

THE UNIVERSITY OF CALGARY

CONTROL OF THE LEARNING PROCESS IN DISTANCE EDUCATION

by

Myra Baynton

A THESIS

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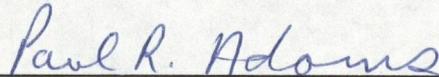
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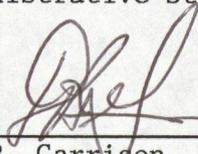
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FACULTY OF GRADUATE STUDIES

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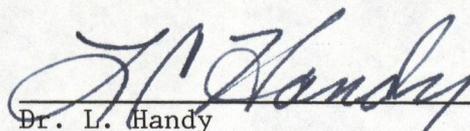
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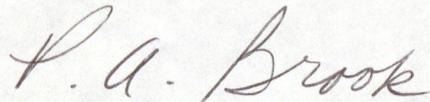
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ABSTRACT

The purpose of the study was to identify the dimensions present in the distance learning situation as experienced by teleconference and home-study students. From a Lewinian field theory perspective, particularly the interaction of the individual and the environment, and based on a conceptual model of *control*, this research explored whether the experiences and priorities of distance learners coincided with the proposed model. The model conceptualized *control* as a three factor construct composed of the dimensions of: *independence, competence and support*.

The methodology consisted of mailed questionnaires to teleconference students at The University of Calgary and home-study students at Athabasca University. The questionnaire consisted of four parts: demographic data, two Likert-type scales and a section containing open-ended questions.

Exploratory factor analysis was used to discern the underlying factors associated with student control as measured by the Likert scales and other descriptive data analysis (frequencies) was used to analyze the open-ended questions.

The results indicated that the proposed model was reasonably congruent with the experiences and priorities of distance education students at these two institutions. However, it was suggested that the original model was too parsimonious to account for the complexity involved in the learning situation at a distance. A six factor orthogonal solution was suggested as the most interpretable and structurally simple solution.

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CHAPTER 1

INTRODUCTION

Background To The Study

Distance education is a relatively new area for systematic research. Although the definition of distance education eludes precision, it is generally distinguished from conventional education by its ability to provide access to individuals who otherwise might be denied an educational experience, by the use of two-way communication between teacher and student, the majority of which is noncontiguous, and by the use of technology to mediate this communication (Garrison and Shale 1987).

The last decade has seen a phenomenal growth in distance education and the integration of this method of education into the standard educational provision in a large number of countries to such an extent that it is now no longer possible to think solely in the traditional sense of face-to-face contact (Sewart 1983:5)

Despite the above statement and recent developments in communication technology, instructional design and improvements in support systems for students, there is evidence that distance education “. . . is little known and little studied” (Keegan 1986:4). Jarvis (1986) points out, with regard to distance education that “. . . it is important to recognise that there is limited theory about it” (p. 51).

Distance education is still in the process of evolving and “the theoretical underpinnings of education at a distance are, therefore, still fragile” (Keegan 1988:4). There is need for conceptual and theoretical frameworks that will add to the current body of knowledge and help to identify and clarify the possible differences from, and similarities to, conventional forms of education (Keegan 1986). Similarly, “strong theoretical bases are needed to defend nontraditional programs from closure or merger in times of economic stringency” (Keegan 1988:4). Attention has been drawn to the need to direct resources and thought

to the description and definition of the field, the discrimination between various components of this area of study, the identification of the critical elements of teaching and learning as it occurs in distance education, and the building of a theoretical framework that will encompass the totality of this area of concern (Moore 1973:661).

Keegan (1986:6) points out that “most research in this field has been practical rather than theoretical. While research on the practice of distance education is important and fundamental, it is incidental and peripheral to a firmly-based theory of distance education.” Holmberg states that searching for a theory that can provide direction for practice is a complex undertaking. “Epistemological concerns must be considered, descriptive elements must be identified, explanatory and predictive potentials looked into” (Holmberg 1986:103).

Several authors have contributed to the nascent theoretical thinking and underpinnings of distance education (Moore 1972, 1973, 1983a, 1983b; Holmberg 1986; Delling 1987; Wedemeyer 1977; Daniel and Marquis 1979; Peters 1971; Keegan 1986). In much of this developmental thinking, the character of the communication between learner and instructor is considered. Holmberg (1986) speaks of *guided didactic* conversation; Moore (1986) conceptualizes this interaction in terms of *dialogue* and *structure* while Daniel and Marquis present the concepts of *interaction* and *independence* as key organizing concepts for distance education. One of the major concepts that has emerged from these writings has been the concept of *independence* (Daniel and Marquis 1979; Moore 1973, 1983a, 1983b, 1986; Keegan 1986).

In distance education, students are frequently expected to carry out a great deal of the learning on their own, often at a geographic distance from the educational institution. Expectations that students can and should be independent underlies much of the distance education literature. Often cited as the ultimate aim of adult education, the concept

independence, frequently used synonymously with *autonomy*, refers to methods and processes as well as outcomes of learning (Chene 1983). Brookfield (1985) states that “the desirability of encouraging learners’ ability independently to plan and conduct learning must be one of the most frequently cited purposes of adult education” (p. 26). This has also been an important goal of some distance educators. Holmberg argues that, in distance education, emphasis is placed “on supporting the independence of students” (Holmberg 1985:8) as well as using “distance education as a means to developing student independence” (Holmberg 1986:69).

Some distance educators view the physical separation of student and teacher as a significant characteristic of independence. Wedemeyer (1981) describes independent learning as that which is “carried on wholly or largely independently of outside direction or control, characterized by learner autonomy and distance from educational authority” (p. xxv). Daniel and Marquis (1979) use independence “to denote those learning activities where there is no interaction . . .” (p. 30). However, Brookfield (1983) suggests that physical separation of teacher and learner does not necessarily guarantee independence to the student. For example, correspondence materials may be highly structured and directive and not allow the student to take responsibility for the content or method of learning (Chesterton 1985:33).

In analyzing the related concept autonomy, Chene (1983) suggests that both psychological and methodological meanings get attributed to the term and often there is failure to distinguish such differences when using the concept. More importantly, she emphasizes that teaching and learning take place within a social context, and referring to the student as independent does not take into account the relationship of the teacher to the learner in the educational transaction.

Although there are a variety of attributes attached to the concept of independence, the essence of its meaning appears to be freedom from the influence of others. However, this, alone, does not appear to take into account the complexity of interacting variables within the communication process that occurs in the distance education situation (Garrison and Baynton 1987). Therefore, in an attempt to move beyond the concept of independence and to consider, more fully, the interactive aspects of the newer technologies available in distance learning, (particularly audio teleconference), Garrison and Baynton (1987) proposed a conceptual model that incorporated learner and situational variables present in the learning process at a distance.

Purpose of the Study

This study is an attempt to operationalize the concept *control* and to identify its components as they relate to the distance education learning situation. The construct control was suggested as the key concept for this model to describe the interaction between teacher, student and other resources in the distance education context. This conceptual model attempted to build on the work of others, particularly on those writings to which Keegan (1986) refers as “theories of autonomy and independence” and theories of “interaction and communication” (Keegan, 1986:58). The model proposed in the present study defines *control* as “the opportunity and the ability to influence, direct and determine decisions related to the educational process” (Garrison and Baynton 1987).

A model might be thought of as a rough version of a theory. It rationalizes or imposes order on reality, but its concepts and propositions are crude and highly abstract, lacking a theory's specificity and therefore its explanatory power. Model building, nonetheless, is often useful in developing theory, and even a simple model is of some value in helping one grasp the dynamics of complex phenomena . . . (Darkenwald and Merriam 1982:141).

Adapted from Garrison and Baynton (1987), this proposed conceptual model hypothesizes that *control* of the learning process results from the combination of three essential

dimensions: *independence*, *competence* and *support*. Using a sample of adult distance learners, these dimensions were hypothesized to be identifiable as the underlying structure of the concept *control*.

Independence is the opportunity to make choices regarding the learning objectives, activities and evaluation procedures. *Competence* involves the ability (knowledge, skill, experience, dispositional attitudes) to participate in a learning situation and make choices related to the learning objectives, etc. *Support* refers to the accessibility of human (teacher/tutor etc.) and non-human (print materials, library, etc.) resources (Garrison and Baynton 1987). The variables representing each of the above dimensions will be explicated in a subsequent chapter.

Need for the Study

Considering the need for and the utility of developing theoretical and conceptual frameworks that can be applied to complex phenomena in a particular area of investigation (Keegan 1986; Holmberg 1986; Darkenwald and Merriam 1982), this study proposed a philosophical perspective and conceptual framework that potentially could assist in the systematic analysis of the multiple variables associated with the distance learning situation. Providing order and attempting to reduce multiple variables into manageable categories promotes ease of communication within the literature and may provide a basis from which to develop future theoretical and empirical foundations. The model presented in this study was an attempt to provide some order to the variables related to adult learning at a distance. Hence, the research question to be addressed concerned whether or not the *control* model's structure of variables was congruent with the experience of the adult, learning at a distance.

The congruency of the proposed typology was to be judged, firstly, on its logical consistency deduced from the assumptions of the person-environment interaction based on field theory; and secondly, by the separability and identifiability of the underlying structure of measures relevant to learner experiences and priorities in the distance learning context.

In summary, the following research question was the focus of the study:

Is the hypothesized *control* model separable and identifiable as an underlying structure of selected measures relevant to the distance learning context?

The target population for this study was comprised of students enrolled in distance education credit courses at The University of Calgary and Athabasca University. The research instrument was developed by the author and administered during the Winter Term (1989) to students taking a variety of teleconference and home-study university-level courses.

Definition of Terms

The following terms have been operationally defined in the study.

adult distance education student: any student 18 years or older enrolled in a credit teleconference or home study course at The University of Calgary or Athabasca University.

distance education: education characterized by the non-contiguous two-way communication between (among) students and teacher mediated by technology (print and/or electronic).

control: the opportunity and ability to influence, direct and determine decisions related to the educational process.

educational process: behaviors undertaken by both teacher and student during the institutional phase to achieve an educational goal.

learning process/transaction: behaviors undertaken by the student (including interaction with the teacher) to achieve an educational goal.

learning situation: the interaction of learner, teacher/tutor, technology and learning resources at a particular point in time.

Recapitulation

The increased understanding of a relatively new area of study depends on the identification and organization of key concepts. The utility of providing order and attempting to reduce multiple variables into manageable categories for continued investigation was acknowledged.

The purpose of this study was to determine the extent to which a proposed model characterized or reflected the experiences and the priorities of adult students in distance education. The results could potentially contribute to the increased understanding and conceptualization of the distance learning situation and provide base-line data for future research related to the prediction of academic success, persistence and participation in distance education and/or to the design of learning materials.

In order that this study be cognizant of previous and related research, a review of studies and theoretical perspectives related to the concept of *control* and *learner control* will be presented in Chapter 2. The third chapter presents the theoretical framework, the proposed conceptual model and the research question. Chapter 4 describes the study's design, procedure and analysis. Chapter 5 presents the results of the analyses and is followed by the concluding chapter which discusses the results, limitations, implications and practical applications of the study. The next chapter provides a review of selected literature related to the concept *control*.

CHAPTER 2

REVIEW OF THE LITERATURE

This chapter reviews some of the literature related to the concept control in education and related areas of study. Since the construct control was the key concept for the proposed conceptual model, it was decided that a review of its definitions and use in education and related disciplines would be appropriate. Therefore, this chapter outlines various definitions of control, describes some of the uses of the concept as an organizing construct and articulates some of the research utilizing the concept control from related areas of study.

Defining Control

The concept control has been used in a variety of contexts and disciplines and has been defined in a number of different ways. Control has been perceived as a need (Langer 1983), a generalized expectancy and a belief or perception (Rotter 1973; Phares 1976; Lefcourt 1976, 1981, 1984). Conceived as an experience, control is the sense of personal causation. “We do not see ‘control’ we feel it” (deCharms 1979:31). “Personal causation is the experience of causing something yourself, of originating your own actions and controlling elements in your environment” (deCharms 1979:33).

Brehm and Brehm (1981) define control as “. . . the ability to affect the probability of the occurrence of a potential outcome” (p. 6). Having control “. . . means that one can maximize desirable outcomes and minimize undesirable ones” (p. 376). Perceived as a process, control is the experience of individuals mastering “their internal (mental) or external environments – as they make the unfamiliar, familiar” (Langer 1983:19). Beniger

(1986) states that control, generally used, means “. . . purposive influence towards a predetermined goal” (p. 7). Its two essential elements are ‘influence’ and ‘purpose’ and it is inseparable from information processing and reciprocal communication” (p. 7). This perspective is particularly relevant to the present study since the educational process tends to be goal-oriented, includes the processing of information by the learner and takes place within the context of interpersonal communication.

Some authors have developed topologies of control (Averill 1973; Seligman and Miller 1979). Averill distinguished three categories of control: behavioral, cognitive and decisional. Behavioral control is direct action taken on the environment to influence a threatening event. Cognitive control relates to the interpretation of threatening events and decisional control is the opportunity to choose among various alternatives. Averill observes a complex interaction among these types of control and concludes that there is a need to refine the analysis (Averill 1973:300).

Arnkoff and Mahoney (1977) examine several meanings of the concept and conclude that the multiple usage of the term contributes to some confusion. They distinguish among four-related definitions of control: (1) as skill; (2) as power; (3) as direction, regulation and coordination; and (4) as restraint or reserve (p. 156). Defining control as skill refers to the internal capabilities that provide the aptitude to choose possible actions. These are also interpreted as self-efficacy expectations (p. 156).

These topologies are relevant because they suggest that control can be conceptualized as a multi-dimensional construct and that it involves elements of choice and decision.

Control as power is the capacity to influence external resources or reinforcements. Power to control reinforcements can reside in the self, in others or outside human control (Arnkoff and Mahoney 1977:156). While skill and power refer to choice, regulation, direction and coordination refer to the management of choice. Control is the capacity to

handle both skills and power (p. 158). As restraint, control refers to the inhibition of behavior as in self-control. Skill and personal power imply freedom in the choices available for action while regulation and restraint imply limits on freedom (p. 158). “Both freedom and limits on that freedom are essential to the notion of control” (Arnkoff and Mahoney 1977:158). The authors point out that all four meanings are closely related.

Some confusion and conflicting perceptions also surround the concept. Bocchner and Lenk Kruger (1979:201) point out that “. . . it is surprising to see that nobody has yet examined the conceptual and empirical applications of the term to see how much consensus there is on its meaning and how rigorously or loosely it has been used.”

The various definitions of control were examined for common themes and conceptualizations. Despite multiple definitions of the concept control and some confusion associated with it (Bocchner & Lenk Kruger 1979; Benders 1987), there are some common elements in many of the definitions. These seem to have relevance and applicability to a variety of contexts including education. There is a repeated reference to such related concepts as *choice*, *freedom* and *ability*. Similarly, the concept tends to be applicable to human interaction and characteristic of interpersonal relationships (Knapp and Miller 1985). Control appears to be a concept that applies to reciprocal relationships and therefore tends to preclude the total absence of control from a situation (Sites 1975; Langer 1983). And, control tends to be perceived as concept that includes the opportunity to make decisions, influence a course of events and carry out actions toward some particular goal (Beniger 1986). It appears to have both internal (belief, need) as well as external (process, situational) dimensions and can be applied at both individual, organizational or societal levels. As well, it was indicated that the concept must be examined and understood within the particular context in which it is to be used.

The Importance of Control as an Organizing Concept

The concept of control was also examined to determine its utility as a key organizing concept. The concept control has been used extensively at both a micro and a macro level in a number of related disciplines including psychology, sociology, communication and organizational theory. This section reports some of the literature that has used control as a significant concept for organizing, communicating and researching social and educational phenomena.

In psychology, this concept has been linked to the physical and emotional health and social adaptation of individuals. The perception that one has some personal control over important areas of one's life ". . . has emerged as a fundamental prerequisite of psychological well-being and social adjustment" (Brenders 1987:86).

More than twenty years of research has reinforced the hypothesis that expecting outcomes to be attainable by personal causation is psychologically adaptive while believing that fate, powerful others, or *the system* determine important outcomes leads to maladaptation, characterized by various cognitive, motivational and behavioral problems (Lefcourt 1981; Brenders 1987). Perceived control is a key mediating variable leading to an adaptive transformation physically and mentally (Langer 1983:11). Langer states that the ". . . belief in personal control may be essential to one's sense of competence and is basic to human functioning – regardless of who the person is or where he or she may be" (Langer 1983:13).

Seligman (1975) supports the centrality of control in the adjustment of individuals when he proposes that a sense of defeat, a "learned helplessness" can result from a perceived lack of control. Phares (1976:61) states that "it has been repeatedly demonstrated that when individuals are in a specific situation that contains substantial cues that they are not in control, their learning or acquisition of knowledge, is significantly reduced."

Brehm and Brehm (1983) and Wicklund (1974), while studying the effects of the loss of control, concluded that when an individual's freedom or control of a situation was threatened, it aroused an attempt on the part of that person to restore his/her sense of control.

The concept control has also been used as a key organizing concept in other disciplines. Besides being a pervasive concept in psychology it promises to be an important concept for the communication scholar as well (Brenders 1987:88). "A theoretically coherent and empirically valid conception of perceived control of interpersonal interaction will add greatly to the theory, research, and praxis of human communication" (Brenders 1987:86). Knapp and Miller (1985:18) state that "... control in some form or another has been a staple interest since antiquity" and that "... control is such a pervasive aspect of human symbolic activities that it is impossible to divorce its implications from the study of interpersonal communication" (p. 19). This lends support for the use of the construct control in an educational context since communication between teacher and learner is so fundamental to the educational process.

Control of learning has been a recurring and underlying theme throughout much of the adult and distance education literature. Several authors suggest that control of learning by the learner is a worthwhile process and goal in adult education (Knowles 1978; Daniel and Marquis 1979; Penland 1979; Tough 1978, 1979, 1982; Wedemeyer 1981; Brookfield 1983, 1986; Moore 1983a, 1983b; Chene 1983; Mezirow 1981; Oddi 1986; Schuttenberg and Tracy 1987).

Brookfield (1985a:47) speaks of one of the consequences of adult learning as "... a developing sense of control and autonomy in the adult." According to this author, adult education is an activity concerned with assisting adults "... in their quest for a sense of control in their own lives" (Brookfield 1985a:46). Tough (1979:125) in discussing why

people choose to learn on their own, states that “to me, it is highly significant that every one of these common reasons reflects the issue of control.” The literature concerned with self-directed learning frequently uses the concept control. Brookfield states that “. . . individual control of learning is often claimed to be the distinctive characteristic of self-directed learning” (Brookfield 1985:7). Cheren (1983) uses the concept control arguing that to “achieve greater self-direction in learning is to achieve greater control over one or more aspects of a learning situation” (p. 24). However, given the frequency with which reference to control of learning by the adult is made, there have been few attempts to define or delimit this concept, particularly within the educational literature, and its use appears to be based on the assumption that there is agreement regarding its meaning. Tough (1979:177) points out that “. . . a large proportion of the literature on education has dealt with such concepts as freedom, control, authority, autonomy and the role and function of the teacher.” But, he adds, “much of the discussion about these concepts has been emotional or imprecise” (p. 177).

Self-directed learning has generated a great deal of research and several scales have been developed to measure variables related to this area of study (Guglielmino, 1978; Oddi 1986; Caffarella & Caffarella 1986). These scales, although they emphasise the importance of individual attributes, competencies and abilities, were not appropriate for this study since the situational, environmental or circumstantial factors that may contribute to the control of one’s learning were not included. These perspectives also do not emphasize the social context of learning, the interactional aspects of the teaching-learning transaction and the availability of support.

Several authors suggest that the educational process is one of collaboration and interaction in which “the comments and contributions of the participants build organically on each others views and in which alternative viewpoints, differing interpretations, and

criticisms are elements essential to the encounter” (Brookfield 1986:23). Brookfield points out that “it is evident that no act of learning can be self-directing if we understand self-direction a meaning the absence of external sources of assistance” (Brookfield 1985:7). Similarly, Moore (1979:669) argued that the self-directed learner should not be thought of as “an intellectual Robinson Crusoe, castaway and shut off in self-sufficiency.” Therefore, the model proposed in this study attempted to incorporate not only the competencies and attributes of the learner but the interactive aspects of the learning situation as well.

In summary, it can be concluded that the use of control as a key organizing construct is appropriate for an educational context for the following reasons:

1. The experience of control by individuals appears to have positive consequences.
2. The construct is applicable for situations that involve interpersonal communication.
3. Control appears to be a worthwhile process to achieve in an educational context.

The Locus of Control

The construct of *Locus of Control* and the resulting scale has been used extensively in psychological and educational literature. This concept has generated volumes of research (Rotter 1966; Phares 1976; Lefcourt 1976, 1982, 1984). This concept was examined to determine if this conceptualization of control would be appropriate for determining the congruency of the proposed model of control.

Based on social learning theory, the major premise of this perspective is that situational variables influence an individual’s perception of the contingency of reinforcement. The *Locus of Control* is a generalized expectancy for internal or external control of

reinforcements. Internal control is the perception of positive and/or negative events as being a consequence of one's own actions and therefore under personal control. External control is the perception of positive and/or negative events as being unrelated to one's own behavior and therefore beyond personal control. A variety of settings including health, occupational and educational contexts have utilized this concept (Rotter 1966; Phares 1976; Lefcourt 1976, 1982, 1984).

In a series of early experiments, subjects given skill-based or chance-based instructions undertook ambiguous tasks. From these studies perceived control was found to be the determining factor in an individual's performance. When individuals perceived their success to be the result of skill they used this experience as an estimate of success in the future. If, however, the outcome was perceived to be a matter of chance, the subjects tended to proceed in a random fashion (Phares 1976). Later, attention was turned to the measurement of individual differences in the expectancies for internal versus external control. Originally, Phares developed a Likert-type scale in 1957 with 13 skill (internal) and 13 chance (external) items. This scale was then improved when more extensive test construction was undertaken by Liverant, Rotter and Seeman (Phares 1976) who developed an internal-external scale (the I-E Scale). This permitted greater accuracy in the measurement of perceived control and was refined even more when the form known as the Rotter I-E Scale was developed into its final version. This scale was used most extensively in subsequent research.

Based on this scale there have been numerous additional instruments developed and tested to deal with specific age groups and organizational settings. Lefcourt (1982, 1984) and Phares (1976) have reviewed the use of this concept from both a theoretical and empirical perspective and have cited research that has taken place in the laboratory and the field including psychotherapeutic, health and educational contexts.

The *Locus of Control* construct, although related to control of learning did not provide the combination of individual and situational variables needed to describe the distance learning situation and the focus tended to be on a specific characteristic of the individual rather than on an interaction of person and environmental variables. In other words, the *Locus of Control* construct tends to emphasize a characteristic of the individual rather than distinguishing the combination of individual attributes and situational characteristics that contribute to the amount of control experienced in the educational context. Despite not being applicable to the present study, the *Locus of Control* construct does lend support to the positive consequences of the perception of control. It also indicates that there are individual differences in the perception of control and that control can be conceived as a construct having more than one dimension.

Learner Control

Since no research directly related to the construct control was found in the distance education literature, some studies utilizing the construct *learner control* were examined from the conventional educational literature. These were examined to determine how the term was operationalized and what types of variables were used to measure learner control. Generally speaking, this concept was used as an unidimensional concept and included behaviors that range from participation in programmed and/or computer assisted learning of elementary school-aged children (Fischer and Blackwell 1975) to self-initiated, self-planned learning of adults in the general community (Tough 1979). Several studies are summarized here to provide an example of the proliferation of operational definitions, sample groups and conflicting conclusions.

Wilcox (1979) reviewed fourteen studies that addressed the interaction of learner styles, abilities and other characteristics with the control of presentation characteristics.

These sample groups ranged from grade six students, high school to college students. The operationalization of learner control included the use of self-paced programmed texts, self-paced auto-tutorials, optional lectures and student-centered discussions. These presentation characteristics were contrasted with teacher-controlled options that included primarily the lecture format as well as conventional texts and in one case, attendance requirements, exams and homework. Wilcox concluded that teachers should take individual differences into account when they decide what presentation characteristics are controlled by the student. One study (Allen and Harshburger 1977), using the *Locus of Control* scale, found that the reading gain score of *internal* subjects in the student-centered section was significantly higher than the internally oriented subjects in the teacher-controlled section. Daniels and Stevens (1976) using a sample of college students and comparing teacher-controlled instruction with a contract for grade plan found an interaction between internality and externality and the method of instruction. They found that *internals* tended to perform better under the contract situation and the *externals* performed better under the teacher-controlled section.

Other studies have examined the interaction of student characteristics such as ability, cognitive style and personality characteristics including anxiety with self versus teacher controlled situations (Wilcox 1979). In one study (Dowaliby and Schumer 1973), it was found that the more anxious students performed better in teacher-centered lectures whereas the less anxious performed best in the student-centered discussions.

Snow (1980) cautions against learner control being viewed as a panacea and advocates the need for further research in this area. This particular article synthesized an otherwise disparate collection of studies in order to arrive at a continuum of learner control. Although concerned with children's learning needs, this author suggested that learner control can take many forms. He distinguished three major levels of learner control

with three qualifying degrees. One extreme is the “adult scholar model,” the ideal, which includes “complete independence, self-direction and self-evaluation. Library resources available.” This is characterised by educational goals and treatments being selected by the individual. It also includes the provision of support as indicated by the inclusion of library resources. The mid-range level includes “imposed tasks, but with learner control of sequence, scheduling, and pace of learning. Alternative instructional treatments available for choice by learner.” Here, the educational goals and treatments are imposed by the institution but the treatment is variable. The third degree of learner control involves fixed tasks but with student control of the pace. Here the goals and treatments are imposed by the institution and the treatment is fixed. This represents the “child robot model” (Snow 1980:154). He suggests that high learner control is not ideal for everyone and that characteristics such as ability may affect the desirability of the use of learner control.

Snow suggests that the consideration of learner control opens up subtle questions and points out that learners always, regardless of the treatment, exercise some degree of control over their own learning activities. He suggests that the research question is too simple if it only considers “whether or not learners are allowed to choose their own amounts, sequences, contents, or methods of instruction” (Snow 1980:157). He suggests that there is the need to measure learner dispositions since learners will differ in the degree to which they prefer self-control or are able to exercise control. “Thus, learner control should be considered both a dimension along which instructional treatments differ and a dimension characteristic of individual differences among learners” (Snow 1980:157).

Merrill (1984) presents a model of learner control as an instructional system. He articulates three levels of learner control: content control, display control, and control of conscious-cognitive processing. He also presents these in terms of internal and external control and considers student characteristics such as confidence and motivation. He argues

that all instruction involves some level of control by the learner and the major challenge facing instructors is how to maximize the learner's ability to use the control available.

deCharms (1979) investigated control in the elementary school classroom. His research indicated that children who experienced personal causation achieved more than those who experienced the situation as *pawns*. In a longitudinal study he demonstrated that by training teachers to create an *origin* climate in the classroom, where students experienced choice and decision-making, the motivation and academic achievement of children was enhanced. Similar results were obtained with college students. Furio (1987) indicated that students who perceived lack of control over achievement-related behaviors demonstrated reduced affective and cognitive learning and decreased motivation to study. Other studies have utilized technologies to study the effects of learner control. Hannafin (1984), Ross and Rakow (1981), Jelden and Brown (1982-3), Sasscer and Moore (1984), the majority using college students, examined learner control in computer assisted learning while Laurillard (1984) and Milheim and Azhell (1988) used interactive video. Cavanagh, Thornton and Morgan (1965), using adult subjects, contrasted teaching machines (auto-tutorial programs) with the conventional classroom. They found that students learned the same amount but the automated system was faster. Hannafin (1984) compared the effects of predetermined paths versus student controlled paths and, although the findings were inconsistent, it was found that learner age and ability affected the degree to which learner control strategies could be applied. Ross and Rakow (1981) contrasted instructional support and learner controlled incentives. They predicted an aptitude-treatment interaction. This indicated that learner control was less effective for low ability students but better for students with high ability scores. Essentially, the low ability students performed better under program control whereas the high ability student performed well under both conditions.

Much of this research has focused on limited aspects of learner control, often operationally defined in terms of the technology used such as computer assisted instruction, interactive video or specific instructional methods such as programmed text versus lecture. Very few of these studies have looked at adult learning situations and none have addressed the distance learning context. Similarly, none of the above studies have conceptualized control as a multi-dimensional concept, although Snow (1980) examined the aspect of degrees of control and Merrill (1984) conceptualized levels of learner control. However, some conclusions can be drawn from this perusal of the literature:

1. The use of the construct control is appropriate for a variety of educational settings and target groups.
2. Learner control involves not only variables in the environment (choice of presentation styles, tasks, pace of learning, availability of resources such as a library) but characteristics of learners (styles of learning, abilities, motivation, anxiety, confidence etc.).
3. Having choice and options is an integral part of experiencing control as a learner.
4. Control can be conceptualized in terms of degrees or levels.
5. The experience of control as a learner has positive consequences.

Recapitulation

This chapter has reviewed the literature related to the concept control and its use and application in education and related disciplines. Much of the research in these areas either defines control as a unidimensional concept, does not reflect the distance education context or addresses only specific characteristics, skills or attitudes of the student. Although the majority of conceptualizations of control include an element of choice on the part of

the learner, interaction with the teacher and/or the degree to which learning resources are available to the student are not generally addressed. Therefore, to compensate for these perceived inadequacies and to attempt to contribute to the conceptualization and description of distance education, a model utilizing the construct of control was developed (Garrison and Baynton 1987). The following chapter outlines the theoretical and philosophical basis on which the model rests and describes, in more detail the conceptual model to be tested in this study.

CHAPTER 3

THEORETICAL AND CONCEPTUAL FRAMEWORKS

Introduction

The first part of this chapter outlines the major theoretical framework on which the proposed model of control is based. The second part of the chapter outlines the development of the proposed model and discusses its hypothesized dimensions. The basic premise underlying the present study is that control of the learning situation cannot be adequately explained without taking into consideration both the characteristics and abilities of the student and the characteristics of the learning environment in which the adult student is operating.

