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An Investigation of Institutional Support for Peer Contact in Distance Education

Cheryl L. Amundsen

A Thesis

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ABSTRACT

An Investigation of Institutional Support
for Peer Contact in Distance Education

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Concordia University, 1988

Two hypotheses derived from Keegan's theoretical framework of reintegration in distance education formed the focus for the primary analysis of this study. The opportunity for peer contact and support was reintegrated for the purpose of affecting achievement, self-perception of learning achievement, final academic standing (including noncompletion), and attitudes. The primary analysis was conducted in two parts; one based on an experimental sample, and the other based on a larger general sample. No significant differences were found between levels of the experimental variable, but peer contact was found to significantly discriminate between levels of both course completion and final academic standing in one of the targeted courses based on the general sample (i.e., Communication course).

A follow-up analysis indicated that students in the Communication course, as compared to students in the other two courses, had completed significantly fewer program courses and significantly fewer courses concerning banking at traditional universities. Based on these findings and in

consideration of the subject matter of the Communication course, an argument is proposed concerning the relationship of peer contact and both experiential factors and course subject matter.

A secondary analysis was done to investigate the relative importance of peer contact in relationship to other factors. Explanations of course completion/non-completion and self-perception of learning achievement were sought. A theoretical model of persistence and withdrawal in higher education (Tinto, 1975) guided the investigation.

Results indicated that the mean score on assignments was by far the most important discriminator. Level of peer contact, stated intention to take another program course and previous experience with correspondence courses were also found to significantly discriminate between those who completed their courses and those who did not. Additionally, scores on assignments, the amount of self-reported learning resulting from the textbook and assignments, stated intention to recommend courses to another and contact with program staff were found to significantly discriminate between student responses to a subjective measure of learning achievement. In all cases, the statistical relationship was in a positive direction.

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CHAPTER 1

INTRODUCTION

Schooling by correspondence is not a new educational phenomenon. Baath and Willen (1984) report the possibility of education by correspondence in Sweden 150 years ago and similar reports come from other countries (Peters, 1982). Throughout its history, the structure of correspondence instruction has remained basically the same. Students are provided with printed instructional materials which they read and study; they prepare assignments and mail them to a course marker; marks and often written comments are returned to the student by mail; finally, a student may sit for an exam, commuting to a central location for this purpose. In general, an education gained through correspondence has not been highly regarded compared to one obtained at a conventional university. Students who study by correspondence have often been thought of as those who could not study at a conventional university for lack of intellectual ability or adequate finances or because of family or social constraints. Correspondence education is often considered to provide an opportunity for a "second chance," but only for a "second rate" education.

The picture is beginning to change. "Learning at the backdoor" (Wedemeyer, 1981) is increasingly being welcomed as a valuable acquaintance at the frontdoor. In the late sixties and early seventies a phenomenal growth was observed in what at that time began to be termed "distance education". Sewart (1983) writes:

> 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. (p. 5)

The changes observed since the early 1970s have been qualitative as well as quantitative. The evidence for this can be found in the proliferation of distance education (hereafter, DE) programs which have begun to consider various approaches to course development, production and delivery. There has also been evidence of a growing concern for support of the student throughout the distance education process. Today, although most DE efforts are still based on the correspondence tradition of printed instructional materials (Holmberg, 1985; Keegan, 1980), the entire teaching and learning system is being viewed from a broader perspective. Program evaluations and applied research efforts to date have clearly indicated that the joint activities of teaching and

learning at a distance raise a new set of problems, administratively and instructionally.

Distance Education as a Distinct Field of Study

Reasoning that the emergence of a new set of problems is the necessary precursor to the establishment of a separate discipline, some (Sparks, 1983; Gough, 1984; Holmberg, 1986) have proposed that DE should be considered a discipline in its own right. Others might hesitate to speak of a "discipline," per se, but rather view DE as a "coherent and distinct field of educational endeavor" (Keegan, 1986,p. 6).

Two areas which must be addressed in any effort to distinguish an educational field of study are theory development and applied research. Over the last two decades, several have sought to develop theoretical frameworks which could encompass the whole of activity in DE. Notable contributions have been made by Moore (1972, 1973, 1983), Holmberg (1982, 1985, 1986), Peters (1982), Sewart (1978, 1980), and Keegan (1986). These works will be discussed later in this chapter.

The professional literature in DE overflows with program descriptions and "how to" articles which pay little or no attention to theoretical bases. Often, this work is not even supported by program evaluation data. A number of commentators in the field (Ljosa, 1978, 1980; Coldeway, 1982; Calvert, 1986) have decried the lack of informative, validly conducted research while at the same time suggesting that

there is evidence the situation has been greatly improving in the 1980s.

One problem has been the lack of a forum for the dissemination of research and theory. In the preface to a book entitled, *The Changing World of Correspondence Study*, the editors MacKenzie and Christian (1971) state:

> During its first seventy-five years of expansion, the field of correspondence instruction was without its own journal in which scholars and authorities of the method could publish writing; consequently, the literature regarding the purpose, problems and potential of this method is widely scattered and not readily accessible to the general reader, researcher, educator and administrator. (p. 1)

Since the above statement was made, at least five (English language) journals have begun publication: *Teaching at a Distance*, recently changed to *Open Learning* (Britain); *Distance Education* (Australia); *Journal of Distance Education* (Canada); *The American Journal of Distance Education* (U.S.A.); and *Epistolodidaktika* (Sweden). A number have also appeared in languages other than English. In addition many periodicals dedicated to areas of study such as educational communication, educational technology, adult education, higher education, international education and rural education regularly publish articles specific to DE.

Access to unpublished information of an international nature has been provided through the development in 1971 of the United Nations International Centre for Distance Learning, physically located at the Open University in Britain. Issues which once inhibited efforts toward the development of an integrated literature base such as a lack of common terminology, disagreements about definition and the failure to recognize the interdisciplinary nature of DE, have, for the most part, been resolved. Today, an immature, but developing theoretical foundation and a growing body of valid research supported by an expanding and easily accessed literature base await the general reader, practitioner or researcher.

Purpose of the Present Study

The study described herein seeks to contribute both to theoretical development in DE and the growing body of applied research. The primary purpose of this study was to test two hypotheses proposed by Keegan (1986) which were derived from a theoretical framework based on his notion of the reintegration of various teaching and learning acts. This perspective argues for the "artificial recreation" in DE of various teaching and learning components. Lack of peer contact and support is considered by Keegan to be one of the characteristics of DE for which compensation must be made. This study attempted to reintegrate peer contact and support while investigating any possible effects on measures of

achievement, final academic standing (including course completion), self-perception of learning achievement, and attitudes. A secondary purpose of this study was to identify those factors which seem to most effectively discriminate between students who complete courses in DE and those who do not, and between students who variously rate how much they learned in their DE courses. This investigation was guided by a theoretical model of persistence and withdrawal in higher education (Tinto, 1975) originally proposed for the four-year residential university setting.

The remainder of this chapter further develops the rationale for the present study. Keegan's (1986) theoretical framework of reintegration is based in part on a synthesis of previous theoretical work addressing DE. To properly understand Keegan's theoretical perspective, it is necessary to describe the most influential (in this researcher's opinion) theoretical perspectives of DE proposed to date. This is accomplished in the first section which follows, entitled "Theoretical Development in Distance Education." A second section, entitled "A Framework of Reintegration," discusses Keegan's perspective in detail. A third and final section, entitled "A Theoretical Model of Persistence and Withdrawal in Higher Education," develops the rationale for the use of Tinto's (1975) model in guiding the investigation which comprises the second part of this study.

Theoretical Development in Distance Education

A Comparison of Distance Education and the Industrial Process

Peters was first involved in DE through his position at the German Institute for DE (D.I.F.F.). He was then at the Berlin College of Education before becoming, in 1975, the Vice-Chancellor of the Fernuniversitat in Hagen, Germany.

In 1967, Peters (English version revised by the author, 1982) proposed a comparison between distance teaching and industrial production, based on an international survey of DE institutions and programs. He is careful to state that it is purely a heuristic exercise, intended for explanatory purposes, and that he is not equating learning processes with industrial production. He takes the position that academic teaching (which he labels "pre-industrial" forms of study) has changed little in the face of industrialization, with the exception of distance education. He suggests that DE is complementary to our industrial and technological age.

In Peters' view, it is not a coincidence that correspondence education began its development only about 150 years ago, when, for the first time, a relatively fast and reliable postal service was available. He similarly explains that the more recent blossoming of DE programs catering to large and remote student groups is possible because of the availability of more sophisticated technical support.

He finds traditional educational theories, principles

and terminology inappropriate for explaining the phenomenon of DE. He believes that an understanding of the industrial process provides more insight about the DE process. Holmberg (1982) states:

> From the start, distance study has a special relationship with the industrial production process insofar as the production of study materials in itself is an industrial process built into the whole teaching process as a constituent part, quite unlike the production of text books, for example. In the case of commercial distance teaching establishments, the further question of selling the printed or otherwise duplicated study units adds calculations of applied economics to the teaching process. Even the distance teaching departments of government-financed universities are not entirely free from these considerations. It would be interesting to examine how far these facts have influenced the structure of distance teaching already. (p. 97)

To further explain the relationship between distance teaching and the industrial production process, Peters compares structural changes in the production process brought on by industrialization to structural changes in education as reflected in DE. He discusses these changes under the following topics: rationalization; the division of labor;

mechanization; assembly line; mass production; planning and preparatory work; standardization; change in function; objectification; concentration and centralization.

Peters identifies the practical implications of his theory as the separation of the teaching and learning processes, which he believes places a different value on the communication process from that held in conventional education. This in turn leads to teaching and learning roles that are different from conventional education. He views the teaching role as one of development and dissemination, and regards the learner as autonomous. Nothing in Peters' discussion ranks as criticism of conventional education. He argues, however, that there are new educational requirements which exceed the limits of conventional educational structures. Listed among these are, access issues of distance and handicapping conditions, huge student numbers in some countries, and national economies which cannot afford to have students end employment to attend school. Peters is one of only a few (Rumble, 1983) who have advised careful consideration of the possible disadvantages of DE systems. There may be conflicts, he suggests, with some deeply held educational values. He believes that the industrial nature of DE needs to be recognized for both its possible advantages and disadvantages. In 1982, Peters clarified this view:

> It was not a purpose of this comparative interpretation to pass judgements on the industrial structures which have been shown to apply to

> distance teaching. Presumably, the striking advantages of these structures, from a point of view of educational policy and organization, are also connected with important educational disadvantages. This question has yet to be discussed. In this context it shall merely be hinted that it must be disadvantageous to a society if the developments outlined here have not been, or have not been fully, recognised, or are even denied . . . They can be detected and remedied more easily, when the industrial structures characteristic of distance teaching are recognised and taken account of . . . (p. 111-112)

Peter's industrial description is based on an extensive survey of DE programs and institutions existing in the early to mid-1960s. Perhaps because of this, his theory seems to closely reflect only one type of DE structure, that being the large, centralized DE institution certainly more typical of the time covered by his survey. However, even this apparent match is now in question with the importance placed on various student support issues at some of the larger DE institutions, e.g., UKOU (Britain), Athabasca University (Alberta, Canada), Open Learning Institute (B.C.,Canada), University of the South Pacific (Fiji), DDIAE (Queensland, Australia), and others.

Staff involved in a decentralized structure may be hard pressed to find clear matches to industrial principles. In

these programs, characterized by the majority of those in Australia, university faculty teach both on campus and off-campus students, and are provided with technical help in course development. Two-way communication with students may be facilitated through computer conferencing, audioconferencing, teleconferencing, telephone or face-to-face meetings.

A Theory of Autonomy and Independence

Over a period of approximately ten years, Moore (1972, 1973, 1983) developed and refined a theory of independent learning and teaching. He seems to have been greatly influenced in his work by his doctoral supervisor, Charles Wedemeyer at the University of Wisconsin. Wedemeyer was an early proponent, in the U.S.A., of what he termed "independent study". Moore moved on to a staff position at the UKOU, then to the Pennsylvania State College, U.S.A. and is editor of *The American Journal of Distance Education*.

Moore's theory is composed of two dimensions. "Distance teaching" referred to most recently by Moore (1983) as "transactional distance," comprises the first dimension and "autonomous learning" comprises the second dimension. Discussion of the first dimension distinguishes "contiguous" teaching and learning and "distant" teaching and learning (Moore, 1973). The contiguous situation is characterized as one in which:

> The teacher as he teaches is in immediate physical proximity with the learner as he learns.

> Communication in such situations is by the human voice; there is immediate, spontaneous, often emotionally motivated interaction between the learner and the teacher, and, usually, between the learner and other learners. (p. 664)

In contrast, distant teaching is described as,

> The family of instructional methods in which the teaching behaviors are executed apart from the learning behaviors, including those that in a contiguous situation would be performed in the learner's presence, so that communication between the teacher and the learner must be facilitated by print, electronic, mechanical or other devices. (p. 664)

Using the concept of distance, Moore has attempted to classify distance teaching programs from most distant to least distant. This is determined as a function of two variables, "dialogue" and "structure". Dialogue describes, "the extent to which, in any educational program, the learner, the program and the educator are able to respond to one another" (Moore, 1983, p. 157). According to Moore, the degree to which this interaction is possible is primarily dependent upon the methods of communication established by the program. In turn, the choice of communication methods is influenced by the philosophy of the program toward the

function of communication in distance education. For example, Moore would contend that in an educational program which offers only instructional materials to the learner, no dialogue results. A correspondence program which provides written feedback or comments on assignments provides varying amounts of (written) dialogue. A program that combines correspondence and teleconferencing is even more dialogic. The second variable, structure, is described by Moore (1983) as "a measure of an educational programme's responsiveness to learners' individual needs" (p. 157). In the DE setting, more structured programs set course starts and ends, have established due dates for assignments, use packaged course materials designed for more than one set of students, etc. Less structured programs allow course registration throughout the year, submission of assignments within a fairly broad time period and contract individually with students as to course composition. Of course, many programs fall between these theoretical extremes of distance and structure.

The theoretical possibilities of both dialogue and structure are shown in Figure 1, which provides a classification of distance teaching programs. In Figure 1, +D represents dialogue, +S, structure, -D, no dialogue and -S, no structure. The most distant programs are those of the -D-S type, and the least distant are those of the +D+S type. Where distance is low, a close relationship is possible between learner and "teacher;" where distance is high, it is less possible. The consideration of the learner's degree of

Figure 1.
Types of Distance Teaching Programs.

	Type	Program Types	Examples
Most Distance	-D-S	Programs with no dialogue and no structure	Independent reading study programs of 'self directed' kind
	-D+S	Programs with no dialogue but with structure	Programs such as in which the communication method is radio or television
	+D+S	Programs with dialogue and structure	Typically programs using the correspondence method
Least Distance	+D-S	Programs with dialogue and no structure	E.g., a tutorial program

Source: Moore, M. (1986). The individual adult learner. In Tight, M. (ed.) *Education for Adults — Volume I: Adult Learning and Education*. London: Croom Helm.

need for this relationship leads to the consideration of Moore's second dimension of independent learning, learner autonomy. Moore (1983) states:

> Autonomous learners — and this means most adults, most of the time — are able to identify learning needs, when faced with problems to be solved, as well as skills they don't have and information they are lacking. Sometimes formally, often unconsciously, they set objectives and define criteria for their achievement. Autonomous learners know, or find, where and how and from what human and other resources they may gather the information they require, collect ideas, practice skills and achieve their goals. They then judge the appropriateness of their new skills, information and ideas, eventually deciding whether their goals have been achieved or can be abandoned. (p. 163)

According to Moore, children will, given the opportunity, seek to become more and more autonomous until each person at some point becomes completely responsible for his own learning. In his view, this is a part of the normal process of maturation. From time to time, an autonomous learner will seek out a teacher for help in formulating his problems, gathering information etc., surrendering temporarily some of his autonomy, but Moore believes that a truly autonomous learner will not give up overall control of

the learning processes.

As Moore created a continuum (classification) of distance, he proposed the same for the concept of autonomy. In examining educational programs, Moore would inquire about three areas.

> 1) Goal setting – To what extent are the goals determined by the learner or by the teacher? Are they the goals of the learner's program, or of the teacher's?
>
> 2) Program implementation – To what extent is the selection of resource persons, and books and other media, and the sequence and pace of learning experiences, the decision of the teacher or of the learner?
>
> 3) Evaluation – To what extent are decisions about the method and criteria to be used in evaluation made by the learner or the teacher? (p. 164)

How programs address these three areas determines, in Moore's (1983) schema, how much autonomy they offer the learner. Figure 2 shows the theoretical typology based on responses to the three questions above. In this typology programs could range from the theoretical extreme of AAA, permitting learners maximum control over their educational programs, to NNN, those programs permitting no control.

In a final step, Moore superimposes the typology of distance teaching upon the typology of autonomous learning

Figure 2.
Types of Individual Learning Programs by Variable Learner Autonomy.

	Goal Setting	Implementation	Evaluation
A — Learner determined ('Autonomous')	A	A	A
	A	A	N
	A	N	A
	A	N	N
N — Teacher determined ('Non-autonomous')	N	A	A
	N	N	A
	N	A	N
	N	N	N

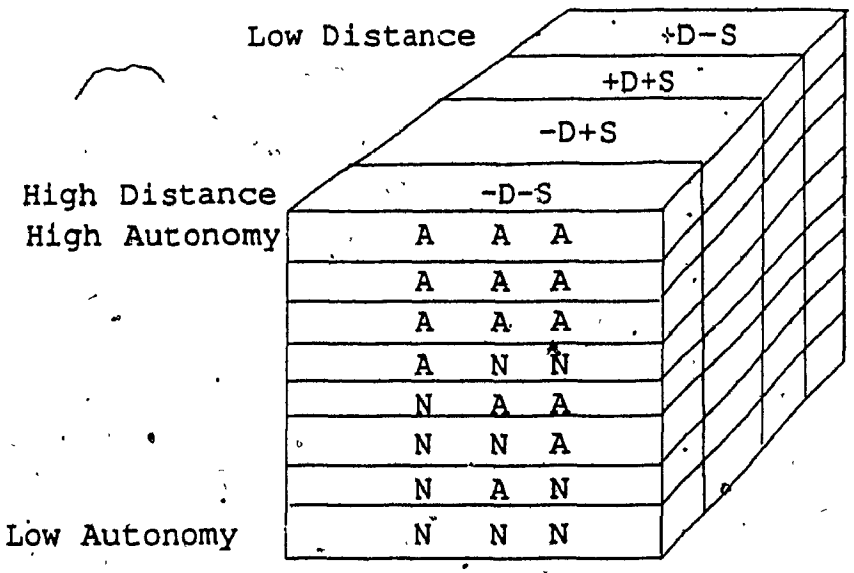
Source: Moore, M. (1986). The individual adult learner. In Tight M. (ed.) *Education for Adults — Volume I: Adult Learning and Education.* London: Croom Helm.

resulting in the typology depicted in Figure 3.

Referring to Figure 3, one can generate a variety of theoretical program types. For example, a program may be of the type 4(ANN) -D-S indicating a program in which the learner sets his/her own goals with little program input, but the program then develops the course and determines evaluation criteria without learner input. There exists no dialogue between learner and teacher nor is the overall structure of the program adaptable to the individual learner's needs. An example of a program of this type would be a self-instructional mail order course of the student's choice. The final step is a qualifying exam which the student takes when he or she feels that the content has been mastered. Similarly, a program which provides for no learner control of course development but provides much opportunity for dialogue and provision for individual needs within the established course would be of the type 8(NNN) +D+S. Much of the UKOU educational program is of this type, given that course development is a product of a course development team (NNN), but support of students once enrolled in a course includes assignment to one particular tutor-counsellor, regional tutorial centers, summer residential courses, and often instructional delivery options of TV and radio broadcasts, as well as others (+D+S).

Moore (1972) observed that programs which offered more autonomy were also classified as more distant, stating that:

Figure 3.
Typology of Educational Programs.



Source: Moore, M. (1986). The individual adult learner. In Tight, M. (ed.) *Education for Adults — Volume I: Adult Learning and Education.* London: Croom Helm.

> There are degrees of 'independent learning and teaching'. The more distant, the more independent, but simultaneously, the more distant, the greater the learner autonomy. The concept of independence therefore must be two-dimensional. (p. 674)

Having established continua for program types along the two dimensions of distance and autonomy, Moore reasoned that, since distant teaching programs, by their structure, require more autonomous behavior from learners, the kinds of people who participate successfully in such programs will be measureably more autonomous. Additionally, he hypothesized that the more distant the program, the more autonomous will be the learners who will choose to participate in it.

In an attempt to test his hypotheses, Moore (1976) identified field-dependent and independent learners within programs ranging in degree of autonomy and distance according to his typology. He found some personality by treatment interactions which tended to at least partially support his hypothesis. Since Moore's study, others have sought to test various hypotheses that certain personalities are attracted to distance study, and that personality types are variously successful, and variously satisfied with their experiences (field dependence-independence, Thompson & Knox, 1987; Thompson, 1984; Nelson, 1985; locus of control, Raynor, 1984). Results are mixed concerning support for Moore's notion that learners in DE programs exhibit more autonomous

characteristics than learners in other more traditional educational settings. To date, however, only one identified study has reported a positive correlation between personality type and achievement (Nelson, 1985). Keegan (1986) accepts the concept of "distance" as one theoretical dimension, but argues that further work is required to justify the concept of "autonomy." Willen (1981, 1984) criticizes Moore's work as being too general. She questions his notion of DE programs attracting more autonomous learners. When viewed from the perspective of educational access, some learners (rural or remote areas, the handicapped etc.) have no choice but to choose DE programs. Furthermore, her own research suggests (Willen, 1983) that there are large variations among adults enrolled in DE programs in Sweden in regard to their subjective concepts of learning and their ability to cope with study materials. She has found that learner strategy is generally based on previous personal learning experiences. Human contact, she suggests, may facilitate and enhance learning and autonomy is not, as Moore has portrayed it, the ideal for every learner.

A Theory of Guided Didactic Conversation

Holmberg is presently Professor of Methodology of DE at the Fernuniversitat in Hagen, Germany. Holmberg (1982, 1985, 1986) considers communication to be the essence of education in general. In traditional education, communication is between the teacher and learner and with members of a peer

group. Distance Education, which he considers equally dependent on the process of communication, is, in his terms, based on "non-contiguous" communication.

Equally important to Holmberg's conception of DE is his reverence for the individual learner and the freedom which he feels should be accorded each learner. To Holmberg, "real" learning is primarily an individual activity and is attained only through a process of internalization. Like Moore, he considers learner autonomy as the ideal. Unlike Moore, he does not assume that most adults are autonomous learners. He believes autonomy is the ultimate state for any adult and that DE institutions should assist learners to achieve complete autonomy. Therefore, he conceptualizes DE as the study of how individual learning can be facilitated and supported. Holmberg (1986) states, "In my view it is important on the one hand to serve the already autonomous learners, on the other hand to use distance education as a means to developing student independence" (p. 69). Like Moore, he promotes systems which offer open admission, free pacing in the start and finish of study units, no fixed assignment due dates, and no required seminars or activities. However, because of his feeling that some students need assistance to accomplish independence, he supports encouraging student motivation through student support structures which provide adequate two-way communication for tutorial and feedback purposes.

Based on his cornerstones of non-contiguous communica-

tion and self-study, Holmberg developed a theory of teaching that would incorporate both. He began with the assumption that activities like thinking aloud, elaborative processing of text (i.e., the interaction of the text content with prior knowledge of the reader), private reasoning and silent reading were communication processes. After a review of pertinent literature, Holmberg concluded that these activities also represented useful learning strategies. His theory of "guided didactic conversation" applied these strategies to printed instructional materials. The result is printed instructional materials which are structured to encourage text elaboration and internalized conversation. Holmberg concluded that if printed materials were developed according to the principles of guided didactic conversation, a simulated conversation would take place between the student and the author(s) of the materials and between the student and himself. Holmberg assumes that if the developers of a DE course consistently seek to enhance the communication process, the components of which resemble a conversation, then students will be more motivated and more successful than if the course were developed in the common textbook format comprising readings and questions.

Holmberg (1985) describes the characteristics of guided didactic conversation as:

- Easily accessible presentations of study matter; clear, somewhat colloquial language; easily readable if the text is printed; and,

moderate density of information.

- Explicit advice and suggestions to the student as to what to do and what to avoid, what to pay particular attention to and consider, with reasons provided.
- Invitations to an exchange of views, to questions, to judgements of what is to be accepted and what is to be rejected.
- Attempts to involve the student emotionally so that he or she takes a personal interest in the subject and its problems.
- Personal style including the use of the personal and possessive pronouns.
- Demarcation of changes of themes through explicit statements, typographical means or, in recorded, spoken communication, through a change of speakers (e.g., male followed by female, or through pauses). (This is a characteristic of the guidance rather than of the conversation). (p. 27)

Holmberg feels that his method will certainly appeal more to the learner with little study experience and who shows little learner autonomy. He believes that learning at more elementary stages is likely to require more structure and a more personal approach. The completely autonomous learner, which he believes DE should seek to create, will have less need and less appreciation of his method. To date,

however, Holmberg has not attempted to test this belief. Against these reservations, Holmberg (1985) puts forth three hypotheses which he proceeded to test.

> 1) The stronger the characteristics of guided didactic conversation, the stronger the students' feelings of personal relationship between them and the supporting organisation.
> 2) The stronger the students' feelings that the supporting organisation is interested in making the study matter personally relevant to them, the greater their personal involvement.
> 3) The stronger the students' feelings of personal relations to the supporting organisation and of being personally involved with the study matter, the stronger the motivation and the more effective the learning. (p. 28)

Hypothesis testing did not proceed by testing separately each of the above three hypotheses as the overlap was thought to be too extensive to allow such an approach. Instead, a composite influence was tested through falsification rather than verification. The design of the three studies included redesigning an existing DE course following the principles of guided didactic conversation. Part of each group was given the revised materials and the other part used the original materials. Student attitudes and performance were compared over three separate studies. Results yielded no conclusive

evidence in favor of materials developed according to the theory of guided didactic conversation.

Holmberg (1982) has since proposed a theory which is more general than his original theory of guided didactic conversation, but less developed and to date untested. The purpose of this more recent attempt was to broaden the application from printed instructional materials only to include written comments or dialogue, media productions, telephone tutoring, etc. (Holmberg, 1986, does not consider face-to-face interaction because he feels that the inclusion of such a communication possibility indicates "a kind of 'middle-of-the-road' practice in using concentrated residential courses and Oxbridge tutorials as supplements of 'pure' distance education" [p. 78]). Maintaining an emphasis on personal communication, Holmberg's (1982) most recent theoretical position distinguishes "simulated" conversation from "real" conversation as follows:

> There is constant interaction ('conversation') between the supporting organization (authors, tutors, counsellors), simulated through the students' interaction with the preproduced courses and real through the written and/or telephone interaction with their tutors and counsellors. (p.115)

The Concept of an Intermediary in Distance Education

Sewart (1978) reasons that in a relatively simple social structure, it is conceivable that each person is able to have a personal relationship with others in positions of more authority. In a society as large and complex as most in the world today, personal relationships disappear as a function of increasing complexity. No longer do individuals have personal knowledge of those who occupy positions of authority in social and medical services, political organizations, or educational systems. The patient, client, or student must go through an intermediary person such as a social worker, medical assistant, teacher, or counsellor; those persons whose primary concern should not be for the system itself, but for the individuals involved in it. It is Sewart's position that educational systems have employed the concept of an intermediary in a variety of roles which match the particular needs of the system. Sewart, who came to the UKOU in 1973 and has had managerial responsibilities for the provision of student support services there, has been involved in the development of the intermediary concept at UKOU. The intermediary roles at the UKOU concern tutoring and counselling functions; roles which Sewart feels necessarily evolve from a system which teaches at a distance to a large number of students through highly structured packages based primarily on correspondence materials.

