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An Investigation of the Relationships Between Learning

Context, Student Approach to Learning and Student

Learning Outcomes in Distance Education

Nancy Price

Department of Educational and Counselling Psychology

McGill University

Montreal

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A thesis submitted to the Faculty of Graduate Studies and

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Abstract

An Investigation of the Relationships Between Learning Context, Student
Approach to Learning and Student Learning Outcomes in Distance Education

Nancy Price
McGill University, 1997

The purpose of the present study was to explore qualitative differences in student

learning outcomes in distance education courses. The following relationships were

examined within the context of three McGill Distance Education Program courses

that vary widely in content and instructional goals: 1) the relationship between

learning context, student approach to learning and student learning outcomes; 2)

the relationship between student and instructor perspectives of the learning

context; and 3) the relationship between type of course, course learning

expectations, course structure and design, and the selected method(s) of

assessment. Learning context was defined as everything touching on the teaching

and support environment in distance education courses. Student approach to

learning was defined in relation to deep and surface approach subscales from the

Approaches to Study Inventory (Ramsden and Entwistle, 1981). Student learning

outcomes were defined in both qualitative terms, the levels of learning student

demonstrate in response to a qualitative measure, and quantitative terms, student

final grade. The design of this study employed a mixture of both qualitative and

quantitative data collection and analysis procedures. The data set included instructor interviews, a qualitative measure of instructor's student learning expectations for their course, qualitative measures of students' course learning expectations, and quantitative measures of students' general learning approach, students' specific approach to learning in their course, and students' positive and negative impressions of their course. The results indicated a strong positive correlation between a deep approach to learning and positive course impression in one of the courses. The results also indicated that student grade was strongly positively correlated with the adoption of a surface approach to learning in one of the courses. There was no correlation between student grade and a qualitative measure of learning outcome. The findings of this study supported the view that high quality student learning outcomes are expected in distance education courses and that students can indeed achieve high quality learning outcomes within this context.

Résumé

Étude sur la relation entre le contexte d'apprentissage, l'approche de l'étudiant envers l'apprentissage et des mesures qualitatives et quantitatives sur les résultats d'apprentissage

Nancy Price
McGill University, 1997

Traditionnellement, en ce qui concerne la formation à distance, la théorie comme la recherche sur la « réussite » de l'étudiant ont mis l'accent sur le pôle persérvérance-abandon. Toutefois, si le principal objectif de ce type d'enseignement est d'amener les étudiants [DoEI]à produire des résultatsd'apprentissage de haute qualité, la recherche s'y rapport devrait comprendre des mesures qualitives de ces résultats. C'est dans cette optique que la présente étude tente d'explorer les différences qualitatives deans les résultats d'apprentissage en formation à distance. Particulièrement, cette étude analyse les points suivants relativement à trois cours de ce type offert par l'Université McGill et variant beaucoup quant au contenu et aux objectifs éducatifs: 1) La relations entre le context d'apprentissage, l'approche de l'étudiant envers l'appretissage et la différence qualitative dans les résultats d'apprentissage des étudiants. 2) L'analyse du contexte d'apprentissage du point de vue de l'étudiant et de celui de l'emseignant. 3) La relation entre le type de cours, les objectifs d'apprentissage fixés pour celui-ci, sa structure et sa conception, et les méthodes d'évaluation choisies. Cette étude fait appel à une combinaison de méthodes de collecte de données et d'analyse de natures qualitatives. Les données comportant des entrevues avec des enseignants, une mesure qualitative des attentes de ceux-ci envers leurs étudiants en ce qui touche

l'apprentissage pour le cours donné, les mesures qualitatives des mêmes attentes chez l'étudiant, de même que des mesures quantitatives sur l'approche générale et particulière des étudiants envers l'apprentissage, et leurs commentaires favorables ou défavorables sur le cours en question. Les résultats indiquent une forte corrélation positive entre une approche en profondeur envers l'appretissage et une impression positive du cours dans l'un des cours. Les résultats indiquent aussi que la note de l'étudiant est fortemant [correlated] d'une approche surface envers l'apprentissage dans l'un des cours. Il n'y a aucune corrélation entre la note de l'étudiant et une mesure qualitative des résultats d'apprentissage. Les résultats de cette étude supportent l'idée que des résultats d'apprentissage de haute qualité sont attendus pour les cours de formation à distance et que les étudiants peuvent réaliser des résultats d'apprentissage de haute qualité dans ce contexte.

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CHAPTER I

Introduction

The concept of excellence in higher education has been and continues to be inextricably linked to high quality student learning outcomes. In 1929 A.N. Whitehead described his view of the role of an institution of higher education:

The university imparts information, but it imparts it imaginatively. . . . This atmosphere of excitement, arising from imaginative consideration, transforms knowledge. A fact is no longer a bare fact: it is invested with all its possibilities. It is no longer a burden on the memory: it is energizing as the poet of our dreams, and as the architect of our purposes. (p.139)

Ramsden (1992) asserts that this concept has remained surprisingly unchanged throughout the years. Indeed, Ramsden cites more recent investigations of objectives for student learning in higher education that echo Whitehead's view (Entwistle, 1984; Hale, 1964; Knapper, 1990). Ramsden maintains that teachers in higher education do not ultimately evaluate the achievement of learning objectives in terms of the quantity of information students possess; rather, achievement of learning objectives are determined based on students' possession

of "self-critical awareness of what they do not know, and their readiness to find out more." (p.23)

Unfortunately, there seems to be a discrepancy between the outcomes of student learning as defined by the aims of higher education and the reality of what students in fact learn. "In other words, there is a gap between what lecturers say they want from their students and what students actually accomplish." (Ramsden 1992, p.17) Entwistle and Ramsden (1983) contend the general view held by lecturers is that the "good" student, the student who is able to examine a subject in depth and analyze it critically, is rare and that mediocre students abound. Entwistle and Ramsden cite interviews conducted by Percy with lecturers (Entwistle and Percy, 1971, 1974) that support this contention. Research examining the objectives of lecturers in higher education in relation to students' academic performance has led to the finding that greater emphasis should be placed on investigating student study processes and the environment in which student learning occurs.

In distance education, which is the context for this study, developing an understanding of the relationship between these variables may be even more complex because there is separation of student from instructor. Indeed, Keegan (1986) identifies the distinguishing characteristic of distance education as "the

quasi-permanent separation of teacher and learner throughout the length of the

learning process" (p.49). The purpose of the study described herein is to further

the understanding of the relationship between learning context, student study

processes and student learning outcomes in distance education. In the context of

this study, learning context is defined as everything touching on the teaching and

support environment in distance education courses. Student study processes are

defined as those variables related to student learning approach. Student learning

outcomes are defined in both qualitative terms, in relation to the levels of learning

student demonstrate in response to a qualitative measure, and quantitative terms,

in relation to the final grade that students' obtain in their course.

The theoretical basis of this study is drawn from three sources; Biggs'

(1979) theory of student learning, Ramsden's (1988) model of situational

influences on student learning, and Kember's (1989a, 1995) longitudinal-process

model of student drop-out in distance education. Each of these sources will be

described in detail below.

Biggs' (1979) theory of student learning has been proposed as a mechanism

for linking learning context and student learning processes to student learning

outcomes. Biggs theorized that student learning is composed of three stages which

he defines as input, process, and output. At the input stage, factors such as

curriculum, instructional design, and learning environment are considered. The process stage is concerned with the individual student's approach to selecting and learning from the input. Three dimensions of study process are distinguished by Biggs, utilizing, internalizing and achieving. Each dimension has a motivational and a cognitive component. The motivational components are described by Biggs as being those most commonly ascribed to students i.e., extrinsic, intrinsic and achievement. The cognitive components referred to by Biggs are surface level and deep level processing. The output stage refers to the subsequent quality and quantity of performance. Biggs views all of these variables as deeply interconnected.

Biggs (1979) has developed the Structure of the Observed Learning Outcome (SOLO) Taxonomy in order to provide a measure of learning quality. The SOLO consists of five levels of response that Biggs applies to learning the meaning of a finite display of information and making judgments about that information. In other words, Biggs uses the SOLO Taxonomy to assess learning quality at the task level. The five levels of response are considered to form a hierarchy of learning, with the possibility of transitional responses between levels. Responses to a learning situation are assessed in relation to their structural complexity. Trigwell and Prosser (1992) modified Biggs' categories of response in

order to assess learning at the course level and have determined that it is valid to use the SOLO at this level.

In relation to the second stage of Biggs' theory, the process stage, research conducted by Marton and Saljo (1976a, 1976b) is considered to be "the pioneering work in this area" (Kember and Harper, 1987a). This work led to the introduction of the concept of "approach to learning" or "the deep and surface approach dichotomy in learning". Students who employ a deep approach to learning search for meaning in written material, critically examine evidence presented in support of an argument, and relate evidence and arguments presented to their own personal knowledge and experience. In contrast, a surface approach is characterized by the rote learning of information.

In order to assess student approach to learning using quantitative measures, Ramsden and Entwistle developed the Approaches to Study Inventory (1981). The theoretical basis of the Approaches to Study Inventory stems primarily from the research conducted by Marton and Saljo (1976a, 1976b) and Biggs' (1979) theory of student learning. Harper and Kember (1986; Kember & Harper, 1987a, 1987b) have modified the Approaches to Study Inventory for use with distance education students and have determined that it is valid to use the

inventory and its associated theories of learning styles with distance education students.

Ramsden (1992) maintains that the way in which anyone goes about learning depends on the relationship between the person and the content being learned. An approach to learning, therefore, describes the relationship between the student and the learning the student is undertaking. Ramsden emphasizes that "an approach is not about learning facts versus learning concepts: it is about learning just the unrelated facts (or procedures) versus learning the facts in relation to the concepts." (p.45) Many research studies have demonstrated that the outcomes of student learning are closely associated with the approaches the student uses. A deep approach to learning has been found to be related to high quality learning outcomes and a surface approach is related to lower quality learning outcomes (Biggs, 1988; Entwistle and Ramsden, 1983; Marton and Saljo, 1984; Prosser and Millar, 1989; Trigwell and Prosser, 1992). Harper and Kember have examined the relationship between student approaches to learning in distance education and the outcome measures of persistence/drop-out and pass/fail (Harper and Kember, 1987b). Harper and Kember found that that for both distance and face-to-face students, the surface approach was the variable that discriminated at the highest level between persistence and withdrawal or failure.

