ATHABASCA UNIVERSITY

THE EFFECT OF GROUP INTERACTION, STUDY SCHEDULE,

TUTOR SUPPORT AND STUDENT ATTRIBUTES ON

PERSISTENCE AND ACHIEVEMENT IN

DISTANCE EDUCATION

BY

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A thesis submitted to the

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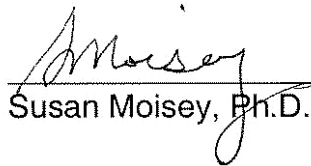

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The undersigned certify that they have read and recommend to the Athabasca University Governing Council for acceptance a thesis "THE EFFECT OF GROUP INTERACTION, STUDY SCHEDULE, TUTOR SUPPORT AND STUDENT ATTRIBUTES ON PERSISTENCE AND ACHIEVEMENT IN DISTANCE EDUCATION" submitted by "PAMELA QUON" in partial fulfillment of the requirements for the degree of MASTER OF DISTANCE EDUCATION.

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DEDICATION

This thesis is dedicated to my late parents, Wai-Heung and Tim Quon. It was my father who believed that education provides a golden opportunity and has always encouraged me to pursue higher education.

ABSTRACT

The purpose of this study was to investigate the problem of high non-completion rates of students enrolled in undergraduate distance education courses. Attrition rates had always been an issue for educational institutions offering distance learning courses. A review of literature had shown various hypotheses that have advanced to explain persistence or dropout in higher education. This study involved a convenient sample of 58 students enrolled in an undergraduate course at Athabasca University. The students were part of a quasi-experiment and were randomly assigned to one of three groups. The effect of three levels of instructional approach (group interaction, study schedule, no treatment) were studied to determine if there were a significant difference among these three groups on persistence and achievement. It was determined that there was no significant difference among the three groups.

The number of Call Centre contacts (requests for tutor support/academic assistance) was analysed. The Call Centre contact was found to be significantly related to persistence. This finding was consistent to that of Weinsheimer (1998) who had found that peer tutoring had a significant impact on retention and Wimbish (2001) who had found that student-teacher interaction had a significant impact on course completion. In contrast, finding for Call Centre contact and achievement were found to not be significant.

A telephone survey was administered to all students to gather additional quantitative and qualitative data which helped to gain some insight on factors that

influence student success in distance education. Student attributes such as marital

status, dependants, status of employment (full-time or part-time), source of financial

assistance, prior distance education experience, and enrolment in a program of

study were analysed to determine whether there was any relationship among these

attributes to persistence and achievement. The findings were not significant. In

addition to the quantitative analysis, a review and analysis of students survey

comments were undertaken. This helped identify the options that institutions have to

help students succeed in distance education. The emerging themes were that

students desired contact, encouragement, and interaction from their

tutors/instructors and peers.

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Completing this research would not have been possible without the support of many individuals. I would like to thank my thesis supervisor Dr. Tom Jones and committee members Dr. Susan Moisey and Dr. Terry Anderson for their experience, insight, comments, and suggestions. Many thanks for those that participated in this study including students, Athabasca University colleagues, and staff, particularly Lynn Hood who provided research assistance, Ann Conquergood for being the course facilitator, Lorna Dennis for administrative assistance and Joe Connolly for setting up and maintaining the conferencing site. I am grateful to my husband Edmond Gee and children Kirsten and Kamren whose love and patience has helped me complete this research.

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CHAPTER I

INTRODUCTION

Statement of the Purpose

This thesis was an investigation of the problem of high non-completion rates of students enrolled in undergraduate distance education courses. The research focused on instructional approach, which was believed to influence non-completion, persistence, and academic achievement in distance education. An experimental study was undertaken to determine whether group interaction or following a study schedule would help to reduce non-completion rates and promote achievement in undergraduate distance education courses. The relationship of Call Centre support to persistence and achievement was also examined in order to obtain a better understanding of the influence of Call Centre support to learning outcomes. Both quantitative and qualitative student data were collected and analyzed to determine their influence on student success.

Research Problem

Persistence and high dropout rates have always been an issue for educational institutions offering distance education courses. Various hypotheses have attempted to explain persistence or dropout in higher education or distance education (Tinto, 1975; Bean & Metzner, 1985; Parker, 1994). While many researchers have focused on predictor variables for persistence and achievement in

distance education such as computer self-efficacy, academic self-concept (Lim, 2000), locus of control and demographics (Whittington, 1997); very few studies have looked at the instructional approach as a predictor of persistence and achievement.

There were very little information available on student support needs and the services provided for distance learners (Cain & Lockee, 2002). There was a need to study student support needs such as tutor support. This study analyzed the relationship of the student Call Centre support service (tutor support) to that of persistence and achievement. In addition, both quantitative and qualitative personal student data purported to be related to persistence was analyzed to determine their relationship to student success.

<u>Hypotheses</u>

<u>Hypothesis 1</u>. There is no significant difference of the effect of three levels of instructional approach (group interaction, study schedule, and no treatment) on persistence in distance education.

Null hypothesis: H_0: $\mu_1 = \mu_2 = \mu_3$

Where μ_1 = Group A, μ_2 = Group B and μ_3 = Group C

<u>Hypothesis 2</u>. There is no significant difference of the effect of three levels of instructional approach (group interaction, study schedule, and no treatment) on achievement in distance education.

Null hypothesis: H_0: $\mu_1 = \mu_2 = \mu_3$

Where μ_1 = Group A, μ_2 = Group B and μ_3 = Group C

Hypothesis 3. There is no significant relationship between the dependent variable 'persistence' and the independent variable 'Call Centre contact'.

Hypothesis 4. There is no significant relationship between the dependent variable 'achievement' and the independent variable 'Call Centre contact'.

Secondary Research Questions

Question 1. Do personal attributes such as marital status, having dependants, status of employment (full-time or part-time), source of financial assistance, prior distance education experience or being enrolled in a program of study have a relationship to student success?

Question 2. What kind of institutional support do students need to succeed in distance education?

Assumptions of the Study

1. The students' awareness of being involved in the study will not have an impact on their normal behaviour (no Hawthorne Effect).
2. The University's student records are accurate and the students' responses to the telephone survey are reliable.

Background and Significance of the Study

The need for this study was prompted by a particular situation at Athabasca University when a comparison was made between two instructional approaches: the individualised mode and the e-Class mode. The Athabasca University School of Business statistics of non-completion rates for undergraduate courses from April 1, 2001 to March 31, 2003 in the individualised study mode had a mean non-completion of 38% (excluding early withdrawals). The non-completion by course ranged from a low of 11% to a high of 66%. The non-completion rates were much lower during the same period for the e-Class mode with a mean non-completion of 13% and a range from a low of 0% to a high of 55%. Why was there a significant difference between the two distance instructional approaches – individualised study mode with mean of 38% and e-Class mode with mean of 13%? Individualised study enrolment was approximately 87% of the 35,000 plus enrolments (over two years) in all four modes (the other modes were e-Class, grouped study (f2f) mode and challenge mode). Since most enrolments were in the individualised study mode, it was more critical to focus on the problem of high non-completion rates within this mode and to come up with a solution. Therefore, the current study centred on the individualised mode rather than on the e-Class mode to determine what factors influenced student success.

Parker (1994) has shown that the variables that are predictors of dropout in distance education are locus of control and source of financial assistance (self–paying). Her study however has shown that mode of delivery was not significantly correlated with dropout. But this may be a limitation of her study because all three

modes of delivery in her study: audiocassette, correspondence and computer conferencing were "intertwined with other factors such as course content, pacing, instructor style or assignment due dates" (Parker, 1994, p. 121). Thus, the focus of the current experiment was an attempt to study the factors that differ between the individualised and e-Class instructional approaches that are purported to have an influence on persistence.

Since this study was focused on Athabasca University's situation, some background information on the types of study approaches at Athabasca University is required. Students in the individualised study mode could start a course in any month of the year and were given up to six months to complete a three-credit course or 12 months to complete a six-credit course. The majority of students worked independently of other students because of different start dates and schedules. Tutorial support was provided on an as need basis, which meant that students were expected to take their own initiative to contact their tutor if they required academic assistance.

The e-Class mode was normally offered twice a year (September and January) for those courses with sufficient enrolment. In addition to student-teacher interaction, there was also student-student interaction through computer conferencing. The classes were paced and follow a schedule for electronic conferencing, assignment submission and exam writing. The e-Class mode provided a virtual class environment in which students were encouraged to interact with the instructor and other students.

The individualised study and e-Class modes were both offered by distance. Yet the mean non-completion rate was 38% for individualised study, much higher than the 13% for e-Class. The grouped study (f2f) mean non-completion rate was 15%, which was close to the non-completion rate for e-Class. Why was there so much difference in the non-completion rates between the individualised study and the e-Class/grouped study (paced) instructional approaches? The paced study modes were closer to what was being offered by traditional universities in that the courses followed a study schedule and there was interaction with the instructor and with other students.

Having identified the two main factors that were different between the individualised study and the paced study instructional approaches and their corresponding non-completion rates, it lead to the question of whether the two factors –group interaction and study schedule--did indeed have a significant correlation with persistence.

Computer-mediated communication such as computer conferencing (group interaction) makes it possible for students to acquaint themselves with each other and discuss course materials; this could reduce the feeling of alienation and facilitate increased elaboration when discussing course material (Lundgren-Cayrol, 1997). Interaction can facilitate "social integration" which has been identified by Tinto (1975) as an important predictor of dropout. While tutorial support was being provided at Athabasca University School of Business through their Call Centre model, a question arose as to the effectiveness of the student-tutor interactions in reducing students' feelings of isolation. Would the added dimension of group interaction –

tutor and peer interaction to Athabasca University's existing Call Centre model via computer-mediated conferencing help to further reduce feelings of alienation and thereby help to reduce the non-completion rates?

Recommended study schedules were provided for individualised study courses but students were not required to follow these schedules and had up to six months or 12 months to complete. In contrast, the e-Class and grouped study students (paced modes) were required to follow a schedule and were reminded by the instructors of assignment and exam due dates. In essence, by reminding students about upcoming deadlines - good study habits and academic commitment were being reinforced. The individualised study mode "allow the students to control much of their own learning, including how and when to respond to academic assignments, there is a potential for some of the students to procrastinate" (Abdul-Rahman, 1994, p. 29). Procrastination may lead to serious problems such as non-completion of assignments. Given this information on the potential for students to procrastinate when they have more control of their own learning, what would be the effect on students that were required to follow a study schedule complemented with frequent reminders?

<u>Limitations</u>

1. While every effort was made to control other variables except for the variable being studied—instructional approach—it is likely that results may be explained by variables other than instructional approach.

2. Results from the study would be influenced by the level of participation of students in computer conferencing and their willingness to adhere to recommended study schedules. Participation was optional; students were not given additional marks for participating.

Delimitations

The sample was from one undergraduate distance education course at Athabasca University. The sample was one of convenience and the students from the course were drawn with the same start date (Sept 1st). It is impossible to generalize findings beyond the population (Athabasca University's undergraduate business students) studied.

Definition of Terms

For the purposes of this study, the following terms are operationally defined as follows:

Achievement. The final course grade which was the composite mark attained for four assignments, one midterm examination, and one final examination (six compulsory components).

Call Centre. The Call Centre was an integral part of Athabasca University's School of Business course delivery, and was normally the point of first contact for students enrolled in business courses. Student Advisors in the Call Centre answered students' administrative questions and Academic staff answered course related questions. Students contacted the Call Centre by telephone, fax or e-mail.

Call Centre contact. Request made to the Call Centre from the student for tutorial support/academic assistance

Computer conferencing (CC). Asynchronous text based discussions among students, and the course facilitator.

Computer-mediated communication (CMC). Text-based discussions among students, and the course facilitator (can be either synchronous or asynchronous).

Course facilitator. Facilitates class discussions and responded to students' queries about course content.

Distance education. Involved learning and teaching activities where the learners and the instructors were separated by distance (Lim, 2000).

E-Class. Was a paced study approach that followed similar timelines as other traditional university courses and group interaction (learner-learner and learner-instructor) occurred through computer-mediated communication.

Group Interaction. Students communicated asynchronously by discussion board.

Individualised study. Unpaced study approach whereby students worked independently to complete a course within a six-month period (3 credit course).