To provide the theoretical framework for this study Lewin's field theory was used. This provided the underlying philosophical and theoretical frames of reference. Using this as a basis, a conceptual model was developed (Garrison and Baynton 1987) based on the adult and distance education literature.

The model developed by Garrison and Baynton (1987), outlined later in this chapter, represents the subject to be explored in this study. This model of control is hypothesized to be composed of three dimensions and reflective of the learning situation in distance education. Prior to presentation of the model the philosophical and theoretical underpinnings of the model are outlined. These are based on Kurt Lewin's field theory.

Field Theory

Field theory rests on the assumption that a person's behavior must be considered in the context of the situation (de Rivera 1976:17). "To understand a piece of behavior it is essential to place it in its context - in the 'surrounding field' - for its meaning will

depend on the whole of which it is a part” (p. 17). Lewin’s observation of perception and behavior suggest that the behavior of a person should be understood in terms of the environmental situation and that this situation is correlated with personal needs (p. 21). Field theory postulates that a person’s behavior is derived from a totality of coexisting facts. The multitude of data from any event provides a dynamic *field* in which all facts are interdependent with all others (Morrow 1969:34).

From this theoretical position it is argued that the organism as a whole is the object of study and that it is the *person-in-relation-to-the-environment* or what Lewin called the *life-space* that is the focus of investigation. There is an interdependence of the person and the environment and the focus of interest is the environment as it affects the person’s perception and/or behavior. Included in the *life-space* is everything that affects current behavior – needs, goals, aspirations. It is the whole psychological environment experienced subjectively by the individual. This *life-space* is conceptualized as having each part consistent with and related to all other parts (de Rivera 1976:27). The properties of the *life-space* of the individual depend partly upon the state of that individual as a product of his history and partly upon the non-psychological, that is the physical and social surroundings (Nelson 1942:217). In the *life-space*, person and environment are interrelated and individual behavior is always derived from the relation of the concrete individual to the concrete situation. Behavior is a function of the *life-space*: $B = f(P \rightleftharpoons E)$. The life space is the product of the interaction between person P and his/her environment E.

‘Life space’ includes all facts which have existence for the person and excludes those which do not. It embraces needs, goals, unconscious influences, memories, beliefs, events of a political, economic and social nature, and anything else that might have direct effect on behavior. The various factors in a given life space are to some degree interdependent and Lewin claims that only the dynamic concepts of tension and force can deal with these sets of interdependent facts (Morrow 1969:35).

Lewin's theory was developed primarily as a theory of motivation and perception (Bigge 1971:180). He thought that "the net effect of simultaneous psychological forces operating in a psychological field or life space of an individual brings about a reorganization of that field and thereby provides the basis for psychological behavior" (Bigge 1971:180). Perception functions to direct behavior by rendering the organism aware of the value of objects (valence) in the environment, and later, by helping the individual, by means of feedback, to orient itself to the consequences of its own action (Neel 1977:343). The basic comprehensive concept *life-space* encompasses the person who is being considered and his/her psychological environment. This means that in order to understand a person's behavior, it is necessary to know about both the characteristics of the individual as well as the characteristics of the environment. This *life-space* "represents the total pattern of facts or influences that affect an individual's behavior at a certain moment, or longer juncture of time" (Bigge 1971:186). This can refer to the physical and social environments as well as represent functional and symbolic relationships (Bigge 1971:186).

Borrowing concepts such as *topology* and *vector* from other disciplines, particularly geometry and physics, Lewin pictured ". . . psychological reality in terms of field relationships of a person and his psychological environment" (Bigge 1971:183). He believed that topology, a nonquantitative geometry, could be adapted to handle problems of structure and position in a psychological field. These concepts make possible the representation of structural relationships within the person's own psyche as well as the psychological environment. Topology and vector are used to represent positions inside or outside a given region, to show relations between a whole or its parts and a great number of other structural characteristics (Morrow 1969:36).

Lewin argued that these topological and vectorial concepts provided a utility, power of analysis, conceptual precision and comprehensiveness that made them superior as

conceptual tools applicable to psychological phenomena (Lewin 1951). This approach, therefore, “enables one to represent adequately a psychological situation, which includes a person, his environment, his needs, his goals, the barriers to his goals and their dynamic interrelations” (Bigge 1971:185).

The three pivotal or major constructs used in field theory are mutually interdependent. It should be noted that the diagram of a life space, the principal concept which represents the contemporaneous situation, is figurative and is difficult if not impossible to indicate all variables simultaneously.

A complete and accurate image of a life space would show all of the psychological facts and constructs in a total situation represented by a differentiated person and a differentiated psychological environment. A differentiated person or environment is one that is structured, i.e., functionally divided into various aspects as perceived by the one being studied. Some differentiated aspects of a person are friends, ambitions, needs and abilities to know about various matters and to carry out activities of different kinds. A differentiated psychological environment contains everything perceived by the person at the time under study (Bigge 1971:185).

The other two concepts – topology and vector further clarify and identify the characteristics of the life space.

The determination of the position of the person within the life space is the first prerequisite for understanding behavior. His social position within or outside of various groups should be known; his position in regard to his goal regions; and in regard to physical areas. This is fundamental because the region in which the person is located determine (1) the quality of his immediate surroundings, (2) what kinds of regions are adjacent to the present region – that is, what possibilities the individual has for his next step – and (3) what step has meaning of an action toward his goal and what step corresponds to an action away from his goal (Lewin 1951).

The *life-space* consists of regions that have a positive or negative valence. This is surrounded by a non-psychological border or *foreign hull* which includes those aspects of individuals' worlds with which they are not currently dealing or involved. These can be potential perceptions as contrasted with actual perceptions of the person's unique field.

“For an aspect of the physical-social world to influence the intelligent behavior of a person, it must be moved from a foreign hull into his life space through his interaction with it” (Bigge 1971:187).

Psychologically, a person is composed of a motor-perceptual region and an inner-personal region. The first has the position of a boundary zone between the inner-personal regions and the psychological environment. This region represents the knowing and manipulative abilities of an individual. While abilities are centered in the motor-perceptual region, needs are found in the inner-personal region (Bigge 1971:188).

A need is a state of a person that has a part in determining behavior toward any goal that may exist in relation to that state; it corresponds to a personal tension. Since the motor-perceptual region is functionally located between the inner-personal region and the environment, it performs functions of both person and environment (Bigge 1971:188).

Topology refers to the relative position of the person to his goals and the barriers to these goals. Therefore, it illustrates the various contingencies or possibilities for behavior or movement (Bigge 1971:189). This is a nonmetrical, geometric term which encompasses such terms as *inside*, *outside* and *boundary*. That is, topologically, things may be next to, inside of, or outside of one another (Bigge 1971:189). This concept represents the structure of the life space and defines the range of possible perceptions and actions that a person can perform or become involved in (Bigge 1971:189).

Parts of a *life-space* are conceptualized as regions with boundaries. “Boundaries of the major parts of a life space and their respective regions are either quite firm or more or less porous and permeable” (Bigge 1971:189). Regions represent activities that are either being currently engaged in (for example, going shopping, attending a teleconference session or making a decision) or being thought about for future engagement. Borrowed from mechanics, the term vector represents direction and strength, two of the three properties of a force. The third property is its point of application (Bigge 1971:190). In

field theory, a vector represents a force that is influencing movement away from or toward a goal. It is a tendency to act in a certain way or direction. Vectors indicate what is happening or what is likely to happen. They are the attracting or repelling powers of the regions and may be either positive or negative. "When an environmental object or event has positive valence for a person it is attractive to him, i.e., it supports fulfillment of a psychological need. When an object or event has negative valence it is repulsive, i.e., it threatens, impedes, or prevents the fulfillment of a need" (Bigge 1971:190).

Goal regions tend to have either positive or negative values whereas barrier regions have only negative ones. Each vector then represents a force which correlates with the valence of a region of the life space (Bigge 1971:190). Topological constructs illustrate what is possible structurally while vectorial concepts describe the dynamics of a situation, that is, what is currently taking place or is likely to take place. Therefore, a vector may represent a driving force or a restraining force. "Both driving and restraining forces may arise from the needs and abilities of the person being studied, from actions of another person, or from the impersonal aspects of a situation" (Bigge 1971:191).

In many ways Lewin's work represents a meta-theory, a theory about method and concepts, and not a theory of speculation on a specific topic. "Lewin was less interested in explaining psychological phenomena than in demonstrating how one might conceptualize and study psychological variables" (Neel 1977:342). The basic principle was that variables could be represented mathematically and that events were formed and caused by a number of interacting forces – not just one cause. Lewin believed that events could be understood in terms of present forces acting on the individual. "Thinking and behaving must instead be seen as a sequence of interacting and co-acting events which went to make up a pattern of incidents, that is, a Gestalt" (Neel 1977:342).

Lewin assumed that the basic motivation of any organism was the need to maintain equilibrium. This applied to the organism as a whole. This concept does not mean a lack of tension or an absence of active forces since it can be a dynamic equilibrium, a series of ongoing and interacting forces that co-act and control each other to maintain a balance (Neel 1977:344)

Anytime that forces acted in contradictory directions they created disequilibrium and in turn motivated actions which reinstated equilibrium. The valence of goal objects present in the space determined the direction of this action although the action may be redirected by the presence of barriers. What was acted upon, the self or the environment, depended upon the nature of the activated forces (Neel 1977:346).

In summary, the pivotal concepts of field theory are: *life-space*, a three dimensional concept that includes differentiation, reality-unreality and time perspective; *topology* and *vector*. These three constructs are basic to the formula $B = f(P \neq E)$. The basic beliefs and assumptions underlying the above theory include the following:

1. One basic unit of analysis was not possible nor necessary. The unit for analysis must be the whole experience (Neel 1977:353).
2. Human behavior is generally purposive and goal-directed (Neel 1977).
3. Psychological situations can be described topologically.
4. A phenomenon can be understood in the present. It is not necessary to study the past to discover causes (Neel 1977:342).
5. Events are usually formed and affected by a number of interacting forces (Neel 1977:342).

In applying the above theoretical framework to the distance education context, the focus of this study, the following linkages can be made:

1. *Life-space* refers to the learning needs, goals, attitudes, skills and knowledge of the individual. This term can also refer to other elements present in the student's environment including the human and non-human resources.
2. The *goal-object* refers to objects and events in the individual's environment. In this context, *goal object* refers to achieving control of the learning process.
3. *Valence* is the value attached to objects in the individual's environment. This can refer to the value that control of one's learning has for a particular person. That is, control of the learning process may have positive or negative value for individual students.
4. *Topology* refers to the individual student's position relative to control of the learning process. Included in this are restraining forces, barriers or vectors. For example, inaccessibility of communication media, lack of input into learning objectives, lack of learning resources may or may not thwart the achievement of student control of the learning process and/or achievement of a particular educational goal. Vectorial concepts refer to the dynamics of the teaching-learning transaction, the movement towards or away from a specific goal.

A Model Of Control

A model is a scheme or conceptual framework that organizes a viewpoint regarding a certain phenomenon (Babbie 1983:38). A model provides a basis from which to ask research questions since it is a theoretical construction intended to explain relationships among the phenomena under study. Models tend to organize and simplify complex events so that their components can be more easily examined and evaluated. Therefore, to explore

the concept of control in distance education a conceptual model, consistent with Lewinian theory, has been developed and is presented here.

Development of the Model

The proposed model was developed as a result of Garrison and Baynton's perceived need to conceptualize the distance education transaction from a broader and more comprehensive perspective than that provided by the current discussions around student independence and autonomy. Garrison and Baynton (1987) argued that the concept *independence* alone was inadequate to fully describe the *life-space* of the individual learner in the distance education context. Therefore, the development of the proposed model was based on the person-interaction premise so fundamental to field theory. This model also reflected the adult education literature, particularly the inclusion of student characteristics (*competence*) that contribute to the participation and persistence in educational activities. Consequently, the model incorporated some pivotal concepts from the distance education literature such as *independence*, *communication* and *support* and some of the terms associated with the theoretical and empirical application of the construct *control* such as *choice* and *freedom*.

The steps in developing the model involved the following:

1. The perusal of the distance education literature to identify the key organizing concepts related to this area of study.
2. The conclusion that the concepts such as *independence*, *autonomy* and other related terms did not fully incorporate the complexity of interactions taking place in the distance education learning process.
3. The search for another, broader concept that would characterize not only the separation of teacher and student, the freedom of choice experienced by the

student but the inclusion of two-way communication and support in an educational transaction. As well, the individual characteristics of students in interaction with their environments needed to be considered.

4. The decision regarding a philosophical and theoretical basis that reflected the individual-environment interaction and articulated how forces move an individual toward or away from a particular goal. Lewin's field theory was chosen for its ability to conceptualize the totality of the situation and for its philosophical and theoretical precepts congruent with the values and assumptions underlying the model.
5. The decision to conceptualize control as a three-component concept that incorporated the key concept of *independence* but also acknowledged the attributes of the individual student in interaction with the learning resources in the environment.

To determine if the proposed model was congruent with students' experiences, it was necessary to consider the *life-space* of the individual. This includes the student's needs, goals, abilities, knowledge and skills as well as the situational elements such as the technology used to communicate with the teacher/tutor, the opportunity for choice and alternative actions and the learning resources present in the environment. That is, to characterize the teaching-learning process in distance education and to determine if control can be defined within this context the people and objects within the student's personal environment or psychological field need to be taken into account. Forces or vectors which move the individual toward control of the learning process and barriers which prevent this achievement also need to be identified in the exploration process. Thus, the unit of analysis is the individual student in the distance education environment.

Based on the assumptions and conceptualizations provided by field theory and from the adult and distance education literature, the following conceptual model is presented and it is hypothesized that its structure is consistent with the experiences of students. The concept of independence is important in the characterization of distance education but, to more fully explain and describe the distance education transaction, it is necessary to go beyond this single concept and to attempt to identify a more complex interaction of concepts that may explain the distance education teaching-learning process more fully. That is, independence **alone** does not sufficiently take into consideration the life-space of the individual student which includes the interaction of that individual (goals, needs, interests etc.) with the environment (teacher, technology, learning materials, etc.).

To assist in understanding the educational transaction at a distance, the concept of control is proposed. Control is defined here as “concerned with the opportunity and ability to influence, direct, and determine decisions related to the educational process” (Garrison and Baynton 1987:5). Control of learning is not achieved simply by providing independence or freedom from outside influence. Control can be achieved by attempting to obtain a balance between independence and other basic elements (competence and support) in the educational transaction. This can be accomplished through the process of two-way communication between the teacher and the adult student. See Figure 1.

To more fully understand *control* in the educational transaction, it is necessary to examine independence in relationship to the competence or abilities of the student and the support available to accomplish educational aims. It is hypothesized that the dynamic balance among these three components: *independence*, *competence* and *support*, enables the student to develop and maintain control in the learning process. The model contains the three dimensions described below. These exist within the larger context of the communication between teacher, student and context.

1. *independence*: Based on the distance education literature (Moore 1972, 1973, 1986; Holmberg 1986), independence is the opportunity to make choices without external influence or restriction. Within an educational context and the individual's *life-space* this refers to choices regarding one's learning objectives, activities, and methods of evaluation. Independence assumes not only that there are alternatives available but that the individual is aware of the alternatives and is free from coercion regarding their choice. Within the individual's *life-space*, independence is the opportunity to diagnose one's learning needs and to formulate learning goals. It is the freedom to choose what, when, how and where to learn.

However, having the opportunity to make these choices presents only a partial representation of the educational transaction. The student and his/her competencies and abilities to operate in such an environment must also be considered.

2. *competence*: Based on the adult education literature, particularly with respect to participation in learning (Darkenwald and Merrian 1982), competence refers to the ability or capacity to take part in and assume responsibility for the learning process. From a Lewinian perspective this dimension is topologically located in the individual's motor-perceptual region. This refers to the requisite intellectual ability, study skills, or motivation necessary to be involved in a learning process. If these are not present the individual cannot be in control of the learning process. Thus, the individual must have the competence (i.e. the knowledge, skills and experience) to participate in a particular learning experience.

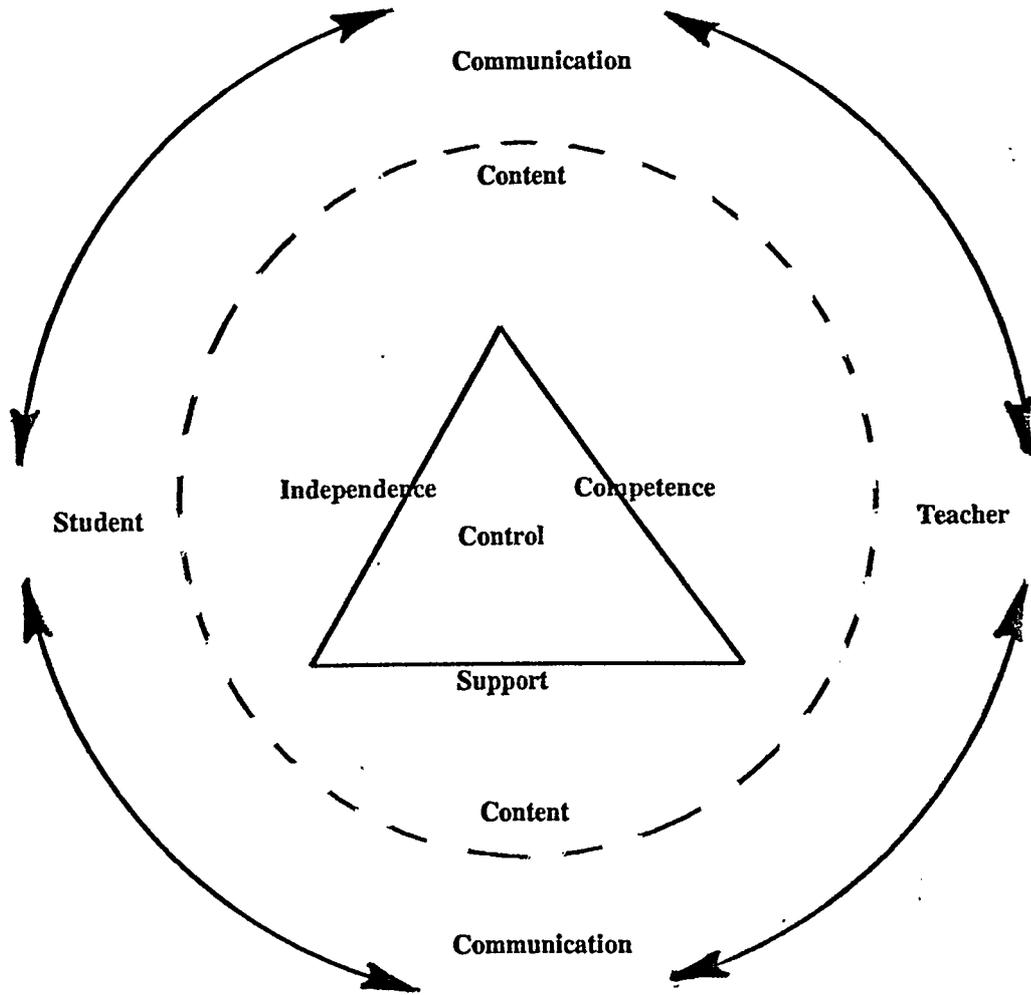


Figure 1

Control and the Educational Transaction*

* Adapted from Garrison and Baynton, 1987.

This dimension refers to the intellectual, attitudinal and dispositional characteristics necessary to participate in an educational process. To merely have the intellectual capacity is not sufficient to follow through with a learning program. Individuals must also have the incentive to learn, have confidence in themselves as learners and the skills with which to approach, maintain and complete a learning process. Within the individual's *life-space*, this also refers to the conscious and unconscious elements (attitudes, values, dispositions) that constitute the person. These are the intrapersonal characteristics, accumulated experiences, knowledge and skills that the individual brings to the learning transaction. These have been developed and continue to be shaped as a result of the individual's interaction with the environment.

3. *support*: A great deal of importance has been placed on the provision of support for the individual learning at a distance (Dodds 1983; Hiemstra 1980; Kember and Dekkers 1987; Lewis 1981; Lewis 1984; Moore 1987; Rumble 1986; Sewart 1981). Within the *life-space* of the individual, support refers to the forces or vectors in the student's environment that determine movement towards or away from learner control and independence. Within the individual's psychological field these are the resources that the learner can access in order to carry out the learning process. Support refers mainly to the availability and accessibility of courses, learning materials, and teachers/tutors. It also refers to other resources such as community experts, library facilities and media such as audio cassettes, television programs and/or computer terminals. In a broader sense, support includes financial assistance or the emotional support given the individual by family members and friends.

Field theory assists in the conceptualization of accessibility issues. Availability of and accessibility to technology with which to communicate with the teacher/tutor reflects the issues of structure and position within an individual's psychological field. For example, the accessibility and immediacy of contact with the teacher or tutor through the telephone or teleconference may be a part of many students' life space but for others this may not be available.

Learning resources may be provided by an educational institution or they may be available from other sources and organizations within the community. The role of the teacher/tutor is of primary importance in the provision of support. Providing assistance and consultation in the educational transaction, paradoxically, enables the teacher to ensure and encourage greater control on the part of the learner. As Tough expresses "the distinction between help and control is important, because it helps us realize that a learner can receive a great deal of help without giving up any of his control or responsibility" (Tough 1979:192).

Providing support does not deplete a student's control. It can actually enhance or facilitate greater control on the part of the student. Due to the distance or non-contiguous nature of distance education programs, this component is of particular concern. Referring to the accessibility of resources for the student, this dimension focuses on how programs are structured and delivered to the individual. Unavailability and inaccessibility of resources decrease the potential degree of control that the student would have in the educational process.

Support often depends upon the type of technology used to mediate the two-way communication in the learning transaction. This can be print, telecommunications, computer or face-to-face contact, plus a range of one-way communication media. Without such technology and media to support communication and learning, distance education

would not exist. Again, this component focuses on the learning environment and attempts to identify forces that enhance or inhibit the individual's movement toward control of the learning transaction.

Therefore, the three components of control: *independence*, *competence* and *support* must be considered together for the student to have control of the learning transaction. Since control is a relative concept, the individual can possess varying degrees of control in the learning situation. The degree of control can change depending on the amount of choice provided in the course design, the technology used, the competency of the student and/or the availability of resources. To have control of the learning process, it is necessary for the student to have the opportunity to explore potential learning objectives, activities and make choices regarding how learning should be evaluated, the ability or competency to handle a learning activity and the support necessary to sustain and complete a learning project.

An individual may have the opportunity to choose the learning objectives and content (*independence*), the necessary *support* (teacher/facilitator or community resources), but if either the intellectual capacity to handle the material or the motivation to perform the learning activities (*competence*) is low or absent, then the degree of control over the learning process is diminished. Similarly, if an individual has the opportunity to choose objectives and content and the ability and motivation to learn, but does not have access to the necessary resources in order to implement the learning program, control of the situation is likely to be lost. Correspondence study can, at times, typify this situation if library resources and/or tutorial services are not available. Finally, if one were to have the capacity and motivation to learn and the resources available but not the opportunity to choose the educational objectives and the content, control would again be diminished. This

is typical of the traditional classroom situation where the teacher determines the objectives and content.

Within the communication between teacher and student the educational experience takes place. It is within this communication that the degree of control is manifested and determined. Communication provides the means by which the institution, teacher, student, content and control dimensions (*independence, competence and support*) interact. The type of communication media used, the frequency and immediacy of contact between teacher and student, who initiates the communication and for what purpose all influence and determine the degree of control that the student has over the educational process.

It was the three components outlined above and their congruency with student experiences and priorities in distance education that was explored in this study.

Assumptions Underlying The Model

The model outlined above is based on the following assumptions:

1. Control is both a process and an outcome in an educational transaction. As a process, control can be considered to be a series of choices, actions, negotiations and other interactions that take place between the student and the teacher during the duration of a learning project. As an outcome, control can be considered to be the end result or goal of those series of actions and interactions between student and teacher culminating in a relative amount of control for any particular student.
2. That the behavior on the part of the teacher towards the student reflects a seeking of knowledge and understanding. That is, it is assumed that there is no hidden agenda or misuse of power/authority on the part of the teacher.

3. That control is a phenomenon that can be experienced by students in a learning situation.
4. That control is a concept that occurs in relative amounts or in degrees.
5. That control of learning is a desirable state and should be encouraged in the communication between teacher and learner.

Recapitulation

This chapter outlined the theoretical framework on which the study is based. Lewin's field theory provided the underlying theoretical and philosophical framework based on the importance of the person-environment interaction and the need to conceptualize these participants in a wholistic fashion, as a total situation. This includes student abilities as well as environmental factors. Using this perspective as a basis and combining concepts from the adult and distance education literature, a conceptual model was presented that perceives control of the learning process as a three component construct that includes *independence, competence* and *support*. Finally, the assumptions underlying this model were presented.

The following chapter discusses the design, methodology, data preparation and results of the study.

CHAPTER 4

METHODOLOGY

The research question being addressed was whether the conceptual model describing the educational transaction in distance education was isomorphic with student experiences of the learning situation. This chapter describes the methodology used to answer the research question.

Instrumentation

A questionnaire was developed consisting of four sections. Part I included demographic questions requesting the number of courses taken, type of delivery system used, institution registered at, age, sex, type of course taken, population of the area in which they lived and reasons for taking distance education courses. Part II included a Likert-type scale that asked students to respond, on a seven-point scale, the extent to which they experienced items related to the learning situation in distance education. Part III consisted of another Likert-type scale asking students to indicate, again on a seven-point scale, the extent to which each of the twenty-eight items was a priority for them in deciding to take a course by distance education. Part IV contained five open-ended questions related to control of the learning process. Learning process was defined as that which “includes all the things you have to do during a course – the assignments, other tasks, the communications with your teacher/tutor and the decisions you made. Control refers to how much you, compared to your teacher/tutor, can influence these tasks, decisions and communications.”

The first scale was developed to assess the present experiences of distance education students with respect to the choice, support and personal characteristics/abilities they

experienced related to learning at a distance. The second scale assessed the priority that students place on these same elements when they chose to study by distance education.

The scales were developed using the conceptual model as a guideline with attempts made to keep the items appropriate for a factor analytic study. There were ten items that addressed issues of *independence*. These items reflected the opportunity to make choices and have input regarding learning objectives, activities, content, deadlines and evaluation procedures. Nine items reflected the *competency* variables. These included items referring to the student's ability (knowledge and skill) to take part in a learning activity. These items included questions related to:

1. the ability to handle the course material;
2. the motivation to handle the course material;
3. the ability to translate learning needs/goals into learning objectives;
4. having study skills;
5. having the ability to manage time;
6. having confidence in oneself;
7. being responsible for one's success/failure; and
8. enjoying learning.

Nine items related to the dimensions of *support*. The variables related to this dimension included financial support, emotional support, being treated as a peer by the teacher/tutor and the accessibility and availability of human (teacher, tutors, peers, counsellors) and non-human (library books, print materials, audio/video programs) resources.

The two scales consisted of twenty-eight items each and used a seven-point scale which ranged from 0 to 6. Zero (0) represented *not at all* on the experience scale and 6 represented *to a very great extent*. On the priority scale 0 represented *no importance, don't*

need it while 6 represented *top priority, must have it*. Three (3) represented a neutral category although no descriptive category was attached. The seven-point scale was used because it approximated a continuous scale, is generally used in parametric statistics, and provided the respondent with a greater number of options to promote variance (B. Dunn, personal consultation December 1988; Osgood, Succi and Tannenbaum 1978; Isaac and Michael 1974).

To determine content validity the instrument was reviewed by nine individuals involved in distance education. Two were professors of education with extensive teaching experience in teleconferencing. One individual was a professor of Social Work with experience teaching by teleconference while another was a high school superintendent also with experience in this method of teaching. Another individual was a nursing administrator with experience in research methodology and teaching by teleconference. Two individuals were psychologists working with distance students and one individual was involved in research at a distance learning institution. Another individual was involved in continuing education at a technical institute offering courses in teleconference and home study. These individuals were consulted to determine if the variables identified were reflective of the distance education context. There was agreement among them on the basis of their knowledge of that particular environment and on the basis of a description of the model provided by the author that the instrument contained items that reflected the educational transaction in distance education. The instrument was also reviewed by four individuals conversant in scale construction. One was a professor of Psychology with experience in factor analysis and test construction. Another was an instructor in statistics and research methodology at a post-secondary institution. One was a researcher at a distance learning institution while another individual was a professor of education with expertise in research methods, particularly factor analysis.

The instrument was pre-tested on thirteen individuals reflective of the sample group (adult teleconference and home study students). As a result of this pre-test, the wording was changed on Scale II. Originally, subjects were asked to respond regarding the degree to which the items were considered *important*. To reduce the tendency for all items to be rated as *very important*, the wording was changed to the extent to which these items were a priority when the individual chose to take a course by distance education. The revised version was pre-tested on a similar sample of adult students. Four high school students were also used to check for clarity and understanding of wording. As a result of this pre-test the wording of two items (#3 and #11) were changed to increase clarity and consistency in interpretation. The respondents indicated that all other items were acceptable in their original form.

Sample

The sample consisted of university level distance-education students registered in credit-courses at The University of Calgary and Athabasca University. The University of Calgary students were taking courses by the teleconference method of delivery while the Athabasca students were taking courses by home study. The total sample consisted of 391 randomly selected Athabasca students and 189 University of Calgary students, totalling 580 students. The response rates differed for the two groups.

For The University of Calgary, a total of 161 responses were received, of which 148 could be used. Athabasca students sent back 180 questionnaires of which 178 could be used. Therefore, the response rate for The University of Calgary was 78 percent whereas it was 45 percent for Athabasca University, giving an overall response rate of 61.5 percent. To check if respondents and non-respondents differed in the Athabasca sample, a Chi Square was applied on the ages, sex and rural/urban breakdown for this group. This

indicated that there were no significant differences between those who responded and those who did not.