At the UKOU, as with many other DE institutions and pro-

grams, course tutors are hired for their particular content expertise and generally for specific courses. The result of this arrangement is that students will have many different course tutors for the duration of their studies. At the UKOU, the course tutor functions as an intermediary in the area of tuition, supporting the academic needs of each student in relation to a specific course.

A second intermediary role at the UKOU, one which serves a counselling function, resulted from the recognition that an intermediary role was necessary for other aspects besides tuition, including advice on general problems of distance study, financial support, registration, examinations, academic planning, career planning, etc. Inclusion of this role completed what Sewart (1978) labels "a continuity of concern" (p. 2) for the DE student.

Those involved in the early development of the UKOU did not, however, necessarily perceive the functions of tuition and counselling as discrete functions involving two separate roles. The current student support structure at the UKOU is consistent with the concept of providing intermediaries and a continuum of concern. When students are accepted by the UKOU, they are assigned tutor-counsellors who will normally be responsible for both the tuition and counselling functions in the foundation year. Ten weeks prior to the start of courses, tutor-counsellors are provided with background information on their students: A computerized information base has been developed for this purpose (Sewart, 1980).

This information, together with direct contact with each new student, allows tutor-counsellors to make an informal pre-assessment about those who may experience problems in the program they are about to begin. This can include a glaring unpreparedness to do academic tasks, but more normally surfaces as study problems which are due to pressures of full-time work, family needs, lack of contact with other students, etc. These are the situations the tutor-counselor tries to foresee and solve during the 10-week period before courses begin. The tutor-counsellor at the UKOU is available on a fairly regular basis at the regional study centres. When this contact cannot be face-to-face, other means including telephone and correspondence are used. The tutor-counsellor is also responsible for marking and commenting on assignments. When students advance to post-foundation courses at the UKOU, the tuition function is taken over by course tutors with a content specialty who may meet students for face-to-face seminars or contact students by other means. The original tutor-counsellor, however, continues with the same students throughout their UKOU academic careers and thus the 'continuity of concern' for the student is actualized at the UKOU.

Sewart sees DE as a particular type of educational structure requiring teacher's and student's roles that are different from traditional education. Therefore, he maintains that the intermediary positions must also be conceived differently and that a consistent, personal relationship is

necessary to support students in their ability to gain an education. He states:

> It is this relationship which breaks down the isolation of the home-based student and begins to encourage and shape the effective dialogue which is the basis of education. There has always been a perspective which regards education as personal development rather than helping people to memorize information. The continuity of contact and concern which is the basis of the relationship between a tutor-counsellor and a student facilitates this personal development. (Sewart, 1978, p. 13)

It is interesting to note here that Holmberg (1986) views the UKOU approach to student support as additionally motivated, "by a social duty to interfere, to prevent failure and to promote success" (p. 70). The UKOU system is at odds with Holmberg's view of the autonomy deserved and desired by most DE learners. Holmberg views interaction as a way to promote learning, but separates that from what he sees as increased control over the learner.

A Summary of Perspectives in Distance Education

In considering the various perspectives proposed to date, which represent the foundation for theoretical development in DE, Willen (1984) made the following observation:

> In Distance Education there seems to be a deep conflict between two divergent conceptions of the nature of distance learning. One standpoint views the student as an independent or autonomous learner, who chooses this form of education because of specific individual characteristics and, because of these characteristics, has every chance of succeeding with his/her studies. The other standpoint represents an interactionist mode where the individual is seen in a wider context, and the explanations for study behaviour are sought both in the individual and in the environment ... The research in this field is in its early beginning, but some findings strongly support the latter standpoint that human contact is a positive and important part of the learning process. (pp. 13-14)

If the previously described perspectives were to be viewed in light of Willen's observation, the results would probably be as shown in Figure 4.

Figure 4.

An Organization of Theoretical Positions.

Autonomous Mode	Interactionist Mode
Moore	Stewart
Holmberg	
Peters	

In Figure 4, Moore and Peters are firmly planted under the heading "autonomous mode." Willen's (1984) belief that human contact is desirable in the learning process is not in agreement with Moore who sees the completely autonomous learner as only seeking human interaction occasionally; Moore's view is greatly influenced by the positive value he places on individual learning. Peters, although placed similarly to Moore, views the learner in DE as autonomous, but only because he sees this as a natural outcome of an industrial educational process and not because he attaches any particular value to this state. Holmberg, who views "real" learning as an individual activity, attained only through an internalization process is placed closer to the center of Figure 4. Although Holmberg, like Moore, sees the autonomous learner as an ideal, his more recent writing (1986), in particular, promotes two-way communication in many forms. Sewart, on the other hand, clearly advocates what Willen terms the interactionist mode, but would probably view his position somewhat more broadly than Willen has interpreted it. Sewart values this mode for both its potential in contributing to student learning and to personal development.

A Theoretical Framework of Reintegration

Keegan, has been involved in the development and administration of several DE institutions throughout the world. His early concern for defining the area of DE

resulted in a definition (Keegan, 1980) which has been more widely accepted and cited than any other. He is founder and co-editor of *Distance Education,* the first international juried journal in the field. His continuing concern for theory development in DE has resulted in his book, *The Foundations of Distance Education* (1986), in which he has proposed a theoretical framework based on the concept of reintegration of the teaching and learning acts. These theoretical notions are based on a synthesis of previously proposed theoretical perspectives in DE and from an in-depth survey of sixty-two DE institutions around the world. The following discussion describes how Keegan has incorporated and built upon the various perspectives in DE already discussed.

It should be noted here that, although not formally acknowledged by Keegan, his own as well as other theoretical perspectives of DE have been obviously influenced by previous work in the area of social interaction. The European tradition of cognitive psychology and the North American view, traditionally more behaviorally oriented, have both contributed to the concept of social interaction in the learning process. Of particular significance to Keegan's ideas is the work of Argyle (1967; 1969; 1975) who has investigated such areas as the culture of groups, the effects of social interaction on motivation, and verbal/non-verbal behavior and its possible meanings. Argyle maintains that skills of social interaction are practised over and over

until one is no longer aware of the behavior. He applies these ideas to various professions including the teaching profession.

Keegan believes that the basis for a theory of DE is to be found in general education theory, but not within the theoretical structures of oral, group-based education. He defends this position by arguing that DE is not based on interpersonal communication, but is characterized by the separation of the teaching acts in time and place from the learning acts. In this view, he is consistent with Moore (1973) who contrasts distance teaching and learning and contiguous teaching and learning situations. Moore's basis for the distinction, like Keegan's, is the nature of the resulting communication.

Keegan also proposes that DE is characterized by a more industrial form of education, an incorporation of Peter's (1982) perspective. Keegan further suggests, however, that DE can only be classified as an educational activity (versus an industrial activity) because educational activities are dominant. Keegan (1986) states the following:

> In all institutions both public and private from all sectors of the educational spectrum that fall within the definition of distance education adopted, one can identify organizational task boundaries that centre around the development of learning materials and another grouping of tasks that focuses around the teaching of the students

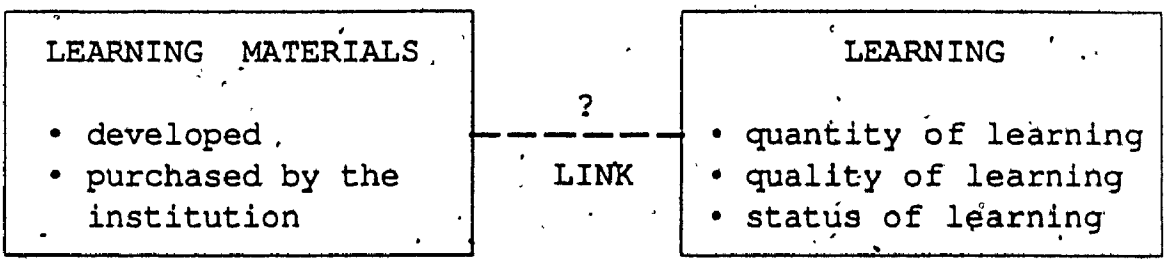
> who eventually enrol in the courses for which the materials were developed. (p. 120)

Keegan suggests that since DE is characterized by an industrial-like process resulting in the separation of the teaching and learning acts, a theoretical justification for DE is to be found in the reintegration of the teaching and learning acts. In this step, Keegan diverges from both Moore and Holmberg who seem to view the separation as both an advantage and challenge to the autonomous student. Keegan (1986) states:

> The intersubjectivity of teacher and learner, in which learning from teaching occurs, has to be artificially recreated. Over space and time a distance system seeks to reconstruct the moment in which the teaching-learning interaction occurs. The linking of learning materials to learning is central to this process. It may be represented schematically thus: (See figure next page) (p. 120)

Keegan argues that the learning link shown graphically in Figure 5 is a given in traditional education, because the learner is in an environment created to support learning (i.e., the school and/or university). In traditional university classrooms, the physical setting, the interest of peers and the presence of the instructor set a stage for

Figure 5:
Relationship of Learning Materials to Learning in a Distance Education System.



Source: Keegan, D. (1986). *Foundations of Distance Education*. London: Croom Helm.

learning; for establishing the "link" between teaching methods and materials and learning. Although every student in a traditional setting may not participate or respond, the opportunity to do so is intrinsic in the setting. The student feels that she/he "could," and that the decision to participate is available. By contrast, in a distance learning situation, these learning components must be deliberately planned or, as Keegan states, "artificially recreated" in order to link teaching and learning.

Keegan believes that for the distance student, the reciprocity of the teaching act (i.e., the link) must be artificially recreated through interpersonal communication; interpersonal communication which is deliberately planned, given the reality of separation and distance. Thus, he places interpersonal communication at the center of the reintegration of the teaching and learning acts in DE. The theme of interpersonal communication incorporates the theoretical positions of both Holmberg and Sewart, but rather than focus on the student or institutional role, Keegan's focus is the learning process. Keegan (1986) states:

> In conventional education teacher and learner are linked by interpersonal communication which consists of language and non-verbal communication or cues. Clearly, conventional education uses textbooks and other materials in addition to interpersonal communication and as the student proceeds from primary schooling to post-graduate

study the proportion of printed materials used in the learning process tends to increase. Interpersonal communication, nevertheless, remains central to the teaching-learning process and its functions may be analysed . . . Distance education presents a cluster of educational efforts to replace these functions of interpersonal communication by printed, electronic or computer-based interaction because the interpersonal communication of conventional education is, by definition, excluded except for occasional sessions or meetings. Thus distance education has to attempt to compensate for the following characteristics:

- no heard language
- absence of non-language communication (environmental factors, proxemics, kinesis, touching behaviour, paralanguage, physical characteristics)
- absence of feed-back processes student-to-teacher
- absence of feed-back processes teacher-to-student
- delayed reinforcement
- absence of student-to-student communication
- change in role of non-cognitive learning

processes (peer contact, anxiety, peer support and criticism). (p.121-122)

Keegan suggests that many DE institutions have attempted reintegration of the characteristics above through learning materials (both print and non-print) designed to achieve as many of the characteristics of interpersonal communication as possible. In addition, many programs utilize various methods of interpersonal communication such as communication by correspondence, telephone tutorials, electronic mail, teleconferences, seminars.

Keegan reasons that if a learner must participate, must respond in order to establish the critical link between teaching and learning acts – that if the opportunity to make the link is not intrinsic in the DE situation – then DE programs must artificially and intentionally reintegrate the teaching and learning acts and that the more successfully a DE program manages reintegration, the more successful its students will be. Keegan (1986) proposes the following three hypotheses:

- That distance students have a tendency to drop-out in those institutions in which structures for the re-integration of the teaching acts are not satisfactorily achieved.
- That distance students have difficulty in achieving quality of learning in those institutions in which structures for the

re-integration of the teaching acts are not satisfactorily achieved.

- That the status of learning at a distance may be questioned in those institutions in which the re-integration of the teaching acts is not satisfactorily achieved. (p. 126)

The primary purpose of this study was to test the first hypothesis and to a lesser degree, the second hypothesis, proposed by Keegan. This was accomplished through the reintegration of two of the interpersonal characteristics Keegan cites as needing compensation (i.e., the absence of student-to-student communication and the change in the role of non-contiguous learning processes [peer contact, anxiety, peer support and criticism]). An attempt was made to artificially recreate these characteristics through the formation of study groups and a network of local contact persons (former students). This was done within the context of an existing DE program which had already attempted to address, to some extent, the remaining interpersonal characteristics cited by Keegan through written comments on assignments mailed back to students and limited student initiated telephone contact with markers. This structure is typical of the Type I DE institutions identified by Keegan's typology (1986) and discussed in detail as an issue of external validity in the third chapter, Methods.

Some work has already been conducted which could conceivably be judged to test the reintegration of some of the

interpersonal characteristics cited by Keegan. Most of these studies, however, did not seek to present the tested variable in a theoretical context, but rather as separate variables operating in a DE system so ill-defined as to make generalization impossible. No documented work, however, to this researcher's knowledge, has sought to artificially recreate and reintegrate opportunities for student to student communication (or peer contact). Keegan (1986) also supports this observation:

> Distance education is different in that it does not compel the student to join the learning group in order to study. Most distance systems treat the student basically as an individual; group work may be compulsory, optional or may never occur, depending on the structure of the distance system in which one enrols. The advantages and disadvantages of the absence of the learning group in distance education is a practically untouched area for future research. (pp. 45-46)

A Model of Persistence and Withdrawal in Higher Education

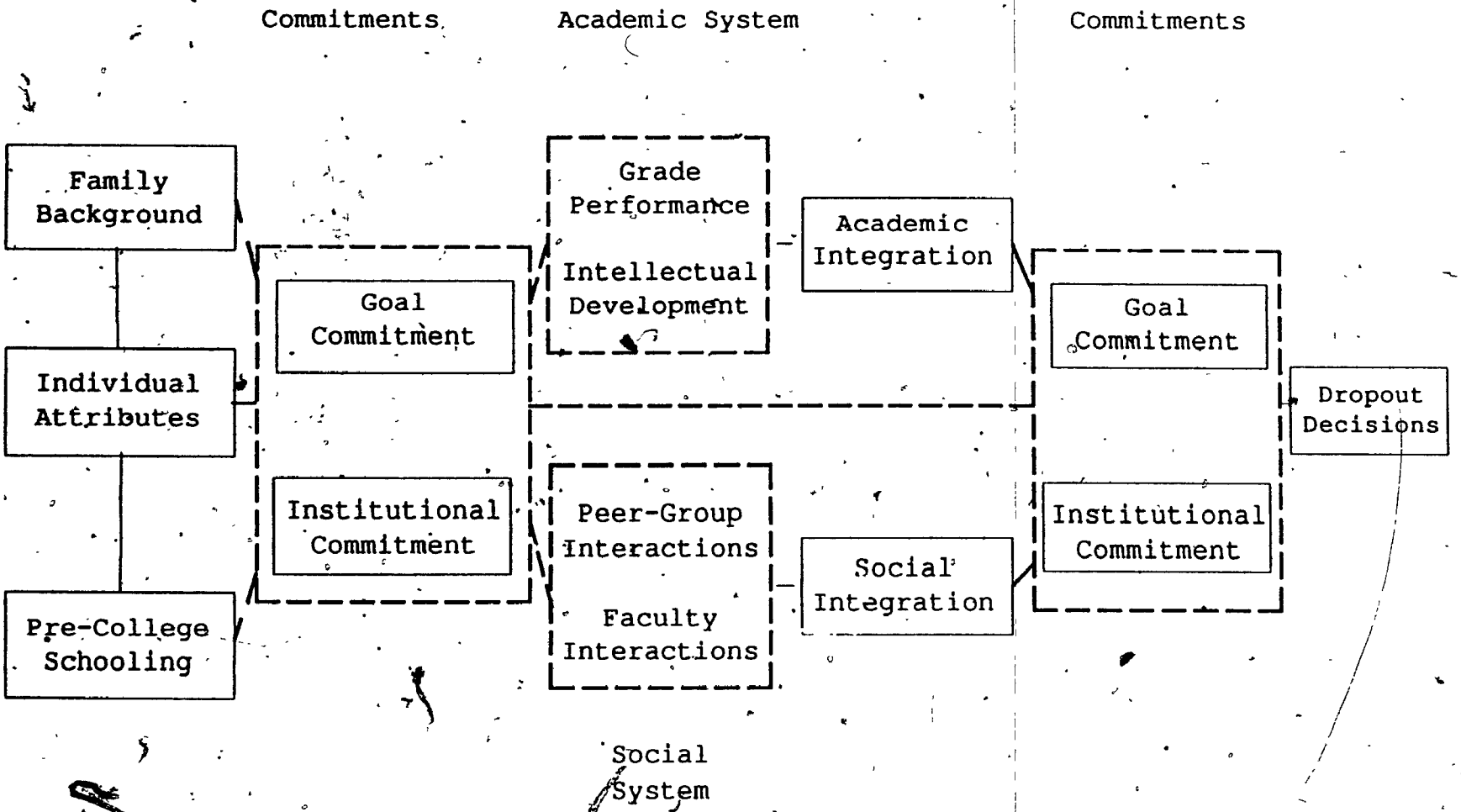
A secondary purpose of the present study was to identify variables which are positively correlated with two indicators of student success, namely, course completion and self-perception of learning achievement. Both the selection and

organization of the variables and the analysis and interpretation of the data was guided by a theoretical model of student persistence and withdrawal originally proposed for four-year, residential university settings (Tinto 1975). Tinto extended the work of Spady (1970) and Rootman (1972) to formulate a theoretical model of dropout in traditional four-year, residential institutions of higher education. A graphic representation of Tinto's model appears as Figure 6.

According to this theory the student brings to college such characteristics as family background and personal attributes and experiences, each of which is presumed to influence not only college performance, but also initial levels of goal and institutional commitment. These characteristics and commitments, in turn, interact with various features of the particular college or university and lead to varying levels of integration into the academic and social systems of the university.

Tinto views persistence toward completion largely as a function of the students' academic and social experiences after enrollment. According to Tinto, the extent of academic integration is determined primarily by the student's academic performance and his or her level of intellectual development. Social integration is primarily a function of the quality of peer-group interactions and the quality of student interactions with faculty. He argues that given individual characteristics, prior experiences and

Figure 6.
A Conceptual Schema for Dropout from College



Source: Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research, *Review of Educational Research, 45* (1), 89-125.

commitments, it is the individual student's integration into the academic and social systems of the institution which relate most directly to continuance at that institution. Further, he argues that given prior goal and institutional commitment, it is the integration into the academic and social systems that promote new levels of commitment. Finally, Tinto reasons that other things being equal, the higher the degree of interaction of the individual, the greater will be the resulting goal of completion and commitment to the institution. The model recognizes that external factors and varying personal perceptions of reality may affect the decision to voluntarily withdraw, but this is viewed as having an effect on goal and institutional commitment and therefore, accounted for by the model.

Tinto (1975) supported his model with a synthesis of existing literature which investigated individual variables thought to be correlated with academic dismissal and voluntary withdrawal. Tinto (1975) concluded:

> . . . although academic dismissal is most closely associated with grade performance, dropout in the form of voluntary withdrawal is not. Such withdrawal, instead, appears to relate to the lack of congruency between the individual and both the intellectual climate of the institution and the social system composed of his peers. (pp. 116-117)

Validation Studies of Tinto's Model

Conventional Residential Universities

The institutional context to which Tinto applied his model is the traditional four-year, residential university with a student population falling in the 18-24 year-old range. In this context, it has gathered substantial empirical support.

Terenzini and Pascarella (1978) conducted a study of entering freshman at Syracuse University in New York to test Tinto's theory. They found that prior-enrollment variables of sex, academic aptitude and personality characteristics were statistically nonsignificant with respect to decisions to dropout or persist. They also found that their designated measures of academic and social integration were significantly important to persistence. Academic measures seemed to be almost twice as important as the set of measures used to assess social integration. Of the three separate variables which made significant unique contributions to the prediction of persistence status, the frequency of the student's interaction with faculty outside the classroom was the largest. The total variance explained by the model was 25.6%. In summary comments, Terenzini and Pascarella advised more investigation of student-faculty contact as this can be practically addressed by universities. They also recommended further investigation of the influence of students' peer reward systems and other interactions among students and how these peer systems may complement or oppose influence of faculty contacts.

Lack of the investigation of peer issues was perceived by the researchers as a weakness in their study.

Again using Syracuse students as respondents, Terenzini and Pascarella (1980) found general support for Tinto's model over three independent data collections spanning a period of three years. They found no statistically significant differences between those who persisted and those who voluntarily withdrew with respect to any of a wide range of characteristics prior to enrollment, but they did find prior characteristics interacted with the quality and quantity of academic and social integration experiences following enrollment. After initial differences were controlled for, measures of academic and social integration contributed significantly. In all three data collections, the frequency of informal student-faculty interaction was either the first or second most important single variable. The total variance explained by the model was 30%.

As a follow-up investigation of faculty-student contact, Pascarella and Terenzini (1979a, 1979b) began by controlling for pre-enrollment characteristics and found that thirteen measures of social and academic integration contributed significantly to increases in the explanation of voluntary withdrawal. They then controlled for pre-enrollment characteristics and measures of social and academic integration while observing the independent effect of student-faculty contact which was found again to make a significant, unique contribution. However, these results

differed somewhat by the type of contact. Interactions focusing on intellectual and course related matters produced the largest significant correlation with persistence of both sexes. Also students with entering characteristics and social and academic profiles of dropouts seemed to benefit most from faculty-student contacts. In a review of research on the topic of faculty-student contact, Pascarella (1980) stated that this contact seemed to positively affect satisfaction with college, educational aspirations, intellectual development, academic achievement and freshman and sophomore persistence and that the quality and type of contact benefited different students differently.

Measures were constructed specifically to assess academic and social integration following Tinto's (1975) view of these components (Pascarella & Terenzini, 1980). The total variance explained using the newly constructed measures surpassed considerably the total variance previously explained by the model (81.4% for persisters and 75.8% for dropouts), thus generally supporting the predictive validity of the major dimensions of Tinto's model. This time, peer relationships were investigated (as per Tinto's model) and were found to contribute less than scales concerned with student-faculty contact. This finding was not in agreement with Tinto's (1975):

> Of the various forms of social interaction that occur within the social system of the college, peer-group associations appear to be most directly

> related to individual social integration, whereas extracurricular activities and faculty interactions appear to be of approximately equal secondary importance in developing commitment to the institution. (p. 110)

However, as discussed earlier, Tinto considers institutional commitment, in itself, insufficient to explain variations in dropout behaviors.

Munro (1981), in a multi-institutional, longitudinal study, could not confirm Tinto's model in general. She found through a path analysis procedure that a student's educational aspirations and those of their parents had a greater effect on goal commitment leading to persistence than did academic integration, and that academic integration had a stronger effect on institutional commitment than did social integration. She found no significant effects of social integration variables. The obtained model accounted for only 14% of the variation in withdrawal behavior.

Less Conventional Institutions of Higher Education

The results of the validation studies discussed so far are generally confirmatory of Tinto's model, although they employ quite different operational definitions of Tinto's constructs. All but one (Munro, 1981), are based on single institution samples at large, residential universities.

In a study involving a less traditional setting, Pascarella, Duby, Miller and Rasher (1981) investigated

persistence and early withdrawal at Chicago Circle, a large urban, nonresident university. Citing literature which distinguished nonresidential from residential students as being less involved with non-classroom activities, either academic or social, the authors limited their investigation to pre-enrollment factors and academic performance, suspecting the latter alone would have a large influence. They note, however, that it would be difficult to determine if noninvolvement was a result of lack of opportunity because of nonresidency or a function of the characteristics of individual nonresident students. Results of the study showed modest, but significant, differences in the age and education of persisters and withdrawers (i.e., persisters were younger and had higher levels of secondary school achievement). When academic performance was added to the equation (in the form of first-quarter grades), it added substantially to the discrimination. The authors caution against over-interpretation, as they contend there are clearly other variables (nonperformance dimensions) which should be considered even for students in nontraditional settings. They list peer interaction, faculty contact and institutional commitment as areas for further research and possible importance. All of these may minimize the importance of academic performance in the nonresident situation.

Pascarella and Chapman (1983) assessed the generalizability of the model to several less traditional institutional settings. Both resident and two- and four-year

commuter colleges were sampled in a discriminant analysis and path analysis study. The total variance in persistence/withdrawal decisions explained by the model ranged from 13% to 17%; it was suggested by the authors that this may be a function of inadequate operational definitions of the model's variables. Distinct differences were found to distinguish resident students from both two- and four-year commuter students. In four-year, primarily residential colleges, institutional commitment had a stronger influence on persistence than did goal commitment; social integration had stronger direct and indirect effects than academic integration; and the influence of student background traits were mediated through the college experience variables. In four-year, primarily commuter colleges, institutional commitment had a stronger direct effect than did goal commitment. The reverse was true at two-year commuter colleges. In both two- and four-year commuter institutions, academic integration had stronger indirect effects on persistence than did social integration. Similarly, in both commuter samples, student background traits were not totally mediated by the college experience, but had direct effects on persistence.

Taylor (1986) employed Tinto's model to structure a discussion of results obtained from a cross-cultural, multi-institutional DE survey. His experience led him to conclude that while some of the results obtained were consistent with Tinto's model, there was no consistent evidence that would suggest any guidelines for practice in DE.

To date, only one study has attempted to validate

Tinto's model in the DE context (Sweet, 1986). Sweet suggests a possible explanation for Pascarella and Chapman's (1983) finding that social integration had neither a direct nor an indirect effect on persistence in commuter colleges is the relative lack of social opportunities in such settings. Even if such social contacts with faculty, for example, were important, the commuter situation offers little opportunity. He continues by drawing a parallel between the commuter situation and DE as concerns opportunities for social integration. He introduces the variable of telephone tutoring present in some DE situations and hypothesizes that to the extent that telephone tutoring represents an effective form of social integration between students and faculty, it may be expected that the patterns of influence among the variables in Tinto's model will match that originally proposed by Tinto.

Sweet structured the data he gathered by reference to Tinto's model with adaptations he considered appropriate in applying the model to a nonconventional system. Sweet collected initial demographic data from 356 students enrolled in courses at the OLI (Open Learning Institute, British Columbia, Canada). Telephone interviews designed to access elements of Tinto's model were conducted after the conclusion of the course. One hundred and fifty-three students (43%) of the initial sample were interviewed. Sweet admits that all but the demographic data was collected after the semester had ended and final marks were issued, which may well have

affected students' perceptions of their experiences with the course.