According to Ramsden (1988), there is persuasive evidence of consistency in approach to learning over time and across tasks. However, Ramsden further contends that although stable, approaches to learning are not fixed and are responsive to variables in the teaching context. These variables in the teaching context refer to students' perceptions of the curricula, the teaching methods, and the methods of assessment. Studies have supported the view that there are common tendencies to adopt particular approaches based on the different demands of courses and students' previous educational experiences. "Variability in approaches thus coexists with consistency." (Ramsden, 1992, p.51)

Ramsden (1988, 1992) has proposed a model of situational influences on student learning. It emphasizes the role of the situation or learning context in students' adaptation of learning approaches. Students' perceptions of learning demands are seen as being partly a function of students' previous experience of learning, and partly a function of the characteristics of the present learning context. According to the model, the learning context is made up of three domains; teaching, assessment, and curriculum. The teaching domain refers to the method of transmitting the learning content. The method of evaluating what is learned constitutes the assessment domain, and the curriculum domain refers to the content and structure of what is learned. The model assumes that different

approaches to learning will be adaptive in different learning contexts. It is argued

that students will try to adapt to their perception of the learning expectations.

Ramsden stresses that striving to adapt does not necessarily indicate that

students' endeavors will be successful and, alternately, successful adaptation does

not necessarily imply that student learning will occur. However, Ramsden asserts

that in so far as the contextual domains are controlled by the teacher, the learning

environment can be structured in such a way as to maximize the likelihood that

students will adapt their learning approaches to conform with the teacher's

learning outcome goals. Ramsden cautions that his model is not complete: "the

way a student engages with the [learning] task is only partly explained by the

relationship between context and experience. A complete model would need to

include many diverse elements, such as chance, determination to succeed, and the

motivational factors..." (Ramsden, 1988, p.161)

Kember (1989a, 1995) has proposed a model of student drop-out from

distance education that incorporates the situational influences depicted in

Ramsden's (1988) model and includes the "many diverse elements" Ramsden cites

as necessary components of a complete model. Kember's model is based upon a

model developed by Tinto (1975) for traditional, face-to-face, higher education.

The Tinto model of drop-out from higher education is one of the most widely

cited and empirically tested (Bean, 1982). According to the Tinto model, the personal characteristics and past history of the student impact upon fundamental levels of commitment to the educational institution and to the goal of completion. These student factors and their corresponding levels of commitment are perceived to interact with the characteristics of the particular educational institution which together impact upon the student's level of integration into the academic and social structures of the institution. Academic and social integration of the student after enrollment is perceived to be most directly related to persistence. Kember has attempted to reorient the Tinto variables into a form more appropriate for distance education.

Kember (1989a, 1995) describes his model as a longitudinal-process model, and includes components relating the drop-out process to student background characteristics, goal commitment, the academic environment, and the social and work environment. In relation to the academic environment component, Kember explains that in distance education, students typically have little or no face-to-face contact with the teacher. The primary element in a distance education course is often a study package delivered through the mail. Therefore, in the context of Kember's model, everything touching on the teaching and support environment, including the study package, is included in the academic realm. Social and work

environment are assessed in relation to the degree in which the student can integrate the study process. Kember's model also includes a student cost/benefit analysis component. Kember (1989b) cites the linear nature of the model as a strength because it acknowledges the multi-variate nature of drop-out and allows for indirect influences on the drop-out process. The model also allows for the changing nature of the items constituting the components by including a recycling loop.

Based upon his model of student drop-out from distance education, Kember (1989a, 1989b, 1995) has developed the Distance Education Student Progress (DESP) inventory. The DESP inventory measures four dimensions of a distance education student's experience: emotional encouragement, external attribution, academic integration, and academic incompatibility. Kember defines academic integration as comprising all elements of a distance education course and all of the different aspects of contact, academic, administrative and social, between the distance education institution and the student. Academic integration is divided into a positive and negative track, with the negative track referred to as academic incompatibility. Academic integration and academic incompatibility each contain four subscales measuring student approach to learning, motivation, course evaluation, and language ability. Student approach to learning is measured using

four sub-scales of the Approaches to Studying Inventory (Ramsden & Entwistle, 1981), modified and validated for use with distance education students (Harper & Kember, 1986).

Kember (1989a, 1989b, 1995) defines measures of progress and drop-out using student Grade Point Average (GPA) as a measure of academic achievement and a ratio between course modules/courses attempted to those attempted as a measure of persistence. The final outcome measure is course completion versus drop-out.

The rationale for the present study has evolved from a critical review of current research and theory that examines the relationship between learning context, student study processes and student learning outcomes. Theories proposed by Biggs (1979) and Ramsden (1988, 1992) have emphasized the relationship between learning context, student learning processes and qualitative differences in student learning outcomes. Similarly, Kember's (1989a, 1989b, 1995) model of student drop-out from distance education relates student outcomes to learning context and student learning processes. However, the final outcome measure in the Kember model is persistence versus drop-out. Student "success" in distance education has traditionally emphasized persistence/attrition processes (Bernard and Amundsen, 1989; Billings, 1988; Kennedy and Powell,

1976; Sweet, 1986; Taylor et al., 1986). It has been argued that qualitative differences in student learning outcomes must also be included because the primary objective of higher education is to help students develop high quality learning.

The purpose of the present study is to therefore explore qualitative differences in student learning outcomes in distance education courses. Specifically, this study seeks to examine the following within the context of three distance education courses that vary widely in content and instructional goals: 1) the relationships between learning context, student approach to learning and qualitative differences in student learning outcomes; 2) the analysis of the learning context from the perspective of both student and instructor; and 3) the relationship between type of course, course learning expectations, course structure and design, and the selected method(s) of assessment.

CHAPTER II

Literature Review

Traditionally, student achievement has been defined in relation to the quantity of information students learn. However, it has been argued that if the aim of higher education is to produce high quality learning outcomes in its students, student achievement must also be measured in terms of qualitative differences in learning outcomes. The purpose of this literature review is to examine the progress of research towards specifying the conditions under which high quality student learning outcomes will be achieved in higher education. The application of this literature to distance education will also be examined.

This review includes studies that investigate any of a number of components and theories believed to be related to qualitative differences in student learning outcomes in higher education. Specifically, it is composed of three distinct categories of research: studies examining the relationship between student learning processes and qualitative differences in learning outcome; research exploring the relationship between instructional variables and student learning processes; and investigations of the relationship between learning context, student learning processes and qualitative differences in student learning outcomes.

As a result of the enormous range of research studies conducted in this area, it is beyond the scope of this review to include all of the studies examining each of the categories described above. Rather, the studies selected for review represent a sample of the research that incorporates the theoretical frameworks of Biggs (1979), Ramsden (1988; 1992) and Kember (1989a, 1989b, 1995). Wherever possible, criteria for study selection was contingent on the inclusion of a description of subjects, a methodology, and a presentation of results. However, in order to include a range of research, it was not always possible to meet the set criteria. Therefore, it is indicated when a specific study under review lacks the set criteria.

Studies Examining the Relationship Between Student Learning Processes and Qualitative Differences in Learning Outcome

Typically, studies examining the relationship between student learning processes and qualitative differences in learning outcome have focused on examining this relationship at the level of a specific learning task. Overall, the research conducted at the academic task level has established that a deep approach to learning is related to high quality learning outcomes and a surface approach is related to lower quality learning outcomes (Biggs and Collis, 1982a; Entwistle and Ramsden, 1983; Marton and Saljo, 1984; Prosser and Millar, 1989). High

quality and lower quality learning outcomes have typically been defined in relation

to the levels of learning described in taxonomies of learning.

Pioneering research in this area was conducted by Marton and Saljo

(1976a). The aim of their study was to recount the perspective of the learner in

relation to how a specific learning task, the reading of explicit academic articles, is

undertaken and to measure the learning outcomes in qualitative terms. Students

were asked to read passages within suggested time limits and were then asked

specific questions pertaining to the text and, in some instances, to explain what

the passage was about. Students were also given a series of open-ended questions

in order to evoke information regarding how the student approached the reading

process and they were asked specific questions designed to assess student

comprehension of the passage. Students' responses were recorded. The findings

of the research indicated that different students clearly learn different things from

one and the same text and variations in learning are in relation to _what_ is learned

rather than simply in terms of _how much_ is learned. Based on these findings,

Marton and Saljo identified a number of levels of learning outcomes that consisted

of fundamentally different conceptions of the content of the learning task.

Differences in levels of processing were also identified when students were asked

to describe their approach to learning and remembering. When student learning

outcomes were compared with student level of processing, processes and outcomes were found to correspond. According to Marton and Saljo, "the most important conclusion we draw from our research is that learning should be described in terms of its content." (p.10)

Most studies have focused on qualitative differences in learning outcomes at the task level. However, Trigwell and Prosser (1992) conducted a study that examined the relationship between approach to learning and outcomes at the course level. Subjects were 122 students enrolled in a first year nursing communications course. An adaptation of the Approaches to Study Inventory (Entwistle and Ramsden, 1983) was used to assess student preferred approach to learning. Learning outcomes were assessed using both qualitative and quantitative measures. Quantitative measures were student final grade in the course. Qualitative measures of learning outcome were assessed using an adapted version of Biggs' (1979) Structure of the Observed Learning Outcome (SOLO) Taxonomy. In their study, students were asked to respond to the following request:

Please describe what you think the content/subject matter of this course was about. (One way of doing this is to pretend you are telling a friend

the sorts of things you thought the lecturer was trying to teach you and wanted you to learn in this subject.)

Responses were assessed using the following categories of response:

1. *Uni-structural.* Those responses that focus on one issue/aspect of the course.

2. *Multi-structural.* Responses that describe or list some or all areas of study without linking them in any way.

