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Communication and Learning:

How Distance Learners Construct Meaning

In the Computer Conferencing Environment

By

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A Thesis Submitted in Conformity with the
Requirements for the Degree of
Doctor of Philosophy to
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University of Ottawa

ABSTRACT

This study arose out of a concern for the adult learners who choose to study in computer conferencing courses offered via the World Wide Web. The numbers of these adult learners are burgeoning; universities are responding to the demand by placing ever-increasing numbers of courses online. However, this learning environment is a new one for many adult students and instructors. Therefore, the primary purpose of this study was to describe the salient features of communicating and learning in this environment, and to explore the factors which underpin the successful participation of adult learners in computer conferencing courses.

Twenty adult learners enrolled in two different computer conferencing courses in two universities located in different provinces in Atlantic Canada participated in this study. As well, the four instructors who delivered these courses were involved in the research study. The design of this qualitative study utilized multiple sources of data. The study entailed in-depth interviews conducted via telephone at two points— once early in the course, and a second time when the course was complete. In addition, information was collected in initial questionnaires and from the transcripts of the courses. A computer-assisted qualitative data analysis program was utilized to assist in the coding of the emerging themes. These emergent themes were incorporated into the protocol for the second set of interviews.

Results of the study indicate that the computer conference supported a shift in the roles of learner and instructor, as instructors functioned as facilitators and learners became

more self-directed in their learning. However, this shift occurs on a continuum, and is dependent upon how the computer conferencing environment is organized. The potential of group work for supporting a constructivist learning environment in the computer conference emerged. The importance of clear communication, which can be supported by forging personal relationships with classmates in the computer conference also emerged as an essential component of achievement in the computer conference. And finally, the learners in this study expressed a strong sense of academic efficacy. They demonstrated a strong subjective assurance in their ability to succeed at the academic task which they had undertaken.

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I would like to express my gratitude and admiration to my thesis supervisor, Dr. Colla MacDonald. Without her guidance and support at every juncture along the way, the quest could not have been completed. She was a strong model of academic learning for me, and her ability to focus on what was truly important helped me concentrate on the key steps towards my long term goal.

I am tremendously indebted to each member of my committee. Dr. Brad Cousins caused me to question, confirm, and justify my thinking throughout the process of proposal development and research. His critical reading and suggestions helped to clarify the on-going development of this research project. Dr. Cynthia Morawski provided support throughout the entire journey, and reminded me of the importance of sensitivity to the needs of the non-traditional learner in the new learning environment of the computer conference. Dr.Cheryll Duquette offered professional advice and guidance as well as perceptive comments which caused me to crystallize my thinking about graduate student persistence and the relationships between students and institutions of learning.

I would also like to acknowledge the impact of three other educators on my writing. The doctoral study conducted by Dr. Elizabeth Burge was an inspiration for my own research, and provided an excellent model of how an inquiry into computer conferencing might be accomplished via distance. Dr. Jessie Lees and Dr. Ray Doiron are two colleagues who provided invaluable critiques of my work, pushed me to be precise, and helped me clarify my research thinking and writing throughout the entire process. I continue to learn from their rigorous academic work and clarity of thought, and I treasure their friendship.

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My family— Gerry, Adam and Jeff— never questioned why. Rather, they encouraged me to pursue my own dream, supported me throughout, and demonstrated their unwavering belief in my goal. Their collective understanding was a strength for me, and allowed me the freedom to devote my time and energy to my academic pursuits. Without them, this academic venture would never have been possible.

Once again, I wish to express my sincere appreciation to each and every person who helped me to complete this academic research.

Dedication

I wish to dedicate this work to my husband, Gerry.

You were always there, you provided a place of refuge for me,

you looked for ways to allow my dream to happen.

This work truly is yours as well as mine.

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CHAPTER 1: DESCRIPTION OF THE PROBLEM

Statistics demonstrate that the number of adult learners enrolled in distance education courses is rapidly expanding, as more adults pursue learning throughout their lifetime (Cross, 1981; Darkenwald & Merriam, 1982; Gibson, 1991; Gibson & Graff, 1992; MacKeracher, 1996; Merriam & Caffarella, 1998). Technological changes, and the information explosion, have created demands for continuing educational opportunities offered by distance (Bernier, 1996; Gelpi, 1992; Gibson, 1998; Hiltz, 1994). Socio-cultural changes-- the necessity of altering one's career much more frequently, professional demands to be aware of international developments, the increasing roles of women in the workforce -- have resulted in heightened demands for more education (Brookfield, 1986, 1993; Candy, 1991).

Computer-mediated communication is a mode of distance course delivery now utilized by universities and colleges worldwide (Berge & Collins, 1995; Duchastel, 1997; Kearsley & Lynch, 1991). Computer conferencing, a specific type of computer-mediated communication, is a relatively new development as personal computers, modems and conferencing software have become more widely available. Researchers have explored the impact of computer conferencing courses on faculty, on the distance institution, and on the learner. These studies have documented the number of notes within the conference, the facilitative role of the moderator of the conference, the challenges of working with particular conferencing software (Heller & Kearsley, 1995; Hiltz, 1994; Szabo, 1995).

Few research studies have explored the learning environment of computer

conferencing from the perspective of the learner (Burge, 1993; Eastmond, 1995). Burge (1994) has called for further qualitative work to investigate this learning context. Distance education literature is rife with statistics about student attrition (Atman, 1991; Coldeway, 1986; Garland, 1993; Kember, Murphy, Siaw & Yuen, 1991; Paul, 1990; Powell, Conway, & Ross, 1990; Rekkedal, 1982). Student drop out can affect learners' quality of life, career goals, and self esteem. Accordingly, it is important that educators develop a better understanding of *the learner in this environment* in order to improve educational practice. This research provides information for educators as they attempt to support distance learners, improve learner persistence, and develop a better understanding of learners' communication strategies.

This qualitative study recounts the process of learning undertaken by twenty adult students who chose to continue their education via computer conferencing at two different universities in Atlantic Canada. Ten adults were enrolled in a course on developing web sites, while the other ten students were enrolled in an educational administration course. The study details the learning process from the students' point of view, and focuses on providing a description of the computer conference from their perspective. The students' perspective of learning in the computer conference is enriched by the inclusion of the perspectives of the four instructors offering the courses, which also form an essential component of the study. This study is framed by the literatures of adult education, distance education, social cognitive theory, and computer-mediated communications. This research provides a worthwhile addition to the distance learning literature, by elucidating the factors which impact on learners specifically in relation to:

- the learning process in a computer conferencing environment,
- the possible relationship between learning and achievement in a computer conferencing environment, and on
- the communication of meaning in a computer conference.

In a fairly global sense, Schwandt (1994) points out that "we are all constructivists if we believe that the mind is active in the construction of knowledge" (p.125). Constructivist epistemology focuses attention on how participants create meaning (Duffy & Cunningham, 1996). Achieving an understanding of the meanings that participants create out of their experiences in a computer conference requires that both participants and researcher articulate and reflect on what we are coming to know. The constructivist paradigm, with a focus on the understanding "the complex world of lived reality of experience from the point of view of those who live in it" provides a framework for the exploration of the construction of knowledge and communication among adult learners in a computer conferencing environment (Schwandt, 1994, p. 118).

Insights from adult education literature allow educators to consider the most effective ways of developing the teaching-learning dyad, the specialized needs of adult learners, teaching according to andragogical principles, and the importance of supporting adults as lifelong learners (Brookfield, 1986, 1993; Candy, 1991; Knowles, 1980; MacKeracher, 1996; Merriam & Caffarella, 1998; Mezirow, 1985, 1994; Tough, 1971). Many adult learners choose to participate in courses offered via distance, though learners with less computer proficiency tend to experience more frustration as they learn how to learn in the new technological environment. A careful consideration of the principles of

adult education offers practical insights into how to support adult learners as they engage in distance education experiences (Collins, 1998). Such considerations underpin the development of an effective computer conferencing approach for adult education.

The literature from the field of distance education focuses attention on the specific needs of adult learners engaged in learning that is not face-to-face. In the past, much of this literature has addressed the responsibilities of the distance institution, the needs of faculty as they develop distance education courses, and the means of producing distance education courses via an "industrial" model (Garrison, 1987; Keegan, 1990; Moore, 1991b). However, current writing in the field reflects a growing consideration of the distance learner, including reflections on the characteristics of the learner as well as specific needs for support (Atman,1991; Brindley, 1995; Bullen, 1998; Gibson, 1998; Paul, 1990). Researchers have investigated the motivational orientations of distance learners. Billings (1988) highlighted the connection between learning styles and motivation to learn via distance education. Ehrman (1990) distinguished among instrumental, intrinsic, and the integrative motivational orientations of distance learners. Figueroa's research (1992) emphasized personal motivation and high interest among distance learners. Von Prummer (1990) also found evidence of instrumental motivation among distance students in her study. Other researchers have determined various factors which impact on distance learners. Wilkes and Burnham (1991) found that outside demands placed upon distance learners by time constraints, family or work, had a greater impact on student withdrawal or persistence than motivational orientations. Wong (1992) found that distance learners had different learning styles and motivational attributes compared to traditional, face-to-face

learners.

Researchers have also investigated the achievement of distance learners. Gibson and Graff (1992) found that the best predictors of student persistence were the learners' confidence in their ability to learn, to concentrate on the task at hand, and to make a commitment to the enterprise of learning by distance. Atman (1988) determined the importance of conative capacity (striving), while Bernard and Amundsen (1989) emphasized the effect of differing course characteristics. Billings (1991) focused on sociological variables, while Coggins (1988), Garland (1993) and Lunneborg (1994, 1997) found that attitudes and perceptions of the self as a learner were critical in determining if a student would persist in distance education. Social integration was determined to have a critical impact on persistence by Kember et al. (1991), while Powell et al. (1990) focused on the predisposing characteristics of distance learners. Rekkedal (1982) found that life circumstances had the greatest effect on distance students' persistence, while Dille and Mezack (1991) established locus of control as a critical variable. Distance educators who attempt to meet the needs of learners must discern the particular reasons for learner motivation and achievement in various distance learning situations. This is particularly urgent in computer conferencing (CC) environments, because of the rapidly expanding number of CC opportunities.

The literature from social cognitive theory focuses attention on the learner, and on the factors that impact on that person's life choices. Bandura (1986) posits an idea of reciprocal interaction among the influences of personal, behavioral, and environmental factors in peoples' lives. These three influences do not occur simultaneously, rather, it is

suggested that these factors and their effects impact over time. "What people think, believe, and feel affects how they behave" (p.25). These influences include personal factors, such as a sense of self-efficacy; the person's behavior; and the environment in which the person operates. This literature allows us to reflect on the impact exerted by the environment of computer conferencing on a learner, as well as on the differing responses to that environment which may flow from the learner's sense of self-efficacy.

Finally, the literature on computer-mediated communication focuses attention both on the medium of communication (reading and writing in a computer environment), and on learners' responses to learning via that medium. The information-rich environment of computer conferencing can be an effective means of learning via distance, for it offers learners an interactive learning experience at the time and place of their own choosing (Ellsworth, 1995). There has been a wealth of writing offered over the last decade on "how-to" develop computer-mediated communication as a means of course presentation (Eastmond & Ziegahn, 1995; Heller & Kearsley, 1995; King, 1998; Szabo, 1995). As well, there have been many reports of specific programs, courses, and the strategies learned by instructors as they worked with this medium (Bates, 1989; Harasim, 1990; Hiltz, 1994; Wiesenberg & Hutton, 1996). However, there is a critical need for research which focuses on the learner, which allows educators to develop a clearer understanding of the learner's perception of learning and achievement in the computer conference, in order to improve educational practice.

Research Questions

The literature establishes the need to further investigate the salient features of communicating and learning in computer conferencing contexts. Research conducted to this point also indicates the need for studies that focus on the learner, and on factors which explain the successful participation of adult learners in computer conferencing courses. Accordingly, the focus in this study is on the adult learner. The factors framing this study emerged from my own experience of distance education, and from the literature of adult education, distance education, computer-mediated communication, and social cognitive theory.

The entire study is framed by a constructivist paradigm, a set of beliefs about the nature of knowledge and reality (Fosnot, 1996; Guba & Lincoln, 1994; Schwandt, 1994). In this study, then, the focus is on the co-construction of knowledge by participant and researcher, and on developing an understanding of life in the computer conference from the point of view of those who live and work in that environment. Within the framework I identify three sets of interdependent factors. The cognitive and personal factors, behavioral factors, and environmental factors emerged from social cognitive theory (Bandura, 1986). Within the set of cognitive and personal factors I have identified three which are particularly relevant for learning in the computer conference: motivation, perception of academic efficacy, and attitude toward technology. Behavioral factors that impact on learning in the computer conference include the strategies utilized by participants to communicate, to learn, and to achieve success. The environmental factors of particular relevance in the computer conference are the literacy requirements of the conference, the

structure of the conference, and the external factors such as home environment that impact on the learner. These sets of factors are interdependent, and are depicted with bidirectional arrows to demonstrate their relationship.

A critical focus of this study is the learner, and the learner's participation and involvement in a computer conference. Elements of the learner's successful participation in a conference include a description of the self as a learner, course achievement of the learner, and the construction of meaning in the conference. Figure 1 demonstrates a research framework upon which I based my inquiry into adult learner participation in computer conferencing contexts.

The three research questions then, which arise from the literature and from the theoretical framework, are the following:

- **How do adult students in a computer conferencing course describe themselves as learners?**
- **What is the relationship between learner achievement in the computer conferencing course, and the adults' descriptions of themselves as learners?**
- **How do adult learners describe the task of constructing meaning in the reading/ writing environment of computer conferencing?**

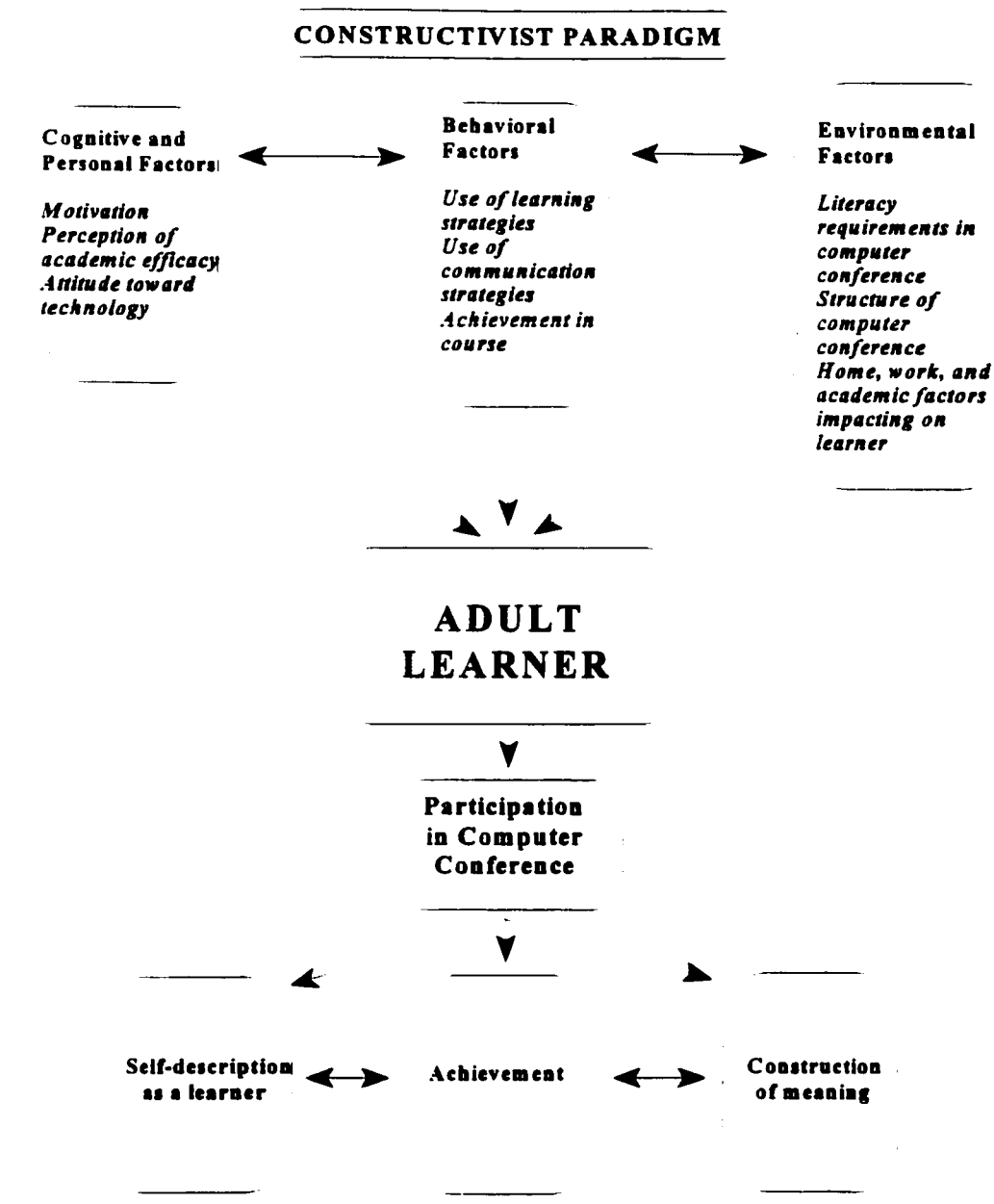


Figure 1 Conceptual Framework
Elements of adult learner participation in a computer conference

The uniqueness of this particular research is that through qualitative, in-depth interviews, the impact of the computer conference on the learning, communication and participation of adult students in two courses in two different provinces will be explored.

Definition of Terms

The following definitions of key terms serve to anchor the study within the body of literature that frames the research.

Distance Education

Distance education is a field of education in which learners and instructors working under the auspices of an educational institution are not physically present to each other. It can be defined as "planned learning that normally occurs in a different place from teaching, and as a result requires special techniques of course design, special instructional technologies, special methods of communication by electronic and other technology, as well as special organizational and administrative arrangements" (Moore & Kearsley, 1996, p.2).

Computer Conferencing

Computer conferencing is a mode of interacting with other people via a computer network, and is a specific instance of computer-mediated communication. In the educational context, learners and instructor are able to communicate with each other across great distances, at times which are convenient to each individual. Messages are stored and can be accessed at any time, any place. Learners and instructors are able to respond to previous messages, and pick up the thread of a new discussions and comment on them.

Computer-Mediated Communication

Computer-mediated communication is a mode of distance education, in which learners and instructors utilize the power of the microcomputer for communication purposes. This communication can be one-alone (a learner who accesses a database); one-to-one (learners communicating via e-mail); one-to-many (learners posting messages on an electronic bulletin board); or many-to-many (learners posting messages to each other and to their teacher on a computer conferencing system).

Achievement

In this study, achievement refers to adult learners' successful completion of the computer conferencing course, including completing all assignments and gaining academic credit for the course.

Motivation

In this study, motivation refers to the condition of having a desire to participate in a computer conferencing course on the part of adult learners, and acting upon that desire.. Bandura (1995) suggests that "Most motivation is cognitively generated. People motivate themselves and guide their actions anticipatorily by the exercise of forethought" (p.6).

Academic Efficacy

In this study, academic efficacy refers to students' assurance in their capability to perform well in the area of formal education. Adults with high assurance in their capabilities in the area of education "approach difficult tasks as challenges to be mastered rather than as threats to be avoided" (Bandura, 1995, p. 11).

Personal Efficacy

Personal efficacy refers not to the objective capability of a person to carry out an action, but to the person's subjective belief in their own ability to achieve their goals.

Attrition

Attrition refers to the discontinuance of participation in a distance education situation, and is also known as dropout or withdrawal.

Persistence

Persistence refers to the opposite of attrition--continuing participation in the distance education situation.

Asynchronous

Asynchronous refers to communication in which interaction between the partners does not occur simultaneously.

Synchronous

Synchronous refers to communication which takes place simultaneously.

Outline of the Dissertation

Growing numbers of adults are pursuing educational opportunities throughout their lifetime. This phenomenon is occurring due to socio-cultural as well as technological changes. Computer conferencing is a relatively new mode of distance course delivery which allows adult students to continue lifelong learning independent of time or place, without the necessity of temporarily disrupting careers or family life. The field of computer mediated communication and specifically, computer conferencing, is relatively young,

though the literature and research base is expanding, driven by the intense interest in this mode of course delivery.

Over the past decade, knowledge about the initiatives of educational institutions in developing computer conferencing courses, computer conferencing course development by instructors, and specific information about the types of information posted in course messaging, has expanded considerably. The focus has been on the institution, the faculty, and the technology. However, there has been a paucity of research exploring the needs of the learner within this new educational environment (Burge, 1993; Eastmond, 1995).

The present research addressed this gap in the literature by implementing a qualitative study utilizing multiple sources of data in two computer conferencing courses offered in two Atlantic provinces of Canada. In-depth interviews conducted by telephone, and course transcripts and informal student notes, provided the data of the study.

Following Chapter One on the problem investigated in this study, Chapter Two presents a review of related research and professional literature concerning the provision of adult learning opportunities in computer conferencing courses. Chapter Three outlines the research design and the methods used in the study. Chapter Four details information gathered with the initial questionnaires, course transcripts, and interviews, and presents a descriptive analysis of the two sets of in-depth interviews conducted with twenty students enrolled in two computer conferencing courses, and with the four instructors offering those courses. Chapter Five considers implications of the study for learning, language use, and learner efficacy and persistence in computer conferencing courses, and suggests insights into teaching and learning for educators providing these courses.

CHAPTER 2: LITERATURE REVIEW

This chapter reviews related research and educational literature considered within the context of this study. The purpose of the literature review is to describe the major studies relevant to learning in the environment of the computer conference, as well as to furnish background for the conceptual framework of the study. The review identifies and integrates concepts from the literature of adult learning, distance education, computer-mediated communication, and social cognitive theory, domains of interest which provide the background for the study. Specifically, the study is informed by the concepts of adult learning throughout the lifetime; on the foundational theory of distance education; and on how issues deliberated in the distance education literature pertain to the emerging field of computer-mediated communication. The focus on the learner— on achievement, motivation, and perceptions of academic efficacy— is elucidated as the review of the literature comes to a conclusion.

The review commences with a discussion of adult learning theory, with a particular focus on three strands of theorizing in the field of adult learning which might illuminate instructional design decisions as educators plan computer conferencing courses. Andragogy is a theory of learning in adulthood which has the potential to elucidate how adults learn in the computer conference. Perspective transformation is a theory of learning in adulthood based on a conception that changes in perspective can define essential learning in adulthood— transformation of learners' perspectives may be a defining characteristic of learning in a computer conference. The framework of self-directed

learning includes a conception of self-directedness— an understanding of this personal attribute of the learner may extend our developing understanding of the characteristics of learners in the computer conference.

Adult Learning

Learning is to occur throughout the entire human lifespan, a principle proposed by a number of adult learning theorists (Brookfield, 1986, 1993; Knowles, 1980; MacKeracher, 1996; Merriam & Caffarella, 1998). Accordingly, adult educators must develop strategies to meet the needs of students over a much longer period as adults at many different stages and phases of life are seeking education. The principle of human growth can offer some explanation for adults' desire to seek out further educational opportunities. Human growth might be considered one overarching principle: growth toward an "autonomous" (Loevinger, 1976) "integrated" (Erikson, 1982), "highly principled" (Kohlberg, 1973), "connected" (Gilligan, 1981), "relativistic" (Perry, 1970), "constructivist" (Belenky, Clinchy, Goldberger, & Tarule, 1986) human being, who must achieve certain life tasks (Havighurst, 1972; Levinson, Darrow, Klein, Levinson, & McKee, 1978; Sheehy, 1995).

These models of human development provide direction when considering the needs of the lifelong learner. Educational frameworks that could facilitate the development of educational programs for lifelong learners include Knowles' theory of andragogy (Knowles, 1980); Mezirow's theory of perspective transformation (Mezirow, 1985, 1994); and the theory of self-directed learning (Brookfield, 1981, 1986; Candy,

1991).

Andragogy

Knowles (1980) developed the concept of andragogy, "the art and science of helping adults learn" based on his perception of adult learning needs (p.43). The theory of andragogy is rooted in assumptions which Knowles made about the learning of adults. Implications for the design of adult learning experiences were drawn from these assumptions about adult learners. Knowles suggests that as people mature: (1) their self-concept moves from being dependent to being self-directing; (2) adults' experience in living is a rich asset for their learning; (3) adult readiness to learn is closely connected to the life tasks related to their social roles; (4) adult time perspective changes with age--adults are more interested in the immediate application of knowledge; and (5) adults are motivated to learn by intrinsic factors, rather than external ones. (Knowles, 1980, p.44-45, 1984, p.12).

This theory has been criticized for its differentiation between appropriate ways to teach adults (andragogy) and children (pedagogy). However, Knowles (1984) did clarify that those two conceptualizations of learning actually exist on a continuum, and either might be appropriate depending on circumstances. Some adult education theorists have asked whether Knowles' theory of andragogy is in fact a theory, or simply a set of principles of good practice (Brookfield, 1986; Hartree, 1984). Brookfield questions the specific assumptions of andragogy. Is self-directedness a given condition, or is it a desired outcome of education? Are adults really more problem-centered than younger learners? (p.98). Brookfield contends that a number of the assumptions of andragogy are

in fact untenable. However, although andragogical principles are not accepted in total by some researchers and educators, these principles do form "the best-known theory of adult learning" (Merriam and Caffarella, 1998, p.249).

Implications for practice flow from the assumptions of andragogy for educators who choose to accept these principles. Knowles (1980) has suggested that there should be a climate of adultness in the physical arrangement of the learning space; learners should be involved in a self-diagnosis of learning needs; learners should be involved in the process of planning their own learning; the teaching- learning transaction is the responsibility of both learners and teacher; learners should engage in a process of self-evaluation (p.46-49). These principles have been adopted and their implementation attempted by many adult educators, who believe that the aim of education is the "development of the whole person" (Daloz, 1986). Some researchers have suggested that andragogical precepts — particularly focusing on respect for the learner— are meaningful when applied to a distance learning context (Burge, 1988; Holmberg, 1989).

Perspective Transformation

Mezirow (1994) proposes that transformation theory is intended to be an integrated, comprehensive theory of adult learning. The theory's epistemological assumptions are constructivist: "the way learners interpret and reinterpret their sense of experience is central to making meaning and hence learning" (p. 222). Merriam (1994) suggests that the theory of perspective transformation is "the most comprehensive theory to date explaining how experience, learning, and meaning are related" (p.85). Within the context of this theory, Mezirow has suggested that all human beings develop meaning structures,

which are the frames of reference for personal concepts, beliefs, judgments and feelings. Adults' lived experiences are sifted through these frames of reference. Adults are comfortable within their meaning structures; if lived experiences fit these frames of reference, they are absorbed. If there is dissonance between experiences and meaning structures, adults might reject the experiences or else engage in learning as they critically reflect on those experiences. Mezirow indicates that critical reflection is an integral component of the learning process, and is included in the phases of adult learning which "have been determined by empirical research" (p.224). He also points out that perspective transformation can occur either as the result of a series of incremental steps in the adult growth process, or it may be the result of a major event in the life of the adult.

The notion of learners shifting their perspectives on the meanings of their experiences is the whole basis of adult education (Cranton, 1994). "Transformative learning is central to what adult education is all about" (Mezirow, 1994, p.226). But as well, adult development inherently involves the alteration of adults' perspectives. In fact, "perspective transformation is the engine of adult development" (p.228). The manner in which learners view and re-view and critically reflect on their own experiences allows them to construct their own meanings and learn.

Some adult learning theorists have criticized Mezirow's theory of perspective transformation because they believe it does not explicitly address the social understanding of human development. Specifically, human growth and development occur within a constellation of beliefs about the world. Tennant (1993) argues that "perspective transformation represents a developmental *shift* (a new world view) rather than simply

developmental *progress*" (p.41). Mezirow believes that both views can actually be accommodated by the theory of perspective transformation. This theory has also been criticized for a lack of attention to social change, or social policy (Collard & Law, 1989; Griffin, 1987; Newman, 1993). Mezirow (1994) has responded to these criticisms by suggesting that "Learning is profoundly social...It is a serious distortion to characterize perspective transformation as an approach limited to 'personal growth', although it may be used by learners and educators for this purpose. (p. 231)

Self-Directed Learning

Brookfield (1986) describes self-directed learning as "the attempts of adults to acquire skills, knowledge, and self-insight through educational experiences that they are responsible for arranging" (p.149). Whether self-directedness is an outcome of adult learning, or a prior condition of that learning, the term "self-directed learning" has been used in the adult education literature for several decades. Frameworks based on self-directed learning have been developed and proposed from radically different perspectives (Brockett, 1994). Self-directed learning has been conceptualized from a behaviorist point of view with a focus on observable behaviors and instructional design (Piskurich,1993); from a humanist perspective which assumes that people have a natural inclination to learn (Brockett & Hiemstra ,1991); and from a constructivist framework which concerns itself with "how people individually make sense of their worlds and how they create personal systems of meaning (Candy, 1991, p.xv).

Candy (1991) suggests that constructivism is closely linked with the concept of adult self-direction, though few theorists have explicitly discussed the parallels. He

proposes that "In view of the way that self-directed learning activities often unfold...an approach that emphasizes and allows for the ebb and flow of circumstances would seem to be preferable to one that presumes a simple linearity" (p.255). This approach is constructivist in its very nature, as "individuals try to give meaning to, or construe, the perplexing maelstrom of events and ideas in which they find themselves caught up" (p.254).

Some theorists focus on the process of self-directed learning-- the teaching-learning transaction-- while others concentrate on self-direction as an attribute of the learner (Hiemstra & Brockett, 1994; MacKeracher, 1996; Merriam & Caffarella, 1998). Brookfield (1986) chooses to focus on the *process* of self-directed learning. He defines self-directed learning as "the attempts of adults to acquire skills, knowledge, and self-insight through educational experiences that they are responsible for arranging" (p.149). He suggests that it is important for educators to maintain a focus on the ultimate purpose of education-- supporting adults in their quest-- rather than focusing on the techniques of needs assessments and program development. "The most fully adult form of self-directed learning ... is one in which critical reflection on the contingent aspects of reality, the exploration of alternative perspectives and meaning systems, and the alteration of personal and social circumstances are all present" (p.58-59). Adults engaged in this enterprise often require the support and help of others.

Therefore, Brookfield (1986) does not advocate that educators abdicate their role as leaders. He suggests that sometimes adults need to be nudged along a path of critical reflection and consideration of alternatives. Other theorists argue that self-direction can

only occur outside of formal educational structures. Gibbons and Phillips (1982) contend that adult learners must make a transition "from guided self-education to the independent pursuit of excellence" (p.74). In their writing, the implication is clear that this self-directed learning *must* take place outside of formal education. Pratt (1988) developed a model which allows adult educators to conceptualize the self-directed education of adults in a matrix, with learner needs for direction and support as the differentiating factors. He suggested that the element of "informed, intentional choice" is an important one for learners (p.170).

Candy (1991) has pursued the notion of exploring alternative perspectives and meaning systems and has extended the concept to include *constructing* alternative perspectives and meaning systems. The constructivist paradigm suggests that learning is active, and involves the striving of learners to make meaning out of their experiences and understandings. This notion has an element of critical reflection in it, similar to Brookfield's emphasis on the importance of critical reflection in making personal meanings. In Candy's opinion, "The constructivist view of learning is particularly compatible with the notion of self-direction, since it emphasizes the combined characteristics of active inquiry, independence, and individuality in a learning task" (p.278). When adult educators develop their practice from a constructivist view of knowledge and people, they support learners' efforts to construct their own realities.

Distance Education

Distance education allows learners to continue to learn and to grow without the necessity of leaving home or career to pursue further education. The separation of student and teacher is an underlying feature of most definitions of distance education (Holmberg, 1989; Kaufman, 1989; Keegan, 1990; Moore, 1986; Paul, 1990). The amount of intervention by an educational institution, however, varies widely within these frameworks as does the mode of information delivery (Burge, 1988; Farrell & Haughey,1986; Garrison, 1987; Hiltz, 1994; Kaye, 1989). The delivery of distance education has evolved in a number of different configurations, depending on the interaction of system, learners, teachers, and modes of communication (Coldeway, 1996; Haughey & Anderson, 1998; Kaufman, 1989; Keegan, 1990; Rothe, 1986).

Early distance education involved correspondence courses, in which students received packets of information from the educational institution, worked on the material in isolation, and submitted assignments to the tutor or professor by mail. Evolving forms of education by distance involved students receiving packets of information from the institution which might include books and papers, audiocassette tapes, or videocassette tapes. Alternatively, students might be expected to tune into a telecast at a certain time on a particular channel, and listen to the material delivered in a televised lecture format. Student assignments would still be submitted by mail (Verduin & Clark, 1991). More recently, distance education practitioners have utilized the potential of audio or audiographic conferencing, videographic conferencing, or conferencing by computer to deliver courses to students via distance. Some of the technical elements included in earlier definitions of

distance education have been eclipsed by these more recent developments, as educators have developed new technologies for offering courses by distance: computer mediated communication (Bates, 1991; Bernier, 1996; Haughey & Anderson, 1998; Kaye, 1989); conferencing technologies including audioconferencing, audiographic conferencing, and videoconferencing (Burge & Roberts, 1998); and computer conferencing (Davie, 1988; Hiltz, 1994). These developments have led Kaufman (1989) to suggest that a final and complete definition of distance education is almost "as elusive as a single definition of the term 'education'" (p.61), because of the continual evolution of the field of distance education.

Miller (1992) proposes that "...distance education is best defined not by the technology used for delivery but by the nature of interaction involved in the educational process". Miller's focus on the interaction between learners and instructor is a major shift from the more traditional focus of distance educators on the delivery of content to the distance student, with little interaction between the two parties. Many researchers and practitioners now focus on the nature of these potential interactions in their writing. Holmberg (1989) suggests that the communication process should have the character of a conversation, and communication facilities should be constantly open to the students and tutors. Keegan (1990) emphasizes the need for rapid feedback to students. Garrison (1987) stresses the two-way nature of communication mediated by technology. Kaufman (1989) focuses on three major dimensions of the learning process--independence, power, and support. He advances the idea that learners should have choice in how, what, why, where, and when to study. As well, he suggests that there should be some learner choice in how

learning is evaluated, and proposes that the power in the educational transaction should reside mainly in the hands of the learners. Paul (1990) supports the notion that educators must support learners engaged in education by distance as the adults undergo changes in personal values and attitudes, and develop new skills critical for success in the educational venture. Burge (1994) focuses on two-way communication technologies, and suggests that distance educators develop their own interactive classrooms, which would include configurations of learners created by the use of various conferencing technologies. Though specifics vary, the developing focus on the nature of the interaction between learner and teacher underpins much of the current thinking in the field of distance education.

Moore (1983, 1986, 1991a, 1993) developed the theory of transactional distance in seminal form in 1972, named it the "theory of transactional distance" in 1986, and has continued to develop and refine it since then. The theory asserts that the psychological distance existing between teacher and learner is at the heart of every educational interaction. He suggests several variables which impact on the transactional distance between teacher and learner: dialogue, structure, and learner autonomy. *Dialogue* is the extent to which teacher and learner are able to respond to each other, and hinges on course design, philosophy, and on environmental factors. *Structure* refers to an educational program's responsiveness to the learner. It expresses the flexibility or the rigidity of strategies of teaching and evaluating the learner in a particular program. *Learner autonomy* refers to a new perception of the learner, in which the basic teaching-learning relationship is changed, as learners gain more control over the scope and sequence of their educational programs. The framework of dialogue, structure, and learner autonomy supports adults as

self-directed learners, who are empowered to make choices for their own education. Moore's framework resonates with the principles of andragogy, perspective transformation, and self-direction from the adult education literature. As Garland (1994) suggests, "The adult need for 'personal control' provides a cogent guiding concept for distance education" (p.45).

Generations of Distance Education

These elements of dialogue, structure, and learner autonomy describe the basic transactional distance existing in all generations of distance education. However, the generations themselves have been defined by the technology used. First generation distance education revolved around correspondence education, and the communication medium was written or printed material (Holmberg, 1989; Keegan, 1990; Rothe, 1986). Second generation distance education involves multi-media education (Bates, 1991; Kaufman, 1989; Miller, 1992). Learners are presented with print material integrated with audio cassettes, video cassettes, video broadcasts, and sometimes computer-assisted learning packages. Third generation distance education involves computer-mediated communication (Kaufman, 1989; Kaye, 1989; Nipper, 1989). Computer-mediated communication gives learners access to a treasury of information from anywhere in the world, at any time of day or night. It allows learners to interact with other learners who are communicating on-line and to join conversations at times and places of their own choosing (Kearsley & Lynch, 1991; Levinson, 1989; McGreal, 1997; Turoff, 1990). This technology affords a substantive change in the way computers can be utilized. The use of computers for conferencing with other learners and with teachers signals a shift in the way learners use

the personal computer, as well as a shift in the way learners engage in learning activities via distance (Eastmond, 1998; Ellsworth, 1995; Galusha, 1997; Harasim, 1989; Haughey & Anderson, 1998; Lewis, Whitaker, & Julian, 1995; Mason & Kaye, 1990; Paloff & Pratt, 1999; Wiesenberg & Hutton, 1996). The phrase "fourth generation" distance education is emerging in the literature to describe computer-mediated communication networking which is embedded in a global access network. It has been suggested that in this world-wide network, students and instructors will be electronically linked around the globe (Bates & Escamilla de los Santos, 1997; MacDonald & Gabriel, 1998; Shimabukuro, 1995).

Computer-Mediated Communication and Computer Conferencing

Computer-mediated communication (CMC) is a term applied to a range of activities involving people communicating across time and space with the technological help of computer, phone line, and modem (Berge & Collins, 1995). It entails non-synchronous (the communication events occur at different times), text-based (communication occurs via words typed onto the computer screen and posted to a group) group communication (Kaye, 1989; Metz, 1994).