Discriminant analysis was used to determine how well the variables predicted persistence in distinguishing completers from non-completers. Total variance explained by the model was 32%, somewhat higher than that obtained in the previous validation studies described above. Student background characteristics explained a significant proportion of variance, 11% , but a greater contribution was made by academic and social integration variables which accounted for 18%. Results suggested that a generally accurate definition of the model was achieved. A path analysis uncovered that academic performance did strongly affect persistence both directly and indirectly. He also found, however, that social integration in the form of telephone tutoring was significantly related to institutional commitment and, therefore, indirectly to persistence. Sweet concluded that Tinto's model only provides a partial explanation to the question of persistence in DE, yet the results of his study, and of others considering commuter students, seems to indicate it is an appropriate framework for further research in DE.

Summary

Tinto's model is considered, by this researcher, to be an interesting complement to Keegan's theoretical framework. Both theorists focus on the integration of components which

many institutions (DE institutions and conventional institutions) consider separately. This aspect seems to indicate that both theorists view the phenomenon under study as complex and not easily explained; a phenomenon which can only be understood by investigating how the component "pieces" work together. The initial ideas for Tinto's model were based on the idea of unsuccessful societal integration or "belonging", as a possible explanation of suicide. Thus, his ideas of academic and social integration into the "society" of the university. Although Keegan's notions are not similarly founded, it is interesting to note that, through the reintegration of certain teaching and learning components, he has created opportunities for academic and social integration for the learner in distance education. This study draws on both theoretical frameworks to assist in arriving at a better understanding of the teaching and learning roles in distance education.

CHAPTER II

LITERATURE REVIEW

Selection Process for the Review

This review includes studies which attempt to explore any of a number of variables thought to be correlated with success in the DE stituation. Guidelines for selection were broad because of the limited amount of research extant, and because many of the located references lacked sufficient detail to allow closer scrutiny. In general, every study was included which incorporated some recognizable methodology concerned with the collection of data and presentation of results. This procedure excluded at least 75% of the material found which addressed the topic at hand. A perusal of the DE literature of the past two decades will uncover an abundance of discussion and advice about "how to" affect success in the DE situation, but comparatively little which can be considered formal evaluation or research.

Defining Success in Distance Education

Success has not generally been defined broadly in DE research. Educational researchers have measured success in

a variety of ways including student achievement measures, self-perception of learning, student satisfaction and attitude measures, and student attrition rates (by course, by program, etc.). Of these, the one measure used most often in DE research is the latter, attrition rates (also referred to as persistence toward completion, drop-out, withdrawal). The reason for this is due at least in part to the comparatively high attrition rates which have always been associated with correspondence/distance education efforts.

Several individuals have discussed possible problems associated with employing attrition rate as a measure of success. Shale (1982) addressed the question of attrition at Athabasca University, Alberta, Canada, a university which does not attempt to pace its students' studies except within very broad timelines. Students can begin courses at any time and some courses allow up to one year to completion, making calculation of completion difficult. Athabasca, like other distance education institutions, also must decide how to consider nonstarters (i.e., those students who never submit the first assignment). After specifying "cohorts" or enrollment periods to try to account for the effects of open pacing, Shale used two formulae to calculate attrition. One formula subtracted nonstarters and the other did not. Results indicated that attrition rates were 50% lower in each case calculated when nonstarters were subtracted. Shale clearly illustrates how measures of attrition can fluctuate depending on various institutional factors and, of course, methods of calculations.

Coldeway and Spencer (1980) suggested that there are subgroups of learners which must be considered in furthering understanding of attrition; one of these subgroups is the nonstarter. They also ask the question, for whom are attrition rates a problem, the administrators or the student? In the case of the former, they cite political pressures on administrators to lower attrition rates. In considering students, they suggest that not every student views completion as a goal, a view echoed by Holmberg (1986, pp. 64-70). All of the individuals cited above feel that definition of success in any adult learning environment should be carefully considered; that it is wrong to focus on ways to reduce attrition. Instead, the focus should be understanding of students' needs and how to meet them. They advise that broader measures of student success should replace the often simplistic measures of student attrition evident in much of the DE literature. Many of the studies cited herein do not consider various subgroups in calculating attrition, do not discuss how they calculated attrition rates and do not use other measures of success. These issues will not be cited for each study concerned, but should be a consideration of the reader throughout this section.

Factors Which Influence Learner Success

The citations herein are presented in a topical format, adapted from Coldeway (1986), as follows:

- Personal Factors
  - Demographics and Previous Experience
  - Study Behavior
  - Personality Characteristics
- Institutional Pacing and Delivery Factors
  - Pacing
  - Tutor Management
  - Turn-around Time in Marking of Assignments
  - Quantity of Assignments
  - Role of the Tutor
- Course Design and Delivery Factors
  - Instructional Model
  - Written Personal Contact to Serve as Encouragement
  - Comments on Assignments
  - Telephone Tutoring
  - Face-to-Face Contact
  - Seminars
  - Peer Contact
  - Local Contact Persons

Personal Factors

Demographics and Previous Experience

Comparativly high attrition rates in DE have prompted numerous surveys of DE learners to investigate the reasons for withdrawal (James & Wedemeyer, 1959; Houle, 1964; Sloan, 1965; Woodley & Parlett, 1983; Raynor, 1985). The results of these surveys have shown that many students indicate they

drop out for reasons not directly related to the coursework or program administration, but rather because of external factors concerning job and/or family responsibilities. A significantly smaller number of adult students have attributed dropping out to problems with course materials, course delivery or student support.

Survey procedures used in the studies cited above have been criticized, often by the researchers themselves, for inaccurately measuring student perspectives or attitudes. Critics claim that students may feel intimidated about admitting they have problems succeeding in a distance learning course, especially if they do not have previous university experience; they may immediately see it as "their" failure. They may be unable to identify which course factors, if added or altered, would have made it possible for them to continue and succeed. In 1976-1978, Rekkedal and associates (reported in Rekkedal, 1985) used a more elaborate method to collect data about reasons for discontinuation. Students were asked to indicate the most important single reason for discontinuation and they were asked to also check whether some reasons given in the questionnaire had been "very important," of "some importance," or of "no importance." External reasons were again mentioned most often as the most important single reason for discontinuation, but course related factors were indicated as "very important" or of "some importance" to 39% of the students.

Coldeway, Spencer and Stringer (1980) analyzed data

from targeted courses offered by Athabasca University to determine the interaction between several learner attributes and course completion. Demographic and personal factors of sex, age, prior post secondary education, reason for taking the course and a stated desire to learn on their own rather than in groups failed to yield significant differences as predictors of course completion and noncompletion. The only significant finding showed a positive correlation between the successful completion of one course (at Athabasca University) and completion in the courses targeted by the study.

Donehower (1968), at the University of Nevada, tried to determine if a relationship existed between success and such variables as sex, achievement, completion, withdrawal, reason for enrolling, distance from the correspondence center, previous education and time elapse between enrollment and the submission of the first assignment. Four hundred and ten males and 495 females participated. Students who submitted the first assignment sooner showed a significantly higher rate of completion. Students who lived closer to the correspondence center showed a significantly higher rate of completion, as did students with a higher level of previous education.

Study Behaviors

At Athabasca University, Peruniak (1983) conducted a qualitative research project (he uses the term "phenomenological" research) in which he monitored study behaviors and

various factors external to the specific coursework. Thirty-eight students were asked to keep diaries as they progressed through the targeted course. Forty percent of the 38 students completed the course, which is a little higher than the average completion rate at Athabasca. There were four findings listed by Peruniak: a) those who completed the course studied more – calculated on a per hour basis; b) completers varied their study time according to the demands of the course whereas noncompleters reported they studied about the same amount of time each week; c) completers initiated four times as many calls to tutors as non-completers, and; d) noncompleters recorded more comments about factors external to the course which influenced their study and continuation or withdrawal.

Personality Characteristics

Among the cognitive styles identified to date, the field-dependence-independence dimension has been the most extensively studied and has had the widest application to general educational problems. In a review of current work, Witkin, Moore, Goodenough and Cox (1977) described the field-dependence-independence dimension in some depth and examined four areas in which sufficient research evidence has accumulated from application of the concept. It appears that field-dependent persons seem to employ external referents to define needs and standards and have difficulty in maintaining their own directions. They tend to rely on others for guidance and direction. In contrast, field-independent

people appear to be less influenced by authority figures and external standards and instead are guided by their own needs and values. Field-dependent persons have also been found to have more difficulty than field-independent persons in learning material which lacks clear inherent structure whereby the learner must provide organization to facilitate learning. This research suggests that field-independent persons tend to be more independent and autonomous whereas field-dependent persons appear to have a greater need for the provision of structure and reinforcement. Finally, field-dependence is also associated with a preference for being with other people; field-independent persons tend to have a more impersonal orientation.

Thompson (1984) argued that the traditional correspondence method is not suited to the needs and characteristics of field-dependent students. He proposed that DE systems, in order to accommodate field-dependent students, might need to provide support elements which promote more interaction with correspondence instructors. Thompson and Knox (1987) explored this assumption by investigating whether students who register for correspondence study tend more toward field-independence. They were also interested in whether field-dependent students were more likely to drop out of their correspondence courses than field-independent students and whether field-dependent students evaluate their correspondence study experience less positively than field-independent students. Subjects in this study were selected from those

study were selected from those who registered in correspondence courses offered by the University of Manitoba during the 1983-84 academic year. A variety of content areas were represented and 102 students participated in the study. Subjects were categorized as either field-dependent or field-independent. As expected, students enrolled in the correspondence courses had mean scores significantly more in the direction of field-independence than the comparison scores of normative groups. This was particularly true for female subjects. These data supported the hypothesis that, in comparison with normative groups, students who register for correspondence study are more likely to be characterized by the cognitive style of field-independence. However, contrary to expectations, there were no differences found in the completion rates between field-dependent and field-independent subjects. It was also concluded that field-dependent subjects did not evaluate their correspondence study experience less positively than field-independent subjects.

A survey of telecourse students enrolled at Anchorage Community College in Alaska, U.S.A., (Nelson 1985) found that field-independent students scored higher marks than students with a field-dependent style. No associations were found between either course completion or attitudes toward the courses and the styles of field-independence-dependence.

In a survey of DE students in a program offered by the Canadian Institute of Bankers (the same experimental setting as employed by the present study), Raynor (1985)

investigated the usefulness of a modified form of the Kolb Learning Style Inventory and a modified form of the Rotter Locus of Control Scale. He found that only 1.5% of the variance was accounted for by either measure and concluded that neither was helpful as an identifier of broad personality traits which could be potentially useful in the discrimination of those who completed courses and those who did not.

Institutional Pacing and Delivery Factors

Pacing

Crawford (1981) compared the completion rates of students at three Canadian institutions: Athabasca University; the Open Learning Institute; and North Island College. The same course package was used by all three institutions, but was delivered according to the institutional practices of each institution. Results indicated that completion rates at the Open Learning Institute were more than twice (58% of the students completed) those at the other two institutions (Athabasca University and North Island College, 20% and 25% respectively). It was argued by the researcher that the structured pacing policy at the Open Learning Institute might have influenced higher completion rates. At the Open Learning Institute, there is a fixed start and end for courses while the other institutions have a much more flexible start and end times. Another finding was that North.

Island College students and Open Learning Institute students reached half and end points in the course faster than Athabasca University students. The researcher proposed that this may have been due to the more structured tutorial policy at North Island College, which provided for more frequent and regular tutorials.

DiSilvestro and Markowitz (1982) investigated their prediction that the use of contracts would significantly affect the time it took correspondence study students to submit their first lessons and, in turn, would influence course completion rates. Four hundred and thirty students, at both high school and University levels, were tracked from start to course completion. The contracts had a significant effect in motivating students to begin work on their courses (i.e., submit the first assignment). Of two hundred and thirty-three students in the contract groups, 81% started their course. In contrast, only 57% of the 197 noncontract students began their courses. However, there were no significant differences in overall completion rates between contract and noncontract groups.

Tutor Management

Coldeway (1980) conducted a study to investigate possible effects of tutor pay schedules. Course completion rates, quantity of learner performance data gathered from tutors, tutor input and cost were compared between tutors provided with an incentive pay structure and those paid at a fixed rate. It was hypothesized that there would be a

correlation between the pay schedule and the tutor's effectiveness as measured by student performance. Tutors on incentive pay were paid according to learner success as measured by course completion. Although tutors on the incentive pay schedules collected more performance data about students (indicating more contact with students), student completion rates did not differ significantly between the tutors on different pay schedules. The researchers conclude that tutors seemed to have limited control over learner progress.

Turn-around Time in the Marking of Assignments

The elapse in time between the receipt of a student assignment and its return to the student after marking ("turn-around time") is one of the first variables to be investigated by many distance education institutions. This is an obvious place to begin given the research findings concerning feedback in the education literature. In the DE situation, assignments are the most consistent, indeed, may be the only form of feedback; delayed feedback is considered to be an evident weakness in distance study. Two survey studies conducted on dropouts (Sloan, 1965; Harter, 1969) reported a correlation between turn-around time and student interest and disinterest. The instructor's late return of corrected lessons was the most frequently mentioned reason for non-completion of study.

Rekkedal (1973) attempted to measure the effect of different turn-around times on a) "study pace" – how long it

took students to complete course units, b) grades, and c) completion rates. The normal time for the marking of assignments at Rekkedal's institution had been four to five days not including postal time to and from the institution (i.e., NKI, Norway) and to and from the marker – already a shorter time than reported by most programs. The marking time was further reduced to one day for the experimental group which means that actual turn-around time for the experimental group was three to four days shorter than for the control group. Sixty-nine students were randomly assigned to the experimental group and 58 to the control group. Results showed that 91.3% of the experimental group completed the course and only 63% of the control group completed the course, a significant difference. The other two measures, study pace and grades, were not significantly different for the two groups. It is also interesting that during the first three months of the course, the experimental group submitted significantly more assignments than the control group. An attitude survey showed that if students received assignments in less than one week, all were satisfied; but if the time exceeded one week, a relatively larger number became dissatisfied.

Quantity of Assignments

Consistent with the concern for immediacy of feedback is the question of the amount of feedback. Baath (1979, translated and reported in Baath, 1980) examined three different groups studying the same course material. On the basis of

the same instructional text, one group was required to submit two assignments, a second group four assignments, and a third group eight assignments. The total number of assignment questions was constant between the three groups and the questions were identical. The results indicated one very clear finding, namely, that more students in the groups with a greater number of submissions began sending in papers than did the students in the other experimental groups. However, no differences between the experimental groups were found with regard to course completion, nor with regard to final test results.

Role of the Distance Education Tutor

The most recent research to be conducted by Rekkedal (1985) considers the complex role of what he terms the "personal tutor/counsellor" in DE. This study tried to integrate a number of variables which had been the focus of earlier empirical and theoretical research and seemed to have a positive effect on study activity and completion rates in DE. One hundred and eighty students formed the experimental group and ninety-six students formed the control group. Students in the experimental group were, during the first stages of their studies, assigned to a personal tutor who followed them through all their courses during a certain part of the program. The main difference between the treatment of the experimental and control groups was that the experimental group communicated with one personal tutor who integrated all the teaching and counselling functions, normally the

responsibility of more than one individual. Because of the complexity of the experimental variable (i.e., tutor role), differences concerning rates of withdrawal/completion could not be ascribed to one single aspect of the experimental variable. Dependent measures were marks on assignments and exams, rate of completion and student attitudes. In comparison to the control group, the experimental group: a) was significantly faster to send in their first assignment; b) completed significantly more assignments eight months later and 12 months later; c) completed a significantly greater total number of assignments; and, d) completed a significantly greater number of courses during the same time period. The experimental group also had significantly more positive attitudes toward correspondence study in general, the tutor's work, follow-up efforts of the institute and/or tutor and, telephone contacts as a helpful medium.

Course Design and Delivery Factors

Instructional Model

Coldeway and Spencer (1982) have suggested the application of Keller's Personalized System of Instruction (PSI) in the design of some courses offered through distance education. PSI is essentially an independent study system which was designed to be set up in a conventional university. The method includes the concepts of self-pacing, mastery learning and a combination of lectures, self-instructional

modules and tutorials. Students in an accounting course offered by Athabasca University, Alberta, Canada were assigned to one of five experimental conditions. The five conditions represented different variations of the PSI model (i.e., variations included feedback from self-corrected exercises, feedback by telephone by the tutor, feedback by mail from the tutor and two conditions which allowed students to choose the variation they preferred). Results showed that those students who received feedback from their tutor by telephone had a higher pass/completion rate than those in other conditions. All groups had a significantly higher completion rate than the control group which was composed of students who had enrolled in the course prior to the incorporation of the PSI model; course materials were the same as used by all other conditions. The authors propose that the study indicates that the PSI model can be successfully implemented in DE by the use of the telephone as a means of providing more immediate feedback. They believe that one of the reasons the PSI model produced superior results is because it provides an instructional as well as a management system, both necessary components in a DE system.

Written Personal Contact as Encouragement

It is thought that one of the reasons many distance learners dropout is because of a lack of motivation. In the traditional educational setting, motivation often results through contact with the instructor and other students. Some researchers have tried to measure the effect of providing

motivation by sending students cards and letters throughout the course or at what is considered to be "crucial times," particularly the initial stages of study. Pfeiffer (1969) attempted to measure the effect of letters and postcards of encouragement on the submission of lessons in correspondence study courses. One experimental group received letters and the other cards. These were mailed weekly to students who had neither submitted an assignment nor received feedback during the preceding four weeks. It was concluded that neither form letters nor post cards of encouragement resulted in a significant increase in the submission of correspondence lessons. Rekkedal (1983) on the other hand, in a simple experimental-control group design, found that written communications to those falling behind increased course completion significantly.

Comments on Assignments

Traditionally, correspondence education has employed part-time tutors/markers to mark and comment on student assignments. There has been a great deal of discussion about the type and quality of tutor comments. Sjogren (1963) conducted an experiment where three types of tutor behaviors were examined with the hypothesis that more extensive feedback would result in better student performance. For one group of students, the tutor only corrected wrong answers and showed where the student could find the right answers. The second group received corrections, as well as subject-related and encouraging comments. In the third group, the tutor

tried to establish a personal and supporting relationship as well, through individual comments and personal letters.. No significant relationships were found between tutor behaviour and course completions.

Rekkedal and Ljosa (1974, translated in Rekkedal, 1982) looked at the viability of preproduced tutor comments. The hypothesis was that the preproduced material would release the tutor from repetitive work and thus make it possible for him or her to concentrate on satisfying the individual needs of the students. Two parallel experiments were carried out to examine the effect of introducing preproduced comments and solutions in addition to the tutor's individual corrections and comments. In one of the experiments, a significantly larger number of the students who received the preproduced material completed their courses, while no significant differences were found in the other. Both experimental groups expressed extremely favorable attitudes towards the preproduced material as an additional feature.

Eva[illegible] (1984) attempted to formally assess the effects of using audio tapes for recording comments for students and also as a mechanism for students to communicate with tutors. A structured format was used to elicit comments from students via telephone during an approximately 20 minute long interview. Results of the interviews indicated extremely positive comments from students regarding the use of audio tapes.

Baath (1980) conducted a three part study involving

1,804 adult students enrolled in Swedish, Norwegian and British correspondence courses at secondary schools and vocational training schools. Students were randomly assigned to experimental groups with a) varying "submission density" (varying number of assignments required), b) varying numbers of assignment questions being replaced by self-check exercises, and c) traditional written comments by mail versus computer assisted comments by mail. Data were collected through questionnaires, final tests, and a special student register. Results of the first and second experimental procedures were not available. Results in the third series of experiments showed that the computerized communications were experienced as more positive by the students than the traditional types. Students receiving computer-assisted correspondence tutoring started submitting more assignments than students receiving standard tutoring by mail. In one of the two experimental courses, the course was completed more rapidly and more often.

Telephone Tutoring

Many DE programs, generally in the more developed countries, have incorporated telephone tutoring as a student support component. In an attempt to investigate the effectiveness of the use of telephone tutoring, Flinck (1978) conducted an experiment which involved two groups of randomly distributed correspondence students. The experimental group received telephone tutoring in addition to the conventional feedback, while the others received only written feedback by

mail. Courses included were introductory French and basic economics, both intended for adult learners. Results indicated that students who received telephone tutoring reacted to it favorably; however, no difference was found between the two groups in achievement, amount of study time or feelings of isolation. Telephone tutoring proved to be of a greater advantage to those students studying a foreign language than to student's studying one of the social sciences.

Sweet (1982) focused a study on the frequency of telephone contact with tutors and supportive behaviours tutors extended. One hundred and eighteen students, at the Open Learning Institute, B.C., Canada, participated in the study. No significant differences were found in the frequency with which tutors telephoned students in the two groups. It was found that 45% of those who completed the course contacted their tutors and 32% of those not completing the course had made contact, a significant difference.

Scales (1984), also at the Open Learning Institute, B.C., Canada, addressed the relationship between telephone contact and persistence in completing the courses. "Persistence" was defined in terms of the proportion of assignments submitted, so a student submitting four assignments was considered more "persistent" than a student submitting only three. Three hypotheses were formulated, as follows: a) there will be a positive relationship between quantity of telephone contact and student persistence;

b) there will be a positive relationship between student persistence and student initiated (as opposed to tutor initiated) phone calls; and, c) there will be a relationship between type of academic program and persistence. At the Open Learning Institute, tutors are provided with a telephone in their home. There are no restrictions on lengths of calls with students. In this study, information was gathered from the records kept by tutors detailing telephone calls. Fifty-seven students were randomly selected and followed for one semester. Results confirmed all three hypotheses. Concerning hypothesis three, the association was strongest with students enrolled in the Adult Basic Education program, where a greater number of students did not have a high school education.

Face-to-Face Contact

Seminars. Many DE programs have incorporated some format for limited face-to-face contact in addition to instruction based on printed materials. Peruniak (1984) conducted a study concerned with the effect of a course seminar on the success of adult learners at Athabasca University. In the context of this study, a seminar was a session conducted by someone hired by the institution. Participants in the study were enrolled in one of two introductory courses: Introductory Psychology or Introductory Administration. Students were randomly assigned to a seminar and a non-seminar control group within each course. The seminar group received invitations to attend a

seminar during the course while the control group received no invitations and attended no seminar. Results showed that less than one-fifth of invited students attended the seminar. There were no significant differences in terms of course performance for Introductory Psychology between attenders and non-attenders, with respect to completion rate and average grade for the course. In the Introductory Administration course completion rate for attenders was significantly greater (62% versus 38%). There was no difference between average grades. In both courses attenders submitted the first assignment (about the same time as the seminar) significantly sooner than the nonattenders. However, nonattenders in both courses completed the courses on the average of one month earlier than the attenders. Variables concerning the ability to attend the seminar were not included in the design. The author notes that the study was correlational only.

Millard (1985) undertook a student evaluation of the UKOU's policy of providing students with a local tutor contact. Those students surveyed included all students in the East Midlands Region of the UKOU studying post-foundation Social Sciences and Educational Studies courses. An attitude questionnaire was also administered, and a 55% response rate was reached. Millard found that the average attendance at face-to-face tutorials is between 40 and 50 percent of the finally registered student population. In terms of distances students must travel to get to the tutorials, above average

attendance is likely within the first 20 miles; after about 50 miles, additional distances seem in no way to be a deterrent to tutorial attendance. Students' ranked contact with their tutor as the most important non-obligatory component of their studies. Other non-obligatory components were course notes and articles, TV programs and notes and Radio/cassette programs and notes. Students rank order of reasons for attending tutorials was as follows:

1) For general support in studying the course;
2) For help with difficult course material;
3) To meet the tutor;
4) For help in writing continuous assessment answers;
5) To meet other students;
6) For help with revision for the final examination;
7) To enrich and extend the course material; and,
8) Because they are provided.

Ranks were obtained by summing the ranks given by each of 1176 student courses and then setting these total component scores in ascending order. Millard found a highly significant correlation between course result and previous education. However, there was not a significant relationship between previous education and tutorial attendance. A statistically significant, positive relationship was found between tutorial attendance and success in terms of course result (grade) for students with no previous educational qualifications. For previously qualified students, no

differences were found.

Peer Contact. Hodgson (1986) describes a study conducted at the British Open University (UKOU) with students registered in the OU Effective Manager Programme. The support system of the UKOU was available to each student: included were an UKOU tutor, three tutorials, three tutor-marked assignments, and one weekend residency. In addition, for participants in this study there was an organizational and/or peer support system available to each group, the characteristics of which differed. One group was allocated an organizational tutor who met with the group every month for half of a day. The half-day sessions were intended both to bring the group together (they all worked in different parts of the company) and to focus on how they might apply their learning in their work. The same organizational tutor ran two three-day skills workshops for the group. Another group was also allocated an organizational tutor, but there was only one initial meeting with the tutor after which they were advised to meet with each other, but not the tutor, on a monthly basis. A convenient meeting place was arranged for this group to be used whenever they wished. Thus, the first group had an organizational support system which was comprised of: an organizational tutor, regular half-day tutor meetings and two tutor-run three-day skills workshops. The second group had: an organizational tutor, planned tutorless monthly meetings, and a study/resource room.

There were seven students in the first group and nine in the second. An unspecified interview technique was used to explore any interrelationships between the support system and a subjective assessment of learning resulting from various course components. All students were interviewed once and some were interviewed twice.

Resulting information seemed to indicate that students in the second group never managed to get together for their proposed monthly meetings and most never made use of the room available to them. Of the nine who originally started the course two completed the whole program and took the exam; one completed all the assignments and attended the residential; the other six all dropped out at different points in the program. In contrast, all members of the first group completed the course and all but one took the exam. Interview information indicated that the perceived benefits of the particular organizational support system was in terms of support to keep doing the work and complete the course, and not in terms of how the organizational support system interrelated with the learning materials and influenced the learning process.

In an article about the formation of study groups, Sewart (1975) describes the difficulties encountered in the UKOU system associated with arranging face-to-face tutorials. As a result, a pilot scheme was initiated for the formation of self-help groups in the Cheshire area of Britain in 1973. A total of 57 groups met initially, organized by counsellors

at the various regional study centres. Groups were formed in all course content areas (i.e., arts, social sciences, education, mathematics, sciences and technology). Counsellors often provided academic help when groups met in regional study centers. Some groups requested assistance from course tutors; some did not, not feeling the need to do so. The analysis was based on a questionnaire filled out by the "secretary" of each group which continued to meet throughout the duration of the course. It is significant to note that many students at the initial meeting did not favor an official group and rather chose to meet informally on an *ad hoc* basis. Unfortunately, no information was collected on these individuals. While fairly "loosely" tabulated, the survey provides evidence of a very positive student reaction to the study group system and evidence that students used study groups as a substitute for tutorials when travelling to tutorial sessions presented a problem.

Crump and Livingston (1981) explored the assumption that different academic disciplines require various degrees of contact between staff and individual students, between staff and groups of students, and between students and their peers. All three forms of contact find a place in traditional university teaching, but not necessarily in distance education settings. It is the contention of the authors that small group contact between staff and students and between students and their peers are necessary to the learning skills which must be developed in certain disciplines: they cite,

as examples, the Humanities and the Social Sciences.