Instructional approach. In this study, there were three levels for the independent variable instructional approach: computer conferencing, study schedule and no treatment (control - no change).

No treatment. Students that received no treatment in this study proceeded with the course in the default manner with the individualised course package, and access to Athabasca University's support services and Call Centre.

Persistence. Students were considered persistent if they fulfilled at least the minimum requirements of the course to receive credit for the course (Parker, 1994).

Study schedule. Paced study in which there were specific dates for students to complete course activities such as lesson readings, assignments, and examinations.

CHAPTER II

REVIEW OF RELATED LITERATURE

<u>Introduction</u>

This chapter includes a review of the concept of distance education. To distinguish the distance learner from the traditional learner, a look at the profile of the adult/non-traditional learner in distance education was made. Then there was a review of the descriptive literature on variables or factors related to persistence. The next section discussed some of the theories and models used to explain persistence. The last section reviewed the various aspects of interaction in distance education and the impact that interaction has had on persistence.

Background

In recent years, distance education had sustained extraordinary growth. According to Campus Canada (2002), the global higher education academic market was huge, at $175 billion with annual enrolments to grow by 20%. In the last few years virtual universities have grown from seven to over 100 with a million online learners. To name a few, some of the virtual universities in the United States included Universitas 21, Global University Alliance, Global Virtual University, and Jones International University; and in Canada include Campus BC, Campus Alberta, Campus Manitoba, Canadian Virtual University, Canadian Virtual College Consortium and Ontario Learn (Campus Canada, 2002). According to the United States General Accounting Office

(2004), enrolments in the American distance education quadrupled between 1995 and 2001 with nearly 90% of public 4-year institutions offering distance education courses during the 2000-2001 school year. The International Data Corporation (IDC) expects a compound annual growth rate of 33% in distance education over the next several years (Oblinger & Kidwell, 2000). The growth in distance education had been fuelled by the overall growth in demand for post secondary education. Recent estimates of the U.S. academic market growth for a five year period were from $16 million to $1.57 billion (Oblinger & Kidwell, 2000), a growth of approximately one-hundredfold. Distance education was seen as the answer by educators to the expansion of higher education in the overall education market (Oblinger & Kidwell, 2000).

Distance education was well positioned to serve the needs of the growing demand for higher education. However, distance learning was not without its' problems. Of particular concern was the issue of persistence for learners in distance education. Distance learners faced challenges in their coursework because of lack of physical contact with their instructor and other learners. In addressing the persistence problem, consideration was given to the distance learners' individual characteristics and circumstances which tended to be quite different from traditional learners. Distance learners tended to be older, were more likely to be employed full-time and studying part-time, have higher income levels and were more likely to be married (U.S. GAO, 2002).

Distance Education: Concept and Review

Distance education, a discipline within education, has been associated with various definitions and terminology. Many terms have been used to identify distance education and it was debatable as to whether these terms were in fact synonymous with distance education.   Some of the language used included correspondence education, open learning, independent study, non-traditional education, technology-based education, and online learning. There were still other terms used which bear some relationship to distance education such as adult education and continuing education. With so many expressions, it could be confusing as to what relationship the above areas have with distance education, and whether they are similar or different from distance education.   This section provides a review of distance education and covers some of the definitions of distance education found in literature; emphasizing the important and generally accepted definitions in order to obtain a better understanding of the concept of distance education.

Distance education as we know it today grew out of correspondence education. This form of education consisted of communication between students and teachers through print-based course materials and the postal services. "From 1870 to 1970 most of the systems were proprietary and the field was known as 'correspondence study' or 'home study' or 'external studies'" (Keegan, 1996, p. 3-4). Starting in the 1970's, distance education was taking a worldwide shift from private to public provisioning (Keegan, 1996). It was during this time that the Open University in the United Kingdom was successfully implemented and the term "open learning" came into being. At this time the adult learners were beginning to gain

special attention and were considered a separate entity from that of younger school-aged learners. "Adult learners have different needs and learn differently from children" (Pattison, 1999, p. 11). Distance education seemed to be the ideal means in which to provide the flexibility required to meet the educational needs of adult learners who were self-directed and non-traditional learners, and needed to balance their time among other demands such as work and family. As distance education served adults to a larger extent than children, issues related to adult education needed to be considered.

By the 1990s distance education was seen as a valuable component to many educational institutions such as traditional schools, colleges and universities that were having difficulty in meeting demand (Keegan, 1996). During the late 1990s there was a multifaceted variety of provision that ranged from correspondence courses to the use of sophisticated technologies. Some of the technologies used included television courses, known as telecourses; teleconferencing, provided by either two way video or one way video with two way audio and audio conferencing (Keegan, 1996). With the advent of computers, the use of the Web, e-mail, asynchronous and synchronous computer-mediated communication were incorporated into distance education courses and the term online learning came into being. While technologies were used in distance education, it should not be assumed that technology-based education is distance education. "That is, distance education is more than technology; it is a combination of processes, products and methodologies" (Crawford, 2000, p. 19).

Given the many terms and their relationship to distance education—what would be an appropriate definition of distance education? The following three are examples of some of the definitions that exist:

> Distance education covers the various forms of study at all levels which are not under the continuous, immediate supervision of tutors present with their students in lecture rooms or on the same premises, but which, nevertheless, benefit from the planning, guidance and tuition of a tutorial organisation.
>
> (Holmberg, cited in Keegan, 1996, p. 42)

> Distance education is planned learning that normally occurs in a different place from teaching and as a result requires special techniques of course design, special instructional techniques, special methods of communication by electronic and other technology, as well as special organisational and administrative arrangements.
>
> (Moore & Kearsley, cited in Moore, 2003, p. 2)

> Distance education refers to teaching and learning situations in which the instructor and the learner or learners are geographically separated, and therefore, rely on electronic devices and print materials for instructional delivery. Distance education includes distance teaching – the instructor's role in the process – and distance learning – the student's role in the process.
>
> (Lane, cited in Keegan, 1996, p. 43)

In all three definitions, emphasis was placed on the separation of the learner and the teacher which is fundamental because this distinguished distance education from the traditional face-to-face teaching and learning. Holmberg as well as Moore and Kearsley also specified that there is planning involved. This implied the involvement of an educational institution and helped to distinguish it from private study at home. Moore's definition also implied that there was two-way communication between the instructor/institution and student(s) by electronic or other technology. This differentiated distance education from educational technology such as library materials, do-it-yourself books, textbooks, television, and radio.

Keegan after reviewing similar definitions from other scholars came up with a list of basic characteristics essential for a definition of distance education:

- the quasi-permanent separation of teacher and learner throughout the length of the learning process (this distinguishes it from conventional face-to-face education);
- the influence of an educational organisation both in the planning and preparation of learning materials and in the provision of student support services (this distinguishes it from private study and teach-yourself programmes);
- the use of technical media – print, audio, video or computer – to unite teacher and learner and carry the content of the course;
- the provision of two-way communication so that the student may benefit from or even initiate dialogue (this distinguishes it from other uses of technology in education); and
- the quasi-permanent absence of the learning group throughout the length of the learning process so that people are usually taught as individuals and not in groups, with the possibility of occasional meeting for both didactic and socialisation purposes.

(Keegan, cited in Holmberg, 1995, p. 2)

For the purpose of this study, distance education included the characteristics described by Keegan. Of particular importance for this study was the two-way communication or dialogue that students engaged in with their teacher or tutor in both a group and individual setting, and the impact that it had on persistence in distance education. Since distance education mainly served adult learners, the next section focused on the non-traditional (adults) learners in order to achieve a better understanding of this group and their participation in distance education.

Distance Education and the Non-traditional Learner

The adult learner had often been referred to as a non-traditional learner. What made the adult learner so different from the traditional learner—full-time post-secondary students aged 18 to 24 years? There were specific characteristics about non-traditional learners that differentiated them from traditional students. This section describes non-traditional students with respect to their demographic characteristics, enrolment patterns, and their unique circumstances which set them apart from conventional students.

The term non-traditional was generally used to refer to students that were 25 years and older. Some defining characteristics that have been commonly used to distinguish the non-traditional learner are age and part-time status (Bean & Metzner, 1985; Pineda & Bowes, 1995). Choy (2002) had identified a non-traditional student as having one or more of the following characteristics: delayed enrolment—not entering postsecondary education immediately following high school; part-time attendance; full-time employment; financial independence; having dependants other than a spouse; being a single parent; and lack of a high school diploma.

In the last few decades, there had been a growing change in the composition of the post-secondary student population. In the United States from 1970 to 1999 the fall enrolment grew 72% from 7.4 to 12.7 million; there were proportionately more part-time students at 39% versus 28%; women replaced men as the majority at 56% instead of 42%; and there was a percentage increase of students over 25 years of age from 28% to 39% (U.S. Department of Education, cited in Choy, 2002). Other changes included a greater proportion of graduate students and dealing with issues

related to transfer students (Andres & Carpenter, 1997). Students with disabilities, ethnic minorities, and economically disadvantaged had often been identified as non-traditional; they constituted distinct populations with needs that were different from mature and returning non-traditional learners (Hughes, cited in Octernaud, 1990). For the purposes of this study, the term non-traditional learner refers to a student with one or more of the following characteristics: over 25 years of age; studying part-time; working full-time; or have family commitments.

The "traditional" undergraduate was attributed to one who entered undergraduate studies immediately following high school graduation, did not work or only worked part-time during school year, and was dependent on parents for financial support (Choy, 2002). It was interesting to note that in 1999-2000 only 27% of undergraduates met all these "traditional" criteria with 73% being in some way "non-traditional"; and that much of the change in demographics and enrolment had occurred in the early 1970s. (U.S. Department of Education, cited in Choy, 2002).

The increasing proportion of non-traditional or adult students had shifted much attention to "the study of Andragogy (the art and science of helping adults learn)" and was "credited to Malcolm Knowles" (Pattison, 1999, p. 11). Non-traditional learners were recognised as independent and self-directed learners; they did not learn in the same way as children and needed to express their ideas and experiences. Their age, prior experiences, self-guided goals, and difference in learning style presented problems (Shankar, 1994). The mature students' reaction time was slower (Pattison, 1999), and therefore needed more time to absorb new material, and think about and react to class discussions. As self-directed learners,

they wanted to focus on and discuss material which was meaningful to them. In additional, given that most adult learners worked and had family commitments, they required the flexibility of being able to study at a convenient time and interact outside of normal class hours.

Distance education was well suited to the needs of non-traditional learners; it offered an alternative to the place and time restrictions of the traditional classroom environment. Distance education allowed adult learners to balance the demands of work, family, and other commitments to their educational pursuits. Non-traditional learners could learn at their own pace within the comfort of their homes. The self-paced nature of most distance education courses allowed slower students to study at their own pace. Asynchronous class discussions "affords the student a period of time to frame ideas and respond to the original posting and to subsequent student postings" (Whiteman, 2002, p.8). Adult learners were mature and independent, and wanted a curriculum that was relevant to their particular needs in a setting of physical flexibility (Hazzard, 1993): they wanted "to share their relevant life experience and often desire[d] contact outside of normal class hours" (Zemke & Zemke, cited in Usrey, 1998, p. 3). Distance education was able to fulfill these requirements.

Although distance education appeared to be the answer for adult learners whose needs were unique, there were also some issues associated with it. Of significant concern were the high attrition levels experienced with students learning at a distance. Much literature was devoted to the topic of persistence or dropout in distance education (Stone, 1991; Parker, 1994; Abdul-Rahman, 1994; Sheets,

1995). "Distance learning can be very isolating, and inadequate attention to course design, student counselling and support can yield poor completion rates" (Paul & Brindley, 1996, p. 43). Student support services such as tutoring, advising and counselling have developed appreciably from the time of correspondence study when completion rates became a concern. While student support services were an integral part of all distance course offerings and contributed to students' success in open and distance learning; there was very little information available on the support needs of distance education students or the support services that were provided (Cain & Lockee, 2002).

Persistence in Distance Education

A review of literature had found that attempts to explain dropout or persistence in distance education centers on various factors or variables which were possible predictors of dropout or persistence. The factors related to persistence and distance education students could be divided into two main categories: personal and environmental (Gibson, cited in Sheets, 1995). The personal category included demographic data, educational attainment, learning styles, and motivation; the environmental category includes post-enrolment student behaviour and institutional interventions (Gibson, cited in Sheets, 1995). The following includes a review of research on some of the variables that have been purported to influence persistence in distance education.

