will need to learn to both compete and collaborate at the same time" (paragraph 1). He further suggests that "partnerships focusing on course development, delivery, and support could be forged on a regional basis" (paragraph 9). These partnerships also help to blur the distinction between secondary and post-secondary education within a community (paragraph 12). To survive in this new global education environment, some institutions are beginning to partner with other institutions or organizations, as private sector corporations have always done. By pooling their strengths, institutions may be able to compete in particular niche markets.

Mason (1998b) suggests that the financial pressures facing higher education institutions are acting as an impetus to become involved in global education (p. 6). In this new global marketplace, students become consumers who can choose how, when and where they learn. Telecommunications systems are providing this opportunity and empowering learners to engage in courses and determine the kind of teaching and learning methods they will accept. So, course developers and teachers need to know how to make their courses learner-centered. She says that "the kinds of courses which the global consumer is demanding are flexible, adaptable, portable and interactive" (p. 7). To compete, traditional universities will need to change from the "constraints on what constitutes the academic year, on where credits can be accumulated, and on how courses can be modularised" (p. 7).

On-line learning is becoming big business. Dirr (1999) suggests that "in the United States, higher education, and especially distance education, has become big business, and that has attracted commercial interests" (p. 25). He says that "this trend is evident in many places" (p. 25) and cites a number of examples such as New York University's move into the development of a "for-profit subsidiary to develop and offer distance education programmes" (p. 25) and Pennsylvania State University's development of a "World Campus to serve students worldwide" (p. 25).

Private sector learning providers, such as the University of Phoenix and Jones International University (JIU), are growing. University of Phoenix was one of the first institutions to provide courses on-line. Its on-line program "serves approximately 9,500 students located in every corner of the world" (University of Phoenix, 1997-2000, paragraph 1). JIU, which was founded in 1995, became the "first fully online accredited

university" (Jones International University, 2000, paragraph 1) last year when it was accredited by the North Central Association of Colleges and Schools in the United States.

This new market is stimulating the development of specialty service providers. For example, eCollege.com is "a Denver-based company that provides technology and services for colleges and universities to offer courses via the Internet" (Woodall, 2000, February 10, paragraph 5). eCollege.com is providing Drexel University with "a $235,000 grant, software and other services, including around-the-clock technical support" (paragraph 5) for its Masters of Business Administration degree in technology management. Dubbed the "techno-MBA," the courses in the program "will be developed and taught by full-time Drexel faculty" (paragraph 5).

New partnerships are emerging. AT&T Learning Network has developed a "virtual academy" (Dirr, 1999, p. 26). It is working with "Western Governors University, Penn State's World Campus, George Washington University, Montana State University, and T.H.E Institute" for the purposes of providing "in-service professional development opportunities for teachers" (p. 26). Within this mix, Western Governors University presents an interesting example of institutional partnering. It brokers 250 distance education courses (T.H.E. Journal, 1999, February, paragraph 2) provided by 43 educational organizations in 22 states and one territory (Guam) in the US and one institution in Canada (Athabasca University) (Western Governors University, 2000).

Many courses provided by new on-line providers and traditional institutions moving into or operating established distributed learning programs are in niche areas. These programs are in high demand by working adults and provided on a fee basis. One of the key niche areas is Masters of Business Administration (MBA) programs. In Canada,

Athabasca, Queens, and Western Ontario universities are providing MBAs through on-line and distributed learning methods. In the United States, many brand name institutions are also providing on-line MBA programs. For example, Duke University has set up a Global Executive Masters of Business Administration program (GEMBA) (Davis, 1999, paragraph 1-3). This program claims to provide "superior round-the-clock service and operations in all time zones" (Davis, 1999, paragraph 5) and costs $85,000 US for a "20 month, five semester program that takes its students on five two-week residential courses around the world" (paragraph 4). The students in this program are located all over the world.