Students were required to meet together in small groups. The sessions were organized through the use of cassette tapes. The first tape explained the nature and purpose of the program and established a structure for its conduct. Subsequent tapes followed a uniform pattern of topic presentation and questions for discussion. The group was instructed to discuss the questions and at the end of its session to set out its conclusions in not more than ten minutes on the same tape, the return it to the University. Responses to the groups' conclusions were made in various ways: by extended individual comment on the same tape, by letter or by both a letter and a single taped response distributed to all groups involved after all the replies from the various groups had been heard.

Groups varied in size from two to ten students. Each group was instructed to appoint a chairman and recording secretary for each tutorial, the positions rotating so that in a group of four students each would have acted once as a chairperson and once as a recording secretary after four sessions. The job of the officers was clearly defined. The chairperson was to keep discussion to the point and ensure that no one individual dominated, the secretary to record the group's conclusions. Precise preparation of specified articles, documents or texts were required of each participant before every session.

The results of an anonymous questionnaire suggested

that the structured tutorial had overcome the problems that previous unstructured tutorials had stumbled on, including the lack of any clearly perceived overall direction, the domination of proceedings by one individual and the stifling of discussion, and simply a general lack of preparation. Findings indicated that only one student felt that other students in his tutorial had not made much effort to prepare themselves, that one individual had dominated discussions in a detrimental way, and that the chairman had been unable to keep discussion to the point. All other replies indicated that these problems had been overcome. Unfortunately, no attempt was made to measure the quality of understanding resulting from this structure although this would have been in keeping with purposes stated in the introduction to the article.

Local Contact Persons. In New Zealand, the Massey University support model for extramural (distance) students is mostly based on a network of unpaid individuals who themselves have a number of years experience as extramural students. The impetus to begin this system came from the students themselves, who formed the initial study groups and began looking for further regional support. Regional panels were established to provide services to extramural students, one of which was to promote the establishment of local study groups. By 1981, single "Area Communicators" (former or continuing extramural students) had replaced the panel structure. Williams and Williams (1985, 1987) tabulated a

survey of 55 members of the area coordinator network and a sample of 530 students were surveyed to ascertain how the network was functioning. A 51% response rate was achieved. Findings indicated that 47% of the student respondents felt that familiarity with extramural study was one of the most important characteristics of a successful Communicator, followed by personal qualities such as friendliness and approachability (45%). The ability to listen (33%) and accessibility (29%) were also considered important. It was found that older students, those in part-time employment, and those without tertiary qualifications were more likely to contact Communicators than younger students or those who already had tertiary qualifications. Students felt that facilitating contact with other students by the organization of area meetings and encouragement of study groups were the sorts of services Communicators should offer. Many students also expressed a need for the Communicator to make direct initial contact with them by mail or telephone.

CHAPTER III

METHOD

The study described herein was designed as a two part analysis. The first and primary analysis sought to investigate the effects of providing opportunities for peer contact in a DE setting, thus testing two hypotheses proposed by Keegan (1986). The second analysis attempted to identify predictor variables which most effectively discriminate between student groupings based on course completion and student groupings based on self-perception of learning achievement. For the sake of clarity, these two analyses will be considered separately in this chapter under the headings, "Primary Analysis" and "Secondary Analysis".

Primary Analysis

As stated above, the primary aim was to test the effects of providing opportunities for peer contact in a DE setting. In the context of this study, the term "peer contact" refers to either face-to-face or telephone interaction among students enrolled in the same course or between students and former students who have already completed the course. "Peer contact" does not include interaction with administrative staff or course graders. However, limited

telephone contact with the researcher forms one component of two of the treatment levels.

The hypotheses tested in the first analysis were as follows:

Hypothesis 1 — Those students who express a desire to study with others and do so and those students who prefer to work on their own, will perform better on both objective and subjective measures of achievement than those students who express a desire to study with others, but are unable to do so.

Hypothesis 2 — The more the distance education institution supports contact among students (by creating opportunities for contact), the better students (who desire contact) will perform on both objective and subjective measures of achievement.

Hypothesis 3 - Those students who desire to study with others and do so and those students who prefer to work alone, will complete the course more often than those students who desire to study with others, but are unable to do so.

Hypothesis 4 - Those students who desire to study with others and do so, and those students who prefer to work alone, will evaluate the course and course components more highly than those students who desire to study with others, but are unable to do so.

Hypothesis 5 - The more the DE institution supports contact among students (by creating opportunities for

contact), the more highly the students who desire contact will evaluate the course and course components.

Hypothesis 6 - Those students who desire to study with others and do so, and those students who prefer to work alone, are more likely to state that they would take another correspondence course and are more likely to state that they would recommend a course to another, than those students who desire to study with others, but are unable to do so.

Hypothesis 7 - Those students who prefer to work on their own will differ from those who wish contact on various demographic measures of age, education and experience.

Design

Field Experiment

The study described herein is recognized to be a "field experiment" as opposed to a laboratory experiment. Kerlinger (1973) describes a field experiment as a "research study in a realistic situation in which one or more independent variables are manipulated by the experimenter under as carefully controlled conditions as the situation will permit" (p. 401). Kerlinger continues by listing what he has determined to be the strengths and weaknesses of a field experiment. These are presented in Table 1.

Attempts to study various phenomena within an existing DE setting create even greater concerns for experimental

Table 1
Strengths and Weaknesses of a Field Experiment

Strengths	Weaknesses
1) Variables in a field experiment have a stronger effect than those of laboratory experiments - the more realistic the research situation, the stronger the variables.	1) Field experiments must operate with less experimental control than laboratory experiments.
2) The realistic situation of a field experiment contributes to external validity.	2) The independent variables in a field experiment may be contaminated by uncontrollable environmental variables; the effects of the treatments cannot be isolated from other effects.
3) Field experiments are appropriate for studying complex social influences, processes and changes in life like settings.	
4) Field experiments are appropriate for testing broad hypotheses.	
5) Field experiments provide flexibility and applicability to a wide variety of problems.	
6) Field experiments are well suited to testing of theory and to the solving practical problems.	

Source: Kerlinger, F. N. (1973). *Foundations of Behavioral Research*. Montreal: Holt, Rinehart and Winston, 401-403.

control than the example of a traditional educational setting cited by Kerlinger. Distance education, by its very structure, is a system where minimal control is possible over student behavior. Distance education students do not "come to class," so that indicators like attendance and participation, often considered at the undergraduate and even the graduate level, are not available. Lack of physical presence renders many methods of control impossible or, at the very least, more difficult to administer and less effective. In many DE settings, including the one chosen for this study, interaction between the student and the program is composed primarily of several assignments for which varying levels of written feedback are given and a final exam for which no feedback is provided. Telephone contact is available, but minimal if measured on an individual student basis. These factors necessitate reliance on self-reporting of behavior in written form, by telephone or if available by teleconferencing, computer conferencing, etc.

There are also tremendous advantages to a field experiment in the context of DE. The realistic situation of a field study is well suited (as noted by Kerlinger, see Table 1) to testing of newly proposed theoretical perspectives and is ideal for the solution of practical problems. The present study seeks to both test a theoretical perspective (i.e., Keegan, 1986) and provide information relevant to the practical problem of program design in DE.

Experimental Design

Independent Variable. To study the phenomenon of peer contact, study groups of two to five students were formed and each study group was assigned to one of three treatment levels. The treatment levels represented varying degrees of institutional support in creating opportunities for contact. The basis for designing and selecting the support elements for each treatment level was a preliminary survey sent to all students registered in the targeted courses the year prior to the present study. An additional required criterion in the design of support levels was that the treatments be easily replicable by regular program staff once the study was completed. The researcher agreed to this stipulation during the initial discussions with the program director. The treatment levels, briefly described in Figure 7, were structured as follows:

Treatment Level 1 – Formation Support Level

Students in this treatment level were provided with aid in contacting other students working or living nearby who had expressed a similar interest in studying with other students.

Treatment Level 2 – Ongoing Support Level

Students in this treatment level were provided with the same support as offered to those in treatment level one. In addition, students in treatment level two were sent an interactive video study unit entitled "Learning at a Distance: Approaches to Studying" and an audio cassette

Figure 7.
Overview of Treatment Levels.

Treatment Level 1	*Formation Support Level* - Aid in making study group contacts
Treatment Level 2	*Ongoing Support Level* - Aid in making study group contacts - Teaching units on study strategies and exam strategies - Provision of Wednesday evening toll-free connection
Treatment Level 3	*Former Students Support Level* - Aid in making study group contacts - Teaching units on study strategies and exam strategies - Provision of Wednesday evening toll-free connection - Contact with former student as a LCP ("local contact person")
Treatment Level 4	*Quasi Control Group* Composed of students who desired study partners, but no study links were possible

unit entitled "Exam Strategies: How to Successfully Study for Exams and Pass Them." The units were structured to be viewed in a group, facilitating discussion about many of the aspects of continuing education in general, and correspondence education in particular, which adult learners may find difficult. The researcher was available by toll-free line each Wednesday evening from 7:00 p.m. until 11:00 p.m. EST for any students in treatment levels two and three who wished to discuss problems with study group organization and function or problems organizing their own studies. Each student in treatment levels two and three was sent information about the toll-free evening time and its purpose.

Treatment Level 3 - Course Graduate Support Level

Students in treatment level three were provided with the same level of support as treatment level two and, in addition, a former student who had already successfully completed the targeted courses and who worked or lived nearby was available to each study group for the purposes of providing general information, answering specific content questions, or simply providing motivation.

Quasi-Control Group

This group was composed of students who expressed a desire to study with other students, but for whom contacts could not be made because of the lack of other students taking the same course and residing within a reasonable distance.

The researcher also followed those students who stated they preferred to work on their own. This group was followed out of a desire to understand any differences which may exist between students desiring contact and those who preferred to work alone.

Dependent Variables. Measures employed were as follows:

Achievement Measures

Mean of assignment scores - A mean percentage score was calculated for each student based on the total number of assignments submitted. Missing assignments were not considered in the calculations; therefore, students described as nonstaters who did not submit any assignments were not included in subsequent analyses employing this measure.

Final exam scores - A percentage score recorded for each student.

Final academic standing - The possible outcomes were Nonstarter, Incomplete, Failure, Pass, and Honors. The latter three levels are based on final percentage marks as follows: Failure, below 49%; Pass, 50% - 80%; Honors, 80% or above.

Questionnaire Item 29 - This was a measure of self-perception of learning achievement structured as a semantic differential scale (See Appendix A).

Attitude Measures

Questionnaire Items 46-61 - Structured as semantic differential scales, some items asked students to

evaluate how much various course components aided their learning. Other items asked students to evaluate how much various course components needed to be improved (See Appendix A).

No reliability estimates were performed on the measurement of assignment scores, nor were they performed on the measurement of final exam scores. This was the case because individual items are needed for such calculations and these were not available. Also, it would have been without meaning to the particular DE system sampled for this study to have created measures other than those in use.

Sample

External Validity

It appears that for the case of DE, matching samples on the basis of demographics to determine generalizability is inexact at best. Coldeway (1986) reports that a review of institutional statistics from a large sample of the DE colleges and universities in Canada strengthens the position that the student population of DE institutions is extremely varied and more heterogeneous than conventional college and university student populations.

Distance education opportunities at the post-secondary level generally attract a clientele somewhat older than conventional undergraduate students and generally those who are employed fulltime and not in the position to be fulltime

students. With respect to the representation of the sexes, there are very strong national differences: in Sweden, the United States and Canada, the majority are women, while in all other countries, women are under-represented (Schutze, 1986). As specific examples, the 1984-85 statistics of Athabasca University in Alberta, Canada, show an enrollment of 8,600 students, 70% of whom were between the ages of 25 and 44, and 60% of the total enrollment were female (McInnis-Rankin & Brindley, 1986). The 1984-85 statistics from four European distance education universities show a similar pattern (See Table 2).

The Personal Education Program of the Institute of Canadian Bankers, the experimental setting chosen for the present study, cites 1984-85 enrollment figures of 10,000. The average age cited was 30.8 years and females represented 65% of the surveyed respondents (Raynor, 1985).

A far more appropriate method of establishing external validity seems to be consistency with other distance education program structures and administrations rather than demographic similarities. Keegan (1986) has proposed a typology of five major types of distance education institutions (See Figure 8). The remainder of this section provides a comparison of the experimental setting employed in this study to Keegan's typology. First, the experimental setting is briefly discussed and then the characteristics of the appropriate category are described.

Experimental setting. The Institute of Canadian Bankers

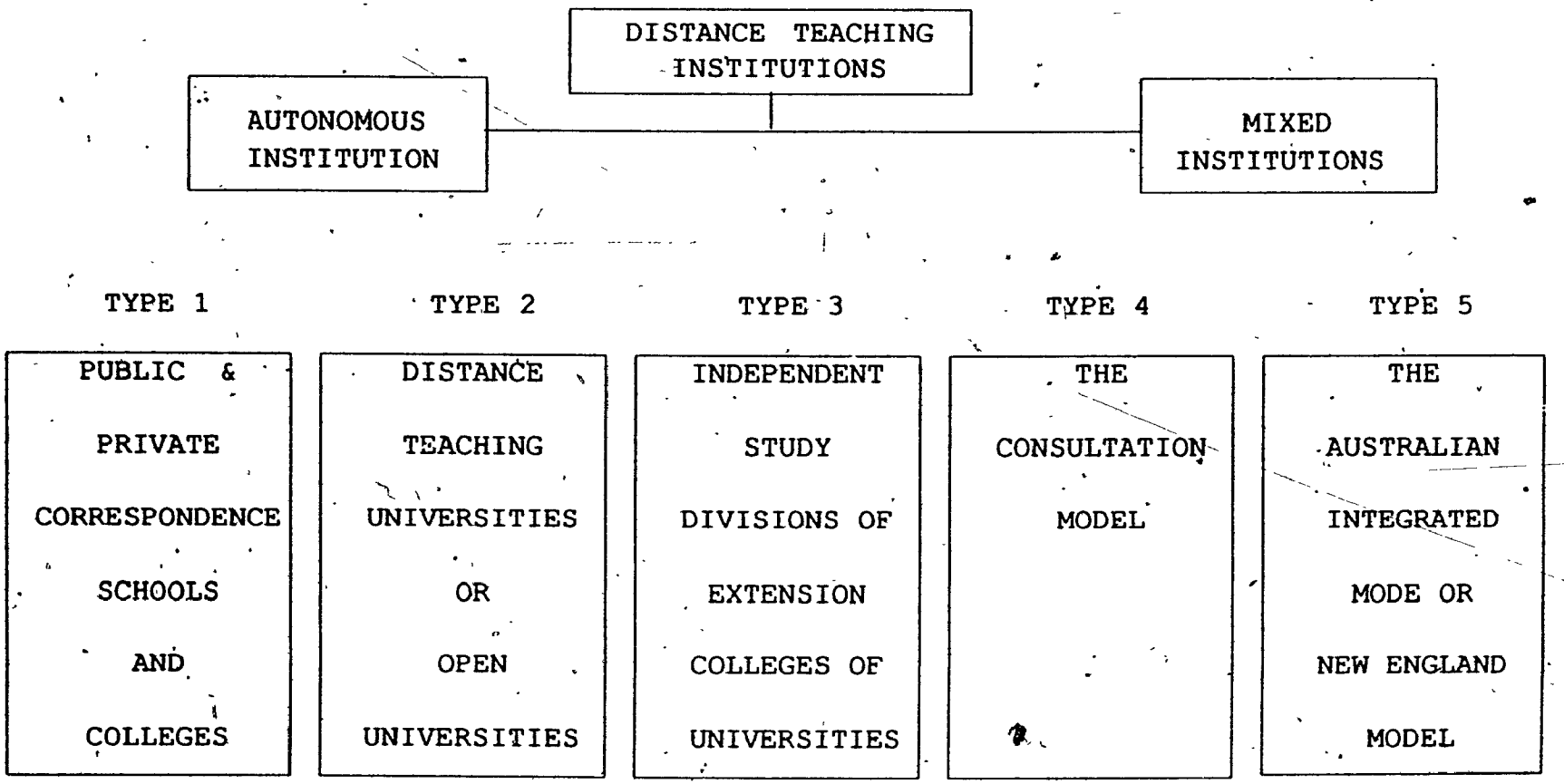
Table 2
Characteristics of degree-seeking students at four European distance education universities in 1984 (or nearest year)

Category	Open University U.K.	UNED Spain	Distance University Germany	Open University Netherlands
Number of degree students[2]	67,800	47,000	13,200	21,700
Age*				
under 25	4.6	22	16	18.7
25-29	17.9	29	45[7]	25.1
31-39	45.3	37	24[8]	36
over 40	32.2	12	15[9]	20.2
Sex*				
male	54.8	62[1]	76	66
female	45.2	38[1]	24	34
Civil Status*				
single	25.7[3]	48	4.6	33.1
married	72.0	49[5]	51	61.7[4]
Employment Status*				
employed	80.2[6]	71.7	87	68
not employed	19.8	28.3	11[1]	32

*in per cent
1) figures do not add up to 100 per cent due to incomplete data; 2) numbers rounded; 3) includes divorced/widowed; 4) including living with a partner; 5) 3% divorced or separated; 6) 5.1 per cent of total described as housewives with parttime work up to 20 hours per week; 7) (25-31); 8) (32-38); 9) (over 39).

Schütze, H. G. (1986). Adults in higher education: Lowering the barriers by teaching and learning at a distance. In Enckevort, Harry, Morin, Schütze, (Eds.) *Distance higher education and the adult learner,* p. 29. The Netherlands: Open Universiteit.

Figure 8. Typology of Distance Teaching Institutions.



Keegan, D. (1986). *The foundations of distance education*, p. 139: London: Croom Helm.

works in cooperation with 49 Canadian universities to offer academic programs to banking personnel throughout Canada. In addition, the Institute recognizes that there are personnel who live too far from any of the designated university centres (a large number of students also reside outside of Canada) or who prefer to study at home for a variety of reasons. For these students, the Institute, again in cooperation with various Canadian university staff and faculty, have developed a correspondence program, the Personal Education Program (henceforth PEP). PEP (Canadian students only) was chosen as the experimental setting for the present study.

Nine courses are offered by PEP through correspondence, as follows:

Module I

- Communication
- Business Administration
- Fundamentals of Accounting

Module II

- Organizational Behavior
- Economics
- Marketing
- Business Finance
- Business Strategy

Module III

- International Banking and Finance

Course notes, assignments and exams are written by course teams composed of staff from the Institute's Research and Development Department and university professors who teach similar courses at their university of employment. Materials for each course are a textbook and course notes and there is limited use of audio cassettes in a few courses. Students are required to submit two or more assignments and sit for a final exam for each course. All course materials are sent to the student at the beginning of the course session. Students can choose to take courses in one of three sessions each year (i.e., October to March, October to June or January to June). It is strongly recommended that students take only one course at a time and, in fact, most students follow this advise.

University professors (from Schools of Business), who may also have been involved in the writing of the course, are contracted to mark assignments and exams. Some of these individual professors subcontract to graduate students or junior faculty who actually mark the assignments. Quality and amount of written feedback to students varies among markers. A toll-free number is available to students and is answered by staff at PEP administrative offices from 1:00 p.m. until 5:00 p.m. EST. If students wish to contact their course marker, they may do so indirectly by asking a PEP staff member to forward a message to the marker indicating they would like to be contacted.

Keegan's Typology. PEP most closely resembles the first type of distance teaching institution described by Keegan –

Public and Private Correspondence Schools and Colleges (See Figure 8). It is the Type I institution to which results from the present study are intended to be generalized. Keegan characterizes Type I as an autonomous institution, meaning it has control of, or authority over, staffing, finance, development of materials and student services. An extension service within a larger university context would not be considered autonomous nor would a training department within a public or private company. Keegan states that this model is used widely throughout the world both by government sponsored and by proprietary institutions. He further states that examples are to be found particularly amongst both publicly sponsored and privately supported colleges at technical, vocational and further education levels. Of the wide range of subjects offered at these institutions, Keegan lists the twenty most common ones. The list includes Accounting, Business, Banking, and Management, all of particular interest here.

Of even greater importance to this discussion is Keegan's description of the instructional structure of the Type I model. The correspondence element is central to this model. The structure is as follows: The correspondence schools and colleges develop or purchase learning materials and send them by mail to the student. The student studies the materials and mails assignments back to the institution which marks and comments on them and mails them back to the student. The student reads through the comments, completes

the next assignment and the process is repeated. Print tends to be the instructional medium with some use of audio cassettes. Some well known examples of this type are the National Extension College, Cambridge, U.K.; Leidse Onderweijsinstellingen, Leiden, Germany; New South Wales College of External Studies, Sydney, Australia, and many more. Hope (1986) lists 39 private correspondence schools, in Canada alone, licensed by provincial governments to provide DE services.

Internal Validity

Selection of the sample. Students in the treatment sample were self-selected; all students in the sample responded to a form asking them to state their study preferences. All of the students in the sample (N = 138) were enrolled in the Module I courses during the session of October, 1986 to April, 1987. Module I courses were targeted in an effort to be consistent with the discussion in the professional literature regarding the seemingly greater support needs of students just beginning courses and without experience in the correspondence mode of education (Daniel & Marquis, 1979; Willen, 1981; Lewis, 1984). Selection of the particular session was made because it had consistently recorded the highest enrollment numbers in previous years.

The treatment sample was compared with a larger student sample obtained through a questionnaire administered to all students enrolled in Module I courses during the targeted session. The return rate of the questionnaire was 77% (425

out of 553). The two samples were compared on the following demographic variables: age, education, reasons for enrolling in PEP courses, previous experience with PEP courses, previous experience with correspondence education in general, and number of ICB courses successfully completed at a traditional university. The frequency distribution of these demographic questionnaire items is shown in Table 3. Clearly, the treatment sample seems to be a valid subset of the students enrolled in the first three courses during the session October, 1986 to April, 1987.

Assignment to treatment levels. Study groups were established among those students who expressed a desire to study with others. The description of how this was accomplished appears in the Procedures section of this chapter. Table 4 shows the number of groups established and the number of individuals represented in the groups.

Assignment of study groups to treatment levels was not completely random given the necessity for considering only factors such as proximity and availability of former students who were willing to serve as local contact persons (a component of treatment level three). The process by which assignment was accomplished is described in the Procedures section of this chapter. Table 5 shows the numbers of students in each treatment level.

Because of the difficulties of monitoring student behavior, as previously discussed, an additional attempt was made to include in the analysis of treatment levels only

Table 3
Percentage of Response on Demographic Questionnaire Items
Treatment Sample (TS), (N=123) and Larger Sample (LS) (N=427)

Question 1 — What is your age?		
Category	Treatment Sample	Larger Sample
20-25	28%	26%
26-30	23%	24%
31-35	18%	21%
36-40	15%	16%
41-45	11%	9%
46-50	6%	3%
50+	.8%	1%

Question 2 — What is the total number of years of schooling you have completed?		
08	0%	0%
09	.8%	.5%
10	.8%	2%
11	7%	5%
12	49%	50%
13	22%	20%
14	14%	16%
15+	6%	6%

Question 5 - "Exppep" (Experience with PEP courses)		
First class	63%	64%
Completed Other Course(s) through PEP	37%	36%

Table 3 cont'd.

Question 6 - Why are you taking correspondence courses through PEP? (More than one response was permitted)

Category	Treatment Sample	Larger Sample
Further My Education	59%	60%
For Interest Only	11%	11%
Recommended by Supervisor	9%	7%
Help Gain Promotion	33%	32%
More Convenient	47%	46%
Information Is Relevant to Job	47%	49%
Other	12%	11%

Question 8 - Have you ever enrolled in other correspondence courses offered by colleges, universities or organizations other than PEP?

Yes	17%	16%
No	83%	84%

Question 9 - How many ICB (Institute of Canadian Bankers) credit courses have you successfully completed at a university?

0	68%	72%
1	15%	15%
2	12%	9%
3	3%	3%
4	1%	1%
5	0%	.5%
6	0%	.5%

Table 4
Number of Study Groups Established

Course	Number of Groups	Number of Individuals
Accounting	11	25
Business Administration	19	51
Communication	20	62
TOTALS	50	138

Table 5
Number of Students Within Each Treatment Level

		By Course (Individuals)	Pooled Sample (Individuals)
Treatment Level 1	Accounting	11	
	Business Administration	18	51
	Communication	22	
Treatment Level 2	Accounting	10	
	Business Administration	21	49
	Communication	18	
Treatment Level 3	Accounting	4	
	Business Administration	12	38
	Communication	22	
Treatment Level 4	Accounting	9	
	Business Administration	16	55
	Communication	30	

those students who actually did have contact with peers or former students according to the treatment specifications. In order to accomplish this, each student's responses to questionnaire items 41-44 (See Appendix A) were analyzed and those who seemed not to have followed through were eliminated from all of the treatment sample analyses.

Quasi-Control Group. It is recognized that the group designated as the control group in this study cannot be considered a valid control group because assignment was not random and because a disproportionate number of students in this group were from rural areas. As previously discussed, students who expressed a desire to meet with others but for whom contact links were impossible because of distance composed the quasi-control group. All students who fell in this category were notified of the impossibility of a contact link. Even with these limitations, the quasi-control group served as an interesting basis for comparison.

Materials

Instruments

Preliminary survey. A preliminary survey was developed to determine the feasibility of the research topic. Survey items which concerned institutional support for contact opportunities were based on program elements described in the professional literature. The survey was developed through a process of revisions based on feedback from the Director of PEP and 20 telephone interviews conducted with students

randomly selected from those residing in Canada (See Appendix B).

Study group journals. One person in each group was asked to keep a simple journal of study group meetings. A booklet for this purpose was developed. One page was made available for each meeting. Each page included the following headings to aid in structuring comments: Date?, What did you do at the meeting?, How helpful was the meeting?, Did you encounter any problems of any sort in this meeting? and Who was in attendance? (See Appendix D).

Local contact person information logs. Each local contact person was asked to keep a log of contacts with members of his/her assigned study group. A form for this purpose was developed to collect information about who initiated the contact, what sort of requests local contact persons received and how helpful the local contact person thought they had been.

Final questionnaire. A questionnaire was designed and mailed to all 553 students enrolled in the first three courses (See Appendix A). The questionnaire employed a variety of question formats including questions for which responses were necessarily of a dichotomous nature, semantic differential scales and two questions which provided the opportunity for open comment. The questionnaire was further developed through an adapted two-step process of formative evaluation (Dick & Carey, 1985). The first step involved expert opinion and revision at three different points in time

(i.e., the last pair of experts to review the questionnaire received a questionnaire already revised twice based on comments and discussions with previous experts). Those who comprised the expert panel included three professors from the Educational Technology Program at Concordia University and the three administrative staff members of PEP. The second step included the distribution of the questionnaire to three PEP students who were part of the larger experimental sample. They were allotted one day to complete the questionnaire and note any comments about confusions and/or problems they encountered in completing the questionnaire. The researcher then met with each student individually and compiled notes based on their comments and their responses to the questionnaire items. Revisions were made accordingly.