Computer conferencing is a specific instance of computer-mediated communication (Laurillard, 1993; Mason, 1993). In this model of human communication, learners interact with each other in a many-to-many communication mode. Students enter the computer conference by logging onto their computers, and then going into the conference by typing in a password provided by the course facilitator. Depending on the particular conferencing software used, students would then be able to read the new

messages that have been posted to their particular conference, or they might review only the messages that might have been posted directly in answer to a particular theme or question raised. They would also have the option to see who else might be logged into the conference at that particular time. This option actually gives students the opportunity to interact synchronously, in real time, if both parties go into the "chat room" that is a feature of many types of conferencing software (Murphy & Collins, 1997). As students type questions or responses to other students' questions, the text scrolls up the screen. Therefore, quick typing and innovative abbreviations are important skills for adult learners communicating synchronously via written text on the computer screen.

Many computer conferences are organized around familiar metaphors, so that students feel more comfortable going into different areas of the conference (Sorenson, 1991). For instance, the place to "relax" and have an informal chat is often called the cafe or the lounge. These chats take place asynchronously; one student would post comments or questions, and then a second student, entering the conference hours or days later, might read these comments and reply to them. Adult learners in the computer conference also participate in discussions (post responses in the various sections of the conference) based on course materials or questions. Researchers have found that interactions among students which focused on course materials require greater cognitive activity, as students actively construct knowledge when they communicate with other students and with the teacher (Bakardjiera & Harasim, 1997; Berge & Collins, 1995; Bullen, 1998; Harasim, 1989, 1990).

Research in the area of student learning in computer conferencing contexts is still in

early stages. Researchers have frequently published work describing computer conferencing course offerings from the instructor's point of view (Annand & Haughey, 1997; Wade, Riordan, & Power, 1997). Few of these studies have explored the learner's perspective. However, more investigation of this learning context is occurring, as educators realize the importance of exploring learning strategies, student concerns, and requirements for effective student support (Burge, 1993; Dede, 1996; Eastmond, 1995; Gunawardena, Lowe & Anderson, 1997; Lockwood, 1995; Rogers & Wells, 1997; Steeples, 1993). The concerns and learning strategies of distance learners were the focus of Burge's (1993) qualitative research study with graduate students at the Ontario Institute for Studies in Education (OISE). She identified different learning strategies developed by students in computer conferencing courses. She found that these strategies focused mainly on factors of choice, expression, group interaction, and the organization of information (p.ii). Eastmond's (1995) qualitative work on computer conferencing courses was completed with undergraduate students at a college in upstate New York. His study focused on an investigation of the "life situation of adult learners who are seeking a degree through distance study" (p.209). These two research studies resulted in a "thick description" (Geertz, 1973) of the educational environment of the distance learners at OISE and at Eastmond's college in New York. These research studies have enhanced educators' understanding of the needs of the distance learner in the computer conferencing environment, and have emphasized the requirement for similar studies which explore learners' perspectives, interpret findings, and make recommendations to improve educational practice.

One theme of computer conferencing research has been the exploration of a collaborative learning process (Davie & Wells, 1991; Garrison, 1997; Haughey & Anderson, 1998; Hiltz, 1994; Kaye, 1991; Mason, 1991; Mason & Kaye, 1990). This collaborative approach to learning means "that both teachers and students are active participants in the shared task of seeking to understand and apply the concepts and techniques that characterize the subject area" (Hiltz, 1994, p.9). The teacher becomes responsible for providing a communicative role model for the students (Davie, 1988; Nipper, 1989); for identifying and clarifying the various issues that evolve in the conferencing (Harasim, 1986); for occasionally summarizing the conversation (Feenberg, 1989); and for cultivating the creation of a learning community (Gabriel, 1998; Mason, 1991; Paloff & Pratt, 1999). The moderator can weave comments together which "supply a unifying overview, interpreting the discussion by drawing its various strands together in a momentary synthesis that can serve as the starting point for the next round of debate" (Feenberg, 1989, p.34-35).

This development of a collaborative learning environment in the computer conference requires changes in the traditional role of the learners, as well as changes in the role of the teacher. In a computer conference, "...the locus of control shifts from the teacher to the group and the group processes" (Kaye, 1989, p. 15). This environment means that there is peer support and more active learning, as students work together to construct understanding (Carrier & Schofield, 1991; Davie & Wells, 1991). Kaye (1989) describes two different types of learners who use computer-mediated communication: those who are comfortable and knowledgeable about using computers and those who are not. He raises a

concern about the "social-psychological barriers, associated with the mastery of a new and unfamiliar mode of written communication" for the novices (p.14). It is essential for all participants in the computer conference to attain a level of competence in using the communication system. It has been suggested that the opportunity for access to technology, as well as the opportunity to gain experience in its use, is a requirement for effective learning in the computer conference. However, some researchers point out that these requirements may cause particular difficulty for some female distance learners (Ellsworth, 1995; Gunawardena, 1991; Harasim, 1989; Rohfeld & Hiemstra, 1995). Other researchers have investigated the hidden linguistic assumptions in computer-mediated conferencing (Berge & Collins, 1995; Davie & Wells, 1991; Hiltz, 1994; Lewis, Whitaker, & Julian, 1995). Learners are expected to read large amounts of text, as well as express themselves clearly and rationally in writing, which can cause difficulty for some adults who do not have fluent reading and writing skills. Instructors are gradually addressing these issues, to enhance students' effective use of the communication medium (Davie & Inskip, 1992; Schrum, 1998).

Distance Learners

Holmberg (1989) has called for distance education institutions to understand their clientele, since distance learners today are more diverse than those who chose to study by distance in the past. Developing this understanding is essential as more diverse groups of learners choose to study by distance. Learners have differing needs based on: the roles they play in their lifespan development (Moore, 1986); their requirement for flexibility (Garrison, 1987); their learning styles (Paul, 1990); the need for "recognition and

validation of female learners' specific life situations and experiences" (Burge & Lenskyj, 1990, p.34) and their status as independent, competent adults (Kaufman, 1989).

The changing look of distance education learners has caused a reassessment of the most effective ways of meeting educational demands (Cantelon, 1995; Gibson, 1993; Haughey, 1989; Paul, 1989,1990). The established role of the distance teacher is evolving as the focus shifts to the transactional dialogue between teacher and learners (Garrison, 1987; Hiltz, 1994; Holmberg, 1989; Moore, 1991b). There is a call for the teacher to act as a support and a facilitator, rather than the deliverer of content, as learners develop new skills in problem-solving, critical thinking, and decision-making (Burge, 1988; Coldeway, 1996; Davie & Wells, 1991; Mason, 1991).

This evolution of the teaching role may be partially explained by comparing a pedagogical approach to teaching the distance learner to an andragogical approach. Pedagogy is the art and science of teaching younger learners, who (some educators believe) need to be guided and led to understanding by a teacher. From this view of the learner, courses are designated by the educational institution, two-way communication is not a priority, and courses are produced for many learners without a consideration of individual needs. Major institutional funding is allocated toward the production of course materials; the teacher is subject expert and courseware developer (Holmberg, 1989; Keegan, 1990; Paul, 1989).

In contrast, andragogy is the art and science of helping adults learn (Cross, 1981; Kaufman, 1989; Knowles, 1980). The validity of the assumptions of andragogy have been debated in the literature (Brookfield, 1986; Candy, 1991), but andragogical principles have

had an impact on the field of adult education (Coldeway, 1986; Cross, 1981; Pratt, 1988; Thompson, 1989). Burge (1988) calls for the examination of andragogy and the principles of a learner-centred view by distance educators.

Holmberg (1989) suggests that "Knowles' 'andragogical approach' is relevant to distance education" (p. 160). This approach allows distance educators to focus on the clients they serve, and determine how to meet their needs in a more effective manner. Moore and Kearsley (1996) in their text on systems in distance education state that theories of adult learning such as "Knowles (1978) provide a very helpful basis for the design and teaching of distance education courses..." (p.153). A learner-centred approach to distance education has a theoretical base in andragogical principles, and emphasizes a holistic, integrated approach to the learner (Burge, 1991; Gunawardena, 1991). Practitioners of adult education as well as distance education theorists have underlined the importance of an approach to distance learning which recognizes adult independence, life experiences, and respect for the individual (Daloz, 1986; Driscoll, 1998; Moore, 1986; Paul, 1990).

Distance Learners' Achievement

The issue of learner persistence (or student attrition) is a major issue in the distance education literature (Bernard & Amundsen, 1989; Billings, 1988, 1991; Kember, Murphy, Siaw, & Yuen, 1991; Lunneborg, 1994,1997; Powell, Conway, & Ross, 1990; Wilkes & Burnham, 1991).

> The question of why some students successfully study through distance education and others do not is becoming increasingly important as distance education moves from a marginal to an integral role in the provision of post-secondary education. (Powell et al., 1990, p. 5)

In the distance learning literature, "success" has been defined and assessed with different measures. Adopted indicators might be: measures of student achievement-- course marks or final exam marks; the learners' self-perception of their performance (Gibson, 1991); student satisfaction with the course and/or institution (Coldeway, 1986); student withdrawal from course or program; or student persistence-- the proportion of students who choose to take a second course by distance after successful completion of their first (Bernard & Amundson, 1989). However, Bernard and Amundson suggest that "...the one measure [of success or lack of success] used most often in distance education research is student attrition (also referred to in the literature as persistence toward completion, dropout, or withdrawal)" (p.27). Attrition is a particularly serious problem for distance educators and their students. Earlier research often found that less than half of the entrants into a distance program completed their first course (Paul, 1990). Current reported rates of non-completion of courses now range from 30% to 50% (Moore & Kearsley, 1996).

"The persistence of high attrition rates has led many researchers to identify 'personal' (as opposed to 'institutional') factors as essential to understanding why students have difficulty in pursuing education at a distance" (Paul, 1990, p. 93). Personal factors include learning characteristics as well as circumstances in the life of the learner, while institutional issues include communication modes, interactivity, and the synchronicity or asynchronicity of the course (Billings, 1991). Some of the salient issues which have been investigated include surface versus deep approach to study (Kember & Harper, 1987); attitudes and perceptions about the self as learner (Coggins, 1988; Garland, 1993, 1994); individual course considerations (Bernard and Amundsen, 1989); life circumstances, such

as lack of time, change in career plans, illness (Rekkedal, 1982); and gender (Kirkup & von Prummer, 1990). These studies have investigated the issues surrounding student persistence in distance education courses, and all of the factors listed have been identified as causes of student attrition. However, as Moore and Kearsley (1996) have pointed out, "One of the methodological difficulties of this [persistence] research is that dropout is usually a result of no one cause, but of an accumulation and mixture of causes" (p.160).

Bernard and Amundsen (1989) suggest that much of the research on attrition has been criticized on three different dimensions: the term "attrition" has been inadequately defined; research on attrition has tended to describe rather than explain the phenomenon; and many of the complex factors in the process have been neglected (p.27). The conceptual models of student persistence developed by Bernard and Amundsen, Kember et al. (1991), and Powell et al. (1990) are attempts to clarify and categorize knowledge about student persistence and attrition as integral parts of the distance education enterprise. The research of Bernard and Amundsen emphasized the impact of the components of the distance course itself, but it has been criticized for not taking account of the impact that home, family, career and social lives can have on the persistence of distance students (Kember et al., p.4). Kember and colleagues demonstrated the importance of the social integration component of distance learners' lives. Powell and associates focused on the predisposing characteristics of the learners themselves, but did not examine the relationship between institutional factors, life changes, and the persistence of distance learners. Also, Cookson (1989) points out that most studies of students who persist in distance education courses are descriptive in nature, and rarely draw upon theories of adult learning, a situation which still exists.

Some researchers in the field of distance education have drawn from the seminal work of Tinto (1975, 1993), whose original model of dropout from higher education centered on residential four year college situations. In his work, Tinto

> ...argues that individual departure from institutions can be viewed as arising out of a longitudinal process of interactions between an individual with given attributes, skills, financial resources, prior educational experiences, and dispositions (intentions and commitments) and other members of the academic and social systems of the institution. The individual's experience in those systems, as indicated by his/her intellectual (academic) and social (personal) integration, continually modifies his or her intentions and commitments. (1993, p. 113-114)

Bernard and Amundsen (1989), Sweet (1986) and Kember et al. (1991) found that with appropriate modifications, Tinto's model could be applied to distance education. For instance, Kember (1989) suggested that home, work, and social environments be included in the social integration component of the model, while Bernard and Amundsen (1989) applied the model to one course rather than a program. Their rationale was that much of the research into student persistence in the field of distance education did not encompass entire programs, but rather considered individual courses.

As well, Tinto (1993) modified the original model, and extended his theory of student persistence to the doctoral level. "Specifically, it suggests that graduate persistence is also shaped by the personal and intellectual interactions that occurs within and between students and faculty and the various communities that make up the academic and social systems of the institution" (p. 231). A modification of the longitudinal model of doctoral persistence would allow application to the experiences of the graduate learners in this study.

Distance Learners' Motivation

Researchers have proposed that motivation is a personality variable that impacts on learning. Houle (1961) developed a typology of adult motivations for engaging in continuing educational experiences. He found three sub-groups of learners: goal-oriented learners, activity-oriented learners, and learning-oriented learners-- "those who pursue learning for its own sake"(Cross, 1981, p. 82-83). Cross (1981) suggests that this research with its resulting typology is the "single most influential motivational study today" (p.82).

Morgan, Taylor, and Gibbs (1982) conducted a qualitative interview study with Open University students in the United Kingdom in which learning was described from the learner's perspective. A learner's orientation to study was defined as "the collection of attitudes, aims and purposes that express a student's relationship with a course and the university" (p.103). These researchers felt that orientation to study was not equivalent to motivation, because it was concerned with the qualitative differences in the way students view their studies, while motivation studies tended to simply describe students as "more or less motivated". These researchers found that students had one of three different orientations to studying: a personal orientation, a vocational orientation, or an academic orientation. These orientations to study seem to parallel motivation typologies. Ehrman (1990) suggested that adult learners can have instrumental, intrinsic, or integrative motivations for pursuing education by distance.

What influences affect the motivation of distance learners? Coldeway (1991) found that motivation is impacted by several different factors; some factors can be controlled by the course design, and other factors are personal. As more research is completed on student

persistence, a large variation in the results of different measures used to describe student behavior is apparent. Coldeway advises that "caution should be used in attempting to generalize to an individual student or even a particular course" (p.10). He suggests that many of the strong motivational factors that educators ascribe to distance learners-- an internalized desire to learn, or a need for credentials or course credits-- are actually "overshadowed by competing factors in the personal lives of students" (p.10). Therefore, students who do manage to complete their courses and programs are highly self-motivated individuals.

Wong (1992) found differing motivations for adult distance learners and traditional age on-campus learners. This research demonstrated a "higher intrinsic motivation, inter-relating ideas and deep approach" (p.15) on the part of learners studying by distance. Wong called for providers of distance education to recognize the different "learning styles and motivational attributes" of the mature student (p.16). Von Prummer (1990) discerned three categories of motivation in survey research carried out with distance education students. She found that students had motives related to jobs and professional development, motives relating to a general broadening of the learner's education, or instrumental motives. In fact, the most predominant motive for study was directly related to students' desires to improve their employability in the labor market, although that was also the goal least often attained.

Researchers stress the need to understand student persistence and attrition by taking all factors unearthed by research into account. But the multiple factors which have been identified in research make it difficult to synthesize information for the purpose of better

understanding the motivations and achievement needs of distance education students. Some of the difficulty resides in how researchers have defined terms, and occasionally in the fact that the data seem inadequate to support the conclusions drawn in the studies. Personal factors which impact on distance learners' motivation and achievement vary widely in different research reports (Lunneborg, 1994, 1997). Biner, Bink, Huffman and Dean (1995) identified proficiency, introversion and independence as decision makers as salient personal factors in distance learner motivation and achievement. Wilkes and Burnham (1991) found that motivational orientation had minimal impact on student satisfaction, whereas time, family and work demands impacted on both student persistence and achievement. Powell et al. (1990) identified persistence in taking on new projects, stability in relationships and independence in learning as salient personal factors. Haughey and Anderson (1998) suggest that, "Learners are the most motivated, learn the most efficiently and are the most satisfied when learning is applied at the correct time to real and authentic problems" (p.6). A study which employs a qualitative approach in which distance learners are empowered to speak for themselves, to clarify attitudes and factors which impact on persistence or attrition, might help resolve some of these variances. As well, personal efficacy is a construct which can provide a bridge to connect and clarify some of these conflicting reports of distance learner motivation and achievement.

Distance Learners' Personal Efficacy

Bandura (1995) describes perceived personal efficacy as "beliefs in one's capabilities to organize and execute the courses of action required to manage prospective situations" (p.2). Thompson (1989) suggests that "Bandura... has provided a framework to

explain how some people are more likely than others to persist at a given task" (p.47). Merriam and Caffarella (1998) also stress the importance of Bandura's theory for work in adult education. The emphasis on reciprocal influences of learners and environment, underlines the way context impacts on learners' behavior. Distance learners' ability to persist in pursuing their educational studies is the issue under consideration in studies of distance learner attrition or completion (Atman, 1991; Garland, 1993; Powell et al., 1990). Bandura (1986) makes a critical connection between the learner, the context, and behavior in his work in social cognitive theory. In his view, the person's behavior, the person's cognitive and other personal factors, and the environment influence each other in a causal way. Behavior, personal factors, and the environment, all of which interact causally, are determinants of what occurs within the teaching-learning transaction in distance education.

Adults who are considering furthering their education would find it very difficult to involve themselves with an institution of learning, if they did not possess an attitude of academic efficacy, and believe that they were capable of engaging in continuing education (Gibson & Graff, 1992). It is not the learners' objective level of academic ability and skill that is the issue; it is the learners' subjective belief that they could succeed at the academic task (Bandura, 1986). Learners who see themselves as efficacious "set themselves challenges that enlist their interest and involvement in activities" (p. 395).

Distance learners must often pursue their studies with fewer social supports for their work. "Under conditions in which external imperatives are minimal and discontinuous, people must partly serve as agents of their own motivation and action" (Bandura and Schunk, 1981, p. 586). These conditions prevail in many distance education

situations (Coldeway, 1986; Paul, 1990). Students who succeed in a situation with rolling enrollments, self-pacing, self-imposed deadlines for assignments, courses, or programs must have a high sense of personal efficacy, and a motivation to complete the work. When students have a high level of belief in their personal efficacy, they are empowered to meet academic demands successfully. There is a reciprocal influence among these factors, for learners who have academic efficacy will continue to learn and achieve higher levels of intellectual performance, which in turn encourages them to set higher academic goals for themselves (Bandura, 1995; Schunk, 1987; Zimmerman, 1995).

Isolation as learners, coping with new technology, allocating enough time to engage in the educational enterprise, are all difficulties that beset adult distance learners. If these adults have gained a sense of personal efficacy, they will be motivated to persist in the face of the challenges of computer conferencing. "Efficacy beliefs play a key role in the self-regulation of motivation" (Bandura, 1995, p. 6). Learners choose goals for themselves based on what they believe they are able to accomplish. Adult learners who believe in their personal efficacy are motivated to spend longer at their learning tasks, persevere when they meet difficulties, and are able to recover from failures.

Summary

The context of this study is one mode of distance education delivery: the computer conferencing learning environment. Computer conferencing allows distance educators to redefine the "transactional distance" existing in every educational encounter. If dialogue is the extent to which teacher and learner are able to respond to each other, then in the context

of computer conferencing, response can be almost instantaneous. The structure of a computer conferencing course can reflect great responsiveness to the needs of the adult learner, since course requirements and discussions can be shaped to accommodate the needs of both learners and teacher. Similarly, a computer conferencing course can enhance learner autonomy as learners control their own choices regarding involvement and response.

The adult learner brings to this environment personal factors which can impact on the possible learning. These factors include socioeconomic and demographic factors, learning style, belief in personal efficacy, motivation and desire to achieve. These factors would also impact on learning if the context of this study was another mode of distance course delivery. The personal factors which impact quite uniquely on learning in the computer conference are literacy factors which underpin communication and learning in this environment: the ability to read, write, and utilize computer technology for the purposes of learning and communicating.

In the computer conferencing environment, communication takes place via text typed into the computer which then appears on the screen. When learners communicate with one other, there are no body language, voice pitch or intonation cues which allow the learners to interpret the communications received from others. What are the salient features of communicating in a computer conference? How do learners learn to communicate and interpret others' communications in this environment?

The process of learning by distance can pose difficulties for adult students because of factors such as isolation from other learners, life circumstances that impact on time or

energy available for learning, approaches to study, perceptions about the self as learner, or course expectations. Courses offered by computer conferencing can be especially challenging as adult learners are required to become adept at using technology for both learning and communicating. This adds a new dimension to the process of learning, which might be problematic for some adult learners who have not had prior experience with computers and keyboarding, or for those adults who have had previous experiences with computers which were anxiety-provoking. What strategies do adult learners develop that help them learn in this particular learning environment? What are the essential factors underlying learning in a computer conferencing environment?

The research literature suggests that there are various factors which can explain the successful participation of adult learners in distance courses, such as family support, employer support, sociological and psychological variables, prior experience with distance courses, interactivity within the course. What factors do the adult learners themselves suggest, to explain their successful participation in computer conferencing courses?

Through the examination of the literature pertaining to the theoretical elements that ground the study, the need to investigate the salient features of adult learner participation, communication, and learning in the computer conferencing context has been established. The factors impacting on learners in distance education contexts, the development of computer-mediated communication as a recent mode of distance education delivery, and the characteristics of learners in traditional distance education settings were explored. It is through the examination of adult learner perceptions of learning, communication and participation in computer conferencing contexts that researchers and educators can discern

valuable insights which will allow educators to design more effective learning opportunities in the computer conference.

The research questions investigated in the study were as follows:

How do adult students in a computer conferencing course describe themselves as learners?

Various researchers in the field of distance education (Bullen, 1998; Burge, 1993; Coldeway, 1986; Crissman, Pope, Vasu, Munro, Alibrandi, Hsaing, & Stillman ,1998; Davie & Wells, 1991; Driscoll, 1998; Eastmond, 1995; Gunawardena, 1991; Moore, 1986; Paul, 1990) have explored the characteristics of learners in distance environments. However, there are few studies which explore the characteristics of learners (1) in the computer conferencing environment; and (2) in a qualitative study which invites the learners to express their own views of their learning characteristics. This study addresses this gap in the literature.

What is the relationship between learner achievement in the computer conferencing course, and the adults' descriptions of themselves as learners?

Learner achievement has been investigated mainly within studies of student attrition (Bernard & Amundsen, 1989; Garland, 1993; Gibson, 1991; Kember, Murphy, Siaw, & Yuen, 1991; Kirkup & Von Prummer, 1990; Powell, Conway, & Ross, 1990; Wilkes & Burnham, 1991). Several models have been developed which attempt to explain the phenomenon (Billings, 1988, 1991; Tinto, 1993). It is essential for distance educators to develop better understandings of the distance learners who enroll in their programs— to provide (as well as construct with the learners) appropriate learning environments to enhance learner persistence, motivation, and achievement. These issues have not been

explored frequently in computer conferencing environments, even though web-based learning is one of the fastest-growing segments of the continuing education sector.

How do adult learners describe the task of constructing meaning in the reading/ writing environment of computer conferencing?

The literacy demands of the computer conference have been discussed by a number of researchers (Duchastel, 1997; Feenberg, 1989; Ferris, 1996; Gunawardena, Lowe, & Anderson, 1997; Levinson, 1989; Mason, 1993). The demands on learners are substantial, as they must learn how to communicate in a text-based environment with no external cues regarding meaning. As well, computer literacy has an impact in the computer conference. A clearer understanding of the literacy demands in the computer conference has the potential to allow distance educators to improve their practice, by facilitating more efficient and effective student communication and learning.

These factors were investigated in a qualitative research study which explores the issues from the learners' perspectives. The following chapter presents the methods utilized to conduct this research study.

CHAPTER 3: METHODS

Introduction

The previous chapter explored and established the need to investigate the salient features of communicating and learning in a computer conference, as well as factors which explain successful participation in this learning environment. Findings from such investigations can make a significant contribution to distance education, in addition to developing better understanding of the needs of learners in this environment. The present chapter begins by establishing the rationale for the use of a qualitative research design in the investigation of learning in the computer conference. The chapter also describes the emergent design of the current study. Finally, the research procedures, data collection, analysis and reporting procedures are discussed.

Rationale

Computer conferencing is a relatively new learning environment which has yet to be thoroughly examined. In this study, I attempted to advance our understanding of the salient features of communicating and learning in a computer conference; to elucidate the factors impacting on successful adult learner achievement in the computer conference; and to offer an interpretation of how these variables interrelate, in order to help improve distance educators' practice. The research questions in this study focused on the "salient themes, patterns, categories in participants' meaning structures" in the computer conferencing environment (Marshall & Rossman, 1995, p.41).

These questions suggested the choice of a qualitative research strategy. Merriam and Simpson (1995) advise that: "Qualitative methods are especially well-suited for investigations in applied fields such as adult education and training because we want to improve practice. The improvement of practice comes from understanding the experiences of those involved" (p.97). The choice of qualitative methodology in this research provided the flexibility required to clarify the learners' perspectives in the computer conferencing environment. The purpose of this research was to explore the experience of learners in this distance learning environment, describe the experience from their own perspectives, and as categories and themes emerged from the data, to work toward "developing overarching concepts and relationships that can theoretically and parsimoniously describe relations and meanings" (Eastmond, 1995, p.207).

The constructivist paradigm is the set of basic beliefs about the nature of reality and knowledge which provides the underlying motif of this study (Fosnot, 1996; Steffe & Gale, 1995; Steier, 1991). Guba and Lincoln (1994) suggest that "Constructivism...sees knowledge as created in interaction among investigator and respondents" (p.111). The researcher, then, becomes very much involved along with the participants in the research, for it is in the questions and answers, the participation and observation of the lives of the participants, that new understandings are forged. "The inquirer's voice is that of the 'passionate participant' (Lincoln, 1991) actively engaged in facilitating the 'multivoice' reconstruction of his or her own construction as well as those of all other participants" (Guba & Lincoln, p.115).

Therefore, it is of the utmost importance that I as researcher understand my own

constructions, as well as exploring the constructions of the participants in this study. Constructivism casts the researcher in the role of both participant and facilitator/organizer of the research process. "The investigator and the object of investigation are assumed to be interactively linked so that the findings are *literally created* as the investigation proceeds" (Guba & Lincoln, 1994, p.111).

There was also a focus on the researcher as a primary data-gathering instrument in this study. This focus is critical, as Lincoln and Guba (1985) suggest, "because of the understanding that all instruments interact with respondents and objects but that only the human instrument is capable of grasping and evaluating the meaning of that differential interaction" (p.39). In this qualitative research, it is essential that the human-as-instrument filters the interactions with (other) participants, is attuned to underlying meanings, and is able to identify the values brought to the research.

Research Approach

This research is a qualitative study utilizing multiple sources of data. Participant observation is a traditional method of data collection in qualitative research. However, in this study, it was impossible to utilize this method because of geographical and technology considerations. The participants in this research were widely dispersed, living throughout the Atlantic provinces, making it problematic for the researcher to visit each student personally. Additionally, these students did not physically come together to learn; their class interaction and learning occurred virtually, online, twenty-four hours a day, seven days a week. These constraints resulted in the choice of in-depth interviews as a primary method of data collection (Fontana & Frey, 1994; Holstein & Gubrium, 1995; Kvale, 1996;

McCracken, 1988). Burge (1993) utilized in-depth qualitative interviews conducted by telephone as a means of collecting data in a research study conducted in a computer conferencing context. Gatz (1985) also conducted in-depth telephone interviews in a study in distance education. The interviews allowed these researchers to successfully dialogue with participants. I chose to utilize the in-depth interview conducted by telephone in this research study because it had been demonstrated as a viable, effective method of conducting research in the area of distance learning.

Utilizing in-depth qualitative interviews as a research method allowed me to share in the perspectives of each individual participant, and develop a "thick description" of participants' experiences within the computer conference. Kvale (1996) proposes that "The research interview is... a specific professional form of *conversational technique* in which knowledge is constructed through the interaction of interviewer and interviewee" (p.36).

McCracken (1988) suggests that:

> The long interview is one of the most powerful methods in the qualitative armory. For certain descriptive and analytic purposes, no instrument of inquiry is more revealing. The method can take us into the mental world of the individual, to glimpse the categories and logic by which he or she sees the world. It can also take us into the lifeworld of the individual, to see the content and pattern of daily experience. The long interview gives us the opportunity to step into the mind of another person, to see and experience the world as they do themselves. (p.9)

The in-depth interviews were supplemented by the gathering and analyzing of documents which were produced in the computer conference. The documents were collected from the course transcripts of the computer conference, from the informal chat

area of the conference, and from the student assignment area. Erlandson, Harris, Skipper, & Allen (1993) suggest that "The data obtained from documents can be used in the same manner as those derived from interviews or observations" (p.99).

This study was an emergent design, in which the data collected from the in-depth interviews and from the documents generated in the computer conferencing courses provided a direction for subsequent data collection and analysis. I "recognize[d] the complexity" of the context of the computer conference, and attempted to "allow structure to build only as ... understanding of that context and of the respondents' constructions of reality allow[ed] the design to emerge" (Erlandson et al., 1993, p.73). However, as these authors suggest, a considerable amount of research design was already in place by the time a site selection was made, and arrangements completed for the researcher to work in it (p.73). I had developed an understanding of the kinds of questions to ask in the in-depth interviews, and I also had an initial approach to analyzing the data. The important point is that the design was still subject to modification and development, as the data were collected and analyzed. Throughout the study I moved from a description of what was going on the computer conference, including the participants' words, to an analysis of how adults say they learn and communicate in this milieu, to interpretation—"making sense of meanings" (Miles & Huberman, 1994, p.14) in the context of the computer conference.

Procedure

Site and Participant Selection

The adult learners involved in this study were taking a computer conferencing course at one of two universities in Atlantic Canada. The focus on finding computer conferencing courses in the Maritimes evolved because of personal interest. I have lived and taught in the Atlantic provinces for the past twenty years. I have encountered the same difficulties shared by many adult learners who wish to pursue graduate education in this region of the country. Computer conferencing can potentially allow learners to pursue lifelong learning, while maintaining their family and career commitments. Because of this background, I possessed a "sharedness of meanings" with the adult learners who were participants in this study, which enhanced my understanding of the context of the interviews (Fontana & Frey, 1994, p.371). I would not attempt to lay claim to "objectivity" in the interviewing situation, since the "naturalist [constructivist] paradigm affirms the mutual influence that researcher and respondents have on each other" (Erlandson et al., 1993, p.15). Rather, I focused on ensuring that the data collected and analyzed were confirmable and could be tracked directly back to their sources throughout the study.

The decision to collect data at two sites was made because it allowed me to make comparisons between two different groups. Designing the study so that data from multiple participants from several different sites could be compared offered a means of triangulating the data. "Triangulation is the act of bringing more than one source of data to bear on a single point" (Marshall & Rossman, 1995, p.144).

The two sites chosen for data collection differed in some respects; the two courses

were not dealing with the same subject matter, nor were the pre-requisites for students taking the courses the same. Students enrolling in the Instructional Technology course had to be familiar with the World Wide Web, and with coding in HTML (HyperText Mark-Up Language) which would be utilized for the development of their web sites. The pre-requisites were technology-based. Students enrolling in the Educational Administration course had to be enrolled in the Master's of Education program, and there were no technology-based pre-requisites. Yet the basic means of course delivery, computer conferencing, was the same. Comparing the learning strategies and communication styles of the adult learners in these two different courses offered via computer conferencing allowed me to check my developing understanding of the phenomenon of learning in a computer conference.

Each instructor welcomed me and the proposed research into his/her course. As a preliminary exploration, I was given an ID number and a password, so that I could go online and peruse the course notes collected in a previous course. This course was very similar to the one in which research was conducted. This initial exploration of the computer conferencing environment confirmed the advantage of conducting the in-depth interviews by telephone rather than by computer communications. Notes written in the conference tended to be concise and to the point, a communication style appropriate for computer conferencing, but not conducive to developing a thick description of the learning environment.

One course chosen for this study was a course in Instructional Technology, offered to both pre-service and in-service teachers. The adult learners participating in this

course resided in different areas of the province, and took this course on a part-time basis. Some of the students were adept at using technology to access information, and were able to use e-mail, ftp (file transfer protocol), and the Internet. Other students were just learning how to access the World Wide Web. This course was offered completely online; there were no face-to-face classes. Students worked totally in the World Wide Web environment. The course centered around learning how to develop an educationally valuable web site. Students learned how to: access the course web site, utilize the course materials found on the web site, plan their own web site, transfer files across distance, code in HTML, and communicate with-- and give feedback to-- other students in the course via the World Wide Web. Communication via the Web was an essential course component.

The second course was in Educational Administration and was a core course in one stream of the Master of Education program. The course was offered only as a telelearning course, which meant that all students in Educational Leadership had to take this course via the World Wide Web. Approximately 40% of the students involved in the course were actually on-campus students, while approximately 60% of the students were off-campus, part-time learners who were located throughout the province. There were two texts and an online manual for the course. Students were expected to read and discuss all of the material online. There were six units in this course, with objectives and guiding questions for each module. Students were assigned to groups, and had to complete a portion of their course work in these small groups. Members of the groups communicated via computer conferencing to develop three major papers responding to

the guiding questions from various modules. The remainder of the course work entailed the submission of an individual final paper.

All of the adult learners enrolled in the two courses were invited to participate in the study; this included 27 students enrolled in the Instructional Technology course, and 22 students enrolled in the Educational Administration course. Eleven students in the Instructional Technology course, and ten students in the Educational Administration course volunteered to participate. One student in the Instructional Technology course was not selected to be involved in the study, because he was a "guru" in the course and had special status; all of the other students in that course who agreed to participate were chosen to be involved. All ten students in the Educational Administration course who indicated their willingness to participate were selected to be included in the study. The twenty students who agreed to be involved in the study completed the informed consent form (see Appendix B) and an initial questionnaire (see Appendix C) which collected demographic information as well as information on student attitudes toward computers and toward learning by distance. The purpose of the Initial Questionnaire was to gather this information on student status, experience with technology, family constellation, and attitudes in order that a broad range of students be chosen to participate in the research. The questionnaire itself was based on a form that had been developed for an earlier research study and administered to 94 pre-service teachers (Gabriel & MacDonald, 1996). The questionnaire was extended and modified for this study, since I wanted to collect more specific data as mentioned above. I had planned to select ten students in each course to participate in the in-depth interviews on the basis of their answers to the

initial questionnaire. Participants would be chosen to reflect a broad representation of age, gender, computer experience, previous achievement in distance education courses, and positive or negative attitudes toward computers. However, since there were just ten adults in each course who agreed to be involved in the research study (as the eleventh student in the Instructional Administration course was not an appropriate candidate), all those who indicated an interest were chosen to be involved in the study.

The four course instructors were invited to be involved in the research interview process as well. Two instructors shared the teaching load in both of the courses in this research study. (There were not separate sections of the courses). I had been in contact with the course instructors both by telephone and by e-mail prior to choosing a research site, and all four indicated their willingness to allow me to conduct research in their respective courses. I then sent a package of information including a request for ethics approval to the appropriate office of each university. I received ethics approval from each university in early August. During the process of entry into the courses (in early September for these fall term courses) I asked the instructors if they would agree to be interviewed after the courses were completed. All four instructors (two male and two female) who taught the courses agreed to participate in the second set of interviews at the end of the term.

The Researcher's Role

Ethical Considerations

I sent a letter of introduction to all the adult learners who registered in the two courses at the universities (see Appendix A).The letter was sent online, via e-mail, and

introduced me, specified the purpose of the study in general terms, informed students that I would be reading their course communications, and explained the informed consent form. I asked students to reply to my e-mail if they were interested in participating in the research, and to provide their postal mailing addresses.

I then mailed a paper copy of the initial questionnaire, the informed consent form, and a self-addressed, stamped envelope so that participants could return those items to me in hard copy via the post.(See Appendices B and C). It was necessary to handle the explanation of the study in this way, because the courses were conducted virtually, online. There were no class meetings during which I could have met with the students to explain the research and to invite students to sign the informed consent form.

Initial Questionnaire

All students who signed the informed consent form were then asked to fill out the initial questionnaire which collected basic demographic data, as well as posing several open-ended questions regarding computer use, attitudes, and experience. Students were invited to contact me either via e-mail, or by a collect telephone call if there were any unanswered questions about the study. It was made clear to all of the students registered in the two courses that participation in this study was voluntary, that they would be under no obligation to complete the study, and that they would be free to withdraw their data from the study at any time.

The confidentiality of the interview participants in this study was also protected. After I downloaded written communication by students involved in the study, the headers on the communication were removed, and replaced with pseudonyms. All transcripts of

online sessions, the informed consent forms, the initial questionnaires, and the transcripts of telephone interviews were stored in a locked cabinet. Pseudonyms will also be used in any reports or publications resulting from this research. In this way, confidentiality will be assured.

Entry

I was given an ID number and a password for each course, so that I could log into the course just as the students and the instructors did. My presence online was made known to all; however, I did not actively communicate with the adult learners in the course discussions. In the Instructional Technology course I was given access to the entire computer conference, with no restrictions. In the Educational Administration computer conference, at first I was only given access to the Cafe and Question and Answer sections. However, the volume of notes posted to those two areas was very low. The instructors in the course posted a message to their students saying that they planned to give me access to all the small group discussions unless they received a negative response from their students. There were no students who responded negatively, so I was given access to all of the four small group discussions in the third week of the course. Students were clustered in the four small groups according to their area of professional interest. Students who agreed to participate in the research came from all four of the groups.

I went online in both of the computer conferencing courses on at least six days out of seven every week during the term, and perused the notes that had been posted that day. I scanned *all* of the communication that occurred in the computer conferences. In

the Instructional Technology course, this meant that I read all the notes that had been posted in the various areas of the conference, such as the site conceptualization room, the site design and specs area, the HTML and web construction area, the open seminar area, and so on. In the Educational Administration course, I read all of the notes posted in each of the small four group areas, and I checked the question and answer area and the cafe for any new postings. I used my web browser to save all of the notes posted by participants in the study. I downloaded these notes onto my hard drive and placed them in a database of information for the study. I also saved them on disk, and printed the conference notes out on hard copy as well.