Personal Factors. Demographic variables such as age, gender, and employment/income related factors have often been identified as possible predictors of persistence in distance education (Abdul-Rahman, 1994; Parker, 1994; Sheets, 1995). Findings for the age of the learner as a predictor of persistence are inconsistent. Abdul-Rahman (1994) and Parker (1994) studies have found that age is not a significant predictor of persistence. While Whittington's (1997) finding moderately supports age as a factor in the completion of courses, that is, younger adults performed better than older adults. In contrast, Sheets (1995) indicated that older ages were positively related to persistence. Parker's (1994) non-significant results for age may have been due to the narrow differences between ages for the distance education completers and non-completers which was fewer than five months; likewise the narrow age range in Abdul-Rahman's (1994) study with almost 90% between the ages of 25-35 may have accounted for the insignificant association of age with completion.

Findings indicated that gender was not a significant predictor of persistence (Abdul-Rahman, 1994; Lim, 2000; Parker, 1994). Employment factors had inconclusive results. Some studies showed that income level (Whittington, 1997), full-time work experience (Sheets, 1995), and number of hours employed (Parker, 1994) were related to persistence.   Whereas, Abdul-Rahman's (1994) finding showed that family income was not related to program completion. Generally, the inconclusive findings indicated that demographics such as age, gender, and employment status have very little or no influence on persistence. This was not surprising, "according to

one estimate, it is possible that less than 10% of the variance regarding persistence was accounted for by demographic factors" (Gibson, cited in Sheets, 1995, p. 19).

There were conflicting findings from studies on educational factors such as educational attainment/previous college hours or distance courses and their effect on persistence. Whittington (1997) had found that the educational level of students contributed significantly to the prediction of persistence. In contrast, Lim (2000) found that academic status (undergraduate, graduate or continuing education) was not significant and Sheets (1995) study showed that fewer previous college hours were related to persistence. Abdul-Rahman's (1994) findings indicated that entry qualification has no direct effect on course completion, but was significantly related to average grade. In addition, Parker (1994) did not find any significant relationship between the number of distance education courses completed with persistence. Most of the recent research tended to indicate that the prior education of students had very little, if any effect on persistence in distance education courses.

Other individual characteristics such as self-esteem, academic self-concept, locus-of-control and learning styles were examined to determine their influence on persistence. Self-esteem was found by (Abdul-Rahman, 1994) to have an insignificant effect on completion (less than .01). Academic self-concept—self perceptions of one's own academic competence—was found to have a positive relationship to satisfaction in a distance education course and learners were more likely to take additional distance education courses (Lim, 2000). Locus of control (Rotter, 1966) whereby the learners attributes outcomes to be contingent upon their behaviour (internal) or to factors beyond their own control (external)—as a single

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independent variable was found by Parker (1994) to be a significant predictor of dropout with an accuracy of 80%. In another study, Dille and Mezack (1991) also found locus of control to be an indicator of students' success. The successful students scored significantly lower in locus of control which indicated an internal orientation where students believed that individual effort affected outcomes as opposed to those students with external orientation who believed that success was controlled by forces outside their control. On the contrary, Whittington (1997) did not find locus of control to be a predictor of persistence. However, he did find that student types (traditional vs. non-tradition) differed on locus of control with the non-traditional students having a more "internal" locus of control—they wanted more control of their own learning rather than to rely on the direction of others. Since he found locus of control to not be a significant predictor, there was also no significant difference in persistence between the traditional and non-traditional students. Dille and Mezack's (1991) study on learning styles found using the Kolb instrument (Kolb, 1984) that successful students scored lower than unsuccessful students on the Concrete Experience portion of the instrument which indicated that the successful students were more tolerant of social isolation. The successful students also had more concrete learning styles as indicated by their higher Abstract Conceptualization minus Concrete Experience scores.

Environmental Factors. The post-enrolment behaviour of students had an impact on their academic success. The amount of study time devoted to a course had an impact on student completion, Sheets (1995, p. 99) found "that greater number of hours in study were related to persistence." In addition, Abdul-Rahman

(1994) found that while study habit was not directly related to program completion, bad study habits such as not going through the learning materials, not attempting all the course exercises and not contacting instructors when problems arose contributed to poor grades. Another behaviour which negatively impacted persistence was that of procrastination. In a study by Wilkinson and Sherman (1989), procrastination on the part of students submitting assignments and on the part of instructors returning students' assignments negatively impacted completion rates in distance education.

Institutional interventions such as student support services had been implemented in response to high attrition rates in distance education. Student support services included a wide range of services described by McInnis-Rankin and Brindley (cited in Brindley, 1995, p. 104), "orientation and information, admissions and other registry services, advising and counselling, instructional support (tutoring/teaching), and student advocacy". These kinds of support services were used to facilitate learning and help students become better prepared for the demands of distance education.

Institutional contact had been identified by Simpson (2004) as being important to retention in any institution. Simpson went on further to make a distinction between reactive and proactive contact:

- Reactive – responding to student-initiated contacts;
- Proactive – the institution initiating contact with students either in a teaching or an advisory environment.

Simpson (2004) believed that the focus should be on proactive contact both from advisory and teaching services because this form of contact would "reach students who might not make contact with the student support system otherwise and may be more likely to dropout". In addition, Simpson (2000) had identified critical points during a student's progress when contact was most important such as at the start of a course, start of an assignment and pre-exam.

Pacing techniques such as having scheduled times for quizzes, assignments and examinations, contacting students to check on their progress and so forth could lead to higher completion rates. In Coldeway's study (cited in Sheets, 1995) completion rates for a course were more than twice as high at a university that used pacing techniques as compared to two other institutions with the same course that was open-ended. In another study, Valasek (2001) found students that kept pace with course work and assignments were more successful.

Descriptive studies helped to shed some light to the occurrence or absence of persistence in distance education. The use of theory would provide a further understanding and assist in the prediction of persistence. The following section focuses on some of the theories in higher education that have been used to explain persistence.

Models of Persistence

There has been much published on the subject of persistence in education, particularly, higher education. Still there remained much more to know about the nature of attrition and the impact that this phenomena had on both students and

institutions. We need to understand the "longitudinal process of student leaving and the complex interplay of forces which give rise to it" (Tinto, 1987, p. 3).

      <u>Tinto Model</u>. The Tinto model (1975) on attrition in higher education was likely the most extensively cited in literature. Tinto's model had been adapted by many scholars to explain attrition in distance education (Bean, 1980; Allen, 1990; Parker, 1994).

Figure 1. Tinto's (1975) Model of Dropout
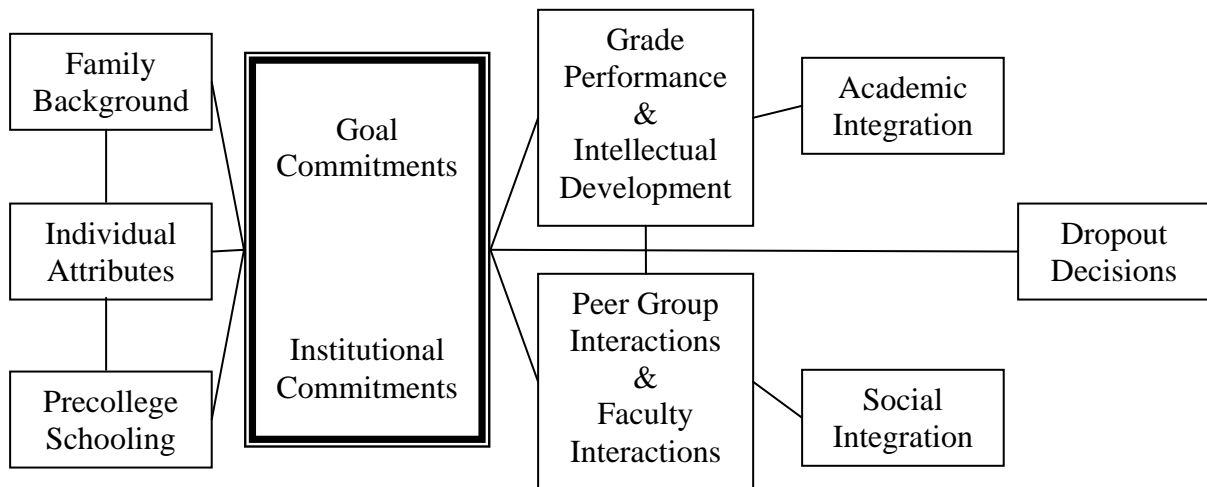
      Tinto (1975) regarded persistence to be mainly due to the student's academic and social integration after enrolment into an educational institution. The student brought along personal characteristics (family background, individual attributes, and prior schooling) and goal commitments to the educational organization. Tinto believed that the more committed students were to the attainment of goals within an institutional context (institutional commitment), the more likely they would be able to complete their program of study. Students' academic performance and abilities

along with subsequent interactions between the individual and other members of the institution are related to further continuance in their studies. Those students that were more integrated into the academic and social systems of the institution, and as Parker (1994, p. 20) had stated those "who feel a sense of belonging to the institution because of interactions persist longer even if past academic performance has resulted in low academic levels of success". Parker (1994) went further on to stress the importance of interaction in distance education which had been debated as a necessity by institutions.

The weakness in Tinto's model (1975) was that it referred to students that were engaged in full-time studies whose main focus was on their educational pursuits. Some modifications to the model were required to reflect more clearly the retention patterns in adult and distance learning programs (Towles & Spencer, 1993). Tinto (1982) later acknowledged that the model (1975) in its stated form was not suitable for students who had extensive social relationships outside their educational institution or for a large commuter population and must be adapted for use in non-traditional educational settings. Thus, for distance learners who were mainly engaged in part-time studies, consideration must be made for other factors that had a strong influence in a distance education context.

Tinto's model (1975) had provided a theoretical foundation for studying dropout in distance education. The works of others were largely modified forms of Tinto's model (Sheets, 1995; Kember, 1989a; Bean & Metzner, 1985). The findings from these adapted studies varied.

Kember Model. Kember (1989a) devised a model which was a modification of Tinto's model to include the special characteristics of distance education. Some of the factors related to distance education were tested to see how well students integrated to the academic and social environments. Kember's model was divided into seven categories: (a) learners characteristics, (b) goal commitment, (c) academic environment, (d) academic integration, (e) social and work environment, (f) social and work integration, and (g) cost/benefit analysis.

The academic environment included all aspects of distance education such as the style of the study packages, interactions with assignments, tutorial interactions, and all other interactions with the institution both administrative and academic in nature. Kember's social and work integration was a modification of Tinto's social integrations to include the extent to which distance learners could adjust to their part-time studies and other commitments of work, home, and social life. Kember felt that students followed one of two paths -- either positively in the direction of social and academic integration, or negatively whereby they have difficulties achieving social and academic integration. The cost/benefit component of the model measured the student's perceived benefits of eventual qualification and other benefits derived from taking distance education courses. Kember's longitudinal model observed changes in the variables throughout the student's academic life and the impact it had on the nature of the cost/benefit analysis. He believed that those students at high risk or in danger of dropping out should be reassessed frequently. By cycling through the model again, students may perhaps follow another path if their circumstances changed.

Kember tested his longitudinal model of dropout to substantiate the variables in his proposed model. Through a qualitative study using quotations from interviews (Kember, 1989b), he was able to support the use of most of the variables in his model. He also performed a quantitative study by administering a questionnaire to 1060 distance education students in Hong Kong (Kember et al, 1991). He found that 80% of the total variance of the students' completion was explained by the constructs of emotional encouragement, external attributions, academic accommodation, academic compatibility, and GPA (grade point average).

Sheets' Models. Sheets (1995) designed models of persistence in higher education telecourses. She created a 96 item instrument based on the instrument Distance Education Student Progress (DESP) questionnaire that Kember and associates (Kember, cited in Sheets, 1995, p. 48) developed and 10 questions related to locus of control from Biggs' (Biggs, cited in Sheets, 1995) Student Behaviour Questionnaire were added to Sheets' questionnaire. Sheet's instrument contained background characteristics, attitudes toward education, and the student's experiences as a distance education student.