Audio-Visual Units

Two units addressing study strategies were produced as part of treatment levels two and three. The first, a video unit, entitled "Learning at a Distance: Approaches to Studying," addressed the following topics: Study Self-Assessment, Choosing a Study Place, Scheduling Study Times, The Problems of Concentrating While Studying, Effective Textbook Reading and Remembering What you Read. The content of the unit was based both on previous experience and work of the researcher in the area of study strategies, and information available in the literature (Morgan, Taylor & Gibbs, 1982; Forsythe, 1982; Marton & Swensson, 1982; Singer, 1982; Howard, 1985; Holmberg, 1986). The unit was designed

specifically to address PEP students enrolled in any of the Module I courses. The unit included a video cassette and printed materials in the form of a booklet with text and exercises which students could follow as they viewed the video. Comments and suggestions offered by students in evaluating this unit were taken into consideration in designing and producing the second unit, entitled: "Exam Strategies: How to Successfully Study for Exams and Pass Them." This unit included an audio cassette and a printed booklet containing notes to be followed as the audio cassette progressed. Evaluation of this unit was also provided for by the inclusion of an evaluation form.

Procedure

Preliminary Information Gathering

Discussions were held with the director of PEP over a period of two months in an effort to gain approval for the research topic and, thus, a commitment to both the financial support and staff support necessary to conduct the study. During the discussions, a decision was made to conduct a preliminary survey in order to determine the feasibility of the study. The specific purposes of the survey were to gain some idea of student interest in study groups, previous experience with study group arrangements, evaluation of previous experience with study groups, student interest in contact with former students who had already completed the course, and the types of assistance from PEP which might be helpful in the

formation and function of study groups (See Appendix B).

The researcher selected all those students residing in Canada who appeared to live near to at least one other student enrolled in the same Module I course during the October 1985 to April 1986 session (the year prior to this study). Approximately 300 questionnaires were mailed, approximately 200 were returned. Tabulated results indicated a study of the issue of contact among peers and between students and former students seemed feasible. Survey respondents were very positive towards more program assistance in developing contact opportunities. PEP had already begun to provide some support by mailing a course list to each student. The lists ordered registered students by province and course and included work phone numbers. Information from 20 telephone interviews, which took place during the development of the survey, indicated these lists were often not used because students could not tell by the phone numbers who lived/worked close enough to them and they were hesitant to call someone who they were not sure wanted to get together. There was also some anxiety expressed about phoning people at work.

It was also necessary to gain a preliminary, if informal, assessment of the interest in the idea of former students as local contact persons. A letter and response form was mailed to 800 former students who had successfully completed the first three courses within the last two years. A significant number or these forms were returned, indicating interest in perhaps being a local contact person . This was

considered a very strong response to a request for what was essentially volunteer time.

Obtaining the Treatment Sample

Included with the course materials packet for the targeted session was a form requesting students to state their interest in studying with other students. The possible responses were:

- I am interested in meeting with other students during this course.
- I already have made plans to meet with the following students who are also taking the course:
- I am not interested in meeting with other students; I prefer to study on my own.

(A sample of the form appears in Appendix C). Students were asked to return the form by September 15, 1986. This date was decided upon in initial discussions with the Director during the spring of 1986 and was based on the anticipation that course materials would be mailed to the students in question during the month of August, 1986. The researcher's intention, consistent with suggestions from the professional literature and personal experience with distance delivery systems, was to establish any study contacts with other students as close to the beginning of the course as possible.

Course material packets were actually mailed to Canadian students between September 4, 1986 and September 29, 1986. This was considerably later (by one month or more) than had been discussed the previous spring at the time the form was

designed. Allowing one to two weeks for delivery, a significant number of students received course materials, and thus the form, after the official beginning of the course and assuredly after September 15, the return date for the form. Through telephone contacts with PEP staff members, a number of students expressed an interest in working with others but indicated they had not returned the form because they thought it too late. At this point a decision was made by the Director of PEP, the Supervisor of mail services and the researcher to mail a second form to all students concerned. The second mailing was completed by October 12, 1986. A significant number of forms were received by the researcher through the first week of November, 1986.

Establishing Study Groups

As forms were received, students expressing a desire to study with others were organized by geographical proximity. This was accomplished by organizing students according to the following priorities:

1) Enrolled in the same course, same session;
2) Working in the same bank branch;
3) Working in banks in close proximity to one another; and,
4) Home residences in close proximity.

As reflected by the list above, students were, of course, first organized by course. The second priority was to group

students working in the same branch, if possible. This grouping allowed students to meet at lunch time or before or after work if they so wished. Working shifts (a.m. or p.m.) also had to be taken into account. If same-branch grouping was not possible, working places in close proximity were sought for the same reason. Finally, if work-place matching was impossible, close proximity of home addresses was considered. Of course, students who had already formed groups on their own remained in those groups. Groups were composed of between two and five members.

The researcher contacted one person in each group by telephone. That person was asked to contact the other potential members and organize the first meeting. The same person was asked if he/she would serve as the researcher's link person for the group, a role which would involve keeping a brief journal and perhaps receiving and distributing information to other members of the group. All persons approached except one agreed to serve as a link person for their group; the person who declined suggested another person. The link person was asked to telephone the researcher when he or she had successfully contacted the other potential group members. The researcher began telephoning to establish groups and link persons on October 20, 1986, even though approximately 50% of the forms indicating interest were yet to be received due to the late mailing and subsequent second mailing. A decision to begin the process of telephoning was made with the understanding that some students might be part

of an active study group two or three weeks earlier than other students. The general effects of the late start, the fact that some groups had established themselves without aid and the relatively long duration of the study were factors which weighed in favor of this decision.

Groups were finalized by November 12, 1986 following a second contact with the link person of each group. During this second contact, the researcher tried to establish whether a first meeting time had been set and whether plans had been made concerning future meetings. Some groups had already decided upon a schedule, regular or not; one or two groups had decided to conduct at least some of their meetings with each other by telephone. Study group journals were mailed to the link person in each group. The diary attempted to follow study group activity informally.

Establishing Local Contact Person Links

Once geographical location of study groups was established, the researcher went back to forms returned the previous Spring to determine the possible matching of study groups with former students serving as local contact persons (a component of treatment level three). The researcher then telephoned the interested former students to ascertain continuing interest. If there was still interest in this activity, the researcher provided the names and telephone numbers of students in the designated study group. The researcher also used this opportunity to discuss the possible role of a local contact person (hereafter, LCP) and

some of the aspects of the project. A request was made to keep a brief log of interactions with members of the study group, and information was provided concerning the Wednesday evening toll-free line which provided a direct connection with the researcher. The LCPs were requested to contact the researcher when they had made contact with each member of the group. The researcher waited a period of one week and if she had not received confirmation, called the LCP. Each person agreeing to serve as a LCP was sent a letter of appreciation which restated the information given over the telephone and which also included suggestions regarding how they might interact with students in their role as LCP. The information log which each LCP was requested to keep was mailed with these materials. To further assure contact, each student in treatment level three received a letter describing the possible role of the LCP and the name and telephone of the LCP assigned to their group.

Assignment to Treatment Levels

Assignment to treatment level three was made first because of the limited number of study group and LCP links possible given the limitations of availability and location. Therefore, assignment to treatment level three cannot be considered random. All treatment level assignments also were obliged to consider that two groups within the same bank branch could not be assigned to two different treatment levels. Within these parameters, the remaining groups were

randomly assigned to treatment levels one and two. It is recognized that while assignment of groups to treatment levels one and two was random, individuals were not assigned to groups in a random manner, but rather according to the prioritization discussed under the section entitled "Establishing Study Groups." All treatment level assignments were made by November 17, 1987.

Audio-Visual Units

The audio-visual units were sent to the link person in each group composing treatment levels two and three. The units were accompanied by a letter which encouraged group viewing and discussion. Evaluation forms were included with both units and a postage paid envelope was provided. The interactive video unit, entitled "Learning at a Distance: Approaches to Studying" was mailed during the first part of the session. The audio unit entitled, "Exam Strategies: How to Successfully Study for Exams and Pass Them" was mailed the beginning of February in anticipation of final exams the end of March.

Administration of the Questionnaire

The questionnaire was mailed to all 553 students enrolled in the first three courses (See Appendix A). The purposes of the questionnaire were as follows:

- To collect demographic information;
- To ascertain previous experience with ICB courses offered at a university;

- To ascertain previous experience with correspondence education in general;
- To gain some idea of the frequency of late mailings and mistakes in course materials;
- To gain some idea of the frequency of use of the toll-free line to contact PEP staff and course tutors;
- To determine if there had been contact between students and/or former students during the session and some idea of the frequency of the contact. (This was considered an important follow up to less formal and less individual attempts to follow study group activity. It also was important to have this information about students not assigned to treatment levels in order to facilitate a broader look at the entire student sample from which the treatment sample were volunteers.);
- To gather evaluative information on the course components and delivery system; and,
- To evaluate the course through self-perception of learning achievement.

Each questionnaire was numbered so as to allow the researcher the ability to follow up when questionnaires were not returned. Students were advised that the information they provided would be treated as confidential and would, under no circumstances, be disclosed with their names. The questionnaire was mailed to all students with adequate time provided

to complete and return it before the week of final exams. A week after the mailing a reminder was sent to everyone requesting that they complete and return the questionnaire if they had not already done so. Two weeks after the first mailing, a second questionnaire was mailed to all students who had not yet returned one.

Collection of Informal Measures

Following the final exam week, a letter was sent to all study group link persons asking that they return the journals with their comments in the postage paid envelope provided. The same was done to collect LCP logs.

Secondary Analysis

A second analysis, guided by Tinto's (1975) Model of Persistence and Withdrawal in Higher Education, was based on the larger student sample (i.e., questionnaire respondents). Students included in the treatment sample in the primary analysis were also included in this analysis if they returned a questionnaire. This analysis posed the following questions:

1) Which variables are the most effective in discriminating between students who successfully complete courses and those who do not?
2) Which variables are the most effective in discriminating between groups based on a measure of self-perception of learning achievement?

The development of the questionnaire has already been described in the Materials section of this chapter. Likewise, the administration of the questionnaire has been described in the Procedures section of this chapter. The remaining topic to be discussed separately from the primary analysis, is the issue of independent and dependent variables (or, in this case, the predictor variables and grouping variables).

Grouping Variables

Question 1 — Completion

Final academic standing was used to create the grouping variable for the first question in the analysis. The grouping variable had two levels (i.e., course completion and non-completion). Students whose final academic standing was recorded as either discontinued or failure were considered to have not completed the course. Only fifteen students (out of 553) failed one of the targeted courses, an inadequate number to permit a third level of the grouping variable. Thus, while it was recognized that students who fail may differ in some ways from those who discontinue their studies, they were grouped together so as not to lose the information contributed by these cases.

Students included in the second level of the grouping variable (i.e., course completion) were those whose final academic status was recorded as pass or honors. All students in this grouping successfully completed the course with a

final mark of 50% or higher.

Question 2 - Self-perception of Learning Achievement

The levels of Questionnaire item 29 were used to create the levels of the grouping variable for the second question of this analysis. Questionnaire item 29 is structured as a semantic differential scale, "How much do you feel you have learned from the correspondence course you are taking?" Too few cases fell into the lowest level of this grouping and, as with the first part of the analysis, it was decided to combine the two lowest levels of this variable rather than lose the information. The resulting grouping variable had a range of "2" to "5": "2" indicated the group of students who felt they had only learned a little and "5" indicated the group of students who felt they had learned a lot.

Predictor Variables

The predictor variables employed were chosen following the major components of Tinto's Model of Persistence and Withdrawal in Higher Education: student background characteristics; academic integration; social integration; and, the intervening variable of institutional commitment. Questionnaire items were arranged in sets according to the components of Tinto's model as follows:

Student background characteristics

- Age (Questionnaire item 1)
- Previous educational level (Questionnaire item 2)

- Reasons for taking the course (Questionnaire item 6)
- Previous PEP courses taken (created variable "Exppep" from questionnaire item 5)
- Previous ICB courses taken at universities (Questionnaire item 9)
- Previous experience with correspondence courses (Questionnaire item 8).

Academic Integration

- Mean of assignment scores
- Attitudes toward effectiveness of course components (Questionnaire items 27 and 28, specific responses)
- Self-perception of learning achievement (Questionnaire item 29)

Social Integration

- Contact with PEP staff or course tutors (Questionnaire item 36)
- Contact with peers or former students (created variable "Contact" from questionnaire items 22,23,24,25)
- Attitudes toward effectiveness of course components (Questionnaire items 27 and 28, specific responses)

Institutional Commitment

- Willingness to take another PEP course (Questionnaire item 30)
- Willingness to recommend PEP to another person (Questionnaire item 31)

Data Analysis

The primary analysis followed the sequence of hypotheses proposed in the first section of this chapter. Statistical procedures employed were Multivariate Analysis of Variance, Discriminant Functions Analysis and certain nonparametric tests. The secondary analysis employed only Discriminant Functions Analysis.

CHAPTER IV.

RESULTS

In this section, the results of the statistical analyses of data collected to achieve the purpose of the study are presented. Assumptions related to the statistics employed are discussed first. The remainder of the chapter follows the structure set forth in the Methods chapter for the primary and secondary analyses. The primary analysis investigated the possible effects of "peer contact" as defined in the previous chapter. The secondary analysis attempted to identify those variables (as defined in the previous chapter) which discriminate most effectively between groups based on two measures of success. Each major section is organized around a hypothesis or question followed directly by a description of the analysis and results related to that hypothesis or question. Table 6 provides an overview of the research questions posed, the sequence of each in the following discussion, the level of analysis explored, the statistical tests used and the results, briefly stated. To provide further structure for the reader, reference will be made to the pertinent questions from Table 6 at the appropriate points in the following discussion.

Table 6
Overview of Research Analyses

Research Question	Level of Analysis	Sample: Pooled	Sample: Not Pooled	Statistical Tests	
Primary Analysis *Treatment Sample*					
1) Differences among groups on achievement measures	Treatment Groups		X	MANOVA	No significant differences
2) Differences among groups on final academic standing	Treatment Groups		X	Non-parametric	No significant differences
3) Differences among groups on evaluation of course components	Treatment Groups	X		MANOVA	No significant differences
4) Differences among groups in attitudes toward taking another course	Treatment Groups		X	Non-parametric	No significant differences
5) Most important predictor variables in prediction of those who desired contact and those who preferred to work alone	Treatment Groups	X		DFA	Significant predictor variables found (see Table 7)

(continued on next page)

Table 6 cont'd.

Research Question	Level of Analysis	Sample: Pooled	Sample: Not Pooled	Statistical Tests	
Primary Analysis Larger Sample (based on questionnaire)					
6) Differences among groups on achievement measures	Larger sample		X	MANOVA	No significant results
7) Differences among groups final academic standing	Larger sample		X	Non-parametric	Significant differences found in Communication course sample (see Table 8)
8) Differences in the three courses on two experience measure	Larger sample	X		Non-parametric	Significant differences found (see Tables 9 and or 10)
9) Differences among groups on evaluation of course components	Larger sample	X		MANOVA	No Significant differences.

(continued on next page)

Table 6 cont'd.

Research Question	Level of Analysis	Sample: Pooled	Sample: Not Pooled	Statistical Tests	
10) Differences among groups in attitudes toward taking another course	Larger sample		X	Non-parametric	Significant differences found (see Table 11)
Secondary Analysis					
11) Most important predictor variables in prediction of final academic status	Larger sample	X		DFA	Significant predictor variables found (see Table 12)
12) Most important predictor variables in prediction of subjective learning measure	Larger sample	X		DFA	Significant predictor variables found (see Table 13)

Assumptions in the Application of the Statistical Procedures Employed

Multiple Analysis of Variance (henceforth MANOVA), Discriminant Functions Analysis (hengeforth DFA) and several nonparametric statistics were employed in the analyses discussed herein. Accompanying these statistical procedures are various assumptions which speak to the appropriateness of the data for the particular statistical procedure. Assumptions relating to MANOVA and DFA will be discussed together, given that the considerations are nearly the same. Assumptions of the nonparametric statistics which were employed will be discussed separately.

Assumptions of MANOVA and DFA

The Question of Missing Data

In this study, missing data resulted when questionnaires were returned without responses indicated for one or more items. Rather than lose the remaining information on the incomplete questionnaires with the resulting loss of power of the test, the appropriate measure of central tendancy (i.e., mean or median depending on the level of measurement) was substituted for all missing values. Tabachnick and Fidell (1983) identify this as the most conservative approach to missing data.

Unequal Cell Sizes

The effects of unequal cell sizes on MANOVA were judged

to be minimal in light of the relatively large sample size. As DFA is typically a one-way analysis, no special problems were posed by unequal sample sizes. MANOVA requires more cases than dependent variables in every cell. This requirement did inhibit two analyses and this is noted in the discussion which follows. Likewise, the sample size of the smallest group in DFA should exceed the number of predictor variables. This was a problem in one analysis; steps taken to address the problem are noted in the following discussions (Tabachnick & Fidell, 1983; Nie, Hull, Jenkins, Steinbrenner & Bent, 1975).

Multivariate Normality

The mathematical model which underlies multivariate techniques is based on the assumption of multivariate normal distribution. Therefore, the sampling distributions of means of the various dependent variables in each cell and the linear combinations of them should be normally distributed. In the present study, the variables employed as dependent variables or, in the case of DFA, as predictor variables, were tested for skewness and kurtosis and scatterplots were constructed to determine the presence of outliers. In both cases, there was no indication of any serious violation of normality.

Homogeneity of Variance-Covariance Matrices

Multivariate techniques are based on the assumption that variance-covariance matrices within each cell in the design

are sampled from the same population variance-covariance matrix. Violation of this assumption could indicate that the pooled matrix is misleading as an estimate of error variance. DFA, like MANOVA, is robust to violation of homogeneity of variance-covariance matrices when sample sizes are large or equally sized (Tabachnick & Fidell, 1983). The DFA analysis performed on the treatment sample was composed of 228 subjects. The remaining DFA procedures in the exploratory analyses incorporated sample sizes exceeding 400. The Box's M test, which points to violations of this assumption, was requested and results indicated rejection of the analyses ($p < .001$). Tabachnick and Fidell (1983) refer to the Box's M test as, "a notoriously sensitive test of homogeneity of variance-covariance matrices" (p. 233). Nevertheless, classification procedures of SPSS DISCRIM, which are not robust to violations of this assumption, were not conducted as follow-up to the main analysis.

Linearity

The MANOVA model assumes that the interrelationships among all dependent variables and covariates are linear within each cell. Similarly, the DFA model assumes a linear relationship among all predictor variables within each group. In the present study, there was no reason to doubt the existence of a linear relationship among all DVs and covariates and among all predictor variables in this study. However, if a violation had occurred, it would have reduced the power of the test, rather than increased the likelihood

of Type I error. Based on this argument, no procedures were undertaken to investigate linearity.

Multicollinearity and Singularity

Multicollinearity or singularity may result when, in the case of MANOVA, correlations among dependent variables are too high or, in the case of DFA, highly redundant discriminating variables are present. For MANOVA, if the determinant of the within-cell correlation matrix is near zero (i.e., < .0001) (Tabachnick & Fidell, 1983), multicollinearity or singularity may be present. A possible violation of this assumption is noted in one of the MANOVA analyses described in the following discussion. The SPSS DISCRIM procedure protects against suspected violations of this assumption by means of a default tolerance value. Variables not meeting tolerance are not considered in generating the prediction. The default tolerance value was used in all analyses described herein.

Assumptions of Most Nonparametric Tests

Nonparametric procedures were undertaken to analyze some of the variables measured at the ordinal level. The requirements for nonparametric procedures are that observations are independent and that the variables under study have underlying continuity. In light of the discussion in the previous section of this document, further consideration of these points would be redundant.

Primary Analysis

Treatment Sample

Achievement Measures (See Table 6, Research Question 1)

Hypothesis 1. Those students who express a desire to study with others and do so and those students who prefer to work on their own, will perform better on both objective and subjective measures of achievement than those students who express a desire to study with others, but are unable to do so.

Hypothesis 2. The more the distance education institution supports contact among students (by creating opportunities for contact), the better students (who desire contact) will perform on both objective and subjective measures of achievement.

Analysis and results. A one-way MANOVA was conducted with four treatment levels comprising the independent variable: Formation Support Level, Ongoing Support Level, Former Student Support Level, Quasi Control Group (See Figure 1). The group of students who expressed a desire to work on their own formed a fifth level of the independent variable. Three achievement measures – mean score on assignments, final exam score and questionnaire item 29 (self-perception of learning achievement) – were the dependent variables. Educational level (Questionnaire item 2) was indicated as a covariate based on the assumption that educational experience covaried with achievement measures.

Three separate MANOVAs (from an identical sample) were performed, one for each course. Each course was addressed in a separate analysis because of prior knowledge that there had been consistent differences between the three courses on exam scores and failure rates (i.e., the Accounting course had had, in the past, consistently lower final exam scores and a higher general failure rate). The analyses of the Accounting course and the Business Administration course were rejected on the basis that two cells in the case of Accounting and one cell in the case of Business Administration had fewer cases than the number of dependent variables.

There were no significant results in the remaining analysis of the Communication course (See Appendix E, MANOVAs #1,2,3 for cell sizes, means, standard deviations and F values).

Achievement Measures (See Table 6, Research Question 2)

Hypothesis 3. Those students who desire to study with others and do so and those students who prefer to work alone, will complete the course they are enrolled in more often than those students who desire to study with others, but are unable to do so.

Analysis and results. Various nonparametric statistical tests were conducted through SPSS CROSSTABS to determine the relationships between the treatment levels and the achievement measure of final academic standing. The levels of the dependent variable, final academic standing, were: Nonstarter, Withdrawal, Failure, Pass and Honors. Nonstarters were

defined as those students who registered for the course, but did not submit any assignments. Nonstarters were distinguished from those students who also did not complete the course but who submitted at least one assignment.

The nonstarter category was established based on discussions in the current literature concerning student populations where nonstarters comprise a large number of those who do not complete courses and therefore form the majority of students categorized as dropouts. In this treatment sample, however, it was found that non-starters comprised less than 2% (two students) of the entire sample; therefore the nonstarter category was combined with the other group of non-completers who were categorized as withdrawals.

Three separate analyses were conducted, one for each course, for the same reasons as described above. No significant differences were found for the Accounting course, $\chi^2 = 8.16$, $p = .52$, $df = 9$, or for the Business Administration course, $\chi^2 = 4.39$, $p = .82$, $df = 8$. Significant differences were found for the Communication course, $\chi^2 = 16.90$, $p = .03$, $df = 8$, but the direction of the results could not be determined in any meaningful way.

Attitude Measures (See Table 6, Research question #3)

Hypothesis 4. Those students who desire to study with others and do so, and those students who prefer to work alone, will evaluate the course and course components more highly than those students who desire to study with others, but are unable to do so.

Hypothesis 5. The more the distance education institution supports peer contact among students (by creating opportunities for contact), the more highly the students who desire contact will evaluate the course and course components.

Analysis and results. Another MANOVA was conducted with the same five treatment levels composing the independent variable and questionnaire items 46-61 serving as the dependent variables (See Appendix A). This procedure was conducted by pooling the cases from all three classes and again employing educational level as a covariate. A pooled sample was used to increase the power of the test; there were no indications that responses should vary on attitude measures based on course membership. No significant results were found (See Appendix E, MANOVA #4 for cell sizes, means, standard deviations and F values).

Attitude Measures (See Table 6, Research Question 4)

Hypothesis 6. Those students who desire to study with others and do so, and those students who prefer to work alone, are more likely to state that they would take another correspondence course and are more likely to state that they would recommend a course to another, than those students who desire to study with others, but are unable to do so.

Analysis and results. Various nonparametric statistics were employed to determine the relationships between questionnaire items 30 and 31 which concerned the desire to take another PEP course or willingness to recommend the same to another person. A pooled sample of the three courses was

used. No significant differences were found: for questionnaire item 30, $\chi^2 = 3.47$, $p = .48$, $df = 4$; for questionnaire item 31, $\chi^2 = 1.88$, $p = .76$, $df = 4$.

Measures of Experience (See Table 6, Research Question 5)

Hypothesis 7. Those students who prefer to work on their own will differ from those who want to study with others on various demographic measures of age, education and experience.

Analysis and results. A final analysis of the treatment sample investigated the differences between those who stated that they would like to study with others (i.e., treatment levels 1,2,3, and 4) and those who stated they preferred to work on their own. DFA was used to determine which predictor variables contributed to maximum differences between the two groups.

In this analysis, Group One was the group which preferred to work on their own and Group Two was stipulated as the group stating they preferred to work with others. The predictor variables used were all factors which were pre-existant to the start of the courses: Age (questionnaire item 1), Educational level (questionnaire item 2), Reason(s) for taking the course (questionnaire item 6), Previous experience with correspondence education other than PEP (questionnaire item 8), Number of ICB courses completed (Questionnaire Item 9) and Previous experience with PEP courses. The variables designating "Course" (D1 and D2, dummy coding for the three courses) were forced into the

equation at the first step of the stepwise procedure, thereby functioning as covariates.

The results of this analysis are shown in Table 7. Only 15% of the total variance was explained and the following discussion of significant variables must be considered in light of this information. Four of the predictor variables, namely, educational level (questionnaire item 2), reasons for taking the course (i.e., interest and convenience) (questionnaire item 6, [2] and [5]) and number of ICB courses completed (questionnaire item 9) appeared as significant at the univariate level. Univariate Fs represent the ability of each predictor variable by itself to predict group membership. This can be misleading because neither correlations between predictor variables nor Type I error due to multiple testing are taken into account.

Another determinant of the importance of individual predictor variables is, in terms of their relative weights in an equation, set up to predict the levels of the grouping variable (in this case, those who preferred to work on their own and those who preferred to work with others) from knowledge of the predictor variables. This is reflected by the Standardized Discriminant Function Coefficients which are analogous to beta weights in a multiple regression equation. The Standardized Discriminant Functions Coefficients for this analysis (see Table 7) indicate that the variables which best predict group membership are number of ICB courses completed (questionnaire item 9), and previous educational level

Table 7
Predictor Variables in a Grouping Structure Based on Those Students Who Desired Contact (Group 2) and Those Who Preferred to Work Alone (Group 1)

Predictor Variable	Univariate F	Significance	Multivariate F	Standardized Discriminant Function Coefficients	Loading Matrix	Unadjusted Means	
						Group 1	Group 2
D1 (Accounting)	.29	NS					
D2 (Bus. Administration)	.51	NS					
Question 1	.35	NS					
Question 2	10.92	.00	8.20	.51	.52	5.94	5.44
Question 6 - Option 1	.20	NS					
2	5.13	.02	2.81	-.29	-.36	.04	.15
3	1.18	NS					
4	.22	NS					
5	7.59	.01	6.44	.44	.44	.60	.40
6	1.37	NS					
Question 8	2.62	NS					
Question 9	7.84	.01	7.98	.52	.44	1.78	1.39
Exppep	1.10	NS					

(questionnaire item 2), followed by convenience as a reason for taking the course (questionnaire item 6[5]).

Yet another indicator of the relative importance of predictor variables is the loading of each variable on a matrix which contains correlations between predictor variables and each discriminant function. In this analysis, there was only one discriminant function (based on the number of groups minus one) and the loading of the various predictor variables on that function is seen in Table 7. Consensus is lacking regarding how high a correlation in a loading matrix must be in order to be interpreted. Correlations in excess of .30 (9% of the variance) are usually considered eligible (Tabachnick & Fidell, 1983). Following this criterion, it appears that previous educational level (questionnaire item 2), number of ICB courses successfully completed (questionnaire item 9) and convenience and interest as reasons for taking the course (questionnaire item 6[2] and [5]) account for the maximum spread among the two groups.