Non-responses were deleted from the factor analysis. This decreased the number of usable responses further. The factor analysis for Scale I used a total of 301 students (163 from Athabasca University and 138 from The University of Calgary). Scale II used a total of 307 students (169 from Athabasca University and 138 from The University of Calgary).

The University of Calgary administrates and coordinates the delivery of credit and non-credit courses across Alberta through the Faculty of Continuing Education. While courses may be delivered to any location in the province there are approximately seventy centres with local individuals to assist with teleconferencing.

Students from a total of nine classes were used in this study. Six of the nine courses were courses in Education. The other three included an Anthropology, Psychology and a Nursing Ethics course.

Athabasca University provides university education to adults 18 years of age or older and a resident of Canada. An open admission policy, flexible registration dates and study schedules, and distance education methods enable this university to provide an alternative for adults seeking a university education. The students use specially designed home-study materials for each course and are assigned a tutor who can be called toll-free from anywhere in Canada. Courses may be supplemented by seminars, workshops, laboratories or teleconference sessions. The institution provides credit courses in four major fields of study: administrative studies, humanities, natural sciences and social sciences. Students may obtain a degree, a certificate, transfer courses, or recognition in professional associations. They may also pursue individual interests for personal or professional development.

This section describes the administration of the questionnaire and the data preparation and scoring.

Administration of Questionnaire

The questionnaires were mailed out at the end of February during the Winter Term, 1989. The author mailed out the questionnaires to The University of Calgary group while a researcher with Athabasca University mailed the questionnaires from Athabasca to that particular sample. The two sets of questionnaires were mailed within the same week. Two follow-ups were done on each group. The first follow-up enclosed another questionnaire and consent form while the second follow-up included a reminder only. A covering letter explaining the purpose of the study and a consent form were enclosed in each packet. See Appendix A. A self-addressed return envelope was also enclosed to facilitate responding. A complementary pen was enclosed in The University of Calgary mail-out but Athabasca University did not agree to enclose these with their mail-out.

Data Preparation and Scoring

All questionnaires were coded by the author. Verification of the coding was accomplished by matching the computer print-out data file with each questionnaire. Any errors found were corrected. For the open-ended part of the questionnaire, each response was examined, with duplicate or very similar responses grouped and their frequencies recorded. When all the responses were recorded for each question, the data were investigated for common themes and concepts. Each response was then grouped according to the theme or category which emerged and the frequency of this category recorded. Themes were then recorded for each of the two sample groups on all five questions.

Analysis

The research question concerning whether the proposed conceptual model was isomorphic or congruent with student experience of the learning situation in distance education was examined using exploratory factor analysis. A principal factoring method with iteration (PA2) was used combined with an orthogonal rotation to obtain the factor pattern (i.e. the underlying variables) to compare with the proposed conceptual model. The principal factoring (PA2) method “automatically replaces the main diagonal elements of the correlation matrix with communality estimates and employs an iteration procedure for improving the estimates of communality” (Nie *et al.* 1975:480). In addition, it may be noted that this method is the most widely accepted factoring method and is reported to handle most factoring needs of the user (Nie *et al.* 1975:480).

Preliminary investigation regarding the number of factors to retain used the Kaiser-Guttman eigenvalue criterion greater than or equal to one (Cattell, 1966). Additional criteria included the Scree test (Cattell, 1966 p. 206), simple structure (Thurstone 1947) and interpretability (Comrey 1973; Harman 1976) with regard to the proposed model and the distance education learning situation. After the initial number of factors was decided upon, a principal factoring method with iteration (SPSS PA2 Factor Analysis) was used. Rotation to simple and interpretable structure was accomplished using the varimax (orthogonal rotation) technique (Harman 1976:290).

An oblique rotation was also carried out on the total sample data using the direct oblimin method with deltas set at .0, .3 and .5 (Nie *et al.* 1975). Factor analysis was carried out on Scale I and Scale II for the total sample and for The University of Calgary and Athabasca groups separately. The factors and factor loadings for Athabasca University

and The University of Calgary were examined to discern if there were similarities and/or differences. The responses of the students from each university were also recorded for the five open-ended questions. The themes that emerged were identified, categorized and discussed in relation to the proposed conceptual model.

Recapitulation

This chapter outlined the methodology used to answer the research question of whether the proposed conceptual model of control was isomorphic with student experience in the distance education context. The next chapter examines the results of the factor analysis and the open-ended questions.

CHAPTER 5

RESULTS

In previous chapters the research question was stated and a description given of the data collection procedure and the analysis used. In this chapter a brief description of the sample and the test reliabilities are provided, followed by a presentation of the results of the exploratory factor analysis. Finally, some descriptive and comparative data is provided to further explore the distance education situation relative to the conceptual model.

Sample Description

Five-hundred and eighty questionnaires were mailed out. One hundred and eighty-nine were mailed to The University of Calgary teleconference students and three hundred and ninety-one to Athabasca University students. The 189 students represent the total number of students enrolled in distance education credit-courses at The University of Calgary during the Winter Term 1989. The 391 students were randomly selected from students enrolled in credit home-study courses at Athabasca University who had completed at least one home-study lesson.

Of the 189 students contacted from The University of Calgary, 161 students responded. Of these, seven indicated that they had withdrawn, two stated that the course had been cancelled, one questionnaire was returned with the wrong address and three returned the questionnaire unanswered. This left 148 usable questionnaires. The Athabasca group returned 180 questionnaires of which two were unanswered, leaving 178 usable responses. The difference in response rates may be explained by the fact that 63 percent of The University of Calgary sample were individuals enrolled in education courses. The majority of this sample (65%) had Bachelors degrees, may have been teachers and therefore may possess a higher interest in and greater cognizance of the learning process

as an area of research. Also, the Athabasca group was not initially informed that this study was a joint effort between The University of Calgary and Athabasca University. The original covering letter to Athabasca students did not explain the study as a cooperative venture and it may have been perceived as solely The University of Calgary study and thus not relevant to them as students.

Characteristics of the Sample

Sex

Demographic characteristics of the sample revealed that males constituted 36 percent and females 64 percent of the total sample. The University of Calgary contained 35 percent males and 65 percent females. Athabasca University had 37 percent males and 63 percent females.

Age

The total sample contained ages in the following categories:

Table 1

Ages of Respondents (Total Sample)

18	-	24 years	10 %
25	-	34 years	36 %
35	-	44 years	40 %
45	-	54 years	10 %
55	-	64 years	2 %
over 65 years			2 %

The majority of The University of Calgary group fell in the age range of 35 to 44 years (52%) with 27 percent in the age group of 25 to 34 years.

Athabasca University students were a little younger with 44 percent in the age range of 25 to 34 years and 31 percent in the range of 35 to 44 years.

Education

The two sample groups differed somewhat in their educational backgrounds. The University of Calgary group contained respondents with higher educational backgrounds than the Athabasca University group. See Table 2 for a breakdown in education.

Table 2
Highest Education Attained by Respondents

	The University of Calgary %	Athabasca University %
Less than high school	.7	3.4
High school	4.1	44.1
Post Secondary Certificate/Diploma	24.5	35.2
Bachelors Degree	64.6	15.6
Masters Degree	5.4	1.1
Doctorate	.7	.6
	100.0	100.0

Population

There were some differences in the rural/urban breakdown for the two sample groups. The Athabasca University group had a larger proportion of students from a definitely urban area (31% versus only 1.4% of The University of Calgary group). The majority of The University of Calgary students came from areas with a population of from

1 – 9,000 and from areas with less than 1,000 people. A more comprehensive breakdown is provided in Table 3.

Table 3
Populations from which the Sample Groups Originated

Population	The University of Calgary %	Athabasca University %
> 500,000	1.4	30.7
100,000 – 499,999	0.0	7.8
50,000 – 99,999	6.1	6.7
10,000 – 49,999	6.8	15.6
1,000 – 9,999	59.9	30.2
< 1,000	25.2	7.8

Types of Courses Taken

The types of courses taken by the entire sample included: education, social science, business, math (including accounting), science, humanities, languages, and medical science courses.

The University of Calgary offered mainly education courses. Six out of the total nine courses were education courses. Athabasca students took more business, math and social science and humanities courses. The most frequently taken courses for the Athabasca group was Administration (Business = 35%). The other courses, except for languages, were fairly evenly distributed. See Table 4 for the breakdown in courses.

Table 4
Types of Courses Taken by Respondents

Type of Course*	Institution	
	The University of Calgary %	Athabasca University %
Education	63	–
Social Science	24	25
Science	–	11
Medical Science	10	–
Mathematics (including Accounting)	–	26
Humanities	–	26
Languages	–	7
Business Administration	–	35

* some students took more than one type of course

Other Courses

Several of the respondents (16 from The University of Calgary and 13 from Athabasca University) indicated that they were also taking courses from other institutions. Nine of The University of Calgary students indicated that they were also taking home study courses from Athabasca University. Three other students were taking on-campus courses from The University of Calgary, one was taking a home-study course from Arizona State University, one from each of the University of Alberta, Grant MacEwan College, the University of British Columbia and one from the Southern Alberta Institute of Technology.

Thirteen Athabasca students also took courses from other institutions. Two indicated that they were taking courses from The University of Calgary (one by teleconference, one on-campus), two students were registered at the University of Alberta, two at the University of Saskatchewan, one student was taking a course from Lakehead University, one from the University of Lethbridge, one from the University of Victoria, one from Red Deer College and three were taking courses from North Island College. The delivery modes included teleconference, home-study and on-campus lectures.

Reasons for Taking Distance Education

The most frequent reason given for taking distance education was to obtain a degree or diploma. The second most frequent reason given was self improvement. The third reason given by students at The University of Calgary was that it saved travel time whereas the third most frequent reason given by Athabasca students was that distance education provided flexibility.

Reliability of Scales

Reliabilities were estimated for each of the two scales based on the total sample. For Scale I (Experience) the measure of internal consistency using the Alpha model (Cronbach's Alpha α) was .81. Scale II (Priorities) had a reliability of .92. See Table 5.

Table 5
Reliability for Scales

Scale	Reliability α
Scale I	.80658
Scale II	.92056

The Conceptual Model of Control

The proposed conceptual model composed of three dimensions evolved from the distance education literature and from field theory based on the person-environment interaction perspective of Kurt Lewin. The research question pertained to what extent the model was isomorphic with student experiences. The statistical procedure for this purpose was exploratory factor analysis.

Using Scale I and the total sample, a principal factoring method with iteration (PA2) was carried out. This generated the eigenvalues (proportion of total variance accounted for by the factors) and corresponding percentage of total variance reported in Table 6. The total number of factors according to the Kaiser-Guttman criterion (i.e., eigenvalue \geq to 1) was eight. The Scree test (see Figure 2) suggested that approximately five to seven factors might be considered in the analysis. A closer examination was then made of factors five to seven.

Table 6
Eigenvalues from Principal Factoring Method for Scale I
Total Sample

Factor	Eigenvalue	Total Variance
1	5.71	20.4
2	2.89	10.3
3	2.50	8.9
4	1.60	5.7
5	1.34	4.8
6	1.18	4.2
7	1.13	4.0
8	1.00	3.6
9	.93	3.3
10	.91	3.3
11	.82	2.9
12	.77	2.8
13	.69	2.5
14	.65	2.3
15	.64	2.3
16	.62	2.2
17	.57	2.0
18	.48	1.7
19	.47	1.7
20	.44	1.6
21	.41	1.5
22	.41	1.5
23	.39	1.4
24	.36	1.3
25	.31	1.1
26	.28	1.0
27	.25	.9
28	.20	.7

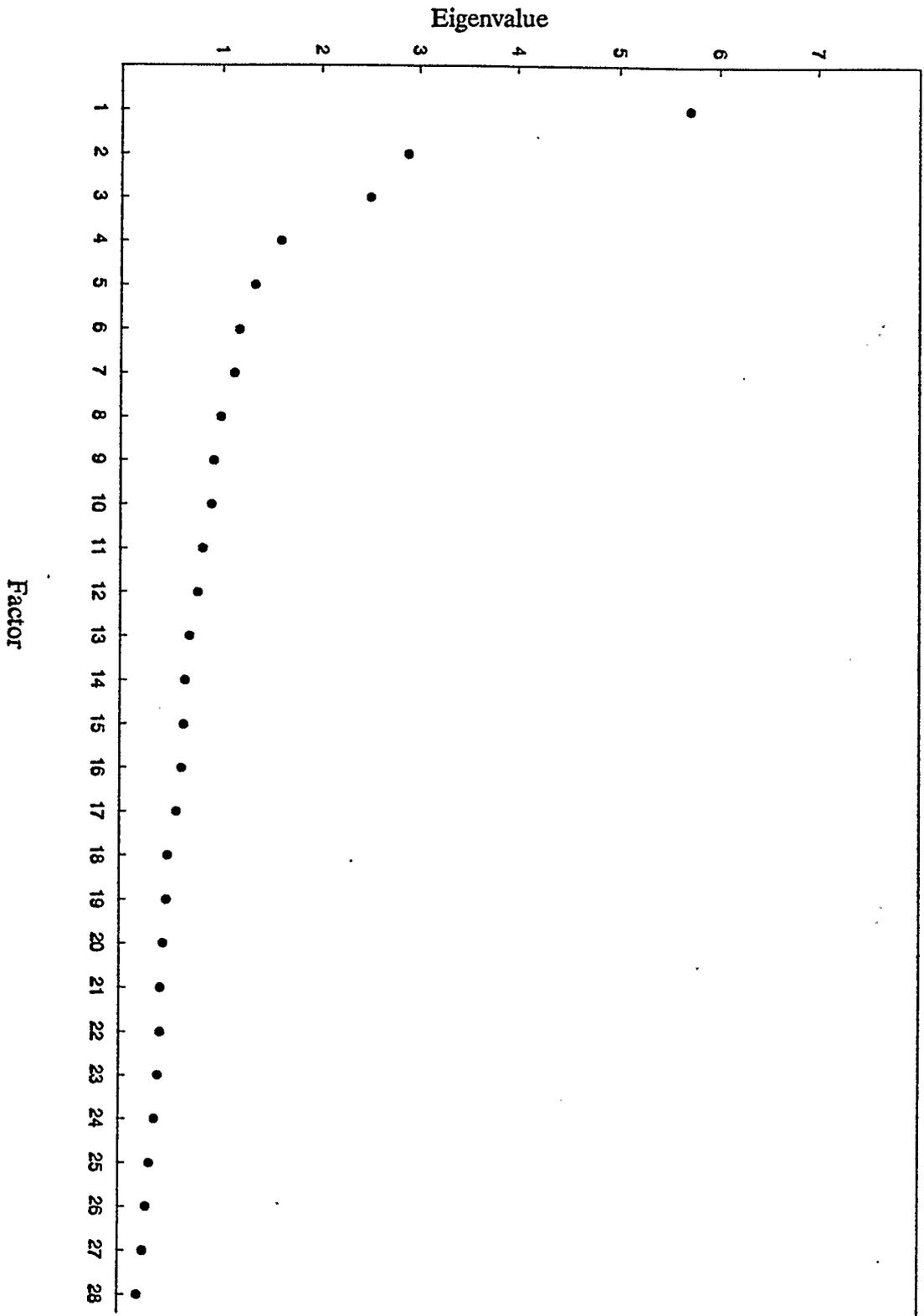


Figure 2
Scree Test

Factor analysis was carried out on Scale II (Priorities) using the entire sample and on each of the two separate sample groups: The University of Calgary and Athabasca University. The reason for running these separate factor analyses was to see if there were any major differences and/or similarities between the two sample groups and/or between the two scales.

The following pages contain the results of the exploratory factor analysis carried out on the total sample and the two sample groups independently.

Results of Factor Analysis on the Total Sample Group (Scale I)

Because of the ambiguity suggested by the eigenvalues, the low percentage of variance accounted for and the scree test related to the fifth to the eighth factors, the decision was made to initially retain factors five to seven and, using a principal component factor solution (PA2), rotate these orthogonally using the varimax procedure of rotation. It was decided to eliminate the eighth factor because only one item was loading on this factor. This was variable 3 (financial support), a variable deemed unreliable by the Cronbach Alpha. Eliminating this variable from the analysis reduced the initial number of factors to seven.

Using simple structure (Thurstone 1947) and interpretability (Comrey 1973; Harman 1976) as criteria, the five, six and seven factor solutions were examined. Salient loadings (the correlation of variable and factor) at the .4 level of salience for the five and seven factor solutions are presented in Appendix B. Comrey (1973) suggests that "a fairly commonly used cutoff level for orthogonal factor loadings is .30" (p. 225). However, salient levels above this can be used at the discretion of the researcher (Zwirner personal communication 1989). Table 7 provides the ratings given the variable-factor correlations by Comrey.

Table 7
Scale of Variable – Factor Correlations*

orthogonal factor loading	% of variance	rating
.71	50.0	excellent
.63	40.0	very good
.55	30.0	good
.45	20.0	fair
.32	10.0	poor

* (from Comrey 1975, p. 225).

The decision was made to use a salience of .4 because it provided loadings from fair to excellent, enhanced the criterion of simple structure and increased the interpretability of the factor solution.

The salient loadings of the six factor solution for Scale I are found in Table 8. Since this was an exploratory analysis the decision regarding the number of factors to retain was based not only on simple structure (Thurstone 1947) but on interpretability, particularly with relation to the proposed conceptual model. After examining the five, six and seven factor solutions the decision was made to retain the six factor solution as the best orthogonal solution. Although simple structure was obtainable in the seven factor solution there was only one loading on the seventh factor. This loading added nothing to the understanding of the proposed model in a seven factor solution but offered increased interpretability in the six factor solution. Similarly, the five factor solution did not achieve simple structure, was definitely not as interpretable as the six factor solution and did not account for as much variance as the six factor solution (50.1 versus 54.3).

Table 8
Salient Factor Loadings after Orthogonal Rotation
Scale I

Variable	F.1	F.2	F.3	F.4	F.5	F.6
1					.46	
2			.60			
3						
4	.80					
5			.75			
6	.39					
7	.63					
8			.42			
9		.75				
10	.68					
11		.54				
12				.83		
13					.35*	
14						.40
15						.49
16	.48					
17				.81		
18				-.41		
19						.52
20	.53					
21					.35	
22					.64	
23					.43	
24		.75				
25						
26						
27			.61			
28		.66				

* highest loading for variable – not salient

To explore the underlying structure further (i.e., the intercorrelations of variables), oblique transformation using the direct oblimin on the five, six and seven factor solutions were carried out. Again, simple structure and interpretability were used as criteria. After examining the results of the five, six and seven factor solutions transformed with different degrees of obliquity (.0, .3 and .5), it was found that there were few differences among the oblique solutions (i.e., non-orthogonal or correlated factors).

After examining the results of the six factor solution transformed with three different degrees of obliquity simple structure was not obtained with the more oblique solutions ($\delta = .3$ or $.5$). With a fairly oblique correlated solution ($\delta = .0$) (Nie *et al.* 1975:486) in the six factor solution, the results were not very different from the six factor solution rotated orthogonally. Using the .5 degree of obliquity (extremely oblique, correlated solution) (Nie *et al.* 1975:486), simple structure was not obtained, double loadings proliferated and the interpretability was not as clear as in the orthogonal solution. At .3 degrees of obliquity, the interpretability of the first four factors was the same as the orthogonal solution but Factors 5 and 6 were not as easily interpreted as five and six in the orthogonal solution. After studying the results of the five and seven factor solutions transformed with three different degrees of obliquity, it was decided that there were few differences in interpretability among the oblique solutions (i.e., non-orthogonal or correlated factors). However, the least oblique transformation ($\delta = .00$) had marginally better simple structure than the other two in both the five and six factor solutions. The oblique 5 factor solution did not differ much in the factor loadings from the orthogonal rotation and it did not differ appreciably in the degree of obliqueness (.0, .3, .5).

Salient factor loadings after oblique transformation of the five, six and seven factor solutions ($\delta = .0, .3, .5$) can be found in Appendix C. Factor intercorrelations for the five, six and seven factor solutions can also be found in Appendix D.

Since simple structure was obtained in the six factor orthogonal rotation and there was no advantage in simple structure gained in the oblique transformation, it was decided to retain a six factor orthogonal solution. This solution, after orthogonal rotation, met the criterion of simple structure since “most of the loadings on any one factor are small and more or less randomly distributed about zero with only a few loadings being of substantial size” (Comrey 1973, p. 107). Similarly,

... a given row of the factor matrix, containing loadings for a given variable on all factors should have nonzero entries on only a few columns. The fewer the columns in which the variable has loadings, the closer to the expected form is the solution (Comrey 1973, p. 107). And thirdly,

Any two factor columns should exhibit a different pattern of high and low loadings (Comrey 1973:107).

Interpretability was also the criterion used to retain the six orthogonal factors. In addition, since the simplicity of uncorrelated constructs or factors are easier to work with for future replicative or predictive studies it was decided to retain the orthogonal six factor solution. See Table 9 for a breakdown of the variables, conceptually, for the six factor orthogonal solution. A description of this six factor solution follows.

Factor 1

This first factor was labelled *Student Competency* because the loadings are variables that relate to student abilities and skills – the intrapersonal elements that the student brings to the learning situation. This factor accounted for most of the variance (20.4%). The variable with the highest loading (.81) is variable 4, **study skills** “I have the study skills I need.” The second highest loading (.68) is **motivation**: “I have the ability to motivate myself.” And, the third highest loading is **confidence** (.63) “I have confidence in myself when I am learning.” These appear to reflect both a skill level and a dispositional element that is present in the individual as the person operates within the learning environment. The two lower loadings also reflect a skill level: **time management** (.53) “I am able to

handle my studying along with other demands on my time (work, family, etc.)” and ability (.48) “I have the ability to handle the course material.”

Table 9
Factor Loadings for Six Factor Orthogonal Solution
Scale I – Total Sample

Factor 1 – Student Competency		Factor 2 – Teacher/Tutor Support	
variable	loading	variable	loading
4. study skills	.80	9. treats like peer	.75
10. motivation	.68	24. provides encouragement/ support	.75
7. confidence	.63	28. encourages own ideas	.66
20. time management	.53	11. teacher directs learning	.54
16. ability	.48		
6. emotional support	.39*		
Factor 3 – Choice (Independence)		Factor 4 – Time Flexibility	
variable	loading	variable	loading
5. input – information	.75	12. length of course	.83
27. ‘say’ in assignment	.61	17. choose deadlines	.81
2. ‘say’ in grade	.60	18. access to students	-.41
8. discuss what want	.42		
Factor 5 – Value Orientation		Factor 6 – Access to Resources	
variable	loading	variable	loading
22. enjoy learning	.64	19. contact teacher	.52
1. interest	.46	15. access to library	.49
23. choice in course	.43	14. access to professors	.40
13. know what want	.35*		
21. responsible for success/failure	.35*		

* highest loading for variable

The sixth loading, although not quite salient (.39) is **emotional support**. “I have the emotional support of family and friends while taking the course” presents an interesting question in interpretation. Originally thought to represent the category of *support* in the proposed model, this variable may be perceived to be different from the type of support offered by access to teachers, libraries and other professionals. Although the source of the support may be external to the individual, the internal experience of the phenomenon of emotional support may be something that the learner brings to the learning situation or experiences internally during the learning process. This may even represent a precipitating factor that predisposes the learner to choose whether to study or not in the first place. The majority of students (68%) stated that having “the emotional support of family of friends” was a **top priority** (rating of 5 – 6 on the 7 point scale) when choosing to study by distance education. Therefore, in this sense, emotional support may be more similar to concepts such as confidence and motivation than it is to access to resources such as libraries. Factor 1, composed of this combination of variables appears to suggest an intrapersonal status or competency of the student. Therefore these variables may be associated with a learner’s capacity or ability to take part in and maintain a distance learning process.

Factor 2

This factor suggests an interpersonal, interactive and a relationship aspect of the learning situation. It accounted for 10.3 percent of the total variance. Named *Teacher/Tutor Support* or *Facilitation*, this factor suggests a certain type of relationship between teacher/tutor and student. It would appear to suggest an atmosphere of some choice, encouragement and support. The two variables loading highest on this factor are “treats me like a peer or equal” (.75) and encouragement/support “I get encouragement/support from the teacher/tutor” (.75). Similarly, “I have a teacher/tutor who encourages me to come up with my own ideas” (.65) suggests an element not only of encouragement but of

choice. The fourth variable “I have a teacher/tutor who directs my learning” (.54) continues to reflect the interpersonal aspect of learning.

The issue of the relationship between learner and teacher/tutor was originally addressed under the dimension of *support* in the proposed conceptual model. In the model, the teacher/tutor and student-student interaction was included with other sources of support such as financial support, access to material resources, to human resources (such as counsellors), and other students. From the results of the factor analysis, it seemed to suggest that the encouragement, support and other relationship issues involved in the teacher-learner interaction need to be distinguished as a separate dimension, different from the other sources of support.

It would appear that *support* as originally conceptualized in the model is not a homogeneous a category as originally conceived. Therefore, to more fully describe and characterize the distance education transaction it would appear to be necessary to delineate and perhaps prioritize the variables associated with support in the learning process.

Factor 3

This factor has been named *Student Choice* and accounted for 8.9 percent of the variance. The highest loading on this factor was “I have input into what information/content is covered in the course” (.75). This is followed by “I have a ‘say’ in what assignments and other learning activities I want to do in the course” (.61). The third loading is “I have a ‘say’ in how my grade is determined” (.60) followed by the variable “I have the opportunity to discuss what I want to learn” (.42). All of these variables suggest student input and choice in course content and evaluation. As well, they reflect an interactive context. Originally projected to load on the *independence* dimension in the proposed model, the loadings, here, appear to be consistent with this projection. However, it was originally thought that these variables would be combined with the variables related to choice in the

length of the course and deadlines for assignments. What was originally thought to be one dimension was subsequently separated into two separate dimensions as evidenced by Factor 4.

Factor 4

This factor was called *Flexibility (Time)*. There are three loadings for this factor, two of which are positive and one that loads negatively. The highest loading (.83) refers to choice in the length of the course “I decide how long it takes to complete the course.” This, combined with the next highest loading (.81) referring to choice in terms of deadlines for assignments and/or exams “I have the freedom to choose the deadlines for my assignments and/or exams,” appears to reflect the opportunity and freedom to make decisions within flexible timelines. The third variable: “access to other students for support or assistance” loads negatively (-.41). This presents an interesting situation. When the freedom to choose the length of the course and assignments and exam deadlines are high, as in the case of the Athabasca student, access to other students is low. Athabasca University students do have a choice in how long it takes to complete a course because they work at their own pace. Similarly, they are permitted to write exams when they feel they are ready and not necessarily at pre-determined times. This differs from The University of Calgary students. The Athabasca students, however, do not have the same access to other students that The University of Calgary teleconference students do since the Athabasca context is one of home study. When the frequency of response to the variables were checked, it revealed that 63 percent of the Athabasca students responded 0 or 1 on the seven point scale indicating that they had *none* or *very little* access to other students for support or assistance. Only nine percent responded that they had access to a *very great extent* (5 – 6). The University of Calgary group, however, indicated that 39 percent had access to a *great extent* while 21 percent felt they did not have access. Similarly, when the frequencies of: “I decide how long

it takes to complete the course” were compared between the two groups it indicated that 12 percent of the Athabasca group responded *not at all* (0 – 1) whereas 80 percent of The University of Calgary group responded that they were unable to decide the length of the course. Fifty-seven percent of the Athabasca group answered *to a very great extent* (5 – 6) while only five percent of The University of Calgary group did so.

The variable reflecting the freedom to choose deadlines for assignments and/or exams revealed that 69 percent of the Athabasca group felt that they had this *to a great extent* (5 – 6) whereas only ten percent of The University of Calgary group did. Sixty-eight percent of The University of Calgary felt that they did not have this freedom (0 – 1) compared to only six percent of the Athabasca group. This may reflect how aspects of control of the learning situation may be affected by the situational context in which the learner operates. This factor appears to more clearly represent the Athabasca situation than The University of Calgary context.

Nevertheless, it does appear to indicate that choice, in terms of time, is not necessarily the same as choice with regard to course content and evaluation procedures. This factor, then, appears to be a further division or differentiation of the original dimension *independence* as proposed in the conceptual model of control. Having choice regarding deadlines and length of a course suggest distinct issues from choice regarding the content, means of evaluation or input into assignments. Therefore, the *independence* dimension in the proposed model may be more complex and possibly composed of at least two separate and distinctive sub-categories: one reflecting choice and input into content, assignments and evaluation with the other reflecting choice with regard to the time lines associated with learning.

Factor 5

This factor was named *Value Orientation* due to what appears to be a suggestion of learner attitudes, values and predispositions with regard to the process of learning. The highest loading on this factor was “I enjoy learning” (.64). The second highest loading (.46) “I am interested in the course” seems also to reflect a positive attitude toward learning. The third loading (.43) “I have a choice in what courses I can take” presents some ambiguity. Originally projected to load on a *independence* dimension because of the element of choice involved, this item, when considered in the context of the other variables in this factor may reflect a positive attitude or feeling toward the context of learning.

This factor also appears to reflect some internal or intrapersonal conditions or dispositions of the individual learner, a positive or value orientation toward learning. These may also reflect some pre-dispositions, prerequisites or pre-conditions that enable or encourage the student to enter and persist in a learning process. It is suggested that because the variables in this factor reflect an orientation or condition of the individual learner and appear to be intrapersonal rather than interpersonal this could be conceived as a category related to Factor 1, *Student Competency*, a factor also concerned with what the individual student brings to the learning situation. Originally conceived as one homogeneous dimension under *competence* in the proposed model, these data seem to indicate that two separate factors exist.