Models were developed by Sheets (1995) from the 328 telecourse students studied in Oklahoma. The models developed to some extent supported the path model devised by Kember and associates (Kember et al., cited in Sheets, 1995). The academic accommodation scale provided some support in Model 2 for married students which included a "positive course impression" construct, similar to a construct included in the Kember and associates model (Sheets, 1995). In addition, univariate tests revealed that two constructs in Sheets model were found in Kember

and associates model were significant: enrolment encouragement and family support. Both these constructs were part of the "emotional encouragement" portion of the Sheets model which in part functioned as a social integration component similar to that originally proposed by Tinto (Sheets, 1995). There were other constructs that were significant in univariate tests which could be found in Kember and associates model under "academic accommodation". These were "institutional support", "reading and study enjoyment", "teacher communication", and "positive course impression" (Sheets, 1995).

Interaction in Distance Education

The studies on social and academic integration (Tinto, 1975; Kember, 1989a; Sheets, 1995) clearly indicated that it was important that students were satisfied and perceived that they were part of a learning community. This would reinforce commitment and in turn impact persistence. Interactions between the instructor and the student, and all other forms of interaction whether of an administrative or academic nature would all contribute to a student's sense of belonging and satisfaction within a distance learning environment. Holmberg (1995) theorized that students' engagement in various social and academic activities was essential to their success:

> Personal relations, study pleasure and empathy between students and those supporting them (tutors, counsellors, etc.) are central to learning in distance education. Feelings of empathy and belonging promote students' motivation to learn and influence the learning the learning favourably. Such feelings are conveyed by students' being engaged in decision making, by lucid problem-oriented conversation-like presentations of learning matter that may be anchored in existing knowledge, by friendly, non-contiguous interaction

between students and tutors, counsellors and others supporting them. (Holmberg,1995, p. 5).

The important role that interaction played in the integration of students into the social and academic fabric of an educational institution warranted a deeper understanding of how it influenced students' persistence. Interaction could be defined as

reciprocal events that require at least two objects and two actions. Interactions occur when these objects and events mutually influence one another. An instructional interaction is an event that takes place between a learner and the learner's environment. Its purpose is to respond to the learner in a way intended to change his or her behavior toward an educational goal. Instructional interactions have two purposes: to change learners and to move them toward achieving their goals. (Wagner, 1994, p. 8)

Thus, interaction had a learning outcome. Interaction implied that there was active learner participation (Garrison, 1990). To differentiate between participation and interaction, "participation refers to involvement and presence, without any response or feedback being involved…. [while] interaction means that some sort of dialogue is occurring between the student and the instructor, other students, or the content itself" (Kearsley, 2000, p. 80).

Holmberg's (1988) theory of interaction and communication was described as guided didactic conversation which consisted of non-contiguous conversation between the student, and the instructor/supporting institution. The constant interaction between the student and the supporting institution was both simulated through the student's interaction with pre-produced course materials and real through written and electronic interaction with counsellors and tutors (Paulsen, 1993). The most important feature of Holmberg's interaction and communication theory was that there was two-way communication between the student and teacher

(Keegan, 1996). Even though Holmberg's theory was more applicable to the early forms of distance education—correspondence courses and one-to-one communication— and did not include group interaction, the theory could be developed further to include group facilitation (Paulsen, 1993).

Types of Interaction. There were four types of interaction in distance education which had been described by (Hillman et al, 1994; Moore, 1989). These interactions were: (1) learner-content (2) learner-instructor, (3) learner-learner, and (4) learner-interface. Following are descriptions which helped to differentiate each type of interaction and the role that each play in distance education.

Learner-content interaction was described by Moore (1989, p. 2) as "the process of intellectually interacting with content that results in changes in the learner's understanding, the learner's perspective, or the cognitive structures of the learner's mind". Essentially, the learner "talks to oneself" about ideas encountered from the content. The content could vary in form to include such medium as paper-based text, audiotape, videotape, and computer generated media. Moore believed this type of interaction was a form of Holmberg's guided didactic conversation.

The learner-instructor interaction was the type of interaction where the learner engaged in two way communication with the instructor. This type of interaction was viewed as "essential by many educators and highly desirable by many learners" (Moore, 1989, p.2). The learner-instructor level of interaction could be more individualised and was more intense than the learner-content type of interaction, and therefore had more influence on the learner (Shinkle, 2001). The learner-instructor

interaction could be instructor to one learner, or instructor to many learners (group setting).

The third type of interaction was learner-learner which was the least observed when compared to learner-content and learner-instructor, and practiced type in distance education (Moore, 1989). Distance education had mainly focused on learner-content interaction with delayed learner-instructor interaction. More recently, with a change in the distance learning environment to include communication media such as electronic mail, internet chat, audio-conference and video-conference; increased attention had been made on learner-learner interaction (Chou, 2000; Fite, 2003).

In light of emerging technologies Hillman et al. (1994) included a fourth category which was applicable to distance education. The fourth type, learner-interface interaction occurred when interaction took place between the learner and the technology used for distance education. Hillman and associates believed that there was a need for excellent user-interfaces in order to facilitate distance learning. The user-interface played an important role to effective communication to help learners understand content and it contributed to the total learning experience.

A fifth type of interaction of particular importance to certain learners, particularly within the computer-mediated communication (CMC) environment was defined, characterized, and described by Sutton (2000). Vicarious interaction was a fairly recent term which was used to refer to students who actively processed the interaction of others. Sutton (2000) believed that direct interaction was not required for all learners and that observation and active processing of interactions by others

would benefit learners through the process of vicarious interaction. Sutton also

presented the principle that enhanced achievement and satisfaction might take place

even when learners did not interact directly.

Task and Socio-Emotional Interaction. Interaction could be either task

oriented or socio-emotional in nature (Grooms, 2000; Chou, 2000). Task-oriented

interaction was directed towards goal attainment, while socio-emotional interaction

was a form of socializing; it included exchange of a personal nature and

conversation of non-academic topics. Both forms of interaction were present in the

online learning environment where there was an "exchange of ideas, information,

and feelings among members of the community" (Hiltz, 1998, p.7). Interactions

among learners and the facilitator would help move learners towards their academic

goals as well as satisfy their social need for interaction. "Studies of achievement in a

distance setting [have shown that] distance learners express high satisfaction with

the distance education paradigm, especially [in] a teleconferencing environment

which [had] facilitated greater interaction with the instructor" (Hopper, 2000).

Task-oriented interaction included intellectual discussion, information

feedback, and corrective/evaluative feedback (Grooms, 2000). Intellectual

discussion involved discussions and debates of academic content, creating new

meanings, generating new ideas, and collaborating with peers. Information feedback

was related to course rules and procedures, technical issues or course organization.

This could include response to questions concerning assignment and examination

dates or the format of an assignment or examination. Corrective/evaluative feedback

provided learners with information on how correct their response was by providing direction, confirming or correcting.

Socio-emotional dimension related to the way in which the learner wished to order the external environment (Grooms, 2000). Online learning was inherently social in nature (Kearsley, 2000) and provided a forum for social-emotional interaction which could range from chat about the weather, discussing one's well-being and personal issues, providing encouragement and engaging in humour. In an earlier study, Grooms found that learners used online communication for more than class-related purposes; they used it for both social and spiritual interaction (as cited in Grooms, 2000).

Social interaction occurred together with task oriented interaction. There were certain kinds of social interaction which could directly promote instructional interaction; for example, group discussions that had high social interactivity while learners were examining opinions about course content (Gilbert & Moore, 1998). The kind of communication—whether it was asynchronous or synchronous would affect the amount of task oriented vs. socio-emotional interactions. Chou (2000) found different patterns of online interaction between asynchronous and synchronous communication networks with a higher amount of social-emotional interaction in synchronous communication mode and a significantly higher percentage of task oriented interaction in the asynchronous communication mode. Chou (2000) concluded that educators should design activities that would ensure that online discussions were focused without digressing to only interpersonal interactions in a synchronous environment, whereas in an asynchronous

environment activities that promote interpersonal connection might aid more two-way communication.

Two important aspects of socio-emotional interaction which appeared throughout literature were clustered into two categories: (1) socializing and (2) motivation and support (Grooms, 2000).

- Social interaction involved "elements of mutuality, flexibility, and bidirectionality that were not as frequently found in purely instructional interaction" (Gilbert & Moore, 1998, p. 31). Cutler (1996) found that the more someone revealed personal information, the more others would respond; the more persons knew about one another, the more likely they would create trust, find support, and satisfaction.

- Interaction was useful in supporting learner control/self-regulation and increasing motivation (Wagner, 1997). Motivation and support were usually in the form of encouraging words from the instructor, tutor or peers. The need for tutorial support should not be taken lightly; distance learners might require greater support than traditional learners (Stevenson et al., 1996).

Psychological Aspects of Interaction. "Psychologically, individuals entered the online learning environment with varying degrees of cognitive and emotional need for interaction (Grooms, 2000). Some had greater expectations than others for interaction. Not only was it important to recognize learners' expectation for interaction, it was also essential to "determine the degree to which they experienced its antithesis, lack of interaction which often resulted in the psychological feeling of

loneliness or isolation" (Grooms, 2000). These feelings of isolation by some students would compromise their participation in distance education (Epstein, 1999).

Although the distance learner was isolated, the activity of learning did not have to be an isolated event. "Learners can transcend geographic and social isolation through electronic correspondence" (Huang, 1999, p. 8). The use of technology communication tools such as telephone, e-mail, electronic discussion boards (asynchronous), chat rooms (synchronous), audio conferencing, and video conferencing could help to bridge the distance by facilitating two-way communication among learners, peers, and the instructor. However, it should be recognized that "learning at a distance can be both isolating and highly interactive … electronic connectedness is a different kind of interaction than what takes place in traditional classrooms" (Kerka, 1996, p. 4). "Lack of nonverbal cues can create misunderstanding, but communications protocols can be established and relationships among learners developed" (Kerka, 1996, p. 4).

Tutorial Support Service. Tutoring support was one of many student support services that were provided at distance by distance learning institutions. Tutoring could be one-on-one or one-on-group academic assistance provided to students. At Athabasca University, tutoring was one-on-one academic assistance provided by an instructor and was provided by telephone or e-mail, this type of interaction would be classified as learner-instructor. As stated earlier, learner-instructor interaction was two-way communication, individualised, and was considered to be more intense than other types of interaction i.e., learner-content interaction (Shinkle, 2001). Tutorial

support could also be provided by a student, this type of interaction would be classified as student-student interaction and was often called peer tutoring.

A three-year longitudinal study on student support services by Weinsheimer (1998) had shown that peer tutoring during the first year of college had a statistically significant impact on students with respect to grades, credits, retention, and participation in the first year of college had a greater impact than in later years. In another study, Chang (2001) found that high and medium GPA (grade point average) students requests for online facilitation, i.e., assistance with network access and assignments and grade criteria were much greater than low GPA students. These findings indicated that it was crucial that students, particularly first time/first year distance education students were encouraged to use tutoring and other support services. In 2001, Wimbish found that student-teacher interactions contributed to course completions.

Computer-Mediated Communication. The main purpose of computer-mediated communication (CMC) was to facilitate two-way communication among learners, peers, and the instructor. CMC applications assisted in text based interaction both synchronously (i.e., Internet chat) and asynchronously (i.e., time independent electronic discussion board, e-mail). The majority of research on learner interaction in distance education had been done on asynchronous networks with fewer studies on learner interaction in synchronous networks (Chou, 2000). The focus of this section was on asynchronous CMC (electronic discussion board and e-mail) since that was the main form of two-way communication in the current study of group interaction in distance education.

There were two perspectives that were considered when viewing two-way communication; distinguishing between quantitative and qualitative interaction. (Lundgren-Cayrol, 1996). Quantitative interaction referred to how much or the amount of interaction that occurred. Whereas qualitative interaction referred to the level of detail and intensity that the learner was engaged in when discussing course content. In terms of quality, "place-based learning currently has superior interactive opportunities", while "online learning, conversely, allows for reflective time in the learning process and a degree of participation well beyond that which is possible within the time constraints" (Parker & Rossner-Merrill, 1998, p. 5). Given that CMC was time independent, it allowed non-traditional students who were slower learners sufficient time to go through conference postings at their own pace, to reflect, and then respond. This allowed for deeper discussions and further facilitated the "increase in learning that is gained through sharing, arguing and debating course material" (Lundgren-Cayrol, 1996, p. 5).