3. *Probably Multi-structural.* Responses that have multi-structural elements but cannot with any certainty be described as multi-structural.

4. *Probably Relational.* Responses that exhibit some elements of relational but the elements are not expressed strongly enough to say with certainty that they are relational.

5. *Relational.* Responses that describe the course as a whole. The areas of study are described in such a way that the student appears to be seeing these areas as parts of a whole rather than as distinct parts.

The results supported that of previous research conducted at the task level. That is, positive relationships between a deep approach to study and higher quality learning outcomes were also found at the course level. There was an insignificant relationship between the surface approach variable and the qualitative

differences in learning variable. When factor analysis was performed on the data, it confirmed and extended the findings of the correlational analysis, with qualitative differences in learning outcomes more substantially related to qualitative approaches to learning than to quantitative measures of learning outcome. According to Trigwell and Prosser, "this suggests that this measure of qualitative differences in learning outcome may have more validity for research in student learning than measures of quantitative measures such as achievement." (p.272) Furthermore, the findings of the study indicate that student grades do not seem to be a reliable measure of learning quality. Based on the consistency of the results of their study to those conducted at the academic task level, Trigwell and Prosser contend that the SOLO is validly used at the course level.

Harper and Kember (1986) administered the Approaches to Studying Inventory (Ramsden and Entwistle, 1981) to a total of 779 distance and face-to-face students studying similar subjects at the Capricornia Institute and the Tasmanian College of Advanced Education in Australia. In addition to comparing the inventory scores of the two subgroups of the sample, the results were assessed by comparing the scores obtained in the present study to those of previous users of the inventory: 2208 students from 66 academic departments in British universities and polytechnic, 540 students from the Australian National

University, and 357 Open University students. Factor analysis of the distance

education student data indicated that the approaches to study of distance students

is not significantly different from that of face-to-face students. The first two

factors, the surface factor and meaning orientation factor, were identified for both

the distance students and total groups and these factors are similar to those found

by all known previous studies that have used the inventory. Based on these

results, the researchers concluded that it is valid to use the inventory and its

associated theories of learning styles with distance education students. In

addition, the similarity of the factor structure found for distance students to that

of the total group as well as to structures identified by previous users of the

inventory provide support for the view that the approach to study of distance

students is qualitatively similar to that of face-to-face students.

Kember and Harper (1987b) next examined the relationship between

learning approach and the outcome variables academic performance and

persistence in distance education and face-to-face students. In this study, the

distinction was made between academic performance and persistence based on the

possibility that categorizing withdrawals (a persistence variable) as failures (a

performance variable) could confound the relationship between process variables

and output variables. Face-to-face and distance student data were examined

separately because it was hypothesized that different variables would be related to persistence for the two groups. Discriminant analysis was performed on the data.

Separate analyses of performance were conducted. In order to obtain a measure of performance, the persisting students were split into two groups: students who received a passing grade and students who received a higher grade. Discriminant analysis was then used to distinguish between the two groups with regard to process variables. Face-to-face and distance students were examined separately. The analysis revealed that face-to-face students who achieved a grade better than a pass tended not to globetrot (over-readiness to jump to conclusions) or to fear failure and were inclined to be achievement-motivated and syllabus-free (do not rely on staff to define learning tasks). In contrast, distance students who achieved a grade better than a pass most importantly did not have negative attitudes to study, did not have a strategic approach (awareness of implications of academic demands made by staff) and were inclined to have organized study methods and to be syllabus-bound.

In relation to persistence, the results indicated that for both distance and face-to-face students, the surface approach was the variable that discriminated at the highest level between persistence and withdrawal or failure. Students who did

not use a surface approach were more likely to persist. Other variables measured by the inventory that significantly discriminated between persisters and non-persisters in distance education courses included syllabus-boundness (i.e. reliance on staff to define learning tasks) and fear of failure. The results also revealed that although individual variables in the inventory significantly discriminated between persisters and nonpersisters, the inventory as a whole cannot be used as a clear predictor of either persistence or performance.

Based on their results, Kember and Harper (1987b) suggested that persistence rates might be increased if students were re-oriented from a surface approach to studying to a deep approach. However, this suggestion is completely unfounded by their results. Although the results demonstrated that the surface approach variable discriminated at the highest level between persisters and nonpersisters, the deep approach variable itself was not a significant discriminating variable in their study. They further suggested that interventions should be aimed at adapting the course design and the learning environment in order to orient distance students towards a deep approach to study. Notwithstanding, the effects of input variables such as course design and learning environment were not factored into their study. Therefore, this suggestion is completely unsupported by their results.

Research Exploring the Relationship Between Instructional Variables and Student Learning Processes

A number of studies have been conducted that examine the influence of different instructional variables on the approach to study that students adopt. In addition to method of assessment (Marton and Saljo, 1976b; Ramsden and Entwistle, 1983) and academic departmental organization (Biggs, 1982; Entwistle and Ramsden, 1981), instructional variables such as contrasting subject specialisms (Entwistle and Ramsden, 1983), students' perceptions of teaching quality (Entwistle and Tait, 1990; Prosser and Trigwell, 1991; Ramsden, 1992; Trigwell and Prosser, 1991) and lecturers' conceptions of teaching (Gow and Kember, 1991) have also been found to influence the approach to learning that students will adopt.

Assessment demands. In a study conducted by Marton and Saljo (1976b), the researchers attempted to induce alternative levels of processing and levels of learning outcome through demand characteristics imposed on subjects. Forty first-term students served as paid subjects and were asked to read three chapters of text and to be prepared to answer some questions about the content. Subjects were divided into two groups with group participation determining the type of demand characteristic imposed. Demand characteristics were in the form of

questions the groups received after reading the first two chapters of text. One

group of subjects was given questions aimed at generating a surface approach to

learning while the other group was exposed to questions intended to induce a deep

approach. When the subjects had completed the reading task, both groups were

asked to recall and summarize the third chapter and to answer questions intended

to measure surface and deep level aspects of the text. Semi-structured interviews

were also carried out with the subjects. Marton and Saljo (1976b) found that

students adapted their approach to study based on their expectations of recall

demands. Students who habitually applied a deep approach to study were

induced to adopt a surface approach in the face of continuous excessively factual

questions. However, although habitual surface learners did adapt their approach

to study when confronted with deep demands, they did not adapt a deep

approach. These findings indicate that the criteria used for evaluating learning

exerts a significant influence on both learning processes and outcomes.

Academic departmental organization. Ramsden and Entwistle (1981)

examined the effects of academic departmental organization on students' approach

to study. Subjects were 2208 students representing 66 academic departments in

six disciplines from universities and polytechnics. Students were asked to

complete a modified form of the Approaches to Studying Inventory (Entwistle et

al., 1979), to provide information regarding student grades and honours specialism(s) as well as a self-rating of academic progress to date, and to provide their perceptions of honours department courses by responding to a course perceptions questionnaire. Factor analyses were conducted in order to determine the relationship between approaches to studying and course perceptions. Ramsden and Entwistle found that a deep approach to study was related to good teaching, freedom in learning, clear goals and standards, and less reliance on formal methods of instruction. Additional findings indicated that departments rated highly by students on good teaching and freedom in learning had students with higher average scores on deep approach to study and its related variables. Lastly, positive attitudes to study and a deep approach were linked to students' self-ratings of academic progress.

Contrasting Subject Specialisms. With the data collected from subjects who participated in the Academic departmental organization research, Entwistle and Ramsden (1983) examined student approach to learning in the contrasting subject specialisms of Science, Social Science and Arts. Based on previous research, it was expected that comprehension learning, associated with a deep approach to learning, would be found to be more common in the Arts and Social Science disciplines than in the Sciences. Conversely, it was expected that

operation learning, associated with a surface approach to study, would be more common in the Sciences. Based on the data collected with the Approaches to Studying Inventory (Entwistle et al., 1979), Entwistle and Ramsden examined relationships between sub-scale scores and subject specialism using analysis of variance. The findings indicated that operation learning and comprehension learning are associated with the different subject specialisms in the expected way. In addition, a deep approach to study was found to be most common in the Arts and Social Science disciplines. However, Entwistle and Ramsden stressed that even when the effects of subject specialism and discipline are large and significant, there are still considerable differences between the individual departments.

Students' perceptions of teaching quality. In relation to students' perceptions of teaching quality, studies have examined student perceptions using teaching evaluation questionnaires (Prosser and Trigwell, 1991; Trigwell and Prosser, 1991a), questionnaires tapping students' preferences for contrasting aspects of their perceived academic environment such as types of lecturing, examining, and courses (Entwistle and Tait, 1990), and questionnaires specifically designed to provide an indicator of student perceptions of their learning environment over their whole academic program (Trigwell and Prosser, 1991b).

Entwistle and Tait (1990) conducted two studies in order to explore the relationships between approaches to learning, evaluations of teaching, and perceptions of the academic environment. In the first study, Entwistle and Tait asked traditional students to complete a questionnaire consisting of scales from the Approaches to Studying Inventory together with a range of items describing evaluations of various aspects of students' academic environments. Measures of academic performance were also obtained based on a student self-rating of academic progress and on the average of the grades obtained by the student across all courses at the end of their first year. The sample consisted of 431 first-year students enrolled in electrical engineering courses in two universities and three polytechnics. Among the findings of the first study was the association between the perception of a course having a demanding workload with the reproducing and non-academic orientation. This finding is supported by earlier research by Entwistle and Ramsden (1983) who found a linkage between a surface approach and a heavy workload or perceived time pressure. Another key finding of Entwistle and Tait's first study was a lack of a connection between good teaching and approach to studying. This lack of a connection was also found in Entwistle and Ramsden's (1983) research.