Standardized Discriminant Function Coefficients and Loading Matrices suffer the same problem as regards interpretation of the univariate F (i.e., they do not necessarily indicate which variables contribute most heavily to discrimination among groups after adjustment for remaining variables). According to Tabachnick and Fidell (1983), a solution to the problems of inflated Type I error rate and the nonindependence of univariate F tests is provided by the procedure of stepdown analysis. In this procedure each

successive predictor variable is tested with higher priority, predictor variables essentially functioning as covariates, to see if the new predictor variable significantly adds to the combination of predictor variables already tested. In this analysis, the predictor variable "course" (D1 and D2) was forced in at the first step of the stepwise procedure, while the other predictors were considered separately, based on the adjusted univariate values as the stepwise procedure continued. This produced, at the last step of the analysis, multivariate F values independent from one another. As can be seen from Table 7, the same four predictor variables which had relatively large univariate F values, and which appeared important in the loading matrices and as standardized discriminant function coefficients, also have the highest multivariate F values.

It can be assumed, based on the information presented above, that the four variables of educational level, number of ICB courses completed, and convenience and interest as stated reasons for taking the course, are responsible for the greatest spread between those who preferred to work alone and those who desired contact. The remaining question is how each group was distinguished by each predictor variable.

The group centroids are the group means arrived at, in this case, by the scores on the predictor variables contributing variance to the discriminant function. As there is only one function in the present analysis and as all four variables in question have significant loadings on that

function, this gives some indication of where the groups fell in relation to the higher priority predictor variables. In this analysis, the group centroids on the discriminant function are .63 for Group 1 (those who preferred to work alone) and -.28 for Group 2 (those who desired contact).

The unadjusted means (derived from univariate procedures, not the stepwise procedure) for each group on each predictor variable provide a clearer picture. Means are used here for the predictor variables questionnaire item 6[2] and [5] even though both are dichotomous variables and a mean score is perhaps difficult to interpret. Dichotomous variables are, however, considered to be of interval and in some cases ratio level measurement (Tabachnick & Fidell, 1983; Nie, Hull, Jenkins, Steinbrenner & Bent, 1975) which would suggest that the mean is the correct measure of central tendency. The mean is used here because it is consistent with that used in the analysis.

The unadjusted means (See Table 7) indicate that those who preferred to work on their own (Group 1) had a slightly higher educational level (5.94 versus 5.44) than those who desired to work with others. Reference to the format of this questionnaire item (See Appendix A) suggests that those who preferred to work alone had more post secondary education than those who desired contact with others. Questionnaire item 9 (number of ICB courses completed at a traditional University) shows, as indicated by the unadjusted means, that those who preferred to work alone appear to have had more

experience with ICB courses offered by traditional delivery systems (i.e., not by correspondence) than those who desired contact with others (1.78 versus 1.39). The unadjusted means for questionnaire item 6[2] indicate that those students who desired contact with others more often stated that they took the course for interest only (.15 versus .04). For Questionnaire Item 6[5], the unadjusted means indicate that students who preferred to work on their own more often took the course because it was more convenient than taking the course at a University (.60 versus .40).

Larger Sample Based on the Questionnaire

In pursuing the issue of the possible effects of student contacts with peers enrolled in the same course and/or with former students who had successfully completed the course, a larger student sample was considered. A new grouping representative of contact levels was established based on student responses to questionnaire items 22-25 (See Appendix A). It is recognized that these groupings were based on a one-time subjective indication of a student's contact with his peers and/or with former students and that this constitutes even less control of actual behavior than the original treatment levels. Of course, random assignment to levels was not possible. It was reasoned that these newly established groups should not differ on system factors which may have prompted them to seek information from others or from the PEP staff.

The four groups were compared on the following factors:

- Number of students receiving course materials late (questionnaire item 10) ($\chi^2 = .44$, $p = .93$, $df = 3$);
- Number of students who found missing pages in module notes or assignment sheets (questionnaire item 11) ($\chi^2 = 4.00$, $p = .26$, $df = 3$);
- Number of students who found mistakes in module notes or assignment sheets (questionnaire item 14) ($\chi^2 = 3.25$, $p = .35$, $df = 3$); and
- Number of students who placed phone calls through the PEP toll-free line to PEP staff and/or course tutors (questionnaire items 17) ($\chi^2 = 1.41$, $p = .70$, $df = 3$).

Employing nonparametric procedures through SPSS CROSSTABS, no significant differences were found among the groups on these measures, as the chi-square values above indicate.

The basis for grouping did not allow consideration of desire for contact which was a factor in the analysis of the treatment sample; grouping was based only on a self-reporting of behavior. Lack of this information made adjustment of the original hypotheses necessary as follows:

Hypothesis 1 – Those students who have contact with peers and/or former students will perform better on both objective and subjective measures of achievement than those students who do not have contact with others.

Hypothesis 2 – The more contact students have, the better they will perform on both objective and subjective

measures of achievement.

Hypothesis 3 - Those students who have contact with peers and/or former students will complete the course more often than those students who do not have contact with others.

Hypothesis 4 - Those students who have contact with peers and/or former students will evaluate the course and course components more highly than those students who do not have contact with others.

Hypothesis 5 - The more contact students have, the more highly they will evaluate the course and course components.

Hypothesis 6 - The more contact students have, the more likely they are to state that they would take another correspondence course and the more likely they will state that they would recommend a course to another.

Achievement Measures (See Table 6, Research Question 6)

Hypothesis 1. Those students who have contact with peers and/or former students will perform better on both objective and subjective measures of achievement than those students who do not have contact.

Hypothesis 2. The more contact students have, the better they will perform on both objective and subjective measures of achievement.

Analysis and results. Statistical procedures followed in the analysis of the larger sample were identical to those

employed to analyze the treatment sample. A MANOVA was conducted with the four newly established groups, namely, a) no contact, b) contact with peers taking the same course, c) contact with former students who had already completed the course, and d) contact with both peers and former students. The same achievement measures used in the previous MANOVAs were used here as dependent variables: mean of assignment scores, final exam scores, and questionnaire item 29, a self-perception of learning. No significant differences were found (See Appendix E, MANOVAs #5,6,7 for cell sizes, means, standard deviations and F values).

Achievement Measures (See Table 6, Research Question 7)

Hypothesis 3. Those students who have contact with peers and/or former students will complete the course more often than those students who do not have contact.

Analysis and results. As in the analysis of the treatment sample, nonparametric statistical tests were conducted to investigate any relationships which might have existed between the groups established on the basis of contact and the measure of final academic standing. As before, those students identified as "nonstarters" were combined with other students who did not complete the course because "nonstarters" comprised less than 2% (7 students) of the larger student sample. As in the previous analyses, three separate analyses were conducted, one for each course.

No significant results were found for the Accounting course, $\chi^2 = 4.89$, $p = .84$, $df = 9$, or the Business

Administration course, $\chi^2 = 11.09$, $p = .27$, $df = 9$. Significant results were obtained in the analysis of the Communication course, $\chi^2 = 12.87$, $p = .04$, $df = 6$ (See Table 8). Additional appropriate nonparametric tests produced the Cramer's V statistic which is based on Phi and ranges between 0 and +1; the Lambda statistic which indicates the improvement in the ability to predict the value of the dependent variable when the value of the independent variable is known, and Gamma which indicates the predominance of concordant or discordant pairs. Cramer's V signifying association equalled .18. The Lambda statistic equaled .05, indicating an improvement of 5% in the ability to predict final academic standing when the level of contact is known. The Gamma statistic obtained was .12, indicating that discordant pairs predominated (i.e., pairs where contact was low and final academic standing was low and pairs where contact was high and final academic standing was high). In other words, students who reported no contact were more likely to withdraw from their courses than those students who reported contact with peers or with peers and former students. In addition, students who received honor grades reported more contact than either of the other two categories.

Achievement Measures (See Table 6, Research Question 8)

Follow-up Hypothesis. Students enrolled in the Communication course will significantly differ from students enrolled in the Accounting or Business Administration courses

Table 8
Final Status by Level of Contact for Students Enrolled in Communication Course

Count / Row Pct	Academic Standing		
Contact Levels	Incomplete	Pass	Honors
No Contact	(20) 30%	(21) 31%	(26) 39%
Contact w/peers	(7) 15%	(24) 51%	(16) 34%
Contact w/former students	(2) 5%	(20) 50%	(18) 45%
Contact w/both peers and former students	(9) 20%	(18) 39%	(19) 41%

$\chi^2 = 12.870$, $p = .0452$, $df=6$

on measures of previous experience.

Analysis and results. Separate analyses were undertaken to confirm prior knowledge that the Communication sample may differ on measures of previous experience. Nonparametric statistical tests were used to investigate the relationship of the three courses with the following variables: previous experience with PEP courses ("Exppep"), previous general experience with correspondence education other than PEP (questionnaire item 8), and number of ICB courses successfully completed at a traditional University (questionnaire item 9).

A significant Chi-Square was found, $\chi^2 = 63.01$, $p < .001$, $df = 2$ (see Table 9), with previous experience with PEP courses ("Exppep"). The Cramer's V statistic equaled .39 indicating a fairly large degree of association, and Gamma equaled -.56, indicating that discordant pairs dominate. An inspection of Table 9 indicates that Communication is a first class for 82% of the students enrolled, while Business Administration is a first class for only 43% of those enrolled and Accounting is a first class for for only 48% of the students enrolled.

Another significant Chi Square was also found, $\chi^2 = 45.097$, $p < .001$, $df = 6$ (see Table 10), with the number of ICB courses successfully completed (questionnaire item 9). The Cramer's V statistic obtained was .24. The Gamma statistic obtained was -.23 indicating the predominance of discordant pairs (i.e., pairs composed of low experience with ICB courses and the Communication course and pairs composed of

Table 9
Previous Experience with PEP Correspondence Courses
(Students Organized by Course)

Count Row Pct.	Previous Experience	
Courses	No Experience	Experience
Accounting	(41) 48%	(45) 52%
Business Administration	(51) 43%	(68) 57%
Communication	(169) 82%	(36) 18%

$\chi^2 = 63.01$, $p = .000$, $df = 2$

Table 10
ICB Courses Taken (Organized by Course) at Universities (non-correspondence courses)

Count / Row Pct	Number of ICB courses successfully completed			
Course	0	1	2	3
Accounting	(68) 80%	(12) 14%	(4) 5%	(1) 1%
Business Administration	(62) 52%	(31) 26%	(19) 16%	(6) 5%
Communication	(167) 85%	(13) 7%	(12) 6%	(4) 2%

$\chi^2 = 45.097$, $p = .000$, $df = 6$.

more experience with ICB courses and the remaining two courses). In addition to having less experience with PEP courses, students in the Communication course also appear to have less experience with ICB courses taken at traditional universities. A significant relationship was not found to exist between general experience with correspondence education and course membership (questionnaire item 8), $\chi^2 = 2.30$, $p = .32$, $df = 2$.

Attitude Measures (See Table 6, Research Question 9)

Hypothesis 4. Those students who have contact with peers and/or former students will evaluate the course and course components more highly than those students who do not have contact.

Hypothesis 5. The more contact students have, the more highly they will evaluate the course and course components.

Analysis and results. Another MANOVA was conducted with the same four groups, namely, a) no contact, b) contact with peers taking the same course, and c) contact with both peers and former students. The same attitude measures used in the treatment sample analyses were used here as dependent variables, Questionnaire items 46-61. As before, a pooled sample of the three courses was used. No significant differences were found (See Appendix E, MANOVA #8 for cell sizes, means, standard deviations and F values).

Attitude Measures (See Table 6, Research Question 10)

Hypothesis 6. The more contact students have, the more

likely they are to state that they would take another correspondence course and the more likely they are to state that they would recommend a course to another.

Analysis and results. Various nonparametric statistical tests were conducted to determine the relationships between the contact levels and questionnaire items 30 and 31 (which queried whether students would take another PEP course or if they would recommend a course to someone else). Three separate analyses were conducted, one for each course. A significant Chi-Square was found for the Communication course between "contact level" and questionnaire item 31 involving the recommendation of PEP courses to others, $\chi^2 = 9.87$, $p = .02$, $df = 3$ (See Table 11). The Cramer's V statistic obtained was .22, indicating an association. The Gamma statistic obtained was -.30 indicating discordant pairs predominated (i.e., pairs where the recommendation to take a PEP class was "yes" and the contact level was high and pairs where the recommendation was "no" and the contact level was low).

Table 11 reflects that, in the Communication course, those in groups with more contact would recommend PEP courses more often. No significant differences were found in testing the students in the other two courses: Accounting course, $\chi^2 = 2.00$, $p = .57$, $df = 3$; Business Administration course, $\chi^2 = 1.78$, $p = .62$, $df = 3$. This is not to suggest that no overall effect exists, but that "course" may have a differential effect here.

Table 11
Frequency with which Students in the Communication Class with Various Level of contact would Recommend the PEP Course They are Enrolled in to Another

Count Row Pct.	Stated Intentions	
Contact Level	Yes – Would Recommend	No – Not Recommend
No contact	(51) 76%	(16) 24%
Contact with Peers	(41) 89%	(5) 11%
Contact with Former Students	(39) 98%	(1) 2%
Contact with both Peers and Former Students	(39) 85%	(7) 15%

$X^2 = 9.868$, $p = .019$, $df = 3$

Secondary Analysis

The secondary analysis sought to identify those predictor variables which significantly discriminated between groups structured on two measures of success, namely, course completion and self-perception of learning achievement. The stepwise procedure of DFA was used for this purpose. Predictor variables were entered as sets of variables, the sets based on major components of Tinto's Model of Persistence and Withdrawal in Higher Education: student background characteristics, academic integration, social integration, and the intervening variable of institutional commitment. The order in which the variable sets were entered was based on Tinto's discussions (1975, 1982) and Sweet's (1986) validation study of Tinto's model in the DE setting.

Question 1. (See Table 6, Research question #11) Which variables are the most effective in discriminating between students who successfully complete courses and those who do not?

Analysis and results. In this analysis, the grouping variable had two levels, course completion (Group 2) and non-completion (Group 1). Those students who failed the course or withdrew were considered not to have completed the course and those students with a passing final mark were considered to have completed the course. Only 15 subjects received failing marks, fewer than the number of predictor variables, making it an invalid grouping for analysis. So as not to lose the information contributed by these cases, they were

included in the noncompletion category. The predictor variables used are described in the Methods chapter.

The variance explained by the total model was 51%. This is somewhat higher than that found by Sweet (1986), who found 32% and also somewhat higher than that cited by all but one of the studies discussed in the Introduction.

As reflected in Table 12, several predictor variables produced F values of significance at the univariate level, but far fewer produced large values in the stepdown analysis reflected in the column titled "Multivariate F." Indeed, some of the variables important at the univariate level were not even considered in the stepwise procedure, having been rejected by the default tolerance level for inclusion. In this case, interpretation is straightforward: the variance which the predictor variable shared with the grouping variables has already been accounted for through overlapping variance with a higher-priority predictor variable. Less easily interpreted, however, is the case (in this analysis with D1 and "Exppep," previous experience with PEP courses), where no significance is produced at the univariate level, but a seemingly significant F value is produced through the stepwise procedure.

It is well to note that the dummy variable D1, which can be interpreted as the Accounting course in reference to the Communication course, had a relatively large multivariate F value. This concurs with results from previous years suggesting that the Accounting course has the highest failure

Table 12
Predictor Variables in a Grouping Structure Based on Course Non-Completion (Group 1) or Course Completion (Group 2)

Var.	Univar. F	Sig.	Multi-variate F	Unadjusted Means Group 1	Unadjusted Means Group 2
D1	1.82	NS	14.33	.27	.21
D2	.84	NS			
Quest. 1	.22	NS			
Quest. 2	.19	NS			
Quest. 6(1)	1.42	NS			
Quest. 6(2)	.03	NS			
Quest. 6(3)	7.67	.00	NS		
Quest. 6(4)	6.85	.01	NS		
Quest. 6(5)	8.41	.00	NS		
Quest. 6(6)	13.10	.00	NS		
Quest. 8	5.08	.02	4.81	1.75	1.82
Quest. 9	.00	NS			
Exppep	.98	NS	3.95	1.36	1.29
Quest. 27(1)	15.94	.00	NS		
Quest. 27(2)	11.01	.00	NS		
Quest. 27(4)	38.13	.00	4.03	3.31	4.03
Quest. 27(7)	5.75	.01	NS		
Quest. 28(1)	.42	NS			
Quest. 28(3)	1.30	NS			
Quest. 28(4)	.01	NS			
Mean	244.67	.00	190.95	.50	.83
Quest. 17	4.86	.03	NS		
Quest. 27(5)	11.62	.00	NS		
Quest. 27(6)	1.50	NS			
Quest. 27(7)	2.83	.09	NS		
Quest. 28(5)	.19	NS			
Quest. 28(6)	.63	NS			
Quest. 28(7)	.00	NS			
Quest. 28(8)	1.16	NS			
Contact	9.67	.00	7.98	1.80	2.22
Quest. 30	62.66	.00	5.14	1.56	1.17
Quest. 31	50.32	.00	7.27	1.40	1.10

and attrition rates of the Module 1 courses; and that the Communications course has the lowest in both areas.

A discussion of unique contributions of individual variables in this analysis must begin with the variable, Mean of assignment scores, from the variable set, Academic integration. As can be seen by glancing at the multivariate F values in Table 12, the variable, Mean of assignment scores, makes, relatively speaking, by far the largest contribution to the discrimination between students who completed their courses and those who did not. The unadjusted means indicate that students who did not complete courses obtained a mean assignment score of 50% while those who completed obtained a mean score of 83%. Even though students who did not complete probably submitted fewer assignments than those who did complete, the variable was based on the mean of those assignments which were submitted. As a result of this procedure, students who submitted no assignments (i.e., nonstarters) were not included in the analysis.

Four predictor variables seem to be important at both the univariate and multivariate levels. In order of importance, they are: Contact (an indicator of contact with peers and former students); questionnaire item 31 (an indicator of the extent to which a student would recommend program courses to someone else); questionnaire item 30 (an indicator of whether a student would take another program course); and questionnaire item 8 (previous experience with correspondence

courses offered by other programs besides the targeted program).

The unadjusted means suggest the following:

1) For Contact (ranging from no contact "1" to contact with both peers and former students "4,") those who did not complete the course (Group 1) had the least contact and those who completed (Group 2) had the most.

2) For Questionnaire item 31, those students who successfully completed the course (Group 2) stated more often than those who did not complete (Group 1) that they would recommend program courses to others.

3) For Questionnaire item 30, those students who successfully completed the course (Group 2) stated more often than those who did not complete (Group 1) that they themselves would take more program courses.

4) For Questionnaire item 8, those students who successfully completed courses (Group 2) had more experience with correspondence courses taken through other programs than did those students who did not complete (Group 1). Additional support may be derived from by the fact that students who completed the course (Group 2) appear to have successfully completed more program courses than those who did not complete (see variable "Exppep"). However, the variable "Exppep" was significant at the

multivariate level, but not the univariate level, leading to difficulty in the interpretation.

Question 2. (See Table 6, Research Question #12) Which variables are the most effective in discriminating between groups of students based on a measure of self-perception of learning?

Analysis and results. The stepwise procedure of DFA was again employed to answer the above question. This time, levels of questionnaire item 29 formed the grouping variable. Questionnaire item 29 was structured as a semantic differential scale, "How much do you feel you have learned from the correspondence course you are taking?" Too few cases fell into the lowest level of this grouping and, as with the previous analysis, the two lowest levels of this variable were combined so as not to lose information. The resulting grouping variable had a range of "2" to "5:" "2" indicated the group of students who felt they had only learned a little and "5" indicated the group of students who felt they had learned a lot. The results of this analysis are shown in Table 13.

The total variance explained by this model was 33%. In this analysis, the individual variables which best discriminated between groups were similar in terms of relative contribution, unlike the previous analysis, where mean score on assignments clearly dominated.

As indicated in Table 13, seven predictor variables produced significant F values at the univariate level, but not

Table 13
Predictor Variables in a Grouping Structure Based on a Measure of Self-Perception of Learning Achievement (Semantic diffential scale ranging between "1" and "5")

Var.	Univar. F	Sig.	Multi-variate F	Unadjusted Means Group 2	Group 3	Group 4	Group 5
D1	.50	NS					
D2	.92	NS					
Ques. 1	.38	NS					
Ques. 2	1.06	NS					
Ques. 6(1)	2.10	NS					
Ques. 6(2)	1.97	NS					
QUES. 6(3)	2.97	.03					
Ques. 6(4)	.50	NS					
Ques. 6(5)	.53	NS					
Ques. 6(6)	6.77	.00	NS				
Ques. 8	.83	NS					
Ques. 9	1.19	NS					
Exppep	1.19	NS					
Ques. 17	2.77	.04	2.52	1.52	1.57	1.66	1.49
Ques. 27(1)	19.79	.00	5.71	3.52	3.87	4.23	4.55
Ques. 27(2)	3.25	.02	NS				
Ques. 27(4)	23.22	.00	6.48	2.88	3.58	4.04	4.30
Ques. 27(5)	4.40	.00	NS				
Ques. 27(6)	2.74	.04	NS				
Ques. 27(7)	1.13		NS				
Ques. 27(8)	6.36	.00	NS				
Ques. 28(1)	.88	NS					
Ques. 28(3)	.58	NS					
Ques. 28(4)	.54	NS					
Ques. 28(5)	.66	NS					
Ques. 28(6)	.22	NS					
Ques. 28(7)	.57	NS					
Ques. 28(8)	.95	NS					
Ques. 30	16.69	.00	NS				
Ques. 31	15.64	.00	2.77	1.48	1.25	1.10	1.03
Contact	2.40	NS					
Mean	11.74	.00	6.10	.58	.78	.76	.83

at the multivariate level. As explained previously, this is to be accounted for by shared variance with higher priority variables. The reverse situation (significance at the multivariate level, but not at the univariate level), which is much more difficult to interpret, was not present in this analysis.

Five predictor variables appear to have relatively large *F* values at both the univariate and multivariate levels. In order of relative importance, they are: questionnaire item 27[3]; mean of assignment scores; questionnaire item 27[1]; questionnaire item 31; and questionnaire item 17; and, questionnaire item 27 which asks students to evaluate how much various course components helped them to learn. The question is structured as a semantic differential scale ranging from "1," indicating that the component was "not helpful," to "5," indicating that the component was "very helpful."

The unadjusted means indicate:

1) that students who felt they learned little (Group 2) had the lowest mean scores on assignments (58%). (Students who indicated they learned a lot had the highest mean scores (83%) and the other two groups fell in between);
2) that students' indications of how much the textbook (Questionnaire item 27[1]) and assignments (Questionnaire item 27[3]) helped them to learn increased consistently with increased feelings of how much they learned;

3) that for Questionnaire item 31, the more students felt they learned, the more likely they were to state that they would recommend program courses to others; and,
4) that for Questionnaire item 17, the more students felt they learned, the more contact with program staff they reported except for the last category of students (i.e., students who reported they learned a great deal, "5") who reported no contact with staff relatively more often.

Summary of Results

The major findings of the present study were as follows:

Primary Analysis - Treatment Sample

1) No significant differences were found among the treatment groups on achievement measures, final academic standing (including withdrawal status) or attitudes toward course components. The various treatment groups were based on levels of institutional support concerning opportunities for peer contact.
2) No significant differences were found among the treatment groups, the quasi-control group (composed of students who stated they wished to study with peers, but adequate arrangements could not be made) and the group of students who stated they preferred to work on their own. Measures employed concerned

achievement, attitudes and final academic standing (including withdrawal status).

3) Several pre-enrollment characteristics were found to make significant contributions to an explanation of stated study preferences. Students who stated they preferred to study on their own reported a significantly higher level of post-secondary education and reported having successfully completed more banking courses at conventional universities than reported by students who stated they preferred to study with peers. In addition, students who stated they preferred to study on their own indicated more often than students who desired peer study that they had taken the DE course for interest only and because it was more convenient than taking the course at a conventional university.

Primary Analysis - Larger Sample Based on Questionnaire

4) Four groups were created from questionnaire responses; the groups reflected increasing levels of self-reported contact with peers (including contact with peers who had already completed the course in question). No significant differences were found between the four groups on achievement measures.

5) Significant differences were found between groups representing increasing levels of peer contact (as per questionnaire responses) in one of the courses

targeted in the present study (i.e., the Communication course). A follow-up analysis found that significantly more students in the Communication course, as compared to students in the other two courses, were taking a program course for the first time. Students in the Communication course were also found to have taken significantly fewer banking courses at conventional universities, in comparison to students in the other courses.

6) No significant differences were found between the four groups (based on increasing levels of self-reported peer contact) in attitudes toward course components.

7) For students in the Communication course, increasing levels of self reported peer contact were positively correlated with the frequency with which students stated they would recommend program courses to others.

Secondary Analysis

8) The mean score on assignments was found to contribute most significantly to an explanation of completion and non-completion. The direction was as would be expected, those students who completed the course had a higher mean score on submitted assignments than those students who did not complete the course.

9) In addition to mean score on assignments, four other predictor variables were found to contribute

significantly to an explanation of completion and non-completion. In order of importance, they were: a) Those who completed the course reported contact with peers more often than those who did not complete; b) Those students who completed the course stated they would take another program and would recommend the same to another more often than those who did not complete the course; and, c) Those students who successfully completed the course reported prior experience with the correspondence mode of instruction more often than those who did not complete the course.

10) Five predictor variables were found to contribute significantly to an explanation of self-perception of learning achievement: a) Increases in self-perception of learning achievement were positively correlated with an increased assessment of how much was learned from both the textbook and assignments; b) As the level of self-perception of learning achievement increased, so did the mean score on assignments submitted; c) As the level of self-perception of learning achievement increased, the more often students stated they would recommend program courses to others; and, d) As the level of self-perception of learning increased, so did the reported contact with program staff with the exception of those who reported learning the most, they reported the least contact with program staff.

CHAPTER V

DISCUSSION

It can be argued that the definitive characteristic of DE is the separation between "teacher" and learner and among learners. As a result, interpersonal communication is not a given in DE and its importance has been the topic of many discussions of both a theoretical and an applied nature. The various views concerning interpersonal communication are each based on a particular perspective of the DE process and could be organized as follows:

- Views based on the perceived needs and desires of the adult learner;
- Views based on the requirements for interpersonal communication of various learning objectives/subject areas; and,
- Views based on the role of interpersonal communication in facilitating the learning process in general.

Those who base their views on the perceived needs and desires of the adult learner can be found at two extremes.

At one extreme are those who view DE as particularly suited to the autonomous adult learner; the separation is therefore perceived as positive because it enhances the possibility of learner autonomy. At the other extreme, are those who see the role of the DE institution as supportive of the learner who, it is felt, is at a particular disadvantage given the isolation of DE. Others fall somewhere in between these extremes - including those who view DE learners as a heterogeneous population composed of individuals who prefer interpersonal communication in the process of their studies and those who prefer little or none.

A second perspective focuses on what is to be learned rather than the learner. This view would consider interpersonal communication as enhancing learning for some learning objectives and/or subject areas and as being less important to others.