The lack of physical cues such as voice tones, facial expressions, and gestures in CMC might be considered problematic. Online learning using the electronic form of interaction restricted communication and was considered by some to be inferior to face-to-face classroom learning. "Others believe, however that online learning provides the opportunity for equally satisfying, albeit different, ways of relating" (Herod, 1999, p. 1). It had been suggested that lack of these physical cues create equality among learners and teachers because they were not evaluated on physical appearance (Mantovani, 1994). However, a negative aspect of the lack of

physical presence in CMC had caused social relationships to be lacking in depth (Herod, 1999).

There were ways that interpersonal presence could be gained in CMC. Herod's study (1999) had identified two broad categories for interpersonal presence in CMC:

- Personal style – referred to the way the person came across or their presence as a "person" e.g., witty, sarcastic, poetic, supportive of others, etc.

- Collegial style – referred to the way the person came across as a fellow student e.g., how well the person worked in a group, how well the person contributed, etc.

Interpersonal presence could be conveyed by three general methods (Herod, 1999):

- Personal identifiers – biographical information, posting of pictures, and links to personal websites

- Socialising efforts – use of e-mail "outside the class" for personal conversation, sharing of personal information/experiences and supportiveness of one another

- Communication style

  - Expressions of emotions e.g., by using emoticons, jokes, etc.

  - Tone of writing e.g., sarcastic, conciliatory, apologetic, etc.

  - Quality and quantity of participation e.g., how often student contributed, how in tune was student to discussions, etc.

Not surprisingly, Herod's (1999) findings indicated that the social and collegial aspects of CMC courses were interwoven which was consistent with Tinto's (1987) argument that the academic and social systems were mutually interdependent. In

Herod's study, the social relationships were based on mutual personal interests such as family and recreation; and the collegial relationships were based on mutual academic interests and purposes. Herod found in particular that the collegial relationships in CMC were important to learning outcomes and satisfaction.

Group Interaction and Persistence. To date, very little research had been devoted to the effect of group interaction in distance education to persistence. This was mostly due to the fact that online group interaction had only existed in the last 10 years or so, from the advent of computer technology which had enabled learner-learner and learner-instructor interaction in a group setting, in a cost effective manner. The research of group interaction in distance education is necessary, as online course offerings continue to grow.

A study by Cadieux (2002) was made to investigate the "sense of community" and four subscales of spirit, trust, interaction, and learning within the Sense of Classroom Community Index (SCCI) for both face-to-face classroom and online learning. There was a significant positive slight correlation between grade and the subscale of interaction only for the face-to-face group and not for the online group. In addition, there was no significant difference between the non-dropout and dropout groups (for both face-to-face and online) on the measures of interaction. Cadieux also found that the online students who experienced the greatest sense of community earned a grade of 'C' in their course; so while these students might have enjoyed the online experience, earning a 'C' might preclude them from repeating the online experience. This finding suggested that "instructors need tools to help them

evaluate the experiences the students may be having and how these relate to course outcome" (p. 81).

In contrast, to Cadieux's study (2002), findings from the Sinclair Community College (2000) study on distance learners and how they compared to their on campus peers showed that interaction did have influence on success in distance education. Not surprisingly, when a comparison was made on traditional learners to distance learners it was found that the distance learners earned a lower course GPA and were less likely to be "successful" in the course. However when comparing the different modes of distance learning (Take-home video, Web-based, Audio, and Live Interactive modes), there were striking differences between student performance and persistence based on the mode of distance learning. There was a significant difference (p<.001) between the televised, interactive mode to the take-home video mode. Students enrolled in the take-home video courses earned the lowest mean GPA (2.04) and students in the televised, interactive courses attained the highest mean GPA (2.73).

> One can surmise that the more structured nature and real-time exchange of the televised, interactive sections contributed to student success; and, conversely, the very independent nature and lack of interchange inherent in the take-home video sections inhibited successful completion (pp. 12-13).

The finding from Sinclair Community College emphasized the importance of interaction and the impact that it had on learning outcomes. Another factor essential to learner success was the structured nature of the televised, interactive sections.

Summary

   In recent years there had been an extraordinary growth in distance education. This expansion in distance education was fuelled by the increase in overall demand for post-secondary education. While distance education was well positioned to serve the growing demand for higher education, it was not without its growing pains. One issue of concern was that of persistence for learners in distance education. Distance learners were physically separated from their instructor and other students. This posed unique challenges for distance learners from that of traditional students.

  There had been many definitions and terminology associated with distance education. While these definitions varied from one to another, the commonality was the emphasis on the physical separation of the learner from the teacher as the distinguishing factor between distance education from traditional face-to-face learning.

  Distance education primarily served adult learners who were often referred to as non-traditional learners. The non-traditional learner tended to have one or more of the following characteristics: over 25 years of age, studying part-time, working full-time, and having family commitments. Adult students were recognised as independent and self-direct learners who wanted to focus on material that was meaningful to them. They also required flexibility to study at a time which was convenient and to interact outside of traditional class hours. While distance education appeared well suited in meeting the needs of adult learners, there was growing concern with the high attrition rates.

In addressing the persistence issue, many scholars had attempted to explain dropout or persistence in distance education on various factors or variables which were possible predictors of dropout or persistence. The data related to persistence were either personal (e.g., demographic, educational attainment, learning styles and motivation) or environmental (e.g., post-enrolment student behaviour and institutional interventions). To date there had been conflicting findings for personal variables such as age, gender, employment status, educational level, and locus of control as predictors of persistence; whereas, the literature was more consistent in identifying external variables such as pacing techniques and institutional contact as having a positive influence on persistence.

In addition to descriptive studies on persistence, there had been many theories and models created over the years to help explain attrition. The theory of social and academic integration by Tinto (1975) appeared to be the most accepted and had been adapted by many scholars. Kember's (1989a) model and Sheets' (1995) model were examples of modified forms of Tinto's model that included special characteristics of distance education. It was quite evident from the studies on social and academic integration (Tinto, 1975; Kember, 1989a; Sheets, 1995) that it was important for students to be satisfied and feel that they were part of a learning community. This would reinforce commitment and have a positive impact on persistence.

Interactions between the student and the instructor, as well as all other forms of interactions whether of an administrative or academic nature, would all contribute to a student's sense of belonging and satisfaction in distance education. There were

essentially five types of interaction in distance education (Hillman et al (1994) and

Sutton (2000): learner-content, learner-instructor, learner-learner, learner interface,

and vicarious. Literature had focused on learner-content interaction with delayed

learner-instructor interaction. It was only in recent years with the advent of computer

technology that learner-learner and learner-instructor interactions in a group setting

were made possible. To date, though there had been little research and conflicting

findings on the effect of group interaction on learning outcomes, it had become

evident that distance learners perceived the ability to interact with their instructor and

peers as being beneficial in helping to bridge the distance, to reduce feelings of

isolation, and to increase satisfaction and motivation.

CHAPTER III

METHODOLOGY

This research was of a mixed method approach (Creswell, 2003) which incorporated both quantitative and qualitative data analysis. The study examined possible predictors of persistence of undergraduate students in distance education and was approved by Athabasca University's Research Ethics Board. A copy of the Letter of Introduction and the Consent Form can be found in appendices A and B.

To test hypotheses 1 and 2, a quasi-experiment was performed to determine whether the two factors, group interaction and study schedule, influenced persistence and achievement of students in a distance education course. To test hypotheses 3 and 4, Call Centre support (tutorial support) was analyzed to determine whether it had no significant relationship to either persistence or achievement.

To investigate secondary research questions, demographic, academic, and other applicable student data (both qualitative and quantitative) were collected and analyzed to determine whether there were other possible predictors of persistence and achievement. The following includes a description of the sample, experiment design, data collection procedures and instrumentation, variables and data analysis.

The sample for this study was one of convenience and consisted of 82 students enrolled in a distance education course at Athabasca University. The sample dropped to 58 after some students withdrew early or requested a course extension. These were students enrolled in the *Administrative Principles* course (ADMN 232) offered by the School of Business, with a course start date of September 1st, 2004 and with a course end date of February 28th, 2005 (six month duration). To ensure that the three groups (Group Interaction group, Study Schedule group and Control group) in the study were equivalent, the students were randomly assigned to each group.

The instructional approach for this distance education course was the individualised study mode, which meant that students work independently and followed a self-determined schedule during the six-month duration. Interaction with the course professor or other academic expert was possible, but this was initiated by the students and the contact was made through the School of Business' Call Centre by toll-free telephone, by fax, or by e-mail. An undergraduate student advisor upon receiving students' queries would log the details onto the Call Centre database system, which tracked students' phone calls, e-mails, and other forms of contacts made by students. The course professors or other academic experts would respond to the queries within 48 hours. The Call Centre model facilitated a hybrid form of interaction whereby students initiated contact with academic staff and only the learner-instructor type of interactions was possible, there were no learner-learner

interactions. The Call Centre form of interaction was a reactive form of interaction on the part of the School of Business; the academic staff would only interact with those students that initiated an interaction.

Experimental Design

The experiment was a quasi-experiment which consisted of two experimental groups and one control group. This differed from a true experiment which is characterised by all of the following: (1) causal link between the independent and dependent variables, (2) the random assignment of participants to comparison groups, and (3) a reduced set of potential threats to internal validity (Huck, 1996). In the current experiment, participants were taken from a convenient sample and there was a lack of control over extraneous variables such as students' physical study environment.

The quasi-experiment conducted to test hypotheses 1 and 2 had one independent variable (instructional approach) with three levels—(A) group interaction (via computer-mediated communication), (B) study schedule (students follow a study schedule), and (C) control group—and two dependent variables (persistence and achievement). The effect of three levels of individualised study instructional approach on distance education delivery was studied to determine if there was no significance among these three levels.   There were three groups examined in the study; these were the (A) Group Interaction group, the (B) Study Schedule group, and the (C) Control group. The students were randomly assigned to each group. The treatment condition of group interaction (via computer conference)

was applied to the first group (A) and the treatment condition of having a study schedule was applied to the second group (B). The third group (C) was the control group.

Group A – Group Interaction. This group was given the opportunity to interact with each other via computer-mediated communication. There were two types of interactions which occurred within Group A which was not available to the other two groups in this study:

1) Learner-instructor – the facilitator (course tutor) interacted with the students via e-mail and on the conference site in a virtual group setting.
2) Student-student – students interacted with other students on the conference site in scheduled discussions and in an informal discussion setting.

The computer conferencing was text based and asynchronous. This form of computer conferencing was chosen in order to ensure that all students assigned to this group would be able to participate in the computer conferencing due to the minimal computer hardware and software requirements for participation. Also in keeping with the flexibility of individualised study, the asynchronous format ensured that students could participate at a time which was convenient for them. A special password protected conference site was set up with two discussion areas:

1) Scheduled discussions

There were six conference sessions set up to discuss course content which was moderated by a conference facilitator (course tutor). A list of the scheduled sessions

was sent out to the students at the beginning of the course. A few days prior to the

start of each scheduled session, the conference facilitator would send an e-mail

reminder to the students about an upcoming session. Each session was one week in

duration which meant that the students could only participate during the week that

each session was scheduled in. The six sessions were distributed evenly throughout

the six month course contract period (September 1st, 2004 to February 28th, 2005):

1. Introductions (Sept 5 to 11) – facilitator, students provided personal information about themselves, their education background and expectations for the course

2. Frequently Asked Questions (Sept 19 to 25) about the course and assignments

3. Student Selected Topic (Oct 17 to 23) students discussed course related concepts and items of interest

4. Midterm (Nov 21 to 27) – discussed content that was applicable to midterm

5. Frequently Asked Questions (Jan 2 to 8) about the course and assignments

6. Final (Feb 6 to 12) – discussed content that was applicable to final exam

2) Informal Discussion Room

This area was set up so students could informally interact with other students.

Discussions in this area could either be course or non-course related and students

could go in anytime during the six month course contract period to converse

asynchronously with other students. This discussion area was monitored by the

conference facilitator and she would only participate on an as need basis e.g.,

respond to a student question that was course related that was not responded to by

other students.