Given this brief environmental scan, it is, as Farquhar has suggested, a very chaotic time. It would be very useful to look at how educational leaders in both traditional education and distance education are making sense of the emergence of globally based, virtual institutions and the development of CT/NM. How are CT/NM affecting their broader program planning initiatives on an institution-wide basis and their plans for course delivery outside of their traditional audiences? What impacts might global competition have on their program planning decisions? On their faculty or course developers? It would be interesting to look at the policy implications that result from new, global program delivery models.

Final Reflections

To conclude, I proposed three suggestions for further study: expand the current study to see how other distance course developers are making sense of CT/NM; look at mainstream educators and how they are making sense of CT/NM; and finally, see how educational leaders are dealing with the challenges brought about through the opportunities of CT/NM. If we conducted research into these topics, we would have a multifaceted view into how CT/NM are affecting both distance education and the wider educational context. This is important because on the one hand, in the study I conducted, course developers seem to be handling the challenges of CT/NM pragmatically; however, they are bound by the constraints of their institutional contexts. On the other hand, in the wider context of education, mainstream educators are moving into distributed learning and educational leaders are suggesting that we are on the brink of revolutionary change. Since educational leaders determine the directions for their organizations, the way that they handle the opportunities and challenges brought about through CT/NM will affect their success and prosperity. However, within organizations, there are multiple levels where innovation takes place. Those institutions that are able to mobilize and reward their key content producers and organizers are, in my opinion, more likely to succeed. That is why I think that the way that course developers and faculty make sense of CT/NM is so very important.

By conducting research with the course developers in this study, I was able to experience a partial, but significant, view of the effects of CT/NM on distance education course development. Through this study and by researching topics such as those suggested above, we in this field have the opportunity to come closer to understanding the depth of

the effects of CT/NM on course development in distance and distributed education. My hope is that continued research into CT/NM will provide the adult learning community – learners, learning facilitators, course developers, and program planners – organizing or participating in distance and distributed education with an increase in choice and flexibility of learning options suitable for a knowledge-based society.

REFERENCES

Anderson, Terry D. (1996). The Virtual Conference: Extending Professional Education in Cyberspace. *International Journal of Educational Telecommunication, 2*(2/3), 121-135.

Arbortext. (1995). *A Guide to SGML (Standard Generalized Markup Language) and Its Role in Information Management.* [An Arbortext SGML White Paper]. Retrieved July 3, 1999 from the World Wide Web: http://www.arbortext.com/think_tank/SGM...ith_SGML/getting_started-with_sgml.html

Ballard, Terry. (1999, December). The Offspring of SGML and HTML. *Information Today 16*(11), pp. 54+. Retrieved March 3, 2000 from EBSCO database (Academic Search Elite) on the World Wide Web: http://ehostvgw11.epnet.com

Barone, Carole A., & Luker, Mark A. (1999, Nov/Dec). The Role of Advanced Networks in the Education of the Future. *Educom Review, 34*(6), pp. 44+. Retrieved February 23, 2000 from EBSCO database (Academic Search Elite) on the World Wide Web: http://ehostvgw11.epnet.com

Bates, Tony. (1994). Educational Multi-Media in a Networked Society. In T. Ottman and I. Tomek (Eds.), *Educational Multimedia and Hypermedia, 1994* (pp. 3-8). Charlottesville, VA: Association for the Advancement of Computing in Education.

Bates, A.W. (Tony). (1995). *Technology, Open Learning and Distance Education.* New York: Routledge.

Bates, Tony. (1996, December). *The Impact of Technological Change on Open and Distance Learning*. Presentation at Open Learning: Your Future Depends on It, Queensland Open Learning Network, Queensland. Retrieved (no date) from the World Wide Web: http://bates.cstudies.ubc.ca

Bates, A.W. (1997, June 18 - 20). *Restructuring the University for Technological Change*. Presentation to The Carnegie Foundation for the Advancement of Teaching, London, England. Retrieved (no date) from the World Wide Web: http://bates.cstudies.ubc.ca

Bates, Tony. (1999, January 19). Allocation of Distance Education Resources, 1999/2000. In *Developing Distance Education or Distributed Learning Courses*. Vancouver, B.C.: Distance Education and Technology, Continuing Studies, University of British Columbia. Retrieved July 23, 1999 from the World Wide Web: http://det.cstudies.ubc.ca/detsite/devman

Bates, A.W. (Tony). (2000). *Managing Technological Change: Strategies for Academic Leaders*. San Francisco: Jossey Bass.