Factor 6

This factor was named *Resource Access*. The highest loading is “I have the freedom to decide when and how often I have contact with the teacher/tutor” (.52). This was originally projected to load on the *independence* dimension due to the choice/freedom aspect. However, this item may have been interpreted by the students as one of *support* particularly, in terms of accessibility to the teacher/tutor. When compared with the other

two variables loading on this factor “I have access to library books, audio/video tapes etc. **other** than those supplied with the course” (.49) and “I have access to professionals (other than the teacher/tutor) who can help with learning (for example, counsellors) (.40) it appears to reflect an accessibility to resources, including the teacher/tutor. This, then, would appear to complement the more dominant factor, Factor 2, which concentrates on support as provided by the teacher/tutor alone, a support that relates primarily to the context and atmosphere or relationship context in which learning takes place. Factor 6 appears to reflect more aptly the availability and accessibility to human as well as material resources. This accessibility was originally projected to load on the *support* dimension but it would appear, again, that the dimensions, as originally conceptualized in the proposed model, are not as homogeneous nor as all inclusive as originally thought. It is suggested that, conceptually, resource accessibility supplements or complements Factor 2.

The results of the above factor analysis did indicate some congruence with the proposed model after taking into consideration the limitations on the number and types of variables that could be included in the instrument and the limitations of the instrument itself. While only three components or factors were originally identified in the proposed model, six factors were subsequently identified by the factor analysis. However, three major factors emerged. Factors 1, 2 and 3 accounted for the majority of the variance (39.6%) and reflected, quite closely, the original dimensions of *competence*, *support* and *independence*. These factors were accompanied by three additional minor factors. These smaller factors appeared to be complementary to the larger, more dominant categories. Certainly, continued analysis is required to further establish the relative heterogeneity and composition of the emergent dimensions. Although this exploratory and thus preliminary analysis did not suggest a total reorganization of the proposed model, it did suggest that:

1. the dimensions may not be as homogeneous as originally thought;

2. there may be at least three dominant factors with three minor, complementary factors identified in the distance learning environment; and
3. there may be more factors operating within the distance education context that need to be identified in subsequent analyses.

Results of the Factor Analysis on the Total Sample (Scale II)

A principal factoring method with iteration (PA2) was also carried out on Scale II (Priorities in choosing Distance Education). Using the total sample, this was done to determine if a six factor solution was evident for this set of variables as well. The eigenvalues (proportion of total variance accounted for by the factors) and corresponding percentage of total variance is found in Table 10. The number of factors according to the Kaiser-Guttman criterion (i.e eigenvalue ≥ 1) was six. The scree test also suggested (see Figure 3) five to six factors. A four and five factor solution was run on Scale II but they did not offer the same interpretability as the six factor solution and, since the decision had been made to retain a six factor orthogonal solution for Scale I (Experience), the six factor solution for Scale II was retained for comparison. The criteria of simple structure and interpretability also applied. See Table 11 for the factor loadings for the six factor solution for Scale II and Table 12 for a conceptual breakdown of these factor loadings.

Except for a few differences, the six factor orthogonal solution for Scale II provided a very similar structure to Scale I. The major differences in the two analyses were as follows: Factor 1 in Scale II (Priority) was *Support* accounting for 25.4 percent of the variance. In Scale I (Experience), the first factor was *Student Competency* accounting for 20.4 percent of the total variance. This would seem to suggest that what students perceive as priorities and what they presently experience are different.

Table 10
Eigenvalues for Scale II – Total Sample

Factor	Eigenvalue	Pct. of Variance	Cum Pct.
1	7.10619	25.4	25.4
2	2.60489	9.3	34.7
3	2.14043	7.6	42.3
4	1.43042	5.1	47.4
5	1.28821	4.6	52.0
6	1.18280	4.2	56.3
7	.96117	3.4	59.7
8	.94928	3.4	63.1
9	.86573	3.1	66.2
10	.84149	3.0	69.2
11	.82402	2.9	72.1
12	.72147	2.6	74.7
13	.70302	2.5	77.2
14	.67208	2.4	79.6
15	.65942	2.4	82.0
16	.60162	2.1	84.1
17	.53703	1.9	86.0
18	.50369	1.8	87.8
19	.47468	1.7	89.5
20	.41587	1.5	91.0
21	.37651	1.3	92.4
22	.36323	1.3	93.7
23	.35585	1.3	94.9
24	.34018	1.2	96.1
25	.30762	1.1	97.2
26	.28135	1.0	98.2
27	.25383	0.9	99.2
28	.23793	0.8	100.0

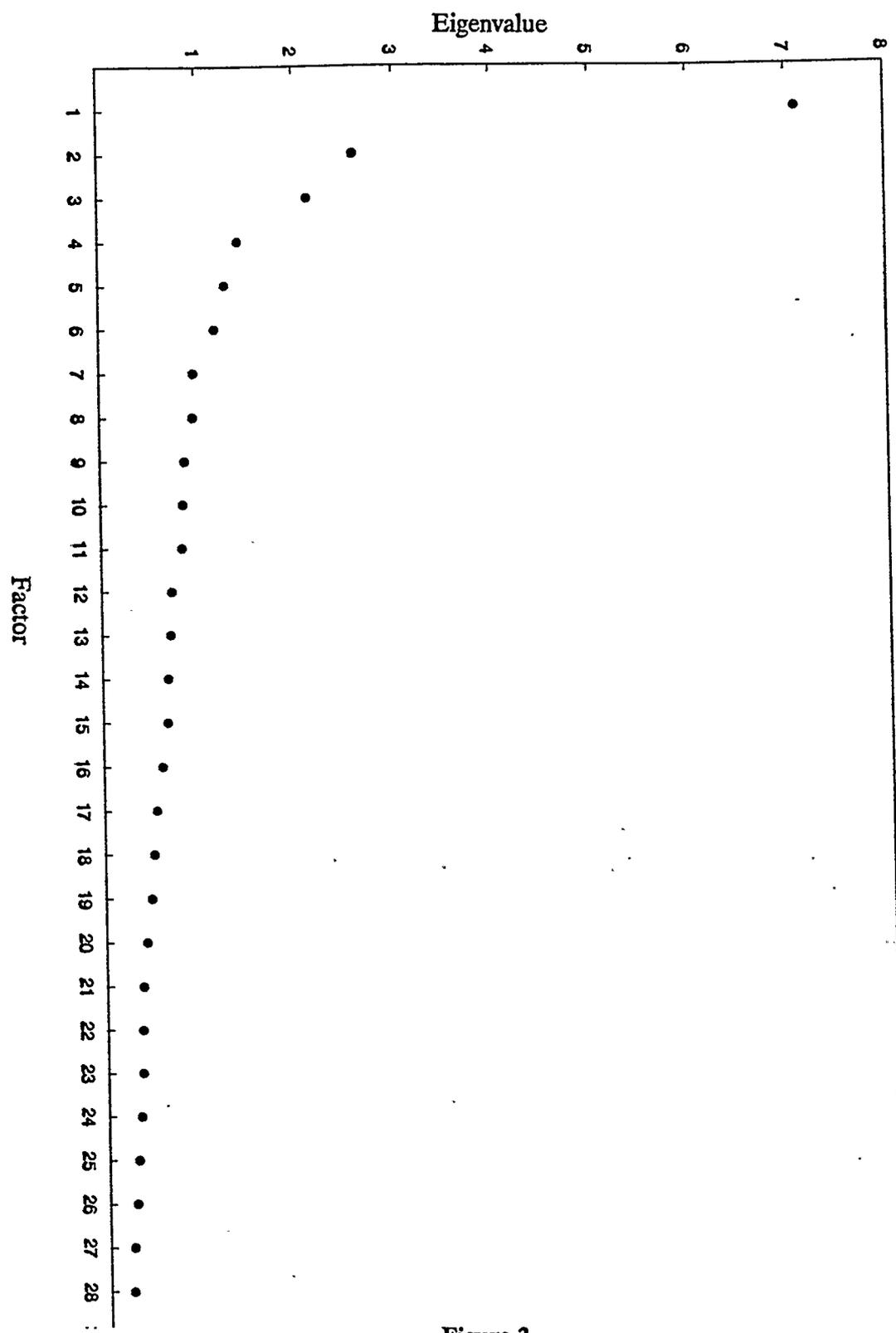


Figure 3
Scree Test

Table 11
Salient Factor Loadings after Orthogonal Rotation
Scale II - Total Sample

Variable	F.1	F.2	F.3	F.4	F.5	F.6
1			.48			
2					.73	
3						
4		.60				
5					.66	
6		.44				
7		.73				
8	.69					
9	.50					
10		.52				
11	.61					
12				.80		
13			.51			
14						.74
15						.45
16		.43**	.43**			
17				.81		
18						.48
19				.48		
20		.56				
21		.53				
22			.63			
23		.39*				
24	.71					
25						
26	.53					
27					.43	
28	.58					

* highest loading for variable

** variable loads twice

Table 12
Factor Loadings for the Six Factor Orthogonal Solution
Scale II – Total Sample

Factor 1 – Teacher/Tutor Support		Factor 2 – Student Competency	
variable	loading	variable	loading
24. encourage/support	.71	7. confidence	.73
8. opportunity to discuss	.69	4. study skills	.60
11. teacher directs 1.	.61	20. manage time	.56
28. encourage ideas	.58	21. responsible for s/f	.53
26. access to teacher	.53	10. motivation	.52
9. treats like peer	.50	6. emotional support	.44
		16. ability to handle	.43**
		23. variety to choose	.39*
Factor 3 – Value Orientation		Factor 4 – Flexibility	
variable	loading	variable	loading
22. enjoy learning	.63	17. flexible deadlines	.81
13. know what want	.51	12. flexible time schedule	.80
1. interest	.48	19. decide contact	.48
16. ability to handle	.43**		
Factor 5 – Choice		Factor 6 – Resource Access	
variable	loading	variable	loading
2. 'say' in grade	.73	14. access to professors	.74
5. input into content	.66	18. access to students	.48
27. choice in assignments	.43	15. access to library	.45

* highest loading for variable

** double loading

Some variables were interchanged. For example, Factor 2 in Scale II, the *Competence* factor, included “feeling responsible for success/failure” and, although not quite salient “a variety of courses to choose from” (.39). Although the former can be explained as a student characteristic, the latter variable (v 23) is not so easily explained. Factor 1 in Scale II *Support – Relationship with Teacher/tutor* included one extra loading not found in Scale I. Having “access to the teacher/tutor . . .” is interpretable in terms of a *support* item. Factor 3 is equivalent to Factor 5 in Scale I except for the inclusion of the “ability to handle the course.” Factor 4 is similar to Factor 4 in Scale I and Factor 5 is equivalent to Factor 3 in Scale I except it does not include “opportunity to discuss . . . what I want to learn.” This loaded on the *Support* factor (Factor 1) instead. Factor 6 – *Access to Resources* is clearly reflective of accessibility to these three types of resources. This factor was more clearly delineated in Scale I which included “. . . freedom to decide when and how often . . . contact.” This may have been interpreted as an accessibility issue rather than a flexibility or choice item in the Scale I (Experience). It appears that in Scale II, however, it more clearly reflected a flexibility issue.

Generally speaking, it can be concluded that the two six factor solutions were quite similar in identifying six underlying factors. The variance accounted for differed. *Teacher/tutor Support* accounted for the most variance in Scale II while *Student Competency* accounted for most of the variance in Scale I. This would seem to suggest that, even though there are six underlying factors what students presently experience and what they feel are priorities are two separate things.

**Factor Analysis on the Separate Samples –
Athabasca University and The University of Calgary (Scale I)**

Since there were two separate institutions providing different learning contexts for students it may be assumed that students could perceive and experience their learning situations differently leading to a potentially different configuration of factors. Therefore, separate factor analyses were carried out on the Athabasca and The University of Calgary sample groups independently to discern if there were differences and/or similarities between the two groups.

Using Scale I and the Athabasca sample, a principal factoring method with iteration (PA2) was carried out. This generated the eigenvalues (proportion of total variance accounted for by the factors) corresponding percentage of total variance reported in Table 13. The number of factors according to the Kaiser-Guttman criterion (i.e., eigenvalue $> = 1$) was nine. The same procedure was carried out on The University of Calgary group. See Appendix E for Scree tests. See Table 14 for the eigenvalues from this procedure.

Given the minimal amount of variance accounted for by the eighth and ninth factors, orthogonal rotations, using the varimax method were carried out on five, six and seven factor solutions for each group. It must be kept in mind that the Athabasca group provided a larger sample than The University of Calgary.

Table 13
Eigenvalues from Principal Factoring Method for Scale I
Athabasca University Sample

Factor	Eigenvalue	Total Variance
1	5.29	18.9
2	3.12	11.2
3	2.25	8.0
4	1.93	6.9
5	1.52	5.4
6	1.31	4.7
7	1.15	4.1
8	1.07	3.8
9	1.01	3.6
10	.87	3.1
11	.86	3.1
12	.81	2.9
13	.78	2.8
14	.62	2.2
15	.61	2.2
16	.59	2.1
17	.51	1.8
18	.46	1.6
19	.45	1.6
20	.43	1.5
21	.37	1.3
22	.35	1.2
23	.32	1.2
24	.32	1.1
25	.29	1.1
26	.25	0.9
27	.23	0.8
28	.21	0.7

Table 14

**Eigenvalues from Principal Factoring Method for Scale I
The University of Calgary Sample**

Factor	Eigenvalue	Total Variance
1	6.72	24.0
2	2.73	9.7
3	1.95	6.9
4	1.38	4.9
5	1.29	4.6
6	1.19	4.2
7	1.16	4.2
8	1.06	3.8
9	1.03	3.7
10	.99	3.5
11	.85	3.0
12	.80	2.9
13	.68	2.4
14	.66	2.4
15	.65	2.3
16	.58	2.1
17	.54	1.9
18	.51	1.8
19	.47	1.7
20	.46	1.6
21	.39	1.4
22	.35	1.3
23	.33	1.2
24	.29	1.0
25	.28	1.0
26	.25	0.9
27	.21	0.8
28	.17	0.6

This difference in sampling may explain some of the differences found between the two groups. Thus, the six factor solution decided upon for The University of Calgary group needed to be interpreted with caution.

A six factor orthogonal solution was decided upon for the Athabasca group because it provided simple structure and was the most interpretable. See Tables 15 and 16. See Appendix F for the loadings for the five and seven factor solutions. The seven factor solution provided no salient loadings on the seventh factor and the third factor was confusing. The five factor solution offered no appreciable advantage over the six factor solution and explained less variance (50.4). The six factor solution explained 55.1 percent of the total variance.

A six factor orthogonal solution was also decided to be appropriate for The University of Calgary group but it was not as definitive as the solution for Athabasca. See Table 17 for the salient loadings for a six factor solution for The University of Calgary. See Table 18 for a conceptual breakdown of the six factor solution. See Appendix F for the loadings for the five and seven factor solutions. The six factor solution for The University of Calgary did, however, provide a reasonable interpretation since the five factor solution did not achieve simple structure nor did it provide any advantage in interpretability over the six factor solution. A similar situation presided in the seven factor solution. The six factor solution for The University of Calgary accounted for 54.5 percent of the total variance.

Some of the differences found may be explained in terms of different groups interpreting the questions differently based on differences in the context in which they are learning. In this regard students may differ in their experience and thus their perception of the learning situation.

Table 15

**Salient Factor Loadings after Orthogonal Rotation of the Six Factor Solution
Athabasca University Sample – Scale I**

Variable	F.1	F.2	F.3	F.4	F.5	F.6
1			.53			
2				.72		
3						
4		.84				
5				.66		
6		.33*				
7		.55				
8						
9	.72					
10		.72				
11	.66					
12					.66	
13			.47			
14						.59
15						.61
16		.40				
17					.67	
18						.42
19					.54	
20		.61				
21			.36*			
22			.68			
23			.51			
24	.81					
25						
26						
27				.55		
28	.73					

Table 16
Factor Loadings for Six Factor Orthogonal Solution
Athabasca University Sample – Scale I

Factor 1 – Teacher/Tutor Support		Factor 2 – Student Competency	
variable	loading	variable	loading
24. encourage/support	.81	4. study skills	.84
28. own ideas	.73	10. motivation	.72
9. treats like peer	.72	20. manage time	.61
11. directs learning	.66	7. confidence	.55
18. discuss what want	.33*	16. ability	.40
Factor 3 – Value Orientation		Factor 4 – Choice	
variable	loading	variable	loading
22. enjoy learning	.68	2. 'say' in grade	.72
1. interest	.53	5. input into content	.66
23. have choice	.51	27. 'say' in assignments	.55
13. know what want	.47		
21. responsibility for s/f	.36*		
Factor 5 – Flexibility		Factor 6 – Resource Access	
variable	loading	variable	loading
17. choose deadlines	.67	15. access to library	.61
12. length of course	.66	14. access to professors	.59
19. decide contact	.54	18. access to students	.42

* highest loading for a variable

Table 17
Salient Factor Loadings for the Six Factor Solution
The University of Calgary Sample – Scale I

Variable	F.1	F.2	F.3	F.4	F.5	F.6
1					.36*	
2				.53		
3						
4	.64					
5				.67		
6	.52					
7	.78					
8		.55				
9		.69				
10	.56					
11		.32*				
12			.63			
13					.50	
14						
15						
16	.65					
17			.70			
18						.56
19			.36*			
20	.47					
21	.39*					
22						
23						
24		.59				
25			.46			
26		.50				
27		.40		.56		
28		.81				

* highest loading for variable

Table 18
Factor Loadings for Six Factor Solution
The University of Calgary – Scale I

Factor 1 – Student Competency		Factor 2 – Teacher/Tutor Support	
variable	loading	variable	loading
7. confidence	.78	28. own ideas	.81
16. ability	.65	9. treats like peer	.69
4. study skills	.64	24. encourage/support	.59
10. motivation	.56	8. discuss what want	.55
6. emotional support	.52	26. get hold of teacher	.50
20. manage time	.47	27. 'say' in assignments**	.40
Factor 3 – Flexibility		Factor 4 – Choice	
variable	loading	variable	loading
17. choose deadlines	.70	5. input into information	.67
12. length of course	.63	27. 'say' in assignments**	.56
25. work on own	.46	2. 'say' in grade	.53
19. decide contact	.36*		
Factor 5 – Value Orientation		Factor 6 – Resource Access	
variable	loading	variable	loading
13. know want	.50	18. access to students	.56
1. interest	.36*		

* highest loading for variable
 ** double loading for variable

The University of Calgary Compared to Athabasca University

Generally speaking, the factors for The University of Calgary group were not as definitive as those for the Athabasca University group. It was debatable whether a five or six factor solution was best for The University of Calgary group. The five factor solution lost a support factor (Factor 6) and had two double loadings while the six factor solution had only one double loading. The decision, although arbitrary, was made to stay with the six factor solution for The University of Calgary. See Appendix F for the five and seven factor solutions for The University of Calgary. The discrepancy may have reflected genuine differences in experience and/or may have resulted from the smaller n in The University of Calgary sample. The Athabasca group's six factor solution reflected, more closely, the total sample group than that of The University of Calgary. A description of the Factors follows.

Factors 1 and 2 were reversed in the two sample groups. Factor 1 in The University of Calgary group coincided with Factor 1 of the total sample. Therefore, it coincided with Factor 2 in the Athabasca group. Factor 1 (*Support*) in the Athabasca University group accounted for 18.9 percent of the variance whereas Factor 1 (*Competence*) for The University of Calgary group accounted for 24 percent of the total variance. This may reflect a difference in emphasis placed on this factor by the two groups. Although the *Student Competency* factor was essentially the same for both groups in content, the highest loading for The University of Calgary group for the *Student Competency* factor was: "I have confidence in myself when I am learning" (.78). Eighty-two per cent of The University of Calgary group reported experiencing confidence in themselves while 67 percent of the Athabasca group reported experiencing this *to a very great extent*. The variable with the highest loading for the Athabasca group was study skills (.81) which reflected the total

sample solution. The University of Calgary sample loaded .64 on the study skills variable. One major difference in the two groups was the inclusion of “emotional support” (.52) in The University of Calgary group. This variable did not load on the Athabasca sample. This may reflect a greater number of The University of Calgary students experiencing this type of support. When the frequencies of response for each of the variables were examined it was evident that considerably more University of Calgary students experienced emotional support from family and friends than did the Athabasca group. Fifty-four percent of the Athabasca group experienced emotional support while 73 percent of those taking courses by teleconference at The University of Calgary reported experiencing emotional support.

Motivation loaded higher for the Athabasca group (.72 vs. .56) than for The University of Calgary group. This may reflect a greater variance in responses from the Athabasca University group and possibly more difficulty in achieving self motivation in the home study method since the student does not have the regular interactive sessions with the teacher and fellow students as provided by the teleconference method. When the frequencies were examined 82.3 percent of The University of Calgary group reported to have the ability to motivate themselves whereas only 50 percent of the Athabasca University group reported having this ability to a great extent. “Ability to manage time” loaded higher for the Athabasca group (.61) than for The University of Calgary group (.47). Not much difference was found between the two groups in their experience of this. Thirty-five percent of The University of Calgary group stated they were able to handle their studying with other demands on their time and 40 percent of the Athabasca University group reported this ability to *a great extent* (5 – 6). This may reflect the need for Athabasca University students to have to develop their own study schedules, working those around other responsibilities rather than attending scheduled sessions as evident in the teleconference sessions.

The *Student Competency* factor in The University of Calgary group also had an additional variable (although not quite salient) from the Athabasca and total sample groups: “I am responsible for my success or failure” (.39). This did not present a problem in interpretation since this same variable was found in the complementary factor (Factor 4 – *Student Value Orientation*) which reflected the dispositional, attitudinal or intrapersonal characteristics of the learner brought to the learning situation. Therefore, this variable was not incompatible with the other variables and actually complements them.

The variables for the *Support* factor (Factor 1 in Athabasca and Factor 2 in The University of Calgary) were essentially the same in each, although the ranking is somewhat different. The highest loading in the Athabasca group is “I get encouragement/support from the teacher/tutor” (.81). For The University of Calgary group the highest loading is: “I have a teacher/tutor who encourages me to come up with my own ideas . . .” (.81). The University of Calgary has a higher loading for “I have the opportunity to discuss with the teacher/tutor what I want to learn” possibly reflecting the greater opportunity for interaction with the teleconference method. This variable does not reach salience (.33) for the Athabasca group but is the highest loading for that variable. The University of Calgary group has two additional loadings on the *Support* factor: “I can get a hold of the teacher . . .” (.50) and “I have a ‘say’ in what assignments . . .” (.40). Both of these variables reflect or suggest an element of interaction. The first variable was originally intended to reflect the *support* dimension while the second was intended to reflect an *independence* dimension and does in both the Athabasca group and the total sample group. For the purposes of interpreting The University of Calgary group and, given that it is a relatively low loading, its positioning on the support factor is compatible with an interactive, support component. “I can get a hold of the teacher . . .” is interpretable in lieu of the interactive element present in The University of Calgary teleconference delivery mode. This

variable did not load on the Athabasca group and may therefore be explained in terms of the greater opportunity for discussion in the teleconference sessions, possibly a greater potential for questions to be answered. This is somewhat surprising given the opportunity, at least theoretically, afforded the Athabasca group to contact the tutor for the same purpose. It may also have reflected a possible concern of the Athabasca students who may, at times, be unable to reach the tutor when desired. In the open-ended questions this concern was indeed expressed by several students. Examination of the frequencies for this variable in the two groups did not reveal any appreciable differences. This variable may, however, reflect an interactive element, a facilitative aspect for The University of Calgary group rather than an accessibility issue as it was originally projected to reflect. Similarly, the fact that the "I have a 'say' in assignments . . ." loaded on the *Support* factor in The University of Calgary group but loaded on the *Choice* factor in both the Athabasca and the total sample groups again may reflect the opportunity to have input and be able to negotiate changes, etc., due to the less structured learning materials. It may also depend on the style of the teacher delivering the course content. It would appear that this variable may have presented some confusion in interpretation for The University of Calgary group and seems to reflect both interactive and choice elements. This lack of definition would need to be rectified if the instrument were modified and used again.

Athabasca University loaded higher on the variable "I have a teacher/tutor who directs my learning" (.66). Although the highest loading for that variable (.32) fell on the *Support* factor for The University of Calgary, it did not reach salience. It is interesting to note that 19 percent of the Athabasca University group responded that the tutor did not direct learning at all (0 – 1) whereas 23 percent reported that their learning was directed to a *very great extent* (5 – 6) In contrast, seven and one-half (7.5%) percent of The University of Calgary group responded that the teacher directed their learning *not at all* (0

– 1) while 49 percent reported that their learning was directed by the teacher *to a very great extent*. This may indicate again how a variable such as teaching style of the instructor may affect the learning experience and thus the amount of control experienced by the student.

Factor 3 for The University of Calgary group is *Time-Flexibility*. For Athabasca it is *Value Orientation*. The University of Calgary Factor 3 is the same as Athabasca's Factor 5. There is, however, one additional variable for The University of Calgary "I work on my own without direction from the teacher/tutor" (.46). This variable does not load at all on the Athabasca group. Although not directly related to a time dimension this variable does reflect a freedom of choice and a flexibility so its inclusion in this factor is compatible conceptually. The reason for its appearance in The University of Calgary group and not in the Athabasca group could be explored further. When the frequencies for this variable were examined no appreciable differences were found between the two groups.

Factor 4 – *Choice* – contains exactly the same variables for each sample group: "input into information . . ."; "say" in assignments"; "a 'say' in grade" These are, however, switched around in importance. The highest loading for The University of Calgary group is "I have input into information . . ." (.67) whereas "I have a 'say' in grade . . ." is the highest in the Athabasca group (.72). In The University of Calgary group, variable 27: " 'say' in assignments" loads twice but the highest loading is on Factor 4 where it is more interpretable.

Factor 5 for The University of Calgary group corresponds to Factor 3 for the Athabasca group: *Value Orientation*. Whereas the Athabasca group's factor is very similar to the total sample group The University of Calgary factor is much smaller, composed of only two variables, one of which is not salient. See Table 18. One of the reasons there are only two variables loading is that the other two that make up this factor in both the

Athabasca group and the total sample group load on the first factor (*Student Competency*) in The University of Calgary group.

Similarly, “interest in the course” received a higher loading with the Athabasca group than the Calgary group (.53 vs. .36). The University of Calgary sample group did not reach salience on this variable.

Factor 6 in the University of Calgary group presents an interesting anomaly. The sixth factor contains only one variable: “I have access to students for support or assistance” (.56). Because this variable is not combined here with other *support* variables that reflect access to other resources, this factor cannot be considered to be equivalent to either Factor 6 in the Athabasca group or Factor 6 in the total sample. For The University of Calgary group this variable and thus Factor 6 appear to reflect more of a social support element. Possibly, fellow students are perceived by the teleconference students as a means of social support rather than as an instrumental or external resource such as books or other professionals or, they may be perceived as an element that is indigenous to the learning situation rather than a resource external to the learning situation such as books or professionals such as counsellors. Comparing the Athabasca group and The University of Calgary group on experience of this item it indicated very clearly how the two groups differed. The Athabasca group reported that 63 percent of the respondents did not have access to other students whereas in The University of Calgary group only 21 percent reported no contact with other students for support or assistance. Thirty-eight percent of The University of Calgary group reported that they had access to other students to a *very great extent* but only nine percent of the Athabasca group reported this. A discrepancy existed between the two groups on the priority placed on this item. Fifty-six percent of The University of Calgary group reported that access to other students was a top priority while only 23 percent of the Athabasca group reported it as a priority.

The Athabasca group has three variables that load on this sixth factor: “access to library books . . .” (.61); “access to professionals . . .” (.59) and “access to other students” (.42). The reason neither of the other two variables: “access to library books . . .” and “access to professionals” loaded for The University of Calgary group is that possibly these two items are not within the experience of The University of Calgary group. Certainly, when the open ended questions were examined the need for library access and access to other material resources such as journals, research materials etc. was overwhelmingly identified by The University of Calgary group as a resources needed to provide control over one’s learning process. Access to a library was rated as a high priority by 69 percent of The University of Calgary group but only by 45 percent of the Athabasca group. This may reflect the fact that the home-study materials may be more self-contained than the materials provided to the teleconference students.

Four variables did not load at all on The University of Calgary group. These included “financial support” which had been eliminated earlier since it did not load on any group and was deemed to be an unreliable item by the Cronbach Alpha. The other three variables included: “I have a choice in what courses I can take”; “I have access to library books, audio/video tapes etc. other than those supplied with the course” and “I have access to professionals (other than the teacher/tutor) who can help with learning (e.g., counselors).” Except for “having a choice in courses” the other two are not typically within the experience of The University of Calgary teleconference student. When the frequencies of response were examined for each of these variables the following was found. The rating of 5 – 6 represents the students’ experiencing the item to *a very great extent*. The rating of 0 – 1 represents *not at all* or *to a very little extent* on the seven point scale. See Table 19.

Table 19
**Frequency of Response to Access to Professionals and
 Library and Choice in Courses**

Athabasca University	The University of Calgary			
	% 5 - 6%	% 0 - 1	% 5 - 6	% 0 - 1
Variable				
access to professional	14	52	21	32
access to library	23	35	35	20
choice in courses	52	5	68	5

Summary

Basically, the two groups, both separately and combined, reflect six quite similar factors. There are some differences between The University of Calgary and the Athabasca groups which may be explainable in terms of different size sample groups, different learning contexts and different learner characteristics. The following section describes the factor analyses carried out on the separate samples using Scale II. This scale measured the priorities students placed on items when choosing to study by distance education.

Factor Analyses on the Separate Samples –

Athabasca University and The University of Calgary (Scale II)

Separate factor analyses, using Scale II were also carried out on the Athabasca and The University of Calgary sample groups independently to discern if there were any similarities and/or differences in the two groups. Table 20 contains the eigenvalues for the Athabasca group for Scale II. Table 21 indicates the eigenvalues for The University of Calgary sample for Scale II. Each of the samples yielded eight factors initially. Again, due to the low amount of variance associated with the sixth to eighth factors, the factors were orthogonally rotated in five, six and seven factor space. See Appendix F for the five and eight factor solutions for Athabasca and The University of Calgary.