Except for the computer conferencing as described above, the students would proceed through the course in exactly the same manner as Group C - the control group. This included working through the same course material and access to the regular Athabasca University services and access to the Call Centre. If students were not comfortable interacting in the group forum, they had the option of contacting the Call Centre and the course tutor would help them with their queries on an individual basis.

Group B – Study Schedule. A course study schedule was sent out at the beginning of the course to the students in the Study Schedule group. The study schedule followed the same timelines as the recommended study schedule included in the regular course package. The schedule was 26 weeks in duration (from September 1st, 2004 to February 28th, 2005) and outlined the specific dates in which students should be performing course activities such as studying lessons, completing assignments, writing midterm and final examinations. The students would be sent e-mail reminders a few days prior to the scheduled start date of each course activity listed on the course study schedule. Several e-mail reminders were sent throughout the duration of the course.

Except for receiving the detailed course schedule and the e-mail reminders, students in Group B would proceed with the course in the same manner as Group C – the control group. Group B would have the same course materials, and the same access to Athabasca University services and the School of Business' Call Centre as Group C.

Group C – Control. This group served as the control (no treatment) group and no changes were made to their course work. The students in this group received the default instructional approach which included the individualised course study package, access to regular student support services, etc. The students in this group proceeded with the course in the individualised study mode and worked independently without interacting with other students and were self-paced. They had access to their course professor or other academic expert through the Call Centre.

Data Collection and Instrument

The researcher worked with the academic expert for this course and obtained students' demographic information, academic results such as grades, pass/fail, completion dates of assignments/examinations, and details on whether students followed course schedule, withdrew from course early, requested a course extension and so forth. The data were obtained from Athabasca University's grading system and were collected a few weeks after the end date of the course (February 28th, 2005). The data collected were used for the testing of hypotheses 1, 2, 3, and 4.

To collect data for the investigation of the secondary research questions, the researcher developed telephone surveys, one for each group, and worked with a research assistant who administered the telephone survey to students in all three groups. Data collected included demographic data and other applicable data that were purported to be related to persistence and student achievement. A different survey was developed for each group. Some questions were similar on the three surveys such as demographic type questions while other questions were specific to

a particular group. For example, the students in Group A – Group Interaction group

were asked the following question:

Did you participate in the computer conferencing? If yes, did you find it beneficial to interact with others in the group? Explain.

A copy of each telephone survey can be found in appendices C, D, and E.

<u>Variables</u>

The dependent variables for this study was persistence (course completion

was used to measure persistence) and achievement (course final grade was used to

measure achievement). Students were considered to be persistent if they fulfilled at

least the minimum requirement for the course (50%) in order to receive a credit for

the course. Student achievement was measured by the final grade awarded the

student which was the composite mark attained for four assignments, a midterm

examination and a final examination (six compulsory components of the course).

The independent variables or factors in this study could be divided into the

two main categories identified earlier in the literature review: personal and

environmental. The independent variables that fall into the environmental category

were (1) instructional approach with three levels (group interaction, study schedule,

and no treatment) and (2) Call Centre contact which measured the number of times

each of the students initiated interaction with the School of Business Call Centre to

obtain academic support on course content. The group interaction (via computer

conferencing) and study schedule (e-mail reminders) were institutional interventions

which were purported to have some influence on persistence and achievement. The

Call Centre contact would measure the post-enrolment behaviour of the students in all three levels of instructional approach (group interaction, study schedule, and control groups) with respect to the number of times the students initiated contact with the course tutor via the Call Centre.

The telephone survey was used to gain an understanding of the experience of the students within each group in the study as well as to determine whether there were other factors/variables which were part of the personal category such as demographics, hours of employment and other personal characteristics which might have influenced persistence and achievement. These personal factors were outside the control of the institution but might help shed some light to persistence and achievement in distance education.

Data Analysis

Statistical analysis was performed using SPSS 11.0 for Windows software. Those students that obtained an early course withdrawal or a course extension were excluded in the data analysis. After adjusting for early withdrawal and extensions, the number of students included in the data analysis was 58.

The Kruskall-Wallis test (nonparametric) was used to compare persistence of the three groups: Group A – Group Interaction group, Group B – Study schedule group, and Group C – Control group. This test would address research hypothesis 1 of: There is no significant difference of the effect of three levels of instructional approach (group interaction, study schedule, and no treatment) on persistence in distance education.

The one-way ANOVA test was used to compare the mean achievement scores of the three groups: Group A – Group Interaction group, Group B – Study schedule group, and Group C – Control group. This test would address research hypothesis 2 of: There is no significant difference of the effect of three levels of instructional approach (group interaction, study schedule, and no treatment) on achievement in distance education.

The Spearman R correlation analysis was performed to determine whether there was a significant relationship between the independent variable Call Centre contact with the dependent variable persistence. This calculation would address research hypothesis 3: There is no significant relationship between the dependent variable persistence and the independent variable Call Centre contact.

The Spearman R correlation analysis was performed to determine whether there was a significant relationship between the independent variable Call Centre contact with the dependent variable, achievement. This analysis would address research hypothesis 4: There is no significant relationship between the dependent variable achievement and the independent variable Call Centre contact.

The Spearman R correlation analysis was performed to determine whether there was a significant relationship among each of the attributes: marital status, dependants, employment status (full-time or part-time), source of financial assistance, first AU course, first DE course, and AU program student to that of persistence and to that of achievement. A comparison of the completers to the non-completers with respect to their attributes was made.

Three of the questions for the Group Interaction group on computer conferencing regarding feelings of personal isolation, motivation, and learning were tabulated and presented in tabular form. A discussion of the qualitative responses was provided on the major themes.

CHAPTER IV

RESULTS

The main purpose of this research was to determine if instructional approach with group interaction and/or fixed study schedule would help to increase completion rates and achievement in an undergraduate distance education course. Another objective was to find out whether there was a significant relationship between Call Centre support to that of persistence and achievement. In addition, a telephone survey was administered to subjects in the study:

1) to gather data on personal attributes and examine their relationship to persistence and achievement

2) to obtain qualitative responses to questions related to student success in order to shed light to the persistence issue and aid future studies.

The sample for the present experiment started with 82 students enrolled in a distance education course, ADMN 232 - Administrative Principles at Athabasca University. The number of subjects dropped to 58 after some students withdrew early from the course or requested a course extension; these students were not presented or included in the statistical analysis. The students that requested early withdrawals were excluded because the 30 day period was considered too short a period for any of the treatment conditions applied to take effect. Students that requested course extensions were excluded in the interest of keeping this study within a reasonable time frame (AU's policy gave students the option to request a

two month extension for up to three times potentially extending the period of study to an additional six months). The subjects were randomly assigned to one of three groups in the experiment (Group Interaction group, Study Schedule group, and Control group).

<u>Descriptive Data</u>

     <u>Age</u>. Group A had students from 17 years to 51 years (range = 34.6) with a median age of 32.7 years. Group B students' ages from 21 years to 47 years (range = 25.5) with a median age of 33.9 years. Group C had students from 20 years to 56 years (range = 36.5) in age with a median age of 37.4 years (the highest of the three groups). See Table 1 for SPSS data run on age.

Table 1. Age Mean, Median and Range

Scale	Value
Group A – Group Interaction ($n = 20$)	
Mean	33.57
Median	32.70
Range	34.58
Group B – Study Schedule ($n = 19$)	
Mean	33.25
Median	33.92
Range	25.51
Group C – Control ($n = 19$)	
Mean	38.14
Median	37.42
Range	36.46

Course Completion. Students were considered course completers (persistent) if they fulfilled the minimum requirements of the course in order to receive credit for the course (a composite grade of at least 50% and a mark of at least 50% on each of the midterm and final exams). Students that completed the course received a rank of 1 and students that did not complete the course at the end of the six month period received a rank of 0. Table 2 shows the course completers.

Table 2. Course Completion

Group	Number of Students	% of Total Enrolment	Course Completers	% of Group
Group A - Group Interaction	20	34.48%	12	60.00%
Group B - Study Schedule	19	32.76%	14	73.68%
Group C - Control	19	32.76%	14	73.68%
Total of All Groups	58	100.00%	40	68.97%

The percentage of completers for all groups was 69.0%. The percentage of completers within each group ranged from a low of 60.0% for Group A; to a high of 73.7% for both Groups B and C.

Call Centre Statistics. There were 33 students out of the 58 students that used the Call Centre (56.9% of the students). Of these 33 students, 24 were females (63.2% of the females) and 9 were males (45.0% of the males) that used the Call Centre. Table 3 provides details of the number of contacts for each group.

Table 3. Call Centre Contacts by Group

Group	Gender	Number of Students	Call Centre Users	Number of Contacts	Mean Contacts
Group A - Group Interaction	Female	15	11	27	2.45
	Male	5	3	4	1.33
	Total	20	14	31	2.21
Group B - Study Schedule	Female	13	9	22	2.44
	Male	6	3	4	1.33
	Total	19	12	26	2.17
Group C - Control	Female	10	4	6	1.50
	Male	9	3	12	4.00
	Total	19	7	18	2.57
Group Totals	Female	38	24	55	2.29
	Male	20	9	20	2.22
	Total	58	33	75	2.27

Groups A and B had the same mean number of contacts by gender, with the females mean number of contacts at 2.5 and 2.4, respectively and the males in both groups at 1.3. Group C differed substantially from that of Groups A and B; with the mean number of contacts for females at 1.5 and for the males at 4.0. Overall both the mean number of contacts by gender was close with females at 2.3 and males at 2.2.

The students that used the Call Centre were more successful in the course than the students that did not use the Call Centre. The Call Centre users had a higher proportion of completers at 81.8% as compared to the non users at 52.0%. In addition, the mean course grade for the Call Centre users was much higher at 72.7% as compared to the non users at 45.6%. Table 4 provides details of the Call

Centre users and non users.

Table 4. Call Centre Users and Non Users

	Call Centre - Users			Call Centre - Non Users		
	Number	% Users	Mean Grade	Number	% Non Users	Mean Grade
Completers	27	81.82%	85.31%	13	52.00%	84.69%
Non Completers	6	18.18%	16.09%	12	48.00%	3.28%
Total	33	100.00%	72.73%	25	100.00%	45.62%

Testing of Hypotheses

Testing of Hypothesis 1. Hypothesis restated: There is no significant difference of the effect of three levels of instructional approach (group interaction, study schedule, and no treatment) on persistence in distance education.

Null hypothesis: H_0: $\mu_1 = \mu_2 = \mu_3$

Where μ_1 = Group A, μ_2 = Group B and μ_3 = Group C

To compare persistence or course completion for the three groups: Group A – Group Interaction group, Group B – Study Schedule group and Group C – Control group, the Kruskal-Wallis test was performed to compare the means. This test was the nonparametric equivalent to the one-way ANOVA. The mean rank of the three groups was compared. The test statistic was not significant with an asymptotic significance of 0.569. The null hypothesis was not rejected; there was no significant

difference of the effect of three levels of instructional approach (group interaction, study schedule, and no treatment) on persistence in distance education. Table 5 provides the details of the SPSS analysis.

Table 5. Kruskal-Wallis Test – Compare Means on Persistence

Group	Number	Mean Rank
Group A – Group Interaction	20	26.90
Group B - Study Schedule	19	30.87
Group C - Control	19	30.87
Total	58	

Note. Chi-Square = 1.127, Asymp. Sig. 0.569., *df* = 2.

Testing of Hypothesis 2. Hypothesis restated: There is no significant difference of the effect of three levels of instructional approach (group interaction, study schedule, and no treatment) on achievement in distance education.

Null hypothesis: H_0: $\mu_1 = \mu_2 = \mu_3$

Where $\mu_1 =$ Group A, $\mu_2 =$ Group B and $\mu_3 =$ Group C

The one-way ANOVA was used to compare the means for achievement (final grade scores) among the three groups. The significance value of 0.723 was not significant. The null hypothesis was not rejected; there was no significant difference

of the effect of three levels of instructional approach (group interaction, study schedule, not treatment) on achievement in distance education. The ANOVA is shown on Table 6.