The third perspective considers the importance of interpersonal communication to the learning process, in general. This view may logically produce different outcomes, one which views learning as primarily an individual activity and another which considers interpersonal communication to facilitate and enhance learning.

As might be expected, interpersonal communication has been a key component in the theoretical development of DE. All theories proposed to date have incorporated at least one of the views of interpersonal communication discussed above.

One of the most recent theoretical efforts in DE is

credited to Keegan (1986). Keegan's theoretical framework is a comfortable fit for the view which considers interpersonal communication as central to the learning process in general. Keegan believes that the establishment of a learning "link" between the learning materials and the resultant quantity and quality of learning is dependent on interpersonal communication. He proposes that this can be accomplished through the "artificial recreation" of interpersonal communication components which DE (in contrast to conventional education) does not naturally include. Keegan (1986) proposes three hypotheses; the following two were tested in the present study:

- That distance students have a tendency to dropout in those institutions in which structures for the reintegration of the teaching acts are not satisfactorily achieved.
- That distance students have difficulty in achieving quality of learning in those institutions in which structures for the reintegration of the teaching acts are not satisfactorily achieved. (p. 126)

Among the interpersonal communication components which must be compensated for, Keegan includes student-to-student communication or peer contact. The primary analysis of the present study attempted to artificially recreate the possibility for peer contact in a Type I (See discussion of external validity in Chapter III, Methods) DE program which

already addressed, to various degrees, the other interpersonal communication components included by Keegan. Study groups were organized (for those students who desired it) and treatment levels were established which represented various levels of support from the institution. In one treatment level, representing the most institutional support, study groups were also provided with a local contact person in the form of a former student who had already successfully completed the targeted courses. A quasi-control group was established composed of students who wanted to study with peers, but for whom arrangements could not be made.

It was hypothesized that greater institutional support of peer contact opportunities for those who wanted it would enhance achievement, produce more satisfied students, and lower dropout rates. It was also predicted that students who wanted, and had, study group support would outperform those who wanted it but for whom it could not be arranged (i.e., the quasi-control group). The treatment groups and control group were compared on various achievement measures, a measure of self-perception of learning achievement and various attitude measures. No significant differences were found between the three treatment groups or between the treatment groups and the control group. Thus, no support was found for either of Keegan's hypotheses in the analysis of the treatment sample.

An analysis of a larger student sample, based on responses to a questionnaire which asked for a self-report of

contact with peers and former students did lend support to Keegan's first hypothesis concerning dropout. However, this larger sample differed from the treatment sample in two important ways: a) indication of peer contact was based on a one-time self-report of behavior, and, b) there was no way of knowing if students did not report peer contact because they wished to study on their own or because they could not arrange to meet with other students.

In the analysis of the larger sample, a positive relationship between level of peer contact and final academic standing was found in one of the targeted courses, namely, Communication. Students who reported no peer contact dropped out significantly more often than students who had contact with peers. Students who reported contact with peers and former students (who had already successfully completed the course) were more likely to receive honors grades (i.e., above 80%) than students who reported contact with peers only or those who reported no contact at all. A followup study explored why significant results were obtained only in one of the three targeted courses. Prior knowledge indicated that the Communication course was often recommended to students who were just beginning the program as it was deemed the easiest of the three Module I courses. The results of the followup analysis lent credence to this suspicion; students in the Communication course had completed significantly fewer program courses than students in the other two courses, and significantly fewer courses related to banking offered at traditional universities. Added support for this

interpretation can be found in several discussions (Daniel & Marquis, 1979; Willen, 1981; Lewis, 1984) which stress the importance of supporting students in the initial stages of their academic programs in DE.

It was also found, in the Communication course only, that the more peer contact reported by students, the more often they stated that they would recommend program courses to others. Presumably, this measure could be interpreted as an indication of satisfaction with the course experience.

Keegan's second hypothesis suggests the use of measures capable of determining quality of learning. The present study attempted to address the quality of learning by employing the following measures: assignments scores, final exam score, self-perception of learning achievement, various attitude measures and unstructured diaries kept by each study group. No significant differences were found between levels of peer contact on measures of achievement or attitude. This was true both for the treatment sample and the larger sample which was based on responses to the questionnaire.

Study group diaries included comments (See Appendix F) which indicated that some of the benefits resulting from studying with peers could not easily have been accomplished studying alone (e.g., "Studying with other people made you think more," "Other points of view were helpful to understanding," "Very helpful, everyone has different views and we had to work it out to see which was better"). Although these sorts of comments were recorded with relative frequency from

study groups in all three courses, only 25% (13 out of 50) of the diaries were returned and thus caution must be taken in speculating how representative they are.

Thus, a modest indication of support was found for Keegan's second hypothesis concerning the quality of learning in the findings that: a) students who received honor marks reported significantly more peer contact than students who received only passing marks; and b) comments from study group diaries indicated some of the self perceived benefits of peer group study.

A partial explanation for the lack of significant results from the treatment sample analysis may lie in the fact that final numbers in the treatment conditions were smaller than originally anticipated. Responses to initial inquiries of student interest conducted six months prior to the beginning of the present study had promised greater numbers. It is believed that the discrepancy between anticipated and actual numbers was due, in part, to the late mailing of initial forms, the confusion over the deadline to return the forms and the resulting second mailing. The possible influence of this unfortunate problem of timing on the results of the treatment sample analysis cannot be overestimated. A significant amount of discussion among DE practitioners is evident in the literature concerning the importance of early intervention to reduce the numbers of early withdrawals, as has already been discussed. Reports received from four local contact persons (i.e., former students who had already com-

pleted the targeted courses) indicated that they thought they could have had more influence on a particular student's decision to dropout if they had been able to contact him or her earlier. Another phenomenon, separate from the issue of timing but which affected three study groups, was the discovery that when one or more of the study group members decided to dropout, the rest of the group followed. One of these groups was in treatment level three to which a local contact person was provided. When two members dropped out, the remaining member began to initiate more contact with the local contact person and completed the course, perhaps indicating one potential value of a local contact network.

The present study considered the stated study preferences of students in structuring the treatment design, a consideration not included by Keegan in the statement of his hypotheses. In the present study, only students who stated that they desired to work with other students were offered the option of study group contact and contact with former students. Students who stated they preferred to work on their own were also followed for purposes of comparison. It was found that students who stated they preferred to work on their own had successfully completed more program courses and had a higher general level of education than those students who stated they wanted to work with other students. This finding is consistent with that of Willen (1981) who found, in a survey of Swedish DE students, that students with a lower educational background, significantly more than others,

would have liked to see an increase in certain activities which increased interpersonal contact (i.e., personal letters, telephone calls, and conference calls with other students). She does not, however, refer to any subgroups which specifically stated a desire to work on their own as was addressed by this study. Similar findings resulted from a survey in New Zealand (Williams & Williams, 1984, 1987) which found that older students, those with at least part time employment and those without postsecondary qualifications were more likely to make contact with area communicators.

Further analysis of any differences in achievement, attitudes, or final academic standing between the treatment groups, the quasi-control group and the students who preferred to work on their own produced no significant results. This finding indicated that even though students stated different study preferences, whether those preferences were met, or not, did not seem to make a difference in conventional measures of achievement or in persistence toward completion. These results add to the findings of others who considered only completion rates as a measure. Coldeway (1980) predicted that learners who indicated they wanted to learn on their own rather than in groups would have higher completion rates (students were only asked their study preferences, treatment intervention was not provided). He found no significant differences in completion rates between the two groups. Other research has sought to identify DE students as field-dependent or field-independent (Thompson,

1984; Thompson & Knox, 1987) and identify any correlations between personality type and attrition. Whereas field-dependence is also associated with a preference for being with other people and field-independence with a more impersonal orientation, the DE process has been seen as more consistent with students who are of the field-independent type. Results found DE students more likely to be characterized as field-independent (also found by Moore, 1976), but there were no differences found in the completion rates between the field-dependent and field-independent subjects.

A secondary analysis of the present study sought to identify variables which significantly contributed to an explanation of course completion and noncompletion and to self-perception of learning achievement. Tinto's Model of Persistence and Withdrawal in Higher Education and other studies addressing Tinto's model were used to select and structure the variables in this analysis and are used here as a guide to discussion. This study cannot, however, be considered an attempt to validate Tinto's model for two reasons: a) one intervening variable included by Tinto, namely, goal commitment, was not used; and, b) the mode of data collection used resulted in questionnaire responses which representing a one-time self report of attitudes and behaviors. Although this form of data collection has been employed by individuals who label their efforts as validation, the researcher does not find this practice in keeping with the original intent of Tinto's model.

Tinto views persistence toward completion in the conventional university as largely a function of the student's academic and social experiences after enrollment. Academic integration is described by Tinto as being primarily determined by academic performance and level of intellectual development. Social integration is described as primarily a function of the quality of peer-group interactions and the quality of student interactions with faculty. Thus, the emphasis placed on interpersonal communication by Keegan is also a major component of Tinto's model. Both theorists hypothesize that the better the educational institution provides for the integration, the more likely the student is to persist toward completion. Keegan goes further, however, and hypothesizes that the quality of learning will also be enhanced.

The present study found that the total variance explained by all of the predictor variables chosen according to the major components of Tinto's model was 51%. This is somewhat higher than the 32% found by Sweet (1986), who attempted to formally validate Tinto's model in a DE setting. This information alone would seem to indicate that Tinto's model offers a good explanation of dropout behavior in DE. However, in this analysis, indications of academic and social integration were much more unequal than predicted by Tinto's model. The mean score on course assignments was by far the most important in discriminating between students who completed courses and those who did not. This finding indicated that even though students who did not complete the

course may have submitted fewer assignments than those who completed, the overall mean on the assignments they did submit was significantly lower (50% versus 83%). It seems likely from this finding that since assignments often constitute the majority of, if not all, the feedback which students receive from DE institutions, then low assignment scores would be particularly likely to lead to discouragement and hence, withdrawal. The comparatively large contribution of assignment scores, while somewhat disproportionate according to Tinto's model, is more consistent with other studies in less conventional university settings (i.e., nonresidential, urban universities) (Pascarella, Duby, Miller & Rasher, 1981; Pascarella and Chapman, 1983) No comparison can be made with the only study to apply Tinto's model in a DE setting (Sweet, 1986) because the unique contribution of variables employed in the discriminant functions analysis was not reported and Sweet did not use actual grade point average as one of the variables considered to be an indicator of academic integration.

Other variables making a significant, unique contribution were, in order of importance: contact with peers and former students who had already successfully completed the courses; intention to take another program course or recommend the same to another person; and previous experience with correspondence courses offered by other programs besides the targeted program.

Contact with peers is considered by Tinto as the most important component of social integration and in this study,

although much less important than the indication of academic integration, peer contact surfaces as an important element in the explanation of course completion and noncompletion. The other element in addition to peer contact considered by Tinto to be part of social integration, is faculty-student contact. In the present study, contact with program staff or markers was not found to be significant in distinguishing those who completed from those who did not. This finding differs from Sweet (1986) who found that telephone tutoring between DE tutors and students contributed directly to completion status. A partial explanation for the disagreement may be the relative lack of opportunity for such contact in the present experimental setting as compared to Sweet's setting and the inability of the present study to collect adequate information about these contacts owing to its problems with pertinent questionnaire items and inability to collect this information directly from program staff as originally planned.

Validation studies of Tinto's model in conventional, residential university settings (Terenzini & Pascarella, 1978, 1980) did not find that student background characteristics were significantly correlated with decisions to persist to completion or voluntarily withdraw. Similar studies, conducted in less conventional university settings (non-residential urban and commuter schools), reported slightly more direct affect of background characteristics on decisions to persist (Pascarella, Duby, Miller & Rasher,

1981; Pascarella & Chapman, 1983). Sweet (1986) found that background characteristics of DE students explained 11% of the criterion variance, a significant proportion. In the present study, only two experience variables of the set of student background characteristics were found to make a significant contribution to the explanation of course completion or non-completion, namely, previous experience with the correspondence mode of education in general and successful completion of at least one program course. These particular variables were not included as student background characteristics in Sweet's study, but were included in the present study based on previous findings reported in the literature. Coldeway, Spencer and Stringer (1980) similarly found that while none of the demographic or personal factors predicted course completion, if students completed the first unit in a course or had already successfully completed a distance education course, they were much more likely to complete a second course.

Sweet (1986) suggested that a reasonable interpretation of Tinto's concept of institutional commitment in a DE system would be a dichotomous measure of students' stated intentions to re-enrol in program courses. The present study followed Sweet's suggestion in investigating institutional commitment and included a second measure to strengthen evidence of commitment (i.e., a dichotomous measure asking the student if they would recommend program courses to others). Both measures made significant contributions; those who completed

courses were more likely to re-enrol and to recommend the same to another person.

A final analysis sought an explanation as to why students had various impressions of their own learning achievement. Students were asked to indicate how much they felt they had learned from the correspondence course in which they were enrolled. The question was structured as a semantic differential scale; four groups were established on the basis of the responses. The same predictor variables, organized according to Tinto's model, were used as in the analysis which sought an explanation of course completion behaviors. This was done for purposes of comparison even though Tinto's model is a causal model of completion and withdrawal and was not intended as an explanation of other issues. The total variance explained in this analysis was 33%, still indicating a useful framework for discussion.

Of the five variables which made significant and unique contributions, three of them were from the set of variables indicating academic integration. Each of the three was at least twice as important as either of the two remaining significant variables (i.e., one from the set of variables describing background characteristics, the other social integration). Results indicated that the more students learned from the textbook and module notes, the more they felt they had learned from the course; predictable in a DE program based on correspondence materials. In addition, the more students felt they learned, the higher the mean score on

assignments, again probably predictable in a correspondence based program where feedback is almost exclusively through assignments.

Results also indicated that the more students felt they learned, the more likely they were to recommend program courses to others, suggesting that satisfaction, as well as the convenience of DE, play a role in institutional commitment. Less expected was the finding that staff/marker-student contact also made a significant contribution to the explanation of self-perception of learning achievement. This finding was a bit more difficult to interpret because contact increased with reported learning over the first three categories, but contact was the least among those in the fourth category who reported learning the most. A possible explanation may lie in the concept of the autonomous learner being best suited to the DE format. Perhaps those who reported learning the most were indeed the most autonomous learners and therefore the least likely to seek contact with program staff and markers. This is tentatively suggested, as no information is available about the nature of the contacts. It is possible that many of the contacts merely concerned clerical or administrative issues.

Implications for Practice and Research

The notion that interpersonal communication may contribute to an explanation of dropout in DE is gathering more and more support. Several program evaluations and

research efforts discussed in this paper have found support for the addition of interpersonal communication components. Generalization of these findings is tentative because of a lack of concern for comparison of the experimental setting to other DE settings. Interpersonal communication has taken various forms in these studies, from the production of both printed and nonprinted instructional materials designed to achieve as many of the characteristics of interpersonal communication as possible, to telephone tutorials between students and DE tutors. The present study, attempting to generalize findings only to Type I DE institutions, found modest support for the incorporation of interpersonal communication in the form of study groups and local contact person networks, thus lending support to Keegan's first hypothesis concerning attrition in DE.

Findings from the present study were also usefully discussed in the framework of Tinto's Model of Persistence and Withdrawal in Higher Education. Peer contact was found to make a significant contribution to the explanation of course completion.

Keegan presumably bases the validity of his assumption, that reintegration affects attrition, on the student motivation which results when the learning process is facilitated through interpersonal communication. Tinto bases the validity of his model on the notion that students will be motivated to persist toward completion if they have a sense of "belonging" to both the academic and social structures of the

institution. Whether students are motivated to persist because of their learning experience or because they feel they belong, or both, has not been established. However, the practical implications of the research to date make practices which choose to incorporate more interpersonal communication theoretically defensible and likely to succeed in lowering general attrition rates.

A second hypothesis proposed by Keegan concerns the quality of learning; there is yet little information which concerns this issue. The present study attempted to address the quality of learning through the incorporation of measures other than attrition rates, but with very limited results. Students who reported the most peer contact more often received honors grades; but this may only indicate that the more conscientious students sought contact and does not necessarily speak to any effects of group study. In addition, diaries submitted by individual study groups and reports submitted by former students serving as local contact persons provided some indication that students working with others may have had a qualitatively different learning experience than those students who (by choice or by lack of opportunity) studied alone. Further investigation of Keegan's concept of quality in learning seems a viable direction for future research in DE. This would, however, require a more indepth look at the function of interpersonal communication in DE.

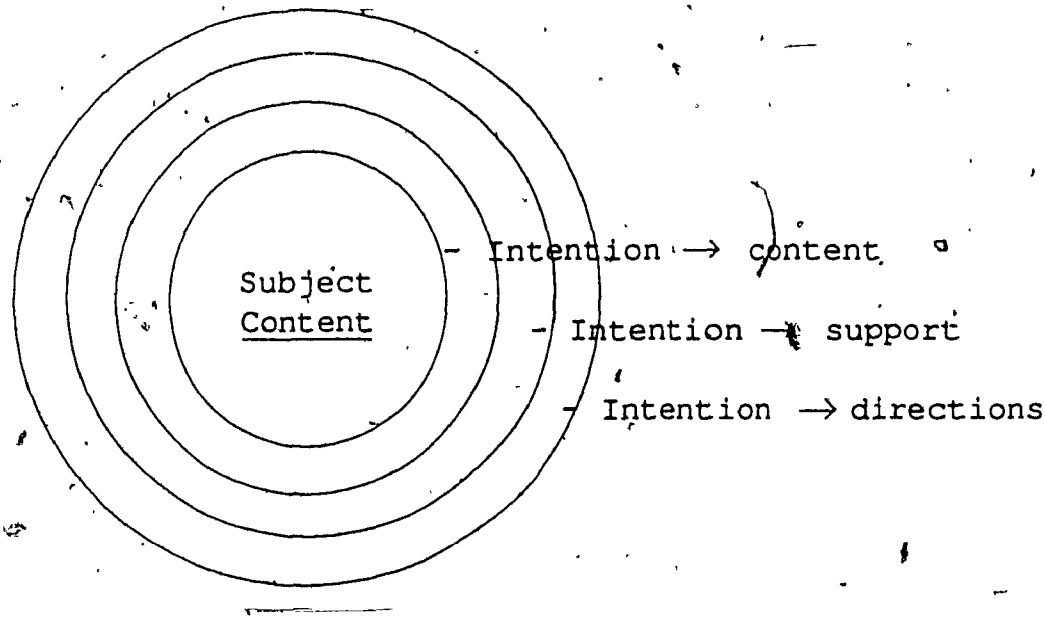
The particular medium which is to "carry" interpersonal

communication is not, in this researcher's opinion, at isssue. Often, especially in North American research efforts in DE, investigations have centered on the medium rather than the more important issue of a sound instructional design. Further investigation of interpersonal communication in DE might profit from consideration of the following ideas:

- Interpersonal communication in DE have different purposes. Research efforts to date have simply considered contact in general (i.e., student-tutor contact, peer contact, etc.), and,
- Different learning objectives and/or subject contents may be facilitated best by various amounts or types of interpersonal communication.

An organization is proposed herein which focuses on the purpose or nature of the interaction (or interpersonal communication) in DE. In this organization, interaction is defined as a process of communication between students and the instructor (or tutor or other such person), or among students, or the "internal" conversations prompted by the design ofinstructional materials. Three possible purposes of personal communication in DE are identified. Figure 9 presents these possibilities graphically. All three possibilities are important to the overall task of distance education and provide what is generally readily available in the conventional educational setting. The three possibilities, as represented in Figure 9, are placed according to their direct applicability to the subject content, which forms the center of the graphic.

Figure 9.
Possible Content of Interpersonal Communications.



The first possibility concerns communications for which the purpose is the further understanding and exploration of the course content. If program descriptions in the literature can be taken as fairly representative of current practices, there are few programs which have used structures developed to facilitate interpersonal communication as a means of developing intellectual skills. Few programs have focused on communication specific to the content as an instructional goal.

The second level shown in Figure 9 has been more frequently addressed in program design. Labelled as counselling, these communications may include motivational support and non-academic problem solving. The need for such interaction has been addressed several times in the literature (Heinze, 1983; Moore, 1981; Woolfe, 1984).

The third level refers to interaction which generally, in traditional university education, takes place at the beginning or end of class (e.g., clarification of assignments, due dates, etc.). Although the distinctions between these categories can and do blur, the point here is that relatively little effort has been made to include intellectual development as a goal of interpersonal communication components in DE, or to evaluate the possible learning outcomes.

Course development efforts in DE have often become locked into the "instructional design formula" resulting in courses which "look" alike, regardless of learning objectives or subject content. Conventional education in higher educa-

tion is guilty of the same with a large percentage of courses across departments taught in exactly the same manner. The difference, of course, is that (at least in theory) physical presence provides students with more control over the instructional process and instructors with more opportunity to respond spontaneously to students.

In the case of DE, Baath (1982) has proposed the beginnings of a theoretical basis on which to make decisions about the interactional requirements of various learning goals. Baath (1982) analyzed the following models chosen to represent a scale of varying theoretical approaches to learning:

- Skinner's behavior control model
- Rothkopf's model for written instruction
- Egan's structural communication model
- Bruner's discovery learning model
- Roger's model for facilitation of learning (p. 14)

In considering DE against these contemporary teaching models, Baath provides the following two general conclusions:

1) Models with stricter control of learning towards fixed goals tend to imply, in distance education, a greater emphasis on the teaching material than on the two-way communication between student and tutor institutions.
2) Models with less control of learning towards fixed goals tend to make simultaneous communication

> between student and tutor/institution more desired, this communication taking the form of either face-to-face or telephone contacts. (p. 15)

Baath also related various types of instructional goals (verbal information, intellectual skills, cognitive strategies, attitudes and motor skills) to the various teaching models, information which has been well established in the literature of conventional instruction. As one might expect, models with stricter control are related to verbal information and intellectual skills because the need for oral simultaneous communication is predicted to be rather limited. The need for personal interaction is necessary for cognitive strategies, attitudes and motor skills and is therefore related to the teaching models with less control of learning. Baath's analysis, while incomplete, does provide a framework for further development. Crump and Livingston (1981), in an interesting and uncommon description of practice in DE, bring to light a specific instance of subject content best facilitated through interpersonal communications and how this was accomplished in the DE context.

In this researcher's opinion, DE research in higher education should now focus on the learning process and how to best facilitate learning with respect to its diverse population of learners and various instructional tasks. Many current DE efforts, which operate within a model of traditional correspondence education, are often criticized as

not providing "true" education, but rather turning out "passive consumers of knowledge" (Rumble, 1983). Perhaps the key to changing this image lies in the creative planning of interpersonal communication opportunities.

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Appendix A

Questionnaire

Place a checkmark on the line to indicate your response to each of the following statements or questions.

1. What is your age?

___20-25 ___26-30 ___31-35 ___36-40 ___41-45 ___46-50 ___Over 50

2. What is the total number of years of schooling you have completed?

___08 ___09 ___10 ___11 ___12 ___13 ___14 ___15 ___16+

3. Indicate below the highest degree or leaving certificate that you hold:

_____High School
_____College
_____University (undergraduate)
_____University (graduate)
_____Other. Please indicate here _____

You may find it necessary to check more than one response in the next four (4) questions.

4. In which PEP (Personal Education Program) correspondence course(s) are you currently enrolled?

_____Fundamentals of Accounting
_____Business Administration
_____Communication
_____Other. Please list: _____

5. Which PEP (Personal Education Program) correspondence courses have you successfully completed to date?

_____This is my first course
_____Fundamentals of Accounting
_____Business Administration
_____Communication
_____Other. Please list: _____

6. Why are you taking correspondence courses through PEP?

_____I wish to further my education.
_____I am taking courses out of interest only.
_____It was recommended by my supervisor at work.
_____I think it will help me to gain promotion in my job.
_____Correspondence courses are more convenient for me than going to University
_____I think the course information is both relevant and helpful in my job.
_____Other. Please explain: _____

7. What do you feel are the most difficult aspects of education by correspondence, or "distance education"?

_____A feeling of isolation.
_____Finding the self-discipline necessary to study on my own.
_____Meeting assignment due dates.
_____Not having the possibility to discuss questions with a professor.
_____Lack of opportunity to have discussions with other students.
_____Not knowing how you are doing compared to other students in the course.
_____Other. Please explain: _____

Place a check mark on the line to indicate your response to each of the following statements or questions.

8. Have you ever enrolled in other correspondence courses offered by colleges, universities or organizations other than PEP?

_____Yes _____No

9. How many ICB (Institute of Canadian Bankers) credit courses have you successfully completed at a University?

_____0 _____1 _____2 _____3 _____4 _____5 _____6+

The following questions address only the current session in which you are enrolled, October 1986 - March 1987.

10. Did you receive your course materials (textbook and module notes) for the course you are currently taking before October 1, 1986?

_____Yes _____No

11. Were there missing pages from your module notes or assignment sheets? (If NO, proceed to question #14.)

_____Yes _____No

12. Did you notify PEP about the missing pages in your module notes or assignment sheets?

_____Yes _____No

13. Were the missing pages mailed to you by PEP?

_____Yes _____No

14. Were there mistakes in your module notes or assignment sheets? (If NO, proceed to question #17.)

_____Yes _____No

15. Did you notify PEP of the mistakes?

_____Yes _____No

16. Were corrections explained or mailed to you by PEP?

_____Yes _____No

17. During the current session, have you ever called the PEP toll-free number? (If No, proceed to question #22 .)

_____Yes _____No

18. Approximately how many times have you tried to call the PEP toll-free number, whether or not successfully?

_____0 _____1-5 _____6-10 _____11-15 _____16+

19. How many times have you called the PEP toll-free line and successfully reached one of the PEP staff?

_____0 _____1 _____2 _____3 _____4 _____5 _____6 _____7

20. How many times have you requested that your course tutor return your call?

_____0 _____1 _____2 _____3 _____4 _____5 _____6 _____7

21. How many times has your course tutor returned a telephone call at your request?

_____0 _____1 _____2 _____3 _____4 _____5 _____6 _____7

22. During the current session, did you speak to or meet with one or more persons taking the same correspondence course you are taking? (If No, proceed to Question #24.)

_____Yes _____No

23. If you spoke to or met with one or more persons taking the same correspondence course as you are, which of the following statements most closely describes your meetings?

_____We discussed the course casually once or twice.
_____We discussed the course casually on several occasions.
_____We met once or twice to discuss specific assignments or readings.
_____We met several times to discuss specific assignments or readings.
_____We met on a regular basis to discuss assignments and readings.
_____Other. Please explain: _____

24. During the current session, did you speak with anyone who had already completed the correspondence course you are taking? (If No, proceed to Question #26.)

_____Yes _____No

25. If you spoke to or met with anyone who had already completed the correspondence course you are taking, which of the following statements most closely describes your meetings?

_____We discussed the course casually once or twice.
_____We discussed the course casually on several occasions.
_____We met once or twice to discuss specific assignments or readings.
_____We met several times to discuss specific assignments or readings.
_____We met regularly to discuss assignments and readings.
_____Other. Please explain: _____

26. Did you use the study-buddy list sent to you in the mail to contact other students taking the same course as your are?