For the Athabasca group, the five factor solution was not as interpretable as either the six or the seven factor solution. The six and seven factor solutions were essentially the same except for the inclusion of the variable “the opportunity to work on my own without direction . . .” This loaded .50 on the seventh factor and since it was the only loading, it indicated a unique factor. This variable did not load with the *independence* dimension as originally intended and did not load at all on the factor analysis using Scale I (Experience). This may reflect that the responses to this item were more definitive as a priority than when considered as a present experience. See Tables 22 and 23 for the six and seven factor solution for the Athabasca sample on Scale II. As one can see, there is little difference between the two rotations. The seven factor solution is marginally better than the six only because the loadings tend to be a bit higher, it includes one more variable, moves variable 13 from Factor 3 to Factor 4 where it is more interpretable and accounts for marginally more variance.

Table 20

**Eigenvalues from the Principal Factoring Method
Athabasca University Sample – Scale II**

Factor	Eigenvalue	Pct. of Variance	Cum Pct.
1	7.33164	25.3	25.3
2	2.81536	9.7	35.0
3	2.07094	7.1	42.1
4	1.82070	6.3	48.4
5	1.29780	4.5	52.9
6	1.19072	4.1	57.0
7	1.14172	3.9	60.9
8	1.11634	3.8	64.8
9	0.94615	3.3	68.0
10	0.86041	3.0	71.0
11	0.81711	2.8	73.8
12	0.72436	2.5	76.3
13	0.64666	2.2	78.6
14	0.62185	2.1	80.7
15	0.58218	2.0	82.7
16	0.54778	1.9	84.6
17	0.53393	1.8	86.4
18	0.49713	1.7	88.1
19	0.45612	1.6	89.7
20	0.42494	1.5	91.2
21	0.39373	1.4	92.5
22	0.37483	1.3	93.8
23	0.33481	1.2	95.0
24	0.30058	1.0	96.0
25	0.27296	0.9	97.0
26	0.24446	0.8	97.8
27	0.23110	0.8	98.6
28	0.21394	0.7	99.3
29	0.18976	0.7	100.0

Table 21

**Eigenvalues from the Principal Factoring Method
The University of Calgary Sample – Scale II**

Factor	Eigenvalue	Pct. of Variance	Cum Pct.
1	7.30499	26.1	26.1
2	2.93205	10.5	36.6
3	1.62352	5.8	42.4
4	1.49038	5.3	47.7
5	1.40663	5.0	52.7
6	1.27552	4.6	57.3
7	1.17285	4.2	61.4
8	1.14462	4.1	65.5
9	0.90662	3.2	68.8
10	0.84773	3.0	71.8
11	0.75781	2.7	74.5
12	0.72187	2.6	77.1
13	0.68741	2.5	79.5
14	0.65288	2.3	81.9
15	0.61029	2.2	84.1
16	0.53325	1.9	86.0
17	0.49632	1.8	87.7
18	0.46915	1.7	89.4
19	0.43146	1.5	90.9
20	0.38803	1.4	92.3
21	0.36001	1.3	93.6
22	0.33071	1.2	94.8
23	0.31044	1.1	95.9
24	0.26592	0.9	96.9
25	0.25201	0.9	97.8
26	0.22352	0.8	98.6
27	0.21326	0.8	99.3
28	0.19077	0.7	100.0

The University of Calgary sample, Scale II, presented some problems in interpretation. Simple structure was not obtained in either the eight or seven factor solutions and interpretability in both of these was not as clear as that for the Athabasca group nor for the total sample in either Scale. A similar situation was found in the six and five factor solutions. The six factor solution was marginally better than either the five or the seven factor solutions. The only factors which did correspond to the other analyses were *Student Competency* and, to some extent *Flexibility – Time*, as well as *Value Orientation* except that these were not as definitive as either the Athabasca sample or the total sample on Scale II. This may be explained by not enough variation in response associated with choosing these items as priorities by The University of Calgary group and a possible tendency for the majority of respondents to choose a majority of items as priorities. The first factor suggested a *Support/Accessibility* dimension but it became confused with the inclusion of “choice of assignments.” Variables 9 and 27 (“a teacher/tutor who treats me like a peer or equal” (9) and “choice in what assignments . . .” (27) appear to load on inappropriate factors.

Despite these difficulties, there is a similarity to the other analyses and, given that a more definitive six factor orthogonal solution is suggested by the other analysis the decision remained to choose a six factor orthogonal solution for both scales. See Appendix F for tables displaying the five, six, seven and eight factor solutions for The University of Calgary.

The next section provides the results from the open ended questions.

Table 22

Six Factor Orthogonal Solution for Athabasca University Sample – Scale II

Variable	F.1	F.2	F.3	F.4	F.5	F.6
1				.40		
2					.54	
3						
4		.61				
5					.86	
6		.41				
7		.71				
8	.77					
9	.57					
10		.49				
11	.65					
12			.60			
13			.46			
14						.64
15						.45
16		.49				
17			.73			
18						.46
19			.51			
20		.56				
21		.49**		.41**		
22				.87		
23				.47		
24	.74					
25						
26	.61					
27					.35*	
28	.70					

* highest loading for variable
 ** double loading

Table 23

Seven Factor Orthogonal Solution for Athabasca University Sample – Scale II

Variable	F.1	F.2	F.3	F.4	F.5	F.6	F.7
1				.42			
2					.59		
3							
4		.60					
5					.82		
6		.39*					
7		.73					
8	.78						
9	.57						
10		.46					
11	.65						
12			.58				
13				.40			
14						.75	
15						.43	
16		.45					
17			.76				
18						.48	
19			.49				
20		.59					
21		.54**		.41**			
22				.84			
23				.49			
24	.74						
25							.50
26	.60						
27					.40		
28	.69						

* highest loading for variable
 ** double loading

Results of the Open-ended Questions

In Part IV of the questionnaire, five open-ended questions were included to provide the opportunity for respondents to comment on their perception of control of the learning process. This was included to see if there were other variables and/or potential factors that were not identified in the original model. As outlined previously, the concepts learning process and control were defined for the respondent in the questionnaire.

Procedure

In order to comprehend and organize the information received from the questionnaires into a coherent form the following procedure was followed. All open ended items were read and scored by the author. Each item was recorded separately until there were obvious categories into which repeated responses fell. After all items had been recorded, the answers were examined for common themes and concepts. These were then recorded and ranked according to their frequency of occurrence. This was carried out for each of the sample groups separately. A description of the findings follows.

What Gives Control?

The respondent was asked to “list 5 things that give you control over your learning process (for example ‘choice in assignments’).” Several dominant themes related to what gives control tended to emerge. Several concepts tended to be repeated frequently such as *flexibility, choice, communication, voluntary participation*. An outline of the themes follows.

1. *Flexibility – Time*

This theme appeared most frequently for both sample groups. The type of comments and items stated tended to reflect having choice or flexibility in the use of time, particularly with respect to when to study, when to complete assignments, when to write exams. Flexibility with regard to the scheduling of deadlines as well as timing regarding

when courses were available also appeared. Some of the comments reflecting this theme were:

- I can begin and finish an assignment when I want. I have my own 'time-table'.
- The freedom to control the pace of my progress.
- In correspondence studies, the choice of taking the exam when prepared instead of when course outline specifies.
- What I enjoy about home study is that I have **time** to learn. At a conventional university, I find I learn just to pass exams. I'm always pressed for time.
- Time – needs to fit into my professional and personal life.
- Time frames which are quite flexible re. due dates, course completion, etc.

2. *Interaction/Communication*

For the Athabasca group, having contact with the tutor when the student chose was the second most frequent theme. A similar theme, but broader, was the third choice for The University of Calgary group. Not only was contact with the teacher mentioned but other students were reported as a resource for The University of Calgary group. Both groups included the aspect of having the freedom when, or whether or not, to contact the instructor. Some of the comments provided by the students included:

- Active dialogue – sharing with other students.
- Lots of time to talk with others and share ideas.
- The freedom to contact the teacher to discuss problems.
- Ability to contact the teacher when needed.
- I can choose how often I wish to discuss the material with my tutor.
- Other students . . . to use as contacts or for moral support.
- The ability to call a tutor when I feel a problem has arisen instead of waiting until it is too late.

- Input into discussion to test my ideas or application of new information to my situation.
 - If my tutor is willing to concede or discuss opposing views.
3. *Choice Regarding What to Learn*

The second most frequent theme for The University of Calgary was having choice/input related to what to learn, particularly with regard to learning activities such as assignments, what courses to take and input into content areas. This included mention of the length, depth, topic, weighting, etc., of learning activities assigned within the course. This happened to be the third most frequent theme for the Athabasca group. Comments from the students related to this theme were as follows:

- Involvement with planning course content – i.e., what are my needs?
- Assignments that allow for personal input according to my work situation.
- Assignments which require some creative thinking rather than emphasis upon rote learning and jargon assimilation.
- Ability to address individual concerns/interests within context of the course.
- Wish I had some choice in assignments.
- Wish I could decide what I think is important to me at this stage of my professional career.
- Opportunity to set one's own objectives for a course.
- If creativity and independent thought is considered as worthwhile – rather than the student analyzing instructor expectations.
- Being able to tell the instructor what you want to learn and going from there.
- A chance to input into the weight of assignment to your grade (i.e., final 40% is too heavy).

4. *Voluntary Participation*

Another theme that was reflected in the students' responses was the aspect of voluntary involvement and participation. This seemed to suggest a learning context with less pressure and having choice regarding how much involvement or effort one was willing to exert. This was a factor identified more frequently in The University of Calgary group than in the Athabasca University group. Comments such as the following reflected this perception of what contributes to control of one's learning.

- Less pressure.
- How much input you want in discussion or how little.
- Amount of effort I put into assignments.
- How much additional research I do.
- Once I am aware of course requirements I decide whether I am willing to commit myself or not.
- I don't need to do the course – I, therefore, can decide what to take and when.
- I can spend as little or a much time as I want on any section . . .
- If I have a strong interest in a topic I can pursue it to a greater depth beyond the course requirements.
- Nobody telling me what to do and when to do it.
- Don't have to worry about keeping up with the teacher's speed.
- I am not affected by the rate of learning or the pace set by a classroom.

5. *Personal Characteristics/Internal Variables*

Several students mentioned characteristics such as motivation, desire to learn and time management abilities as sources of control. Example of statements related to this aspect included:

- Self control – I will do this!

- Visualizing myself completing the course.
- I enjoy the stimulation of learning.
- My independence, resulting in a preference for working on my own.
- I have an interest in learning. I also know that with hard work I can do well.
- I want to be there.
- The knowledge that I am responsible for my success in a course.
- Having a background in the course material.
- Being able to balance work load, family time and study time.

6. *Contextual Variables*

Several additional items were mentioned by students that were present in the learner's environment and appeared to be related to the ease with which these enabled them to enter and persist in a learning situation. Ability to relate the course content to the job situation; having a lifestyle that enabled one to take time to study as well as being able to maintain one's lifestyle were mentioned. Other items included the following:

- I am able to work towards a diploma or masters if I want without leaving my hometown.
- Retirement.
- The support of my family in a busy active lifestyle. . . . I have young children and it is difficult to find time.
- Full transfer from U. of C. to Atha. and vice versa.
- No travel.
- Single with no dependents.
- No financial worries.

No Control

A few students stated that they felt they had no or very little control over their learning. Comments such as the following reflected this:

- None in present course I am taking from teleconference.
- At present time not much. As with any course, this is dependent upon the instructor.
- Everything is preset by the university – we have no choice in assignments or dates of exams, etc.
- I don't feel we have much control in the course I am taking.
- Not a lot of control.
- None – totally instructor controlled.
- Treated in child-like fashion.
- The accounting course is totally structured.

The two sample groups differed only slightly with a greater emphasis placed on support found in the Athabasca group. This dealt primarily with the student having access to and contact with the tutor when the student chose to do so. The Athabasca group did, on the whole, give narrower examples with less variability, description or breadth than those given by The University of Calgary group. Again, the greater variety given by The University of Calgary may reflect the heavy emphasis on education courses taken by this group and thus reflect the perspective of people not only providing but experiencing the process of learning.

Responses tended to be quite diverse and ranged from concepts of freedom and choice to items equating control with having deadlines, schedules and clear expectations. It would therefore appear that the students' perceptions of control were very much a reflection of what they were presently experiencing. Similarly, it would appear that control is a personal concept. Although there definitely appear to be some common themes

regarding what gives control there are also some very definite idiosyncratic perceptions of what gives one control in a learning situation.

Student Characteristics that Contribute to Control

When asked: “What personal characteristics or abilities do you have that enable you to control your learning process?” a vast array of descriptors were provided by both groups. Generally, these self-described characteristics reflected:

1. The ability to persevere with a learning task – This included characteristics such as self-discipline, goal-orientation, determination, ambition and desire for self-improvement.
2. Learning skills – This included the ability to manage time, the possession of study skills, communication skills, the ability to learn (intelligence) and relevant work and life experience.
3. Positive attitudes toward learning – This, of course, is related to 1 and tended to reflect a value orientation that perceived education as worthwhile and desirable. This value orientation may enable the individual not only to enter into a learning situation but persist with it once there.
4. Other characteristics such as – sense of humour, creativity, flexibility, fear of failing, high energy, maturity, assertiveness, self-awareness, independence and particularly self-confidence.

Factors such as time, resources, family support, lifestyle, and financial security were also mentioned. Some of the comments made by the students in regard to their characteristics were as follows:

- Persistence to complete course once started regardless of factors that may inhibit the process.
- I feel that I am a highly motivated, energetic organized individual. I like a challenge and rise to the occasion.

- Definite career goals. Desire to climb ladder of success.
- Being excited about learning new ideas – a perpetual student.
- Maturity of older student who is determined to learn.
- As an adult I believe I 'know myself' and I can see thru information and judge whether or not it is meaningful, realistic . . .
- Instestinal fortitude to carry through even when material is boring (perseverance).
- Ingenuity – had to find sources of info. when library etc. is not available in a small center.
- The understanding that education and hard work will bring many rewards.
- A great 'bump' of curiosity.
- I am the type of person that likes things, activities etc. orderly and scheduled.
- An ability to set realistic goals and not beat myself up for falling short of intended schedules sometimes.
- Belief education is good.
- Ability to juggle workload – job, family, course.

Support

The respondents were asked what materials/resources they needed to be in control of their learning process. The most frequent response for both groups was access to print materials in the form of books, articles, journals, course materials etc. The University of Calgary emphasized particularly the need for access to these through a library. Other people, as resources, were also cited with the tutor mentioned more frequently by the Athabasca group. The Athabasca University sample also mentioned study manuals, course outlines and other print materials as the third most frequent need. The third most frequent response for The University of Calgary was technology such as VCRs, computers, telephone

and teleconference for communication purposes as well as access to on-line literature searches and word processing. This type of technology was not suggested by the Athabasca group although audio-visual materials related to course content was the fifth most frequent response. Audio-visual materials related to course content was the second most frequent response for The University of Calgary group.

Nineteen of the Athabasca students felt that the resources supplied by the course were all that was necessary. Additional resources that were suggested, with much lower frequency included: course outline and study manuals, time, supportive family and friends, learning resource centre, financial support, personal energy, practical experience, study skills information and child care.

Teacher/Tutor and Increase in Learner Control

The respondents were asked to indicate how a teacher/tutor can increase a learner's control of the learning process. The responses provided interesting insight into the needs of adult distance learners with regard to their relationship with the teacher/tutor. There were also some interesting differences in emphasis between the two groups. See Table 24 for a summary of the responses.

Table 24

**Responses to *How Can a Teacher/Tutor Increase Learner Control?*
(By institution)**

The University of Calgary	Athabasca University
1. Allow student choice/flexibility.	1. Provide encouragement/support.
2. Respect student as adult learner with other responsibilities.	2. Be accessible/available.
3. Provide opportunity for discussion and input from student.	3. Allow student choice/flexibility.
4. Provide guidance, direction and advice.	4. Provide guidance, direction and advice.
5. Be accessible/available.	5. Respect student as an adult learner with other responsibilities.

Athabasca University appeared to emphasize the *support* dimension, the provision of encouragement, being responsive to student needs and providing the learner with feedback. Another emphasis was the need for the tutor to be available when the learner required assistance or support. The University of Calgary seemed to place more emphasis on the choice or *independence* dimension suggesting that greater choice and flexibility in terms of content, assignments, deadlines etc. afforded the student greater control of the learning process. Some of the comments made by students included the following:

- Guide a student in selecting their own assignments and grades.
- Negotiation on assignments re. focus, types, grading.
- Clearly outlining his/her goals but allow flexibility and time to explore the learners goals.
- More flexibility in assignments deadlines.
- Encourage student input into grading criteria and topics for assignments.
- The teacher should never badger, browbeat or harass the adult learner about assignments!
- Direction – encouragement and critical analysis of one’s ideas and just listening to one ideas in a collegial sense. Make that person more self-reliant, less externally controlled (provide options) and generally improve their appreciation in life for the intangible aspects of learning. Also, consider students responsibilities outside of University, i.e. family.
- More tutor hours so you can talk to the instructor when you need to.
- Be flexible, approachable and fair.
- Care about the student mostly and the university secondly.
- Encouragement is the best sort of help a tutor can give a student.
- Encourage me to finish, not make me feel guilty when I’m late submitting assignments!
- Be supportive. If people are supportive student can use the skills they have, or develop the skills they need.

- Be encouraging, not judgmental. If a tutor criticizes a student it could alienate them so far as to discourage course completion – optimism about our abilities helps.

The University of Calgary group emphasized the need for the teacher to recognize and respect the learner as an adult with multiple roles and thus other demands on their time in addition to studying. Being responsive to individual needs and providing feedback regarding one's progress were also reflected in the responses like the following:

- Be sensitive to the other demands on time by family and job.
- Be aware of the pressure students are under: family, work, lack of resources. Distance education is much more difficult than in-house studies.
- Frequent feedback is I believe just as important to adults as it is to young children and I believe that the tutor must, somehow establish a personal focus and demonstrate his respect for his students.
- Attitude toward student is of utmost importance.
- Be reasonable and flexible and realize that adult students have many demands on their time.
- Be more respectful of learners . . .
- Recognize students' work situation and use this experience to plan/evaluate – help apply theories.
- Know something of the student's background, expectations of the course, and education/career goals.
- Treat students as equals especially those who are in distance education.

Athabasca students suggested the following ideas:

- Take student concerns to program developers.
- Constantly determine if material is relevant to student's learning style and innovate to accommodate the student's needs, style of learning.
- Promote and encourage creative, independent thinking.
- Not push the student before he is ready.
- Appreciate that I am an adult learner.

Providing guidance, advice and direction seemed to be related to a need for clear expectations and explanation of information. Students mentioned that the teacher/tutor should provide organized materials, clear expectations regarding what was required from them and the provision of additional resources from which to work. For example, students expressed the following:

- Provide very clear course outlines, provide as much material as possible in a student package to supplement text material.
- The teacher/tutor needs to be well-organized and familiar with the possibilities that current technology affords (i.e. teleconference, fax machines, computer data banks).
- It would be nice to know prior to taking a course what the expectations and course load is going to be.
- Make them responsible for their learning. Give them the room to grow with direction. Set clear concise expectations in the beginning, check and support student and let them grow.
- Give a comprehensive selection of handouts in course materials.
- Give more direction as to what has to be learned and what is just background information.
- Perhaps to guide one in the right direction and make suggestions on improving one's self-study techniques.

The University of Calgary group suggested that providing opportunity for discussion and encouraging input from the student increased learner involvement, participation and thus control. Some of the comments included the following:

- Allow for group discussion/debates.
- More class input into # of assignments, exams, etc.
- A need's assessment and then modifying the course to meet learner's needs – on an ongoing basis.
- Listen to ideas that may not always agree with theirs.
- Encourage us to give our ideas and suggestions or reasons.
- Encourage more exchange of ideas, debates in order to make challenging new views part of a creative learning process.

- Ask for input as to what the students want to learn and explore.
- Allow student to voice difference of opinion and help student to expand on rationale.
- Allow feedback during the course and to adapt it if appropriate.

Some Athabasca students reflected similar themes:

- Openness to suggestions.
- Discuss and acknowledge my point of view.
- Willing to discuss openly and honestly student concerns with course material.
- Ask intermittently for feedback from student.
- Be flexible for individual learning needs – e.g., I don't need to be in constant contact with my tutor, only for specific question I might have.

Some other interesting comments reflected the adult learner's perspective on the issue of control and its relationship to learning at a distance. For example:

- I feel I have more control at AU than I would anywhere else, perhaps **choice** is a better word than **control** . . . but correspondence does not provide the student network which often increases skills through interaction and synergy.
- Learning should be **self-discovery**, not memorizing for exams and quizzes. Although I realize the latter is necessary I also believe teachers can put out the effort to help students **discover** the work of math etc. How? Maybe bonus points for self-directed studies encompassing course requirements while involving heart and soul of student.

As well, some learning preferences were expressed:

- I don't know. I learn best by myself from a book.
- A teacher/tutor should encourage the student not to rewrite the teacher/tutor ideas or views on the course. . . . I would rather not pass a course than to agree with the tutor if I disagree.
- If complete details of what each course is to entail were given to students in all institutions they'd be better prepared and more in control.

How can the University Increase Learner Control?

When asked the above question, several themes emerged. See Table 25 for a breakdown of the major themes according to institution. The responses to this question were less amenable to categorization and a greater number of respondents left this question blank. The provision of choice in courses, transferability of courses between institutions, flexibility in assignment and exam deadlines, etc. were some of the responses most frequently given by both groups. This question seemed to reflect a number of comments, concerns and complaints from students as well as some complimentary comments regarding how well distance education had been able to meet individual needs. There were also some very interesting, solid suggestions for greater responsiveness on the part of the university to student needs and concerns. For example:

- I am very pleased with the course I am presently taking. It allows for an adult student with other responsibilities such as family, etc. to still be provided access to a program of further education. Most other facilities which are not as flexible make it impossible for students like myself to pursue furthering my career until family obligations are completed.
- Counselling before entering a college so that the student is informed about available courses and programs so that he is able to choose the correct path for him.
- I think that educational institutions can increase a learner's control by allowing him/her to make decisions within the course(s). For example, allowing a student to pick their own essay topic provokes more thought into the course, while at the same time makes the experience more interesting for the learner and at the same time gives the learner a certain degree of control over what he is learning.
- In my opinion there is little anyone can do for the home studier – the initial drive and motivation has to come from that person – if it doesn't – there is very little anyone else can do.
- Give student control in terms of time allowed to complete course, course in self-motivation, study techniques.
- It should allow students to voice their concerns about anything relating to the course (i.e. textbooks, assignments, tutor, etc.).

- 1. Be receptive to a variety of needs i.e. allow for a variety of educational objectives.
- 2. Offer a good variety of courses – keeping in tune current trends in a variety of fields.
- 3. Eliminate as much ‘red tape’ as possible.
- 4. When offering teleconferencing courses, be certain to have involvement of tutors willing to adapt to a rather different teaching environment.
- SOME DAY – total computer hookup to the University library.

Table 25

Responses to *How Can the University Increase Learner Control?*

The University of Calgary	Athabasca University
1. Provide choice/flexibility in courses, assignment, exam deadlines, transferability of courses.	1. Provide choice/flexibility in courses, assignment, exam deadlines, transferability of courses.
2. Provide access to learning materials/resources such as the library, print materials, computers, etc.	2. Provide access to human resources, particularly tutors (also counsellors).
3. Decrease bureaucratic procedures and humanize contact with students. Recognize students as adults with experience and knowledge.	3. Provide access to learning materials/resources such as the library, print materials, computers, etc.
4. Provide mechanisms whereby students can provide feedback to the institution re: needs, wants, etc.	4. Provide mechanism whereby students can provide feedback to institution.
	5. Decrease bureaucratic procedures and humanize contact with students. Recognize students as adults with experience and knowledge.
	6. Provide students with information regarding the availability of resources (including other students).

In summary, learner control, with respect to the institution and its administrative procedures seems, again, to be perceived in terms of provision of options, choice and flexibility that would enable learners to meet needs as students as well as manage the other responsibilities in their lives. Similarly, another strong theme that emerged was being provided with learning materials or access to resources that facilitated the learning process. It would appear that the student feels more in control when resources are readily available and accessible. In addition, control seemed to be equated with being recognized and respected as an individual, a person with additional responsibilities and a wealth of experience and life knowledge.

In conclusion, the responses to the open-ended questions provided material that not only supported but enhanced and enriched the original proposed model. As with the factor analysis the open-ended responses seem to suggest that a greater demarcation of the original dimensions was necessary to more fully describe the distance learning situation. There appears also to be need to acknowledge a greater number and variety of pre-dispositional and contextual variables in addition to those that operate in the actual interactive learning environment. This will be discussed more fully in the following chapter.

Recapitulation

This chapter has presented the results of the study. This included a description of the demographic data, the results of the factor analyses on the total sample and each individual sample for Scale I and Scale II. The results of the five open-ended questions were also documented. The next chapter will discuss the theoretical interpretation and implications of the results as well as examine the limitations of the study and suggestions for further research.

CHAPTER 6

DISCUSSION

Introduction

Distance education is still a relatively new area for systematic research. Because of this there is a continued search for concepts to order thinking and research related to this area of investigation. Several conceptual frameworks and fledgling theories have been put forth (Moore, Holmberg and Keegan). In this search for conceptualization Garrison and Baynton (1987) and Garrison (1989) attempted to go beyond some of the initial concepts such as *independence* and proposed a three component model of the concept *control* to describe and explain the interactive teaching-learning situation in the distance education context. This model conceptualized *control* as resulting from the dynamic balance of micro elements such as *independence*, *competency* and *support*. This study was an attempt to operationalize these components and to test whether there were any empirical referents for their existence.

Summary

The research question addressed whether or not the proposed conceptual model was isomorphic with student experiences in distance education. Two groups of distance education students, one consisting of teleconference students from The University of Calgary and one composed of home study students from Athabasca University were used to explore the applicability of the model. Two Likert-type 28-item scales were developed by the author to measure:

1. the extent to which students experienced *independence*, *competence* and *support*, and

2. the extent to which students felt these dimensions were a **priority** when deciding to study by distance learning.

The questionnaire also contained five open-ended questions that attempted to solicit student perceptions related to control of the learning process. These were used to determine if students would provide any additional information regarding control of the learning process not considered by the authors in the original conceptualization of the model.

The statistical procedure used to analyze the research question was exploratory factor analysis while frequencies were used to analyze the open-ended section.

Although there is need to replicate this study on other populations the results do permit some preliminary observations. The results of the two factor analyses of the 28 manifest variables yielded six orthogonal factors (three major and three minor factors). The factors corresponded reasonably well to the proposed typology but included twice as many components as originally proposed. Therefore, for these teleconference and home study students, the structural forms of their educational experiences fell into six general categories. The factor solutions for both present experience and priorities when choosing distance education yielded nearly the same interpretation. Thus, it seems reasonable to suggest a revised typology or model that includes three dominant categories consistent with the proposed model and three minor dimensions. The major deviations from the proposed model were the subdivision of the original three components into two factors each and the concentration of teacher-student interactive communication as an important component of *support*. Although preliminary and exploratory in nature, the factor analysis did suggest a patterning or clustering of variables similar to that proposed in the original conceptual model.

The remaining section of this chapter will present a discussion of the limitations of the study, the theoretical interpretation of the model, the application of the results to the theory and practice of distance education, the conclusions of the study and finally the implications of the study for further research.

Limitations

One major limitation of this study occurred in the administration of the questionnaire. Approximately two thirds of the Athabasca sample received Scale II first followed by Scale I while the other third received it the same way as The University of Calgary group: Scale I, then Scale II. Examination of the responses for both groups did not reveal any noticeable differences nor discrepancies. Although unlikely that this reversal caused any significant differences in the answering of the items the question remains whether this incident affected the results of the factor analysis to any extent.

Another limitation results from the unrepresentativeness of the samples. Therefore, the ability to generalize to distance education students in general are limited. One must recognize that the results represent specific students enrolled in specific courses during the Winter term of this specific year and not representative of The University of Calgary teleconference students for other times of enrolment. Similarly, even though the Athabasca sample was randomly selected, the low response rate and specific institutional context limit the generalizability. However, the results do provide descriptive data for the two sample groups used in the study. Further research is needed on different distance learning sample groups and on conventional education groups to further establish the universality and generalizability of the model.

Another limitation may lie in the instrument itself. Since these Likert-type scales were author developed they may not be valid despite being reviewed by a panel of distance

educators. Although reviewed by experts and pre-tested the instrument still rests on the assumption that the respondents answered the self-report questions honestly. Because the type of questions related to both experience and priority in a learning situation, there is the strong tendency for the questions to be answered with socially desirable responses.

There may have been other variables that could have been selected for inclusion in the study as indices of control. For example, student preference for control, learning styles, socioeconomic variables or variables related to specific technologies (eg., teleconference). The myriad of responses provided by students in the open-ended questions raises the question of whether other variables would have contributed more information to the analysis. The decision was made during the development of the instrument to keep the number of items manageable in terms of the time it took the student to fill out the questionnaire and to reflect the basic elements of the model. Further study may be necessary to identify more or different variables.

Theoretical Interpretation

As with other social sciences, adult education shares a continuing need to sort, classify, and label its phenomena of interest. Typologies and taxonomies facilitate communication, suggest problems for research and reduce large and complicated phenomena to manageable proportions (Boshier and Collins 1985:129).

The field theory of Kurt Lewin which describes behavior as the result of the interaction of the individual with the environment provided the theoretical and philosophical underpinnings of the proposed model of control. Similarly, discussions of relevant concepts and a movement toward theoretical development in the distance education literature was also used as a basis from which to conceptualize the proposed model.

This study was an attempt to analyze and structure some of the complexities of the adult learning situation in distance education. Further research is needed to test whether

this typology would, in fact, identify salient factors for the prediction of dropout, learner satisfaction, persistence and/or academic success.