Data Collection Methods

Initial Questionnaire

The first means of gathering information in this research was the initial questionnaire (see Appendix C) as discussed above. The questionnaire gathered demographic information, including student status, occupation, and family situation. I also posed questions about the students' attitudes toward, and experience with, technology. Students also described their own learning style, and completed sentences which explored future technology, and their beliefs in what they could do.

I originally sent the questionnaire out to all the students who agreed to participate in the research via mail. However, several students requested an online version of the questionnaire, so I prepared the questionnaire in electronic form, and sent it via e-mail to five of the twenty research participants. Four of these five students were in the Instructional

Technology course, and one was enrolled in the Educational Administration course.

I became concerned about the slow pace of response to my initial communication with the students in the Educational Administration course. And I then discovered that some students had difficulty getting online in the first week of the course, and had not actually received the original letter of introduction that I posted. I then wrote a second message to these students with a more informal explanation of the research— more typical of e-mail notes (see Appendix D).This was sent as a back-up note to students enrolled in the Educational Administration course from whom I had not heard. I proceeded in this manner because it was impossible to tell if the students had received my first e-mail message or not. I then decided to send this note as the initial contact with all the students in the Information Technology course. This second message was successful at engendering positive responses from students, and was then immediately followed up with the more formal research information and informed consent form.

This questionnaire was completed by the twenty students who agreed to participate in the research. I had anticipated that by the second week of the course, all initial surveys would be completed and returned. In fact, however, some students required more time to submit the completed questionnaires. In several cases this occurred because students were unable to gain access to the computer conference until the second or third week of the course. By the beginning of the fourth week of the courses, I had received 18 out of the 20 initial questionnaires. The nineteenth arrived during the fifth week of the course. The twentieth questionnaire was not submitted until the twelfth week of the course. The student involved misplaced the questionnaire several times. Eventually, she submitted it

electronically. I used the chat I had with this student on the phone when I was setting up the interview with her to informally collect the questionnaire data, so I was aware of the information before we had the first research interview.

Telephone Interview

The primary method of data collection in this study involved telephone conferences with individual participants. "Interviewing is one of the most common and most powerful ways we use to try to understand our fellow human beings" (Fontana & Frey, 1994, p.361). These individual telephone interviews facilitated the gathering of more complete, richer data than would have been possible with written responses posted in the computer conference. Telephone interviews also allowed me to follow up on the participants' comments, thus providing the opportunity for developing a better understanding of the participants' lived reality. As Reinharz (1992) points out,"Open-ended interview research explores people's views of reality and allows the researcher to generate theory" (p.18).

The decision was made to conduct interviews over the telephone rather than by computer for two reasons. First, since this would be the first computer conferencing course taken by a number of these students, it was anticipated that there would be some inaugural set-up difficulties. For these students, an online interview early in their course might not even be accessible. Second, a number of the students taking these courses were not accomplished in using the computer keyboard and communicating in the written mode. If I had interviewed these students online, their responses would tend to be perfunctory because of their difficulty in typing. A written, online interview would not

produce the rich data which could be collected in an auditory/oral telephone interview (Burge,1993).

I scheduled telephone interviews at the participants' convenience, with all twenty students and with the four instructors who agreed to be involved in this research. I found that making the appointment for the research interview over the phone allowed me to begin to develop a more personal relationship with the participants in the study. Our formal research interviews on the phone were facilitated by having these earlier chats. I also began the individual in-depth qualitative interviews with a chat, so that both "partners in this language event" were comfortable (Bogdan & Biklen, 1992; Fontana & Frey, 1994; McCracken, 1988). During the teleconference, I attempted to "provide a framework within which respondents can express their own understanding in their own terms" (Merriam & Simpson, 1995, p.152).

I had previously conducted successful qualitative interviews in two different research projects (Gabriel, 1983; Gabriel & MacDonald, 1996). In this study, I explored the adult learners' perceptions of learning in the computer conferencing environment. Although the emphasis was placed on obtaining a "thick description" of the computer conferencing environment, the interview was flexible in nature. I invited participants to discuss any additional issues related to computer conferencing or to learning in general that they believed were important. I used a tape recorder with a telephone recording device to record each interview in full. As well, I took handwritten notes as each interview unfolded. Each question was listed on a separate sheet of paper, so that it would be evident if any questions had not been addressed in the course of the interview

(Burge, 1993). This situation can sometimes arise because I used the interview guide with its suggested questions as just that: a guide. If a participant addressed issues early in the interview which I intended to explore later, then the interview followed the lead of the participant. I also listened intently throughout the interview in order to follow up on topics of interest introduced by the participants, and to seek clarification when necessary. In all of these "conversations with a purpose", "the most important aspect of the interviewer's approach concerns conveying an attitude of acceptance— that the participant's information is valuable and useful" (Marshall & Rossman, 1995, p.80).

The first set of teleconferences took place from October 7 to October 29, 1997 (See Appendix E). These interviews were audiotaped and then transcribed in full (McCracken,1988; Taylor & Bogdan, 1984). I had planned to complete all twenty transcriptions myself, however, because of time constraints, the services of professional transcribers were engaged for seven of the interviews. When the transcripts were completed by individuals who had not taken part in the actual interview, there were subtle nuances of the various communication acts missing. I had to carefully review all seven of the interview tapes and transcriptions produced by other typists, and make revisions before sending them out to the participants. I shared these transcriptions with the participants, so that they had the opportunity to read them, and suggest any necessary changes or clarify any misunderstandings. There were no changes requested by any of the participants. The first set of twenty interviews ranged from forty to sixty-five minutes in length, and resulted in 333 word processed pages of transcriptions. The pages were set up so that speech acts were single-spaced, with double-spaces between speakers.

The second set of teleconferences with students and with the course instructors occurred from January 19 to January 30, 1998 (see Appendices F and G). Course instructors were included in this set of interviews, because their presence in the computer conference had an impact on the context of the conference. I was attempting to develop a better understanding of the learning environment of computer conferencing; exploring the attitudes and beliefs of the instructors was a valuable addition to this understanding. This entire set of interviews was audiotaped and also transcribed in full by myself. I found that typing all of the transcriptions in this study myself, (other than seven from the first set of interviews), allowed me to come to know the words and thoughts of the participants in the study very well indeed. I mailed the transcriptions to participants so that they had the opportunity to read them, and suggest any necessary additions, corrections, explanations or clarifications. Again, there were no changes requested in the transcripts by any of the participants.

The second set of twenty-four interviews ranged from forty to eighty-eight minutes in length. Again, these were set up so that the speech acts were single-spaced, with double spaces between the speakers. These twenty-four transcribed interviews resulted in an additional 558 pages of transcriptions. The combined first and second set of interviews resulted in 891 pages of transcripts. The researcher's reflective journal filled approximately 40 pages.

Transcripts of the Courses

One of the benefits of research into computer conferencing is that entire transcripts of courses are available for the researcher or the instructor to analyze after the

course is completed (Davie, 1989). Marshall and Rossman (1995) suggest that "the review of documents is an unobtrusive method...one rich in portraying the values and beliefs of participants in the setting"(p.85). I scanned the course transcripts on an on-going basis throughout the term, to identify messages which pertained to the research questions under investigation. These were included in the analysis. The transcript from the entire course was not included in the analysis, since a large number of communications were not within the parameters of this research. It is difficult to determine the number of pages filled by the portions of the course transcripts which were included as data, since some of the pages contain only one or two notes from a particular conference, while other pages are single-spaced, and full of notes from a conference thread. Basically, each course generated a large binder with several hundred pages full of computer conference notes, which have provided further rich data for this study.

Data Analysis

To begin data analysis, I read and reread the words of the participants in an effort to identify emerging themes. Bogdan and Biklen (1992) characterize a theme as "some concept or theory that emerges from your data" (p.186). The themes which were identified in the telephone interviews, in the initial questionnaires, and in the transcripts from the courses were identified and coded, compared, sorted and analyzed (Lincoln & Guba, 1985). The categories and patterns that emerged in this process were evaluated for their credibility; at the same time, I searched through the data for disconfirming instances, and alternative explanations.

I had previously utilized the computer-assisted qualitative data analysis program

HyperQual (Padilla, 1991) to assist in the organization, coding, and analysis of text in a research study on the attitudes of pre-service teachers toward computers (Gabriel & MacDonald, 1996). In the current study, I utilized the more powerful code-and-retrieve, memoing, and analysis capabilities of NUD*IST (Non-numerical, Unstructured Data Indexing, Searching, and Theorizing) to assist in the development of understanding (Richards & Richards, 1994). I converted each transcript to ASCII text, and then entered it into the NUD*IST database. When first placing the ASCII text of the transcripts into the database, I had to make a choice about what portion of text would be a "text unit" for the project, that is, the smallest part of the transcript that I wanted to be able to code and retrieve. I chose to use "lines" as the basic text unit, for, as suggested by Miles and Huberman (1994) line by line coding can "permit 'nesting' and 'overlapping' codes, rather than keeping chunk boundaries fixed" (p.65). This qualitative computer data analysis software allowed me to spread my coding over as many lines as necessary to capture an entire chunk of meaning.

NUD*IST collected and displayed the coding categories at nodes at various levels--the display was organized in a hierarchical tree structure. The first set of coding categories included the demographic data collected in the initial questionnaire, such as gender, age range, and computer experience, the "base data" in NUD*IST terminology. Coding categories came to mind as I listened carefully to what the participants in the study had discussed during our interviews, and I read and reread the interview transcripts. I searched through my data for "regularities and patterns as well as for topics" covered by the data (Bogdan & Biklen, 1992, p.168). Coding categories that

emerged during this process included *unexpected outcomes, willingness to learn*, and *giving feedback*. I found that the codes which evolved throughout this research study could be categorized in several different "families of codes" (p.167-172), for instance, demographic data were considered context codes. There were a number of codes that could be categorized as "definition of the situation" codes, such as *working in groups* and *home life*. Other codes focused on the perspectives shared by the participants in the study such as *giving feedback* and *dealing with problems*. Several codes elucidated participants' ways of thinking about other students and the computer conference, such as *creating the characters* and *understanding others*. The *flaming* incident was a one-of-a-kind event, and thus could be considered an "event" code. (See Appendix H for further details of the NUD*IST coding categories).

When I coded a section of a particular transcript I included enough lines of text, so that the meaning was intact. When working in the NUD*IST database, I always had access to the original transcript. If I wanted to check the context of a coded text unit, I could either expand the number of lines included in that section, or go back to the original transcript for a check. I requested several automatic text searches, such as "motivation" and "learn", but I did most coding manually. NUD*IST also permitted me to perform multiple coding of the same pieces of information. If a particular statement seemed to pertain to several categories, it was coded in each. As my understanding of the constructions of the participants grew throughout the study, I was able to add new codes as they occurred to me. I could also move the coding from one place to another in the database, attach new "children" to parent nodes, and move coding categories from the

free nodes to the hierarchical tree structure when appropriate.

NUD*IST allowed me to develop memos to attach to any node, or coding category. It permitted me to attach memos to the transcribed interview documents in the database as well, an option which I utilized as I was working through the texts. Working online in the early stages of coding the texts allowed me to move back and forth from the coding categories to the original transcripts. Later in the process, I printed the various coding categories out, a strategy which enabled me to thoroughly examine the database in hard copy. At this time, I also reread the participants' course notes that I had downloaded and printed. These notes were included in the analysis, and provided an opportunity to triangulate the data. For example, my understanding of the flaming incident was enriched by considering the information from the interviews, notes posted on the course web site, and listserve e-mail messages.

I also used data displays and summary tables to help me reflect on the data (Miles & Huberman,1994). The summary tables helped me record the concerns of students at the two different sites, as well as summarizing the demographic data collected from each participant. A thematic matrix was constructed of the problems encountered in learning in the computer conference, and the coping strategies which students developed.

I began the work of transcribing the data and the initial stages of data analysis as soon as the first round of interviews was completed. The second set of interview questions was grounded in the emerging themes and categories, for example, how factors in work, home, or academic life impacted on performance; the appropriateness of computer conferencing for lifelong learning; and development of a community of learners

in the computer conference. Thus, I developed the second interview protocol in December, after the courses were actually completed, in preparation for the second set of interviews in January. The reading and rereading of the course transcripts , and the student-generated postings in the computer conferences, occurred on an ongoing basis throughout the entire fall term. Findings which emerged from these iterations were interpreted against the backdrop of the entire data set, and the relevant research literature.

Trustworthiness of the Study

Lincoln and Guba (1985) propose four criteria to use in assessing the trustworthiness of a qualitative study: credibility, transferability, dependability, and confirmability. Regarding credibility, Miles and Huberman (1994) pose the questions: "Do the findings of the study make sense? Are they credible to the people we study and to our readers? Do we have an authentic portrait of what we were looking at?" (p.278) This research was thoroughly grounded in the data collected from the participants; the focus of the research was to accurately reflect the perspectives of the participants. I triangulated the data by conducting in-depth interviews with twenty different participants, at two different sites, at two different times. In addition, I conducted one set of interviews with the two teams of course instructors after the completion of the courses. Erlandson et al. (1993) suggest that "single items of information contribute little to an understanding of the context of the study unless they are enriched through triangulation" (p.138).

In addition, throughout the collection and analysis of data, and writing the

findings of this study, I met regularly with two peers to discuss the emerging study. The questions posed and discussed with these peers helped me clarify my own values and beliefs, and their role in this study. This is similar to the concept of peer debriefing proposed by Guba and Lincoln (1989) as a technique for increasing the credibility of a study.

Toward the end of the research, when I had produced a draft of my study, I shared this with the participants and invited their comments. I had utilized e-mail and telephone interviews throughout the study for data collection; I used these communication modes again to share the findings of the study with the participants. I e-mailed the findings to the participants, and then followed up a number of days later with phone calls. Using this means of communication, I was able to reach 15 of the adult learners. I interviewed 12 of these 15 students. The other three participants responded that they were interested in the study findings, but were unable to find a time to discuss them until later. I was unable to contact five students: one participant had moved to British Columbia, a second was working in India, and a third was teaching in Switzerland The fourth and fifth students' e-mail, phone number, and mailing addresses were all inaccurate, and I was unable to discover any current way of reaching them. I followed the same procedure with the four instructors in the study. One instructor was on sabbatical, two were involved in travel and work out of the province. Those interviews had to be postponed until the instructors returned. I was able to have a conversation with the fourth instructor.

During my conversation with the participants in the study, I checked the learners'

reaction to the findings. I specifically wanted to inquire about how accurately they believed I had represented their "constructed reality", or if they believed that their constructions had been misinterpreted or misrepresented. During these informal discussions, in general participants commented that they believed that the findings were representative of the reality they found in the computer conference. There were several small points of difference, however. One student suggested that the finding about time requirements in the computer conference did not apply to him personally, because of his expertise both with the medium of conferencing and with the subject matter of the course. However, he did allow that the time issue could certainly apply to most other students. Another student made the point that she did not believe that computer conferencing was an appropriate mode of course delivery under any circumstances, though the findings did reflect her own experience in the computer conference.

In terms of instructor presence in the conference, one professor pointed out the constructivist philosophy of choosing to take a less active role in the conference, and allowing students to develop ownership and construct their own knowledge. Other participants found that the findings reflected their views quite exactly. One student told me, "I was really pleased when I read them...You really listened."(Colleen Interview). One student remarked, "Actually, I thought they [the findings] were excellent. They were dead on to the experiences that I went through with learning in an online environment." (Corinne Interview). A third learner commented that "You could be describing my experience exactly...I agree with everything you said" (Andrea Interview).

This process was similar to the "member checks" proposed by Guba and Lincoln

which allowed participants the chance to correct errors of interpretation. Earlier in the study, I had carried out another form of a "member check" when I submitted both the initial interview transcript and the follow-up interview transcript to each participant. I invited them to "verify that what was written is what was intended to be communicated" (p.239). Throughout this process, none of the participants wished to have any changes made to their interview transcripts.

To address the issue of transferability, I include a detailed description of the context of the study. I provide brief profiles of the participants in the study, as well as further information on the context of the courses as well as the assignments. I have also attempted throughout the write-up of the study, to provide a thick description for the reader (Geertz, 1973).

Guba and Lincoln (1989) suggest that "Dependability ...is concerned with the stability of the data over time...But methodological changes and shifts in constructions are expected products of an emergent design dedicated to increasingly sophisticated constructions... Such changes and shifts are hallmarks of a maturing --and successful-- inquiry. But such changes and shifts need to be both tracked and trackable" (p.242). As I conducted this research study, I left an audit trail consisting of six different types of information (Erlandson et al., p.149). Raw data files, data reduction files and data reconstruction files represented the phenomena being studied--learning in the computer conferencing environment. Process notes, notes about intentions and motivations, including my reflective journal, and copies of instruments and tools represented the procedures of the study. These artifacts were all kept in a locked cabinet, and were

accessible only to myself. The presence of this information ensured that the "shifts in constructions" and the growth of my understanding would be trackable throughout the study.

Confirmability is conceptually related to dependability. It is "concerned with assuring that data, interpretations, and outcomes of inquiries are rooted in contexts and persons apart from the evaluator and are not simply figments of the evaluator's imagination... The constructivist paradigm's assurances of integrity of the findings are rooted in the data themselves. This means that data (constructions, assertions, facts, and so on) can be tracked to their sources" (Guba & Lincoln, 1989, p.243). Guba and Lincoln suggest that the check of a study for confirmability and dependability can and should be carried out concurrently. Therefore, at a point in the study when data analysis was coming to a close, and I was writing an interpretation of the findings, an independent researcher audited sections of the work in progress. The researcher who carried out the audit had access to all files of information from the entire study. She reviewed randomly selected tapes of interviews from both courses. She then examined the transcripts of those participants, and reviewed notes from each course. She chose four themes at random, and cross-checked the thematic files with the transcripts and also with pertinent sections of the thesis. The auditor confirmed that there was an accurate reflection of the data and the findings in the written work of the thesis. (For further details, see Appendix I) This independent audit was carried out to ensure that the proposed interpretation was linked solidly to the data.

The Researcher-as-Instrument

"Qualitative design requires the researcher to become the research instrument" (Janesick, 1994, p. 212). In this study, I interacted with 24 participants throughout a term of course work. As I engaged in research interviews, and read conference notes, I questioned what biases I had that might impact on the study. I approach teaching and learning from a constructivist perspective. Some students who participated in this study seemed to prefer to have knowledge transmitted to them, even in a Master's program. For instance, one student commented, "You need to give people step by step instructions, and not assume that they know things" (Christina, October Interview). Some of the students' visions of teaching and learning were substantively different from my own. Consequently I had to be aware of my own beliefs in discussion with these participants, and be cautious to listen carefully to understand their perception of learning in the computer conference.

In addition, I am an experienced technology user who teaches in the field of educational technology. I had to be careful to understand the reality of participants who were not as experienced in using technology. It is difficult to move back to a state of "not knowing" after one "knows". However, in my teaching responsibilities, I instruct adults who are learning to use technology in their teaching. This experience has allowed me to become sensitive to students' feelings— their fears and apprehensions about technology— and thus better understand the study participants' attitudes toward using computers for learning.

Context of the Study

In a qualitative study, a comprehension of context is critical for the development of understanding. Guba and Lincoln (1989) suggest that "Phenomena can be understood only within the context in which they are studied" (p.45). In order to provide a deeper appreciation of the context in which this study occurred, in this section I provide a brief profile of the participants in the study. I also describe the courses in greater depth and provide information about specific assignments which students were required to complete. Hopefully, this lens will help illuminate the context of the computer conferences and provide sharper details of the context of the study.

Participants in the Research Study

Participants in the Educational Administration Course

All of the students in the Educational Administration course who participated in this research study had completed some portion of their Master of Education degree. Some students had nearly completed their program, while others were mid-way through it. There was a range of experience in taking distance education courses among these students (including computer conferencing courses), as well as a range in attitudes toward technology in general.

Barry was working to complete two different programs, the Master of Education and also a program in educational technology. He was balancing the courses from these two programs over time. He was on a study leave from his high school teaching position during the computer conferencing course. He felt very comfortable with the technology in the computer conferencing course, and very confident in his ability to learn in the distance

education context (Initial Questionnaire).Though he believed that computer conferencing had "not reached its full potential...it's better than just sitting here at a desk and writing up a bunch of answers and sending them off to your instructor. ..At least you get the chance to read other people's ideas, the way they are thinking" (October Interview).

Janet was pursuing the Master of Education degree full time. She cautioned that she felt she was "very much at a disadvantage not having live classes--Learning [is] not the same" (Initial Questionnaire). She had not taken a course by distance before, and stressed that for her to do her best learning, she required contact with other students and with the professor. She did state that she was an intermediate level computer user, who felt comfortable using various pieces of software, though she had never used computer conferencing. She found that the web course caused her to develop "another way of tackling work. It just means you have to develop a different way of thinking about how you're learning, and how you're doing your course" (October Interview).

Scott was an elementary school teacher approximately mid-way through his Master of Education program. He was concentrating in the area of Teaching and Learning, and was taking the Educational Administration course as an elective. He described himself as an intermediate level computer user who enjoyed working with computers. He had pursued a number of courses by distance before, and had used computer conferencing in two of them. He stated that "it keeps you on your toes, the constant interaction between you and your classmates... making sure you are on top of everything...And also getting the thought and feelings of other people on the various issues in the course. So that's great in that way" (October Interview). Scott did not complete the Educational Administration course for

reasons which will be discussed in chapter four.

Andrea was a high school teacher taking her Master of Education degree on a part-time basis. She shared a major attitudinal change that she had experienced toward computers: "My attitude towards computer has changed significantly in the past three years. In my first year of teaching I was thrown into a situation where I had to teach a variety of high school computer courses so [I] learned about the applications very quickly. Having my own computer has lightened my workload at school ...tremendously ... Technology is not to be feared but to be treasured" (Initial Questionnaire).

Beverly was a teacher librarian who had finished her Master of Education program, and was taking further courses for higher certification. She believed that computers were a vital tool for work and personal life. She had already taken courses by distance including one that was offered via computer conferencing, and was an intermediate level user of technology who used e-mail and listservs daily, and the World Wide Web at least several times each week. She stated that "I guess it's a new way...for students to complete courses, and a new method of delivery, because I don't think it's going to go away anytime soon. And we should embrace the opportunity to learn in that way" (January Interview).

Edward was a elementary school teacher almost at the end of his Master of Education program who was also responsible for the school computers. He was in the Teaching and Learning concentration of the Master's program, and was taking this Educational Administration course as an elective. He described himself as an intermediate level computer user, who found that working with computers was "challenging but rewarding" (Initial Questionnaire). He was ready to learn more about technology and had

already taken one computer conferencing course. He found that he was growing more confident about learning in the distance education context as time went on, and he was even thinking about introducing the web forum to his school. He found that "It's stressful trying to get it [computer conferencing] to work and you're under more pressure, but yet it is rewarding because you can reflect more, and if you have problems, you can ask other students" (October Interview).

James was an administrator at a training center who found that pursuing his Master of Education program was difficult because of the travel requirements of his work. He felt strongly that because of his busy work schedule, he would be able to accomplish more through distance education than through traditional, face-to-face courses. His feelings toward the computer conferencing course were very positive: "well, it's my first time doing one this way, and for me, it's one of the better courses I've done in terms of flexibility and being able to work at my own pace...I'm really enjoying it" (October Interview).

Colleen was on a one year leave from her position as instructor at a community college who had completed her Master of Education degree ten years previous. She returned to university to upgrade her credentials. She described herself at the novice level of computer user, and said that she felt somewhat "insecure and apprehensive" about using computers (Initial Questionnaire). However, she reported that she had chosen to take this computer conferencing course because "I wanted to do a computer conferencing course because in my work, you know, I think it'll be good for me at some point to have gone through that experience if I get involved in development or giving a computer conferencing course" (October Interview).

Peter was a high school teacher who had nearly completed his Master of Education degree. He described himself as an intermediate level computer user, who regarded the computer as a useful tool (Initial Questionnaire). He had not taken any other distance education course as he worked toward his degree. Even though he had not taken a computer conferencing course before, he felt that he had "a fair idea of what to expect, although I didn't know...I hadn't actually seen the software. We're using Alta Vista Forum.I knew what to expect basically. I read the manual that was mailed to me...So in that sense, there were no surprises at all" (October Interview).

Deborah was a high school teacher who was nearing the end of her Master of Education program. She described herself as a novice computer user, who was "apprehensive, uneasy, but yet I want to learn" (Initial Questionnaire). As the course progressed, Deborah found working with the technology became much easier. She said, "In the beginning... I was much more apprehensive, but at the end, I was just going in and logging in myself. There was no problem at the end" (January Interview).

Participants in the Instructional Technology Course

The ten students in the Instructional Technology course who participated in this research study had varying degrees of familiarity with web site creation, programming in HTML, and working in a computer conferencing course.

Curtis was an experienced computer user who had been working with computers since 1985. He had gone online then with what would currently be considered a very slow modem, and Compu-Serve. "I spent all my free money. That was slow and it was the most amazing thing!" (October Interview). He was the Department Head in Mathematics and

Information Technology at a private school, and taught a number of courses in those areas, including teaching students how to develop their own web sites. He described himself as a very experienced computer user, who had used the World Wide Web every day for the past four years (Initial Questionnaire). He dropped out of the Instructional Technology course for reasons which will be discussed in the following chapter.

Theresa taught at the same school as Curtis, and was also very experienced in the use of computers. She taught information literacy to a range of students at various grade levels. She also taught younger students to design their own web sites. Theresa recounted how she and Curtis would work together on new technologies that were coming into the school: "We sit down and say, 'Hey, look at this!' and we play with it and between the two of us, you know, we end up learning how to use it. And every week, there seems to be something else new...We installed the Web Board here...so we've got to learn how to use it" (October Interview). Theresa was highly accomplished and comfortable working in a technology-based environment.

Jack was in the last year of an undergraduate degree program, preparing to become a teacher. He described himself as "very experienced" with using computers, and stated that he could not see an end to the advancement of technology. He added that he would like to share these advancements with his future students. (Initial Questionnaire). In the computer conference, then, Jack felt very comfortable: "There was stuff I didn't know. But I still had some rudimentary knowledge of concepts, or HTML, or small things of the sort that didn't allow me to become overwhelmed with all those things coming in" (January Interview).

Stuart was also in the last year of his undergraduate program. He shared his love of computers with me, and mentioned how his father had had an old Commodore 64 around, and he had begun playing around on that as a child. But he was able to develop a real expertise with computers when he became a sales person at a computer store. "From that experience at the computer store, that was it, I was hooked! I liked everything about it!" (October Interview). Stuart learned HTML by working on his own, exploring a variety of Internet tutorials, and by chatting with friends. He translated that enjoyment of the media into his work in the computer conferencing course: "Anything with a computer, I usually can. I can't pick it up with a snap of my finger, but ... I guess I have more incentive to keep at it" (October Interview).

Frank was working on a Master of Education degree part time, and he was employed full time as a computer programmer working on the Y2K problem. He told me that he had prior experience with computer conferencing in a course setting, and he had already done some web page development. "So both I guess academically and my own personal business, I've done a lot of what we did in the course" (January Interview). Frank was extremely comfortable with all the aspects of technology involved in the Instructional Technology course; "I'm somebody that's, you know, has my electronic mail on the go all day, or any of the listservs that I'm on, would be on the go all the day, so I'm very used to that" (January Interview).

Ronald had finished his undergraduate degree the previous spring, and was working in the area of technology at the university where Instructional Technology was being offered. He had worked as a "guru", a student/mentor or "technical assistant" who was

hired to help other students with the use of technology. He had worked for three terms teaching introductory material to students. He took the current Instructional Technology course as an independent study while he was developing several online courses for other institutions. The technology posed no challenges for Ronald. He mentioned that, "I think because I have such an interest in computers, that whatever course I would take online, if it was a subject I was interested in, I think I would excel" (October Interview). He also shared with me his feeling about computer conferencing and web-based courses, "I see the Internet as a great marketing tool, and as a great educational resource... So I'm happy with the way things are going now!" (October Interview).

Maureen was a former teacher who had chosen to stay home with her young family. She was pursuing an MBA degree while she was caring for her children, and was looking forward to completing her program in the spring following the Instructional Technology course. She was the person in the class who might have known the least about computer conferencing and website design, but she set herself the task of finding out all about HTML code, designing a site, how to ftp assignments. She told me that "I admitted right away that I didn't know anything, so then I had nothing to hide...That way if you ask dumb questions--like everybody may assume that you know how to do it. But at least if everybody knew I had no skills, then I didn't have to pretend that I knew something. But then anytime I didn't understand anything, then I just asked the people" (October Interview).

Donna was working on her Master of Education degree on an almost full-time basis. She was taking three other courses at the same time as the Instructional Technology course. She considered herself an intermediate user when working with computers, and was

quite excited about the opportunity to develop a web-based course (Initial Questionnaire). She planned to work on developing other web-based courses after she completed her degree. She wrote that she was excited about future technology, because "It's a tool that I would like to use to facilitate learning, i.e. facilitating through a virtual campus" (Initial Questionnaire).

Christina was an instructor in a technology-related field at a community college. She was studying to complete her Bachelor of Education degree, which was essential at her college. She was familiar with various pieces of software, but had not actually developed a web site before. She wanted to pursue this particular course, because she was planning to facilitate some distance education courses herself. Christina considered herself an intermediate user of technology, and stated that she was both excited and apprehensive about the technology of the future (Initial Questionnaire). "I think it can be a really positive learning experience...but it's not the end all and be all." (October Interview).

Corinne was an instructor at the same community college as Christina. She also taught in a technology-related field. She already possessed a number of degrees in her field, and was in the process of completing her Bachelor of Education degree (this was her final course). She also was pursuing work on her Master of Education degree. She was very comfortable using the technology in the Instructional Technology course: "I feel I am extremely self-directed, and learn very easily using this medium" (Initial Questionnaire). She also mentioned that "now I've taken pretty much my whole degree by distance... it [taking a computer conferencing course] worked out perfect for me." (October Interview).

Course Requirements

Assignments for the Educational Administration Course

In this course students were expected to:

- Post messages throughout the term, 100-250 words in length, related to various topical readings. These messages were to be used by the facilitator to construct a group paper.
- Collaborate in developing group reports: three 2000 word papers were to be submitted over the term
- Write an individual research paper focused on policy analysis.

The course content included six units which covered traditional areas of Educational Administration. There were two texts for the course, as well as an online manual approximately one hundred pages in length. Students often downloaded and printed the online manual as they came to various sections of the course, because they found it easier to read the information from hard copy rather than from the computer screen.

Students were informed about the expectations for discussion and debate in the small groups, which focused on the course's guiding questions. Thoughts were to be posted as "contributions" of 100 to 250 words which the facilitator could eventually integrate into the group's paper. During the term, three 2 000 word papers were required from each group, and each member of the group received the same mark. These papers were all posted online. Occasionally the instructors gave a particular learner a mark lower than the rest of the group, if that student's contributions to the group in terms of

messages posted online were lacking in either quality or quantity. The last course assignment was an individual paper which was submitted to the course instructors online.

Students worked in Alta Vista Forum. Their notes were posted to other students in their own group. Members from other groups could not see any other group's postings or submitted papers. The only place in the Forum where all the students in the class could communicate with one another was in the Question and Answer area, or in the Cafe. However, that option was underutilized, and students tended to communicate only in their own group's area in the Forum. However, students did communicate with the course monitor (a technology mentor) via e-mail, and the mentor replied via e-mail, or in the Forum. Students also communicated with the course instructors via e-mail or telephone, and were able to receive speedy answers to their queries. Some students also communicated with other students via e-mail or telephone for course-related or personal matters, after receiving a class list that included e-mail addresses.

Assignments for the Instructional Technology Course

Students in the Instructional Technology course were required to:

- Engage in ongoing discussions about web design skills and web sites.
- Produce a draft of their site conceptualization, including vision statement, intended audience, and user activities. Submit final draft of site conceptualization.
- Produce a draft of site design. Submit final draft of site design.
- Place finished web site on university server.
- Submit reviews of four sites produced by peers.

When the students enrolled in the course, they were shown a matrix of appropriate types

of messages to post in the Web Board. They were encouraged to try to post a number of different types of messages to each other. The first messages in the course were personal introductions. Students were then expected to immediately begin working on the conceptualization of their web site. There were various seminar rooms provided within the virtual classroom where students could go to practice their HTML skills, or to discuss problems or issues that arose in the course of their work on the Web. Student communications in these various seminar rooms received a course mark, and this assessment was ongoing throughout the course.

The second assignment entailed submitting an early draft, and then after receiving feedback, a final draft, of their site conceptualization. (Students were expected to ftp their conceptualizations, design drafts, and final sites to the university server). The third assignment involved submitting an early draft, and again, after feedback from other students, a final draft of their web site design. A fourth assignment was to ftp the finished web site to the university server. The final assignment in the course entailed a peer review of four web sites. Students in this course worked as a class on the Web Board. They were not divided into small groups, so everyone was aware of questions posed by others in the class. Those students who knew the answers to questions posed by another person were expected to share their knowledge and skill by replying. If no one in the class replied to a particular query, the instructors would step in and post an answer. The instructors in this course also encouraged learners to communicate through the Web Board rather than via personal e-mail or telephone. Due to the sheer volume of messages, web-based communication was considered the most efficient and effective way to

communicate.

Summary

In summary, this chapter presented the rationale for this qualitative study which explored the attitudes and perceptions of adult learners engaged in a computer conferencing course. I discussed the rationale for the constructivist approach which informed the research study, and shared my thinking about the making of meaning. The unfolding of the research study was described in detail. In particular, the rationale for my choices of methods of data collection are shared: the manner in which I invited participation in the study and the qualitative, in-depth telephone interviews which I held with the participants. The data analysis is described, as I worked toward increasing my understanding of the participants' multiple perspectives about learning in a computer conference. I also provided a sketch of each participant in the study, as well as further information about the courses.

The following chapter commences with an examination of the meanings which evolved throughout the study. These findings are organized in three sections, to illuminate the three research questions which motivated this study.

CHAPTER 4: FINDINGS

Introduction

This study involved participants from two universities in two different Canadian provinces enrolled in graduate courses offered via computer conferencing. The computer conference is a virtual, asynchronous learning environment in which students may come online and post messages from anywhere, any time. Of the twenty adult students who chose to participate in this study, ten learners (five women and five men out of a total of 27 original registrants) were enrolled in a Master's level Instructional Technology course. The other ten learners (five women and five men out of a total of 22 original registrants) were enrolled in a Master's level Educational Administration course. These twenty adult learners became involved as participants in the research study by responding to my information letter and completing the original questionnaire. The design of the study called for ten participants from each of the two courses chosen from among those who indicated their willingness to be involved. Only ten students from each course replied to my letter of invitation; therefore all who indicated a willingness to participate, did in fact participate in this research. Nine of the ten students who agreed to participate in the research actually completed the computer conferencing course. One research participant in each course did not persist in the course and dropped out.

In addition, a team of two instructors taught each of these courses, and all four of these professors (one woman and one man on each team) participated in the study. The instructors of the courses brought an important perspective to this research. Each team had taught its respective course several times, and thus could discuss instructor concerns and

learner needs from a viewpoint informed by experience. As well, the four instructors in these two courses viewed themselves as lifelong learners, whose learning is ongoing and experiential. New insights and understandings evolve for them during every iteration of the computer conferencing courses they offer.

In this study, I invited the participants to share their thoughts and views on learning in the computer conference. These viewpoints were collected through in-depth interviews conducted over the telephone, both early in the course and after the course was completed.(See Appendices F, G, and H for Interview Protocols). As well, I studied the conference notes in each course on a daily basis, and I collected the notes posted by the participants in the study. The salient features of communicating and learning in the computer conference from the adult learners' point of view were the principal focuses of examination. As well, the factors believed by the participants to explain their successful participation in the computer conference were of primary interest. Specifically, the research addressed the following questions:

- **How do students in a computer conferencing course describe themselves as learners?**
- **What is the relationship between learner achievement in the computer conferencing course, and the adults' description of themselves as learners?**
- **How do adult learners describe the task of constructing meaning in the reading/writing environment of computer conferencing?**

These findings are reported in three main sections. Each section is entitled in keeping with the primary research question being addressed. Janesick (1994) suggests that "Qualitative research depends on the presentation of solid descriptive data, so that the researcher leads the reader to an understand [sic] of the meaning of the experience under study" (p. 215). Therefore, observations and summative statements about these findings have been supported with extensive quotes from the participants. I have adopted this approach to ensure that the views and attitudes of the participants are accurately reflected.

Research Question One:

Adult Students' Description of Themselves as Learners

In this section I discuss the ways in which the adult learners described themselves as they worked in the computer conference. Firstly, seven personal learning characteristics emerged which were identified by the participants: (1) independence in learning; (2) persistence; (3) striving for excellence; (4) solving problems; (5) patience; (6) procrastination; and (7) flexibility. Secondly, I address two constructs which emerged as the learners and I worked toward developing a joint understanding of their learning in the computer conference. These constructs are perception of academic efficacy and motivation as learners. Thirdly, with the four instructors I explore two issues which arose from the literature: questions of gender and the needs of special learners.

Personal Learning Characteristics

When asked about (1) their own learning in the computer conference; (2) any learning strategies they developed; and (3) the internal factors that enhanced or inhibited their performance in the conference, the twenty adult learners identified seven common learning characteristics that impacted on their performance in the course. It should be noted that a learning characteristic had to be expressed by at least three participants for it to be reported. For example, fourteen of the students indicated that they were independent and self-directed in their learning. Eleven students expressed the view that they were persistent in overcoming obstacles. As well, a varying number of students identified striving for

academic excellence, openness to solving problems, having patience, being inclined to procrastinate, and being flexible in their approach to their academic work as personal learning characteristics. (See Table 1 for a tabulation of personal learning characteristics by participant).