Table 6. ANOVA - Compare Means on Achievement

		Descriptives		
Group	Number	Mean	Std. Dev.	Std. Error
Group A	20	55.62	39.52	8.84
Group B	19	64.72	35.73	8.20
Group C	19	63.07	37.32	8.56
Total	58	61.04	37.15	4.88

	Analysis of Variance		
	df	F	Sig.
Between Groups	2	.326	.723
Within Groups	55		
Total	57		

Testing of Hypothesis 3. Hypothesis restated: There is no significant relationship between the dependent variable persistence and the independent variable Call Centre contact.

To determine whether there was no significant relationship between the dependent variable persistence and the independent variable Call Centre contact,

the Spearman's rho nonparametric correlation was performed. The correlation

coefficient was significant for persistence and Call Centre contact with a correlation

coefficient of 0.355 and significance at the 0.01 level. See Table 7 for the correlation

results.

Table 7. Correlations – Call Centre Contact and Persistence

Variable	Number	Spearman's Rho Correlation Coefficient	Sig.
		Call Centre Contact	
Persistence	58	.355**	.006

Note. **p < .01 (2-tailed).

    <u>Testing of Hypothesis 4</u>. Hypothesis restated: There is no significant

relationship between the dependent variable achievement and the independent

variable Call Centre contact.

    The Spearman's rho nonparametric correlation was calculated to determine if

there was no significant correlation between achievement and Call Centre contact.

The correlation was not significant. Details of the SPSS run are shown in Table 8.

Table 8. Correlations – Call Centre Contact and Achievement

Variable	Number	Spearman's Rho Correlation Coefficient	Sig.
		Call Centre Contact	
Achievement	58	.240	.070

Telephone Survey Results

A telephone survey was administered to each of the students in the three groups (a slightly different survey per group, see Appendices C, D, E). Not all students participated in the survey. After a few unsuccessful attempts to contact some students by telephone, an attempt was made to contact them by e-mail. The rate of response was 85% for Group A, 79% for Group B, and 84% for Group C with an overall total response rate of 83%. Table 9 shows details of the number of students that responded to the survey.

Table 9. Number of Student Survey Responses

	Students	Number of Responses	Response Rate	Respondents that Completed	% of Respondents that Completed
Group A - Group Interaction	20	17	85.00%	12	70.59%
Group B - Study Schedule	19	15	78.95%	13	86.67%
Group C - Control	19	16	84.21%	12	75.00%
Total Group	58	48	82.76%	37	77.08%

There were 48 respondents of which there were 37 respondents (77.1%) that completed the course and 11 respondents (22.9%) that did not complete the course. The marital statuses of the respondents were classified into four groups: 27 that were married, three that were living common-law, five that were divorced, and 13 that were single (see Figure 2).

Figure 2. Marital Status Ratio
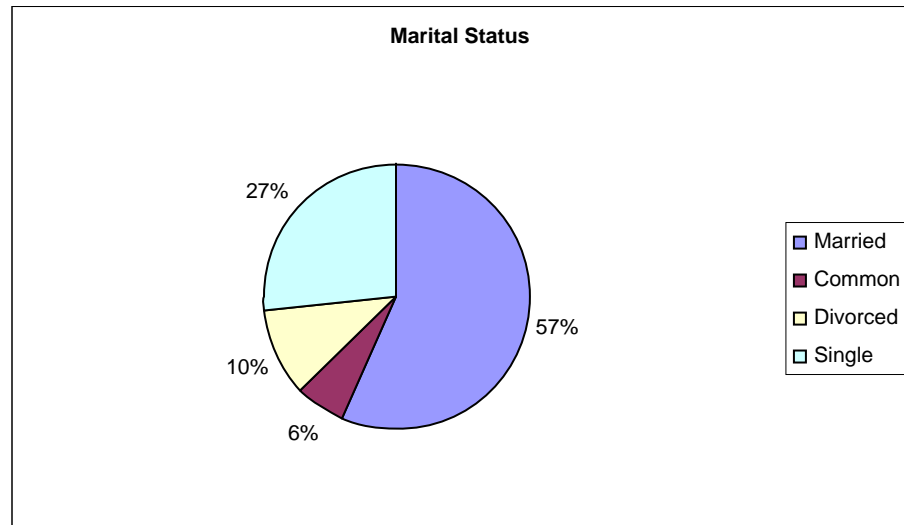
There were 29 respondents (60%) that had dependants living with them. All five in the divorced category and two in the single category had dependants. Forty-four out of the 48 were employed with 34 working full-time and 10 working part-time; the mean hours of employment per week was 36.7 hours. Twenty-six of the students had their tuition paid by someone other than themselves i.e., their parents or their employer. Of the 10 students that did not complete the course, eight have indicated that they plan to take the course again by distance education.

The number of completers and the non completers with the personal attributes identified above is shown on Table 10. The data provide a comparison between the two groups. The attributes include: marital status, whether students had dependants, employment status (working full-time or part-time), source of financial assistance, whether this was their first course at Athabasca University, first distance education course, and AU program student.

Table 10. Attributes of Completers and Non Completers

Attributes	Completers	Non completers	Completers %	Non Completers %	Total with Attribute
Married	22	5	81.5%	18.5%	27
Common Law	2	1	66.7%	33.3%	3
Divorced	3	2	60.0%	40.0%	5
Single	10	3	76.9%	23.1%	13
Dependants	23	6	79.3%	20.7%	29
No Dependants	14	5	73.7%	26.3%	19
Work Full Time	25	9	73.5%	26.5%	34
Work Part Time	10	0	100.0%	0.0%	10
Not Working	2	2	50.0%	50.0%	4
Tuition Paid By Other	20	6	76.9%	23.1%	26
Tuition Paid By Self	17	5	77.3%	22.7%	22
First AU Course	19	8	70.4%	29.6%	27
Not first AU Course	18	3	85.7%	14.3%	21
First DE Course	14	7	66.7%	33.3%	21
Not First DE Course	23	4	85.2%	14.8%	27
AU Program Student	33	9	78.6%	21.4%	42
Not AU Program Student	4	2	66.7%	33.3%	6

The completers tended to be married. The marital status of students that were single had the next highest completion rate of 76.9%. Many of the completers had

dependants. Almost all of the completers worked full-time or part-time. Those students that were working part-time had greater success than those working full-time with their completion rates at 100% and 73.5%, respectively. Students that had their tuition paid for by someone other than themselves were just as likely to complete the course as those that paid their own tuition. The students that took this course either as a first AU course and/or as a first distance education course had a lower completion rate than those that had previously taken a distance education course either through AU or another distance education institution. Those students that were AU program students were more likely to complete the course.

Statistical Analysis of Attributes. A SPSS correlation analysis using Spearman's rho was made on each of the attributes to determine their relationship to persistence and achievement. The results are summarised on Table 11. These results indicated that the attributes did not have a significant relationship to either persistence or achievement.

Table 11. Correlation Statistics on Attributes

Attributes	Persistence		Achievement	
	Correlation Coefficient	Sig.	Correlation Coefficient	Sig.
Marital Status	-.082	.580	-.038	.798
Dependants	.065	.658	-.026	.860
Working FT or PT	-.085	.564	-.067	.649
Source of Financial Asst	-.004	.978	.053	.721
First AU Course	-.181	.218	-.182	.215
First DE Course	-.219	.136	-.202	.169
AU Program Student	.094	.527	.155	.293

Group A – Group Interaction Survey Results. In Group A – Group Interaction group, the total participation rate was 11 out of 20 (55%), with eight students out of 20 students (40%) that participated in at least one of the six conference sessions set up to discuss course content, eight students out of 20 (40%) that took part in the informal discussion room where discussions were either course or non-course related, and five students participated in both the scheduled conferences and the informal discussions. Table 12 provides details about the number of students and the participation results. Learner-instructor and student-student interactions occurred in the Group Interaction group. The discussions varied from the exchange of non course related information such as personal details about family, achievements, and

aspirations to discussion of course related items such as course topics, concepts, and details of what to expect for midterm and final exams.

Table 12. Group Interaction Participation

Participation By Interaction Type	Students	Number of Postings	Average Postings per Student	Participation %
Scheduled Conferences Only	3	10	3.33	15.0%
Informal Discussions Only	3	4	1.33	15.0%
Both				
Scheduled		13	2.60	
Informal		14	2.80	
Sub-Total	5	27	5.40	25.0%
Total Group	11	41	3.73	55.0%

For those students from Group A that participated in the conferencing and/or informal discussion, four found the interaction useful, two found it somewhat useful and two found it not useful due to the low participation level. Four of the students that did not participate in the conferencing did however read other students' or the facilitator's postings. They found this to be helpful for their studies. Four students indicated that they communicated with another student outside of the scheduled conferences for course related purposes and they found this to be beneficial. A few

students indicated that it was reassuring to know that other students felt the "same way" about the course or were in the same "boat" as themselves.

Questions 18, 19 and 20 asked questions related to feelings of personal isolation, motivation and learning.

Q18. The computer conferencing helped to reduce feelings of personal isolation in this course.

Q19. The computer conferencing helped to motivate you to do the course work by keeping you connected to others.

Q20. The computer conferencing facilitated learning from other students and/or the course facilitator.

Students were asked to rate these according to whether they a) strongly agree b) agree c) neutral d) disagree e) strongly disagree. Table 13 shows the results of the responses. In general, most students agreed that computer conferencing helped to reduce feelings of personal isolation, helped motivate them to do their course work and interaction with other students/course facilitator helped with their learning.

Table 13. Group Interaction Responses

Questions	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Reduced feelings of personal isolation	2	8	3			13
Helped motivate to do course work	3	6	3	1		13
Facilitated learning from other students and/or the course facilitator	1	9	1	2		13

One student referred to the computer conferencing as a start in the right direction to reduce alienation. Another student indicated that conferencing should be mandatory so that there would be increased participation and thus would become more beneficial for students.

Group B – Study Schedule Survey Results. The majority of students found the e-mail reminders to be useful in keeping them on schedule with their course work. In response to the question: The e-mail reminders were helpful in keeping you on schedule with your course work; there were eight students that 'strongly agree', five that 'agree', one that was 'neutral', one that 'disagree', and one student that 'strongly disagree'. There were 13 out of 15 survey respondents that agreed/strongly agreed that the e-mail reminders were helpful. From the 13 students that found the e-mail reminders helpful, nine completed the course. There were four students that followed a schedule of their own (these were the students that disagree/strongly disagree that the e-mail reminders were helpful). One student indicated that e-mail reminders were important because they would keep a student on track. She would appreciate having e-mail reminders in future courses.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Interest in student retention has not waned. If anything it has increased over the years as more and more… [colleges and universities are required] to report and in some cases, be accountable for improvements in student retention. No where in this movement more strongly felt than among those institutions that are least prepared to meet the many academic and social demands college life imposes. And nowhere is the need for effective action more urgent. "At-risk" students are our future. Their success is our success. (Weinsheimer, 1998, p. 2)

A review of literature has shown that the persistence rate of students taking distance education courses in higher education has been of great concern. The main purpose of this research was to investigate the problem of high non-completion rates of students enrolled in undergraduate distance education courses. The study investigated three levels of instructional approach (group interaction, study schedule, and no treatment) to see if they might predict persistence and achievement in a distance education course. The study also looked at the independent variable Call Centre contact to determine the degree of the relationship between this variable to that of persistence and achievement. A telephone survey was administered to students in this study to obtain information on some personal factors which might have help shed some light to the persistence issue.

<u>Hypotheses 1 and 2</u>

The findings on the three levels of instructional approach (group interaction, study schedule, and no treatment) on student persistence and achievement showed that there was no significant difference in persistence and achievement for the three levels of instructional approach. The finding of no significant difference for Group A – Group Interaction group from Group C – Control group was consistent with Cadieux (2002) that interaction for an online class made no significant difference on grades or dropout. However, this current finding contrasted with the study by Sinclair Community College (2000), which had found interaction did have an influence on success in distance education. Finding for Group B – Study Schedule group of no significant difference from Group C – Control group, contrasted with Valasek's (2001) study that pacing of coursework resulted in greater success and higher completion rates.