The intention of this study was to operationalize the model and thus to initiate some preliminary groundwork from which further research could be developed. The intent was to test out to what extent the proposed model was congruent with student experience in distance education. Although the results of the factor analyses and open-ended questions suggest that the model was reasonably congruent with the experience and priorities of students, it does suggest that the original model is too parsimonious to fully explain the complexity of the learning situation in distance education. It became evident that it was inappropriate to subsume a large number of variables under the original categories without spelling out their specific similarities and differences. The results would seem to suggest that the model, as originally conceived, needs to be more fully delineated and that components/dimensions such as *independence*, *competence* and *support* are not as homogeneous as originally thought. It would appear that there is need to consider subdividing the original dimensions into separate and distinguishable subunits. For example, *independence* appears to be represented by both an element of *choice* as well as an element of *flexibility* with regard to time lines and scheduling. *Support* appears to include not only access to resources (both human and material) but an emphasis on the teacher-student relationship.

Competence seems to involve a demarcation of values and attitudes from skills and abilities that the student brings to the learning situation. There also appears to be need to redefine the emphasis or importance of some of the major concepts within the model. *Student Competency*, *Teacher/Tutor Support* and *Choice* account for a greater amount of variance than *Flexibility*, *Value Orientation* or *Access to Resources*.

Data from the open-ended responses seem to suggest a further differentiation under the original dimension of *support* to include *psychosocial* and *academic* support from the teacher/tutor. The former would include relationship skills such as providing encouragement, respecting and listening to the student. The latter would include providing structure, being accessible, providing resources, being organized, knowledgeable in the subject area and clear regarding expectations. The open-ended questions also revealed how such elements as lifestyle, time and institutional policies can be perceived as affecting control.

One of the issues that became very evident through examination of both the frequencies of response to the 28 item Likert-type scale (Scale I Experiences) and the open-ended questions, particularly the first question "What gives you control over your learning process?," was that the definition of *control* was bounded by the parameters of students experience in the learning situation.

At times the responses reflected what the student would like the situation to have been. The responses given in the open-ended section suggest that control of the learning process is a very complex, personal and situational phenomena. Generally speaking, the responses were quite narrow and reflected the level of choice and decision-making experienced by the students within the current parameters of the distance education learning transaction. Some differences in the situational context were evident as Athabasca students cited the opportunity to choose when and where to write exams and the ability of pace themselves whereas The University of Calgary students cited more frequently the opportunity to discuss ideas with others and have choice or input related to learning activities such essays and other assignments. The opportunity to contact the tutor when the student chose was indicated more frequently in the Athabasca group than The University of Calgary group as well.

Generally, control as perceived by the students, seems to contain essentially the same elements as those proposed by the model. However, the answers given by students, although reflecting primarily the context in which they operated, did provide some richer insight into the variety of ways in which a concept such as control of learning can be interpreted. This suggests the need for further research into student preference and individual needs for control. Control was conceived as ranging from freedom of choice regarding assignments, grading, content, etc., to working within timelines and schedules. It would be interesting to investigate further whether, for some students, awareness of what is expected of them with regard to deadlines, content of assignments, etc., is necessary for them to feel in control of their learning.

Similarly, the original model tended to combine the issue of accessibility and availability of both human and material resources under the one dimension of *support*. The relationship with the teacher/tutor was also subsumed under the original dimension of *support*. It became evident from the results of the factor analysis and the open-ended questions that the relationship between the teacher/tutor and the student should be augmented or more clearly articulated as a separate component of the larger umbrella concept of *support*. From the analysis, it would also appear that it is not only the contact with the teacher/tutor *per se* but the particular flavour or manifestation of this relationship that is significant.

In the open-ended part, when asked how a teacher/tutor can increase a student's control of learning, the students repeatedly suggested the necessity for the teacher to treat them as individuals, to listen to them, respect and generally acknowledge them as adults with experience and knowledge and a lifestyle that involves multiple roles and responsibilities.

Therefore, in conceptualizing the distance learning situation it becomes necessary to characterize or distinguish the teacher/tutor-learner relationship as separate from and possibly more significant than other types of support.

It may be surmised that the teacher/tutor relationship is composed of accessibility as well as a teaching style conducive to involvement of the learner. The results suggest that there may be need develop an additional sub-category of Teacher Competency and/or Value Orientation that addresses not only what the teacher brings to the learning situation in terms of knowledge, organizational skills and teaching ability but the attitudes toward education and the students as learners. This may include the ability to encourage and be supportive, the ability to treat students as equals and not only the ability to relate to the students as adults but the assumptions and beliefs that the teacher/tutor holds regarding control of the learning process.

A Suggested Integration

The results of the factor analyses indicated that there were six factors – three dominant and three minor factors. See Figure 4. The results of the open-ended responses supported these factors and also suggested some other variables that might be considered in the conceptualization of control in the distance education context. It is therefore suggested by the author that one way to integrate the factor analytic results and the open-ended responses is to consider the model of *control* within a broader context that not only incorporates the results of the current study but potentially could incorporate other variables and/or factors identified by other theoretical models and further research. The suggestion is as follows. When conceptualizing control of the learning process in distance education the following categories are suggested:

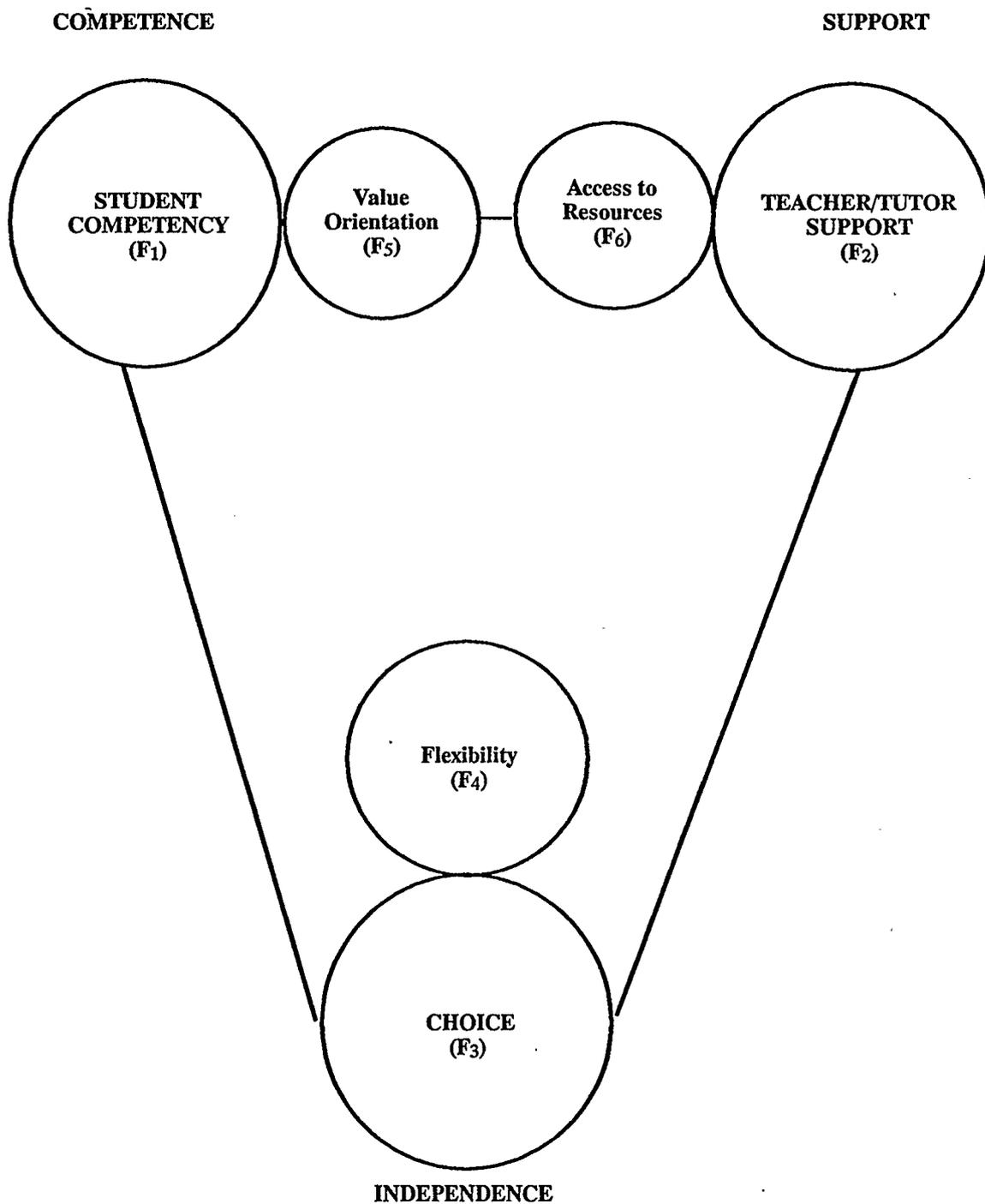


Figure 4
Factors Identified by the Factor Analysis
(Scale I)

1. **a predispositional category:** These are elements that predispose the student and/or the teacher/tutor to enter the distance learning situation in the first place. One of the factors identified in this study could be included in this category – *Student's Value Orientation*. These components could be considered to indirectly affect the amount of control experienced by the student. This category may need to be broadened to include the value placed on education, preferences for control, the socioeconomic situation of the student, need for the course and previous educational experiences. This category could also include values that teachers/tutors possess related to education, their attitudes toward learners, their needs as educators and their socioeconomic situations.
2. **an operative category:** This category contains components which are interactive and operate within the communication between the teacher and learner during planning and particularly during the instructional phase of the learning process. These components directly affect the amount of control experienced by the student. The model of control tested in this study fits into this category. This includes the factors of *Student Competency*, (Competence), *Choice, Flexibility* (Independence), the *Relationship with the Teacher* and *Access to Resources* (Support). It could be argued that Value Orientation be included here as well, since attitudinal dispositions can not only affect ones ability to enter but to persist in a learning situation.
3. **an environmental/contextual category:** These components exist in the environment of the student and/or teacher and indirectly contribute to the enhancement or inhibition of the amount of control experienced by the student in the teaching-learning situation. These would include institutional

elements such as registration and other administrative procedures/policies, the larger political and economic climate, the availability of distance education courses and the lifestyle of the student. For example, transferability of courses may afford the student greater control over learning than inability to receive credit from other institutions. Course design, the time available to study, distance from resources etc. are all variables that appear to determine, to varying degrees, the amount of control available to the student in the learning process.

The intention of the above conceptualization was to place the model explored in this study into a larger context, taking into consideration the responses made in the open-ended section of the questionnaire. This conceptualization addresses the elements that directly affect the student's control of learning when in interaction with the teacher (operative components) and also elements that indirectly affect the control of the student – predispositional and environmental elements. See Figure 5.

The potential contribution of this model of control to distance education theory is that it may provide a conceptual schemata for further description and explanation of the distance learning situation. As a premise from which to communicate the complexity of the teaching-learning situation, particularly the interaction of several different components, this model may provide a basis from which to identify additional factors to promote the understanding and explanation of the distance learning context and a basis from which to develop predictive studies.

The results of this analysis support the perspective provided by Lewin's theory regarding the person-environment interaction and suggest a basis for the analysis and thus increased understanding of the complexities of the individual adult distance learner operating within the social and physical environment.

The predictive power of this conceptualization has yet to be tested. However, some parallels between the control model and other typologies in the adult and distance education literature appear.

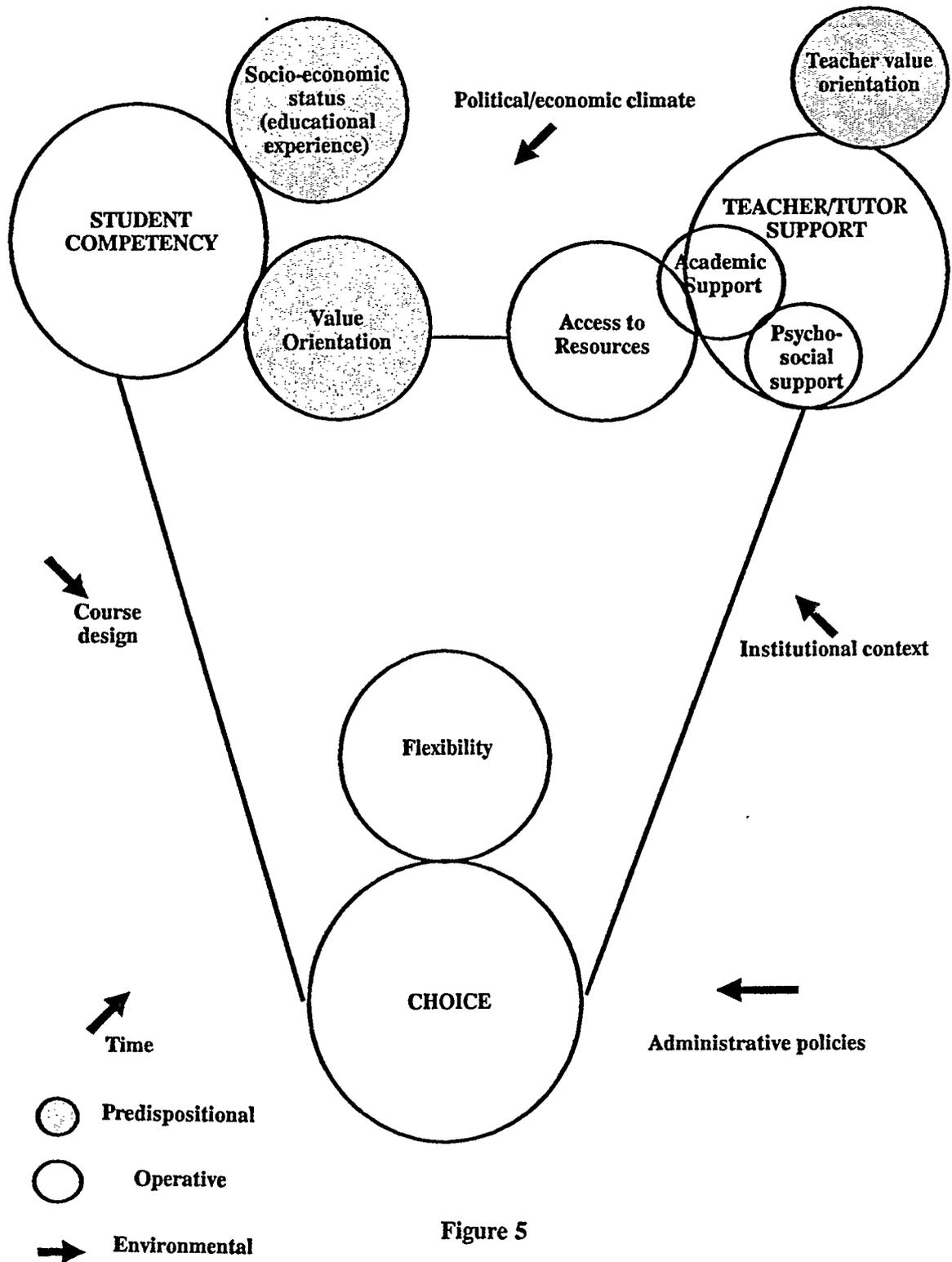


Figure 5
Components Suggested by the Open-ended Responses
Combined with the Six Factor Solution

The results of this analysis tend to provide support for the inclusion of a value orientation as well as the consideration of skills and abilities. Such values and beliefs as enjoyment of learning, belief in one's own responsibility for success or failure, the desire to learn, interest in the course etc. all seem to reflect a basic belief in and value placed on the process of learning. Much of the open-ended information that solicited information on student characteristics coupled with the identification of factors entitled *Student Value Orientation* and *Student Competency* seem to suggest a parallel with many of the variables identified in Tinto's (1975) model such as family background, individual attributes and goal commitment.

If this model is to have the potential for predictive studies related to adult participation in distance education and/or for the prediction of drop-out or persistence in distance education then the attitudinal or value orientation of the individual student needs to be demarcated. As Tinto (1975:93) points out:

... if one wishes to develop a theoretical model of dropout from college, one which seeks to explain the longitudinal process of interactions that lead differing persons to varying forms of persistence and/or dropout behavior, one must build into the model sets of individual characteristics and dispositions relevant to educational persistence. To do this, it is suggested here that one must include not only background characteristics of individuals (such as those measured by social status, high school experiences, community of residence, etc. and individual attributes such as sex, ability, race and ethnicity) but also expectational and motivational attributes of individuals (such as those measured by career and educational expectations and levels of motivation for academic achievement (Tinto, 1975:93).

Similarly, the inclusion of the *Student Competency* factor, *Value Orientation* and the placing of the control model in a larger context parallels the suggestion in the ISSTAL Model adapted from Smith by Cookson (1986). He suggests the importance of the inclusion of "... six classes of independent antecedent variables: external context factors, social background and social role factors, personality and intellectual capacity factors, attitudinal dispositions, retained information, and situational factors" (Cookson 1986:131).

It would appear that the factor analysis and the open ended questions have identified similar factors to those suggested by Pratt (1988). His conceptualization includes three interacting sets of variables. Situational variables include variables such as time, content and cost; learner variables include self-confidence, commitment and prior knowledge and teacher variables include personality, confidence, experience and training. The factor analysis in this study identified *Student Competency* which includes study skills, confidence, time management skills and ability to handle the course and *Value Orientation* which includes enjoyment of learning, interest in the course and belief in one's responsibility for learning. These would appear to parallel Pratt's learner variables. Pratt (1988) suggests that learners' desires or preferences for control are often situationally determined and related to the level of competence, confidence and commitment to educational goals.

Although the analysis in this study is highly speculative, at minimum it does suggest some questions for further research; but more importantly it suggests the usefulness of the proposed model to assist in the understanding of a complex interactive learning situation and to potentially provide a basis from which to test hypotheses with independent (i.e. orthogonal) predictors. The order suggested by the model, among seemingly disparate variables, encourages theoretical speculation and formulation by reducing complexity as well as providing a means to operationalize some relatively abstract concepts. "The nature of typologies and factor structures is descriptive. Their function is to help organize raw experience in a way that is meaningful" (Darkenwald and Valentine 1985:179).

The factors identified in this analysis, particularly those related to student characteristics may reflect necessary conditions or ingredients for students not only to achieve control over their learning processes but to persist in a learning situation. It may be speculated that the same character traits that predispose the learner to enter and persist in a learning situation are the ones that provide the learner with a preference to control

their learning process. The question may also be raised whether low levels of control may be tolerated by those students who hold strong values related to the instrumental worth of educational endeavours, have strong goal orientations, ambition and self-determination.

This section suggested that the model of control as tested in this study has some potential utility for the further theoretical development and understanding of the distance education context. The model provides some data that parallels other conceptualizations and typologies in the adult and distance education literature.

Implications for Practice

This section addresses the practical utility of the model of control for distance education. Keeping in mind the limitations regarding the generalizability of the findings, an attempt will be made to extrapolate to the practice of distance education and suggest some ways to apply the information found in this study to other aspects of adult education as well.

One of the most significant implications of this study for the practice of adult education within the distance education context is the provision of a framework from which to conceptualize, analyze and make decisions related to the teaching-learning interaction. The conceptualization of the teaching-learning situation in terms of, at least, these six factors may be used by teachers/tutors as a means to assess learners' initial needs coming into the learning situation. Similarly, it could be used for the assessment of continued, possibly changing needs throughout the learning process.

This model may provide a framework from which the degree of control can be negotiated between the teacher/tutor and student. Taking into consideration the needs of the students, the complexity of the content and the administrative flexibility, the amount of direction and/or freedom given the student can be negotiated and adjusted. Decisions

regarding the amount of control available in the teaching learning situation can be made in consultation with students so that control becomes an explicit issue, the result of a conscious decision on the part of the teacher and learners and not something that is imposed by the teacher without due consideration. Operative components may be altered to increase flexibility and choice and thus the degree of control the student has in the learning situation. Similarly, awareness of contextual and predisposing components may provide the teacher/tutor with greater understanding of the context in which the student and the teacher operate.

By using the model as a means to conceptualize the teaching-learning situation in distance education teachers/tutors may have a basis from which to assist students to make informed decisions regarding the amount of control appropriate for particular situations. For example, if the content of a course is extremely complex and/or necessary to meet institutional or professional requirements then it may be necessary for the student to relinquish greater control to the teacher/tutor. Or, if support, in the form of library resources is not available, then the student may have to rely more heavily on the resources supplied by the teacher. Content that involves personal exploration such as values and/or information that is directly applicable to a particular job situation may lend itself to greater flexibility in terms of delivery and the structuring of assignments and other learning activities.

Judgments regarding the degree of control appropriate can then be based on the combination of explicit situational (content) and individual (competency) variables. By conceptualizing learner control in terms of these six factors the teacher/tutor can analyze the educational transaction. *Student Competency* can be considered a concept around which assessments of student ability to learn on their own, their confidence level, motivational level and study skills can be assessed. *Support* indicates the importance of the teacher/tutor

relationship and implies assessment of the resources needed by and accessible to the student. This is an important consideration during planning. Being aware of the need to be accessible to students and exploring ways, with them, to maximize this will help to contribute to student control of the learning process. *Independence (Choice/Flexibility)* can help to focus thinking on issues such as course design, student decision-making and accommodation of student lifestyles. When attempts are made by the teacher/tutor to keep these factors in dynamic balance, conscious, deliberate assessments and decisions can be made during planning and instructional phases. Theoretically, this could lead to optimal matching of content demands, students needs, abilities and available resources.

Related to this is the role of the teacher/tutor. Many authors have addressed this issue in adult and distance education (Rogers 1969; Bruner 1971; Tough 1978, 1979, 1982; Moore 1972, 1973, 1986; Wedemeyer 1981; Knowles 1978; Jarvis 1983; Brookfield 1986). From both the factor analysis and the open-ended question the importance of the teacher-learner relationship and its role in the provision of support was indicated. The importance of how the teacher/tutor relates to the student was reinforced both in the student comments and the factor loadings. This included the need for respect and acknowledgement of the learner as a person with experience, knowledge and competence and also a person with additional responsibilities in life, studying being only one of these. Similarly, it included treating students as peers, providing encouragement and support and allowing students to come up with their own ideas.

The role that is implied by the factor analysis and the open-ended questions is one of facilitator including the provision of direction and guidance. "The tutor acts as a resource person, a procedural specialist, and a co-inquirer, and does not try to make the other person learn" (Moore 1986:19). Adult learning is facilitated when activities provide a balance between independent functioning and interdependent, interpersonal relationships

(Brundage and MacKeracher 1980:115) and when learning is perceived as a cooperative rather than a dictatorial process (Jarvis 1983:168). Tough perceived the role of the teacher/tutor as one of a helping relationship. He states that “the ideal helper has confidence in the learner’s ability to make appropriate plans and arrangements for his learning” (Tough 1982:182,183).

Conceptualizing *control* in the way suggested by the model places the emphasis on the interaction and interdependence between student and teacher/tutor. Therefore, from a practitioner’s point of view this model provides a wholistic conception of the teaching-learning process taking into consideration not only the intrapersonal characteristics of the student, the interpersonal exchange between student and teacher but the social environment of the student.

The *control* model suggests some points for intervention for distance education practitioners to increase the probability of student satisfaction, participation and/or persistence. Operative factors such as the amount of choice, flexibility, how the teacher/tutor relates to the student, the availability of resources may all provide indices to gauge learners’ needs with respect to control. Whether the content dictates close guidance or the student’s lack of experience suggests the need for closer supervision and support, the model provides a basis or conceptual guideline from which to determine and decide, in collaboration with the student, the optimum amount of control appropriate for that individual.

The major value of the control typology or model was to establish some order to an array of variables operative in the distance education learning situation and to attempt to explain and go beyond concepts such as *independence* and *autonomy*. McKinney (1966) suggested that order can be accomplished through the establishment of conceptual schemes that present a systematic interconnection of concepts and observations. The conceptual model presented here could provide a step in that direction.

An attempt to determine the relative contribution of these typological or conceptual variables in predicting persistence, course satisfaction and/or academic success may be of interest to teachers and administrators of distance education. The results suggest that teachers/tutors and administrators may wish to place greater emphasis on providing students, if the student so chooses, with greater choice and input into the content of courses, assignments and allow greater flexibility in deadlines to accommodate lifestyles, competing social roles and responsibilities.

The results of this study may also have implications for the design of instructional materials. Traditionally, correspondence programs have been pre-packaged, rigidly structured courses. There is seldom optional learning objectives or alternative ways of attaining established goals. Usually all students study the same material in similar ways (Baath 1980:25). This “. . . tends to enforce a pattern of ‘us’ providing and ‘them’ receiving” (Harrison 1974:3). The inflexibility and lack of choice does not allow students to apply their experience and/or background and differences in capacity to learn are not taken into account (Ljosa and Sandvold 1983:299; Childs 1971:112). Chesterton (1985) notes that the “particular characteristics of distance education tend to shift the focus of curriculum control heavily towards the institution and its staff and away from the students” (p.32). However, based on the factor analysis and the responses in the open-ended questions there may be ways to *build in* greater freedom of choice in objectives, learning activities and evaluation procedures as well as provide greater flexibility in terms of time lines and deadlines (Childs 1971; Cumming and Mackay 1982; Harrison 1974; Ljosa and Sandvold 1983). Encouraging students to choose their own topics and timing for projects, negotiating the scope and phasing of the work as well as the evaluation criteria may be ways to increase flexibility and choice. Having the freedom to choose material on different levels of difficulty, based on personal experience or interest, or being able to develop projects

directly related to the students home or work environment will not only provide the student with more options, choice and hence control but could also provide the flexibility to accommodate differing student preferences for control. Approaches such as these will tend to “. . . place the students in the centre of the learning process. Instead of letting the course material choose for him/her, the student himself/herself will be the active part, taking the initiative in the choices that have to be made” (Ljosa and Sandvold 1986:299)

Related to this is the implication for distance learning institutions to consider ways to incorporate student input into course production teams and planning processes. “As developers of course material we tend to think of the student solely as a student, so that the student’s environment consists of nothing but the course” (Ljosa and Sandvold 1983:305). Student participation on planning committees and other forms of assessment and evaluation may be necessary to keep programs flexible and accommodating to student needs and lifestyles (Boone 1985:112). Similarly, the results suggest the need for administrators to keep in mind the possibility of building in certain amounts of flexibility and choice into administrative policies and decrease bureaucratic procedures so that student control of their learning can be maximized.

Another implication of this study is the need for the teacher and tutor to be cognizant of and attuned to the control needs of their adult students. Being aware that students may differ in their preference for and need to control their learning process may increase the instructor’s ability to be more responsive to students in general and to certain students in particular.

This study has provided some preliminary data that indicate the existence of several factors operating within the teaching-learning situation. This study suggests that this transaction between teacher and learner in distance education is indeed complex but the proposed model has offered a means to reduce the complexity of this interaction into some

manageable components that may provide a basis from which to understand and investigate this area of study further.

Conclusions

The results of this preliminary investigation into how isomorphic the proposed model of *control* was with student experiences in distance education suggest that the data were reasonably close to the original model. Therefore, the following conclusions can be drawn:

1. The proposed dimensions: *Independence*, *Competence* and *Support* were more complex than originally envisaged. Although three major factors were identified, three minor factors also emerged. The dimension of *Competence* was subsequently divided into *Student Skills and Abilities* and *Student Value Orientation*; *Support* broke down into *Teacher-learner Relationship* and *Access to Resources* while *Independence* became a composite of *Choice* regarding content items and *Flexibility* in terms of time lines.
2. Data from the open-ended questions suggested a further demarcation of *Teacher/tutor Support* into **psychosocial** and **academic** support.
3. The teaching-learning situation in distance education is very complex. A model such as described above can help to reduce this complexity and provide a basis for further theory and research.
4. The model of *control* needs to be understood within a larger context that takes predispositional as well as contextual components into consideration. Therefore, to describe the distance education context:

- a. predispositional elements related to the student and the student's social environment need to be considered. This includes socioeconomic factors as well as value or attitudinal factors.
 - b. operative factors (*Student Competency, Teacher/tutor Support, Choice, Flexibility* and *Access to Resources* need to be considered in concert with **environmental** or **contextual** factors such as the administrative context in which the teacher/tutor must operate and the environment in which the learner operates.
5. Placing the original model within a larger context of predispositional and environmental components helps to conceptualize the distance learning context in terms of components operating **consecutively** as well as **simultaneously**. This may assist in capturing the dynamic aspect of the learning situation.

This study has provided some preliminary data that suggest the existence of at least six factors operating within the teaching-learning transaction in distance education. The data provide a reasonable reflection of the proposed model both in terms of its consistency with the person-environment interaction of field theory and in terms of the separability and identifiability of its underlying structure. Although a reasonable reflection of the proposed model is suggested further research is necessary to move the information beyond the initial stages of a highly speculative and purely theoretical analysis. The following section suggests some implications for future research.

Implications for Further Research

One of the major contributions of this analysis is its implication for further research. This learner-centered study was intended to provide a preliminary basis from which to develop research in distance education based on the theoretical framework suggested by the model of *control*. Some of the potential directions for future research emerging from the current study include the following:

1. The six factors of the control model accounted for 54.4 percent and 56.3 percent of the total variance in Scale I and Scale II respectively. Since just over half of the total variance was explained this could be a result of underestimating the complexity of the phenomenon (the distance education situation). This may also reflect some problems with the reliability and validity of the instrument as well as the use of a relatively small sample. It may be advisable, in future, to attempt to obtain a stronger delineation of some of the trivial factors and possibly increase the amount of variance explained. This may necessitate the careful selection and inclusion of more variables with a larger, more representative sample size.
2. The question can be raised whether the complexity of the distance learning process creates a large number of unrelated and unique factors. Further research is indicated to answer this question.
3. There is need to establish the stability and universality of the factor structure. There is need for the establishment of its predictive validity. This could be accomplished by using the model as a conceptual basis for predictive studies related to student satisfaction with distance education

course, student success rates in distance education, learner participation in distance education and/or student persistence or dropout in distance learning.