What follows are some of the students' personal comments captured during the interviews. They are presented in the order of frequency of responses among the group of participants in the study.

Independence

Independence in learning was mentioned by fourteen students as an essential personal characteristic for effective involvement in the computer conferencing course. This characteristic was reflected in comments such as: "I think I learn well independently" (Andrea, October Interview). "I guess I'm very independent, also...You have to be the kind of student that doesn't have to have a lot of supervision" (Maureen, October Interview).

> I enjoy working independently. I don't mind not being in a class. I don't need that physical reminder that I'm with a group of people. (Curtis, October Interview)

The participants in this study equated being a self-directed learner with independence in learning. "Right now, the way technology is, I think, you really have to be a self-learner (Theresa, October Interview). "I am self-directed" (Donna, October Interview).

> I guess I'm really driven, and...I don't have to be prodded along, so I enjoy a distance course. I'm self-directed, and I know what I want. (Christina, January Interview).

Table 1: Personal Learning Characteristics

	Independence	Persistence	Striving for Excellence	Solving Problems	Patience	Procrastin-ation	Flexibility
Participants	**in**	**Educational**	**Administration**	**Course**			
Andrea	✔	✔					
Barry			✔				✔
Beverly	✔					✔	
Colleen	✔		✔				
Deborah	✔	✔			✔		
Edward		✔			✔		
James							✔
Janet	✔	✔					
Peter	✔	✔	✔				
Scott					✔		
Participants	**in**	**Instructional**	**Technology**	**Course**			
Christina	✔	✔	✔	✔			
Corinne	✔		✔	✔			✔
Curtis	✔			✔	✔	✔	
Donna	✔	✔					
Frank	✔	✔			✔		
Jack		✔					
Maureen	✔	✔	✔				
Ronald	✔			✔		✔	
Stuart				✔			
Theresa	✔	✔	✔				

> I do tend to do most of my learning independently, because there's not a whole lot of people at the end of their programs, like I am, and in the learning environment I'm in at work. (Peter, October Interview)

These independent, self-directed students were able to grasp the requirements of the online learning situation, and develop their own ways of achieving their learning. As a result they did not tend to rely heavily on instructor direction as evidenced by their performance online.

Persistence

Persistence was identified as an essential trait in the computer conference by eleven students. Persistence allowed students to continue to meet course requirements, even when things became difficult. In the Instructional Technology course, the server crashed on several occasions, and students had to shift to another server with a different-looking interface for over three weeks in the middle of the course. Without persistence, students might have been tempted to drop the course at that time. In the Educational Administration course, several students had major problems in getting online and connected to the course. As one student explained, "I know that I'm going to persist somehow..."(Edward, January Interview). If students who met obstacles had not persisted, they might have decided that the struggle was not worth their time and effort. "So I think endurance, too, being able to stick with it, came through" (Deborah, January Interview).

> I mean there's time when I was ready to sort of say, 'Look, maybe you don't have time to do this.' But I was really determined; this was something I wanted to do. So I did do it. I don't like to give up. So it was, I think, that determination helped me get through it. (Theresa, January Interview)

Striving for Excellence

Another factor which was identified by seven adult learners was their desire to do extremely well in their academic endeavors. "I'm driven to achieve well...So I strive for perfection even if it's not needed" (Maureen, January Interview).

> ... [I'm] not a perfectionist, but I'm very critical of my own work... Because we always bounce things off each other...we push each other to do our best. (Theresa: January, October Interview).

> In order for it to be a meaningful experience for me, in terms of learning, I have to feel that I'm being challenged. (Colleen, October Interview).

These students exhibited a desire to achieve a certain excellence which contributed to their commitment to hard work and attaining success in the computer conference.

Solving Problems

Openness to solving problems was mentioned by five adult learners who were all members of the Instructional Technology course. Learners in the computer conference courses faced a number of challenges, ranging from problems with the technology to facing the stress of interacting with others and meeting deadlines online. The problems described by these learners, however, were logistical (server crashes, problems with software) rather than cognitive or affective in nature.

Learners who had an orientation toward developing the "ability and the desire to search for solutions" (Christina, October Interview) perceived the problems as learning opportunities. "I don't mind technical problems. If something goes wrong, I don't panic, like the world's coming to an end. I can adapt, be a bit patient" (Curtis, October Interview). The instructors in the Instructional Technology course planned for some of the unexpected

glitches and encouraged their students to observe and learn from the problem solving strategies that they used.

> My feeling is that you learn as much from the problems as you do from the in-class information as well. That you have to learn how to troubleshoot because computers are going to do what they're going to do and that's that. (Corinne, October Interview).

> Being able to find out why it's not working, understand why it's not working, and think up solutions...Because just knowing there's a problem is one thing...but then finding a solution is something else. (Christina, October Interview).

> In troubleshooting...it doesn't really matter, if you agree that no question is too dumb, and everybody makes mistakes, it doesn't matter if the mistake is yours or somebody else's. You want to find the mistake. (Professor David MacDonald, January Interview).

Patience

Patience was a personal characteristic identified by five students in the computer conferences. When students logged onto the conference and posted a message or a question, instantaneous answers would not be forthcoming (unless the conversation took place in a chat room where two people 'talked' synchronously). People had to wait to receive feedback or answers from others. One student mentioned her belief that her involvement in competitive sport had helped her develop patience, a trait which was a benefit to her in the computer conferencing course.

> In terms of having patience, I tried to be encouraging, and to spur people on, and myself, you know, to try to do the best we could. (Deborah, January Interview)

Several other students pointed out the importance of patience in the computer conference, so that classmates did not give up on hearing from others in the conference or react too

quickly to perceived negative statements or opinions that others might have posted online. "It's not something you can rush, it just basically happens when it happens, so I think patience is important" (Frank, October Interview).

> I don't think I respond as quickly to verbal, or in this case, written barbs. Some people react a bit too quickly....You need a bit of patience. (Curtis, October Interview)

Procrastination

Three of the adult learners identified a tendency to procrastinate, to avoid beginning a particular assignment until the last minute as a personal learning characteristic. The computer conference was perceived as a learning environment which allowed that procrastination to occur without penalty.

> I'm a terrible procrastinator. But an online course like this gives a student like me the option to wait a couple of days and put things off, and still be able to take advantage of the full course, and not be left behind or anything like that. (Ronald, October Interview)

> My tendency to procrastinate has a large effect...and the problem sitting in front of me has more relevance than a problem that exists in cyberspace. (Curtis, January Interview)

> I am a procrastinator, and I think that this kind of lets you do that, you know what I mean? ...That's when I do my best work! I leave it right to the last minute. (Beverly, October Interview)

Flexibility

Being adaptable and flexible in the way work was approached was identified by three students as a beneficial learning characteristic in the computer conference, as well as in today's society (where change has paradoxically become one of the few constants). The adult learners found that a computer conference can be a fluid environment, where

everything is not "set in stone". If students were able to suspend a desire for certainty and go with the various changes that technology fostered, they could be more comfortable in the computer conferencing learning environment. "Things are changing so fast that you've got to change with it...If you don't change, you have a chance of *not* going ahead with the future" (Barry, October Interview).

> Technology's a truck, you have to be the trailer. You have to follow it turn for turn and you have to be willing to go with that and not resent changes. (Corinne, October Interview)

Psychological Constructs: Academic Efficacy and Learner Motivation

In this section, I continue to explore the first research question, how adult students describe themselves as learners. However, I examine the learners' descriptions from a slightly different viewpoint, which emerged as learners and researcher jointly worked to develop an understanding of learning in the computer conference. Two important constructs, academic efficacy and motivation, emerged from the exploration of the participants' description of their own learning in the computer conference. Participants in both courses pointed to a firm conviction in their own ability to learn in the conference and their strong motivation to learn in the computer conferencing environment. "I just don't let anything... stand in my way of learning what I need to learn" (Donna, October Interview).

Academic Efficacy

Engagement in a computer conferencing course requires that learners cope with new technologies, allocate time for the educational venture, and work at a physical distance from other learners. This applies to all computer conferencing courses. However, the

particular technology and the cognitive requirements of the two computer conferencing course in this research study differed somewhat. In the Instructional Technology course, students were expected to use technology to learn about technology, whereas in the Educational Administration course, students used technology to facilitate learning about educational administration. Because of these varying course requirements, students' responses in terms of academic efficacy also varied somewhat by course. Therefore, when I address academic efficacy, I separate the two courses. I discuss students' perceptions of their academic efficacy first in the Instructional Technology course, and second in the Educational Administration course.

Some adult students registered in the Instructional Technology course without possessing the recommended prerequisites. As they learned what the course expectations were, especially in terms of the technology, there were two different responses. A number of registrants dropped the course. In fact, one of the course registrants who had been willing to participate in this research study withdrew his name, because he felt he might be quitting the course due to the steep learning curve he encountered with the technology. Other learners accepted the challenge of the course, and worked diligently to develop an understanding of the basic prerequisites. One student knew she was starting with little knowledge about the Web:

> I was one of the people who knew nothing about web site creation when the course started, so I was probably very bottom of the class. And so I would go regularly every day for, I don't know, six to eight hours, into different sites to develop HTML skills....I just loved working online so much. (Maureen, October Interview)

Another student in the Instructional Technology course did not have quite as much time to

spend developing her HTML skills, but she was confident that she could learn whatever was necessary to work successfully in the course.

> I've only searched the Web before. I've never done anything to create my own web site, and never even heard of HTML before taking this course, but that kind of stuff doesn't scare me. I just see it more as a challenge. (Donna, October Interview).

"I'm adept (isn't that arrogant!); I'm adept technologically" (Curtis, October Interview). "I would think that I can achieve all of the same goals in a conferencing course" (Frank, October Interview). "I was very comfortable in the environment that we were working in" (Corinne, January Interview). Nine participants in the Instructional Technology course voiced or demonstrated a firm belief in their ability to learn successfully using technology and communicating in the computer conference.

The adult learners in the Educational Administration course also believed that they would be able to handle the course content and delivery mode successfully. Many of these students were quite advanced in their M.Ed. program. Four out of ten participants were experienced in taking Master's level courses in both face-to-face and distance learning situations, while the other six research participants were experienced in taking Master's courses in a face-to-face classroom only. However, these adult learners believed they could make a connection from their prior Master's level experiences to what the computer conference would require of them as learners. "But I had done so much that I knew I could do it" (Colleen, January Interview). "Oh, I think I can do it, without the shadow of a doubt" (Barry, January Interview).

> I pretty much look after myself. I mean, I'm at the end of my program. I can

> read perfectly well, I can follow the directions, I can synthesize well. If I end up in trouble, you know, I'll seek feedback from somebody. (Peter, October Interview)

Even one of the participants in this research who dropped the course was confident in his ability to accomplish the work using computer conferencing. "I would be confident in my ability... in the computer conferencing mode. Because it's usually based on writing skills, that sort of thing" (Scott, October Interview). After the course was over, which he had dropped and not completed, this student still believed firmly that he could have done well, given other life circumstances. "I think I'd do quite well, so long as I had the time to put into it...I would feel pretty confident that I would be able to be successful" (Scott, January Interview).

Another student who initially was intimidated by the computer, found her belief in her own ability growing throughout the course.

> Initially, I found it to be a bit threatening, because I wasn't quite sure. But once I got into the program, and with the help of my husband, who hoists the decks at computers, I find the course itself to be really good, in terms of learning... I don't think the computer's hard at all. I think we're just scared by it. And you know, I think if I had to use a program in administration, for instance, how to do a budget or something, I think it'd just be a matter of sitting down and fiddling around with it 'til I find out how that program works.(Deborah, January Interview)

Working through the course helped students who were not confident in their ability to learn successfully and develop confidence that they could cope with the demands of the technology and the course content.

> I guess through the course last term, by the end of it I had figured it out, you know, pretty much where I was going and what I was doing, and how to make it work a little better. So then when I had the opportunity to go back again this term I felt much more prepared, more confident. (Andrea, January Interview)

Seven participants in the Educational Administration course articulated or demonstrated their belief in their ability to learn successfully using technology in the environment of the computer conference from the very beginning of the course. Three participants found their belief in their ability to learn successfully (their perception of their academic efficacy) grew throughout the course. Professor David MacDonald suggested that with regard to computer conferencing, "those who are afraid, remain [afraid] you know, and can't do it. Those with confidence can do it" (January Interview). The adult learners in the courses in this research study demonstrated both in word and action that they had confidence in their own ability to learn in the computer conferencing environment.

Motivation to Learn

A factor that emerged in participants' responses in the interviews was adult motivation for learning. The participants in this research study described a number of motivations for their involvement in a computer conferencing course. When asked about internal factors which enhanced or inhibited their performance in the computer conferencing course, 17 out of 20 participants mentioned that their motivation was a factor in their performance. Participants in the research study articulated eight different motivations for their involvement in the computer conference including: (1) a desire to continue learning; (2) a desire to complete a degree, a course, or a program; (3) a desire to gain a credential; (4) a desire to become adept in the use of technology; (5) a desire to explore the relevancy of course material to work life; (6) a desire to take a course available by distance; (7) a desire to develop marketable skills; and (8) a desire to get good marks. (See Table 2).

Table 2: Motivations for Learning

	Professional and Work-Related Motives	Broadening of General Education	Instrumental Motives (Other External Goals)
Participants in the	**Educational**	**Administration course**	
Andrea	✔ Toward M.Ed		
Barry	✔ Toward M.Ed; Available by distance	✔ To stay on top of new information	✔ To work toward a leadership position; to share knowledge with students
Beverly	✔ Already possessed M.Ed.; Upgrade certification	✔ Interest in the area of educational leadership	
Colleen	✔ Already possessed M.Ed.; Upgrade certification	✔ To learn about designing computer conferencing courses	
Deborah	✔ Toward M.Ed.	✔ To learn more about computers	
Edward	✔ Toward M.Ed; Available by distance		✔ Prestige of obtaining Master's degree
James	✔ Toward M.Ed.; Available by distance	✔Relevance in work environment	
Janet	✔ Toward M.Ed.		
Peter	✔ Toward M.Ed.		✔ Develop new career skills
Scott	✔ Toward M.Ed.; Available by distance		
Participants in the	**Instructional**	**Technology course**	
Christina	✔ Toward B.Ed.		✔ To gain entry into M.Ed. Program
Corinne	✔ To complete B.Ed.		
Curtis		✔ To develop greater pedagogical knowledge re web site design; Available by distance	
Donna	✔ Toward M.Ed.	✔ Excitement in designing web page	✔ Desire to develop other web courses; develop her own job
Frank	✔ Toward M.Ed; Available by distance		✔ To get an acceptable mark
Jack			✔ To improve chances of getting teaching position
Maureen	✔ Toward finishing MBA	✔ To develop skills in web design; Enjoys learning	✔ To get accreditation for web-design work
Ronald	✔ To complete web design contract	✔ To hone web design skills and better understand process	✔ To improve web-site design skills for career advancement
Stuart			✔ To improve chances of attaining a position after graduation
Theresa	✔ Toward M.Ed; Available by distance	✔ To develop a site for other educators	

The adult learners' motivations were categorized utilizing Von Prummer's (1990) three categories of motivation for study by distance: (1) professional and work-related motives (for example, higher professional qualifications, increasing specialist knowledge); (2) broadening of general education (for example, pursuing learning for its own sake, acquiring a comprehensive theoretical background, enjoyment in opening up new areas of knowledge); and (3) instrumental motives (for example, achieving an external goal, such as getting and keeping a job, attaining career success, receiving greater pay).

The following section highlights some of the participants' descriptions of their motivations for enrolling in a computer conferencing course.

A Desire to Continue Learning

One motivation identified by many of adult learners was their need to continue learning and upgrading their own knowledge. These students placed an intrinsic value on learning, and articulated their belief in the worth of learning. "I want to learn. If I am to be successful, I'll have to feel that somebody's learning something from me, and I'm learning from them" (Colleen, October Interview).

> I figured that I was starting to get behind on new information and new ways of "doing" or "knowing". I figured that I needed to upgrade some of my educational ideas and beliefs and values... I am a learner, and then I go, get, and seek and I want new information. (Barry, October Interview)

> I, you know, I want to learn...That has something to do with the fact of achieving--for me it's the fact of achieving my Master's...of having a go and obtaining it, really...I enjoy learning new strategies. I enjoy learning new things that I can take back with me, that I can use... I enjoy using the computer, I guess it goes back when I see relevancy to what I am doing, is what makes me learn or what makes learning enjoyable, and therefore I learn more. (Edward, January Interview)

Many of the students demonstrated a commitment toward being lifelong learners, and discussed their enjoyment of learning. "I think as a learner I'm starting to figure out more things like, 'I need to know this. How can I find out' ?" (Christina, January Interview). " I think...you have to be constantly open to learning. You have to be willing to go with the changes" (Corinne, October Interview).

> I enjoy learning... I enjoy meeting other people, and I'm curious what other people are doing in terms of technology, in terms of how they see technology progressing. (Curtis, October Interview)

> I think I was just really motivated by the fact that I was excited by the whole thing. And once I actually started getting a scope and seeing what I was doing, putting all the pieces together, it just really excited me. (Donna, January Interview)

A student who was completing her M.B.A. described the enthusiasm that helped her decide to take the computer conferencing course.

> I guess I could just say I'm motivated and I'm driven to achieve well, and I'm driven to learn. I like learning new things all the time! (Maureen, January Interview)

One student stressed the idea that "I can sort of appreciate the opportunity to learn it when the time is right, when I want to learn by myself" (Frank, October Interview). Other learners in these two computer conferencing courses did not raise the idea of just-in-time learning, as Frank did, though learning something "just-in-time" is a hallmark of effective adult education. As Haughey and Anderson (1998) point out, "Learners are the most motivated, learn the most efficiently and are the most satisfied when learning is applied at the correct time to real and authentic problems" (p.6).

A Desire to Complete a Course, Degree, or a Program

Some students had been working on a degree for a number of years. They were motivated to achieve in this computer conferencing course because of a drive to complete what they had begun.

> Once I pick something up, I want to continue in it. So that kept driving me. The fact that I know I'm near the end of my program, that kept pushing me...I know how I felt when I finished my past course...I felt really good, because I have another closer to the end. And that kind of motivated me to do this course. (Edward, January Interview)

> I have a particular goal, and I have to meet that goal. I tend to set a goal for myself, and then I set a particular date that I want to have it done by, such as I had to have this degree done by this past December...I'm a very driven person...My actual primary objective when I enrolled in that course was to graduate, because that is the final course for my graduation...And I was really glad to have that over with. (Corinne, January Interview)

One student felt strongly about the importance of sharing the benefits of what he was learning with his students, and he also stressed that he intended to finish the program because he felt he had a long term contribution to make.

> I apply everything I learn to my students...I think the learning experience is the most important. You've got to want to learn...I think I have something to offer leadership... Mightn't be today, might not be tomorrow. Sometime down the road, I think I got the ability to be a good leader. Because I don't want to stop learning. (Barry, October Interview)

A Desire to Gain A Credential

One student identified the prestige associated with completing his Master's degree as an important motivator. "The fact of knowing that I'll get my Master's. That's a push, the prestige with it... or the feeling good about completing it." (Edward, January Interview). Other students realized that receiving accreditation for work done could impact on their

future work prospects: "It's nice, too, if you take a course, then at least you've got the accreditation behind you" (Maureen, January Interview).

Another student confirmed that his motivation in taking the computer conferencing course was to take a course at a distance that would help him attain the next level of his teacher's certification. "So in terms of motivation, I knew the course wouldn't be a core course for me, not a required one, but ...it would be three units and it was really important to get" (Scott, January Interview).

A Desire to Become Adept in the Use of Technology

Other students desired to learn how to use the technology for their own learning. They perceived technical competence as a life skill which would help them in the future. Becoming adept in the use of the technology was a motivator.

> And that's another reason I wanted to do the course, because I wanted to learn more about the computer... I went from not knowing a single thing about getting online in this course, to knowing now in a relatively short period of time, you know, without much hassle. (Deborah, October Interview)

One student who worked with computers on a daily basis stated that, "This is one of my outlets, where it's not just a job for me, but it's also a hobby I enjoy. I just love working on the computers, doing this sort of thing" (Ronald, January Interview).

A Desire to Explore the Relevancy of Course Material to Work Life

Several of the adult learners felt strongly about completing the computer conferencing course because of its relevance. The subject matter of the course itself had a strong relationship to their own work, and allowed the learners to make a linkage between the academic world and the real world. "I'm doing the course because I'm interested in

how I can relate it to my work...I was really interested in the content, so that helped academically" (Colleen, October Interview).

> A lot of the concepts they were talking about in the course were exactly what I was doing in my regular job, right from the adults that we were servicing, to the staff we have at the training center. (James, January Interview)

> I'm a graduate student who's very interested in progressing and looking at jobs...There's a vision and a sort of push, a motivation that comes from there, as much as it does from the material, you know? In other words, I'm at a point where I'm really ready to grow. And I think that is my main push. (Peter, January Interview)

One student's full-time job was in teaching technology to school children. She found that she was able to make many connections between the subject matter of the course and the work she did in her own teaching.

> I have such a personal interest in it...I enjoy working with the children. I enjoy, you know, making things simpler for them. So that was my motivation to do it. And again, if you like something, and you're motivated to do something, it's always easier. (Theresa, January Interview)

A Desire to Take a Course Available by Distance

Several students commented that one motivation in taking the course was that it was offered by distance. The fact that the course was offered by computer conferencing allowed one student to continue to work on his Master of Education degree, while living in a different province. Although this rationale for taking a course was a traditional, acceptable rationale, the student spoke as if he had to defend his position.

> So... I guess the fact that it was a conferencing course was one of the prime reasons, as opposed to what the actual material was in the course...I guess you could say, "Does a good student take a course for the credit, or do they take it for the learning gained from it?" And I guess here was a case where I took it for the credit...And I mean, I want to learn as well, but maybe the fact that I have a degree is just as important, or more important than what I learn in the

> course, from a practical point of view. If I have that Master's of Education, that may open some doors that aren't open to me right now. (Frank, January Interview)

A Desire to Develop Marketable Skills

Another student's motivation for taking the computer conferencing course was "to get that extra break that you need to get into the work force. Like being able to put that on my resume" (Stuart, January Interview). One student who was completing his teacher training had chosen a second concentration in computer education for his degree, and believed that it would be important for him to be able to work with developing web sites after he achieved his goal of being offered a teaching position.

> I basically got into it because of the job market and because of my interest in computers...There's a pilot program ...in computer education...So there is a new-found interest, I guess, in computers and Internet literacy. (Jack, October Interview)

A Desire to Get Good Marks

Several students identified the importance of getting good marks in the course as being a motivation to work hard and complete the course.

> So when I take a course, 'cause I'm finishing up my B.Ed., there's two things that I want. I want to learn from the course, and I also want a good mark. Because I need the good marks to get into this [program], for they're pretty selective...(Christina, January Interview)

One student mentioned that he felt "a mark-driven motivation...I'm motivated to get what I feel is reasonable or acceptable mark for the course...I have to do well enough that I'm at least going to be satisfied with what I get." (Frank, January Interview). He observed

that making the "Top Ten Posters" public knowledge (one of the features of Web Board) placed a pressure on him. He felt he *had* to post messages, and get his name among the top ten.

> So you know that maybe as much as you don't want to say something, you say, "Well, okay, I can say blah, blah, blah." Maybe it doesn't really turn me on to say that, but I'll write it in, it'll be another tech mark for me...Those are the kinds of motivation, I guess, that I would have in this kind of a course.(Frank, January Interview)

However, he also felt an urge to help people if they happened to ask for help on the Web Board. "I guess basically, I'm almost as motivated to help people as to make my site that little inch better...So in other words, I'm satisficing, isn't that the word? I'm making it satisfactory that I can live with it" (Frank, January Interview).

The range of motivations for these adult learners to pursue the computer conferencing course was varied. Achieving good marks, completing degrees, learning for the fun of learning, preparing for the world of work, upgrading skills and knowledge--are well-documented motivations for adult learners to engage in a learning experience. The group of adult learners who were involved in this research study, then, described motivations to learn which were quite similar to motivators described in earlier research studies (Ehrman, 1990; von Prummer, 1990; Wilkes & Burnham, 1991).

Exploratory Issues: Gender and Learners with Special Needs

In the literature surrounding computer conferencing, the issues of gender and special needs learners have occasionally been investigated (Ferris, 1996; Kinner &

Coombs, 1995; Pemberton & Zenhausern, 1995). In this study, questions regarding these two issues were addressed with the four instructors of the computer conferencing courses. I explored these issues with the instructors because of their longer-term perspective of working with learners in computer conferencing courses over a number of years. I did not raise these issues with the twenty adult learners who participated in the research, because I wanted to see if these issues emerged as concerns of theirs in their interviews. The issues did not emerge, and now in hindsight, I would have preferred to ask the students directly. This points to one possibility for further research.

Gender

When I explored the issue of the gender differences in the computer conference with the instructors in the courses, all four instructors were aware of the potential impact of the question on learners, though gender did not appear to be an issue in the computer conferencing courses they taught. Gender was certainly *not* an issue for the instructors in the Educational Administration course.

> [I have] not observed any difference in gender, and you know, the degree of comfort...certainly does not appear to be related to gender in any way. (Professor Ben Stone, January Interview).

> I haven't seen or felt that the females were any more intimidated by the media, you know, the computer and the methodology of using it in the conferencing than the males. In fact, some of our stronger people were females. (Professor Jennifer Stanley, January Interview).

As well, neither of these instructors had seen any gender differences in the type of communication posted in the computer conferences.

> I don't really see any difference whatsoever in the style of presentation...there's certainly nothing that jumps out to say, "This is a

> typical male response, or male structure, and this is a female structure as such." (Prof. Stone, January Interview).

There was a balance between male-female numbers of students in the course, with five male and five female participants in each course involved in this research. (There was also a gender balance in the course offered the term following the course in this research study, with ten women and eleven men registered for an Educational Leadership course.)

Gender and technology were not issues for the instructors in the Instructional Technology course, either. Professor Amy Newson said that she had "thought and talked and read a fair bit about ...gender and technology" (January Interview), although gender issues had never struck her as having an impact in the Instructional Technology course. However, she did observe that female participants in these computer conference courses tended to produce a higher volume of postings. "I would say that in terms of quantity, the females create more volume, you know" (Professor Newson, January Interview).

In the Instructional Technology course, students are shown various levels of conferencing discussions, since the seminar component is part of the course mark. The first level of quality discussion is (1)"information sharing," the next is (2) sharing "well-thought out suggestions and ideas," while the third and highest level of quality discussion entails (3) posting "well-written and thoughtful critique and defended argument." Quick messages which simply indicate agreement or approbation are not really encouraged, unless these notes are substantiated with "additional information, suggestions, ideas, critiques, or arguments" (Course notes: Grading Criteria). As she continued to think about the factors of gender in the course, Professor Newson mentioned that the female

students might produce more of the "pat-on-the-back, helpful" types of communication. However, even if the female members of the course produced more supportive types of communication, Professor Newson suggested that her observation did *not* mean that females did not post higher level communications as well, "because they do." Sometimes both types of communication were included in one note.

> Hi Curtis: I took a look at your draft and it certainly is impressive. This is a huge undertaking- are you planning to complete the whole thing for this course, or are you doing a module of the final project? I found your information to be very precise and driven to the intended audience. Looks great! Corinne (Corinne, Course note, September 29, 1997)

Mentor Roles

Within the Instructional Technology course, Professor David MacDonald mentioned that "there might be more men in the course overall, but not necessarily those taking leadership roles" (January Interview). Within the course itself, both females and males took on leadership roles. As well, he had not observed that males were more confident with communication technology. However, Professor MacDonald did caution that there was probably a different population that took the Instructional Technology course, for: "These are people who are interested, obviously, in communications technology, and interested in this in the first place" (January Interview).

However, outside of the course, the distribution of roles became a little different. This particular course had historically been a source of technology mentors, who "rise to the top" in the course, and who were then offered a mentoring position to help in the labs and work with other students. Professor MacDonald reflected that "by far the

majority of gurus (as we call them) have been male. I don't know why, but that's been the case" . He suggested that there might be a number of reasons why this was so.

> Maybe men like the title better than women... They're interested in technology, and some are interested in these leadership titles. (Professor MacDonald, January Interview).

In fact, one of the female students in the Instructional Technology course had just been hired as a mentor-- and she was one of the very first female mentors who would be working closely with the instructors.

In the context of these two computer conferencing courses, the issue of gender had little impact in terms of the quality or quantity of work produced by the students, though in the Instructional Technology course, one instructor observed that women students tended to produce a larger quantity of "pat-on-the-back, helpful"notes.

Learners with Special Needs

The issue of the learner in need, who might benefit from the asynchronous nature of the computer conference, has been discussed by educators (Kinner & Coombs, 1995; Pemberton & Zenhausern, 1995; Schrum, 1993). It has been suggested that adult learners who have special learning needs might benefit from the use of technology and technological adaptations (Coombs, 1989). In the research interviews, I asked the instructors of the research courses if they had ever had the opportunity to work with special needs learners in the context of a computer conferencing course. Special needs were defined as including students with mobility, sensory, learning, or cognitive challenges. There were few special needs students who were mentioned by any of the instructors. "I don't know of a student I've had who had any special needs, certainly

hasn't been brought to my attention" (Professor Ben Stone, January Interview). Professor Stone contrasted the computer conferencing situation with a face-to-face learning situation. In a face-to-face class, he just had had a student tell him that he needed to sit in a particular seat, and needed to be able to see the professor's face because of a hearing loss. In contrast, in the computer conference, there would probably not be a reason to mention that physical disability.

English as a Second Language

Professor Jennifer Stanley mentioned that one group of students who had special needs in the computer conference were those for whom English was a second language (ESL). In the research course, one ESL student had come to her for help in understanding English conventions and the academic style of writing. The professor was able to offer one-on-one assistance in her office to this student, because this person happened to be on-campus. If students in the program require assistance in that manner, Professor Stanley confirmed that "we would ...make sure that we would accommodate them in any way we could". However, she was not aware of any other learners with special needs who had participated in the computer conferencing courses, since "nothing has been brought to our attention that required any kind of interventions, or any kind of special consideration" (January Interview).

Visual Impairment

Professor David MacDonald recalled one student in a mixed mode class, a course in which some work occurred online, but there were also class meetings face-to-face. Because of the face-to-face component of the class, the instructors were aware that one

student was visually impaired. Because of the difficulties this student encountered as he attempted to use the web resources to complete his class work, the instructors realized the importance of guidelines for building web sites for sensory-impaired students. "He went out and tried things, discovered things, and taught us about the situation" (January Interview). Professor MacDonald and Professor Amy Newson developed guidelines using the feedback from their visually impaired student and his mentor, and now utilize these guidelines for web-site development in all of their web-based work. These guidelines include information such as placing periods at the end of phrases in a bulleted list, so that the software reading the text recognizes it as a list rather than one long, run-on sentence. These guidelines were certainly an adaptation that allowed visually and hearing impaired students to function successfully in the web-based environment.

Low Literacy Levels

When asked about learners with special needs in computer conferencing courses, Professor Newson mentioned a student in the Instructional Technology course who seemed to have special needs in terms of her verbal and writing ability. This student:

> ...had an extreme difficulty putting her thoughts in writing so that we could understand-- articulating, writing...just a really really low low writing level. We just had a horrendous time....she could not articulate in writing or verbally, the problem.(January Interview).

This difficulty prompted many meetings and discussions with the student, as well as with her advisor, to help the student learn and complete the course. Such a serious difficulty in written communication made functioning successfully in the computer conference problematic for this student. Yet, Professor Newson stressed that:

> If there is a learning disability that we're not aware of, that is surmountable, and we need to make some adaptations or adjustments. We need to know about it so that the learning can still take place. (January Interview).

She was confident that the adaptations that could be made would allow a learning disabled student to work and learn successfully in the computer conference. Other than the aforementioned students, Professor Newson was not aware of any special needs learners who had ever enrolled in the Instructional Technology course.

None of the adult learners discussed above by the instructors participated in this research study. The student who was learning English as her second language, and the student who had major difficulties in expressing her thoughts in writing, had both been invited to participate in the research, but had not chosen to take part in the research study. The hearing impaired student mentioned by Professor Stone, and the visually impaired student mentioned by Professor MacDonald had been students in courses that had been offered previously, not in the courses in this research study.

A Summary of Research Question One

In reference to the first research question, participants identified a range of learning characteristics which they felt they possessed. In the reported findings I highlighted the seven learning characteristics that were expressed by at least three participants in the research interviews. The characteristics of "independence" (reported by 14 students) and "persistence" (reported by 11 students) in the computer conference were the most frequently identified. Adult educators have suggested that without these two

learning characteristics, it would indeed be difficult for adults to initiate and complete academic work in addition to their everyday responsibilities (Garland, 1993; Gibson & Graff, 1992).

Seven of the students reported that "striving for excellence" was characteristic of the way they learned--these learners felt that it was critical for them to try their best and as a result, to learn successfully in the course. Five of the participants in the research study identified "solving problems" as one of their personal learning characteristics. This phrase is often utilized in conjunction with requisite skills for the information age. It is interesting to note that all of the learners who identified "solving problems" as a characteristic were members of the Instructional Technology course. In that course, both of the instructors stressed the importance of becoming problem solvers and learning how to trouble shoot problems, and as well, they demonstrated and modeled that skill for their students. "Patience" and "flexibility" were identified by students who had become aware of the requirements for these learning characteristics in the computer conference. Learners had to exercise patience while waiting for their colleagues' postings in the conference. Learners who identified flexibility as a learning characteristic had become aware of the fluidity of work, postings, and communication in the computer conference, and could cope with this constant change. "Procrastination" was perhaps the most surprising learning characteristic identified by the adult learners in the computer conference. Three participants in this study identified how the environment of the computer conference allowed them to procrastinate and not address course issues, assignments, and postings until the latest possible moment. One student suggested that this characteristic might be understood as prioritization--the

work that was immediately present exerted more pressure than an assignment not due for a week or two. However the other two participants stressed that procrastination-- not working on it because it was not yet due— was certainly a personal learning characteristic which the computer conference allowed them to utilize.

Two constructs that emerged during discussions with the participants in this study were learners' perceptions of their academic efficacy and their motivation for involvement in the computer conference. Nineteen of the twenty participants in the research study voiced or demonstrated their conviction that they would be able to learn successfully in the computer conference. Eighteen out of twenty participants did in fact, complete assignments and other course requirements, and successfully earn academic credit in the course. The adult learners also voiced a number of different motivations for choosing to take the computer conferencing course. These motivations ranged from completion of a degree to a desire to develop marketable skills. The participants in this research study did not identify any atypical motivations for choosing to take a course by computer conferencing.

In the final component of this section, I explored the issue of gender and of learners with special needs with the four instructors in the two courses. Although both these issues are strong themes in the distance education literature, "gender" and "learners with special needs" were *not* identified as issues exerting an impact in either of the courses in this study. I asked the instructors direct questions about these issues, and found that these were not issues in the research courses. I had anticipated that these issues might emerge in discussions with the twenty student participants in the study, but this was not the case.

The findings from this section-- adult students' description of themselves as

learners— form a base for the exploration of the second research question in the next section. In addition, what the participants in this study said about the intrinsic and environmental factors that influenced their achievement in the course are presented and explored.

Research Question Two:

Learner Achievement and Students' Self-Description as Learners

In the previous section, those participating in this study shared their views of themselves as learners. Their perceptions of their personal learning characteristics, their various motivations to study, and their strong belief in their own ability to learn were the salient factors of their self-descriptions as learners. As well, I examined the instructors' comments about gender issues and special needs learners in the computer conferences. In this section I explore the participants' views about learning successfully in the computer conference, and the factors they identified as contributing to that success in order to answer the second research question:

> **What is the relationship between learner achievement in the computer conferencing course, and the adults' description of themselves as learners?**

In this study, achievement has been defined as learners' successful completion of the computer conferencing course, including completing all assignments and gaining academic credit for the course. The measure of student attrition or persistence is the measure used most frequently in distance education research to determine learner achievement (Bernard & Amundson, 1989). Eighteen of the participants in the study were able to achieve success according to this definition, while two participants did not. However, the eighteen students who did achieve in the courses had various self-perceptions of this success (Gibson, 1991). The participants had varying personal learning objectives, which impacted on their perception of their own achievement in the computer conference.

In the first component of this section, I explore the relationship between learners' attitude toward achievement in the course, and what they said about their personal learning characteristics. In the second component of this section, I discuss the connections between learners' attitudes toward their achievement in the course, and various strategies that they described as important for success. Specifically, the adult learners identified seven factors which impacted on their ability to learn successfully in the computer conference: (1) actively participating; (2) interacting with others in the conference; (3) working consistently and maintaining links; (4) using technology capably; (5) communicating effectively; (6) being organized in the conference; and (7) learning from prior experience.

External factors have been identified as having a major impact on learner achievement in distance learning environments (Coldeway, 1996; Wilkes & Burnham, 1991). In the next component of this section, I share the adult learners' opinions about the impact that various environmental factors from their work, home and academic lives had on their achievement in the course, and on their ability to achieve their own learning objectives. I also share the insights of learners and instructors into two interconnected issues that had a major impact on learning in the computer conference: time and workload. Finally, a major issue in the literature, student attrition, is examined with relation to the two participants in this research who dropped out of the computer conferencing courses.