In a second study conducted by Entwistle and Tait (1990), students were asked to express a preference for contrasting aspects of their perceived academic environments. A new questionnaire was developed that incorporated those items found in the first study to most strongly define the study orientations, study habits and methods, and the general factors relating to evaluations of the academic environment, and new items relating to preferences. This new questionnaire was given to a sample of 271 first-year students from engineering and psychology. The response rate for the second study was 60 per cent. The results of the second study indicated that students who adopt deep approaches to studying show a clear preference for an environment which is likely to encourage understanding, while students with a surface approach prefer an environment that promotes rote learning. Entwistle and Tait (1990, second study) cautioned that good teaching in higher education is typically defined in terms of factors that encourage understanding. However, based on the findings of the second study, it seems likely that students who are oriented towards a surface approach to study do not define good teaching in this manner. Therefore, it seems that the criteria they use to evaluate teaching quality will be considerably different from that of students who are oriented towards a deep approach to study.

Ropo (1993) examined the relationship between student approaches to learning and their evaluative perceptions of the instructional context. The sample consisted of 181 students largely from the department of engineering (n=165) with the remainder from the department of architecture. Students completed a questionnaire consisting of questions from the Approaches to Studying Inventory, questions relating to other aspects of studying such as cooperation and social climate between students, and questions relating to perceptions of teaching. Student teaching perceptions were also measured using open-ended questions. Additionally, thirty students were interviewed about their perceptions of teaching and studying at the university. Comparisons were made between three subgroups of students: experienced and inexperienced students (more than/less than five years as a student); efficient and inefficient learners (determined according to the number of credits obtained per year); and full-time and part-time students. Results were summarized into three conclusions. First, the results seemed to support the view that approaches to studying are relatively independent of the students' perceptions of teaching. These results support those of Entwistle and Tait (1990, first study) and Entwistle and Ramsden (1983) who found a lack of a connection between good teaching and approach to studying. According to Ropo, the results of his study "may be interpreted to indicate that satisfaction or

dissatisfaction with teaching depends on how well the student's life situation or conditions for studying fit together with experienced instruction in supporting the acquisition of the student's goal."(p.126) Secondly, results between experienced and inexperienced students indicate that long-term dissatisfaction with teaching decreases students' comprehension orientation, associated with a deep approach, to study. Lastly, the results indicated that the processes between instructional context, perception of teaching and approach to learning are related to students' experience as students, to their efficiency as students (as defined in the present study), and to their full-time versus part-time status.

Eley (1992) has criticized studies, such as those conducted by Entwistle and Tait (1990, first study) and Entwistle and Ramsden (1983), that compare relatively large but separate samples of students taking different courses. According to Eley, the researchers make within-student inferences based on between student findings: "The findings...are usually that students studying within different complexes of course requirements report different mixes of study approaches, and that the approaches reported are systematically related to the between-group differences in the perceived course requirements." (p.232) Eley asserts "that two different students each in a different teaching contexts are found to have adopted different study approaches does not necessarily imply that if

they swapped contexts they would also swap study approaches." (p.233) He

further contends that "by themselves such between-student comparisons cannot

logically distinguish an association between study approaches and teaching

contexts from one between students and teaching contexts." (p.233)

Lecturers' conceptions of teaching. Lecturers' conceptions of teaching and

their subsequent approaches to teaching have also been addressed in the literature.

Trigwell, Prosser and Taylor (1994) explored the intentions associated with

lecturers' teaching approach. Their findings indicated that logical relationships

exist between teaching approach and intention with five qualitatively different

approaches to teaching. Approaches ranged from a teacher-focused approach

with the intention of transmitting information to a student-focused approach

aimed at students changing their conceptions. In a later study conducted by

Trigwell and Prosser (1996), strong relations were found between conceptions of

teaching and teaching approach. Relations between conceptions of teaching and

learning were less strong; however, lecturers with highly evolved conceptions of

teaching differentiated between teaching and learning in substantially different

ways than lecturers with less highly-evolved conceptions. Although no causal

relationships between lecturers' teaching approach and student approach to

learning were proposed by Trigwell and Prosser, the researchers did question whether such a relationship does indeed exist.

Gow and Kember (1993) conducted a study in which they examined the relationship between teaching orientation and the quality of student learning. In order to investigate lecturer's views of teaching and learning, researchers conducted semi-structured interviews with 39 lecturers at a polytechnic in Hong Kong. Lecturers were randomly selected from the entire academic staff of approximately 1200 people. The sample was determined to be adequately representative of the range of specialisms offered by the polytechnic and included a range of level of appointment.

Based on the semi-structured interviews, Gow and Kember (1993) established a number of constructs related to teaching conceptions. A trial questionnaire was developed based on these constructs. Results of the trial questionnaire were analyzed and necessary revisions were made. The revised questionnaire was administered to fifteen departments, representing a wide variety of academic disciplines, from two institutions. The response rate was 29.7 per cent; however, no bias was detected when the characteristics of the responders were compared with those of the sample of the fifteen departments.

The revised questionnaire revealed two teaching conceptions which were defined as "learning facilitation" and "knowledge transmission". Lecturers who held teaching conceptions defined as learning facilitation were characterized as those who conceive of teaching as a facilitative process to help students develop problem solving skills and critical thinking abilities. They conceive that their role is to provide motivation, to stimulate interest and to encourage interactive class sessions. In contrast, lecturers who view teaching as the transmission of knowledge focus more on the subject than on the learning. The lecturer is conceived to be a subject matter expert, and teaching involves the accurate and clear presentation of that subject matter.

The relationship between teaching conceptions and the quality of student learning was then examined. Students from the same fifteen departments were asked to complete Biggs' Study Process Questionnaire (SPQ) and over 3000 SPQ scores were obtained. Correlations were obtained between the conceptions of teaching scales and final and change SPQ scores by department. The results indicated that learning facilitation has a significant negative correlation with the final surface approach scores. Knowledge transmission has a significant negative correlation with both final and change in deep approach scores.

The researchers (1993) found that in departments where the predominant orientation to teaching is knowledge transmission, students' use of a deep approach to learning tends to decline through the period of the course of study. Conversely, departments who hold a learning facilitation orientation to teaching tend to discourage the use of a surface approach to learning. Put in context with the body of research examining the effect of teaching method, learning tasks, assessment demands, and workloads on student approach to learning, Gow and Kember suggest that these factors are strongly influenced by teaching orientation. Furthermore, teaching orientation affects the curriculum design, the method of teaching, and the learning tasks assigned. Alternately, these factors influence student learning approach. The researchers concluded that in order for students to adopt meaningful approaches to learning, initial attention should be focused on lecturers' conception of teaching.

Investigations of the Relationships Between Learning Context, Student Learning Processes and Qualitative Differences in Student Learning Outcomes

The research presented thus far can be classified into two basic categories; studies examining the relationship between student learning processes and student learning outcomes, and studies investigating the relationship between learning context/environment and the approach to learning that students adopt. To date,

very little research has explored the relationship between all three (Trigwell and Prosser, 1991).

Boulton-Lewis (1994) compared conceptualizations of learning held by 869 students and their 21 lecturers in 12 courses representing 5 university faculties. Students and instructors were asked to write approximately one page describing their beliefs about learning with the aid of a prompt. Their responses were analyzed based on Biggs' (1979) Structure of the Observed Learning Outcome (SOLO) Taxonomy (described in detail in the Introduction). Lecturers SOLO levels and their descriptions of student learning were compared with those of the students. In addition, students' approach to learning was assessed using Biggs' (1987) Study Process Questionnaire. Relationships between approach to learning and student SOLO level were then examined. The results indicated that across all disciplines and courses, the majority of both students and lecturers were at the multistructural SOLO level in relation to their beliefs about learning. This indicates that for the majority of students and instructors, descriptions of their beliefs about learning were selective and undeveloped. However, there was a larger proportion of lecturers whose beliefs about learning were determined to be at the relational level. At the relational level, most or all of the relevant items are included in relation to a belief. Conflicting information is addressed and discussed

in terms of a relating concept inherent to the context, and a resolution is found.

According to the researcher, the fact that the majority of both student and lecturer responses were at the multi-structural level indicates that generally they can describe some or many of the relevant aspects of the learning process. However, they have not yet "organized the information sufficiently to view it as an overarching structure that they can apply selectively to different aspects of learning or teaching." (p.400) Boulton-Lewis (1994) also found that there was no strong relationship between increasing year/level of course and increasing knowledge of the learning process as assesses by the SOLO. A significant relationship was found between approach to learning and SOLO level with increase in deep approach related to increase in SOLO levels. Tukey post hoc analyses revealed significant differences for deep approach between the uni-structural and relational SOLO levels. When the content of student responses to the SOLO taxonomy was assessed randomly, it was found that the majority of students define learning quantitatively in terms of increasing knowledge. Based on these findings, Boulton-Lewis asserts that "current teaching and assessment methods are having little positive effect on students' knowledge of the learning process and on their approach to learning." (p.400)

Trigwell and Prosser (1991a) conducted a study in which they examined

student evaluations of their learning environment, student approach to learning,

and both quantitative and qualitative differences in student learning outcomes.

The sample consisted of 143 students who were enrolled in the same first year

nursing communications course. Students were broken down into eleven groups

with eleven different teachers and the course was taught over a period of fourteen

weeks. Quantitative differences in student learning outcome were based on course

grade while qualitative differences were assessed using a modified form of Biggs'

(1979) Structure of the Observed Learning Outcome (SOLO) Taxonomy. The

SOLO taxonomy was adapted by Trigwell and Prosser (1992) in order to measure

qualitative differences in learning outcomes at the course level. (See Trigwell and

Prosser (1992) cited under the heading Studies Examining the Relationship

Between Student Learning Processes and Qualitative Differences in Learning

Outcome for a more detailed description.) Student approaches to learning were

measured using sub-scales from Entwistle and Ramsden's (1983) Approaches to

Study Inventory. Student evaluations of their learning environment were based on

responses to an adapted form of a teaching and course evaluation questionnaire

developed by Moses (1986).