4. The factors identified in the current study could be used as a basis from which to measure and compare the relative degree of control experienced by learners in different delivery modes in distance and/or conventional education.
5. There is the need to replicate this study on a larger sample and to attempt to test it out on a variety of different populations to further test its validity. Using learners in conventional education would attempt to test its applicability to this population as well as the distance learning context.
6. The present instrument may serve as a preliminary prototype for the development of a more sophisticated instrument to measure the degree of control experienced by distance and/or conventional learners.
7. The results of this analysis also highlight the importance of examining further the ingredients of the teacher/tutor relationship in distance education and its potential for the enhancement or inhibition of learner control.
8. The results of this analysis suggest the need to examine variables related to student competency particularly in relation to participation in adult education. This may include looking more closely at student preferences for control.
9. Discrepancy between what students experience in terms of control and what they prefer or wish to experience may provide useful information related to satisfaction, persistence and academic success.

10. Comparative data between The University of Calgary and Athabasca University may contribute to an increased understanding of the distance learning context.
11. Confirmatory factor analysis, using a 6 factor solution would further test the validity of the model.
12. The teacher's perspective regarding learner control would provide additional information.

Recapitulation

This chapter provided a discussion of the results of the study. A summary of the analysis was provided followed by a discussion of the study's limitations. An interpretation from a theoretical perspective was presented, placing the original model in a larger context and relating it to other conceptual models. The study's implications for practice were discussed, the conclusions were outlined and the chapter ended with suggestions for further research.

REFERENCES

- Allen, A.R., & Harshberger, M. (1977). Student locus of control and teaching style in relation to college reading improvement. *Reading Improvement, 14* (2), 104-108.
- Arnkoff, D.B., & Mahoney, M. (1979). The role of perceived control in psychopathology. In L.C. Perlmutter, & R.C. Monty (Eds.), *Choice and Perceived Control*, 155-174. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Averill, J.R. (1973). Personal control over aversive stimuli and its relationship to stress. *Psychological Bulletin, 80*, 286-303.
- Baath, J.A. (1980). Postal two-way communication in correspondence education. Malmö, Sweden: Liber Hermods.
- Babbie, E. (1983). *The practice of social research*. Belmont, CA: Wadsworth Publishing Co.
- Beniger, J.R. (1986). *The control revolution*. Cambridge, MA: Harvard University Press.
- Bigge, M.L. (1971). *Learning theories for teachers*. New York: Harper Row.
- Bochner, A.P., & Lenk Krueger, D. (1979). Interpersonal communication theory and research: An overview of inscrutable epistemologies and muddled concepts. In D. Nimmo (Ed.), *Communication Yearbook, 3*, 197-211. Transaction. New Brunswick.
- Boone, E.J. (1985). *Developing programs in adult education*. Englewood Cliffs, NJ: Prentice Hall.
- Boshier, R., & Collins, J.B. (1985). The Houle topology after twenty-two years: A large scale empirical test. *Adult Education Quarterly, 35*, Spring, 113-120.
- Brehm, S., & Brehm, J.W. (1981). *Psychological reactance: A theory of freedom and control*. New York: Academic Press.
- Brenders, D. (1987). Perceived control: Foundations and directions for communication research. *Communication Yearbook, X*, 86-116. Newbury Park, CA: Sage Publications.
- Brookfield, S.D. (1983). *Adult learners, adult education and the community*. Milton Keynes, UK: Open University Press.
- Brookfield, S. (1984). Self-directed adult learning: A critical paradigm. *Adult Education Quarterly, 35*(2), 59-71.
- Brookfield, S. (1985a). A critical definition of adult education. *Adult Education Quarterly, 36*(1), 44-49.
- Brookfield, S. (Ed.). (1985b). Self-directed learning: From theory to practice. *New Directions for Continuing Education, 25*. San Francisco, CA: Jossey Bass.

- Brookfield, S. (1986). *Understanding and facilitating adult learning*. San Francisco, CA: Jossey Bass.
- Bruner, J. (1971). *Toward a theory of instruction*. Cambridge, MA: The Belknap Press.
- Brundage, D.H., & MacKeracher, D. (1980). *Adult learning principles and their application to program planning*. Toronto: Ministry of Ontario.
- Caffarella, R.S., & Caffarella, E.P. (1986). Self-directedness and learning contracts in adult education. *Adult Education Quarterly*, 36(4), 226-234.
- Cattell, R.B. (1966). Handbook of multivariate experimental. *Psychology*. Chicago: Rand McNally.
- Cavanagh, P., Thornton, C., & Morgan, R.G.T. (1965). The British European airways study. *Programmed Learning*, 2, 118-125.
- Chene, A. (1983). The concept of autonomy in adult education: A philosophical discussion. *Adult Education Quarterly*, 34(1), 38-47.
- Cheren, M. (1983). Helping learners achieve greater self-direction. In R.M. Smith (Ed.), *Helping adults learn how to learn*, 23-27. San Francisco, CA: Jossey Bass.
- Chesterton, P. (1985). Curriculum control in distance education. *Teaching At A Distance*, 26, 32-37.
- Childs, G.B. (1971). Recent research developments in correspondence instruction. In O. Mackenzie and E.L. Christensen (Eds.), *The changing world of correspondence study*, 109-119. University Park, PA: The Pennsylvania State University Press.
- Comrey, A.L. (1973). *A first course in factor analysis*. New York: Academic Press.
- Cookson, P.S. (1986). A framework for theory and research on adult participation. *Adult Education Quarterly*, 36(3), 130-141.
- Coser, L.A. (1982). The notion of control in sociological theory. In J. Gibbs (Ed.), *Social control views from the social sciences*. Beverley Hills, CA: Sage Publications.
- Cumming, A., & Mackay, R. (1982). Increasing student involvement and minimizing teacher dominance: The assessment and practice of writing improvement. Paper 82. In J.S. Daniel, M.A. Stroud, & J.R. Thompson, *Learning at a distance a world perspective*, 222-226. Athabasca University.
- Daniel, J.S., & Marquis, C. (1979). Interaction and independence: Getting the mixture right. *Teaching At A Distance*, 14, 29-43.
- Daniels, R.L., & Stevens, J. P. (1976). The interaction between the internal-external Locus of Control and two methods of college instruction. *American Educational Research Journal*, 13(2), 103-113.

- Darkenwald, G.G., & Merriam, S.B. (1982). *Adult education foundations of practice*. New York: Harper Row.
- Darkenwald, G.G., & Valentine, T. (1985). Factor structure of deterrents to public participation in adult education. *Adult Education Quarterly*, 35(4), 177-193.
- deCharms, R. (1979). Personal causation and perceived control. In L.C. Perlmutter, & R.C. Monty (Eds.), *Choice and perceived control*, 29-39. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Delling, M.R. (1987). Towards a theory of distance education. *International Council for Distance Education Bulletin*, 13, January, 22-25.
- Deci, E.L. (1980). *The psychology of self-determination*. Lexington, KY: Lexington Books.
- deRivera, J. (1976). *Field theory as human science*. New York: Gardner Press.
- Dodds, T. (1983). *Administration of distance-teaching institutions - A manual*. Cambridge, MA: International Extension College.
- Dowaliby, F.J., & Schumer, H. (1973). Teacher centered vs. student centered mode of college classroom instruction as related to manifest anxiety. *Journal of Educational Psychology*, 64(2), 125-132.
- Field, L. (1989). On investigation into the structure, validity and reliability of Guglielmino's self-directed learning readiness scale. *Adult Education Quarterly*, 39(3), 125-139.
- Fischer, M.D., & Blackwell, L.R. (1975). Effects of student control and choice on engagement in a CAI arithmetic task in a low-income school. *Journal of Educational Psychology*, 67(6), 776-783.
- Furio, B.J. (1987). *The relationship between instructor behaviors and student perception of control in the classroom*. York College of Pennsylvania. (ERIC Document Reproduction Service No. ED 291, 124.)
- Garrison, D.R., & Shale, D. (1987). Mapping the boundaries of distance education: Problems in defining the field. *American Journal of Distance Education*, 1(1), 7-13.
- Garrison, D.R., & Baynton, M. (1987). Beyond independence in distance education: The concept of control. *American Journal of Distance Education*, 1(3), 3-15.
- Garrison, D.R. (1989). *Understanding distance education: A framework for the future*. London, UK: Routledge.
- Guglielmino, L.M. (1978). *Development of the self-directed learning readiness scale*. Unpublished Doctoral Dissertation. University of Georgia.
- Hannafin, M. (1984). Guidelines for using Locus of Instructional Control in the design of computer-assisted instruction. *Journal of Instructional Development*, 7(3).
- Harman, H.H. (1976). *Modern factor analysis*. Chicago: The University of Chicago Press.

- Harrison, B. (1974). The teaching-learning relationship in correspondence tuition. *Teaching At A Distance*, 1, 2-8.
- Hiemstra, R. (Ed.). (1980). Policy recommendations related to self-directed adult learning. Occasional Paper 1. Continuing Education Publications (CEP-). Division of Educational Development and Administrative Studies, Syracuse University. Adult Education: Syracuse, NY.
- Holmberg, B. (1985). *Status and trends of distance education*. Lund, Sweden: Lector Publications.
- Holmberg, B. (1986). *Growth and structure of distance education*. London, UK: Croom Helm.
- Isaac, S., & Michael, W. (1974). *Handbook in research and evaluation*. San Diego, CA: Robert R. Knapp Publishing.
- Jarvis, P. (1983). *Adult and continuing education theory and practice*. London, UK: Croom Helm.
- Jarvis, P. (1986). Models of distance education. *International Council of Distance Education Bulletin*, 11, May, 51-57.
- Jelden, D.L., & Brown, B.R. (1982-83). A generalized learner-controlled education system. *Journal of Educational Technology Systems*, 11(1), 13-21.
- Katz, D., & Kahn, R. (1978). *The social psychology of organizations*. New York: John Wiley & Sons.
- Keegan, D. (1986). *The foundations of distance education*. London, UK: Croom Helm.
- Keegan, D. (1988). Problems in defining the field of distance education. *American Journal of Distance Education*, 2(2), 4-11.
- Kember, D., & Dekkers, J. (1987). The role of study centres for academic support in distance education. *Distance Education*, 8(1), 4-17.
- Knapp, M.L., & Miller, G.R. (Eds.). (1985). *Handbook of interpersonal communication*. Beverley Hills, CA: Sage Publications.
- Knowles, M. (1978). *The adult learner: A neglected species*. Houston, TX: Gulf Publication Co.
- Langer, E.J. (1983). *The psychology of control*. Beverley Hills, CA: Sage Publications.
- Laurillard, D.M. (1984). Interactive video and the control of learning. *Educational Technology*, June, 7-14.
- Lefcourt, H.M. (1976). *Locus of control. Current trends in theory and research*. Hillsdale, NJ: Lawrence Erlbaum Associates.

- Lefcourt, H.M. (Ed.). (1981). *Research with the locus of control. Vol. 1. Assessment Methods*. New York: Academic Press.
- Lefcourt, H.M. (Ed.). (1984). *Research with the locus of control construct. Vol. 3. Extensions and limitations*. Orlando, FL: Academic Press.
- Lewin, K. (1942). Field theory and learning. In N.B. Henry, (Ed.), The forty-first yearbook of the National Association for the Study of Education. Part II. *The Psychology of Learning*, 215-239. University of Chicago Press.
- Lewin, K. (1951). *Field theory in social science*. New Hork: Harper & Row.
- Lewis, L.H. (1984). Support systems: An essential ingredient for high-risk students. *Adult Literacy and Basic Education*, 8(2), 73-79.
- Lewis, R. (1981). A correspondence college considers local support. *Teaching At A Distance*, 20, Winter, 48-54.
- Ljosa, E., & Sandvold, K.E. (1983). The student's freedom of choice within the didactical structure of a correspondence course. In D. Sewart, D. Keegan, & B. Holmberg (Eds.), *Distance education: International perspectives*, 291-315. London, UK: Croom Helm.
- McKinney, J. (1966). *Constructive topology and social theory*. New York: Appleton Century Crafts.
- Merrill, D.M. (1984). What is learner control? In *Instructional Development: The State of the Art, II*. (IR 013 273). (ERIC Document Reproduction Service No. ED 298 905.)
- Mezirow, J. (1981). A critical theory of adult learning and education. *Adult Education*, 32(1), 3-24.
- Milheim, W.D., & Azbell, J.W. (1988). *How past research on learner control can aid in the design of interactive video materials*. Proceedings of the Association for Educational Communications and Technology. January. New Orleans. (ERIC Document Reproduction Service No. 295 652.)
- Moore, M.G. (1972). Learner autonomy: The second dimension of independent learning. *Convergence*, 5(2), 76-87.
- Moore, M.G. (1973). Toward a theory of independent learning and teaching. *Journal of Higher Education*, 44(12), 661-679.
- Moore, M.G. (1983a). On a theory of independent study. In D. Sewart, D. Keegan, & B. Holmberg, (Eds.), *Distance education: International perspectives*, 63-94. London, UK: Croom Helm.
- Moore, M.G. (1983b). Self-directed learning and distance education. *Ziff Papiere #48*. Hagen: Fern Universitat.

- Moore, M.G. (1986). Self-directed learning and distance education. *Journal of Distance Education, 1*(1), 7-24.
- Moore, M.G. (1987). Learners and learning at a distance. *International Council For Distance Education Bulletin, 14*, May, 59-65.
- Morrow, A.J. *The practical theorist. The life and work of Kurt Lewin*. New York: Basic Books.
- Neel, A. (1977). *Theories of psychology: A handbook*. New York: John Wiley & Sons.
- Nelson, H. (Ed.). (1942). The forty-first yearbook of the National Association for the Study of Education. Part III. *The Psychology of Learning*. Chicago: University of Chicago Press.
- Nie, N., Hull, C.H., Jenkins, J.G., Steinbrenner, K., & Bent, D. (1975). *SPSS statistical package for the social science*. New York: McGraw Hill.
- Neil, M. (Ed.). (1981). *Education of adults at a distance*. London, UK: Kogan Page.
- Osgood, C., Succi, E., George, J., & Tannebaum, P.H. *The measurement of meaning*. Urbann, IL: University of Illinois Press.
- Penland, P. (1979). Self-initiated learning. *Adult Education, 29*(3), 170-179.
- Peters, O. (1971). Theoretical aspects of correspondence instruction. In D. MacKenzie, & E.L. Christensen, (Eds.), *The changing world of correspondence study*. University Park, PA: Pennsylvania State University.
- Oddi, L.F. (1986). Development and validation of an instrument to identify self-directed continuing learners. *Adult Education Quarterly, 36*(2), 97-107.
- Oddi, L.F. (1987). Perspectives on self-directed learning. *Adult Education Quarterly, 38*(1), 21-31.
- Phares, E.J. (1976). *Locus of control in personality*. New Jersey: General Learning Press.
- Pratt, D.D. (1988). Andragogy as a relational construct. *Adult Education Quarterly, 38*(3), 160-181.
- Rogers, C. (1969). *Freedom to learn*. Ohio: Charles E. Merrill Publishing Co.
- Ross, S.M., & Rakow, E.A. (1981). Learner control vs. program control as adaptive strategies for selection of instructional support on math rules. *Journal of Educational Psychology, 73*(5), 745-753.
- Rotter, J.B. (1973). *Social learning and clinical psychology*. Englewood Cliffs, NJ: Prentice Hall Inc.
- Rumbles, G. (1986). *The planning and management of distance education*. London, UK: Croom Helm.

- Sasscer, M.F., & Moore, D.M. (1984). A study of the relationship between learner control patterns and course completion in computer-assisted instruction. *PLET*, 21(1), 28-33.
- Schuttenberg, E.M., & Tracy, S.J. (1987). The role of the adult educator in fostering self-directed learning. *Lifelong Learning*, 10(5), 4-6, 9.
- Sewart, D. (1983). Distance teaching: A contradiction in terms? *Teaching At A Distance*. 8-18.
- Seligman, M. (1975). *Helplessness: On depression, development and death*. San Francisco, CA: W. H. Freeman and Co.
- Siebold, D.R., Cantril, J.G., & Myers, R.A. (1985). Communication and interpersonal influence. In M.L. Knapp, & G.R. Miller, (Eds.), *Handbook of interpersonal communication*, 551-607. Beverley Hills, CA: Sage Publications.
- Sites, P. (1975). *Control and constraint: An introduction to sociology*. New York: Macmillan Publishing Co.
- Snow, R. (1980). Aptitude, learner control and adaptive instruction. *Educational Psychologist*, 15(3), 151-158.
- Thurstone, L.L. (1947). *Multiple factor analysis*. Chicago: University of Chicago Press.
- Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research*, 45(1), 89-125.
- Tough, A. (1978). Major learning efforts: Recent research and future directions. *Adult Education*, 28(4), 250-263.
- Tough, A. (1979). *The adult's learning projects*. Toronto: Ontario Institute for Studies in Education.
- Tough, A. (1982). *Intentional changes: A fresh approach to helping people change*. Chicago: Follett Publishing Co.
- Wedemeyer, C.A. (1971). Problems in learning by correspondence. In O. Mackenzie, & E.L. Christensen, *The changing world of correspondence*, 120-127. University Park, PA: The Pennsylvania State University Press.
- Wedemeyer, C.A. (1977). Independent study. In A.S. Knowles, (Ed.), *The international encyclopedia of higher education*. CIHED Boston. 2114-2132.
- Wedemeyer, C.A. (1981). *Learning at the back door*. Madison, WI: University of Wisconsin.
- Wicklund, R.A. (1974). *Freedom and reactance*. Potomac: Lawrence Erlbaum Associates.
- Wilcox, W.C. (1979). *Interaction of learner control and student aptitudes*. Paper presented at the Annual Meeting of the American Educational Research Association. San Francisco, April.

APPENDIX A

PART I: PLEASE ANSWER THESE GENERAL QUESTIONS FIRST.**1. HOW MANY COURSES ARE YOU PRESENTLY TAKING?**

- 1.0 one _____
 1.1 two _____
 1.3 more than three _____

2. ARE THESE:

- 2.0 home-study course(s) _____
 2.1 teleconference courses _____
 2.2 a combination of home-study / teleconference _____
 2.3 other (please specify) _____?

3. FROM WHICH INSTITUTION?

- 3.0 The University of Calgary _____
 3.1 Athabasca University _____
 3.2 The Southern Alberta Institute of Technology _____

4. WHAT IS/ARE THE TITLE(S) OF THE COURSE(S)? _____
 _____**5. IN WHICH AGE CATEGORY ARE YOU?**

- | | | | |
|-----------------|-------|-----------------|-------|
| 5.0 18-24 years | _____ | 5.3 45-54 years | _____ |
| 5.1 25-34 years | _____ | 5.4 55-64 years | _____ |
| 5.2 35-44 years | _____ | 5.5 65 and over | _____ |

6. WHAT IS YOUR GENDER?

- 6.1 Male _____
- 6.2 Female _____

7. HIGHEST EDUCATIONAL LEVEL ACHIEVED:

- | | | | |
|---|-------|----------------------------|-------|
| 7.0 less than High School | _____ | 7.3 Bachelors degree | _____ |
| 7.1 High School | _____ | 7.4 Masters degree | _____ |
| 7.2 Post Secondary
Certificate/Diploma | _____ | 7.5 Doctorate | _____ |
| | | 7.6 Other (please specify) | _____ |

8. DO YOU LIVE IN AN AREA WITH A POPULATION:

- | | | | |
|---------------------------|-------|-----------------------|-------|
| 8.0 greater than 500,000? | _____ | 8.4 10,000 to 49,999? | _____ |
| 8.1 100,000 to 499,999? | _____ | 8.5 1,000 to 9,000? | _____ |
| 8.3 50,000 to 99,999? | _____ | 8.6 less than 1,000? | _____ |

9. PLEASE INDICATE WHY YOU ARE TAKING A COURSE BY DISTANCE EDUCATION:

- | | | | |
|-------------------------------|-------|--------------------------------|-------|
| 9.0 not available elsewhere | _____ | 9.4 allows greater flexibility | _____ |
| 9.1 self-improvement | _____ | 9.5 other (please specify) | _____ |
| 9.2 get a degree/diploma etc. | _____ | | |
| 9.3 saves travel time | _____ | | |

PART II: THE FOLLOWING STATEMENTS REFER TO SOME LEARNING SITUATIONS IN DISTANCE EDUCATION. PLEASE CIRCLE THE NUMBER THAT BEST INDICATES THE EXTENT TO WHICH YOU PRESENTLY EXPERIENCE THIS ITEM.

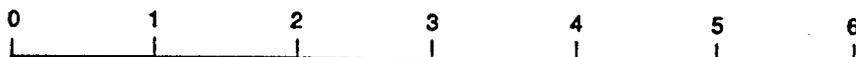
0 MEANS YOU DON'T EXPERIENCE IT AT ALL.

6 MEANS YOU EXPERIENCE IT TO A VERY GREAT EXTENT.

If you are taking more than one course, choose **one** to keep in mind while you answer. Try not to spend too much time on any one item. Your first reaction will be most accurate. There are no right or wrong answers.

NOT AT
ALL

TO A VERY
GREAT EXTENT



1. I am interested in the course I am taking 0 1 2 3 4 5 6
2. I have a 'say' in how my grade is determined 0 1 2 3 4 5 6
3. I have the financial support I need while taking this course 0 1 2 3 4 5 6
4. I have the study skills I need 0 1 2 3 4 5 6
5. I have input into what information/content is covered in the course 0 1 2 3 4 5 6
6. I have the emotional support of family and friends while taking the course 0 1 2 3 4 5 6
7. I have confidence in myself when I am learning 0 1 2 3 4 5 6
8. I have the opportunity to discuss with the teacher/tutor what I want to learn 0 1 2 3 4 5 6
9. I have a teacher/tutor who treats me like a peer or equal 0 1 2 3 4 5 6
10. I have the ability to motivate myself 0 1 2 3 4 5 6
11. I have a teacher/tutor who directs my learning 0 1 2 3 4 5 6
12. I decide how long it takes to complete the course 0 1 2 3 4 5 6
13. I know what I want to learn from the course 0 1 2 3 4 5 6
14. I have access to professionals (other than the teacher/tutor) who can help with learning (eg. counsellors) 0 1 2 3 4 5 6
15. I have access to library books, audio/video tapes etc. other than those supplied with the course 0 1 2 3 4 5 6
16. I have the ability to handle the course material 0 1 2 3 4 5 6
17. I have the freedom to choose the deadlines for my assignments and/or exams 0 1 2 3 4 5 6
18. I have access to other students for support or assistance 0 1 2 3 4 5 6
19. I have the freedom to decide when and how often I have contact with the teacher/tutor 0 1 2 3 4 5 6
20. I am able to handle my studying along with other demands on my time (work, family, etc.) 0 1 2 3 4 5 6
21. I am responsible for my success or failure 0 1 2 3 4 5 6
22. I enjoy learning 0 1 2 3 4 5 6
23. I have a choice in what courses I can take 0 1 2 3 4 5 6
24. I get encouragement/support from the teacher/tutor 0 1 2 3 4 5 6
25. I work on my own without direction from the teacher/tutor 0 1 2 3 4 5 6
26. I can get a hold of the teacher/tutor when I have questions I want answered 0 1 2 3 4 5 6
27. I have a 'say' in what assignments and other learning activities I want to do in the course 0 1 2 3 4 5 6
28. I have a teacher/tutor who encourages me to come up with my own ideas on things 0 1 2 3 4 5 6

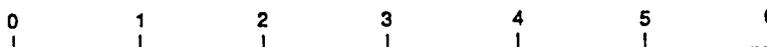
PART III: WHEN ADULTS CHOOSE TO TAKE COURSES BY DISTANCE EDUCATION THEY PLACE A HIGHER PRIORITY ON SOME THINGS THAN ON OTHERS. THIS PART IS CONCERNED WITH THE IMPORTANCE OR PRIORITY YOU PLACE ON CERTAIN LEARNING CONDITIONS WHEN YOU CHOOSE TO STUDY. PLEASE CIRCLE THE NUMBER THAT INDICATES WHAT PRIORITY OR DEGREE OF IMPORTANCE YOU PLACE ON EACH ITEM.

0 MEANS THE ITEM HAS NO IMPORTANCE FOR YOU AND YOU DON'T NEED TO HAVE IT WHEN YOU TAKE A COURSE.

6 MEANS THE ITEM HAS TOP PRIORITY - YOU MUST HAVE IT OR YOU WOULD NOT BOTHER TO TAKE THE COURSE.

No importance
don't need it

Top priority
must have it



- 1. Interest in the course 0 1 2 3 4 5 6
- 2. A 'say' in how my grade is determined 0 1 2 3 4 5 6
- 3. Financial support while taking a course 0 1 2 3 4 5 6
- 4. Study skills 0 1 2 3 4 5 6
- 5. Input into what information/content the course covers 0 1 2 3 4 5 6
- 6. The emotional support of family and/or friends while taking a course 0 1 2 3 4 5 6
- 7. Confidence in myself when learning 0 1 2 3 4 5 6
- 8. The opportunity to discuss with the teacher/tutor what I want to learn 0 1 2 3 4 5 6
- 9. A teacher/tutor who treats me like a peer or equal 0 1 2 3 4 5 6
- 10. The ability to motivate myself 0 1 2 3 4 5 6
- 11. A teacher/tutor who directs my learning 0 1 2 3 4 5 6
- 12. A flexible time schedule within which to complete the course 0 1 2 3 4 5 6
- 13. An idea of what I want to learn from the course 0 1 2 3 4 5 6
- 14. Access to professionals (other than the teacher/tutor) who can help with learning (eg. counsellors) 0 1 2 3 4 5 6
- 15. Access to library books, audiotapes etc. other than those supplied with the course 0 1 2 3 4 5 6
- 16. The ability to handle the course material 0 1 2 3 4 5 6
- 17. Flexibility in deadlines for assignments/exams 0 1 2 3 4 5 6
- 18. Access to other students for support or assistance 0 1 2 3 4 5 6
- 19. The freedom to decide when and how often I want contact with the teacher/tutor 0 1 2 3 4 5 6
- 20. The ability to manage studying along with other demands on my time (work, family, etc.) 0 1 2 3 4 5 6
- 21. The feeling that I am responsible for my success or failure 0 1 2 3 4 5 6
- 22. The enjoyment of learning 0 1 2 3 4 5 6
- 23. A variety of courses to choose from 0 1 2 3 4 5 6
- 24. Encouragement/support from my teacher/tutor 0 1 2 3 4 5 6
- 25. The opportunity to work on my own without direction from the teacher/tutor 0 1 2 3 4 5 6
- 26. Access to the teacher/tutor when I have questions I want answered 0 1 2 3 4 5 6
- 27. Choice in what assignments and other learning activities I do in the course 0 1 2 3 4 5 6
- 28. A teacher/tutor who encourages me to come up with my own ideas on things 0 1 2 3 4 5 6

EXAMPLE OF CONSENT FORM

I understand that the purpose of this research is to gather information about students' experience in distance education and I know my anonymity will be respected.

Signed _____

February 21, 1989

Dear _____:

I am a doctoral student at The University of Calgary studying Adult Education. I am particularly interested in distance education and how teleconference and home-study students define and experience control of their learning processes. I would greatly appreciate your completing the enclosed questionnaire. Your answers will help not only to provide a clear understanding of student experiences in distance education but provide information on how educational institutions can better meet the needs of students like yourself. The questionnaire should take you approximately 25 minutes to complete. I have enclosed a complimentary pen in appreciation of your cooperation.

All information will be completely anonymous. The number at the top of the questionnaire will be removed upon return to ensure your anonymity and, this way a reminder or follow-up letter will not be necessary. Your name will not be used since I am interested in group data only. But, because I am asking you to participate in a study your written consent is required. If you don't mind, please sign the attached form and return it with the questionnaire in the enclosed envelope by March 10, 1989. Thank you very much for your participation.

Yours truly,

Myra Baynton
PhD Candidate
Department of Educational Policy
and Administrative Studies
The University of Calgary

March 22, 1989

Dear teleconference student:

A few weeks ago I sent you a questionnaire asking about student experiences in distance education. As yet, I have not received your questionnaire. Your input is very important since an understanding of the distance learning transaction and the needs of the distance learner are derived from the responses of students like yourself.

I have enclosed another questionnaire for your convenience in case the original one was misplaced or lost in the mail. I realize that this is probably a busy time of year for you with Easter and classes finishing in early April, but I really would appreciate your cooperation. I am hoping to complete my data-collection in the first week in April so I would be grateful for a prompt response. Thank you very much for your time.

Yours truly,

Myra Baynton
PhD Candidate
Department of Educational Policy
and Administrative Studies
The University of Calgary

March 23, 1989

Dear Student:

A few weeks ago I mailed you a questionnaire asking about student experiences in distance education. If you have already returned your questionnaire, thank you very much for your cooperation. If you have not completed it, I would appreciate your response since your input is very important for an understanding of how you experience distance education and your needs as a distance learner of Athabasca University.

I have enclosed another questionnaire for your convenience in case the original one was misplaced or lost in the mail. I realize that this is probably a busy time of the year for you but I really would appreciate your cooperation. I am hoping to complete my data-collection in the first week of April so I would be grateful for a prompt response. Thank you very much for your time.