Boyle, Pat, & McIntire, Shelley. (1999, November 22). SMIL Broadens Network Delivery. *Electronic Engineering Times*, 1088, pp. 78+. Retrieved March 9, 2000 from EBSCO database (Academic Search Elite) on the World Wide Web: http://ehostvgw11.epnet.com

Bradshaw, Jacqueline, & O'Brien, Patrick. (1997, June 2-6). Hitchhiking on the Information Highway: An Alliance Between a University College and a Distance Education Institute for Delivery of Online Courses [CD-ROM]. In *The New Learning Environment: A Global Perspective, Conference Papers, The 18th ICDE World Conference*. University Park, Pennsylvania, U.S.A.: Pennsylvania State University.

Burge, Elizabeth, & Roberts, Judith M. (1998). *Classrooms with a Difference: Facilitating Learning on the Information Highway* (2nd ed.). Montreal: Cheneliere/McGraw-Hill.

Campion, Mick. (1996). Post-Fordism: not a poison either! *Open Learning, 11* (1), 41-46.

Collis, Betty. (1996). *Tele-learning in a Digital World: The Future of Distance Learning*. London: International Thomson Computer Press.

Daniel, John. (1996). The Mega-University: The Academy for the New Millennium? [CD-ROM]. In *The New Learning Environment: A Global Perspective, Conference Papers, The 18th ICDE World Conference*. University Park, Pennsylvania, U.S.A.: Pennsylvania State University.

Davis, Jessica. (1999). Duke Finds Virtual Classrooms Teach Communication. *InfoWorld,* 21(6), pp. 66+. Retrieved February 23, 2000 from EBSCO database (Academic Search Elite) on the World Wide Web: http://ehostvgw11.epnet.com

Dede, Chris. (1996). The Evolution of Distance Education: Emerging Technologies and Distributed Learning. *American Journal of Distance Education, 10* (2), 4-36.

Denzin, Norman K. (1997). *Interpretative Ethnography: Ethnographic Practices for the 21st Century*. Thousand Oaks, California: Sage Publications Inc.

Dirr, Peter J. (1999). Distance and Virtual Learning in the United States. In Glen M. Farrell (Ed.), *The Development of Virtual Education: A global perspective* (pp. 23-48). Vancouver: The Commonwealth of Learning.

Distance Education and Technology. (1999, April 8). *Staffing Chart.* Vancouver, B.C.: Distance Education and Technology, Continuing Studies, University of British Columbia. Retrieved May 16, 1999 from the World Wide Web: http://det.cstudies.ubc.ca/detsite/staffing.htm

Distance Education and Technology (1999, May 3a). *50 Years of Distance Education at UBC.* Vancouver, B.C.: Distance Education and Technology, Continuing Studies, University of British Columbia. Retrieved May 16, 1999 from the World Wide Web: http://det.cstudies.ubc.ca/detsite/newspage.htm

Distance Education and Technology. (1999, May 3b). *Course Franchise Agreement between UBC and Athabasca University.* Vancouver, B.C.: Distance Education and Technology, Continuing Studies, University of British Columbia. Retrieved May 16, 1999 from the World Wide Web: http://det.cstudies.ubc.ca/detsite/newspage.htm

Distance Education and Technology. (1999, June 4a). *Project Management.* Vancouver, B.C.: Distance Education and Technology, Continuing Studies, University of British Columbia. Retrieved June 10, 1999 from the World Wide Web: http://det.cstudies/detsite/serv022.htm