A review of survey comments made by Group A – Group Interaction students helped to make sense of the no significant difference results. A few students expressed concern about the low participation level. One student said that she was ahead of the rest of the students with her course work so did not find discussions useful. Another student felt that the computer conferencing should have incorporated more free form discussions rather than follow a hard and fast schedule. The set dates for computer conferencing may have been a serious flaw in the design of the study for Group A. Given that the students were enrolled in the individualised study mode, they worked independently and had the flexibility to follow their own schedule within the six month period. Although the study included only students with

the same start date – September 1, 2005, it did not take into account the fact that students could be at different sections of the course at any given time during the six month period. The computer conferencing was designed with six scheduled asynchronous computer conference sessions that were each one week in duration and were distributed evenly throughout the six month period (approximately one session per month). The conference sessions topics covered course content that followed a 26-week course schedule provided in the individualised study course package. By fixing the dates for the computer conference sessions, the opportunity for some of the students to participate was reduced. This was likely the reason for low participation with only eight out of the 20 students participating in the scheduled conferences (40% participation rate). Another reason for low participation was that the conferencing was optional and no marks were given for participation in the group interaction. Participation marks would have provided an incentive for students, placing a quantitative value on the group interaction, and increasing the level of participation.

The finding for Group B – Study Schedule group of no significant difference from the control group was a bit of a surprise given that 13 out of 15 survey respondents in Group B indicated that the e-mail reminders were helpful in keeping them on schedule. One might surmise that while students believed that the e-mail reminders served a useful purpose in principle, the students might not have been capable of following the study schedule due to circumstances beyond their control. For example, one student found the e-mail reminders useful, but was having difficulty keeping up with the schedule; this student was working 50-60 hours per

week and had to request a course extension. Those students that did not find the e-mail reminders useful, followed a different study schedule than the one suggested.

Hypotheses 3 and 4

Student contacts to the Call Centre for tutorial support were significant and positively related to persistence. This was not surprising; a review of literature had indicated that 'student support services' which included tutorial support/academic assistance plays an important role in student retention (Brindley, 1995; Simpson, 2000). The current finding was consistent with previously cited, Weinsheimer's (1998) study which had shown that peer tutoring had a significant impact on retention. In addition, Stone (1991) found that learners with external loci of control when exposed to regular tutor telephone contact were significantly more likely to complete courses at a faster rate than learners with internal loci of control.

The current finding for student contacts to the Call Centre for tutorial support was not significant to achievement. This was a bit surprising and was not consistent with Weinsheimer's (1998) finding that peer tutoring had a significant impact on grades and Chang's (2001) study that high and medium GPA students requests for online facilitation were greater than low GPA students.

Examination of Attributes

Results from the telephone survey related to students' personal attributes on marital status, dependants, employment status (full-time or part-time), source of financial assistance, and if it was their first AU or first DE course did not yield any significant relationship with completion rates or achievement. The majority of

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completers were married, many with dependants. Students who were single had a fairly high completion rate of 76.9%. Almost all of the persisters worked either full-time or part-time. Those students that were working part-time had greater success than those working full-time with their completion rates. These findings on demographics were consistent with previous literature which had found that demographics have little or no influence on persistence; one previously cited estimate was that demographic factors account for less than 10% of the variance in persistence (Gibson, cited in Sheets, 1995). Students who paid their own tuition were just as likely to complete the course as those who had their tuition paid by another source and was consistent with Parker (1994). The students who took this course either as a first AU course and/or as a first distance education course had a slightly lower completion rate than those who had previously taken a distance education course either through AU or another distance education institution; but this finding was not significant, a finding was consistent to that of Parker (1994). Those students that were AU program students were more likely to complete the course, but this finding was not statistically significant.

Discussion on Factors Related to Student Success

What factors make a difference on student success? Students were asked for suggestions that would help them succeed. A review of survey transcripts suggests the following:

- Computer conferencing is a step in the right direction, would also like to see a motivation board to help with intrinsic motivation

- Would like direct contact with the tutor rather than going through the Call Centre

- Tutors should contact their students on a regular basis to check on their progress

- Computer conferencing should be compulsory, i.e., marks should be given for participation, this will help to increase participation levels

- E-mail reminders should be sent out to students in all courses to help them keep on schedule

The emerging themes from these suggestions are:

- Students desire regular contact from the institution

- Students need to be encouraged (motivated)

- Students want to interact with their instructor/tutor and peers

Recommendations for Further Study

The results of the present study suggest that further research is required in the following areas:

Group interaction in Unpaced Environments. Further study is required on interaction in unpaced distance education environments. Future studies must consider flexible computer conferencing options. Considerations must be made for those students that desire the flexibility to work at their own pace and also desire interaction with other students and their instructor. A suggestion as to how this may be achieved is by having different conference sessions on different topics active

simultaneously. This way, students can participate in the conference topic that matches where they are in their course work at a particular point in time. This recommendation will only be suitable for high enrolment courses.

Paced Studies. Future studies on pacing techniques in a flexible distance learning environment may consider looking at ways of tailoring schedules to meet the individual needs of each learner. For example, at the start of the course, the student can decide what the critical dates are for course activities and reminders can be sent on that basis. Thus the reminders may be more meaningful to each student and there will be a greater likelihood that the dates will be adhered to.

Student Support Services. More research is required on student support services and the impact it has on student retention and academic achievement. Further research will help determine which student services are needed and which services have the most impact on student success. This will help practitioners and administrators allocate resources appropriately to the required services.

Longitudinal Studies. The current study only focused on one course that was six months in duration. Future studies should be longitudinal and include graduates in programs and students that continue to enrol in courses. Those students that withdraw early should be studied to find out if they go on to re-enrol and successfully complete future courses. Also those students that have requested course extensions should be studied to see if the extra time allowed does result in course completion or is just an expensive way for students to procrastinate.

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APPENDIX A

Letter of Introduction

To Student:

Participants of the study will be randomly assigned to one of three groups. Group A students will have the opportunity to participate in asynchronous computer-mediated conferencing with a group facilitator and classmates. Group B students will follow a set course schedule and will receive e-mail reminders on important dates such as assignment and exam dates. Group C students will proceed with the course unchanged.

Participants will be required to fill out a student information sheet at the beginning of the course (will only take a few minutes to fill) and a telephone survey will be conducted at the end of six months (the survey will only require a few minutes of your time).

Results of this study will be summarised and analysed. Findings from this study will in no way identify an individual participant nor will participation in this study negatively affect a student's grade. These findings will be incorporated into my thesis.

If you have further questions related to this study, please do not hesitate to contact myself, Pam Quon (principal investigator and graduate student in the MDE program) either by e-mail pamelaq@athabascau.ca or by phone 1-866-213-0822.

My supervisor, Dr. Tom Jones, Associate Professor at Athabasca University's Centre for Distance Education can also be reached by e-mail tomj@athabascau.ca or by phone 1-800-788-9041 ext. 6180 should you have any concerns about this study.

APPENDIX B

Consent Form

I _____ agree to participate in the Acct 253 study conducted by Pamela Quon (AU MDE graduate student). I understand that I have the option to withdraw from the study at any time. Participation in the study consists of three components: filling out of a student information sheet, being a participant assigned to one of three groups and participating in a telephone survey at the end of the course.

Phone: _____

Student ID: _____

E-mail: _____

Date: _____

Signature: _____

(signature not required if e-mailing this form back)

Please return this form by e-mail to pamelaq@athabascau.ca, or arrangements can be made to fax or mail back by phoning Pamela Quon at 1-866-213-0822.

If you have any concerns about this study please contact
Dr. Tom Jones (Supervisor) tomj@athabascau.ca 1-800-788-9041 ext. 6180

APPENDIX C

Telephone Survey for Group Interaction Group

1. What is your marital status? I.e., Married, Single, Divorced, etc.

2. Do you have any dependants?

3. Were you working (employed) while taking this course? Yes or No

4. If yes to Q3. How many hours per week were you employed?

5. Is your tuition for this course being paid by someone other than yourself i.e., parents, employer? Yes or No

6. Have you completed all the requirements for this course? I.e., assignments, midterm and final exam? Yes or No

7. If no to Q6. Which of the following best describes the reason for non-completion?
   a) Other commitments conflicted with time
   b) Course was too difficult
   c) Course no longer required
   d) Other reason

   If other reason, please explain.

8. If no to Q6. Do you plan to take this course again? Do you plan to take another course? If yes, will this be through AU or another institution? If no, why not?

9. Is this the first course you've taken through AU? Yes or No

10. If yes to Q9. Is this your first distance education course? Yes or No.

11. Are you an AU program student? Yes or No

12. If no to Q11. Do you plan to take another course from AU or another distance education again? Yes or No

13. Did you make use of our Call Centre service during the duration of this course? Yes or No.

14. If yes to Q13. Did you find this service beneficial? Please explain.

15. Did you participate in the computer conferencing? If yes, did you find it beneficial to interact with others in the group? Explain.

16. If no to Q15. Did you read what other students and the instructor posted online? If you read what others posted, did you find it beneficial? Explain.

17. Did you communicate with students in this course outside of the scheduled or informal computer conferences set up by AU? If yes, was this for social or course related purposes or for both? If yes, did you find this communication outside of class time beneficial? Explain.

18. The computer conferencing helped to reduce feelings of personal isolation in this course. a) Strongly Agree b) Agree c) Neutral d) Disagree e) Strongly Disagree

19. The computer conferencing helped to motivate you to do the course work by keeping you connected to others. a) Strongly Agree b) Agree c) Neutral d) Disagree e) Strongly Disagree

20. The computer conferencing facilitated learning from other students and /or the course facilitator. a) Strongly Agree b) Agree c) Neutral d) Disagree e) Strongly Disagree

21. What is one suggestion that you would make for Athabasca University to help students succeed in a course?

APPENDIX D

Telephone Survey for Study Schedule Group

1. What is your marital status? I.e., Married, Single, Divorced, etc.

2. Do you have any dependants?

3. Were you working (employed) while taking this course? Yes or No

4. If yes to Q3. How many hours per week were you employed?

5. Is your tuition for this course being paid by someone other than yourself i.e., parents, employer? Yes or No

6. Have you completed all the requirements for this course? I.e., assignments, midterm and final exam? Yes or No

7. If no to Q6. Which of the following best describes the reason for non-completion?
   e) Other commitments conflicted with time
   f) Course was too difficult
   g) Course no longer required
   h) Other reason

   If other reason, please explain.

8. If no to Q6. Do you plan to take this course again? Do you plan to take another course? If yes, will this be through AU or another institution? If no, why not?

9. Is this the first course you've taken through AU? Yes or No

10. If yes to Q9. Is this your first distance education course? Yes or No.

11. Are you an AU program student? Yes or No

12. If no to Q11. Do you plan to take another course from AU or another distance education again? Yes or No

13. Did you make use of our Call Centre service during the duration of this course? Yes or No.

14. If yes to Q13. Did you find this service beneficial? Please explain.

15. The e-mail reminders were helpful in keeping you on schedule with your course work. a) Strongly Agree b) Agree c) Neutral d) Disagree e) Strongly Disagree Please explain.

16. If Q15 is disagree or strongly disagree. Did you follow a schedule that was different from the recommended schedule? Yes or No.

17. What is one suggestion that you would make for Athabasca University to help students succeed in a course?

APPENDIX E

Telephone Survey for Control Group

1. What is your marital status? I.e., Married, Single, Divorced, etc.

2. Do you have any dependants?

3. Were you working (employed) while taking this course? Yes or No

4. If yes to Q3. How many hours per week were you employed?

5. Is your tuition for this course being paid by someone other than yourself i.e., parents, employer? Yes or No

6. Have you completed all the requirements for this course? I.e., assignments, midterm and final exam? Yes or No

7. If no to Q6. Which of the following best describes the reason for non-completion?
    i)   Other commitments conflicted with time
    j)   Course was too difficult
    k)   Course no longer required
    l)   Other reason

    If other reason, please explain.

8. If no to Q6. Do you plan to take this course again? Do you plan to take another course? If yes, will this be through AU or another institution? If no, why not?

9. Is this the first course you've taken through AU? Yes or No

10. If yes to Q9. Is this your first distance education course? Yes or No.

11. Are you an AU program student? Yes or No

12. If no to Q11. Do you plan to take another course from AU or another distance education again? Yes or No

13. Did you make use of our Call Centre service during the duration of this course? Yes or No.

14. If yes to Q13. Did you find this service beneficial? Please explain.

15. What is one suggestion that you would make for Athabasca University to help students succeed in a course?