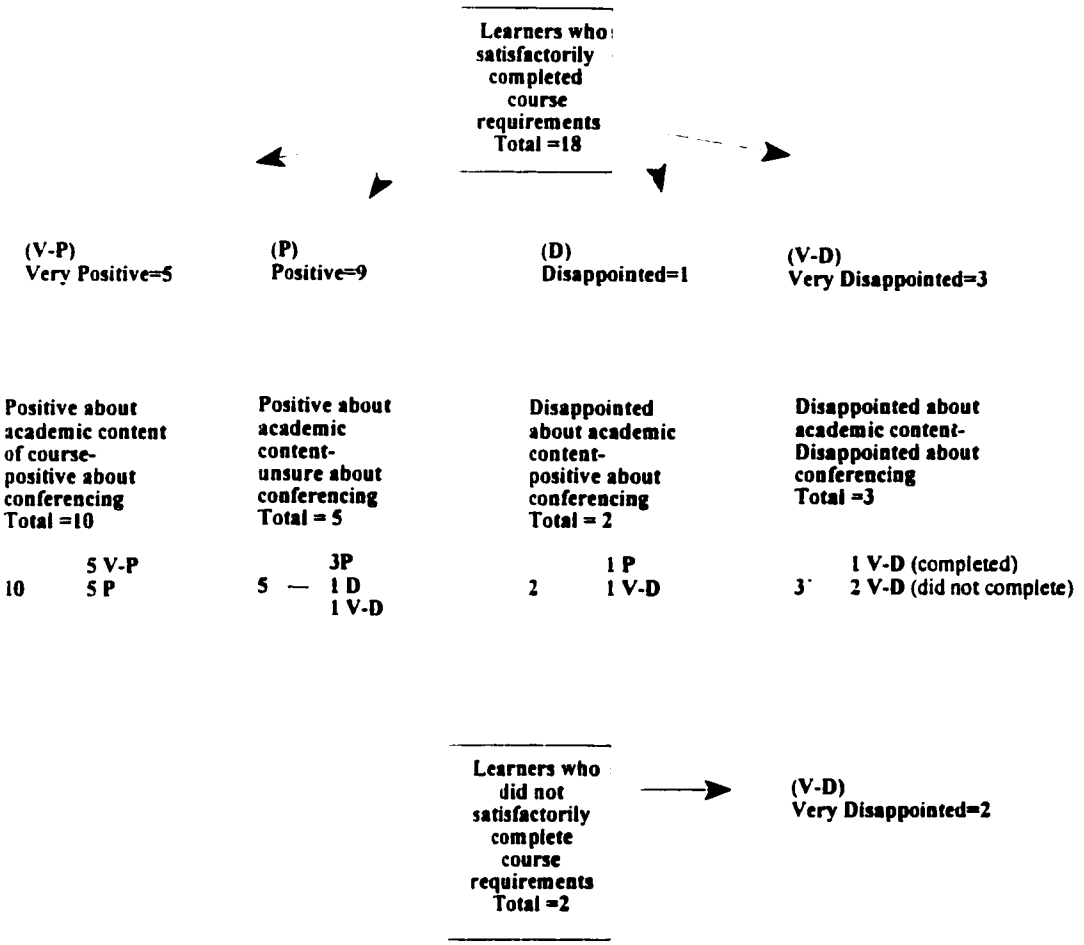
Learners' Attitude toward Their Achievement in the Computer Conferencing Course

The learners in this study had a range of personal learning objectives when they enrolled in the computer conferencing courses. Although for the purposes of this study

"achievement" was defined as satisfactory completion of the course, for many learners, their sense of achievement in the computer conferencing course seemed to be dependent upon their own learning objectives when they initially enrolled in the course. The adult learners in this study had a range of reasons for enrolling in the course, including completion of requirements for a Master's or a Bachelor's degree, earning one more credit toward completion of a program, or developing marketable skills which could lead to employment. Students' motivations for enrollment in the computer conferencing courses had a major impact on their learning objectives. Some learners were intent on developing HTML skills (learning a skill), while others wanted to make strong connections between theory and practice in the area of Educational Administration (developing knowledge). Their sense of achievement upon completion of the course depended in part upon whether, or to what extent, their personal learning goals and objectives were met.

Figure 2 depicts learner achievement and sense of satisfaction along two dimensions: (1) academic content and (2) the computer conferencing aspect of the course. Five learners felt *very positive* in their reaction to the question probing how they would evaluate their learning achievement in relation to their own objectives. All five of these students were positive both about the conferencing aspect of their achievement, and the academic content of the course. Nine participants felt *positive* in general about how their achievement matched their objectives. There were some differences, however among these learners, since five felt positive about the conferencing and the content of the courses,

Figure 2. Learners' achievement and sense of satisfaction in computer conferencing course



while three learners felt positive about the academic content of the course, but did not confirm that the conferencing aspect had really met their objectives. And the last student in this group, felt disappointed about the content of the course, but was very positive about the conferencing aspect of it. One student was *disappointed* in the computer conferencing course. Even though he had satisfactorily completed the course, he was disappointed because the learning objectives he had set for himself had not been met. He did feel positive about the course content, but did not feel that the conferencing experience was all it could have or should have been. He had previous experience in computer conferencing courses, and had high expectations for learning in the conference. These expectations were not met, thus leading to disappointment with the course.

The final group of five learners were those who were *very disappointed*, and felt their learning objectives had not really been met. Two of these students had not completed the course, while three learners had completed the course requirements. Within this group, there was one student who was positive about the content of the course, but not sure how well the conferencing aspect of the course met her objectives. Another student felt disappointed about the academic content, but positive about how the conferencing aspect of the course had in fact met her learning objectives. The other three students were disappointed in both the conferencing aspects and the academic aspects of the course.

Figure 2 is intended to highlight student achievement and sense of satisfaction in terms of meeting personal learning objectives, and thus allows the reader to gain a clearer impression of learner achievement and satisfaction in the computer conference.

Learners' Attitude toward Achievement and Personal Learning Characteristics

The twenty learners who participated as students in this study named seven prevalent learning characteristics which described themselves as learners in the computer conference. These characteristics have been discussed at length in the previous section of the chapter. Table 3 presents the participants in the study arranged in a continuum of "attitude toward achievement" ranging from *very positive* to *very disappointed.* The twenty learners have been placed in groups on the continuum according to their own evaluation of their learning achievement relative to their personal learning objectives. Students' learning characteristics are arranged in the columns. When this representation was examined, it was concluded that there was no apparent pattern differentiating the learners. That is, there did not seem to be any distinctions that could be made generally about the groups of learners on the continuum from *very positive* feelings about achievement in the course to *very disappointed* feelings about achievement in the course. Nevertheless, it can be suggested that these learning characteristics, taken together, are important--they help to portray a collectivity of feelings about achievement that may be typical of learners in computer conferencing courses.

Table 3: Perception of Achievement of Learning Objectives in the Computer Conference and Personal Learning Characteristics

Participants in order of strength of attitude toward achievement in course	Independence	Persistence	Striving for Excellence	Solving Problems	Patience	Procrastination	Flexibility
1 Andrea	✔	✔					
2 *Corinne*	✔		✔	✔			✔
2 *Donna*	✔	✔					
1 *James*							✔
2 **Maureen**	✔	✔	✔				
1 Barry			✔				✔
1 **Beverly**	✔					✔	
1 **Colleen**	✔		✔				
1 **Edward**		✔			✔		
2 **Frank**	✔	✔			✔		
2 *Jack*		✔					
1 Peter	✔	✔	✔				
2 *Stuart*				✔			
2 *Theresa*	✔	✔	✔				
2 *Ronald*	✔			✔		✔	
2 *Christina*	✔	✔	✔	✔			
2 *Curtis* *	✔			✔	✔	✔	
1 **Deborah**	✔	✔			✔		
1 *Janet*	✔	✔					
1 **Scott** *					✔		

1= member of Educational Administration course
2= member of Information Technology course
***= student who did not persist in course**
Names in *italics*=participants who met ftf
Names in bold=participants who "met" only within computer conference
Note: Participants are arranged within categories (very positive, positive, disappointed, very disappointed) in alphabetical order

Learners' Attitude toward Achievement, Intrinsic Factors, and Environmental Factors

When participants in the study were asked to describe internal or intrinsic factors which enhanced or inhibited their performance in the course, they identified various factors which they believed impacted on their learning in the course. In addition, learners were asked to describe external or environmental factors which they believed impacted on their performance. The learners' comments are displayed in Figure 3.

This figure includes both intrinsic and environmental factors which the students identified as impacting on learning, and clarifies the differences among the groups of learners on those dimensions. Learners who felt *very positive* about attaining their learning objectives described themselves as "driven to learn". They were goal oriented, and had a strong perception of academic efficacy; they believed they would be able to utilize the technology to learn the academic content of the course. A majority of these learners had a supportive employer, accessible technology, and found that they could make numerous connections between course content and their work lives. They also raised the issue of course workload as having an impact on their ability to do all they would have liked to do in the course. Learners who felt *positive* about their achievement in the course stressed their "desire to learn". They were strongly motivated, had an interest in the cognitive content of the course, and had a fairly strong perception of academic efficacy. The students in this group believed as well that they would be able to learn the course content utilizing the technology of computer conferencing. The one learner who was *disappointed* in his achievement was very motivated to learn, enjoyed technology, and found the course content relevant for his work life. The group of learners who were *very disappointed* in

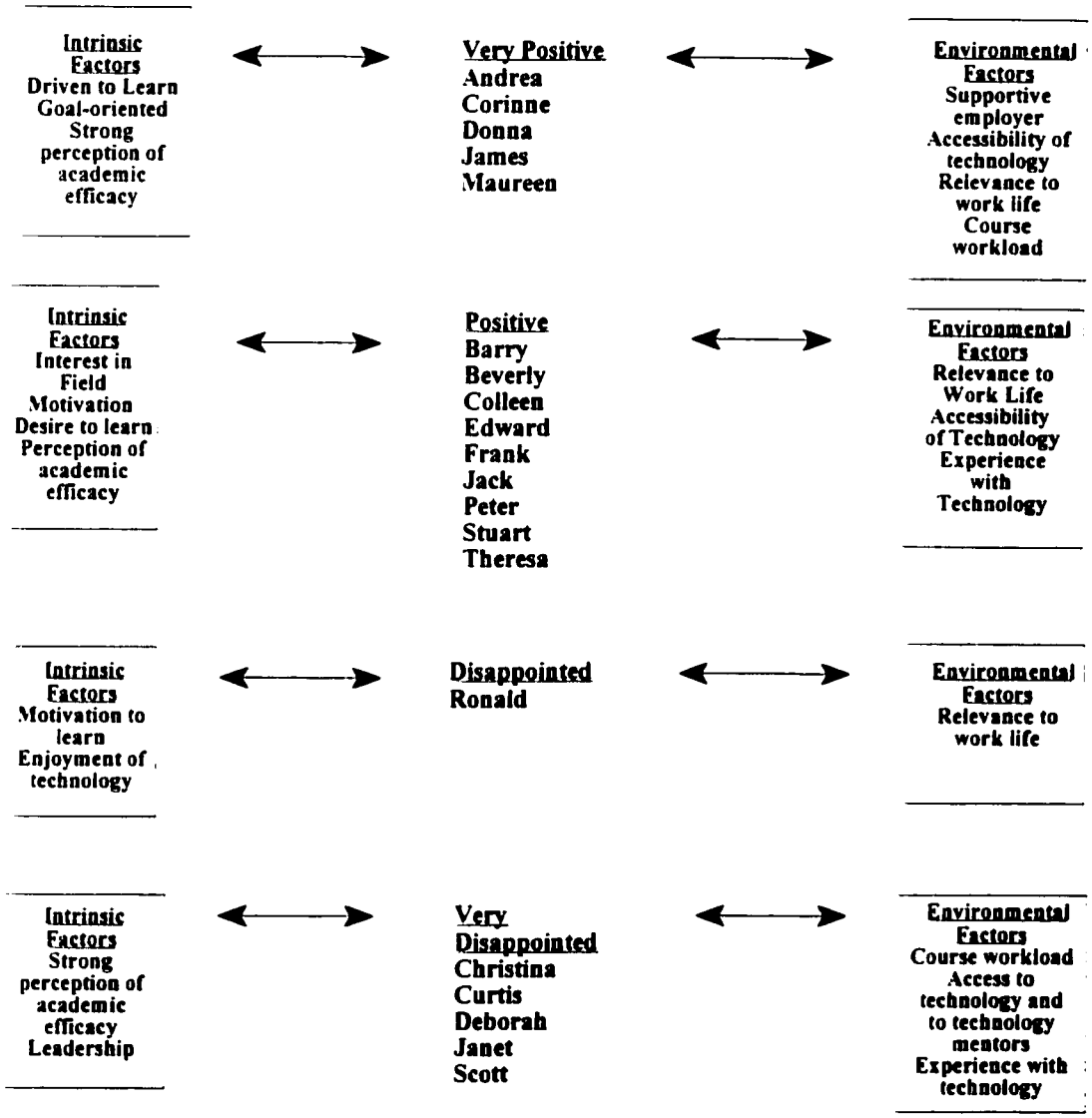


Figure 3. Learners' attitude toward achievement and expressed intrinsic and environmental factors impacting on that achievement

their achievement in the course had strong perceptions of academic efficacy. They believed that they would be able to learn the academic content of the course through computer conferencing technology. A majority of this group also spoke about fulfilling a leadership role in the course. They stressed course workload, the importance of access to technology and technology mentors, as well as the importance of having experience with technology. One interesting observation is that the groups who were either very positive or very negative about their achievement in the course had strong perceptions of their academic efficacy (with one exception). This trait is also found in the students in other groups, although not voiced or demonstrated as strongly.

Learners' Attitude toward Achievement and Strategies for Successful Learning in the Computer Conference

The adult learners in the computer conferencing courses in this study had various ways of approaching learning. In their own past experiences, they had developed different strategies and applied them in different learning situations. The students applied many of these strategies to learning in the computer conference, their new learning environment. Table 4 presents the participants in the study arranged in the continuum of "attitude toward achievement" and the strategies they identified for learning in the computer conference. Once again, when this representation is examined, there is no strong pattern that would differentiate the learners on the continuum. Those students who were very positive about the achievement of their learning objectives did not differ noticeably in learning strategies utilized from those students who were very disappointed.

However, there was a slight difference in the number of learning strategies discussed by the various groups of students. The group of five learners who were *very positive* identified strategies a total of 15 times during the interviews, while the group of five students who were *very disappointed* in the achievement of their learning objectives identified strategies a total of 11 times. All groups had students who utilized a range of strategies to learn in the computer conference. It is difficult to draw any distinctions among the groups, nevertheless, it may be suggested that the learning strategies are important facets of adult students' learning in the computer conference. As such, seven factors leading to successful learning identified by the participants are explored individually in the following discussion. (See Table 4).

Work on a Consistent Basis

The learners in the computer conference courses came to the realization that working in the conference on a regular basis, putting the time in, was an essential requirement for success. "You have to dedicate time to work on the requirements for the course...you have to do it every day so you don't fall behind" (Maureen, October Interview). "Daily, I'm on the computer, looking to see if anyone else has contributed" (Andrea, October Interview). Some adult learners found that logging on frequently throughout the day was a good learning strategy for them in the computer conference, while others found that they needed to dedicate a time period for their work in the conference.

> I'm definitely not a "Well I have ten minutes here. I'll log on and see what's going on." I prefer to set aside time and really dedicate myself to something. (Ronald, October Interview)

Table 4: Perception of Achievement of Learning Objectives and Strategies for Success in the Computer Conference

Participants in order of strength of attitude toward achievement in course	Work on a Consistent Basis	Be an Active Participant	Learn from Prior Experience	Interact with Others	Be Organized in the Conference	Use Technology Capably	Communicate Effectively
1 Andrea	✔		✔				
2 *Corinne*				✔	✔	✔	
2 *Donna*		✔			✔		
1 *James*	✔					✔	
2 **Maureen**	✔	✔	✔	✔	✔		✔
1 Barry	✔		✔				
1 **Beverly**	✔	✔					✔
1 **Colleen**			✔				
1 **Edward**			✔				✔
2 **Frank**	✔		✔	✔	✔		
2 *Jack*	✔	✔		✔		✔	
1 Peter		✔			✔		
1 *Stuart*		✔	✔			✔	
1 *Theresa*						✔	
2 *Ronald*	✔	✔	✔	✔			✔
2 *Christina*					✔	✔	
2 *Curtis* *	✔	✔		✔			
1 **Deborah**	✔	✔			✔		
1 *Janet*							✔
1 **Scott** *				✔			✔

1= member of Educational Administration course
2= member of Information Technology course
***= student who did not persist in course**

Names in *italics*=participants who met ftf
Names in bold=participants who "met" only within computer conference

Note: Participants are arranged within categories (very positive, positive, disappointed, very disappointed) in alphabetical order

> I do want to prepare a certain amount of time, of free time to be able to go on there...I am not going to go on if I only have five minutes... I knew I would go on, and I have an uninterrupted period of time to stay on, until I had done whatever I had wanted to do. (Frank, October Interview).

> To get at the computer and get in there, and I mean, I check every day, to see if there's any new information on the conference, to see if anybody's got any questions,...if there's any e-mail, you know, see what our group is doing. (Barry, January Interview).

Devoting an appropriate amount of time to working in the computer conference is an important ingredient of success.

> People have to be very willing to give it a lot of time...this so far has taken actual hands-on time...far more than the others [face-to-face courses]. (Andrea, October Interview).

> [If] somebody has lots of time, and really wants to have a look at what other people have said, and mull it over, go back over it as often as they want, it's right there for them to do...And you can spend ... as much time as you need. (Beverly, October Interview).

Whether learners logged on frequently throughout the day, or only when they had enough time to sit down and work in the conference, they had to consistently put the time into the conference to be successful.

The strategy of getting online at the beginning of the course and maintaining the communication links with the class was important. Students mentioned that in the computer conference, it was often easy to drop out or not to communicate for a period of time. If students did neglect their course for a period of time, it sometimes felt a little overwhelming to pick it up and begin again. In the Instructional Technology course, the server crashed a number of times. There was one point in the course when students had to log into a different server that was hosting the Web Board and the computer conference.

When that occurred, some learners found it difficult to communicate as frequently as they had before the change in "course venue".

> One of the things that happened to me personally, is that when...the Web Board crashed, it became easier at least for me to kind of let a day, let two days, let three days, let four days go by without actually doing anything in the course...And that habit was hard to get back into. And I know at one point in time, I felt that I had fallen... dreadfully behind, but I guess because , the advantage I had of already developed web sites, I was able to catch up to everyone. Whereas somebody else, that might have been enough reason for them to drop out of the course. (Frank, January Interview)

Be an Active Participant

In the computer conference, being an active participant is an important trait. It does not preclude students who "lurk" in the conference from learning, but the belief was quite strong that they would not learn as much. "I think contact is the big thing. You do it at your own pace. You do it at your own time" (Beverly, October Interview).

> I like to be a very active participant... I tried to post often, and if I ever had any problems, I wasn't afraid to ask, and I found that really helped me, you know. (Ronald, October Interview).

Several students used the term "aggressive" to describe their active participation in the computer conference.

> I suppose other people might spend half an hour every two days, and just lurk around, and just read and catch up on things. But I would prefer to be, I don't know, a little more aggressive in it. (Ronald, October Interview).

> I'm an aggressive learner. I will find a way. And if I can't find a way, I'll find someone who can...I think the same things would apply to any style of learning, regardless of the mode of delivery. You know, it's an open-mindedness, it's an aggressiveness, it's willingness to challenge your own frames and your own mental model. It's giving yourself...permission to move forward, if you can do that, and engage your own issues. (Peter, October Interview)

Learn from Prior Experience

In this research project, the participants discussed their experiences with technology and computer conferencing, and how they could apply what they had learned to the new experiences they were having. The instructors in both of the courses in this research project could see how students were able to apply strategies learned in one computer conferencing course to a second course. Professor Ben Stone mentioned how "we've got a number of people now ... who've done one course from us, and this is their second time around. And they're very comfortable with it [computer conferencing]" (January Interview).

One student found that throughout the term, she had finally developed a good *understanding of the process* of the computer conference and working in small groups. She was determined to apply that understanding to the next course she was taking.

> I really figured my perspective from last term could really help get everybody online...it's ten times better than it was last term...I feel much better about the whole process...The other thing that I see much better this term is the over-all picture. Last term until the end I think I just saw the guiding questions. (Andrea, January Interview).

Another student also found that he had a better understanding of *working in a group* in the computer conference, after he had experienced the entire course.

> I figured it out all last term what we had to do...we were too laid back in our last course. We took everybody's ideas as, I don't know, to be the gospel or whatever, but we really didn't do enough analyzing of each other's ideas, trying to find faults or positives. (Barry, January Interview).

One student was concerned about the *lack of interaction* between students and professors on the listserv, but she was sure that: "Even if I'm not learning anything from the course, I will learn from the experience, I can assure you! Because I'm an analyst, I suppose" (Colleen,

October Interview).

Many students found that they had developed a comfort level with learning in the computer conference during the course. One student had also developed different *learning strategies* that he tried to share with his partners in the new computer conferencing course the following term.

> Now I'm familiar with it now, and I got right into it... So that now this time, I look at it and I ... feel for them 'cause I know what they're going through, which now for me, after doing one, that's not a major problem. (Edward, January Interview).

Many, but not all, of the learners in the Instructional Technology course were familiar with computers and web-based technology before the course began. Seven out of ten participants in this research study had taken distance courses before, courses which utilized an array of audio and video conferencing as well as computer conferencing. Even so, the virtual environment of the Instructional Technology course had a different look and feel, even for those who were experienced distance learners.

> Well, I have had some experience with computer conferencing in other courses and I did have an experience of doing some web page development in another course. So I did have some work, that other students might or might not have had leading up to this. (Frank, January Interview).

Another student discussed her previous experience; she had not taken a computer conferencing course before, but she had registered for this particular course the previous summer. Due to unforeseen circumstances, she was unable to take the course at that point in time. But she did have a friend who took the course in the summer term, and who was willing to share her experience of the conference.

> So what she did was she gave me an overview of the whole site, before I started the course, which was really really helpful. She sat with me for two hours, and as soon as I understood the site, then I knew where everything was supposed to go...But I think it would be somewhat difficult for some of the new students just knowing what goes on in all the different places in the site. (Maureen, October Interview).

Other students also stressed the benefit of prior experience in computer conferences. As well, students found that their own understanding was often enhanced when they attempted to help other students. Actually *teaching a concept or skill* supported their own learning.

> I find that teaching is the best way to actually understand it more clearly yourself. And I learned more by teaching [as a guru in the introductory course] the second term than I ever did by actually taking the course the first time round. (Ronald, October Interview).

Another student had previously developed a personal web page, and had discussed a number of ideas on HTML and the way pages should look. He suggested that other students in the conference needed to go ahead and *learn by experimenting.*

> The best experience is hands-on. It's so much easier to get on and try to do something, than trying to read a book and learn it that way... The fact that I had one done before was a big help. (Stuart: October, January Interviews).

These adult students were able to extend their learning by reflecting on the experiences they had in the computer conferencing course. The students were enabled to apply various strategies learned to new learning situations and environments.

Interact with Others

Another learning strategy that underpinned successful learning in the computer conference was interacting with others. "I think it's important if we're going to learn, that as group members, we take time to communicate on a regular basis" (Deborah, October

Interview).

> I love feedback and interaction even if this is a personal project you have to work on by yourself...I can give input, and they can give me insight into things that I wouldn't normally think about. (Ronald, January Interview).

Some students believed that it was essential for learners to contribute to the conference.

> I think one has to have the willingness to contribute to the conference. And as I've said before, some people might have a natural inclination to not do so....to gain fully the most out of the course they have to contribute. (Frank, October Interview).

The instructors in the Instructional Technology course made a point of reassuring learners that it was critical to contribute. "Just as everybody has something to contribute, so please contribute what you know, everybody has something they don't know. So don't be afraid that you don't know something." (Prof. MacDonald, January Interview).

An experienced computer conferencing student strongly believed that it was critical for participants to be:

> ...actually making a contribution... You have to be there, I guess. Give your fair share, because you're certainly benefitting from everybody else's contributions, whether you agree with them or not... Conferencing is not a spectator sport! (Curtis, October Interview).

Be Organized in the Conference

Being organized in the conference is another essential skill for adult learners to achieve success.. If people are not organized, it is difficult to follow the threads of conversation and make a personal contribution.

> I think being organized is important...in this particular course those organizational skills or ideas should be being thrown out to them [people who don't have good organizational skills] and if they're not being thrown out to

them, they should be asking for them. (Frank, October Interview).

> For sure, I have to be on task. One of the great copers with stress is to be well organized, you know? (Deborah, October Interview).

The adult learners in this study shared various strategies for accomplishing their work. Being well organized helped participants in the discussion groups (Educational Administration course) get their group papers written and posted. Adult learners who were not well-organized had difficulties that sometimes impacted on others in the conference. Other participants in the study spoke about organization strategies such as (1) developing their web pages by mapping with paper first; (2) coping with all the messages in all of the rooms in the conference by reading new messages only; (3) mapping out a very logical approach to learning one skill at a time; (4) downloading information, and reading it carefully from hard copy. The adult learners who did not impose their own organization on the computer conferencing course they were taking had a difficult time coping with the volume of work and the volume of messages in both of the courses.

Use Technology Capably

Adult learners who were interested in technology and felt comfortable with computers were able to learn effectively in the computer conference.

> I suppose what is going to make me successful in this is basically my interest in computers, my interest in what the Internet has to offer, the amazing opportunities you can gain from it. (Jack, October Interview).

One student suggested that the most effective way to learn about computers and to get over any fears of the technology was to jump in and fiddle with the machine.

> The best thing, the best way to learn about and get your fears away... is actually get in and start playing around with them...Make your mistakes. Fool it up a couple of times. That's the way you learn. (Stuart, January Interview).

Another experienced technology-user agreed believed that if students felt very uncertain about how the technology worked, they had to expend time and energy to learn, even before dealing with the content of the course.

> If you're comfortable with computers in several ways, even playing games for an adult...then you'd be comfortable doing this course...If you start cold, and you end up taking this course, and you buy a computer to take the course, well then, wow, you're doing a lot in one shot! (Theresa, October Interview).

Communicate Effectively

The adult learners in the computer conferencing courses found that having good communication skills was a key to success in the course.

> You have to be able to express your ideas really clearly, make sure that your message is not misinterpreted. (Janet, October Interview).

Another student made a connection between the situation in the computer conference, where students read other people's messages, with the face-to-face classroom, where students must learn to listen to others' comments.

> Good communication's being patient, you have to be patient. The same idea in the class where you have to have good listening skills, so I think you need to read and reread comments and topics that... that students write on there before you can respond to them. (Edward, October Interview).

Another essential communication skill is being able to express yourself in writing.

> I think writing is one of my strengths, so that makes it that much easier for me to express. I guess people who are more verbal wouldn't appreciate this environment at all, but I think my writing ability is an asset. (Beverly, October Interview).

Many of the adult learners conceptualized the computer conference as a community of their colleagues, where they were able to discuss, learn and share as if they were

interacting face-to-face. "I think with the web forum, it shortens the distance, You don't feel like you are so far away from everyone" (Edward, October Interview)

> You are exposed to others...with the conferencing forum ...you get people from all over, and you're interacting as if you were at class every Monday night. (Beverly, October Interview)

> You've got all these people in different parts of the province, isolated pretty much from each other, and this is a way that everybody on their own...can actually interact, get someone else's opinion, and get someone else's thoughts, and see if they're similar to your thoughts. (Scott, October Interview)

Communicating effectively underpinned all of the interactions and learning that occurred in the conferencing course.

Learners' Attitude toward Achievement and Environmental Factors in Computer Conferencing Courses

The participants in this study underlined the impact that factors at home, work and in their academic lives had on their achievement in the computer conference. The research literature suggests that environmental factors have a large impact on student persistence, achievement, and sense of satisfaction in distance education courses (Coldeway, 1986; Powell, Conway, & Ross, 1990). Wilkes and Burnham (1991) found that external environmental variables proved to have more power in predicting student satisfaction with the distance education courses they were taking than internal variables. The major environmental factors identified by the adult learners in this study are explored in the following section (See Table 5). Many of the external factors identified by the participants were similar to those found by Billings (1988, 1991) when she investigated factors impacting on students in distance education environments.

Table 5: Environmental Factors Identified by Participants as Impacting on Achievement in Computer Conferencing Course

Home	Work	Academic
• supportive partner • technology mentor • home computer with Internet access • course-related discussions	• access to Internet • relevance of course to work life • discussions with colleagues • available technical expertise	• prior academic experience • technological literacy • good writing skills
• *children* • *illness* • *family demands on learner's time*	• *juggling work with course- time commitments*	• *lack of knowledge of field addressed in course*

Home Factors

For the participants in this study, home life certainly did have an effect on their studies, and on how easily they were able to pursue their program. Nine out of 20 participants identified *having a supportive partner at home* or friend down the hall (in the case of one student in residence) as an important aspect of home life for them. The supportive partner played different roles, depending on the family. For instance, one student depended on ongoing support from her husband to take care of their very young child:

> I have a very supportive husband ... he assumed a great deal of the parenting role...He made sure that I had enough time in the evenings to work on my projects...by putting her to bed, and feeding her... (Corinne, January Interview)

Other participants had families with teenage children, who could actually help the adult student when needed. One adult learner related that both her husband and son were willing to do some word processing for her, so that she could spend more time with her books and

composing responses.

> I can be fairly independent when I'm working. So they helped me more than I helped them, in other words. (Colleen, January Interview).

Another critical aspect of home life was the presence of someone who could be a *support person in a technological sense*. The knowledge that there was a person to call on if trouble occurred was a relief for several adult learners who did not feel totally comfortable with the technology.

> [My fiancé] is in school...and he's studying computer programming, so any technical difficulties I had were instantly solved by him. (Andrea, January Interview).

> My husband is very knowledgeable in the area of computers. So ...he's here as the tech, as my personal technician!" (Beverly, January Interview).

The appreciation of a technologically literate support person was an issue in the Educational Administration course, but not among the learners in the Instructional Technology course, since seven out of the ten participants in this course described themselves as very experienced in working with technology, and the other three participants reported that they had intermediate level of experience.

A third factor which the participants identified was having a *computer at home with Internet access*. This allowed the adult learners to work their academic schedule around family commitments.

> I also have a computer here at home. So it was very easy for me once I got off work, to come home and do my work right here from home, rather than having to stay at the school or go outside to use a computer. (Corinne, January Interview).

Other participants found that if they *only* had access to a computer at work, and not at home, it could cause difficulties.

> Every time I had to do something, I had to be in the office...you have people knocking on your door, students knocking on your door, wanting this and that. (Christina, January Interview)

> So I always have to travel to school to use the computer...So of course, being gone all day at work, and then coming home and leaving again to do some reading or try to log on, takes an extra time away from home. (Scott, January Interview).

Other learners in the computer conferencing courses mentioned the positive aspects of *being able to discuss the ideas* they were learning about with a friend or with a class member. "Lots of times what I'll do is I'll just confer with somebody else I know" (Christina, October Interview).

> I've got a really good friend who I'll discuss this with. He has got his Master's....if I can't get something--an idea that somebody else tried to portray or whatever--I'll ask him first...I've got to have somebody to bounce ideas off in person. (Barry, October Interview)

By talking things out with another person, the adult learners in the computer conference were often able to gain a better understanding of the material or of the skills.

Participants did identify several aspects of home life that made their pursuit of their academic goal more difficult. Children became instant priorities: if a baby was teething or a child was sick, the academic work plan must be discarded to care for the child. One student had a relative who entered the hospital and was very ill for the duration of the course. The student spent a number of hours every day with her sick relative, and these were hours that she was unable to spend on her course work.

Families sometimes placed a subtle demand on the student to spend *quality time* with the rest of the family, and this made some adult learners feel like they were being pulled in several directions. "A busy social life would hinder time that you have [for the

course]...company coming, going places..." (Beverly, January Interview). This is a classic dilemma of adult learners in a formal educational program.

> Saturdays is taken up when I'm doing my course, doing my work. And at the same time I feel like, "Oh, my wife'll probably want to go somewhere, this is her holiday too. We should probably be going somewhere or doing something...."So I try to get up really early in the mornings on Saturday while she sleeps in, and work as much as I can. And a lot of times she'll go to bed early, and I'll stay up. (Edward, January Interview).

One individual travelled home from one province to another every weekend. He mentioned that in terms of the course, those trips "did present a problem...It's almost like any break from your pattern is enough to cause you to find other things to do, and you have to reestablish your pattern again." (Frank, January Interview).

However, in general, the participants in this study reported that their families were very supportive of their academic work, and the distractions or difficulties at home were predictable and could be handled.

Work Factors

The participants in this study identified a number of workplace factors which impacted on their learning. Thirteen out of 20 participants in this study worked full-time. Five other participants were full-time students, while two learners were part-time students without full-time work commitments. Many of those who did work full-time had full *access to the Internet* at their place of work. They found this very beneficial, because they were able to access the course frequently. "So I just, any time I'm sitting down, I just check the Web Board, check the e-mail, and it's very convenient for me." (Theresa, October Interview).

Having access to the Internet at work also meant that the students in the courses

were able to accomplish some of their online tasks at their workplace, with the result that they did not have to use up their hours of home Internet access, whether those hours were free or they were paying for a private Internet service provider. A third benefit was the potential for students to download information at work, and print it if required. This would mean that personal ink cartridges and paper supplies would last a little longer. Many participants found great support from their places of work.

> In my work life, I think the thing that primarily enhanced this, the work in this course, is the fact that we have a very supportive employer. (Corinne, January Interview).

A second area where participants found that work life had a positive impact was in the *strong connections between course work and the real world.* Many writers have discussed the importance of making the material that adults are learning relevant for their lives (Driscoll, 1998; Knowles, 1984; MacDonald & Gabriel, 1998). Students in both courses were able to see the relevance of what they were doing for their work. "I found that enhanced my learning for the course, because...you could really see the relevance" (Beverly, January Interview). Taking on leadership roles through committee involvement became much more meaningful for some students.

> When I'm going to school daytime, I can reflect on what I learned in the readings I've done...and relate it to my own school, own experience. That's pretty positive. (Edward, January Interview).

Another positive aspect of work life was the fact that the students in a number of work places were able to *discuss issues with colleagues in the work place.* If they had concerns or issues they wanted to discuss, they were able to network with people face-to-face. As well, in several work places of participants in this study there were colleagues who

were technically very adept. If there was a need to resolve technical difficulties with the course, these in-house experts could help.

There was also one major concern about trying to work and study. The concern revolved around time, or to be more precise, around the *lack of time* to accomplish all that these learners were called upon to do. Many of the participants in this research study raised the issue of time. "It was hard to fit in the time" (Deborah, January Interview). "I would have to say lack of time impacted on it" (Donna, January Interview). "The negative part about it is the time" (Edward, January Interview).

> Just the way the school runs, it's twenty-four hours a day, and so it's a matter of assigning a time to do it. (Curtis, January Interview).

Time has traditionally been an issue for learners who are studying by distance (Bernard & Amundsen, 1989; Gibson, 1991). This concern was voiced very clearly by the participants in this study as well. Because time was such a major concern for the students, it is discussed in more depth at the end of this section.

Academic Factors

The participants in this study identified five academic factors which impacted on their learning. The adult learners found that having *prior academic experience* made a positive experience in the computer conferencing course possible. A number of students found that they had much more confidence approaching this course because they had so many courses completed at the graduate level.

> Because I had done so many courses at the graduate level, I went in with a level of confidence that I would not have had, had I only done one or two or none. (Colleen, January Interview).

Having prior academic experience with the same professors also gave the students a sense of confidence. "I think having prior experience with them...I was familiar with the theory and just the whole attitude, the atmosphere" (Beverly, January). Students had an idea of the types of expectations the professors had, and felt confident that they would be able to meet those expectations.

> [Having taken another web-based course] also gave me a better idea of what it was that I would be expected to do in this course, to the point that I found that I was very comfortable in the environment that we were working in. (Corinne, January Interview).

Besides having previous academic experience, students felt that *having technological literacy underpinned a positive academic experience* in the computer conferencing courses. As one student mentioned: "Having the background already in the computer field added to it" (Theresa, January Interview). Those students who were not literate in terms of the computer had a much steeper learning curve than those who were comfortable with technology.

> I don't think that you should be allowed to do that course unless you're computer literate. I think you'd be too frustrated trying to do the hard writing part and learning the computer at the same time. (Deborah, January Interview).

Other students found that *being able to write well* was an important skill for success in these courses. "I had a lot of writing experience, now" (Peter, January Interview). Some students had developed their writing skills over time, as they had taken other courses. "Having done ...a lot of writing was certainly beneficial to me" (Deborah, January Interview).Conversely, a lack of writing skill was a detriment in the computer conferencing course. One student whose expertise lay in the area of the sciences, but who felt that his style in written English needed support, took his responses for the computer conference

over to a friend for proofreading before he posted them. "You know I have difficulties composing papers, that are sound English, I should say" (Barry, October Interview).

As well, *lack of experience either in the field covered by the course, or in the area of technology* could be detrimental to students' learning. One student stressed that her lack of technical skill certainly impacted on her. She was unable to access the computer conferencing course for the first several weeks because of technical difficulties, and then she felt rushed and not terribly comfortable when she was finally able to make contact with her group. Another student believed that his lack of experience in the area addressed by the course impacted negatively, and was a factor in his decision to ultimately drop the course. "I didn't have any experience academically, or any kind of administration courses, so that kind of hindered me a little bit...kind of lost me a bit" (Scott, January Interview).

The participants in this research study identified a number of factors in their home lives, their work lives and their prior academic experiences which impacted on their achievement in the computer conferencing courses. Adult learners frequently engage in study at the same time as they are working full time, and also living within their family constellation. The factors identified by the participants might either enhance or inhibit the learners' achievement in their course work.

The Factor of Time

Time was mentioned so frequently by the participants in this study as a factor in their learning that their comments about it have been placed in this separate component of the section. The participants in this study underlined the idea of time as both flexible and inflexible. One of the benefits of learning in a computer conference is the asynchronous

nature of the conference, as students can post messages at any time of day or night, from any time zone. In the courses in this research study, there were a number of time-related issues and observations raised by both students and professors.

> I think one of the fallacies of computer-based education is that the deliverer expects it to be less time-consuming. We always think computers save us time, but I don't know that that has actually happened! (Colleen, January Interview)

Encountering the Tyranny of Time

Deborah, a student in the Educational Administration course who was nearing the completion of her M.Ed. degree, had previous, successful experiences with distance learning and anticipated that this course would be successful as well.