Distance Education and Technology. (1999, June 4b). *Online Courses.* Vancouver, B.C.: Distance Education and Technology, Continuing Studies, University of British Columbia. Retrieved June 10, 1999 from the World Wide Web: http://det.cstudies.ubc.ca/detsite/onlinecourses.html

Distance Education and Technology. (1999, July 13). *Distance Education and Technology External Projects.* Vancouver, B.C.: Distance Education and Technology, Continuing Studies, University of British Columbia. Retrieved July 23, 1999 from the World Wide Web: http://det.cstudies.ubc.ca/detsite/partners.htm

Distance Education and Technology (1999). *Learning Through New Technologies: The Response of Adult Learners Proje*ct. Vancouver, B.C.: Distance Education and Technology, Continuing Studies, University of British Columbia. Retrieved January 22, 2000 from the World Wide Web: http://det.cstudies.ubc.ca/detsite/research-adnan/index.html

Distance Education and Technology (1999). *Assessing the Costs and Benefits of Telelearning: A Case Study from the University of British Columbia.* Vancouver, B.C.: Distance Education and Technology, Continuing Studies, University of British Columbia. Retrieved January 22, 2000 from the World Wide Web: http://det.cstudies.ubc.ca/detsite/nce/index.htm

Farquhar, Robin H. (1999). Integration or Isolation: Internationalism and the Internet in Canadian Higher Education. *Journal of Higher Education Policy & Management, 21*(1), pp. 5+. Retrieved February 23, 2000 from EBSCO database (Academic Search Elite) on the World Wide Web: http://ehostvgw11.epnet.com

Farrell, Glen M. (1999). The Development of Virtual Institutions in Canada. In Glen M. Farrell (Ed.), *The Development of Virtual Education: A global perspective* (pp. 13-22). Vancouver: The Commonwealth of Learning.

Florini, Barbara M. (1990) Communications Technology in Adult Education and Learning. In Michael W. Galbraith (Ed.), *Adult Learning Methods* (pp. 367-390). Malabar, Florida: Krieger Publishing Company.

Forer, Barry. (1996, April). *An Evaluation of the Delivery of Five UCFV Courses by Interactive Television.* Unpublished report, University College of the Fraser Valley, Abbotsford, BC.

Forsythe, Kathleen. (1984). Satellite and Cable. In A. W. Bates (Ed.), *The Role of Technology in Distance Education* (pp. 57-66). London: Croom Helm Ltd.

Garrison, D. Randy. (1989). *Understanding Distance Education: A Framework for the Future.* New York: Routledge.

Garrison, D. Randy. (1997). Computer conferencing: the post-industrial age of distance education. *Open Learning, 12* (2), 3-11.

Geetz, Clifford. (1992). "Local Knowledge" and its limits. *Yale Journal of Criticism, 5* (2), 129-135.

Goldman-Segall, Ricki. (1998). *Points of viewing: children's thinking.* Mahwah, New Jersey: Lawrence Erlbaum Associates, Publishers.

Harasim, Linda. (1989). On-Line Education: A New Domain. In Robin Mason & Anthony Kaye (Eds.), *Mindweave* (pp. 50-62). Oxford: Pergamon Press.

Harasim, Linda, Hiltz, Starr Roxanne, Teles, Lucio, & Turoff, Murray. (1995). *Learning Networks.* Cambridge, Massachusetts: The MIT Press.

Haughey, Margaret, & Anderson, Terry. (1998). *Networked Learning: The Pedagogy of the Internet.* Montreal: Cheneliere/McGraw-Hill.

Hiltz, Starr Roxanne. (1993). *The Virtual Classroom: Learning Without Limits Via Computer Networks.* Norwood, New Jersey: Ablex Publishing Corporation.

Jarvis, Peter. (1996). Distance education in a late modern society: a response to Greville Rumble. *Open Learning, 11*(2), 47-50.