_____Yes _____No

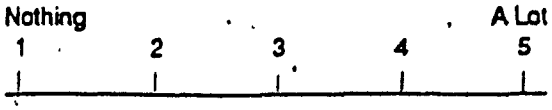
27. How much do you feel that each of the following course components has helped you to learn from the correspondence course you are taking? (Circle a number to the right to indicate your response.)

	N/A	Not Helpful				Very Helpful
Textbook	_____	1	2	3	4	5
Module Notes	_____	1	2	3	4	5
Audio Tapes	_____	1	2	3	4	5
Assignments	_____	1	2	3	4	5
Comments on assignments from graders	_____	1	2	3	4	5
Discussions with PEP staff reached through the toll-free number	_____	1	2	3	4	5
Discussions with the course tutor	_____	1	2	3	4	5
Information provided on study and exam strategies	_____	1	2	3	4	5

28. Do you feel that any of the following could have been improved? (Circle a number at the right to indicate your response.)

	N/A	Not Improved At All				Improved A Great Deal
Module notes (in general)	_____	1	2	3	4	5
Audio tapes	_____	1	2	3	4	5
Written instructions in the module notes	_____	1	2	3	4	5
Written instructions on assignments	_____	1	2	3	4	5
Time lapse between submitting an assignment and getting it back	_____	1	2	3	4	5
Comments on assignments from graders	_____	1	2	3	4	5
Availability of PEP staff	_____	1	2	3	4	5
Availability of course tutor	_____	1	2	3	4	5

29. How much do you feel you have learned from the correspondence course you are taking? (Circle a number to indicate your response.)



30. Would you take another correspondence course through PEP?

_____Yes _____No

Comments:

31. Would you recommend taking a correspondence course through PEP to someone else?

_____Yes _____No

Comments:

Appendix B

Preliminary Survey of Student Interests

PEP Program
Study Group Questionnaire

1. Check the courses you have completed in the PEP program.

_____ Communication
_____ Business Administration
_____ Fundamentals of Accounting
_____ Other. Please specify

2. Have you ever met or studied with any other students taking the same PEP course?

_____ Yes
_____ No (If no, skip to Question #6)

3. In which courses did you meet or study with other students taking the same PEP course?

_____ Communication
_____ Business Administration
_____ Fundamentals of Accounting
_____ Other. Please specify _____

4. For each course in which you met with other students, please indicate on the chart below approximately how many other students you met with and approximately how often you met.

	Approximately how many other students did you meet or study with at the same time?	Approximately how many times did you meet over the entire course?
Communication		
Business Administration		
Accounting		
Other course? Please specify		

5. Please briefly describe what you did when you met with other students, i.e., discussed readings, worked on assignements or other activities. (If you did different things for different courses, please indicate which activities belong to which courses.)

_____

_____

_____

6. If you **never** met or studied with other students in any of your PEP courses, please check the reason or reasons why not. (If you **have** met or studied with other students taking the same PEP courses, skip to question #7.)

_____ Prefer to study alone
_____ Would have liked to, but it did not work out
_____ No one contacted me
_____ Did not consider the possibility
_____ Other. Please explain _____

7. While taking a PEP course, did you ever meet or study with anyone who had **already completed** the same PEP course?

_____ No
_____ Yes. Please explain how it did or did not help you _____

_____

_____

8. Which of the following do you consider would help in the formation and functioning of study groups for PEP courses? (Check more than one if applicable.)

_____ assistance in forming study groups (e.g., phoning students, arranging meeting places, etc.)

_____ provision of suggested study activities or additional support materials based on course content (e.g., exercises, case studies, study guides, videos, etc.)

_____ assistance in establishing contacts among different study groups

_____ assistance in recruiting recent graduates of the same course to provide orientation information to study groups

_____ assistance in recruiting recent graudates of the same course to be available (to study groups or individuals) for questions about course content and assignments

_____ other. Please explain _____

_____

_____

_____

9. What do you consider to be the main advantages and disadvantages of meetings with other students?

Advantages: _____

_____

Disadvantages: _____

_____

10. Do you have any other comments about study groups or student support services in general for the PEP Program?

Thank you very much for your time and cooperation!!!

Appendix C

Student Study Preference Form

_____I am interested in meeting with other students during this course
_____ I may also be interested in helping to coordinate a study group

_____I already have made plans to meet with the following students taking this course:

_____

_____

_____

_____I am not interested in meeting with other students; I prefer to study on my own.

Additional Comments:

Name: _____

Student Number: _____

Address:

Home _____ Work _____

_____ _____

_____ _____

_____ _____

Phone: _____ _____

Best time to contact you:

_____ _____

Course you are registered for:

_____ Communications
_____ Business Administration
_____ Fundamentals of Accounting
_____ Other. Please specify

Session you are registered for:

_____ September to March
_____ September to June
_____ Other. Please specify _____

To facilitate routing of mail, please write the following on the return envelope:
Attention: Cheryl Amundsen

Appendix D

Study Group Journals
(Organized as a booklet)

As I mentioned when we spoke on the phone, I am asking you to keep some information for me. My intention is to gather information about studying with other students so as to be able to pass helpful information among students. I am asking you to use this booklet to keep the following information:

Date (When you meet to study, discuss, etc.)
Even if only part of the group gets together informally, please record it.

What You Did
Even if only a sentence or two, please *briefly* describe what you did when you met and, how helpful you and the others found it. Probably, the best way to do this would be to keep this booklet with your course materials so you have it with you. During or directly after you meet, fill in the information.

Who Was There
First names are fine or just jot down who was missing. This will help me to get an idea of how often the group meets with all members, only part of the group, etc.

Thank you for your cooperation. Don't forget that if you have any questions (or suggestions) you can call me any Wednesday evening on the toll-free line, 1-800-361-4636 at the following times:

Newfoundland	7:30-11:30 pm
Maritimes	8:00-12:00 pm
Quebec/Ontario	7:00-11:00 pm
Manitoba/Saskatchewan	6:00-10:00 pm
Alberta	5:00-9:00 pm
British Columbia	4:00-8:00 pm

Cheryl Amundsen

Many of you have already started to meet together -- so to start, fill in the information below. For future meetings, please use one page for each meeting to record information.

Approximately how many times have you already met since the course began?

Who have been the regular members of your group?

What kinds of things have you done when you met?

How helpful have you found the sessions?

Have you encountered any problems in meeting together?

Additional comments:

Please provide the following information each time you get together with other students to study, discuss, etc.

Date

What you did:

How helpful was the meeting?

Did you encounter any problems of any sort in this meeting?

Who did you meet with?

Please provide the following information each time you get together with other students to study, discuss, etc.

Date

What you did:

How helpful was the meeting?

Did you encounter any problems of any sort in this meeting?

Who did you meet with?

Appendix E

MANOVA Statistics

MANOVA Number One – Accounting Course

Variable	Code	Mean	Std. Dev.	N
Mean				
Treatment Group	1	.86	.08	3
Treatment Group	2	.81	.14	3
Treatment Group	4	.79	.10	4
Treatment Group	5	.87	.04	8
For Entire Sample		.84	.08	18
Exam				
Treatment Group	1	.45	.29	3
Treatment Group	2	.34	.14	3
Treatment Group	4	.63	.28	4
Treatment Group	5	.56	.14	8
For Entire Sample		.52	.21	18
Item 62				
Treatment Group	1	3.67	.58	3
Treatment Group	2	4.33	.58	3
Treatment Group	4	3.25	.50	4
Treatment Group	5	4.13	.64	8
For Entire Sample		3.89	.68	18
Item 2				
Treatment Group	1	5.33	.58	3
Treatment Group	2	5.33	.58	3
Treatment Group	4	6.00	1.83	4
Treatment Group	5	5.75	1.28	8
For Entire Sample		5.67	1.19	18

Multivariate Tests of Significance
(S = 3 M = -1/2 N = 4 1/2)

Test Name	Value	Approx. F	Hypoth. DF	Error DF	Sig. of F
Pillais	.87	1.77	9.00	39.00	.11
Hotellings	1.83	1.97	9.00	29.00	.08
Wilks	.30	1.97	9.00	26.92	.09
Roys	.60				.09

MANOVA Number Two – Business Administration Course

Variable	Code	Mean	Std. Dev.	N
Mean				
Treatment Group	1	.85	.05	5
Treatment Group	2	.83	.05	9
Treatment Group	3	.84	.02	2
Treatment Group	4	.81	.10	7
Treatment Group	5	.87	.04	10
For Entire Sample		.84	.06	33
Exam				
Treatment Group	1	.63	.08	5
Treatment Group	2	.60	.16	9
Treatment Group	3	.63	.04	2
Treatment Group	4	.59	.12	7
Treatment Group	5	.66	.09	10
For Entire Sample		.62	.11	33
Item 62				
Treatment Group	1	3.80	.84	5
Treatment Group	2	3.89	.78	9
Treatment Group	3	3.50	.71	2
Treatment Group	4	3.43	.98	7
Treatment Group	5	3.90	.88	10
For Entire Sample		3.76	.83	33
Item 2				
Treatment Group	1	4.20	.84	5
Treatment Group	2	5.00	.87	9
Treatment Group	3	6.00	1.41	2
Treatment Group	4	5.57	1.13	7
Treatment Group	5	6.50	1.27	10
For Entire Sample		5.51	1.30	33

Multivariate Tests of Significance
(S = 3 M = 0 N = 11 1/2)

Test Name	Value	Approx. F	Hypoth. DF	Error DF	Sig. of F
Pillais	.23	.55	12.00	81.00	.87
Hotellings	.27	.53	12.00	71.00	.89
Wilks	.78	.54	12.00	66.44	.83
Roys	.18				.69

MANOVA Number Three – Communications Course

Variable	Code	Mean	Std. Dev.	N
Mean				
Treatment Group	1	.83	.06	12
Treatment Group	2	.82	.04	4
Treatment Group	3	.83	.02	7
Treatment Group	4	.80	.07	12
Treatment Group	5	.84	.04	12
For Entire Sample		.82	.05	47
Exam				
Treatment Group	1	.74	.08	12
Treatment Group	2	.64	.09	4
Treatment Group	3	.73	.06	7
Treatment Group	4	.75	.08	12
Treatment Group	5	.78	.09	12
For Entire Sample		.74	.09	47
Item 62				
Treatment Group	1	3.92	.90	12
Treatment Group	2	3.25	.96	4
Treatment Group	3	4.57	.79	7
Treatment Group	4	3.83	.83	12
Treatment Group	5	3.83	.72	12
For Entire Sample		3.91	.86	47
Item 2				
Treatment Group	1	5.08	.51	12
Treatment Group	2	5.25	.50	4
Treatment Group	3	5.14	1.57	7
Treatment Group	4	5.75	.75	12
Treatment Group	5	6.00	.85	12
For Entire Sample		5.51	.93	47

Multivariate Tests of Significance
(S = 3 M = 0 N = 18 1/2)

Test Name	Value	Approx. F	Hypoth. DF	Error DF	Sig. of F
Pillais	.43	1.71	12.00	123.00	.07
Hotellings	.53	1.66	12.00	113.00	.08
Wilks	.62	1.70	12.00	103.48	.08
Roys	.25				.17

MANOVA Number Four — Pooled Sample of Three Courses

Variable	Code	Mean	Std. Dev.	N
Item 46				
Treatment Group	1	4.20	.77	20
Treatment Group	2	3.87	1.01	23
Treatment Group	3	4.20	.79	10
Treatment Group	4	3.80	.86	29
Treatment Group	5	4.38	.71	39
For Entire Sample		4.10	.85	121
Item 47				
Treatment Group	1	3.75	1.21	20
Treatment Group	2	4.09	1.08	23
Treatment Group	3	3.70	1.06	10
Treatment Group	4	3.76	1.02	29
Treatment Group	5	4.08	.93	39
For Entire Sample		3.92	1.04	121
Item 49				
Treatment Group	1	3.75	1.37	20
Treatment Group	2	4.00	.95	23
Treatment Group	3	3.90	.87	10
Treatment Group	4	3.76	.95	29
Treatment Group	5	4.03	.87	39
For Entire Sample		3.90	1.00	121
Item 50				
Treatment Group	1	3.15	1.04	20
Treatment Group	2	3.26	1.14	23
Treatment Group	3	3.20	1.32	10
Treatment Group	4	3.31	1.11	29
Treatment Group	5	3.05	1.19	39
For Entire Sample		3.18	1.13	121
Item 51				
Treatment Group	1	1.55	1.10	20
Treatment Group	2	1.48	.95	23
Treatment Group	3	2.10	1.20	10
Treatment Group	4	1.55	.95	29
Treatment Group	5	1.59	1.19	39
For Entire Sample		1.60	1.07	121
Item 52				
Treatment Group	1	1.10	.45	20
Treatment Group	2	1.17	.49	23
Treatment Group	3	1.00	0.00	10
Treatment Group	4	1.45	1.06	29
Treatment Group	5	1.41	1.16	39
For Entire Sample		1.29	.89	121

Item 53				
Treatment Group	1	2.70	1.17	20
Treatment Group	2	2.74	1.32	23
Treatment Group	3	3.30	1.06	10
Treatment Group	4	2.55	1.15	29
Treatment Group	5	2.33	1.22	39
For Entire Sample		2.60	1.22	121
Item 54				
Treatment Group	1	2.35	.93	20
Treatment Group	2	2.30	1.02	23
Treatment Group	3	2.60	1.17	10
Treatment Group	4	2.10	1.01	29
Treatment Group	5	2.08	.98	39
For Entire Sample		2.21	1.00	121
Item 56				
Treatment Group	1	2.35	.81	20
Treatment Group	2	2.30	.97	23
Treatment Group	3	2.70	1.25	10
Treatment Group	4	2.14	1.09	29
Treatment Group	5	2.18	.94	39
For Entire Sample		2.26	.99	121
Item 57				
Treatment Group	1	2.40	.94	20
Treatment Group	2	2.65	1.23	23
Treatment Group	3	2.10	.99	10
Treatment Group	4	1.83	1.00	29
Treatment Group	5	2.44	.97	39
For Entire Sample		2.30	1.05	121
Item 58				
Treatment Group	1	2.75	1.29	20
Treatment Group	2	3.74	1.21	23
Treatment Group	3	2.90	.88	10
Treatment Group	4	3.14	1.48	29
Treatment Group	5	3.31	1.30	39
For Entire Sample		3.22	1.32	121
Item 59				
Treatment Group	1	2.80	1.20	20
Treatment Group	2	2.70	1.29	23
Treatment Group	3	2.70	1.49	10
Treatment Group	4	2.69	1.47	29
Treatment Group	5	2.82	1.32	39
For Entire Sample		2.75	1.32	121

Item 60

Treatment Group	1	1.50	.89	20
Treatment Group	2	1.61	.89	23
Treatment Group	3	1.90	.88	10
Treatment Group	4	1.66	1.17	29
Treatment Group	5	1.36	.74	39
For Entire Sample		1.54	.92	121

Item 61

Treatment Group	1	1.45	.89	20
Treatment Group	2	1.57	.99	23
Treatment Group	3	2.10	1.37	10
Treatment Group	4	1.69	1.23	29
Treatment Group	5	1.53	1.10	39
For Entire Sample		1.61	1.10	121

Item 2

Treatment Group	1	4.90	.72	20
Treatment Group	2	5.22	.67	23
Treatment Group	3	5.40	1.43	10
Treatment Group	4	5.69	1.11	29
Treatment Group	5	6.05	1.12	39
For Entire Sample		5.56	1.09	121

Multivariate Tests of Significance
(S = 4 M = 4 1/2 N = 50)

Test Name	Value	Approx. F	Hypoth. DF	Error DF	Sig. of F
Pillais	.58	1.28	56.00	420.00	.09
Hotellings	.71	1.28	56.00	402.00	.09
Wilks	.53	1.28	56.00	398.93	.09
Roys	.24				.16

MANOVA Number Five – Accounting Course

Variable	Code	Mean	Std. Dev.	N
Mean				
Contact	1	.83	.10	34
Contact	2	.83	.08	21
Contact	3	.86	.09	15
Contact	4	.83	.10	11
For Entire Sample		.83	.09	81
Exam				
Contact	1	.57	.21	34
Contact	2	.53	.21	21
Contact	3	.63	.23	15
Contact	4	.56	.28	11
For Entire Sample		.57	.22	81
Item 62				
Contact	1	3.88	.69	34
Contact	2	3.81	.68	21
Contact	3	4.13	.74	15
Contact	4	4.00	1.00	11
For Entire Sample		3.93	.74	81
Item 2				
Contact	1	5.65	1.07	34
Contact	2	5.19	.68	21
Contact	3	5.87	1.60	15
Contact	4	5.64	.92	11
For Entire Sample		5.57	1.09	81

Multivariate Tests of Significance
(S = 3 M = -1/2 N = 36)

Test Name	Value	Approx. F	Hypoth. DF	Error DF	Sig. of F
Pillais	.05	.43	9.00	228.00	.92
Hotellings	.05	.42	9.00	218.00	.92
Wilks	.95	.42	9.00	180.25	.92
Roys	.03				.66

MANOVA Number Six – Business Administration Course

Variable	Code	Mean	Std. Dev.	N
Mean				
Contact	1	.84	.08	37
Contact	2	.81	.08	33
Contact	3	.79	.13	13
Contact	4	.81	.08	13
For Entire Sample		.82	.09	96
Exam				
Contact	1	.63	.11	37
Contact	2	.59	.11	33
Contact	3	.60	.11	13
Contact	4	.65	.10	13
For Entire Sample		.61	.11	96
Item 62				
Contact	1	3.86	.89	37
Contact	2	3.79	.89	33
Contact	3	3.77	.93	13
Contact	4	4.15	.69	13
For Entire Sample		3.86	.87	96
Item 2				
Contact	1	5.97	1.18	37
Contact	2	5.21	1.08	33
Contact	3	6.15	1.21	13
Contact	4	5.77	1.09	13
For Entire Sample		5.71	1.19	96

Multivariate Tests of Significance
(S = 3 M = -1/2 N = 43 1/2)

Test Name	Value	Approx. F	Hypoth. DF	Error DF	Sig. of F
Pillais	.08	.86	9.00	273.00	.52
Hotellings	.09	.84	9.00	263.00	.58
Wilks	.92	.85	9.00	216.75	.57
Roys	.05				.65

MANOVA Number Seven – Communication Course

Variable	Code	Mean	Std. Dev.	N
Mean				
Contact	1	.80	.10	48
Contact	2	.82	.05	41
Contact	3	.82	.05	39
Contact	4	.83	.04	39
For Entire Sample		.81	.07	167
Exam				
Contact	1	.75	.10	48
Contact	2	.74	.08	41
Contact	3	.74	.10	39
Contact	4	.76	.08	39
For Entire Sample		.75	.09	167
Item 62				
Contact	1	3.98	.86	48
Contact	2	3.83	.86	41
Contact	3	4.08	.87	39
Contact	4	4.10	.75	39
For Entire Sample		3.99	.84	167
Item 2				
Contact	1	5.71	.90	48
Contact	2	5.51	.84	41
Contact	3	5.62	1.04	39
Contact	4	5.36	1.11	39
For Entire Sample		5.56	.97	167

Multivariate Tests of Significance
(S = 3 M = -1/2 N = 79)

Test Name	Value	Approx. F	Hypoth. DF	Error DF	Sig. of F
Pillais	.06	.87	9.00	486.00	.55
Hotellings	.05	.86	9.00	476.00	.56
Wilks	.95	.86	9.00	389.55	.59
Roys	.03				.69

MANOVA Number Eight – Pooled Sample of All Three Courses

Factor	Code	Mean	Std. Dev.	N
Item 46				
Contact	1	4.11	.86	157
Contact	2	4.06	.93	114
Contact	3	4.18	.79	72
Contact	4	4.24	.74	74
For Entire Sample		4.13	.85	417
Item 47				
Contact	1	3.96	1.01	157
Contact	2	3.92	1.03	114
Contact	3	3.91	1.00	72
Contact	4	3.85	.97	74
For Entire Sample		3.92	1.01	417
Item 49				
Contact	1	3.85	1.03	157
Contact	2	3.84	1.06	114
Contact	3	3.99	.76	72
Contact	4	3.91	1.05	74
For Entire Sample		3.88	1.00	417
Item 50				
Contact	1	3.08	1.23	157
Contact	2	3.06	1.12	114
Contact	3	2.96	1.14	72
Contact	4	2.88	1.23	74
For Entire Sample		3.02	1.18	417
Item 51				
Contact	1	1.57	1.15	157
Contact	2	1.58	1.12	114
Contact	3	1.42	.92	72
Contact	4	1.64	1.13	74
For Entire Sample		1.56	1.12	417
Item 52				
Contact	1	1.38	1.03	157
Contact	2	1.21	.71	114
Contact	3	1.32	.95	72
Contact	4	1.28	.82	74
For Entire Sample		1.30	.90	417
Item 53				
Contact	1	2.48	1.24	157
Contact	2	2.56	1.20	114
Contact	3	2.46	1.26	72
Contact	4	2.47	1.22	74
For Entire Sample		2.50	1.22	417

Item 54				
Contact	1	2.20	1.12	157
Contact	2	2.38	.99	114
Contact	3	2.25	.96	72
Contact	4	2.39	1.16	74
For Entire Sample		2.29	1.07	417
Item 56				
Contact	1	2.21	1.07	157
Contact	2	2.27	.90	114
Contact	3	2.10	.94	72
Contact	4	2.30	1.14	74
For Entire Sample		2.22	1.01	417
Item 57				
Contact	1	2.30	1.12	157
Contact	2	2.41	1.12	114
Contact	3	2.21	1.13	72
Contact	4	2.32	1.01	74
For Entire Sample		2.32	1.10	417
Item 58				
Contact	1	3.20	1.32	157
Contact	2	3.34	1.22	114
Contact	3	3.00	1.21	72
Contact	4	2.74	1.22	74
For Entire Sample		3.12	1.27	417
Item 59				
Contact	1	2.84	1.29	157
Contact	2	2.82	1.22	114
Contact	3	2.85	1.26	72
Contact	4	2.88	1.29	74
For Entire Sample		2.84	1.26	417
Item 60				
Contact	1	1.62	1.14	157
Contact	2	1.56	.98	114
Contact	3	1.65	1.04	72
Contact	4	1.78	1.23	74
For Entire Sample		1.64	1.09	417
Item 61				
Contact	1	1.70	1.23	157
Contact	2	1.46	.93	114
Contact	3	1.61	1.01	72
Contact	4	1.72	1.27	74
For Entire Sample		1.62	1.13	417
Item 2				
Contact	1	5.70	1.11	157
Contact	2	5.34	.91	114
Contact	3	5.85	1.23	72
Contact	4	5.51	1.10	74
For Entire Sample		5.59	1.09	417

Multivariate Tests of Significance
(S = 3, M = 5, N = 198 1/2)

Test Name	Value	Approx. F	Hypoth. DF	Error DF	Sig. of F
Pillais	.10	.96	42.00	1203.00	.54
Hotellings	.10	.96	42.00	1193.00	.54
Wilks	.91	.96	42.00	1184.39	.54
Roys	.06				.35

Appendix F

Study Group Journal Comments

Study Group Journal Comments

Accounting Course

Comments	Frequency
Frequency of Meetings	
Weekly meetings	2
Frequently, by phone	2
Casually, at work	1
What did you do during the meeting?	
Discussed the assignment	4
Discussed the returned assignments	4
Discussed the text readings	6
Did the self study problems and discussed the answers	7
Made notes together on the readings	1
Discussed the module notes	5
Studied for the exam together	3
Listened to the exam strategies tape together	2
Discussed how we were managing with the course	1
How helpful was the meeting?	
Quite helpful	7
Very helpful	2
Reasonably helpful	2
Not very helpful	1
Very helpful, everyone has different views and we had to work it out to see which was better	3

Accounting Course, cont'd

Helpful – it took all of us to figure it out	1
It upped our spirits alot	1
It provided better insight into the problems	3

Did you encounter any problems in the meeting?

We understood each other's views, but were not sure which was correct	1
No problems	10
We have had to go ahead in the chapter we haven't read to find answers to some assignment problems	2
All week, we phoned each other, we had alot of problems with this assignment	1
We tried to call the tutor, but the call was returned after the assignment was due	1
Both of us got two problems wrong and we did not understand the answer given to us as the correct answer	1
Getting behind on an assignment created a problem for use	1

Study Group Journal Comments

Business Administration Course

Comments	Frequency
How often did you meet?	
Weekly	2
Mixed formal and informal meetings at work and over the phone	2
Two to three times per assignment	1
How helpful did you find the meeting?	
Fairly	1
Very helpful	17
Gave us a better perspective	1
Helpful - we have different views of the cases sometimes	7
Very helpful for some, marginally for others	1
Motivating	3
We are a great team - togehter we seem to figure it out	1
We worked out problems - we all seemed to have the same ones	2
Helped us to regain confidence	3
What did you do during the meeting?	
Discussed assignments and our difficulties with it	16
Compared corrected assignments and compared answers - discussed	2
Just check with each other to see how we were doing	2

Business Administration Course, cont'd.

Met to ask each other about questions that had come up in the readings	1
Discussed a company case study	4
Discussed our recommendations on a case study - our reasons for and against	8
Reviewed the questions in the module and textbook	9
Discussed outlines for our reports	2
Listened to the exam strategies tape together	3
Discussed how the course was related to our work	1
Discussed problems each of us was finding	1
Used the textbook to back up our thinking in a discussion	1
Helped each other understand things	7

Did you encounter any problems in the meeting?

Difficult to arrange a time to get together	1
No problems	7
Discussed the time requirements of the course and how it is difficult to fint into our schedules	1
People are getting sick and it is difficult to meet	1

Study Group Journal Comments

Communication Course

Comments	Frequency
How often did you meet?	
Casually at work and on the phone	2
Every two weeks	2
How helpful did you find the meeting?	
Very helpful	10
Helpful - we differed on the essays, but understood each other's point of view	2
Other points of view are helpful	1
Getting together confirmed we were all at the same level	2
Helpful - we made sure we were on the right track	1
Good to know someone is there if needed	1
Much better than being alone	2
Discussing with another person made you think more	1
Good support for each other in writing essays	1
Good - tried to boost each other's confidence	3
Helpful - if one doesn't understand - someone else usually does	1
The Communication course would be difficult by yourself	1
Being our first correspondence course - it is helpful talking to each other	1

Communication Course, cont'd.

What did you do during the meeting?

Discussed our fears of essay writing	2
Discussed our work as an example for the assignment	2
Discussed problems with the assignment	9
Discussed the text readings and modules	7
Talked about the exam and our jitters	4
Discussed the essay topics and our ideas and suggestions - to get us started	2
Discussed the multiple choice questions in the modules	3
Compared and discussed returned assignments	2
Viewed the video together	1
Did the unit on exam strategies together	2
Started meeting 2 times a week to begin reviewing the whole course - we took turns preparing each meeting	1
We reviewed several chapters - one memeber photo-copied our questions so we could keep them for review.	1

Did you encounter any problems during the meeting?

We have to be careful to stay on the subject	2
No time to get together	2
It is more difficult to have a meeting with only one other person	1
Self-discipline is the biggest problem - meeting weekly helped a great deal	1
The major problem was lack of confidence - we have to constantly reassure each other	1