Sincerely,

Richard D. Hotchkis
Research Analyst
Centre for Distance Education
Athabasca University

sent Apr. 19/89

IF YOU
HAVE NOT YET
SENT IN YOUR
QUESTIONNAIRE
PLEASE SEND
IT - I NEED IT
THANKS!
MYRA

APPENDIX B

**Salient Factor Loadings after Orthogonal Rotation of the
Seven Factor Solution (Total Sample)**

Scale I

Variable	F.1	F.2	F.3	F.4	F.5	F.6	F.7
1					.43		
2			.57				
3							
4	.80						
5			.76				
6	.41						
7	.64						
8			.41				
9		.74					
10	.68						
11		.54					
12				.83			
13	.35*						
14						.55	
15						.62	
16	.47						
17				.79			
18				-.43			
19							.63
20	.51						
21					.42		
22					.68		
23					.41		
24		.75					
25							
26		.33*					
27			.62				
28		.63					

* highest loading for variable

**Salient Factor Loadings after Orthogonal Rotation of the
Five Factor Solution (Total Sample)**

Scale I					
Variable	F.1	F.2	F.3	F.4	F.5
1					.32*
2			.58		
3					
4	.81				
5			.66		
6	.38*				
7	.64				
8		.40	.44		
9		.75			
10	.69				
11		.56			
12				.83	
13					.36*
14			.41		
15					.45
16	.48				.47
17				.84	
18				-.34*	
19			.40		
20	.54				
21					.48
22					.62
23					.39*
24		.73			
25					
26					
27			.64		
28		.65			

* highest loading for variable

APPENDIX C

**Salient Factor Loadings after Oblique Rotation of the
Six Factor Solution (Delta = .0) (Total Sample)**

Scale I						
Variable	F.1	F.2	F.3	F.4	F.5	F.6
1						-.49
2			-.61			
3						
4	.81					
5			-.77			
6	.42					
7	.65					
8			-.49	-.48		
9				-.80		
10	.71					
11				-.59		
12		.86				
13						-.43
14					.43	
15					.52	
16	.54				.42	-.44
17		.83				
18		-.39*				
19					.57	
20	.55					
21						-.42
22						-.67
23						-.45
24				-.79		
25						
26				-.39*		
27			-.66			
28			-.47	-.71		

* highest loading for variable

**Salient Factor Loadings after Oblique Rotation of the
Six Factor Solution (Delta = .3) (Total Sample)**

Scale I						
Variable	F.1	F.2	F.3	F.4	F.5	F.6
1						-.49
2			-.61			
3						
4	.81					
5			-.77			
6				-.35*		
7	.66					
8			-.50	-.50		
9				-.80		
10	.71					
11				-.60		
12		.86				
13	.40					-.44
14					.43	
15					.51	
16	.56					
17		.83				
18		-.38*				
19					.57	
20	.55					
21						-.43
22						-.67
23						-.45
24				-.79		
25						
26				-.41		
27			-.67	-.41		
28			-.48	-.72		

* highest loading for variable

**Salient Factor Loadings after Oblique Rotation of the
Six Factor Solution (Delta = .5) (Total Sample)**

Scale I						
Variable	F.1	F.2	F.3	F.4	F.5	F.6
1	.36*					
2			-.55			
3						
4	.75	-.50		-.44		
5		-.40	-.74	-.49		
6	.46	-.42		-.41		
7	.62			-.40		
8			-.55	-.53	.43	
9	.47		-.43	-.74	.45	
10	.66	-.43				
11		-.49		-.56		
12		.63				
13	.45				.47	
14					.45	
15					.55	
16	.57				.55	
17		.56				
18		-.54				
19					.52	.43
20	.52					
21					.44	
22					.48	
23						
24	.44		-.44	-.73	.43	
25						
26	.42				.44	
27			-.69			
28		-.53	-.60	-.71		

* highest loading for variable

**Salient Factor Loadings after Oblique Rotation of the
Five Factor Solution (Delta = 0.0) (Total Sample)**

Variable	F.1	F.2	F.3	F.4	F.5
1					.37*
2				.58	
3					
4	.82				
5				.68	
6	.41				
7	.66				
8			-.45	.50	
9			-.78		
10	.71				
11			-.61		
12		.85			
13	.40				.45
14				.43	
15				.41	.48
16	.55				.55
17		.86			
18				.44	
19					
20	.56				
21					.51
22					.63
23					.41
24			-.76		
25					
26					
27				.67	
28			-.71	.43	

* highest loading for variable

**Salient Factor Loadings after Oblique Rotation of the
Five Factor Solution (Delta = 0.3) (Total Sample)**

Variable	F.1	F.2	F.3	F.4	F.5
1					.38*
2				.58	
3					
4	.81				
5				.68	
6	.42				
7	.66				
8			-.43	.51	
9			-.77		.39
10	.71				
11			-.62		
12		.85			
13	.42				.46
14				.44	
15				.41	
16	.56				.56
17		.85			
18				.44	
19					
20	.56				
21					.51
22					.62
23					.41
24			-.75		
25					
26					
27				.67	
28			-.71	.44	

* highest loading for variable

**Salient Factor Loadings after Oblique Rotation of the
Five Factor Solution (Delta = 0.50) (Total Sample)**

Variable	F.1	F.2	F.3	F.4	F.5
1					.40
2				.57	
3					
4	.79				
5				.67	
6	.43				
7	.66				
8			-.44	.53	
9	.43		-.77		.48
10	.71				
11		-.43	-.64		
12		.82			
13	.46				.50
14				.44	
15				.43	.51
16	.58				.58
17		.83			
18		-.36*			
19				.47	.43
20	.55				
21					.50
22					.61
23					.40
24			-.74		.42
25					
26					.39*
27				.67	
28			-.71	.43	

* highest loading for variable

APPENDIX D

**Factor Correlations for the
Seven Factor Oblique Solution (Total Sample)**

Scale I

Factor Correlations Delta = 0.00							
	F1	F2	F3	F4	F5	F6	F7
F1	1.00	-0.168	-0.296	0.255	0.229	.233	-0.097
F2	-0.168	1.00	-0.025	-0.155	0.081	.071	-0.179
F3	-0.296	-0.025	1.00	-0.07	-.296	-.0007	.105
F4	0.255	-0.155	-0.071	1.00	.231	.238	-0.221
F5	0.229	0.081	-0.296	0.231	1.00	.188	-0.240
F6	0.233	0.071	-0.0007	0.238	0.188	1.00	-0.148
F7	-0.097	-0.179	0.105	-0.221	-0.240	-0.148	1.00

Factor Correlations Delta = 0.30							
	F1	F2	F3	F4	F5	F6	F7
F1	1.00	-0.187	-0.105	-0.365	0.320	0.249	-0.238
F2	-0.187	1.00	-0.035	0.221	0.092	0.106	-0.226
F3	-0.105	-0.035	1.00	0.352	-0.368	0.016	0.098
F4	-0.365	0.221	0.352	1.00	-0.330	-0.268	0.093
F5	0.320	0.092	-0.368	-0.368	1.00	0.195	-0.261
F6	0.249	0.106	0.016	-0.268	0.195	1.00	-0.127
F7	-0.238	-0.226	0.098	0.093	-0.261	-0.127	1.00

**Factor Correlations for the
Six Factor Oblique Solution (Total Sample)**

Scale I

Factor Correlations		Delta = 0.00				
	F1	F2	F3	F4	F5	F6
F1	1.00	-.09	-.08	-.26	.27	-.27
F2	-.09	1.00	-.04	.14	.19	-.08
F3	-.08	-.04	1.00	.31	-.25	.06
F4	-.26	.14	.31	1.00	-.16	.27
F5	.27	.19	-.24	-.16	1.00	-.21
F6	-.27	-.08	.06	.27	-.21	1.00

Factor Correlations		Delta = 0.30				
	F1	F2	F3	F4	F5	F6
F1	1.00	-.12	-.11	-.35	.31	-.31
F2	-.12	1.00	-.05	.18	.22	-.10
F3	-.12	-.04	1.00	.38	-.26	.09
F4	-.35	.18	.38	1.00	-.18	.35
F5	.31	.21	-.26	-.18	1.00	-.20
F6	-.31	-.10	.09	.35	-.20	1.00

Factor Correlations		Delta = 0.50				
	F1	F2	F3	F4	F5	F6
F1	1.00	-.67	-.66	-.77	.72	.43
F2	-.67	1.00	.64	.73	-.39	-.26
F3	-.66	.64	1.00	.78	-.64	-.52
F4	-.77	.73	.78	1.00	-.68	-.34
F5	.72	-.39	-.64	-.68	1.00	.41
F6	.43	-.26	-.52	-.34	.41	1.00

**Factor Correlations for the
Five Factor Oblique Solution (Total Sample)**

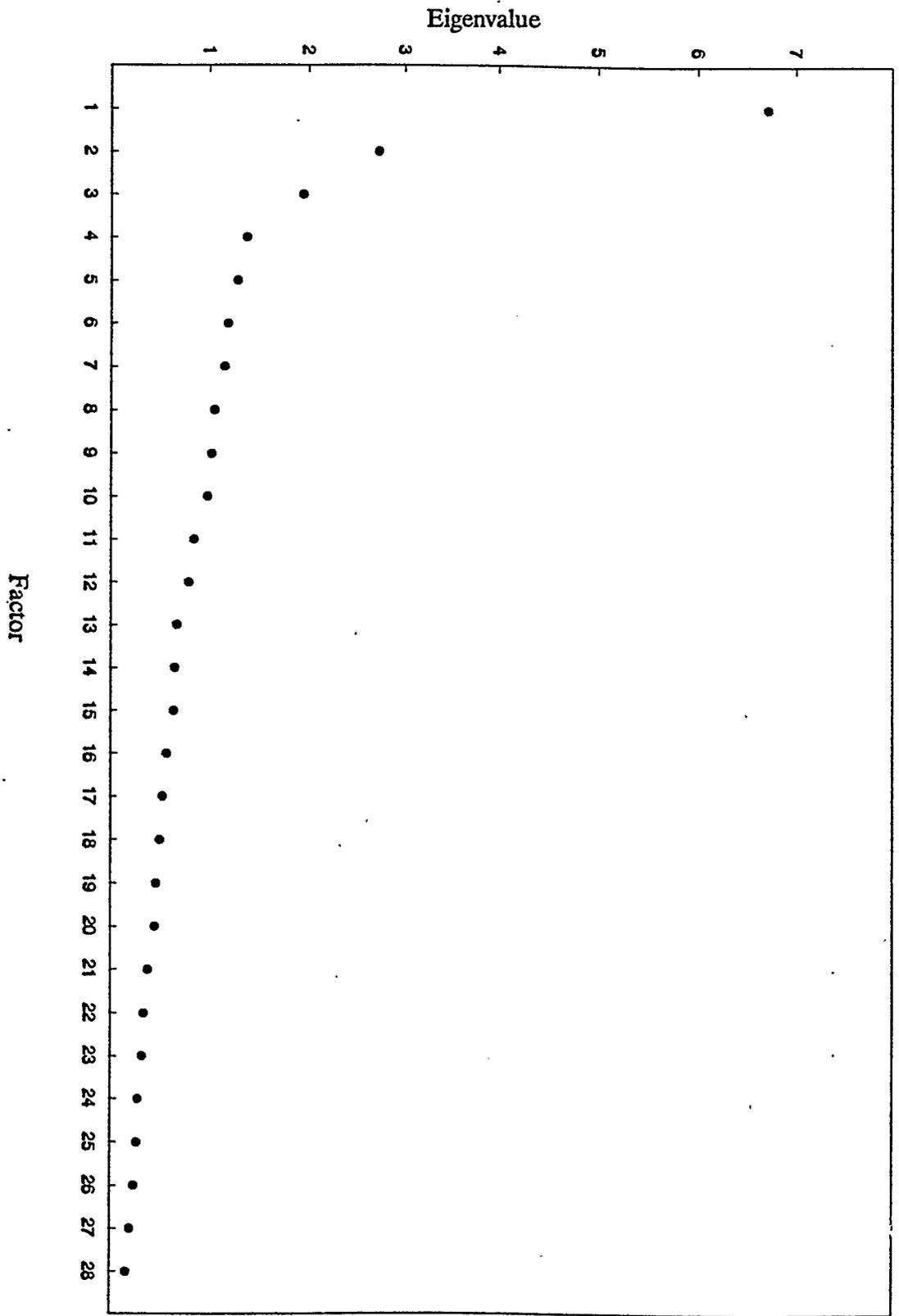
Scale I

Factor Correlations Delta = 0.00					
	F1	F2	F3	F4	F5
F1	1.00	-.881	-.211	.196	.363
F2	-.082	1.00	.163	.136	.162
F3	-.211	.163	1.00	-.252	-.187
F4	.196	.136	-.252	1.00	.213
F5	.363	.162	-.187	.21	1.00

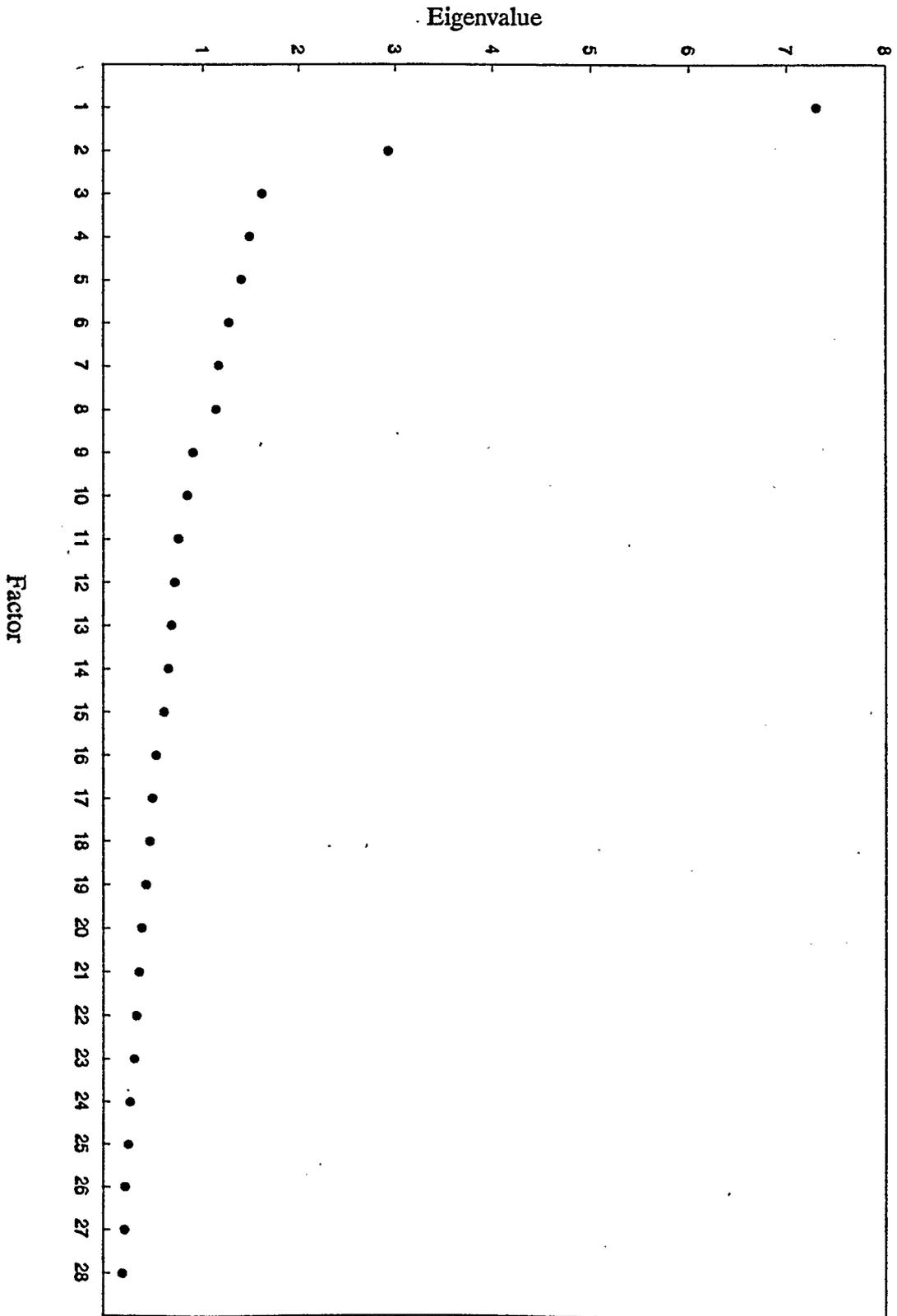
Factor Correlations Delta = 0.30					
	F1	F2	F3	F4	F5
F1	1.00	-.099	-.25	.244	.438
F2	-.099	1.00	.228	.159	.195
F3	-.253	.22	1.00	-.25	-.195
F4	.244	.159	-.250	1.00	.273
F5	.438	.195	-.195	.273	1.00

Factor Correlations Delta = 0.50					
	F1	F2	F3	F4	F5
F1	1.00	-.259	-.52	.38	.658
F2	-.259	1.00	.49	.13	.041
F3	-.521	.49	1.00	-.297	-.432
F4	.379	.13	-.297	1.00	.468
F5	.658	.04	-.43	.47	1.00

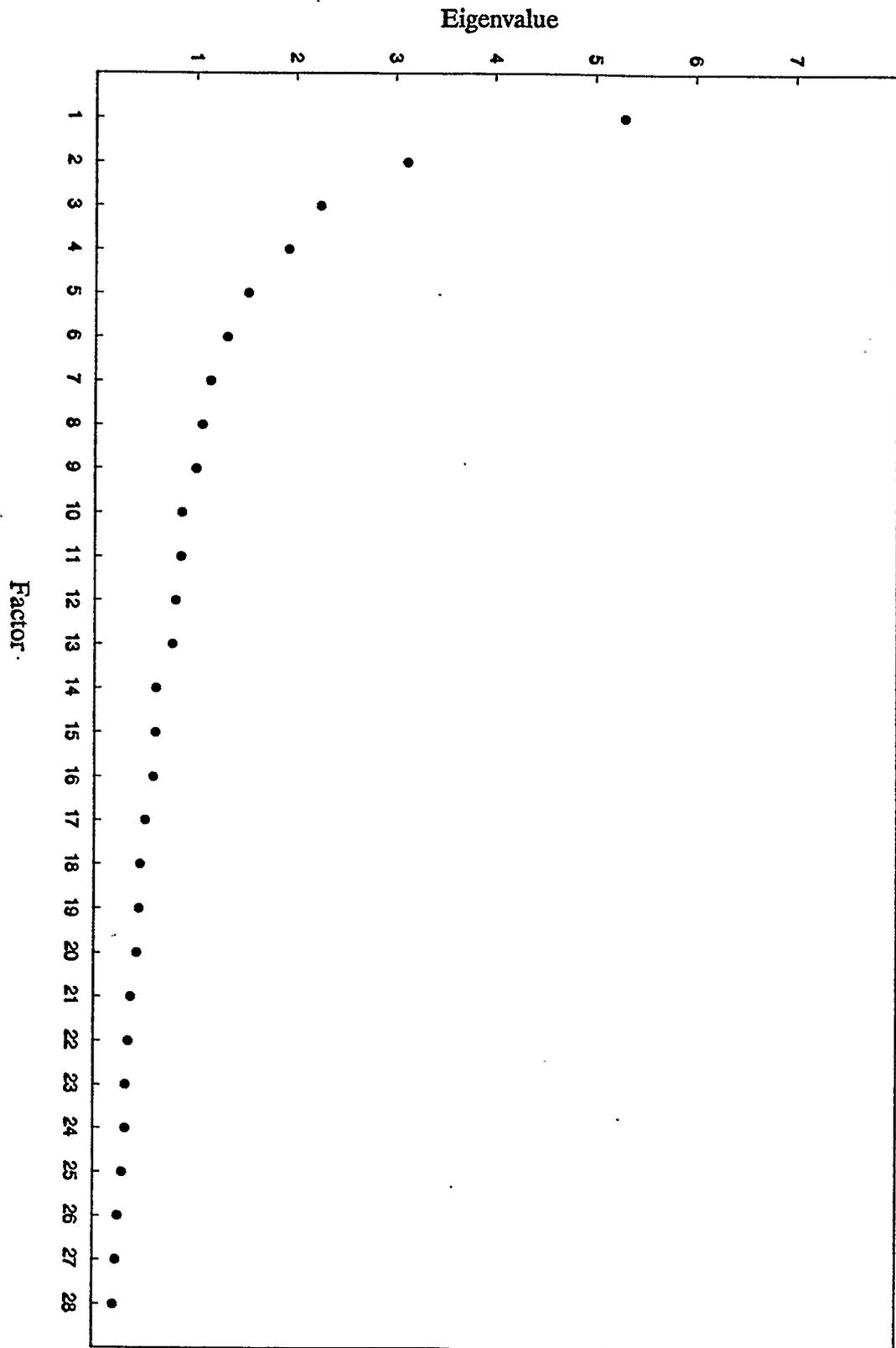
APPENDIX E



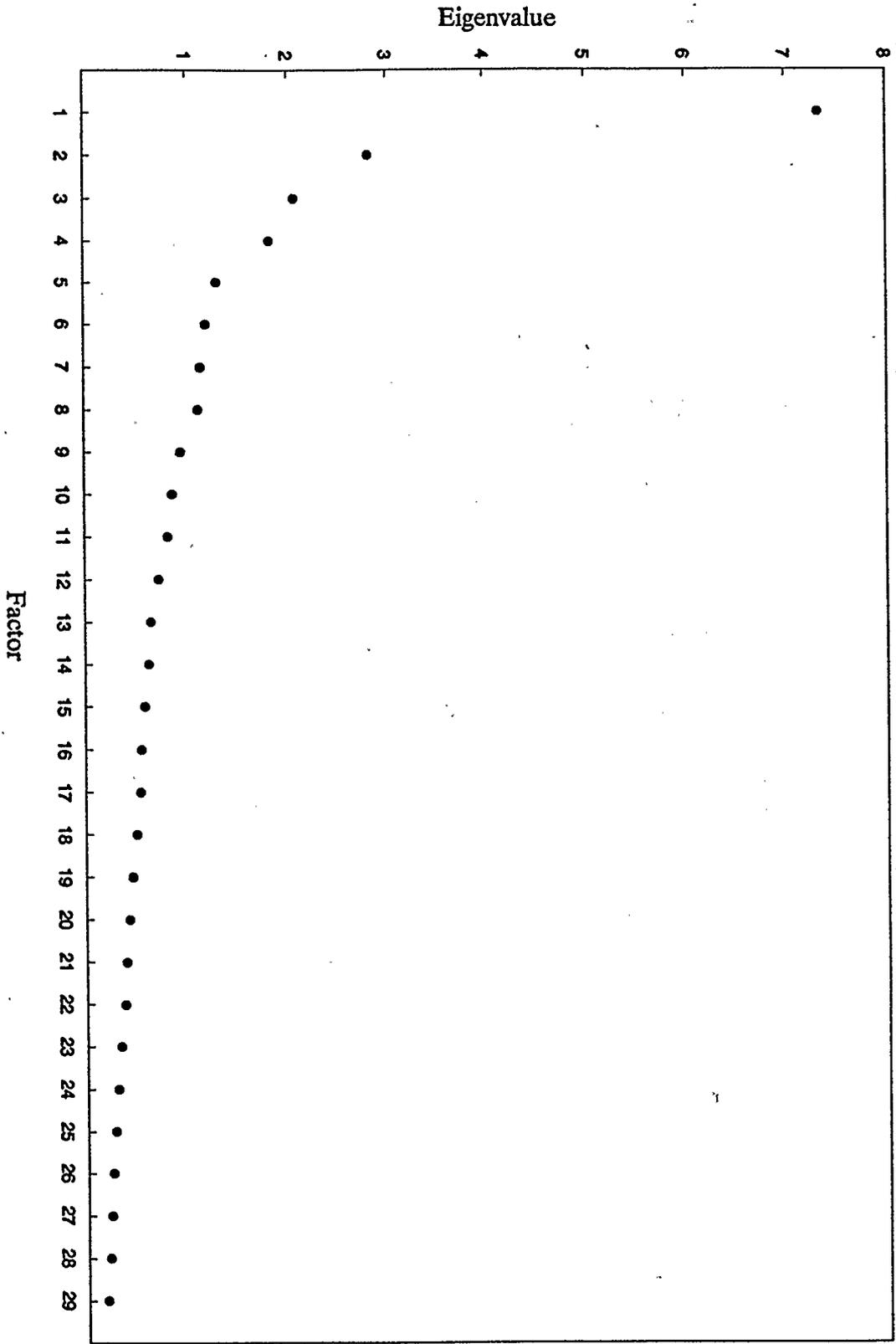
Scree Test - The University of Calgary - Scale I



Scree Test - The University of Calgary - Scale II



Scree Test - Athabasca University - Scale I



Scree Test - Athabasca University - Scale II

APPENDIX F

**Salient Factor Loadings after Orthogonal Rotation of the
Five Factor Solution (Athabasca University Sample)**

Variable	F.1	F.2	F.3	F.4	F.5
1					
2				.60	
3					
4		.85			
5				.55	
6					
7		.55			
8	.36*				
9	.69				
10		.74			
11	.70				
12					.67
13			.44		
14				.54	
15			.52	.54	
16		.41	.48		
17					.64
18				.40	
19					.46
20		.61			
21			.55		
22			.69		
23			.43		
24	.77				
25					
26					
27	.40			.47	
28	.77				

**Salient Factor Loadings after Orthogonal Rotation of the
Five Factor Solution (The University of Calgary Sample)**

Variable	F.1	F.2	F.3	F.4	F.5
1					.44
2				.49	
3					
4	.62				
5		.45		.53	
6	.52				
7	.70				
8		.59			
9		.68			
10	.59				
11					
12			.63		
13					.47
14					
15					
16	.68				
17			.70		
18					
19			.38*		
20	.47				
21	.44				
22	.39*				
23					
24		.57			
25			.49		
26		.50			
27		.46			
28		.82			

* highest loading for variable

**Salient Factor Loadings after Orthogonal Rotation of the
Seven Factor Solution (Athabasca University Sample)**

Variable	F.1	F.2	F.3	F.4	F.5	F.6	F.7
1			.52				
2				.74			
3							
4		.81					
5				.67			
6							.36*
7		.53					
8				.35*			
9	.72						
10		.76					
11	.66						
12					.70		
13			.51				
14						.39*	.39*
15			.42			.41	
16			.40				
17					.69		
18						.47	
19						.51	
20		.62					
21			.38				
22			.67				
23			.51				
24	.81						
25							
26							
27				.59			
28	.73						

* highest loading on variable

**Salient Factor Loadings after Orthogonal Rotation of the
Seven Factor Solution (The University of Calgary Sample)**

Variable	F.1	F.2	F.3	F.4	F.5	F.6	F.7
1					.54		
2			.51				
3							.69
4	.64						
5			.68				
6	.49						
7	.85						
8		.43	.46				
9		.51			.59		
10	.60						
11					.45		
12				.64			
13	.38*						
14							.35*
15							
16	.61						
17				.73			
18							.57
19		.35*					
20	.46						
21	.38*						
22	.34*						
23							
24		.47			.45		
25				.44			
26		.49					
27		.42	.56				
28		.79					

* highest loading for variable

**Salient Factor Loadings for the Eight Factor Orthogonal Solution
(Athabasca University Sample)**

Scale II

Variable	F.1	F.2	F.3	F.4	F.5	F.6	F.7	F.8
1				.42				
2					.70			
3								
4		.62						
5					.74			
6		.38*						
7		.73						
8	.78							
9	.57							
10		.48						
11	.72							
12			.61					
13				.39*				
14						.58		
15	.40							
16		.46						
17			.78					
18						.72		
19			.43					
20		.60						
21		.55		.41				
22				.82				
23				.49				
24	.73							
25								.53
26	.57							
27					.46			
28	.68							

* highest loading for variable

**Salient Factor Loadings for the Eight Factor Orthogonal Solution
(The University of Calgary Sample)**

Scale II

Variable	F.1	F.2	F.3	F.4	F.5	F.6	F.7	F.8
1					.65			
2	.72							
3			.39*					
4			.55					
5	.68							
6			.53					
7			.64					
8	.73							
9					.49			
10			.56					
11		.47						
12				.76				
13						.58		
14							.47	
15							.80	
16					.35*			
17				.81				
18				.42				
19	.39*							
20			.48					
21			.42					.62
22					.43	.50		
23								
24		.77						
25								.41
26			.64					
27			.51					
28			.50					

* highest loading for variable

**Salient Factor Loadings for the Seven Factor Orthogonal Solution
(The University of Calgary Sample)**

Scale II

Variable	F.1	F.2	F.3	F.4	F.5	F.6	F.7
1						.63	
2		.71					
3			.41				
4			.57				
5		.67					
6			.49				
7			.64				
8		.72					
9						.50	
10			.53				
11	.45						
12				.76			
13					.62		
14	.53						
15	.37*						
16							
17				.80			
18	.42			.40			
19					.39*		
20			.47				
21			.44				.60
22					.47		
23							
24	.67						
25							.43
26	.66						
27	.60						
28	.43				.43		

* highest loading for variable

**Salient Factor Loadings after Orthogonal Rotation of the
Five Factor Solution (Athabasca University Sample)**

Scale II

Variable	F.1	F.2	F.3	F.4	F.5
1					
2			.61		
3			.37*		
4		.63			
5			.53		
6		.36*			
7		.72			
8	.78				
9	.55				
10		.50			
11	.62				
12				.62	
13				.47	
14			.60		
15					.43
16		.50			
17				.73	
18			.54		
19				.49	
20		.61			
21		.58			
22		.41			
23					.56
24	.74				
25					
26	.61				
27			.42		
28	.70				

* highest loading for variable

**Salient Factor Loadings for the Five Factor Orthogonal Solution
(The University of Calgary Sample)**

Scale II

Variable	F.1	F.2	F.3	F.4	F.5
1				.45	
2					.70
3					
4		.57			
5					.63
6		.43			
7		.69			
8					.70
9					.41
10		.60			
11	.44				
12			.69		
13				.46	
14	.57		.43		
15	.39*				
16				.42	
17			.87		
18	.43		.47		
19			.41		
20		.51			
21		.48			
22		.43			
23					
24	.58			.46	
25				.36*	
26	.58				
27	.56			.54	
28					

* highest loading for variable

**Salient Factor Loadings for the Six Factor Orthogonal Solution
(The University of Calgary Sample)**

Scale II

Variable	F.1	F.2	F.3	F.4	F.5	F.6
1					.38*	
2		.70				
3						.39*
4			.50			
5		.66				
6						.45
7			.68			
8		.72				
9		.43				
10			.62			
11	.44					
12				.75		
13					.58	
14	.49			.43		
15						
16			.43			
17				.83		
18				.45		
19				.40		
20			.40			
21			.58			
22					.60	
23						
24	.67					
25						
26	.65					
27	.62					
28	.45				.45	

* highest loading for variable