Jones International University. (2000). *JIU Backgrounder*. Retrieved February 28, 2000 from the World Wide Web: http://www.jonesinternational.edu/faculty/about_jiu/jiu_backgrounder.html

Keegan, Desmond. (1993). Reintegration of the teaching acts. In Desmond Keegan (Ed.), *Theoretical Principles of Distance Education*, (pp. 113-134), New York: Routledge.

Kershaw, Adrian. (1999, December). If Geography is History, What Happens to Community Colleges? *Community College Journal of Research & Practice, 23* (8), pp. 747+. Retrieved February 23, 2000 from EBSCO database (Academic Search Elite) on the World Wide Web: http://ehostvgw11.epnet.com

Kinney, Thomas. (Winter 98/99). Knowledge Management, Intellectual Capital and Adult Learning. *Adult Learning, 10*(2), pp. 2+. Retrieved March 9, 2000 from EBSCO database (Academic Search Elite) on the World Wide Web: http://ehostvgw11.epnet.com

Knowles, Malcolm. (1977). *A History of the Adult Education Movement in the United States*. Malabar, Florida: Robert E. Krieger Publishing Company.

Kvale, Steinar. (1996). *InterViews: An Introduction to Qualitative Research Interviewing*. Thousand Oakes, California: Sage Publications Inc.

Lather, Patti. (1991). *Getting Smart: Feminist Research and Pedagogy with/in the Postmodern*. New York: Routledge.

Lauzon, Allan. C., & Moore, George A. B. (1989). A Fourth Generation Distance Education System: Integrating Computer-Assisted Learning and Computer Conferencing. *The American Journal of Distance Education, 3*, (1), 38-49.

LeCompte, Margaret D., & Preissle, Judith. (1993). *Ethnography and Qualitative Design in Educational Research* (2nd ed.). San Diego: Academic Press Inc.

Lee, Leva. (1999). *Wired Workpath Summative Evaluation*. Unpublished report, Open Learning Agency, Burnaby, BC.

Lincoln, Yvonna S. (1995). Emerging Criteria for Quality in Qualitative and Interpretative Research. *Qualitative Inquiry, 1*(3), pp. 275+. Retrieved February 17, 1999 from EBSCO database (Academic Search Elite) on the World Wide Web: http://ehostvgw11.epnet.com.

Logan, Robert K. (1995). *The Fifth Language: Learning a Living in the Computer Age*. Toronto: Stoddart.

Lowry, Charles B., & Chestnutt, David R. (1998). Managing Technology SGML and the Digital Libraries of Tomorrow. *Journal of Academic Librarianship, 24*(3), pp. 232+. Retrieved March 9, 2000 from EBSCO database (Academic Search Elite) on the World Wide Web: http://ehostvgw11.epnet.com.

Mason, Robin. (1998a). Models of Online Courses. *ALN Magazine, 12*(2). Retrieved February 5, 2000 from the World Wide Web: http://www.aln.org/alnweb/magazine/vol2_issue2/Masonfinal.htm

Mason, Robin. (1998b). *Globalising Education: Trends and Applications*. Routledge: New York.

McGreal, Rory. (1997). Information Technology and Telecommunication: A course on the World Wide Web. *Journal of Distance Education, 12* (1/2), 67-84.

Merriam, Sharan B. (1998). *Qualitative Research and Case Study Applications in Education*. San Francisco: Jossey-Bass Inc.

Miles, Matthew B., & Huberman, Michael A. (1994). *Qualitative Data Analysis: An Expanded Source Book* (2nd ed.). Thousand Oaks, California: Sage Publications Inc.

Moore, Michael G., & Kearsley, Greg. (1996). *Distance Education: A Systems View*. Belmont: Wadsworth Publishing Company.

Morrison, James L. (1998, May 1). The Educational Object Economy Project: An Interview with James Spohrer. *Microsoft in Higher Education* Retrieved May 4, 1998 from the World Wide Web: Http://www.microsoft.com/education/hed/vision.htm.

Mumford, Lewis. (1963). *Technics and Civilization*. New York: First Harbinger Books.