Factor analysis of learning approach, learning outcome and evaluations of the learning environment were performed and the three factors were found to explain a total of 57% of the variance. A deep approach to learning was found to be associated with positive student evaluations of the learning environment. These results conflict with those of Entwistle and Tait (1990, first study) who found a lack of a connection between good teaching and approach to studying. A deep approach was also found to be linked with qualitative differences in learning outcome. This supports the findings of a study conducted by Trigwell and Prosser (1992) in which the researchers found substantial and significant relationships between the deep approach to study variable and the qualitative differences in learning variable at the course level. Quantitative differences in learning outcomes were linked to a surface approach to learning and to elements of the learning environment suggesting that subject relevance, opportunities to ask questions, and clear assessment criteria may help a student who adopts a surface approach to achieve good assessment results. Citing previous research on the influence of assessment on approach to learning, Trigwell and Prosser assert that "in an environment where assessment encourages a surface approach, subject relevance, chances to ask questions, and clear assessment criteria may simply enhance the effectiveness of the surface approach." (p.257) It should also be

noted that no relationships were found between qualitative differences in learning outcome and evaluations of the learning environment.

Prosser and Trigwell (1991) conducted between-class and within-course examinations of the data obtained in Trigwell and Prosser (1991a). According to Prosser and Trigwell, while the within-course results provide indications of whether individual students who rate the teaching and course more highly also adopt deeper approaches to study and achieve higher quality learning outcomes, the between-class methodology contributes to the validity of student ratings for summative purposes. "The between-class methodology shows whether those teachers and courses with higher ratings also had students who adopted deeper approaches to their studies and had higher quality learning outcomes." (p.295)

In relation to the between-class analysis, Pearson correlation coefficients were conducted between the class means of student ratings of teaching and courses, prior academic ability, approaches to learning, and qualitative and quantitative learning outcomes. The results of the between-class analysis suggested that, generally, in those classes where the teaching and course received a higher rating, the students had adopted deeper approaches to their learning and had attained higher quality learning outcomes. The findings also indicated that for the course under investigation, quantitative measures of learning outcome, student

grades, might not be an accurate measure of validity for student evaluation of

teaching. According to Prosser and Trigwell (1991) the results indicate that in

terms of how students approach their learning, the validity of ratings of courses is

confirmed and the ratings of teaching are supported. In addition, the results

confirmed the validity of student ratings of teaching and courses for summative

purposes in terms of the quality of learning outcomes.

In relation to the within-course analysis, the data was assessed using factor

analysis. Factor analysis explained 53% of the variance. The first factor had high

loadings on the deep/relating ideas approach to learning and the qualitative

differences in learning outcome variable. This suggests that a deep approach to

learning is related to the qualitative differences in learning outcomes. The second

factor had high loadings on student evaluations of teaching and course variables.

The third factor had high positive loadings on prior academic ability and the

quantitative differences in learning outcomes variable, a small positive loading on

the qualitative differences in learning outcomes variable, and a small negative

loading on the surface approach to learning variable. This suggests that a surface

approach to learning is negatively related to prior academic ability and both

learning outcomes. Overall, the three factors suggest that within the course, using

the individual student as the unit of analysis, the ratings of neither the teaching nor

the course were related to prior academic ability, approach to learning, or learning

outcome. "Thus there is no evidence to suggest that individual students who

adopted deeper approaches to study or had better learning outcomes rated the

teaching or the course higher." (p.300) In their discussion of the study, Prosser

and Trigwell (1991) state:

> While we have interpreted the results as offering support for the validity
>
> of student ratings of teaching and courses, an alternative interpretation
>
> exists. Students who enter the course with a particular orientation to
>
> learning may automatically structure their studies according to those
>
> orientations and then rate the course and teaching in ways related to those
>
> orientations. Further research using an orientation to study pretest would
>
> be required to test this hypothesis.(p.301)

In a second study conducted by Trigwell and Prosser (1991b), the

researchers focused on student perceptions, as opposed to student evaluations, of

their learning environment. It was hoped that by making perceptions the focal

point of the study, it would be possible to establish a relationship between

perceptions of the learning environment and the quality of student learning

outcomes. Overall, the second study examined perceptions of the learning

environment its relationship to student learning approaches and qualitative

differences in student learning outcomes. Student perceptions of their learning environment were assessed using the Course Experience Questionnaire developed by Ramsden (1991) to assess student perceptions of their learning environment over their whole academic program. The questionnaire contains five sub-scales: Good Teaching, Clear Goals, Appropriate Workload, Appropriate Assessment, and Emphasis on Independence. Student approaches to learning were measured using sub-scales from Entwistle and Ramsden's (1983) Approaches to Study Inventory. The SOLO Taxonomy, adapted by Trigwell and Prosser (1992), was used to measure qualitative differences in student learning outcomes at the course level. Subjects in this study were 55 students in the final year of a three year nursing course.

Factor analysis of course perceptions, approach to learning and qualitative differences in learning outcomes were performed and two factors were found to explain 60% of the variance. The first factor indicated a high negative loading on the Surface Approach and positive loadings on two variables related to student perceptions of their learning environment; a high positive loading on the Workload/Assessment variable and a moderately high positive loading on the Good Teaching/Clear Goals/Independence variable. According to Trigwell and Prosser (1991b), this suggests that the perception of a heavy workload, and

assessment aimed at rote recall is associated with students adopting a surface

approach and this finding is supported by previous research. The second factor

indicated a high positive loading on the Deep Approach/Relating Ideas variable,

the variable Good Teaching/Clear Goals/Independence, and the qualitative

differences in learning variable. This factor suggests that students who perceive

that the teaching was good, that there were clear goals and some independence in

learning also adopted a deep approach to learning and had higher quality learning

outcomes. The results supported the existence of a relationship between student

perceptions of their learning environment, their approaches to learning and

qualitative differences in learning outcomes. The finding that learning approach is

related to student perceptions of the learning environment is supported by

Entwistle and Tait (1990, second study) who found that students who adopt deep

approaches to studying show a clear preference for an environment which is likely

to encourage understanding, while students with a surface approach prefer an

environment that promotes rote learning.

In their discussion of implications for future research, Trigwell and Prosser

(1991b) suggested that "future research may well focus on the effects of different

contexts (with substantial descriptions of the contexts) [sic], and not just on

perceptions and evaluations of such contexts." (p.263) Trigwell and Prosser also

maintain that "in future research, it is this set of relations between approaches, perceptions and *outcomes* [sic] which we believe is most important for practice and requires substantially more research." (p.263)

Kember's (1989a, 1989b, 1995) theoretical model of student drop-out from distance education relates student outcomes to learning context and student learning processes. Kember, Lai, Murphy, Siaw, & Yuen (1992) used the DESP inventory to test Kember's model with a sample of 1060 Hong Kong distance education students enrolled in four distance learning courses. (Kember's model and the DESP inventory are described in the Introduction.) Kember et al. attempted to link the scales of the DESP together into a path model. Background characteristics were the starting point of the path model, with the four main scales, social integration, external attribution, academic integration, and academic incompatibility, considered as intervening variables. Progress criteria, used to indicate completion or drop-out, were the resulting outcome measures. The results indicated that the path model showed a good fit with the theoretical model. The path model suggested that student background characteristics influence the social and academic integration variables, which alternately relate to the progress variables.

Background characteristics were found to correlate with the intervening

variables. According to Kember et al (1992), this implies that the way a student

attempts to adapt to study is strongly influenced by the pre-entry characteristics,

experiences and social patterns of the student. However, the path model also

suggested that between entry and outcome, the distance education student goes

through processes of development and adaptation. The intervening variables in

the path model attempt to describe and measure influences of social integration,

external attribution, academic integration, and academic incompatibility on student

progress. The path model indicated that entry characteristics influence the degree

of social integration and, alternately, the extent of academic accommodation.

According to the path model, external attribution and academic incompatibility

lead to lower GPA and an increased potential of drop-out.

Kember et al (1992) found that the academic accommodation factor was

not related by a significant path to either GPA or drop-out ratio. The Academic

accommodation refers to such things as positive course evaluation, intrinsic

motivation and deep approach to study. This finding supports those of Kember

and Harper (1987) who found that surface approach was the Approach to

Studying Inventory variable that best discriminated between students who

persisted in their courses and non-persisters, but deep approach scores did not

distinguish better performance. In a study conducted by Gow and Kember (1990) findings indicated that deep approach scores declined through the course of study or were lower in final year of study compared to initial scores. According to Kember et al , these concurring results may be interpreted as the lack of an assessment process in higher education that encourages and tests for those learning qualities epitomized in the deep approach and intrinsic motivation subscales of the Approaches to Study Inventory.

Roberts, Boyton, Buete, and Dawson (1991) have applied Kember's (1989) model to distance education at Charles Sturt University-Riverina. The Kember model was "used to provide a theoretical framework around which to conduct the study (p.61)." For the purpose of their study, the seven components comprising the Kember model were reduced to five; background characteristics, goal commitment, academic environment and integration, social and work environment and integration, and cost/benefit analysis. The researchers conducted semi-structured interviews with thirty-six students enrolled in two subjects. The researchers cautioned that the sample could not be considered representative of the total population of distance students due to the size of the sample and the fact that it was drawn from only two courses.

Interviews were based on a questionnaire developed by Kember and consisted of forty-three items. Items were broken down into five groups corresponding to the five major components of the Kember model. The results of these interviews indicated that of the thirty-six students, seven students stated that they studied only to pass assignments and another seven stated that they study only to pass assignments and exams when they have time constraints and when they find the subject uninteresting. Roberts, Boyton, Buete, and Dawson (1991) found that although a number of students in the sample may be resorting to surface learning techniques, their incentives for doing so may differ. The interviews revealed that a number of factors either individually or collectively contributed to the application of a surface approach to learning. These factors were time constraints, the form of assessment demanded, and a lack of relevance/interest of subject materials.

Roberts, Boyton, Buete, and Dawson (1991) found that the Kember model provided an appropriate and practical theoretical framework for their investigation. "The plethora of interacting factors likely to influence external students to continue or abandon their studies is all encapsulated in one or more of Kember's major components (p.82)." The researchers also emphasized that in their study, the Kember model was used to examine student progress, and that the

description of the model as a model of drop-out is limiting. They further suggest that there is tremendous potential for the model to be used as a tool in the area of student counseling. Lastly, it was concluded that "Kember's linear-process model of progress and attrition has enormous potential for researchers and counselors in the field of distance education (p.83)."