> So I figure well, great, based on my experiences with the other two courses that I've done on the computer, that it's my own time, right?...but it wasn't like that. The one we just did was very much dependent on other people's time. (January Interview)

Deborah found that time had a profound impact on her comfort level in the course, "and I don't need the pressure of time. So like whenever I do courses...when I go into my first class...I try to see if that flexibility is there, and if it's not, I don't do them" (January Interview). As a student, she was willing to work hard and contribute to the course. However, she discovered that three-quarters of the course work was to be done in small groups. Working with small groups face-to-face is difficult enough, as people jockey for position on who is going to do what, when, and how. Working those issues out in a distance context takes a great deal of time. Then after those issues were resolved, members of Deborah's group had to post their responses to the course content in a timely fashion, so that other group members could respond to postings before the facilitator melded those responses into a paper.

Deborah tried hard to post on a regular basis, but found that sometimes she was forced to wait for other members' responses before she could post her own.

> It was hard to fit in the time. Sometimes an entry might come in at 10:00 in the night, and then after you worked all day...Like some people might work better in the night time, and I might be more alert say, right after school than I am 10:00 in the night. And some people in our group didn't, you know... they worked 10:00, 11:00 at night, when I'd rather be in bed. (Deborah, January Interview).

With many computer conferencing courses, this would not be an issue. However, for some students in the Educational Administration courses it became an issue, because of the heavy demands of the group work. Rather than being totally asynchronous, in terms of the workload, this course became a hybrid in which students had to be online consistently every day or two to meet the demands of the group work, though they did *not* have to be online at exactly the same time. "So that's why this group dynamic thing, you had to be on time, in order for us to meet the time line...the time line itself was there" (Deborah, January Interview).

This student found that the time lines were so tight, that there was "no flexibility in how you learn, and the rate at which you learn, and the rate at which you digest information, and there's no time for reflection" (Deborah, October Interview).

> There's no provision in this course for the working student, I don't think. There's very strict guidelines; it's very stressful. It's just ...I hate being restricted to a lot of work in a short period of time. (Deborah, October Interview)

Edward was actually in Deborah's small working group, and he agreed that "the negative part about it [the computer conference] is the time" (January Interview). As a teacher working full time, and trying to do this course part time, he felt a crunch of time:

> There's not as much time to spend on it as you would like...I find that using the Internet is...it's good, it's very helpful, but yet I think it's more time consuming. A lot more! (Edward, October Interview)

In other distance courses, he found that he was able to work on the course sporadically. Over the term, he put all the hours in, but they might not be distributed evenly. In the computer conferencing course, Edward found that he could not operate that way. "You got to keep going along with the flow to keep on the same level as everybody else...it is more time consuming" (October Interview). Scott found the same type of demands difficult to meet:

> I find the time factor is the real killer...with this, you've got to always be getting on and getting out and certain deadlines, and other people in your group counting on you to get this on there, or get this facilitated, or you know there is much more responsibility (October Interview).

These three students were all participants in the Educational Administration course which included heavy demands for small group work as an integral part of the course.

Expanded Time

Students who were not facing the demands of timely small group work found that the *asynchronous nature* of the computer conference had an impact on the way they participated in the course.

> In a face-to-face class, if you don't respond pretty immediately to what is being spoken about...then the topic is going to be changed, and your thoughts will be lost...Whereas in a computer conference, the ideas are out there, and if you respond three days later...it still has the same impact." (Corinne, January Interview).

The computer conference helped to break down any time barriers. "This type of technology allows you to work in the time that you have, which for many adults is key" (Prof. David MacDonald, January Interview).

> The fact that it's asynchronous...allows the student to take what someone else has written, and to think about it, and then react to it, after they've had a chance to look at it, reflect, and do an analysis with themselves. (Professor Ben Stone, January Interview).

In this scenario, time could flexibly expand to allow threads of conversation to make sense even though they occurred hours, days or weeks apart.

Air Time

One issue that arose in the Educational Administration course was the amount of time that students were able to access the Internet. A number of students had no choice but to utilize an Internet provider that gave them only ten hours of Internet access a month. In the context of a computer conferencing course, that does not allow much time for students to be online. "So you take ten hours over a month, and you're not going to get much interaction, are you? (Barry, October Interview). Some students were able to purchase more hours of Internet access per month from a private service provider, so they did not feel the time crunch as seriously as students unable to get more hours of online time. "You're always worried about the time factor...I've even called and asked if there was any way to get more time"(Scott, October Interview).

This Internet access situation was a concern for Professor Jennifer Stanley. She explained that:

> Time is still a big factor, and that also has its impact on student learning. And then the time that they actually get to sort of spend on computers, on the computer with conferencing, I think that's a factor, too, with running out of online time...to force yourself to operate under such time constraints as that, I think, is really putting a burden on your learning. (Professor Stanley, January Interview).

This situation impacted some, but not all, of the students in the Educational Administration course.

Time from the Other Side of the Desk

The instructors who participated in this study emphasized that courses offered via computer conferencing are more, not less, time intensive. "Online is very labor intensive" (Professor David MacDonald, January Interview).

> It's still the most time intensive, time intensive teaching that I've ever done in my entire life, those distance courses, using that environment that you see. (Professor Amy Newson, January Interview).

> So the amount of actual time you spend on your computer...and sending feedback back to students is there...all in all, we find it takes a lot of time. (Professor Jennifer Stanley, January Interview).

One of the participants in the study, who was a student in the computer conferencing course, but also an instructor at a community college was considering developing web-based courses. She commented:

> I would not do [teach] a web-based course expecting that I'd have an easier workload. Because I don't think that would be accurate... From a professor point of view, I think it would be even more time, if it was done to my satisfaction...It would require a lot of online time.(Colleen, January Interview).

Workload

The issue of workload is intimately entwined with time, though the focus is slightly different. Workload can be addressed from several perspectives: (1) the issue of student workload within the course, and instructor expectations for the amount of work completed; (2) university expectations for the development of computer conferencing courses; and (3) instructor workload after the development of the computer conferencing course.

Student Workload

A number of the students in both courses found that the workload of the course surprised them, and they had to allocate much more time than they anticipated to complete the requirements of the course. A computer conferencing course requires a commitment on the part of students to work with the technology as well as to learn the content of the course. "Another thing would be to consider the amount of work you're putting into it...it needs to be manageable, even more so than a classroom course" (Andrea, January Interview). Because of the workload requirement, another student commented that "We can't assume that it's [computer conferencing] a tool that's going to make our lives easier, because I don't think it will. I don't think that's what it's for. If we're going to increase learning, then that's what we have to focus on" (Colleen, January Interview).

University Expectations for Course Development

University administration sometimes appears to have expectations for courses delivered by computer conferencing: (1) that these courses make more efficient use of faculty time; and (2) that computer conferencing allows professors to work with more students in a course, since there is no set time for the class to meet, and the instructor does not have to provide traditional office hours for the students in the course.

> I hear it, wherever I go, that this [computer conferencing] might be a means of delivering courses to more people in a more efficient manner, that is, it will make more money on it as an institution. Certainly, with the current state of things, that's a false assumption from a university perspective...While I have flexibility, I spend twice as much time on this course than I would on an in-class, face-to-face course. Workload is a major factor. Keeping the course up-to-date and staying on top of things online as well is very very time consuming. (Professor Ben Stone, January Interview)

Instructor Workload

Instructors who develop and offer computer conferencing courses have sometimes found that while the university might give release time for the development of the course, after the initial development, there is little offered by way of assistance. Yet, the workload demands of the computer conference are very high.

> We're hoping, hoping, hoping, hoping that things will begin to stabilize with the two distance courses, too. You know, the content and the technology, the software that we use, everything, because it's a real heavy workload all round. Redesigning the objectives, redesigning the web site, dealing with broken technology... (Professor Amy Newson, January Interview)

Another reason for the high workload in a computer conferencing course is student expectation for professor availability. This is an issue raised at several different points in this research. If professors attempt to meet heightened student expectations for their availability, however, it certainly has major workload implications.

> This course was a very very, in terms of what I was supposed to be doing, small part of my workload. But to the students online, who are at a distance, or not seeing you at the university, not seeing you, for example every day, in other classes, this is all you do. (Professor David MacDonald)

In the computer conference, factors of time and workload were issues identified by both students and instructors.

Exploratory Issue: Student Attrition, the Flip Side of Persistence

In the distance education literature, high rates of student attrition in distance courses have been a major concern for distance educators (Gibson, 1991; Powell, Conway & Ross, 1990). Attrition or student drop-out is the means of measuring student achievement in

distance courses used most frequently in the research (Bernard & Amundson, 1989). Participants in this research study had differing views about their achievement in the computer conferencing courses, depending on their original goals. One global way of assessing achievement in distance education is to look at student persistence in the course, that is, completion of the course. If we look at this measure, two participants in the research study did not achieve success, since they dropped the course, while eighteen other participants did successfully complete the course work. However, this global measure does not give an understanding of the reasons for student attrition. One participant in the Educational Administration course left on the very last day possible without a penalty (Scott). The student enrolled in the Instructional Technology course who was participating in this research left quietly, so that other participants in the course were not even aware that he was *not* going to complete the course. In this study, the rationale for opting out of the course was quite different for the two students who dropped out. Considering the factors of attrition which impacted on these students may help illuminate the relationship between learner achievement and the adults' description of themselves as learners.

Scott's Story

Scott taught in a small community, where he taught language arts to students from grade four to grade eleven. His teaching assignment on a daily basis was very busy. "A lot of preparation involved in it, plus my two courses, and plus trying to help out at home and now with this particular trip coming right down in the middle of the course." (October Interview).

When the course in Educational Administration started, Scott planned to use the

computer with Internet access in his school. However, he was not informed which version of Netscape was required for access to Alta Vista Forum. He spent hours trying to access the course, to no avail, because he had an earlier version of Netscape than the course required. Scott finally got his brother to download and send him the correct version of Netscape so that he could log on to the conference. In the meantime, the course had started, and other people in his group were already working on the readings. When Scott finally got in, he found that in his group, the other members were specializing in educational administration. "A couple of people in the group seemed to be wholly familiar with administrative issues ... kind of lost me a little bit." (January Interview). Scott found this somewhat intimidating, because he did not have the background that other members had. Reading, synthesizing and posting messages were lengthy tasks for him. He said "I know I've been behind from the start, trying to catch up sort of thing, just open damage control." (October Interview).

Over the first few weeks of the course, the composition of the group changed somewhat-- one student dropped the course, a second student was added to the group from another group-- it was difficult for group members to be sure of exactly who were members of the group. When people discussed the facilitation of papers, one member offered to facilitate paper number one, and a second group member offered to take care of paper number three. That left paper number two...

> I volunteered to facilitate this particular paper. There didn't seem to be anyone interested in doing this one so I volunteered even though I knew I would be pressed for time, 'cause I wanted, you know, more or less to do my share of the work. (Scott, October Interview).

Scott was indeed pressed for time, because he was chosen to fly to Ottawa to spend two weeks at the Terry Fox Center. This trip came right at the time when the second group report was due, the paper that Scott had volunteered to facilitate. Scott said that he planned to bring all the work with him to Ottawa, and "hopefully" get access to the Internet there, and send the facilitated paper back on time. However, he feared he would be too busy to work on the course while he was there. Just a few days before he left for Ottawa, Scott posted a message to his group saying:

> I am going to need some help from other group members (especially those who did not volunteer to be facilitators). I definitely won't get the report done by Wednesday. I have to leave on Friday morning and am not guaranteed I'll have any access to the Internet up there. If another member with more time can take on Section B, that would be great. If Daphne would switch with me and I'll do Section C, that would be great. Otherwise, I'll have to scramble and see what I can do. Would all group members please reply. (Course Posting, October 13)

Eventually, one of the members who had just joined the group facilitated the report. The instructors sent a message to the group two and one-half weeks later that Scott had dropped the course.

When he discussed dropping the course later, Scott commented on what could have been changed to achieve another outcome:

> If we had been in a group where we knew each other, or if we had more time...if there had been more interaction. I didn't, of course, overly like the cross-section of people we had in the group...And you know, I think if I hadn't gone away I think I probably would have managed it, and gotten through it, and had a different perspective on it, right? (January Interview).

He did successfully complete the second course that he was taking that term. But as he was reflecting about it, Scott said "And really, you know, perhaps I would have had to drop one anyway, because two courses was a high workload" (January Interview). After he came

back from Ottawa and dropped the course, Scott wondered what had actually happened with his group. He knew that the new member had agreed to facilitate the second paper, even though she was going to be away on business during that time period. "I did check in afterwards, after I did drop, after I came back, out of curiosity...I felt bad about that, actually." (January Interview).

As he thought about the course, and the term he had just had, Scott mused, "Yeah, I probably would do it again, actually, if it was offered again. I would be comfortable with--you know, where I have all the material— I think I would do it again, especially to prove to myself where I had to drop it, I can actually do it and get it done." (January Interview).

Curtis' Story

Curtis was in a very different position than Scott. He chose to take the Instructional Technology course because he could apply it toward his Master of Education degree, and because it was offered by computer conferencing. The teaching situation he was in did not allow easy access to the university, so a course offered over the web was ideal for him. The course itself was in an area where he had a good deal of experience. This situation left Curtis feeling like he was midway between a student and an instructor.

> So in that respect, I sort of felt outside of it. I mean, I've created web sites, I've done it for classes, and so...a lot of their discussions and concerns, I sort of hesitated responding, because you don't want to sound like you're speaking from the mount or something. (January Interview).

Curtis found that he really did not fit into either group: "And so, in some respects, I think I existed outside of it, halfway between instructor and student." (January Interview). As he read the messages posted to the conference, Curtis came to the realization that for many of

the other students:

> ...Their situation was certainly different than mine. And so in that respect, I think, I didn't exist in that group. The discussions were not necessarily in line with what I was ready to talk about, in terms of, in terms of creating web sites and HTML. (January Interview).

Because that was the case, Curtis tended to keep a low profile in the computer conference, and only interacted with people occasionally. He found the design steps that were outlined for the construction of a web site felt stifling to him. He did not want to place his preliminary work up on the server for everyone to see and critique. Curtis' preference was to complete his web site and then post it for others to see and critique after it was completed. He decided to go ahead and finish the web site he was working on, but "not to the bureaucratic outline...that was required for the course. And [I] sort of worked outside that...I'm somewhat of an individualist, and like to do my own little thing. And then I'll come back to you and talk about it. But I like to do my own little thing."(January Interview)

Curtis said he found the course "a disappointment...it didn't go to what I'd hoped it would be...At the Master's level, I mean, you sort of hope it would go beyond that." (January Interview). Curtis did not complete the course, but he was able to complete his web site the way he wanted to without changing it to meet the parameters laid out in the course.

Scott dropped out of the Educational Administration course because of lack of time, other professional commitments, and a discomfort with the tone of the discussions within his group in the computer conference. Scott's objective when he enrolled in the course was to take an elective course by distance toward his Master of Education degree. He was not

able to achieve his learning objectives in this course.

Curtis left the Instructional Technology course because he was not learning anything new; he felt as if he did not have much in common with the members of the class who were communicating on the Web Board, and he did not like working within the parameters for web site design set in the course. His objectives when he signed up for the course were twofold: an interest in further developing his knowledge of the field, and completing another course toward his Master's degree. Curtis did not achieve either of these objectives. The reasons why these two students dropped out of the respective distance education courses were very different, and underline the diversity of reasons for attrition in distance education courses.

Persistence

The other eighteen students in the two computer conferencing courses persisted in their work and completed the courses. Of the twenty students who participated in this research study, fifteen told me that they felt their learning achievements in the course, relative to their objectives when they enrolled in the course, had been met. Their objectives ranged widely, from completing the Bachelor of Education program, to learning how to design an online learning environment, to learning about educational administration, to gaining credit for one more course toward their Master's degree. Fifteen of the adult learners were satisfied with their achievement; five were dissatisfied. The five adult learners who did not believe their learning objectives had been met were Christina, Deborah, Janet, Scott, and Curtis. I have addressed the rationale for Scott's and Curtis' departure from the computer conferencing courses, now I would like to turn my attention to

the other three learners.

Janet

In Janet's view, she did not learn a great deal in the course at all. She had been skeptical about the benefit of offering the Educational Administration course via the World Wide Web from the very beginning. It seemed that her opinions and fears were confirmed throughout the term that the course took place.

> I don't know if it had to do with the subject matter or the fact that it was a computer, web-based course, that I just didn't really feel like I got a whole lot out of it. I wasn't terribly keen on the subject matter to begin with...I think it was set up properly...as web courses go, but I don't feel that I personally got a whole lot out of it...Well, I wasn't happy with my grade at the end. And I think I put a whole lot of work into the course...I feel a bit cheated in terms of my grade. So in that sense, I don't feel really good about the achievement in the course in a way. (January Interview).

Christina

Christina was very disappointed with the Instructional Technology course. Her own learning objectives revolved around learning "what is the best way to deliver a course online...what are the technical things...that we need to know for creating a course online." These were the things she really needed to learn, because there was a possibility that she would be developing online courses for her college.

> I really feel I learned what *not* to do as a distance educator. But I think for my own objectives from the beginning I certainly didn't meet them.(Christina, January Interview).

Christina was also very disappointed in the mark she received in the course. She expected a much higher mark, given the work that she did in the course. That mark was a shock for her, so she had requested a review of it. "That's discouraging when you know you work

hard, and there are people that didn't work hard, or didn't put as much into it, and they come up with just the same mark or a better mark." (January Interview). The instructors were reviewing her work when we spoke. This was important for Christina, because a secondary goal for her was to get good marks in her Bachelor of Education degree courses in order to get into a Master of Education program in another university.

Deborah

Deborah did not feel that her learning achievement in the Educational Administration course matched her objectives at all.

> I don't really feel that I learned anything from the course which is too bad, because...the material itself I found very very interesting, and I found the layout as done by the two professors extremely organized and good. But the actual process I didn't learn anything from it really...(January Interview).

Deborah felt strongly that the online discussion which was supposed to parallel in-class discussions never occurred. "And that discussion did not take place on the screen, on the forum at all, I didn't think." (January Interview). Deborah's discussion group was slow to begin working together because of technical difficulties, and the late arrival of two new members from a group that was disbanded. She worked very hard to help the group function well, but found that toward the end of the course, she was very frustrated with the situation.

> And you know, it's frustration, because you knew your mark was based on this group interaction, and it just wasn't happening. And in the end, I was penalized...And I was just extremely disappointed and frustrated with the whole process. (January Interview).

These three adult learners, Janet, Christina and Deborah, whose achievement did not match their objectives, all felt they had worked very hard in their respective courses.

However, their expectations in terms of the course process and content were not met. As well, their expectations in terms of their course marks and their own learning were not met. This lower-than-anticipated learning was a source of disappointment for all three of these adult learners.

The five participants in this research who did not achieve their goals in the computer conference identified the following factors as impacting on their performance in the course: (1) lack of time; (2) personal over-commitment to other enterprises; (3) discomfort with tone of discussions in the computer conference; (4) inability to find a niche in the computer conference; (5) discomfort with parameters developed by instructors for course assignments; (6) disappointment with subject matter of course; (7) difficulties with group work, particularly with strict time lines and inequitable work load distribution; and (8) frustration with process of communication via the computer conference.

Research Question Two Summary

In reference to the second research question, I addressed issues of learner achievement, sense of satisfaction with the course, and intrinsic and environmental factors impacting on learning in the computer conference. Learners' attitudes toward their achievement in the computer conferencing course were related to their personal learning objectives in taking the course. If the adult learners achieved the objectives they had set for themselves, there was a sense of satisfaction and a positive attitude toward the course. Alternatively, if the participants were unable to achieve their personal goals, there was a

sense of disappointment with the course. This sense was not global, because students could have a positive attitude toward the academic content of the course, but a disappointment with the mode of delivery-- the computer conference-- or vice versa.

The relationship between students' perception of their achievement and the personal learning characteristics they discussed was also investigated. However, clear relationships among those factors could not be discerned. In a similar vein, there were no significant differences in the strategies utilized by students who had differing attitudes toward their sense of achievement in the course. However, the participants in the courses did express their views regarding the essential intrinsic and environmental factors that had impacted on them throughout the computer conferencing course. Many participants in this study had strong perceptions of self-efficacy. Learners stressed the fact that they were "driven to learn". They were goal-oriented and often assumed leadership roles in the context of the course. These students reported either that they were experienced users of technology or else confident that they would learn how to use the technology. The work they completed in the course frequently had a strong relevance to their work lives, present or future.

The amount of time required to successfully learn in the computer conference, and the workload of the course were also identified as major factors in learners' attitudes toward their achievement in the course. These time and workload issues impacted on nearly all of the adult learners in this study. Those learners who were not aware of the demands of computer conferencing course delivery had to adjust their expectations and plans in order to accommodate the demands of the course. Other learners who had already taken a computer conferencing course were already aware of the time commitment that such courses require.

Learner persistence and attrition were also addressed in this section. The definition of achievement utilized in this study was a traditional definition from the distance education literature--that students achieve success if they complete the course assignments and earn the academic course credit. The two students who did not achieve success according to this criteria had a wide array of reasons for dropping their course. The exploration of the phenomenon of attrition reveals that there is a complexity of reasons for this ultimate outcome to occur. For example, in the case of the two participants in this study, the rationale for their dropping out underlined the impact of (1) course design, including learner reaction to requirements for group work and peer evaluations; and (2) environmental factors including family or work commitments, on learner achievement and satisfaction with the course.

In the next section of chapter four, I address the third research question. I look at the environment of the conference, and how adult students describe the construction of meaning in this learning environment.

Research Question Three:

How Learners Describe the Task of Constructing Meaning in the Computer Conference

In the second section, the participants in this study discussed their achievement in the computer conferencing courses, and the strategies they developed which allowed them to achieve their goals in the conference. In this third section, I examine the environment of the computer conference, and ways in which students can communicate effectively with each other in this environment in order to answer the third research question:

> **How do adult learners describe the task of constructing meaning in the reading/writing environment of computer conferencing?**

In the first component of this section, I share the learners' perceptions of the environment of the computer conference, and how work is accomplished in such an environment, including special challenges which occur when group work is a course requirement. In the next component, I share the participants' construction of meanings surrounding communication via the written word. And finally, one of the issues that became a focus for the participants in this research, and which also arises in the literature, is a particular disintegration of meaning which can happen in a text-based environment called a flame war. I examine the flame war that occurred in one of the research courses.

The Environment of the Conference

Metaphors that theorists and researchers have suggested for conceptualizing groups of online learners working together in a course situation include "virtual communities" (Rheingold, 1993) , "virtual classrooms" (Hiltz, 1994), and "communities in cyberspace" (Cutler, 1995; Davis, 1997). The learners in the computer conferences in this study suggested their own metaphors to capture what being in that learning environment felt like. They included thinking about a computer conference as a "For Sale Board" at the grocery store.

> You post the messages, and whoever walks in and chooses to read them, reads them. And they last until someone takes it down (either on the machine or other users). You try to reinforce the concept of choice. You choose to read or not to read. It's very free form. Anyone who's in the grocery store can post. And the contents are not necessarily moderated beyond the manager coming in and taking down things that are patently off-topic. (Curtis, January Interview)

Another student suggested an image of Rowan and Martin's laugh-in as a metaphor for the computer conference. He asked, "Do you remember when they had all the windows, and they'd all pop out and say different stuff at different times?...And no two people were usually out at the same time, but occasionally they were." (Peter, January Interview). One student visualized the computer conference as an anthill:

> Where people are going around and doing their own thing, and even though they're in one community they can be conversing on different topics... And they can all contribute...you may be coming in at a different level, you may have a different background, you may have a different job...The reason I'm thinking about an anthill, every one of the ants has a different job...And they're doing their own thing. And they go about and do what they have to do, and they communicate what they have to, and otherwise they go out and they do their work and they bring their work back and they present it to the rest.(Corinne, January Interview)

Another student explained his conception of the computer conference as a web:

> A web of connecting thoughts among different students, really. That's how I see it...And I'm in the middle, kind of connecting to other students' thoughts, and as they connect to theirs, I learn something else...You know, sometimes you talk about learning ... as connecting to things you learned before, and that's how you learn, from things that you've learned in the past, and making connections. (Edward, January Interview).

One student thought back to earlier times during Canadian winters, when folks in a community would gather around the hot stove in the general store to discuss the state of the world, and hockey, in particular. "You know, it's [the computer conference] like sitting down like a hot stove league...and you get around there and chat about things." (Frank, January Interview).

Nine of the participants in this study shared metaphors that they used to help them express their perception of working and learning in the computer conference. Some of these adult learners had a strong image of connections with other learners, while others expressed a view which was much more disassociated from their colleagues.

Entering an Online Community

Connections with their colleagues could be conceptualized as "building a community". As students in the computer conferencing courses spent time with one another and communicated with each other, they developed an online relationship with other learners. Did those relationships constitute a community? There are multiple meanings of this construct. Scherer (1972) suggests that "Communication is at the heart of community...We can only share in common what we can communicate" (p. 104).

What does it feel like, then, to enter an online community which exists via the textual communication of its members? Nine of the 20 research participants enrolled in the computer conferencing courses had never taken a course by distance before. Many of these learners did not know what to expect in terms of course organization, professor expectations, or computer use. However, some of these students had a great deal of experience with computers, even though they did not have prior experience with a distance or a web-based course. Learners who had a great deal of technology experience often reported that they felt very confident in their ability to learn in the course. Learners who were not as experienced in using computers often found it easier to ease into the course, to read others' postings for a period of time, until they felt more confident in posting their own message. The computer conferencing environment allowed these students to observe for a short while, before using the system themselves. Over time, all the adult learners were able to successfully join and work in the virtual environment.

By the end of the term, sixteen students indicated that they felt part of a community as they worked in the computer conference. One student said that "you are very much a community. You're your own little web world" (Andrea, January Interview). Another student observed that "you communicate about yourself in the computer conferencing... whether you meet in person or not, you're still involved in a community of learners" (Corinne, January Interview).

In contrast, four participants felt quite strongly that they had not experienced any sense of a learning community. The four adult learners who had not experienced a sense of community were all members of the Educational Administration course. In this course,

students were divided into small working groups which were responsible for the collaborative production of three synthesis papers over the twelve weeks of the course. Within the course's online environment there was a Cafe as well as a Question and Answer area available, where students could go to chat with each other or to pose questions. However, a number of the students involved in that particular course reported that they were so busy completing the course requirements in terms of reading, producing reflections on course content, and writing group reports, that they had no time online to go to "relax" or have a "friendly chat" in the area set up for that purpose. "No, I would not have said 'This group is a learning group.' It didn't feel like that at all" (Colleen, January Interview).

Two other students explained that though a learning community might develop if there was a critical mass of people interacting with each other, there simply were not enough participants in some of the small groups to produce that critical mass. "There's no sense of community in this forum...with only two people in my group, it didn't happen" (Peter, January interview). A second student pointed out that, "In my case, I would have said that the community might have been a bit too small" (Scott, January interview).

Even with a larger group to work with, however, there is not necessarily a sense of connection with others for all learners in the computer conference. Although her working group was a larger one with five participants, one student found that the computer conference felt like a lonesome place to live and work. She said,

> ...it's pretty lonely, in a way...It's the human side that's really missing. Like I say, not being able to have conversations and exchanges with instructors and other students, which is really, I think , a big part of the learning process in

any course. (Janet, October interview)

The four students who did not experience a sense of community explained that either (1) members of their groups did not communicate often or effectively enough; (2) the groups themselves were too small to support effective communication; or (3) they had a strong individual desire for face-to-face classroom contact. However, the majority of students involved in both courses believed that for the duration of the course, at least, they had joined an online community whose members worked together to learn. "Once we got going, everybody had a role, and we did it, and it worked" (Barry, January interview).

> So you really kind of develop your own, I don't know, there's a bond among these people. And that's what you get from being in that community for three months. (Andrea, January interview).

> I think that normally when you do a course through correspondence, you're isolated and you're by yourself. I guess almost like an island by yourself....When you're doing ... a course using the web forum ... you're all learning together. (Edward, January Interview)

A strong belief in the existence of an online community was articulated by the instructors in the computer conferencing courses as well. Indeed, the concept of building a community was a cornerstone of both courses. Professor David MacDonald asserted that:

> And that concept of the virtual textbook was very much entrenched in the idea of virtual community, where there was a dynamic area that students and instructors created the community and the text over the course of the term. So there was structure there, and we primed the pump. (January Interview)

> We've structured the course...and one of our primary objectives would indeed be to develop a community of learners. (Professor Ben Stone, January Interview)

Working with Colleagues

Gradually over the term, learners in both courses began to engage in the kinds of activities that are traditional features of communities. Learners began to ask questions, talk to each other, construct an understanding of one another, share ideas, and work together to accomplish a task. These activities allowed learners to accomplish the objectives of the course, while at the same time developing a relationship with other students. The adult learners involved in these two courses offered by computer conferencing communicated for different purposes throughout the term.

> Once you see what someone else thinks, then you can see if they're on the same length as you, or you get a new idea from them. (Andrea, October interview).

> ... you'd find out how to do something, and say, "Well, this is kind of useful, so I'll write about this, or write about that [to others in the conference]"... And you get around there and chat about things, and somebody'll write in and say, "Oh, don't do this, but do this." (Frank, January interview)

Some adult learners found that typing their thoughts on the computer screen, and posting them in the conference was a challenge. Concerns about the content of their posts, as well as the length of time required to communicate via writing, were reflected in a number of participants' comments. These concerns caused some students to spend an enormous amount of time composing their communication with their colleagues. However, they did become more fluent as the term progressed. This fluency developed as the communications began to resemble a speech event more than a writing event.

> ...At the beginning of the course, I can remember going through and typing in all my entries...first in Word Perfect, they were spell-checked, they were grammar [checked], they were edited, and put on, and then previewed first, and then making sure it was perfect before it goes on there. And if you're in a real

> discussion, you're not thinking about your speech and what's the best way to say something, you're just telling how you think it. So near the end of the course it was just like, you read something, and something comes to your mind and you respond to them right away. None of this going to the Word Perfect and all that kind of stuff. (Edward, January interview)

As students engaged in these communicative acts, which involved keyboarding text into the computer, and reading others' text from the computer screen, they began to get to know each other. Even though separated in time and space, many of the participants in these courses began to develop a relationship with other students.

> You get to know the people that you are in the class with on a very, almost on a different level, where you may never see them, but you get to know their interests...and I...know the type of learners that they are, because you communicate about yourself in the computer conferencing...You know, I consider them to be personal contacts of mine, even though I've never met them personally. (Corinne, January interview)

The requirements of both courses forced these adult learners to spend time with each other online. As students worked together on constructing a paper, or on critiquing each others' web sites, they began to develop an understanding of how other people would react; they began to be able to predict behavior.

> You can tell you have different personalities. Some will come out being quite blunt, and will say, "This is wrong", or "I disagree with you." And others will be quite different, will say something like, "How about if you look at it this way?" You can tell the personalities a lot. (Edward, October interview)

However, a few students found it very difficult to "make friends" or to develop relationships with other students in the conference. They also tended to be the students who didn't spend much time interacting with other participants in the course; they were the "lurkers" in conferencing language- they read notes in the computer conference, but did not add their own comments to the discussion.

> I don't think you can get an accurate "take" on anybody through this medium at all...It's very hard to get a real understanding of who someone is, what someone stands for, or how they feel about any topic, I guess. (Jack, October interview)

However, his view was not representative of the entire group of participants. A majority of the students felt that they were able to get to know one another quite well online. "You'll get a vision for someone. I guess you just create them. Same as reading a book, really, to create the characters" (Andrea, January interview).

> ...you certainly do feel a sense of camaraderie with some of the students in the class. And your personalities still click. Whether or not you're in the same city... (Christina, January interview).

Other students went out of their way to get to know others and to help the group develop good working relationships. "There's a real sense of community and family when you're out there" (Ronald, October interview).

> I think it's good to have input all the time with each other, conversations with each other. And I think the support aspect is really important, that we all sort of encourage each other and sort of be each other's cheer leader... (Janet, October interview)

Instructors in both computer conferencing courses felt strongly that the computer conference supported the development of a community.

> It *is* a community. It is very people-oriented. You make friends out here. You can talk to friends out here...a good vehicle for lifelong learning. (Professor David MacDonald, January Interview)

> I find it quite fascinating how you can start with a group of strangers...but they do, they really bond. You can tell that they do develop into a community and they support each other, and they ...talk to each other. (Professor Jennifer Stanley, January Interview).

> Many of those things that define a community in a face-to-face context define

> the community in the conferencing context as well. You know, personalities, background, education level, interest. What can make it or break it is being very careful--I've learned over the years— You have to be extremely careful in how you write. (Professor Amy Newson, January Interview).

Group Work

There are a number of reasons why educators require their students to engage in group work. In the "real" world, adults are frequently expected to collaborate and cooperate with each other to produce some product— a committee report, a list of recommendations, a detailed plan of action. Educators of adults may utilize the strategy of cooperative projects to make learning more authentic, to assist in the construction of knowledge through interaction with peers, and to encourage adults to take more responsibility for their own learning. And when it works, group work can enhance the learning experience for all.

> I like the fact that the groups were small, you worked in small groups and you were kind of dependent on everybody...And I think the smaller group work is better, because you don't get lost in the crowd, and you become dependent on each other, and it's kind of like you got...a sense of community...You have a sense of sharing. You have your own little group that you can work with. (Beverly, January Interview)

Group work in a face to face context can pose challenges for adult learners, in terms of making time to meet with their group and adhering to group time lines for completing work. Group work in a computer conferencing context can pose even greater challenges, because of the need to communicate thoughts and opinions in a timely fashion, the need to respond to other student's opinions, and the need to work together to produce a product.

Group work was a strong component of the Educational Administration course. Adult learners in this course were divided into small groups of two to five learners. The

original groupings consisted of four to five learners in each group, but because of student desire to join different groups, or because of student drop out, some groups ended up with very small numbers. Students in the groups were expected to work together to address various questions posed by the instructors in the course, and to develop three two thousand word papers online which were submitted to the instructors at various points in the course. A number of students found this requirement for online group work difficult to accomplish.

> I think the very nature of administration is that you learn to work with groups, so that's good. That's a good learning experience, even though it's a difficult one. (Deborah, October Interview).

One reason why participants felt group work could be difficult was because the goals of the adult learners in the group might be very different from one another.

> If your goals...like the goals of the group members might have been all different. One might have been just to get a credit. The other's, I'm sure, the other girl's was just to pick up some of the language. Whereas I think the other two [group members] are more inclined to get their grades. (Deborah, January Interview)

When goals are so different, it can cause friction among the members of the group. The members of the group had to come to some agreement about what a common goal for the group might be throughout the course. This involved some give-and-take and some students felt an impact on their personal learning. "That's frustrating, really, you know, to have to change some goals of mine" (Deborah, January Interview).

Another issue that caused consternation for a number of students in the Educational Administration course was the differential sizing of groups. When three major group papers had to be written during the course, students felt that groups that had fewer numbers of students in them were at a disadvantage. "Larger numbers in the groups... in my mind

minimizes the work load of that group" (Deborah, October Interview).

A number of students questioned why there were no provisions made for adjusting the groups after students dropped out or "retired" from particular groups.

> Whoever is monitoring the conversation, the electronic conversation and the electronic postings, has a much greater, I believe, a much greater onus to provoke comment, and/or respond to a lack of it by redefining groups, or making decisions, and then communicating them quickly...I have not been told that our group has shrunk. Maybe I don't need to be told. But it would be nice to be told. (Peter, October Interview).

The size of the group could also have an impact on the dynamic of the conversation and the learning that went on in that virtual space. In one group (which actually did have more than two members) it *felt* to a student as if there was only one other student actually working with him to accomplish the course goals.

> I think you have to have a critical mass in terms of the ... numbers in a group...I would think minimum of three to five, with four being pretty close to ideal. Any less than three I don't think provides a critical mass. (Peter, January Interview).

Starting a Course On Time

A computer conferencing course does not "start"in exactly the same way that a face-to-face class does. The course material is placed on the Web, and students are sent passwords at the start date of the course so that they can gain access to the online material. Adult learners who choose to take web-based courses possess a range of hardware, a range of software, as well as a range of technology skills. It can take up to two or three weeks before all students are able to successfully access the course. At that point, if members of the course are engaged in group work, the new members are left feeling breathlessly far behind, although they have only just begun.

> Hi guys, I'm really sorry I am late getting into the forum but I had the wrong version of Netscape and it would not let me into the forum. But, here I am willing to do whatever I can to help in our group. I've already done some reading it is just putting it all together. Please give me some direction for our group!! Thanks. (Edward, Course notes, September 22).

Several days later, on September 26, the group received a message from the course instructor confirming that two more members had been added to their group. Included in this message was a suggestion that members of the group begin communicating together more effectively:

> I am concerned about the slow pace of discussion. I am looking forward to seeing an accelerated pace from this group. If not, I suggest that anyone who is prepared to contribute at this point should go ahead without the other group members! (Professor Ben Stone, Notes to Group).

Two hours later, one of these new members of the group posted a message to the listserve introducing herself, and stating that she would move her previous contributions (postings) to her original group over to her new group. "I'm really anxious to get to it, so...I'm looking forward to this sharing of our learning" (Colleen, September 26, Group Notes).

Inability to Provoke Responses and Change the Group Dynamic

Sometimes the adults in the small groups in the course felt incapable of changing anything about the dynamics of their group. This lack of control was particularly frustrating for some students in the Educational Administration course, because group work comprised a major component of their course. "It's terribly frustrating ... in this program because of lack of entries being put in by members of the group" (Deborah, January Interview).

One student compared the differences in trying to communicate with silent members of his group with the response he would expect in a face-to-face learning

situation.

> It's a great forum, and it works well if everybody's participatory. If they're not...I feel a little more powerless to provoke an action...if I was in a room with somebody, they would feel much more obligated to respond to me. (Peter, October Interview).