Nipper, Soren. (1989). Third Generation Learning and Computer Conferencing. In Robin Mason & Anthony Kaye (Eds.), *Mindweave* (pp. 63-73). Oxford: Pergamon Press.

Oblinger, Diana G., & Maruyama, Mark K. (1996). Distributed Learning. *CAUSE Professional Paper Series, #14*. Boulder, Colorado: CAUSE.

Open Learning Agency. (1997). *Electronic Internship*. Unpublished report, Burnaby, BC.

Open Learning Agency. (1997-98). *Goals and Accomplishments: Annual Report 1997/98*. Burnaby, BC: Author.

Open Learning Agency (1999, March 15). *Open College and Open University jump to the Web*. Press release. Burnaby, BC.

Owston, Ronald D. (1997). The World Wide Web: A Technology to Enhance Teaching and Learning. *Educational Researcher, 26* (2), 27-33.

Paul, Ross H. (1990). *Open Learning and Open Management: Leadership and Integrity in Distance Education*. New York: Kogan Page.

Peters, Otto. (1993) Distance education in a post-industrial society. In Desmond Keegan (Ed.), *Theoretical Principles of Distance Education* (pp. 39-58). New York: Routledge.

Peters, Otto. (1996). Distance Education is a form of teaching and learning sui generis. *Open Learning, 11* (1), 51-54.

Porter, Lynette. (1997). *Creating the Virtual Classroom: Distance Learning with the Internet*. New York: John Wiley & Sons.

Robertson, William. (1986). Use of Audio Teleconferencing. In Ian Mugridge and David Kaufman (Eds.), *Distance Education in Canada* (pp. 283-295). London: Croom Helm.

Rumble, Greville. (1986). *The Planning and Management of Distance Education*. New York: St. Martin's Press.

Rumble, Greville. (1992) *The management of distance learning systems*. Paris: UNESCO International Institute for Educational Planning.

Rumble, Greville. (1995). Labour Market Theories and Distance Education I: Industrialization and distance education. *Open Learning, 10* (1), 10-20.

Selman, Gordon, & Dampier, Paul. (1991). *The Foundations of Adult Education in Canada*. Toronto: Thompson Educational Publishing, Inc.

Sherron, Gene T., & Boettcher, Judith V. (1997). Distance Learning: The Shift to Interactivity. *CAUSE Professional Paper Series, #17*. Boulder, Colorado: CAUSE.

Soules, Marshall. (1996, October). *Enhancing Capacity with Video Conferencing*. Unpublished report, Malaspina University-College, Nanaimo, BC.

Tapscott, Don. (1996). *The Digital Economy: Promise and Peril in the Age of Networked Intelligence*. New York: McGraw-Hill.

Taylor, James C. (1996). *Perspectives on the Educational Uses of Technology*. Report produced for the International Council for Distance Education Standing Conference of Presidents, Lillehammer, Norway on behalf of the Task Force on Educational Technologies.

T.H.E. Journal. (1999, February). AT&T Learning Network Hosts WGU Content. *26*(7), pp. 14+. Retrieved February 23, 2000 from EBSCO database (Academic Search Elite) on the World Wide Web: http://ehostvgw11.epnet.com.

Tuller, Charlie, & Oblinger, Diana. (Winter 1997-98). Information Technology as a Transformation Agent. *CAUSE/EFFECT, 20* (4), 33, 38-45.

University of British Columbia: Continuing Studies (1999/2000). *Winter 1999/2000 Credit Courses: Extra-Sessional Studies - Distance Education and Technology*. Vancouver, B.C.: Author.

University College of the Cariboo. (1995, June). *The Learning Network Faculty Handbook*. Unpublished draft document, Kamloops, BC.

University of Phoenix. (1997-2000). *Online Students*. Phoenix: Author. Retrieved March 1, 2000 from the World Wide Web: http://online.uophx.edu/ourstud.htm

Verduin, John R., & Clark Thomas A. (1991). *Distance Education: The Foundations of Effective Practice*. San Francisco: Jossey-Bass Publishers.