Putting It All Together

The purpose of this literature review was to examine the progress of research towards determining the relationship between learning context, student approach to learning, and qualitative differences in student learning outcomes. A review of the literature in this area has determined that research examining qualitative differences in student learning outcomes can be classified into two basic categories; studies examining the relationship between student learning processes and student learning outcomes, and studies investigating the relationship between learning context and the approach to learning that students adopt. Very little research to date has examined the relationship between all three variables. In their discussion of implications for future research in the area of higher education, Trigwell and Prosser (1991b) asserted that "in future research, it is this set of relations between approaches, perceptions [of the student learning context] and

outcomes [sic] which we believe is most important for practice and requires substantially more research." (p.263)

In relation to research in the area of distance education, the bulk of studies examining student success have focused on the effects of student (Hough, 1984; Rekkedal, 1983; Thompson and Knox, 1987; Woodley and Parlett, 1983) and institutional variables (Rekkedal, 1983; Scales, 1984) as opposed to learning context and high quality learning outcomes (Bernard and Amundsen, 1989; Cookson, 1989). Persistence/attrition rates have been examined as the most significant measure of success for the independent variable(s) under investigation (Rekkedal, 1983). Research conducted by Kember, Lai, Murphy, Siaw, & Yuen (1992) has incorporated components related to learning context in the distance education context. However, qualitative differences in student learning outcomes in distance education have not been addressed in this research

The present study examines the relationship between learning context, student approach to learning and student learning outcomes in distance education. Learning context and student approach to learning in their distance education courses will be assessed with Kember's (1989a, 1989b, 1995) Distance Education Student Progress (DESP) inventory. In order to measure qualitative differences in learning outcomes at the course level, the Trigwell and Prosser (1992) adapted

version of Biggs' (1979) Structure of the Observed Learning Outcome (SOLO)

Taxonomy will be used. Moreover, in order to test the hypothesis proposed by

Prosser and Trigwell (1991) that "students who enter the course with a particular

orientation to learning may automatically structure their studies according to those

orientations and then rate the course and teaching in ways related to those

orientations."(p.301), an approach to learning pretest will be used as

recommended by Prosser and Trigwell. This pretest will be a slightly modified

form of the Ramsden and Entwistle (1981) Approaches to Study Inventory

modified and validated for use in distance education by Harper and Kember

(1986).

Lastly, research findings have indicated that examination of lecturer's

conceptions of teaching and learning is warranted. Results of research conducted

by Gow and Kember (1993) examining the relationship between teaching

orientation and the quality of student learning indicate that in order for students to

adopt meaningful approaches to learning, initial attention should be focused on

lecturers' conception of teaching. As well, the results of a study comparing

conceptualizations of learning held by students and their lecturers led Boulton-

Lewis (1994) to assert that "current teaching and assessment methods are having

little positive effect on students' knowledge of the learning process and on their

approach to learning." (p.400) Therefore, in addition to examining student

perceptions of the learning context, the present study will also explore the student

learning expectations held by instructors in relation to their course as well as the

possible relationships between course learning expectations, course structure and

design, and the selected method(s) of assessment. Instructors' student learning

expectations will be assessed using the SOLO Taxonomy.

CHAPTER III

Methodology

The present study is an investigation of the relationships between learning

context, student approach to learning and student learning outcomes. In this

study, the learning context is defined according to the academic environment

component of Kember's (1989a, 1995) longitudinal-process model of drop-out

from distance education. In relation to the academic environment component,

Kember explains that in distance education, students typically have little or no

face-to-face contact with the teacher. The primary element in a distance education

course is often a study package delivered through the mail. Therefore, in the

context of Kember's model, everything touching on the teaching and support

environment, including the study package, is included under the academic

environment component.

Student approach to learning is defined according to research conducted by

Marton and Saljo (1976a, 1976b). Marton and Saljo identified a number of levels

of learning outcomes that consisted of fundamentally different conceptions of the

content of the learning task. Corresponding differences in levels of processing

were also identified. These findings led to the introduction of the concept of "approach to learning" or "the deep and surface approach dichotomy in learning". Students who employ a deep approach to learning search for meaning in written material, critically examine evidence presented in support of an argument, and relate evidence and arguments presented to their own personal knowledge and experience. In contrast, a surface approach is characterized by the rote learning of information.

Student learning outcomes are defined in both quantitative and qualitative terms in the present study. Student grades in their course constitute a quantitative measure of learning outcome. Qualitative learning outcomes were assessed using the Trigwell and Prosser (1992) adapted version of Biggs' (1979) Structure of the Observed Learning Outcome (SOLO) Taxonomy. Responses to a question asking students to describe what they think the content/subject matter of their distance education course was about are assessed in relation to their structural complexity. The SOLO consists of five levels of response that are considered to form a hierarchy of learning, with the possibility of transitional responses between levels.

This study also explores conceptions of learning held by instructors, their possible influence on instructional design and method of assessment, and, in turn,

the relationship between these factors and student learning approach. Instructors'

conceptions of learning were assessed using the SOLO Taxonomy.

Sample

Distance education students

The sample for this study consisted of students enrolled in one of three

specific courses offered by McGill University's Distance Education Programme.

This programme is designed to provide teachers with professional development

courses. The programme recognizes that there are teachers who live too far away

to attend on-campus courses or who prefer to study at a distance for a variety of

reasons. Courses within the distance education programme are also available for

credit to McGill University's on-campus students in the Education program.

Students were selected to participate in the present study based on their

enrollment in specific distance education courses: Effective Written

Communication, Introduction to Logo, and Learning and Behavioral Problems in

Children. These courses are traditional distance education courses in the sense

that there is separation of student from instructor. The courses are print-based

and materials are mailed to individual students.

Those students included in the sample were enrolled in one of the three

courses held during the Fall session, September to December, of 1992. Students

were asked to complete questionnaires two times during the Fall session; at the beginning of their course and just prior to course completion. Only those students who completed both questionnaires (N=30) were included in the study. The return rate of both questionnaires was 61% (30 out of 49). This corresponds to a breakdown by course of 60% (9 out of 15) for Introduction to Logo; 85% (11 out of 14) for Learning & Behavioral Problems in Children; and 50% (10 out of 20) for Effective Written Communication.

Course Instructors

Each of the three course instructors were also responsible for the development of their respective courses as well as the teaching of them. Instructors were interviewed individually in the Winter session, January to May, of 1992. These specific courses were selected because they vary widely in content. A brief description of each course, based on interviews with the course instructors/developers, is provided below:

Effective Written Communication. An interactive writing program where the basic principle is that the student must create a writing workshop in their own environment. They must create this workshop among their peers and go through the writing process together and share their brainstorming, their organization, the

first draft, their goals and their purpose for writing. This course is self-directed and structured around the individual's needs.

Introduction to Logo. In this course, students are the programmers learning the basics of Logo programming and how to put it together to create things. The goal of this course is for students to be able to manipulate what they have learned with Logo in order to create tools that are useful to them.

Learning and Behavioral Problems in Children. This course is about the learning and behavioral difficulties that exceptional children experience. The course goes through the entire range of exceptionality and looks at teaching strategies, curriculum adjustments and tools that are used with these children.

Materials

Instruments

Distance Learning Pre-Questionnaire. (See Appendix A) The Pre-Questionnaire was used to assess students' *general* approach to learning and was administered to students at the beginning of their course. General approach to learning refers to students' typical study orientation. The Pre-Questionnaire was made up of subscales from the Distance Education Student Progress (DESP) inventory (Kember, Murphy, Siaw, & Yuen, 1991). The entire DESP inventory measures four dimensions of a distance education student's experience: emotional

encouragement, external attribution, academic integration, and academic incompatibility. Academic integration comprises all elements of a distance education course and all of the different aspects of contact (i.e. academic, administrative and social) between the distance education institution and the student. Academic integration and academic incompatibility each contain four subscales measuring student approach to learning, motivation, course evaluation, and language ability.

There have been two main versions of the DESP inventory. The original version was tested using four distance education courses (Kember, Murphy, Siaw, & Yuen, 1991; Kember, Lai, Murphy, Siaw, & Yuen, 1992) and was later modified based on the findings of this research. The revised version contains the same subscales and scales as the original version, but changes have been made to the items that constitute the subscales. These changes were largely related to improving the reliability of the subscales. This was accomplished by increasing the number of items within the subscales. The revised version has been tested and results indicate that the path model from the revised version substantially replicates that of the original (Kember, 1995).

The Pre-Questionnaire, as explained above, is composed of the subscales in the DESP that measure student approach to learning. These particular

subscales originate with the Approach to Study Inventory (Ramsden & Entwistle, 1981), modified and validated for use with distance education students by Harper & Kember (1986). Subscales were modified slightly in the present study in order to obtain measures of both general and specific approach to learning.

For the Pre-Questionnaire, students were asked to respond to 29 questions and were given the following instructions: "Please circle the number that best describes your attitude towards each statement. Answer every question. Please do not leave any blank." Responses were selected based on a Likert scale ranging from 1, "Definitely Agree" to 4, "Definitely Disagree" with 5, "Don't Know" and 6, "Not Applicable". In addition to these questions, students were also asked, "How long has it been since you have taken a higher-education level course?" and if they had "Any Comments?".

Distance Learning Post-Questionnaire. (See Appendix B) A Post-Questionnaire package was mailed to students just prior to the completion of their course. It included the same subscales measuring approach to learning in the Pre-Questionnaire; however, the Post-Questionnaire package contained additional measures to assess learning context and learning outcome variables specific to distance education courses. Additional measures included: the other subscales comprising the Distance Education Student Progress (DESP) Inventory (Kember,

Murphy, Siaw, & Yuen, 1991) with the exception of the enrollment

encouragement and English ability subscales, the Structure of the Observed

Learning Outcome (SOLO) Taxonomy (Biggs 1979; Trigwell and Prosser, 1992),

and Bloom's Taxonomy (Bloom, 1977). A description of each of the measures

contained in the Post-Questionnaire package is presented below.