Another student pointed out that the *potential* for non-response from others in a group was present. However, once he got involved in the conference, he found the members of his group supportive, helpful, and responsive.

> A person could easily say on the email, "Sorry I am busy" or not respond. ...It is not like you are seeing someone face to face and asking them for help. You know if you ask someone on the e-mail if they wanted to, they can just not e-mail you back. In general, I find people [in the conference] very friendly and very helpful. (Edward, October Interview)

The students in two of the four small groups in the Educational Administration course pointed out many of the challenges of working in that environment. Research participants in the other two groups found that their groups functioned fairly well, with members being responsive to one another. The experiences of the adult learners in working together in groups were quite different, depending on the composition of their particular group.

Students felt that when a group was experiencing difficulties, caused by lack of communication or a shifting of group membership, more intervention from the instructors were required.

> You know, I don't shy away from working with groups, but if you are experiencing difficulty, I think you need a lot more direction...that's something that a group conferencing course should be mindful of, that groups that are experiencing trouble need... help. And help should be provided. (Deborah, January Interview)

Meeting Face-to-Face

Computer conferencing courses are touted for their asynchronous nature, and for the flexibility that gives the adult learner, who is generally *not* required to be online at a particular time to work with others. In this research study, I found that a number of the students in both courses made arrangements to meet each other and to work on the course together.

One student in the Educational Administration course who had been in touch with other students who had previously taken the course, learned that the most difficult part of the course was the instructors' expectation for group work via the computer conference. Rather than wait for possible communication difficulties to occur, this student contacted all of the members of her group via e-mail and phone, and suggested meeting together face-to-face. Since most of the members of her group lived within a 50 km radius, it was possible for this group to come together.

> So we met and we decided that maybe we should meet before, at least before each report is going to be taken on. And so it's been, you know, we sort of mutually agreed that this was important. (Janet, October Interview).

If there were members who were unable to attend the meetings because of work or travel commitments, the work for the next report was divided up and assigned by those present, and those absent were informed later.

The members of this group were careful to chat about the meetings only on e-mail, which allowed private communication, rather than on Alta Vista Forum, which was monitored by the instructors. After the meetings occurred, group members also ensured that the division of labor was mentioned on the Forum, so that the instructors could see that they

were discussing the process of developing the group reports. There was a definite feeling among the members of this group that the instructors' expectations were for communication to take place only electronically.

> We're sort of wary about them knowing that we meet, because I think for them, for the instructors, it's really important that this group work be done over the Web. (Janet, October Interview).

Instructors shared firm expectations about communication via computer conferencing as an integral part of this course. Some students felt very strongly about communicating with group members *only* via the course web site. These students felt uncomfortable with the idea of communicating with other members of their groups via phone or arranging to see each other in person.

> She thought ...that [getting together] would be very dishonest to the whole purpose of the course... So we never did do it...I wouldn't even call her, because I didn't want to betray that honesty.(Deborah, January Interview).

One of the benefits of meeting face-to-face (for the group which did arrange to meet) was that everyone could picture the other members of the group. The human face connected with a name caused group members to respond to each other a little differently.

> If you're doing a web course without ever having met them in person, I think that it would make it more difficult. I think people might tend to *not* see these people as people, because they're not. They're just printed words on a page...So I think having met each other...we do sort of correspond on the Web like we're colleagues in a workplace, rather than just being these non-entities out in cyberspace. (Janet, October Interview)

This student's comment about perceiving people just as words on a screen certainly counters one prevailing idea that computer conferencing is an empowering technology for all users, as she points out one of the difficulties of working in a virtual environment.

The Written Word

The ability to write, to read and to understand the written words of others is a fundamental requirement for successful functioning in the computer conference. The participants in this research found that writing and posting notes in the computer conference allowed them to communicate with others. However, they discovered that there were hidden challenges to communication throughout the course. The students found that while the technology allowed them to pursue things that would have otherwise been impossible, it also placed some hurdles in their path. The learners found that misunderstandings occasionally arose because of dependence on the written word. However, the fact that they were learning via asynchronous posting of messages had many positive aspects as well. The benefits and the hurdles posed by communicating via the written word as described by the learners will be shared in this component.

The purposes for which the participants in this study communicated with each other were: (1) sharing ideas; (2) clarifying; (3) posing questions either academic or technical; (4) posting answers; (5) making academic statements; (6) responding to each others' academic statements; (7) making personal comments; (8) suggesting how the group could perform better; (9) posting humorous comments, trying to keep the mood light and friendly; (10) cajoling, trying to get someone else to do something. In face-to-face classes, the communication is verbal-aural, that is, students and instructor speak and listen to one another. In the computer conference, the communication occurs as reading/writing. Reading messages is analogous to taking information in by listening, while writing messages is analogous to verbalizing thoughts, opinions, or information. Many of the adult learners

enrolled in graduate courses are readers; they are used to taking information in through written text, processing it, thinking about it. The possible exception to that general statement is the learning disabled student, for whom reading might be difficult, and a non-fluent way to process new information. Reading in the conference, though it did pose a few challenges for students, was a comfortable activity for many. It was the writing side of communication which challenged the adult learners.

The act of writing allowed students to engage in thoughtful reflection about what another student or the instructor had written, or to think through what had been read in a text before expressing an opinion. This opportunity for reflection before response was perceived as a major benefit of working in the computer conference by a number of students. These were often the students who said that when they were in a face-to-face class, they did not tend to share their opinions or speak up that frequently.

> I never really reflected on it, but I find that when I write, I think that for me, I sometimes am better able in my writing to express what I am going to say because you get the time to reflect on what you have written...You get the opportunity to, you know, think about what you are going to write. And you get the opportunity to revise and edit when you write what you are thinking, and you have the opportunity to go back to fix things and clarify. In some ways you are better able to express how you feel, more than in a face-to-face classroom. (Beverly, October Interview).

> Often formulating thoughts in my head and speaking them out in class doesn't come as easy as formulating them on paper which essentially is what I'm doing on the computer. (Andrea, October Interview).

> I guess the writing mode makes it easier for a lot of people who might not, who might not communicate in terms of face-to-face interaction, and might not get their point across clearly. In writing in the computer conference, it gives you much more time to think about what you're going to say, revise it. Put it on the word processor, and put it into the conference exactly as you wanted it, because you had the time to think and respond. But the written--gives you much more

> opportunity to prepare and probably greater opportunity to get your points across, but auditory learners might find it a little harder. (Scott, January Interview).

Thinking about other people's messages and considering carefully what they wanted to say gave students time for thoughtful reflection. It also allowed adult learners who had difficulty with spelling or grammar to use a spell check or a grammar check on their word processor, so that the messages they posted could be in perfect English.

> Everything I go online my buddy proofreads. I'm truthful. He's got to proofread it. He just cuts out the ah's and there's, more or less, right? He keeps it more of a professional nature as opposed to a speaking nature. (Barry, October Interview).

Theorists who write about readers and text discuss the process of how readers construct meaning (Goodman, 1986; Smith, 1986). As readers read the text on a page, they call upon their prior knowledge and experiences to help them understand the meaning of the written word. Readers construct a meaning that is not developed solely from the author's words on the page, but also from what they as individuals bring to the reading. In this interaction with the text, the reader constructs meaning.

The process of making meaning from the written word in the computer conference is similar. Learners in the computer conference bring their background knowledge and prior experiences to the task of making meaning from the messages that they call up on their computer screens. In interacting with the text on the computer screen, readers construct their understanding of the author's meaning.

> The words are very much open to your interpretation, well, the reader's interpretation when you read what someone else has written. And then you can put your own slant on it...then it can become what you thought was written.

> And what the person intended might not be the same thing. (Andrea, January Interview).

This was a particular concern for groups in the Educational Administration course, since the text they were constructing together needed to display academic rigor and a synthesis of Educational Administration theories.

One student shared a thought about how her fellow students constructed meaning in the context of the computer conference. Since the Instructional Technology course did not have a hard copy textbook, much of the information the students needed to accomplish the goals of the course was made available to them in the virtual library, or through links to other information sites on the Internet. This adult learner suggested that the participants in the course actively constructed their own written text for learning as they communicated with each other.

> Well, I think that the written notes that were supplied back and forth were probably the primary means of learning in the course that we just took. What was happening was if one of the students did not understand something about designing web pages, they would post the question. And then we'd get a response to it, and everyone would learn from that. (Corinne, January Interview).

The instructor in the Instructional Technology course agreed that the written messages which students post throughout the term, as learners ask questions and receive answers, are the basis of what could be considered the course "textbook". "So the learners create it as we go along" (Professor MacDonald, January Interview). The questions dealt with in this "textbook" were ones that were relevant to student needs at that point in time— an online example of just-in-time learning.

Challenges of the Written Word

Communicating in the computer conference through writing allowed students to reflect on their own writing, to revise their thinking if necessary and to collaboratively construct understanding. However, there were also challenges associated with the fact that the communication occurred via written text in the computer conference, including: (1) lack of body language; (2) lack of clarity in writing; (3) not knowing one another; (4) lack of typing skill; and (5) the unpredictability of what students would find each time they logged onto the conference. These five challenges surrounding writing as a mode of communication which were identified by the participants in the research study are detailed in the following section.

The adult learners in both courses found that although people tried to express themselves clearly in writing, the possibilities for misunderstandings were great.

> Sometimes it is not the best form of communication, because comments can be misunderstood, and people, when they're short on time and are answering messages, can be a little more abrupt than what you would necessarily want them to be. So not being face-to-face sometimes there is miscommunication. (Maureen, January Interview).

Ten students found that they didn't always quite know how to take what someone else had posted in the conference. They felt that a large part of the difficulty was rooted in the fact that *communication couldn't be supported by body language*. "You quite don't know how to read people and what they're saying, because you can't see the gestures" (Donna, October Interview).

> Probably nine times out of ten, the context in which something is taken is probably not the context in which it was meant. So, it can be very difficult. (Jack, January Interview).

Four students found that some of the communication difficulties lay in the fact that the people involved in the computer conferencing course were so diverse.

> Well there's great variety, diversity, I would say, among us. Sometimes I found it difficult to try to get a grasp on what people were saying.(Beverly, January Interview).

Sometimes the lack of clear understanding arose from the *inability of students to express themselves clearly in writing*. This was stressed by eleven students. If a person did not have good language skills, and an understanding of how to put their thoughts together in a coherent manner, then effective communication was at risk. "Often you see that people do have difficulty in expressing what they're trying to say through the written word" (Beverly, January Interview).

While watching other students in the computer conferencing course struggle to clarify questions, so that others could provide answers, students came to a realization of the importance of text as communication.

> That's one thing I probably learned the most from taking this course...how much written communication is a barrier to learning. (Donna, January Interview).

> When you write, unfortunately, your character is based on your writing. And if you're a weak English student, and your spelling is atrocious...then that's what people see...You're basing everything by their written text...I guess when we see people face-to-face, we base people on their appearance. So when we see things online, we base them on their punctuation, spelling and grammar. (Theresa, January Interview).

Even though many adult learners agreed that they made judgments about fellow students based on the quality of their writing, this was not equivalent to really getting to know someone. In the written text of the conference, it was frequently *difficult to interpret people's personalities*. Being unable to develop a better understanding of their classmates' personalities caused frustration for five students, because it was difficult then to know how the text was intended to be read.

> Well, it's difficult, because I don't have any personality to attach to the language. You know, if I knew a person, met a person, and some sense of who they were and where they came from, then I could have a better sense of what it is they mean when they say something. One of the big challenges of this is that all I get about what they're saying is what they wrote. (Peter, October Interview).

> It is rather difficult because of the confines that you have, not being able to use the tone of your voice or the expressions on your face. It's very difficult to relay certain aspects of maybe your personality, whether or not you're joking about something, or you're being sarcastic. You can't really relate that to someone else when you're typing it down and all they're reading is words. (Jack, January Interview).

Actually posting messages by *keying the words in at the computer keyboard*, is a challenge pointed out by four students. For some students, it took an inordinate amount of time to compose and post messages to the computer conference.

> I tried to communicate often, but there were a lot of things that were left unsaid because I had to do it, to type it I suppose. I had [handwritten] notes written up, that I meant to post and I never did, for example. (Colleen, January Interview).

Some students found that typing responses took much more time than anticipated. "But I mean you know the time it takes to type a response, right?...I'm not a ten finger typer. I should be, but I'm not. I am a two finger typer" (Barry, October Interview).

> But for those persons who are two finger typists, to explain a point by typing something onto a web conferencing or by e-mail, is a major feat...So I think that's a major impediment to people getting their points across. (Curtis, January Interview)

Another cause for concern in the computer conference, its *unpredictability*, was pointed out by one student. Adult learners are very busy people, because they are frequently balancing family, work and study all at once. Students tend to allocate a certain amount of time that they plan to spend working on their academic pursuits, whether it is an hour each night or six hours on a Saturday. This student found that the computer conference was a very unpredictable place. In contrast to a face-to-face class, when students could plan on a three hour class on Monday night, plus whatever time they chose to spend preparing for the class, students going into the computer conference never knew what to expect when they accessed their course.

> I guess there's two frames of thought going on here. You're trying to post on your own thoughts, and get those straightened away, and in the meantime, there's the unpredictableness of what the other people are going to say, really. To do justice to the conference you should be in, responding to those thoughts as well. Trying to do both, trying to guide what you have to do yourself, and on the other hand, you have the unpredictable nature of logging on and seeing if there's postings there for somebody else, or at other times, expecting to see some and not seeing them. You know, it's basically unpredictable.(Scott, October Interview)

Strategies to Meet the Challenges

The participants in this study developed methods to cope with the challenges posed by working in the computer conferencing courses. The adult learners identified seven strategies that facilitated writing and constructing meaning in the conference including:

(1) getting to know each other; (2) communicating with other students outside of the computer conference; (3) giving feedback cautiously; (4) letting a message simmer if a sender was unsure of how it would be received; (5) using humor judiciously; (6) paraphrasing a confusing message; and (7) learning how to touch type. These strategies will be discussed in further detail in the following component of the third section.

First and foremost, many of the participants in this study felt that it was essential to *get to know their classmates on a personal basis*. "If you can't see the face, then you have to have something about the person" (Colleen, January Interview).

> I think one of the reasons why a lot of these courses get you to introduce each other is so that you can sort of get to know the person first. Because if you don't know the person, it's really hard. (Theresa, October Interview)

Another student also felt very strongly about the importance of getting to know his classmates. Introductions at the beginning of the course were one strategy, but really paying attention to others as they posted messages to the conference was helpful as well.

> You begin to know your classmates as they write more: what their direction is, what their sense of humor is like online, how direct they are, or how indirect they can be. The more a person writes, just like the more a person speaks, the easier it is to sort of scope out where they're coming from. (Curtis, October Interview)

Some students found other means to get to know their classmates on a more personal level. There were pockets of students in this study who *met face-to-face*. Even though the courses were both web-based, distance courses, there were groups of people who lived fairly close to one another. Sometimes these students would meet to discuss the course. Janet's group in the Educational Administration course met a number of times over the term as described earlier. Other students worked in the same school or lived in the same

town. Among participants in the Instructional Technology course, Christina and Corinne taught at the same college, and Donna lived in the same town as they did. All three knew each other personally, and would chat on the phone or in person about course-related matters. Jack lived in residence along with several other students in the course. Curtis and Theresa taught in the same school, and saw each other on a daily basis. Other students did not have the opportunity to get to know their classmates better on a personal basis. They did, however, in some cases, resort to e-mail. They communicated through their private e-mail, not on the Web Board or on the Alta Vista Forum to share information and compare notes. A number of students found this was an effective way to share their thoughts, away from the perceived "watchful eye" of the instructors in their courses.

By design, *peer feedback* was to be an integral part of each course. In the Instructional Technology course, students were to provide feedback on the iterations of each other's web sites. In the Educational Administration course, members of groups were directed to dialogue with each other and critique each others' thinking. However, because statements could be so easily misunderstood, feelings can be unintentionally hurt. Adult learners learned to be very cautious when giving feedback to each other. They felt that when giving feedback, they had to walk a fine line.

> I find it difficult, if you don't know somebody, to write comments about them, because you don't see them, and you don't know how touchy they are, or how they're going to take it. And that's what, you can try to be as diplomatic as you want, but I find that part difficult. (Christina, October Interview).

Giving feedback to others is an art even in face-to-face situations. It is even more difficult to accomplish in a computer conference, where students can't see body language cues

which might soften the critiques being shared. The instructors tried to show students appropriate ways of giving feedback to others:

> One, by trying to provide a model; two, by giving online information of how to do it constructively. And I guess three is being quite sensitive of how awful it is to have your work edited and criticized. (Professor MacDonald, January Interview).

The instructors' advice to the adult learners was to always state the positive first. "You go in with the positive stuff and then bring in, 'Hey, you know, maybe you could try this, this, and this type of thing'"(Professor David MacDonald, January Interview).

> ...Always phrasing things in the positive, always phrasing things in the positive. I think it's important in the written text, because people will interpret, people will sit there and look at it, and look at it, and look at it. And if, you know, it's stated in the positive, I think it just creates a better tone....Leaves less interpretation, less room for interpretation and other meanings. (Professor Amy Newson, January Interview).

> We have to build some trust as well, and a little bit of respect. We will give some feedback. If, for example, you challenge somebody, or you criticize an idea, if the person doesn't know you, or doesn't know something about you, they may be intimidated by that. (Colleen, January Interview).

If learners had concerns about how a message might be received after they had finished composing it, the participants suggested asking someone else to read and respond to it.

> I have my wife occasionally read my postings, just for flow. She...hasn't done the readings I've done... although they can be clear from context, often aren't. So I do get her to read it for flow, and see if it makes any sense. (Peter, October Interview).

If it doesn't make sense to an outside reader, the writer can work to clarify the language before posting the message.

> Last night I was working on something...I was sending an e-mail, and I said to my fiancé, "Come in and read this and see how you take it."...He said, "Okay, you've got to lose the first line, because she's going to think, you know, that you're really pissed off." So I said, "Okay." But often when you're writing, you know it's difficult to do that. You know, you say something light-hearted on the computer screen, and someone reads it, it depends on how they take it. And often I do that, I get someone else to read it too, to see how it comes across. I'm certain that not everybody takes that time, either. (Andrea, October Interview)

If there is no one available to read the message in question, and give the writer feedback on it, students suggested *letting it simmer for awhile* before sending it. If it seemed acceptable later on, it was probably safe to send.

> I'll put it down and then I'll re-read it about five times before I actually put it on there...The thing with written words, particularly once it's out there, you can't retract it. (Corinne, October Interview).

> One of the things about making a posting is that it stays there... it's fixed. And you know, there's a certain amount ...of saying--the point of no return— when you post something. (Peter, January Interview).

The participants in these two courses who did not know each other previously found it difficult to get to know each other personally. Sometimes, people would be tempted to *include some humor* in their posts as a way of letting their personality shine through.

> One of the things, I think, that is the most difficult to come across is sarcasm. Sarcasm, if you're standing in front of someone, the smirk sort of...you know, describes it. Whereas on an e-mail, you might mean it sarcastically, but you forget that the person who's reading might not take it that way...by the time they send back a message and say, "Well hey, what did you mean by that?" you know a day or two could go by...twelve hours can really get somebody upset. (Theresa, October Interview).

Another way students tried to share their personalities and their emotions was by using emoticons, or smileys.

> When we speak, even face-to-face or on the phone, it's a matter of inflection. Whereas with written communication, you have to rely on type, space, font, emphasis in terms of all caps, repetition, those little smileys that indicate some kind of humor. If I make a joke and I don't indicate in some way on the computer screen, it could be taken completely the wrong way, mutual lack of empathy. So there has to be some way of knowing that. (Curtis, October Interview).

Smileys work if everyone in the computer conference understands their meaning and uses them appropriately. Professor Stone explained that the students in the computer conference felt the need for a mutually agreed way of expressing emotions. "I've had some students say to me, 'I wish I had some little icons that I could easily pull in, to say that this is a joke. You know, this is a smile.'" (January Interview).

Some students found that an effective way to ensure that they were understanding the meaning behind a particular message was to reply to the author, and *paraphrase the message* in the reply. "I paraphrase what they've said to make sure I'm understanding" (Donna, October Interview).

> A lot of the times, I probably state it back to them, what they are already saying, but probably put it in the way I think they are saying it...I may ask them, "So what you are saying is--", or "If I get you right, you are telling me that--" And then probably if I am wrong, and at times I have been, they'll write back and say, "No, I mean this." (Edward, October Interview).

A practical strategy to overcome some of the time crunch that students felt in the computer conference, was to *become a touch typist*. This would allow students to spend more time engaged in the cognitive activities of the course, rather than the physical activity of keying in responses and comments. As well, some professors and students were thinking about utilizing a chat room more frequently for synchronous discussion. However, chat

room talk, when people type in comments which then are displayed on everyone's screen, can move along very quickly. Those unable to type at a reasonable rate would soon be left behind in the "conversation".

> People who wanted to say things, either aren't comfortable because they can only contribute maybe two or three lines, or they can't explain their point well enough in the time allotted to type it...And in some ways, that's very unfair. Because they're limited by their typing ability. They can't express themselves fully...They can communicate, but they can't communicate *as well.* (Curtis, October Interview).

A Flame War: When the Construction of Meaning Breaks Down

Posting messages in a computer conference can at times be problematic. As the mode of communication is words on a screen, occasionally students forget about the person who wrote the message.

> Sometimes people have a tendency to say things in writing that they may not have said in person...it's a real sort of problem that people can slip into, without even realizing it. And they might disagree with someone, but instead of putting it in a ...constructive criticism format, they might become too critical [of the person]. (Janet, October Interview).

As well, in the computer conference, students oftentimes do not know each other, and probably would never meet each other. Given those factors, occasionally messages are posted that precipitate hasty actions.

> I think when people sometimes disagree with stuff and they're right on the e-mail, they don't take the time to think about it first. They type it all in and fire it off. You know, there's something to be said about typing it in, and waiting an hour before you fire it off! (Christina, January Interview).

If students do *not* take advantage of the opportunity for "sober second thought" that computer conferencing affords, then sometimes messages are posted in haste that cause

difficulties. Professor MacDonald pointed out, " at this advanced level, they're probably veterans of flame wars." (January Interview).

In the Instructional Technology course, a flare-up erupted into a small flame war during the last days of the course. The flare-up had several roots. Students waited until the last moment to request an extension. They assumed that the professors would be available to give them an extension over the weekend. As Professor MacDonald pointed out, "The medium seems to foster people's belief that you should have instantaneous response. Whereas if I'm teaching a course face-to-face, you know, they either come to my office hours, or they wait 'til next week [when] we meet" (January Interview). He identified two reasons why people have very different expectations of instructors during online courses. One reason was the computer conferencing environment which makes an instantaneous response possible. A second reason he suggested was that: "We set it up. We kind of pride ourselves on being able to do this, and troubleshooting and answering in an hour, or working over the weekend" (January Interview).

Another root of the conflict lay in the way messages were misinterpreted. Instead of exploring the exact meaning of the instructor's message, one student deduced that he knew the meaning and responded accordingly. Then other members of the conference jumped into the fray. The tension escalated and made the atmosphere in the conference uncomfortable for all. Much of what happened could be traced to the medium which allowed a mis-communication to occur, and to the student's quick interpretation. The end result was that the flare-up left some students feeling quite uncomfortable, and posed a deterrent to the effective flow of communication.

> Then there came the problematic stuff...I don't want to be involved in it. So I'm not going to become entangled in 'the stuff', 'the beep'." (Jack, January Interview).
>
> I kept checking my e-mail, there was comments there. And people were fighting back and forth, like over the Internet...in written communications. It was fighting. And I just thought, 'Wow. This is really ridiculous' And that's what it was, just because tension was high, frustration, and because there was nobody they could talk to about it." (Donna, January Interview).

As this flare-up occurred right at the end of the course, it was never resolved but merely dissipated with the course ending. A flame war can be a serious communication challenge posed by the reading/writing environment of the computer conference.

Research Question Three Summary

In reference to the third research question, the participants in my study and I together developed an understanding of how meaning was constructed in the reading/writing environment of the computer conference. As adult learners entered the computer conferencing course, they joined a group of learners working online. At first, the other members of the group were quite anonymous, and were only words on the computer screen. But gradually over the term, through online reading and writing--acts of communication with one another--learners came to know each other, as the members of the class built an online community.

The participants in this study found that small group work in an online community was a particular challenge. Accomplishing work in small groups was possible (and valuable for some learners) but required a special effort and determination to work successfully. Special challenges for groups included members who were unable to access the course on

time, changing group membership because of student withdrawal from the course, and members who lurked rather than participated in the discussions. If the challenges were acknowledged and addressed, the group was empowered to work effectively.

Although computer conferencing is well known for its asynchronous nature, there were adult learners in both of the courses in this research study who chose to meet face-to-face. These meetings allowed learners to resolve issues that arose within the small groups or to tackle technical problems together. The face-to-face meetings also appeared to facilitate work online with members of the class. Members of the groups which chose to meet face-to-face felt this time was well invested. The desire of learners to meet each other face-to-face underlined the importance that online students attach to getting to know one another as individuals in the computer conference.

The fact that communication in an online community takes place via written text posed special challenges for learners, such as developing understanding of meanings when there was no body language to help clarify the message. The participants in this study developed a number of strategies for coping with the special challenges of written text which included stating the positive first when responding to a classmate, learning to use caution when posting and interpreting messages, and going slow--taking time to request clarification.

The members of the Instructional Technology course experienced an uncomfortable situation online, when meaning and civility broke down and some participants dispensed with online manners ("netiquette"). The flaming incident which occurred was unfortunate, and was an example of the way understanding can break down. This incident was a

demonstration of the importance of making a commitment to good communication strategies in an online environment.

Now I turn from a discussion of the findings of this study, to an examination of the implications of what has been presented.

CHAPTER 5: SUMMARY AND IMPLICATIONS

Introduction

This study arose out of a concern for the adult learners who choose to study in computer conferencing courses offered via the Web. How do these adults describe themselves as learners? What is the relationship between how these students say they learn and their achievement in the course? How do adult learners construct meaning in the computer conference, with its specialized literacy demands? What impact might the answers to these questions have on teaching and learning in the computer conference? The summary of the results encapsulates the understanding of these issues which was co-constructed by the adult learners in this study and myself, to suggest implications for educators and to identify areas for future research.

Summary of the Study

Adult learners in computer conferencing courses were the focus of a qualitative study using multiple sources of data. Little qualitative research had been done to explore the attitudes and perceptions of adult learners in the computer conference. The goals of the study were: (1) to describe the salient features of communicating and learning in a computer conferencing environment; and (2) to explore the factors which explain the

successful participation of adult learners in computer conferencing courses. On the basis of these goals, three research questions were established which became the focus of the research process.

Two computer conferencing courses being offered in two universities in Atlantic Canada were chosen as sites for this study. One course was Educational Administration, and the second was a course in Instructional Technology. Students enrolled in the two courses were invited to participate in the study, and eventually twenty students and four instructors participated in the research. At the same time, I went online, as an observer of the inter-communication among the participants in both research courses. A first set of interviews was conducted via telephone approximately one month into the course. I read and re-read the interview transcripts, and as themes emerged, incorporated these into the protocol developed for the second set of interviews. These interviews were held after the courses were completed, and final marks had been posted.

Illuminating the Research Questions

This research study addressed the following questions:

- How do students in a computer conferencing course describe themselves as learners?
- What is the relationship between learner achievement in the computer conferencing course, and the adults' description of themselves as learners?
- How do adult learners describe the task of constructing meaning in the reading/writing environment of computer conferencing?

The First Research Question

On the basis of the findings presented in chapter four, the following encapsulates how adult students in a computer conferencing course described themselves as learners.

- The adult learners identified a number of personal learning characteristics which underpinned their learning in the computer conferencing environment: independence, persistence, striving for excellence, being problem solvers, patience, procrastination, and flexibility.
- A factor which emerged as an essential component of learning in the computer conference was the participants' perception of their academic efficacy, their belief in their own ability to accomplish their academic goals. Learners' belief in their ability to achieve academic goals could be separated into two strands: (1) a belief that they would be able to learn the cognitive content of the course; and (2) a belief that they would be enabled to use the technology— conferencing software, computer, modem— to successfully complete the course. When the courses began, three of the participants in this study voiced a concern about their ability to learn in the computer conference because of the technical requirements, though they had no concerns about learning the cognitive content of the course. However, these students also were confident that they would eventually learn to use the technology successfully. Their confidence in a successful outcome grew throughout the course, and all three students did complete the course successfully.
- Motivation was identified by the participants as having a major impact on their persistence in the computer conference, that is, on their successful completion of all

the course requirements. A number of different motivators were identified by the adult learners, such as a desire to continue learning, to complete a program, to explore the relevance of the course to work life, to gain a credential, or to take a course because it was available by distance. Although there were numerous motivators named by the learners, one of the most important factors was their personal determination to complete the course.

The Second Research Question

On the basis of the findings presented in chapter four, the following encapsulates what this study was able to describe about the relationship between learner achievement in the computer conference and the adults' description of themselves as learners.

- Achievement in this study was defined as the successful completion of the computer conferencing course, that is, completing all assignments and gaining academic credit for the course. According to this criterion, eighteen out of twenty participants achieved success in the computer conferencing course.
- Two participants dropped out of the course. There were a number of reasons for the attrition of these two students including course structure being out of synch with personal learning style and overwhelming work and personal demands. It is important to note that despite their non-success, each of these students appeared to have a strong sense of academic efficacy.
- Various participants in the study described themselves as "independent", "persistent", "patient" and "flexible problem solvers" who "strove for excellence". Two factors mentioned most frequently by the participants were their spirit of

"independence in learning", and their "persistence in working toward their goals". Interestingly, three participants nevertheless described themselves as "procrastinators".

- The adult learners in the computer conferencing courses identified "being active participants", "interacting with others", "working consistently", "maintaining links", "using technology capably", "communicating effectively", "being organized", and "learning from prior experience" as key factors that impacted on their successful achievement.
- "Time" and "workload" were also factors that impacted on students' achievement as most students did not anticipate the major time and workload demands that learning in a computer conference would make on them.
- Successful completion of the course by a participant does not always translate into a learner's objectives being achieved. For example, three students who successfully completed the course indicated their dissatisfaction with academic and conferencing aspects of the course, and thus in their view, their personal learning objectives had not been met.

Given the above findings in this study, the following summation can be made:

- When the learning characteristics described by participants in this study were examined, there was no discernible pattern differentiating those who persisted and achieved success in the course from those two participants who dropped out of the course.

- Factors ascribed by students as contributing to their drop-out from the course can obscure a deeper sense of academic efficacy.
- This study's definition of achievement as persistence (that has been utilized extensively in earlier research) did not allow a sufficiently fine examination of the relationships between achievement and learners' characteristics within a homogeneous group of adult learners such as graduate "high achievers".
- The manner in which the research question was framed did not facilitate an in-depth exploration of learners' achievement in a computer conference.
- The question regarding achievement could be enriched to include such elements as learners' competence and connectedness (MacKeracher, 1996) thereby affording a more in-depth conceptualization of learners' achievement.

The Third Research Question

On the basis of the findings presented in chapter four, the following encapsulates how adult learners described the task of constructing meaning in the reading/writing environment of the computer conference.

- Readers construct meaning from the text of messages in the computer conference in a way analogous to how readers construct meaning from the text on a page, that is, learners bring their background knowledge and life experiences to the task of constructing meaning as they interact with the text written by another.
- The text in a computer conference can be especially prone to being misunderstood. The act of communicating in a computer conference is often understood by participants in the conference as a speech act, even though it presents to readers as

textual communication. Messages are often posted with abbreviations and short cuts in language; messages tend to be terse, since people don't typically type any more than necessary. It is frequently difficult to understand the tone of messages, since the text is not supported by body language; students often do not know each other personally; and the meaning of the writing itself needs to be clarified.

- Participants identified strategies they used to help construct or re-construct the intended meanings of computer conference communications. Developing personal relationships with other students in the conference, being extremely cautious when sending or receiving feedback, and not replying in haste were identified as helpful strategies.
- Flame wars can occur when communications in a computer conference are misunderstood by two or more people, and can cause discomfort and withdrawal from participation in the conference.
- Constructivist pedagogy/andragogy supports the development of collaborative environments for student learning. This philosophical belief translates into group work requirements in the computer conference. Group work can be a challenge for adult learners in any learning situation--one of the strongest learning characteristics among the participants in this study was their independence in learning. Group work in the computer conference poses even more challenges, because of the lack of synchronous feedback, difficulty in developing an efficient decision-making process, and dependence on others whom the students do not know and do not even

see. It requires more time, energy, and patience for students to work within groups in the computer conference because of the challenges just cited.

Illuminating the Experience of Teaching

The findings in this study helped to clarify the role of the instructors in the courses, and the experience of teaching in the computer conference.

- The instructors identified time and workload as major factors of their work in the computer conference. All four instructors reported spending much more time, up to twice as much time in some cases, on computer conferencing courses compared with their face-to-face courses. They also found that students had very different kinds of expectations of them as instructors in the computer conferencing course, compared to student expectations in face-to-face courses. Meeting these expectations (if the instructors chose to do so) increased instructor workloads considerably.
- Instructors found that students' perceptions of the instructors' role is different in the computer conference than in face-to-face courses. Many students expect nearly instantaneous replies to the messages they post in the conference. The expectation seems to be that if students can access the conference at any time from any place, then the instructors should be available at all times from all places.

Implications

The findings of my study have implications in the following areas: the development of online communities, supporting learners in computer conferencing environments, the power of language, personal efficacy in educational environments, and applying the Tinto model to learner persistence in online learning environments.

The Development of Online Communities

Davie & Wells (1991), Hiltz (1994), Mason (1991), and Rheingold (1993a, 1993b) elucidated changes in the role of the instructor as well as changes in the role of the adult learner in the computer conference environment. Researchers have worked to develop a better understanding of the new educational role which each partner in the computer conference must play, for effective teaching and learning to take place (Davie, 1988; Feenburg, 1989; Harasim, 1986). In a computer conferencing environment, there is a subtle shift in the location of control over the learning, from a teacher-centred environment to a group and a group process environment (Kaye, 1989; Schrum, 1993).

This matches the findings reported in this study. In the courses involved in the research study, instructors and learners worked together to communicate effectively, give feedback appropriately, and support the learning process for their colleagues. The learning that occurred in the courses was not dependent on pronouncements by the instructors. Rather, learners and instructors together constructed understanding in the context of the conference.

Moving beyond that, in one course involved in my research study, those involved in the conference actually co-constructed the "text" of the course, as messages were posted in

the conference and queries were answered by learners as well as by the instructors. These postings indeed contained the information that was required by the learners to successfully fulfill the objectives of the course. These suggestions were then available online as pertinent, essential information that could be accessed and reviewed at any time.

In the second research course, the learners were expected to construct an understanding of issues within small groups with minimal involvement of the instructors. The groups were organized to function as if they were small discussion groups on campus with the goal of producing three products over the term. Though some students were uncomfortable with a perceived "lack of direction" on the part of the instructors, other learners thrived in the independent atmosphere which was set up in the small group conferences. Knowledge was constructed through the interactions of participants in the small groups.

In this research there was indeed a shift in the roles of learners and instructors, as instructors functioned as facilitators and learners became more self-directed in terms of their learning. However, the experiences of learners in the computer conference might be substantially different, depending on the configuration of the computer conference. Involvement of instructors in conferences exists on a continuum, from (1) initial set-up and direction only, to (2) involvement only when necessary to answer queries which others have not been able to answer, to (3) consistent and frequent involvement in the conference. Initial instructor expectations and how learners understand and negotiate regarding those expectations have a great deal to do with how the conference evolves.

Supporting Learners in Computer Conferencing Environments

In my literature review, I found that the successful participation of learners in computer conferencing environments has been addressed in a small number of qualitative research studies (Bullen, 1997; Burge, 1993; Eastmond, 1995). Work continues in this area, as educators reflect on the importance of exploring learning strategies, student concerns and the need for effective learner support in this new learning environment— an environment in which the number of participating students is increasing in geometric proportions (Dede, 1996; Rogers & Wells, 1997; Steeples, 1993).

My research study supports these findings, as the learners in this study identified a number of factors for successful participation in a computer conference. The requirements of students for flexibility, for an approach to learning which takes account of their previous life experiences, and for an approach which helps them forge connections to their work life if at all possible, have been documented. The learners in this study also underlined the importance of developing an ability to use technology capably and to use language properly in order to communicate in the conference. These factors underpinned successful learning experiences in the computer conferences, and support the findings in the literature.

What may be even more important, the participants in this study stressed the importance of learning from prior experience, of being able to transfer learning from one environment to another. The learners affirmed the importance of active participation in the computer conference for successful learning. Even though they conceded that those who did not participate actively *might* be able to learn, there was a firm belief that students had to consistently participate in the conference in order to learn efficiently. In addition, the

participants confirmed that they needed to learn how to impose an order and an organization on the computer conference, in order to learn efficiently. This suggests that understanding how to impose an organization on the communication in the computer conference was essential for achieving successful learning in this environment.

The Power of Language

Berge and Collins (1995), Davie and Wells (1991), Hiltz (1994), and Lewis, Whitaker and Julian (1995) have suggested that the language requirements of the computer conference posed a major concern for educators. The hidden linguistic requirements of this milieu have been underlined, because learners in a computer conference must be able to read large amounts of text and respond in clearly developed writing in order to participate fully and effectively in this learning environment.

This study reiterated the necessity for clear writing, as well as the ability to read and digest large amounts of text, as essential for successful functioning in the computer conference. This was clearly demonstrated in one course as a flame war erupted, partially caused by participants' inability to understand the intent of a written note in the conference, as well as a lack of clarity in writing particular messages.