Western Governors University. (2000). *Participating Education Providers*. Retrieved March 3, 2000 from the World Wide Web: http://www.wgu.edu/wgu/about/educators_institutions.html

Witherspoon, John P. (1997). *Distance Education: A Planner's Casebook*. Boulder, CO: Western Interstate Consortium for Higher Education.

Woodall, Martha. (2000, February 10). Drexel 'techno-MBA' program to provide all courses online. *Philadelphia Inquirer*. Retrieved February 21, 2000 from Philadelphia Newspapers Inc.

Appendix A Record of Contact and Materials

Course Developer	Alison	Daniel	Elaine	Farrah	Gary	Henry	Ingrid	Lulu
Consent Forms Returned	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Date 1st interview	May 3/99	May 6/99	May 17/99	May 20/99	May 13/99	June 11/99	June 16/99	May 6/99
Date 2nd Interview	June 4/99	May 25/99	May 25/99	June 1 & 15/99	May 31/99	June 17/99	June 24/99	May 25/99
Materials Provided for Review	Web courses.	Course planning booklet; learner guide.	Web courses.	Course planning documents.	Web course.	Course planning document; technology planning document.	Web course materials suggested; readings recommend-ed.	Web course.
Research Draft: Comments Returned	January 31/00	February 1/00	February 1/00	January 26/00	January 25/00	February 9/00	January 21/00	January 25/00

Appendix B Summary of Study Participants' Characteristics

Course Developer	Alison	Daniel	Elaine	Farrah	Gary	Henry	Ingrid	Lulu
Position	Department Manager	Department Manager	Project Manager	Project Manager	Project Manager	Project Manager	Department Manager	Project Manager
Institution	OLA	UBC	UBC	OLA	OLA	UBC	OLA	OLA
Years in DE	12	16	10	9	11	20	16	19
Age	Middle age	Early middle age	Early middle age	Mid 30s	Middle age	Middle age	Middle age	Middle age
Practice Area	K-12, Adult Basic Education, Teacher Pro-D	Various distance education courses, technology-based learning	Health, education, technology-based learning	K-12, instructional design	University, Sciences	University programs, international projects; distributed learning	University Arts, distance and distributed education.	University. Arts, general public education
Role	Oversee course team	Lead course team	Lead course team	Lead course team	Lead course team	Lead course team	Oversee course team	Lead course team
Budget Control?	Y	Y	Y	Y	N	Y	Y	N

Appendix C Study Invitation and Informed Consent Form

April 22, 1999

Dear

I am writing to invite you to participate in a research study on how technology convergence and new media are affecting the way distance education programs are being developed for adult learners. I am conducting this study as part of the thesis requirement for a Master of Arts degree from the Faculty of Education: Department of Educational Studies, Adult Education Program at the University of British Columbia (UBC).

Attached, please find two copies of the *Informed Consent Form*. This form provides further details on the nature of my study. If you are interested in participating as a volunteer in this study, please sign both copies of the consent form. One copy is for you and the other is for UBC. I'll collect one copy of the form from you when we meet for the first interview session.

If you decide to withdraw from the study after signing and returning the consent form, you can do so at anytime without jeopardy. Should you withdraw, all information provided by you will be removed from the study.

I will be contacting you by telephone to see whether you are willing to participate in this study. If so, I will schedule an interview session with you at that time. In the meantime, should you have any questions concerning this research study, feel free to contact me at or Dr. Tom Sork, Department of Educational Studies, UBC.

Thank you for considering this request. I look forward to talking with you soon.

Sincerely

Cathy van Soest

Informed Consent Form

Making Sense of Converging Technologies and New Media:
A Study of Distance Education Program Planners

Faculty Advisor:
Dr. Tom Sork
Professor
University of British Columbia
Faculty of Education
Department of Educational Studies
2125 Main Mall
Vancouver, BC
V6T 1Z4

Graduate Student:
Cathy van Soest
M.A. Candidate
University of British Columbia
Faculty of Education
Department of Educational Studies
2125 Main Mall
Vancouver, BC
V6T 1Z4

This study is being conducted by the graduate student, Cathy van Soest, as part of the thesis requirement for a Master of Arts degree from the Faculty of Education: Department of Educational Studies, Adult Education Program at the University of British Columbia.