Distance Education Student Progress (DESP) Inventory. All of the sub-

scales, with the exception of the enrollment encouragement and English ability

sub-scales, comprising the DESP inventory were included in the Post-

Questionnaire package. The enrollment encouragement subscale was excluded

because in the context of the present study, the study participants were teachers

who enrolled in courses to upgrade skills or students who enrolled in courses to

meet program requirements. The English ability subscale was excluded since it

was designed for students studying in Hong Kong. Student responses to the

DESP were in the form of a Likert scale ranging from 1, "Definitely Agree" to 4,

"Definitely Disagree" with 5, "Don't Know" and 6, "Not Applicable". The scales

included in the DESP were used in order to provide measures of student academic

accommodation and incompatibility, emotional encouragement, and external

attribution.

Structure of the Observed Learning Outcome (SOLO). The SOLO Taxonomy was

developed by Biggs (1979) in order to provide a measure of learning quality. The SOLO

consists of five levels of response that Biggs applies to learning the meaning of a finite

display of information and making judgments about that information. In other words,

Biggs used the SOLO Taxonomy in order to assess learning quality at the task level. The

five levels are considered to form a hierarchy of learning, with the possibility of

transitional responses between levels. Responses to a learning situation are assessed in

relation to their structural complexity.

Trigwell and Prosser (1992) have modified Biggs' categories of response in

order for them to pertain to the assessment of learning at the course level. Based

on the consistency of the results of their study to those that have examined the

relationship between approach to study and qualitative differences in learning

outcomes at the academic task level, Trigwell and Prosser contend that it is valid

to use the SOLO at the course level. In their study, students were asked to

respond to the following request:

> Please describe what you think the content/subject matter of this course
>
> was about. (One way of doing this is to pretend you are telling a friend
>
> the sorts of things you thought the instructor was trying to teach you and
>
> wanted you to learn in this subject.)

In the present study, students were asked to respond to the same question posed in the Trigwell and Prosser (1992) study. As well, student responses were assessed using the categories of response adapted and validated for use at the course level by Trigwell and Prosser (see Appendix C). They are as follows:

1. *Uni-structural:* Those responses that focus on one issue/aspect of the course.

2. *Multi-structural:* Responses that describe or list some or all areas of study without linking them in any way.

3. *Probably Multi-structural:* Responses that have multi-structural elements but cannot with any certainty be described as multi-structural.

4. *Probably Relational:* Responses that exhibit some elements of relational but the elements are not expressed strongly enough to say with certainty that they are relational.

5. *Relational:* Responses that describe the course as a whole. The areas of study are described in such a way that the student appears to be seeing these areas as parts of a whole rather than as distinct parts.

Student final academic standing in course. A letter grade was recorded for each student. The percentage scores corresponding to the letter grades are as follows: A, 85-100%; A-, 80-84%; B+, 75-79%; B, 70-74%; B-, 65-69%; F, 0-

64% (failure). A letter grade of "K" represents "incomplete": deadline extended for submission of work in a course for a maximum of four months. In the present study, the mean percentage score corresponding to a particular letter grade was used to represent each student's final academic standing. For example, the letter grade "A" corresponds to a mean percentage score of 92.5%. Therefore, an "A" grade was recorded as 92.5% for the purpose of data analysis. Student grades provided a quantitative measure of learning outcome.

Bloom's Taxonomy. Bloom's taxonomy of the cognitive learning domain assesses learning in relation to six discrete categories. (See Appendix D) In the present study, students were asked the following question: "In your opinion, what kind(s) of learning do you think the tutor expected in this course? (Indicate more than one if appropriate.)" Student responses to Bloom's taxonomy were used as a qualitative measure of student evaluation of learning in their course.

Instructors' SOLO. During the course of the semi-structured interviews, instructors were asked to respond to the following question:

How would you describe the content or subject matter of your course? (One way of doing this is to imagine you are telling a friend or colleague what you taught and what you wanted your students to learn in this course.)

Instructor responses to the SOLO were used to measure qualitative differences in instructor's conceptions of student learning in their course. Instructor responses were also compared to those of their students using the same five categories described above.

Procedure

Permission to Collect Data

In the fall of 1991, preliminary discussions were held with the Director of McGill University's Distance Education Programme, Mr. Peter Burpee. The purpose of the discussions was to familiarize Mr. Burpee with the research topic in order to obtain his support and permission to collect data from courses within the program. Subsequently, the researcher was permitted to use this setting in order to collect data and was provided with a schedule of distance education courses that were being offered in the Fall session.

Three distance education courses were then selected for study based on the fact that they varied widely in content and instructional goals. Next the course instructors were contacted in writing (see Appendixes E & F) and were provided with an overview of the research and their role in the study. A copy of the Pre-Questionnaire was also provided. The course developers/instructors were contacted by telephone. The purpose of this phone call was to address any

questions the course instructors may have had and to obtain permission to collect data from the students enrolled in their courses. They were also asked to engage in an interview with the researcher.

Instructor Interviews

Interviews were held with the course instructors in the fall of 1992. Two of the interviews were held at McGill University. The course instructor, the researcher and the researcher's thesis advisor were present at these interviews. With the consent of the course instructor, each of the interviews was recorded and later transcribed verbatim. Due to the fact that one of the course instructors/developers lived outside of the province, the third interview was held over the phone and, with the consent of the course instructor, was recorded. This interview was also transcribed verbatim. Copies of the transcribed interviews were given to the course instructor in order for them to clarify, modify, and/or include any additional information as they saw fit.

Interviews were semi-structured in the sense that they were loosely based on questions that attempted to uncover information concerning course structure and design, the methods of assessment used, and the learning that the course instructor/developer expected students to accomplish (see Appendix G). In addition, the three course instructors were asked the following question so that

their responses could later be assessed using the SOLO Taxonomy: "How would you describe the content or subject matter of your course?" When necessary, the following prompt was also used: "One way of doing this is to imagine you are telling a friend or colleague what you taught and what you wanted your students to learn in this course."

Student Data

Students were mailed an initial letter of transmittal, (see Appendix H) along with the Distance Learning Pre-Questionnaire approximately two weeks after their courses began in September of 1992. The purpose of the letters of transmittal and follow-up letters was to inform students of their role in the study and to seek their participation. A follow-up letter (see Appendix I) and a second copy of the Pre-Questionnaire was mailed to students two weeks later in an attempt to increase response rate.

Numbers were attached to the questionnaires so that the researchers could match responses to the pre and post assessment packages. The numbers were also necessary in order to match responses to a specific course. All student responses to the SOLO were transcribed. Student SOLO responses were identified according to their course and their assigned subject number. Neither the course instructors nor the Director, Mr. Peter Burpee, had access to this data.

Approximately three weeks prior to the completion of their courses,

students were mailed the Post-Questionnaire package along with a second letter of

transmittal. In this letter of transmittal students were told they would receive

monetary compensation ($5.00) for completing the post-assessment package (see

Appendix J). This was done in order to encourage a high rate of response. Two

weeks later students were mailed a follow-up letter (see Appendix K) and a

second copy of the Post-Questionnaire package. Following course completion,

students' final academic standing in their course, represented by a letter grade, was

recorded.

Only those students who completed both questionnaires (N=30) were

included in the study. The return rate of both questionnaires was 61% (30 out of

49). This corresponds to a breakdown by course of 60% (9 out of 15) for

Introduction to Logo; 85% (11 out of 14) for Learning & Behavioral Problems in

Children; and 50% (10 out of 20) for Effective Written Communication.

Data Analysis

Qualitative Analyses

Instructors. The three instructor interviews were transcribed and then

coded by a researcher as falling into one of four possible categories: description of

learning, description of course structure/design, description of method(s) of

assessment, or none of these. A second researcher then reviewed the transcripts coded by category. The two researchers then met to discuss any discrepancies concerning coding category. Responses were then re-coded according to a decision reached between the two researchers.

Two researchers independently coded instructor responses to the Structure of the Observed Learning Outcome (SOLO) Taxonomy. The coding exercise required the researchers to categorize instructor descriptions of learning to an appropriate SOLO level. Assignment to SOLO level was determined using the same levels of response that were used with the student data. (See <u>Structure of the Observed Learning Outcome (SOLO) Taxonomy</u> above). There was agreement between the two researchers in all three cases. Quotations from instructor transcripts and their corresponding SOLO level are provided in Appendix L. The SOLO Taxonomy assesses responses in relation to their *structure*. Descriptions of instructor's student learning expectations were also examined in relation to their *content*. Content was examined using Bloom's Taxonomy of the Cognitive Domain (Appendix D) as a guideline.

Instructors' descriptions of their course design were examined in order to determine underlying factors that influenced the course design process. As well, the coded descriptions of course design were analyzed in relation to how they

supported the course learning expectations. Instructor statements concerning their selected method(s) of assessment were coded using Bloom's Taxonomy of the Cognitive Domain as a guideline. (See Appendix D.)

Students. Students' actual course learning outcomes were analyzed using the Structure of the Observed Learning Outcome (SOLO) Taxonomy. Of the 30 students who participated in the study, 26 completed the SOLO Taxonomy. This corresponds to a breakdown by course of 78% (7 out of 9) for Introduction to Logo; 82% (9 out of 11) for Learning & Behavioral Problems in Children; and 100% (10 out of 10) for Effective Written Communication.

Assessment of qualitative differences in student learning outcomes was conducted in two stages. In the first stage, two researchers independently assigned student responses to one of the SOLO levels. There was agreement between the two researchers in 16 out of the 26 cases, or 62% agreement. Following a discussion of the criteria used by each researcher for each of the SOLO levels, the researchers again coded all student responses. The second stage of the assessment process yielded agreement between the two researchers in 77% of the cases (20 out of 26 cases). In the six cases where there was not agreement, the two researchers again discussed the criteria used for the assessment of the

specific response, and an appropriate level was determined. Examples of student

SOLO responses and the resulting coding are presented in Appendix C.

Quantitative Analyses

A quantitative analysis, incorporating descriptive statistics, was used.

The selection of appropriate statistical procedures was guided by the fact that in

the present study the sample is small (N=30) and the three groups comprising the

sample are of unequal size (n=9, n=11, n=10).