Moving beyond that, this study suggests that parallels can be drawn with the construction of meaning from reading various texts. As well, participants elucidated their strategies for communicating in the computer conference. The rigor of clarity in writing was stressed, though it might be difficult for some students to achieve this clarity. This situation may be partially ameliorated by forging strong personal relationships with classmates, so that if uncertainties regarding meaning arise, those involved in the

communication feel free to request clarification from another student. Another communication challenge underlined by the participants was the lack of body language to attach to the notes in the conference. The development of a set of idiosyncratic icons to express feelings and body language was suggested as a way of apprehending meaning.

Personal Efficacy in an Educational Environment

As far as independence in learning (Paul, 1990), proficiency in using technology (Burge, 1994), and persistence in achieving goals (Powell, Conway & Ross, 1990) is concerned, the participants in this study identified all of those factors as being critical for their successful learning in the computer conferencing environment. It would appear that many of the factors which have been suggested as essential for learning in a distance environment in general also apply to the computer conferencing environment.

Other interesting findings which emerged from this research study extended the literature. The learners in this study reported high levels of a sense of academic efficacy. The statements of 19 of the 20 student participants reflected confidence in their ability to learn in the computer conference. This attitude was particularly striking among some of the learners in the Educational Administration course, some of whom were inexperienced in using computer technology for learning. These learners showed a strong subjective assurance in their ability to succeed at the academic task (Bandura, 1986; Gibson & Graff, 1992). The participants in this study expressed their desire to continue to learn, as well as their strong belief in their eventual success in the learning environment. Though research which focuses on learners' perceptions of academic efficacy has not yet been conducted in computer conferencing environments to this researcher's knowledge, there are indications

that learners' perceptions of their academic efficacy had an impact on their achievement in this study.

Applying the Tinto Model

It is useful to examine the research undertaken in this study within the context of Tinto's model of graduate student persistence (See Appendix K). There are some concepts that Tinto proposes that are relevant to this research, such as "nested and intersecting communities" (1993, p. 234). Graduate students participate in a number of communities, including the communities of faculty members in their department, other scholars in their field of study, and their colleagues both within and outside the university. It is important for adults studying by distance to develop feelings of membership in these various communities. Participation develops through interaction with others in the community of learners, and computer conferencing as a mode of course delivery can support and enable that interaction. For instance, a "visiting scholar" can be invited to be a discussant in a course for a week, sharing new points of view with students. Through conference messaging, students can build and strengthen the community of learners to which they belong. Instructors can also support the building of community through the choices made in the instructional design of computer conferencing courses. These "nested and intersecting" communities provide an anchor for graduate students as they proceed one course at a time through their program. Adult learners are also members of communities of interest external to their academic interests. These communities may include family and work. The demands exerted on adults by these communities have been discussed by the learners in the study—learners found that these communities could have a either a positive effect on their

academic progress, or possibly a negative effect. Whichever the case, the learners were very aware of the impact exerted on them by these communities.

It is also of interest to explore the related concept of "developing peer relationships". Adult learners studying at a distance in the past often felt isolated from their peers, and did not feel part of any learning community. Computer conferencing as a mode of course delivery offers learners the potential to develop relationships with others in their course. Students can get to know each other on a personal level very well, despite not meeting or seeing each other. Peers working together in the virtual classroom of the computer conference have an impact on each others' thinking, writing, beliefs, and development of academic competencies. Peers can push each other to excel in the atmosphere of the conference. Conferencing allows students to develop strong social relationships with others within their virtual community.

Finally, it is salient to examine the issue of "mentor relationships". Instructors in computer conferences develop and teach online courses to their students. Some instructors develop courses based on constructivist epistemology. These instructors often perceive their role as a facilitator, rather than a subject matter expert. In the role of coach or facilitator, the potential exists for a different type of relationship to evolve between adult learner and instructor— one in which the instructor mentors the student's intellectual growth and development. This is similar to the type of relationships that faculty can develop with students who attend the university on a full time basis. These relationships are more difficult to achieve with adult learners who are part-time, distance students, however, computer conferencing as a mode of course delivery can facilitate academic mentoring.

Possibilities for Further Research

The major increase in the number of courses offered via computer conferencing points out the need for continuing research on the needs of the increasing numbers of adult learners who choose to study in this learning environment. While this study confirms many findings in previous distance education studies, and adds to our understanding of the adult learner in the computer conference, the construction of meaning, and strategies for successful participation, I offer several suggestions stated as questions to guide and stimulate future research.

- In this study, "course completion" (in keeping with other reported studies) was used as the indicator of achievement. Many of the studies examined achievement of undergraduate students (Coggins, 1988; Kember, Murphy, Siaw & Yuen, 1991; Rekkedal, 1982). However, the adult learners in this study were graduate students engaged in courses at the Master's level. As such, they represent learners that could be characterized homogeneously as "high achievers". The results of this study suggest that a finer definition of achievement among learners described as "high achievers" is required. The utilization of a more finely tuned assessment of achievement in future research could reveal a more discernible relationship with individual learner characteristics. This could lead to such questions as: Would indicators of learners' competence and connectedness (identified as motivating tendencies, MacKeracher, 1996) contribute to the construction of a fuller understanding of learners' achievement?

- The methodology underlying this study is qualitative. Other means of obtaining information on the research question investigating the relationship between learner characteristics and achievement could be quantitative in nature. Further research which collects quantitative data and utilizes quantitative data analysis methods may add new understanding to the relationship between learning characteristics and achievement in the computer conferencing environment.
- In this study, group work caused consternation and difficulty for many of the participants. How can the constructivist approach to collaborative learning, with an emphasis on group work, be implemented effectively in the context of the computer conference? What structures need to be in place for true collaborative learning to occur in the computer conference?
- Many of the literacy requirements which affect student performance have been described in the literature. How can educators take this information one step further, and inform and educate students about these literacy requirements, to ensure a successful learning experience for each student?
- Literacy requirements in the areas of reading, writing, and technology impact on all students. Is the impact of these requirements amplified in the case of students with learning disabilities? How do students with learning disabilities cope with the reading, writing, and technological literacy requirements of an online course?
- Gender was not an issue which emerged in the data collected in this study. However, gender has been identified as an issue for adult learners in the distance education literature. What specific gender issues might emerge among adult learners

in computer conferencing environments? What effect does the availability of learning at any time, in any place have on the access to learning, technological requirements, persistence in the course, and perceptions of academic efficacy of female learners?

- The interviews with participants in this study were conducted over the telephone. Does this mode of data collection impact on the quality, quantity, or accuracy of data collected? Would any differences emerge if some interviews in a study on computer conferencing were conducted face-to-face and compared with other interviews conducted by telephone?
- This study was conducted in two courses which offered academic credit for students who completed the course. The students in these courses were very much oriented toward attaining particular academic goals. However, hundreds if not thousands of courses are currently available to adult learners over the World Wide Web which offer information and tutorials, but no academic credit. Would the needs of learners who pursue non-academic or non-credit computer conferencing courses differ substantively from the needs of learners in computer conferencing courses taken for academic credit?
- Time emerged as a major issue for the adult learners and instructors in this study. How could students and instructors make more efficient and effective use of their online time? Both learners and instructors reported that working in a computer conference requires approximately twice as much time for learning and

communicating. Can this time requirement be streamlined, while still allowing effective learning in the computer conference?

- The computer conference is a text-based learning environment. Because all communication occurs via text with no body language component, the possibility of misunderstandings arise. Is there a symbol system which learners could utilize in their communication, which would help them express clearly to their readers their linguistic meaning as well as the affective component of their messages? Is there a graphical interface, similar to American Sign Language which might be developed for use in computer conferencing environments, which would help learners communicate more clearly?

Limitations of the Study

The limitations of this research study are to be found in the generalizability of the study findings, in how the participants in the study were selected, and in the measure of achievement utilized. The first limitation resides in the extent to which the findings can be generalized. Qualitative research data collected from each of the computer conferences and from each of the participants in the study supports findings that are specific to each environment and learner. If, however, one believes that the findings of the study which are rooted in the particular can help illuminate a similar situation, that is a judgment to be made and applied by the reader.

Another limitation of the study was the fact that the research design called for participants to be chosen from a larger group of students enrolled in the courses who exhibited a range of characteristics of age, gender and computer experience. However,

when the researcher first invited students who were enrolled in the computer conferencing courses to become involved in the research, twenty students did not reply to this invitation. A second letter (in the form of a much more informal note more appropriate to the computer conference) was sent out to the students and more responses were forthcoming. Eventually, a total of twenty-one students accepted the invitation to participate in the research study. One student in the Instructional Technology course was not accepted to participate in the research-- because he was the technical assistant in the course and had special status. All other students who indicated a willingness to participate were accepted. Therefore, it was impossible to make choices about participants based on gender, age, and computer experience as had been planned. However, a wide distribution in terms of gender and age was the ultimate result of this process (See Appendix J). As well, the participants from the Educational Administration course possessed a broad range of computer experience. This was not the case in the Instructional Technology course though, where all students who agreed to participate in the study were already comfortable working with technology.

A third limitation of the study was the manner in which achievement was defined. Achievement in this study was specified as the learner's successful completion of the computer conferencing course, including completing all assignments and gaining academic credit for the course. This definition was based on research in the distance education literature, which frequently utilized persistence as the criterion to measure achievement (Bernard & Amundsen, 1989; Cookson, 1989; Rekkedal, 1982). However the manner in which the research question was framed did not foster exploring learners' achievement in

depth. The question regarding achievement and adult students' learning characteristics could be enriched by including an exploration of learners' competence and connectedness (MacKeraher, 1996) enabling a "thicker" description of achievement.

Thus the measure of achievement in this study did not allow a finer examination of the potential variation within a largely homogeneous group of graduate "high achievers". There are many and varied reasons for an individual learner's persistence in a particular course (Moore & Kearsley, 1996). Current research suggests that completion rates in distance education courses typically range from 50 to 70 per cent. This would suggest that it would not have been unusual to see a 30 per cent attrition (or the drop-out of six participants) among the distance learners in this study. Yet only a 10 per cent attrition occurred among the participants, representing an unusually high persistence rate. This points once again to the special collective "high achiever" characteristics of the study participants, and may underline the reason why a significant relationship between learner achievement and the adults' description of themselves as learners was not discernible.

As in any qualitative or quantitative research, this study is limited by the bounds of its methodology. Another way to obtain information on the research question investigating the relationship between learning characteristics and achievement in the computer conferencing course could have been the utilization of quantitative methods. Including quantitative data collection and analysis in this study might have offered a different dimension to the exploration of the relationship between learner characteristics and achievement.

Insights for Teaching and Learning

The twenty student participants and the four instructors in this study shared their views, attitudes, and beliefs about learning in the computer conference. I offer a synthesis of some of these observations, with a view toward sharing participants' and researcher's insights into the teaching and learning processes that occurred in the computer conferencing environments in this study. These insights are potentially useful for other educators or learners as they teach and learn in the computer conference.

1) If students are to feel welcome, comfortable, and well-organized at the beginning of a computer conferencing course, it is essential to provide them with a hard copy manual of the course syllabus including important due dates for assignments. As well, it is extremely important to include the procedure for accessing the computer conference and the necessary passwords in this manual. Students benefit by having an opportunity to come together face-to-face for an initial class, and if that is not possible due to geographical considerations, then a teleconference can afford students a similar opportunity. Students need the information for accessing the teleconference in sufficient time to allow for their attendance. This allows students at a very minimum to begin to forge personal connections with their classmates.

2) Many university courses tend to begin quite quickly. After the first class when the course syllabus is introduced, students are frequently expected to purchase their text, and begin to read and prepare for their first assignments. Computer conferencing courses generally should *not* begin in a similar fashion. It can take two or three weeks in some situations before all learners are able to access the computer conference on a consistent

basis. As well, it is difficult to develop an online community if learners are not given the opportunity to get to know each other as people. It is beneficial for participants if the activities during the first two weeks of computer conferencing courses focus on allowing students and instructors to get to know each other, to post personal introductions, to place scanned-in photos or other personal memorabilia online, to give all in the class the opportunity to share a bit of themselves, as they would be expected to do in a face-to-face class. Online communities require time to build mutual trust and respect, which is essential for learning in the computer conference. The cognitive content of the course can be addressed more successfully after classmates begin to establish personal connections with one another. As well during that time period, instructors might consider presenting learners with introductory activities such as guided small group work or a simulated communication breakdown. These activities can support learner development of skills which are essential for learning in the computer conference.

3) Engaging in group work builds a learning community, but at the same time places special demands upon learners for coordinating schedules, negotiating tasks, and developing educational presentations with which all group members agree. It is important that instructors develop expectations for group work very carefully. Learners benefit from receiving information on how to work effectively in online groups, including suggestions on posting timely responses, how to voice dissenting opinions constructively, and how to negotiate what learning task the group will undertake. Teaching learners how to take advantage of real-time chat features of the conferencing software programs used is one way of helping learners work out together certain specific issues in real time.

4) Computer conferencing courses require a much greater time commitment on the part of both learners and instructors. Learners appreciate being informed of this "hidden requirement" at the beginning of the course. In this way the adult learner will be enabled to make an informed choice about participation in, or withdrawal from, the course. As well, this medium allows the possibility of enhanced communication response times, but instructors have to decide what is reasonable and communicate that to their students. It is helpful if the planned response time on the part of instructors to inquiries from learners in the course is outlined at the beginning of the course. As mentioned earlier, there is an apparent expectation on the part of learners that instructors will be available immediately to deal with questions and requests, including any inquiries posted on weekends. If instructors plan to be available to their students at those times, this could be confirmed for the students. If instructors do *not* plan to be available online on weekends or holidays, clarifying this for students at the beginning of the course ensures that unreasonable or unnegotiated expectations do not arise.

5) Computer conferencing courses should promote interactivity between student and instructor, as well as among students. Students expect the online presence of instructors in the conference. If the instructor is not visible in the conference, this situation may cause dissatisfaction among the students, and gives rise to the notion that the instructor is watching everything from afar, rather than being involved with the course and with student learning. Instructors walk a careful line in the computer conference between facilitating the intellectual growth of their students and being directive within the conference. Though conferencing offers instructors the potential of dealing with questions and issues with the

entire class at once, some students prefer to pose questions to their instructors in private via e-mail or phone calls. This happens sometimes because students are afraid of sounding "stupid" and do not want to admit not knowing something they believe they should know in front of their classmates.

It is important for instructors to clarify how they plan to interact with the class, if personal e-mail messages or phone messages will be responded to, or if the focus is on dealing with questions through the computer conference. Instructors can monitor these modes of interaction throughout the course. The belief that "there is no such thing as a stupid question" can also be reinforced, to give students the confidence to pose questions in the conference. Hopefully, these communications will occur in a way that is the most effective for both instructor and students.

6) As more universities offer courses via computer conferencing, many instructors are being asked to develop courses for this mode of distance course delivery. Learners in the computer conference have found that the use of technology for the presentation of a course amplifies the effect of an instructor's teaching style. If instructors have never been involved in a computer conference before, it is strongly suggested that they place themselves in the position of learners in a computer conference. Instructors inexperienced with the unique demands of computer conferencing should consider enrolling in a computer conferencing course in an area which is not their field of expertise. The experience they gain will allow them to develop a better understanding of the feelings, tribulations, and satisfactions experienced by learners in this environment. Within this context, instructors might also develop self-monitoring strategies to utilize as they work

with students in the computer conference. These understandings may then be applied to the effective development and implementation of new computer conferencing courses.

7) Course designers might give some thought to burning a CD-ROM, if collections of course references and notes are available online, and do not require revision on a regular basis. In that way, the student could purchase the CD-ROM as part of the course package, and peruse the notes on a more leisurely basis, rather than using online time to do so. The idea of burning a CD-ROM is *not* intended to replace the interactivity of the course. The interaction among students is a critical component of the course which enhances student learning. This suggestion would be particularly helpful in situations where students have limited Internet access or slow download times, a situation that is slowly being resolved even in rural areas in Canada.

8) The requirement for technological literacy can cause difficulties for the generation of adult learners currently involved in computer conferencing courses. It is important for instructors to be sensitive to the real frustrations experienced by students who have difficulty gaining access to the computer conference, or who are not sure what to do once they arrive in the conference. Students will know where to turn for help in dealing with the technology if technical help lines are set up in advance. Information on how to access these help lines should be included in the hard copy manual sent in advance; all students registered in the course will have access to it. Universities engaged in marketing computer conferencing courses might consider offering preliminary mini-courses to prospective students to teach them how to use the technology. In this way, the adult learners

would not be forced to learn how to cope with the technological demands of the computer conference at the same time as learning the cognitive content of the course.

A Closing

This research study is one of a small but growing number of studies which attempt to develop a "thick description" of the perspectives of participants in computer conferencing courses. Adult learning in various educational environments is complex and multi-faceted. The salient features of learning and communication in a computer conference, as well as factors identified by learners to explain their success in this new learning environment have been investigated in this study. The research has illuminated several facets of a growing and complex issue for distance learners and educators.

A focus of this research study has been an exploration of adult learners in graduate courses. As this research comes to a close, the major findings of the study resonate with a modified model of persistence in distance learning environments. The exploration of the attributes of the learner, the external commitments which impact on students' social integration, and the academic integration which includes both technical and affective aspects, fit the model well. The concept of "nested and intersecting communities" on the one hand, conceptualizes how learners studying by distance can take advantage of the opportunity to participate in academic communities. On the other hand, it focuses attention on the time requirement for that participation to occur, an issue that was identified as problematic in the computer conference.

The online community offers members a sense of belonging, and a group of colleagues to engage in academic discourse. However, in this study, independence in learning was identified as a defining quality of a majority of the participants. This situation sets up a dialectic, for how are learners who treasure their independence socialized into a working group of their colleagues? And finally, experiences within the academic and social systems, leading toward academic and social integration, are based on strong and effective communication. Communication has been shown to be a critical factor in this mode of learning, one which requires learner effort and effective strategies.

The need for further and continuing research in this area is great, as both learners' and instructors' involvement in web-based computer conferencing courses in this age of information is increasing and will continue to increase at an astronomical rate.

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Appendix A: Letter of Introduction

Title of Project: Communication and Learning: How Distance Learners Make Meaning in the Computer Conferencing Environment

Researcher: Martha A Gabriel
Faculty of Education
University of Ottawa

When a research project involving individuals is undertaken by researchers at the University of Ottawa, the Ethics Committee of the University requires the written consent of the participants. This does not imply that the project is risky in any way; the intention is simply to assure the respect and confidentiality of the individuals concerned.

The purpose of this research is to explore how adult students go about communicating and learning in a computer conferencing environment. It is hoped that what is learned can help educators better understand the needs of adult learners in computer conferencing courses, in order to improve educational practice in this new learning environment.

The study will take place in the context of your own computer conferencing course. Since we will never have the opportunity to meet face-to-face, this research will be carried out both online and by telephone. If you have any questions about this research which have not been answered, I invite you to call me collect at (902) 628-3896 or you can e-mail me at gabriel@isn.net, and I will answer any further questions you may have. If you decide to participate, you will be asked to fill out the enclosed informed consent form, as well as an initial questionnaire which will help me get to know you a bit better. These forms will take about fifteen minutes to complete. I would ask you to mail these forms back to me in the self-addressed, stamped envelope.

A number of students will then be invited to take part in two individual interviews. If you are invited and decide to participate, the interviews will take place on the telephone, at a time and a place that is convenient for you. I will be responsible for all long distance charges incurred. The first interview will take place in the third week of the course, and the second interview will take place after the course is over. The interviews will each take approximately forty-five to sixty minutes, and will be audio-taped. If you do not want to answer any questions you may refuse to do so, and you can choose to stop the interview at any time. If you decide at any time to withdraw from this study, you may do so.

The interviews will be transcribed into printed form. Your name will not be on the transcription, associated with the study, or on any publication resulting from the research. When direct quotes or paraphrasing is used, pseudonyms will consistently be used.

During the course of the study, I will be reading the course notes online. If you have signed this informed consent form, I may use some of your written comments in addition to your interview comments in my study. The same guarantee of anonymity applies to any written material utilized in this study.

This research has been approved by the Faculty of Education Human Research Ethics Committee (HRECFE). Inquiries or any questions dealing with the ethical conduct of this research can be addressed to the Secretariat of the Ethics Committee at (613) 562-5800, ext. 4057.

Sincerely,
Martha Gabriel
Doctoral Candidate
University of Ottawa

Appendix B: Informed Consent Form

I, (please print your name)_____ , hereby consent to participate in the above-named study being conducted by Martha Gabriel, University of Ottawa. My participation is voluntary, and I understand that my participation has no effect on the marks received in this course. None of the information gathered will appear on any administrative records, and all information will be seen only by the researcher involved in this study and will be used solely for research purposes.

I understand that I will be enrolled in a course in either Educational Administration or Instructional Technology.

I understand that I will be invited to fill out a questionnaire about distance education and computers at the beginning of the course. I also understand that I may be invited to take part in two telephone interviews, each of which may take forty-five to sixty minutes, be tape-recorded, and take place at a time and day at my convenience. I also understand that the researcher is responsible for any and all long distance telephone costs.

I have received assurance from the researcher that the information I share will remain strictly confidential. I, in turn, assure other participants that I will treat in the same confidential manner any information I may obtain in the context of this project.

I further understand that I am participating in this project anonymously, and that my name will not be associated with this project in any way. I understand that by signing the form, I am giving the researcher permission to quote me anonymously. I understand that I may refuse to answer any questions and may stop the interview or withdraw from the study at any time without penalty.

I have been given the opportunity to ask any questions regarding this research and these questions have been answered to my satisfaction. Any information requests or complaints about the ethical conduct of the project may be addressed to the Secretariat of the Ethics Committee (613) 562-5800, ext.4057. There are two copies of the consent form, one of which I may keep. The other copy should be signed, and then mailed to the researcher along with the initial questionnaire in the stamped, self-addressed envelope provided.

Signature of Participant Date

Signature of Researcher Date

Thesis Director Date

Optional: I wish to receive a summary of the findings of this study which will be made available during the fall of 1998.

Appendix C: Initial Questionnaire

Name: _____

Phone Number: ( ) _____

Address: _____ **E-Mail Address:** _____

_____

_____

Gender: Female Male

Age: 20-29 30-39 40-49 50-59 60-69

Student Status: Full Time Part Time

Why are you taking this course?

_____

Occupation: _____

How long have you worked at this occupation?

Family: (please describe your family situation)

Married Single

Children Age:

Age:

Age:

Age:

Technology

Do you own a computer? Yes No

If yes, how long have you owned it?

Why did you decide to purchase it?

If you do not own a computer, do you plan to purchase one? Yes___ No

Please write down the names of any applications you have used on a regular basis for over a year (if any):

How would you describe yourself as a computer user?

novice intermediate very experienced

What words would you use to describe your own feelings toward computers?

Have you taken a course by distance before? Yes No

If yes, name the course:

Have you used the World Wide Web before? Yes No

If yes, in what context?

How often?

Have you used e-mail before? Yes No

If yes, in what context?

How often?

Have you ever used a listserv before? Yes No

If yes, in what context?

How often?

How confident do you feel in your ability to learn in the distance education context?

What conditions are necessary for you to do your best learning?

How would you describe your own learning style?

Please complete the sentences:

When I think of technology of the future I... _____

I believe that I can... _____

Appendix D: Informal Note

Dear

My name is Martha Gabriel, and I am a teacher with almost 20 years' experience in Prince Edward Island and Nova Scotia. I decided to return to university to learn more about technology in education, so I am now involved in doing doctoral research at the University of Ottawa. My research focuses on how learners go about the process of learning in a computer conferencing context.

The instructors in your computer conferencing course have given me permission to conduct research in the course - and I'd like to invite you to become involved. If you are interested in helping me explore learning in computer conferencing, it would involve filling out a questionnaire (taking approximately 15 minutes) and sending it back to me. Some of those who are willing to be involved will also be invited to be interviewed by me over the telephone twice, once early in the course, and a second time after the course is over. (I'll be responsible for all long distance costs).

I am looking forward to the opportunity to explore this learning context- and I hope you are willing to explore it with me within your course. If you are interested, please reply to my e-mail message and send me your mailing address, so I can send you a hard copy of the questionnaire and an informed consent form.

Cheers!
Martha

Appendix E: First Interview Protocol

1. Can you tell me a little bit about the course and your own thoughts and feelings about computer conferencing?

2. What do you do to prepare for a session (in the computer conference)?

3. What do you do to get your ideas across during a computer conference?

4. What do you do to make sure you understand other people's ideas in a computer conference?

5. Have you developed any particular strategies to help you learn in the computer conference?

6. What is it about you as a learner that will help you be successful in this environment?

7. What factors help people learn successfully in a computer conference?

8. What factors make learning in the computer conference difficult for people?

9. As a learner, how would you compare your ability to achieve in a computer conferencing course with your ability to achieve your goals in other learning situations?

10. Is there anything else you would like to mention about learning in a computer conferencing environment that we haven't already discussed?

Appendix F: Second Interview Protocol

1. How would you evaluate your learning achievement in this computer conferencing course, relative to your objectives when you enrolled?

2. If you were to take another computer conferencing course, how would you prepare yourself?

3. I want you to think about external factors that may have impacted on your learning achievement in the computer conferencing course. I have a three part question for you:
   a) What factors in your work life enhanced or inhibited your performance in the course?
   b) What factors in your home life enhanced or inhibited your performance in the course?
   c) What factors in your academic life enhanced or inhibited your performance in the course?

4. We've just been talking about external factors which had an effect on your performance in the course. Now I'd like to ask what internal factors enhanced or inhibited your performance in the computer conferencing course?

5. One of the themes mentioned by several participants is that a computer conference is a community of learners. Could you comment on that idea?

6. Another theme identified by some participants is whether computer conferencing is an appropriate way to offer lifelong learning opportunities to adults. Could you comment on that issue?

7. A third theme mentioned by several participants is the impact of written text on communication and understanding in the computer conference. Could you comment on that idea?

8. Given what you've said earlier about X, Y, and Z, what advice would you give to developers of computer conferencing courses?

9. Is there anything else that you would like to mention about computer conferencing that we haven't already addressed?

Appendix G: Instructor's Interview Protocol

1. In reflecting upon the computer conferencing course just completed, what would you identify as the key factors that influenced student learning?

2. I'm interested in exploring the issue of gender and the use of telecommunication as a delivery mode of instruction.

   a) What impact does gender have (if any) on learner achievement in computer conferencing courses?
   b) What impact does gender have (if any) on communication in the computer conference?

3. Have you ever had the opportunity to work with special needs learners in a computer conferencing course? (special needs includes students with mobility, sensory, learning, or cognitive challenges)

   If so, what adaptations (if any) were necessary for special needs students to achieve success in the computer conference?

4. One of the themes mentioned by several participants is that a computer conference is a community of learners. Could you comment on that idea?

5. Another theme identified by some participants is whether computer conferencing is an appropriate way to offer lifelong learning opportunities to adults. Could you comment on that issue?

6. A third theme mentioned by several participants is the impact of written text on communication and understanding in the computer conference. Could you comment on that idea?

7. Is there anything else you would like to mention about computer conferencing courses that we haven't already addressed?

Appendix H: NUD*IST Coding Categories

1 Base Data
11 Base data/Interviewees
111 Base data/Interviewees/Gender
1111 Base data/Interviewees/Gender/Male
1112 Base data/Interviewees/Gender/Female
112 Base data/Interviewees/Age-group
1121 Base data/Interviewees/Age-group/20s
1122 Base data/Interviewees/Age-group/30s
1123 Base data/Interviewees/Age-group/40s
113 Base data/Interviewees/Student Status
1131 Base data/Interviewees/Student Status/Full Time
1132 Base data/Interviewees/Student Status/Part Time
114 Base data/Interviewees/Family
1141 Base data/Interviewees/Family/Married
1142 Base data/Interviewees/Family/Single
115 Base data/Interviewees/Technology
1151 Base data/Interviewees/Technology/Own Computer
1152 Base data/Interviewees/Technology/Not Own Computer
116 Base data/Interviewees/Computer User
1161 Base data/Interviewees/Computer User/Novice
1162 Base data/Interviewees/Computer User/Intermediate
1163 Base data/Interviewees/Computer User/Very Experienced
2 Learning in Computer Conference
21 Learning in Computer Conference/Community of Learners
211 Learning in Computer Conference/Community of Learners/Dealing with Problems
212 Learning in Computer Conference/Community of Learners/Working in Groups
213 Learning in Computer Conference/Community of Learners/Unexpected Outcomes
214 Learning in Computer Conference/Community of Learners/ "Creating the Characters"
22 Learning in Computer Conference/ Education of Adults
221 Learning in Computer Conference/ Education of Adults/Appropriateness
222 Learning in Computer Conference/ Education of Adults/Gender Issues
223 Learning in Computer Conference/ Education of Adults/Learners with Special Needs
224 Learning in Computer Conference/ Education of Adults/Comparing Abilities in CC& FTF
2241 Learning in Computer Conference/Education of Adults/Comparing Abilities in CC & FTF/Initial Excitement

225 Learning in Computer Conference/ Education of Adults/Evaluating Achievement
2251 Learning in Computer Conference/ Education of Adults/Evaluating Achievement/Attrition
2252 Learning in Computer Conference/ Education of Adults/Evaluating Achievement/Persistence
226 Learning in Computer Conference/ Education of Adults/Factors-Difficulties in Learning
227 Learning in Computer Conference/ Education of Adults/Factors-Success in Learning
3 Participation in Computer Conferencing
31 Participation in Computer Conferencing/Work Life
311 Participation in Computer Conferencing/Work Life/Positive
312 Participation in Computer Conferencing/Work Life/Negative
32 Participation in Computer Conferencing/Home Life
321 Participation in Computer Conferencing/Home Life/Positive
322 Participation in Computer Conferencing/Home Life/Negative
33 Participation in Computer Conferencing/Academic Life
331 Participation in Computer Conferencing/Academic Life/Positive
332 Participation in Computer Conferencing/Academic Life/Negative
34 Participation in Computer Conferencing/Advice for Developers
341 Participation in Computer Conferencing/Advice for Developers/Developing Courses
342 Participation in Computer Conferencing/Advice for Developers/Instructor Concerns
4 Adult Learners
41 Adult Learners/Strategies in Computer Conferencing
412 Adult Learners/Strategies in Computer Conferencing/Preparing for a Course
413 Adult Learners/Strategies in Computer Conferencing/Learning to Synthesize
42 Adult Learners/Personal Factors
421 Adult Learners/Personal Factors/Willingness to Learn
422 Adult Learners/Personal Factors/Learning from Experience
423 Adult Learners/Personal Factors/Belief in Self
4231 Adult Learners/Personal Factors/Belief in Self/Perception of Efficacy-Academic
4232 Adult Learners/Personal Factors/Belief in Self/Perception of Efficacy-Technical
424 Adult Learners/Personal Factors/Motivation
4241 Adult Learners/Personal Factors/Motivation/Professional
4242 Adult Learners/Personal Factors/Motivation/General Ed
4243 Adult Learners/Personal Factors/Motivation/External Goals
425 Adult Learners/Personal Factors/Interest in Technology
426 Adult Learners/Personal Factors/Learning Styles
427 Adult Learners/Personal Factors/Beliefs and Feelings re Computer Conferencing

5 Communicating in Computer Conference
51 Communicating in Computer Conference/Impact of Text
512 Communicating in Computer Conference/Impact of Text/Sharing Ideas
52 Communicating in Computer Conference/Giving Feedback
521 Communicating in Computer Conference/Giving Feedback/Understanding Others
522 Communicating in Computer Conference/Giving Feedback/Flaming
53 Communicating in Computer Conference/Alternative Communication

Free Nodes:
Metaphors
Comments on Research by Participants
Time Issues
Technical Issues
Methods

Appendix I: Statement of Audit

28 April 1999

I carried out an audit of work in progress by reviewing random samples of data at different stages of transcription and interpretation. All tapes, transcriptions, notes and communications for each course, encoded materials, and thematic listings were made available to me.

I listened to passages from randomly-sampled tapes of participant interviews for each course and reviewed the corresponding transcripts. Following the same participants, I examined the methods used for selection of relevant passages and for encoding material. I chose four themes: motivation; time; technical issues; and willingness to learn. Again at random, I used these thematic files to find quotations from participants whose tapes I had heard, and verified each passage with the original transcript and where applicable, with the thesis.

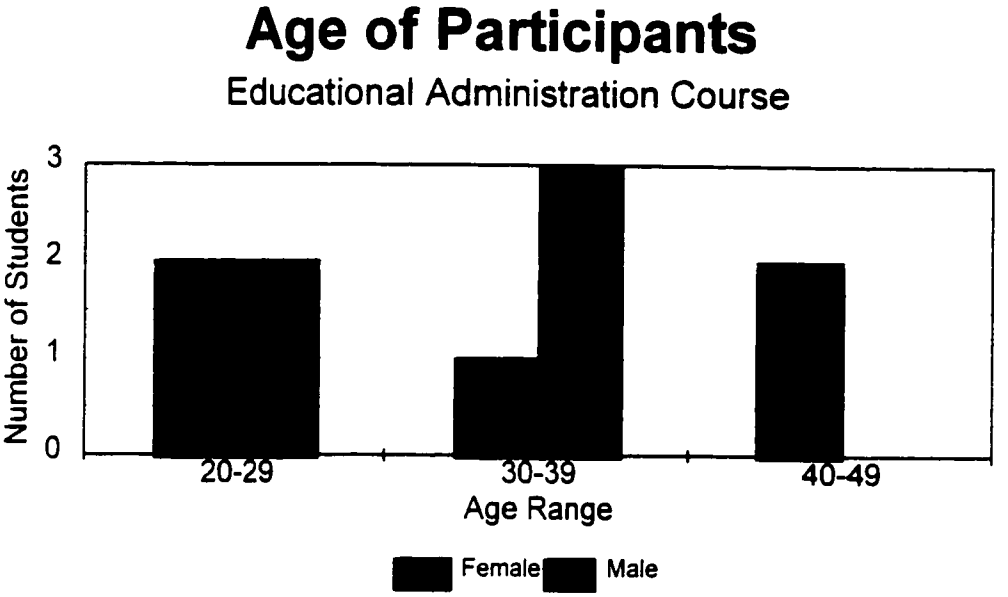
I studied sections of the two files of down-loaded course material to confirm their compatibility with various accounts and descriptions in the thesis.

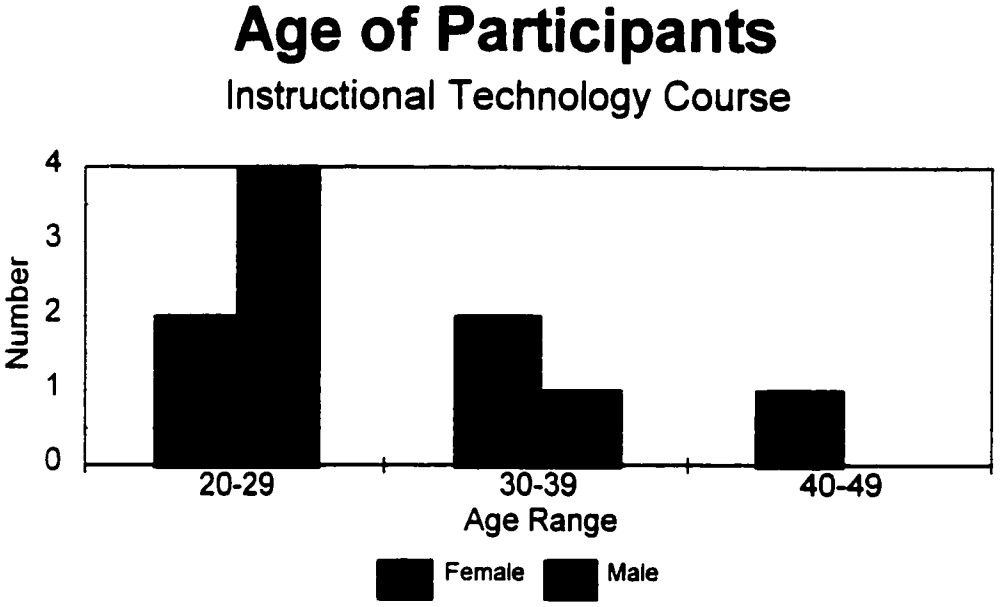
In each case, I found a clear, well-documented, and logical progression from the original data to the interpretation and identification of themes. In the written work there was an accurate reflection of the findings and data.

Jessie B. Lees Ph.D.

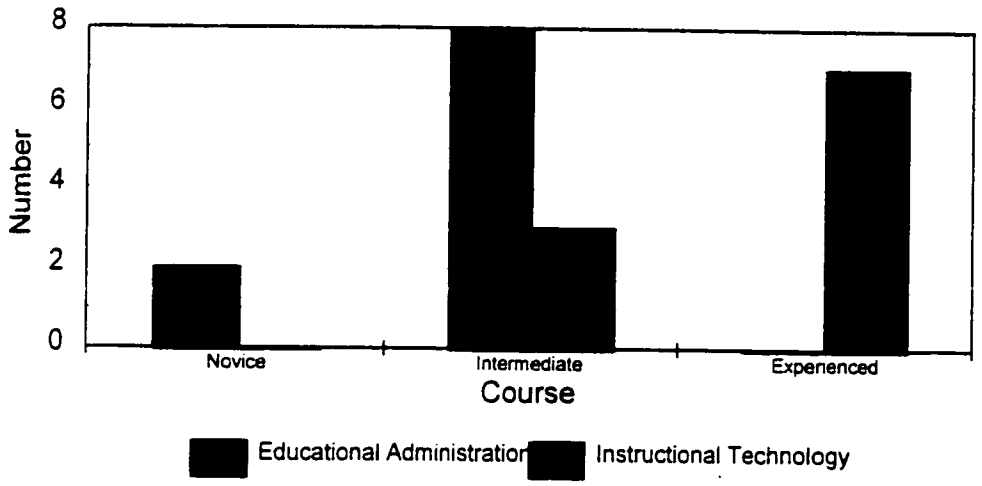
Jessie B. Lees Ph.D.
Charlottetown, Prince Edward Island

Appendix J: Demographics





Technology Experience



Appendix K: Modification of Tinto Model of Doctoral Persistence for Graduate Students Studying in a Computer Conferencing Course