Purpose:
The purpose of the study is to research how technology convergence and new media are affecting program planning decisions made by distance education program planners or distance education course developers in developing programs for adult learners. I understand that I have been selected as a participant in this study due to my expertise in distance education program planning or course development and in the use of media and technology in distance education.

Study Procedures:
I understand that this study will be conducted through interviews and through the analysis of my program / course development planning documents and course materials.

Interviews. As a research study participant, I will participate in an initial interview session at my place of work, or at a place convenient to me, during my normal work hours. The length of the initial interview will be dependent upon me, as the participant, but will likely take between one and two hours.

Following the initial interview session, I will be contacted by Cathy van Soest for one follow-up session. The purpose of this session will be to provide feedback concerning the information I provided during the initial session and to clarify any points that I made. The follow-up interview session will take place in person. The length of this session will be dependent on me, as the participant, but will likely take between one and two hours.

Between the interview sessions and following the final interview session, Cathy van Soest may contact me by phone or electronic mail for clarification purposes.

The initial interview session and follow-up interview session will be audio taped to capture the conversation between me, as the participant, and Cathy van Soest, as the graduate student. This information will be transcribed by Cathy, kept securely on a computer, and used to inform the requirements for the research study.

Document Review. I understand that Cathy van Soest may want to analyze relevant program/ course development planning documents and course materials developed in print formats such as course study guides and instructional modules; and in electronic formats such as computer conferencing-based learning environments and/or world wide web learning environments. Discussion of the analysis of these documents will take place during the follow-up interview session.

Confidentiality:
I understand that all information provided by me, as a participant in this study, will be kept confidential. I will select a pseudonym that will be used by the graduate student in reporting the research results. My name will not be published in the research study or in any reports resulting from this study. The information developed during the interviews will be kept on a computer hard drive or a computer storage device in a secure manner and will be accessible only by the graduate student.

Remuneration/Compensation:
I will not receive remuneration or compensation for participating in this research study.

Contact:
If I have any questions concerning this research study or if I require additional information, I may contact Cathy van Soest or Dr. Tom Sork.

If I have any concerns about my treatment or rights as a research study participant I may contact the Director of Research Services at the University of British Columbia, Dr. Richard Spratley.

Consent:
I understand that I am participating in this research study as a volunteer and that I can withdraw at any time without jeopardy. If I withdraw, the information that I have provided will be removed from the study results. I therefore consent to participate in this study and have received a copy of this consent form for my own records.

_____

Subject Signature Date

_____

Signature of a Witness Date

Appendix D Memo to Study Participants

Memo

To: **Study Participant**

From: **Cathy van Soest**

Date: **December 1999 - January 2000**

Subject: **Making Sense of Converging Technologies and New Media**

Hello! Thanks for agreeing to read the research section of my thesis. I'm delighted that you are able to do this. I'm distributing this draft just to the study participants and my thesis committee at this time.

Enclosed, please find a draft copy of the research section. The draft contains a section that begins with "Introducing Participants" and includes Chapter 5. As well, I've attached a summary chart that describes the participants in this study.

My purpose in providing you with the draft research section is to ensure that you are comfortable with how you are described and with the comments that I've selected from the transcript and notes of our meetings. If you have any comments, please feel free to write directly on the draft copy. Also, if you have any additional comments that you would like to share with me, please feel free.

I've assigned pseudonyms to everyone in the study. If you are unhappy with the name that was assigned, please let me know.

It would be very helpful if I could receive any comments you have by (date). Please let me know when you are finished with the draft research section and I will arrange to pick it up.

Thanks again for your interest and participation in this study! ☺