Distance Learning Pre-Questionnaire. Student responses to the DESP

subscales comprising the Distance Learning Pre-Questionnaire were in the form of

a Likert scale ranging from 1, "Definitely Agree" to 4, "Definitely Disagree" with

5, "Don't Know" and 6, "Not Applicable". Student responses were recoded

using an ordinal scale in order to investigate possible relationships between DESP

subscale scores on the pre and post questionnaires, SOLO Taxonomy levels of

response, student responses to Bloom's Taxonomy, and student grades.

Post-Questionnaire Assessment Package. As with the Pre-Questionnaire,

student responses to the DESP subscales of the Post-Questionnaire were in the

form of the Likert scale described above. Responses to DESP questions on the

Post-Questionnaire were categorized into one of fourteen subscales that constitute

the four scales of the DESP: emotional encouragement, external attribution,

academic integration, and academic incompatibility. A mean score was derived for each of the fourteen subscales. Mean subscale scores were then converted into a total mean score for each of the four DESP scales. Scores were recoded using an ordinal scale in order to provide a comparison with qualitative data.

Structure of the Observed Learning Outcome (SOLO) Taxonomy. The SOLO Taxonomy levels of response were recoded using an ordinal scale where "1" represents "Uni-structural" and "5" represents "Multi-structural". This was done in order to assess relationships between this variable and others using quantitative analysis.

Student Final Academic Standing in Course. In order to analyze relationships between this quantitative measure of learning outcome and other variables, it was necessary to convert student grades to an ordinal scale where "1" represents a grade of "C" and "5" represents an "A" grade.

Bloom's Taxonomy. Student responses to Bloom's Taxonomy were recoded using an ordinal scale where "1" represents "Knowledge" and "5" represents "Evaluation" so that relationships between this variable and others could be analyzed using quantitative methods.

CHAPTER IV

Results

In this chapter, the results of the qualitative and quantitative analyses of the data are presented. The purpose of the data analysis was to investigate the relationships between learning context, student approach to learning and student learning outcomes. Therefore, in this chapter, the thirteen questions that guided the analysis are organized under the following headings: Learning Context, Student Approach to Learning, Student Learning Outcomes, and Interrelations Between Variables.

<u>Learning Context</u>

Learning context was defined as everything touching on the teaching and support environment in each of the three distance education courses under investigation. These three distance education courses, Introduction to Logo, Learning and Behavioral Problems in Children and the Effective Written Communication, vary widely in content and instructional goals. The analysis of the learning context was guided by four basic questions:

1. How do the instructors/developers of three different distance education courses describe the learning that they expect students to accomplish in their course?

Instructors' learning expectations for students were determined according

to the results of the coding of their responses to the Structure of the Observed

Learning Outcome (SOLO) Taxonomy and statements from the instructor

interviews. The SOLO Taxonomy assesses responses in relation to their

structure. Statements from the instructor interviews were also examined in

relation to their *content*. Content was examined using Bloom's Taxonomy of the

Cognitive Domain (Appendix D) as a guideline.

The results indicate that for the *Introduction to Logo* course, the

instructor's student learning expectations were coded as falling into the Relational

SOLO category. This suggests that the instructor expected students to see the

areas of study as parts of a whole rather than as distinct parts. For example, when

describing the role of the student, the instructor stated:

> They are the programmers... learning the basics of Logo
>
> programming...being able to put it together to create things. The thing that
>
> I want them to get most out of this by the end is being able to manipulate
>
> what they've learned with Logo to be able to create tools that are useful for
>
> them.

The coding of the *content* of this statement using Bloom's Taxonomy suggests

that this course is an Application course in which students are expected to learn

specific information related to developing a skill ["...learning the basics of Logo

programming..."] and to apply that skill to new situations ["...to manipulate what

they've learned with Logo to be able to create tools that are useful for them."] As

well, the fact that the instructor describes learning in relation to "being able to put

it together to create things" suggests that the course stresses the Synthesis of

information in order to create these tools.

For the *Learning and Behavioral Problems in Children* course, the results

of the coding exercise indicate that the instructor's student learning expectations

fall under the Probably Relational SOLO Level. This indicates that although the

instructor's student learning expectations display some elements of relation, such

as linking the areas of study together in some way, these elements are not strong

enough to say with certainty that they are relational. The coding of the *content* of

the instructor's statements concerning learning suggest that this course is

primarily Knowledge-based although it can be described as an Application course

for those students who possess practical experience in the content area:

First of all, I'd say it's a knowledge course. And that they get to find

out...practical stuff about exceptional children. ...In fact that it can be a

hands-on, in terms of that if these children are in your classroom, then the

types of strategies and new learning techniques that are presented in the

textbook, you can apply. So it can be an application course. Now, if you

don't have these children in the classroom then it makes it, you know,

difficult to call it an application course.

Lastly, the instructor's student learning expectations for the *Effective*

Written Communication course were coded at the Relational SOLO Level. This

indicates that the instructor's student learning expectations are for the student to

see the areas of study as parts of a whole rather than as separate parts. When

asked to describe the kind of learning a student should come out of their course

with the instructor stated:

> It's so self-directed I can't put adjectives on... You see every one of them
>
> has to fill out a writing inventory where they're talking about their own
>
> strengths and weaknesses and what they need to work on and what sorts
>
> of work they do on the job and you know, what sorts of problems they've
>
> been having and how they dealt with them and they have to answer a
>
> whole bunch of things. They're right in our textbook. All our students
>
> have to do this...and so really the course is an individual order. It's really
>
> structured around the individual's needs.

Based on the coding of the *content* of this statement and related statements ("But I

always look at it in terms of the process.. I mean that's our philosophy, this is the

process."), it seems that this course is process-oriented and emphasizes the development of Evaluation skills ("they're talking about their own strengths and weaknesses and what they need to work on").

It appears that these three distance education courses vary not only in terms of content, but in terms of their instructional goals. In turn, the instructional goals of the instructor determine the student learning expectations for their course. A summary of the results in relation to course type, expected level of learning, design emphasis and Bloom coding for method(s) of assessment is provided in Table 1.

2. How do the instructors/developers of the three different distance education courses describe their course structure/design?

Course structure/design was examined based on statements from the interviews with the instructors/developers. For example, in the *Introduction to Logo* course, the instructor stated that:

> The nicest thing that one student mentioned about this- the way the course
>
> is laid out last time and I'm trying to keep it this time too, it's kind of like
>
> building blocks. You build upon what you learn the last time...constantly
>
> throughout the course.

This statement indicates that there is a hierarchy of learning and that the course design supports this hierarchy. As well, it seems that the instructor/developer designed the course so that emphasis would not be on the knowledge-based information ("try this, try that"); rather, the course was designed so that students would focus on the creative aspect:

> That was the biggest thing in my mind all the way through. I didn't want to be a really breeze, ...too much of a breeze, I was making sure- Do I have enough to please? You know, to keep them busy, thinking, interested... I like to have something where they're not just doing things, ...try this, try that, but things they have to create themselves. They're not just following instructions, it's a challenge...

In the *Learning and Behavioral Problems in Children* course, the instructor stated that in designing the course her initial thoughts were: "I think what happened was initially, the way the course was presented... I tried to find out what texts were being used here." It seems that the design of the course evolved from the presentation of information in the form of a text. The instructor also emphasised the role of the study guide in the course design:

> Essentially the study guide... just tells them... the path to follow, in terms of like, behaviour-this is week one. You should be doing this right now. Week

two, we're now looking at... you should be reading this, or that. Don't forget

to mail in... you know, giving them this kind of directionality.

It appears that in this course, where the transmission of knowledge is highlighted, a

key factor in the course design is structure:

> The design of the course, when it's put together, I think, the kind of feedback
>
> I've been getting from the students has been, it's very structured, they know
>
> exactly what they're doing. Other comments, ... where ... this is not this first
>
> distance education course [the student has taken]... said, you know, your
>
> course is so easy, I know what to do and when. Other courses, they felt
>
> there wasn't the same structure. ...I tried to explain to them that sometimes
>
> depending on the subject matter, that it can't always be... as structured,
>
> maybe as I am, or as clear, or as defined ...because of the subject matter itself.
>
> According to the instructor of the *Effective Written Communication* course,

a key factor that influenced the course design was the fact that: "I kept having to

think well how can we adapt this to a real, you know, interactive writing

program." It seems that in this process-oriented course, interaction was an

essential component. In order to maintain this interaction, the course was

designed in such a way that:

> The first, the basic principle of this is that the student has to create a workshop in their own environment. ...They cannot take this course in isolation and the ones who do, the ones who do really suffer. ...They have to create a writing workshop among their peers and usually they're in a school setting because they are all teachers... so it works.

The instructor also described the course as being structured around the individual student's needs:

> You see every one of them has to fill out a writing inventory where they're talking about their own strengths and weaknesses and what they need to work on and what sorts of work they do on the job and you know, what sorts of problems they've been having and how they dealt with them and they have to answer a whole bunch of things. They're right in our textbook. All our students have to do this and so really the course is an individual order. It's really structured around the individual's needs.

To summarize, based on the instructors' descriptions of the course design process for these three distance education courses it appears that the type of course, knowledge-based versus application versus process-oriented, had a significant influence on the design and structure of the course. A summary of the

results in relation to course type, expected level of learning, design emphasis and

Bloom coding for method(s) of assessment is provided in Table 1.

3. How do the instructors/developers of three different distance education

courses describe their method(s) of assessment in their course?

The method(s) of assessment used in the courses was examined using

statements taken from the interviews with the course instructors/developers.

Instructor statements concerning their selected method(s) of assessment were

analyzed using Bloom's Taxonomy of the Cognitive Domain as a guide. (See

Appendix D)

The methods of assessment used in the *Introduction to Logo* course were

based on a format of evaluation whereby students determine their grade based on

fulfilling certain criteria set by the instructor:

They [the students] don't tell me at the beginning what they are going

for....I just lay it out in such a way that ... they know what they have to,

what the expectations are for a certain grade so when it comes in, like when

the first assignment comes in if I find there's only ... three assignments and

no challenges and they're supposed to send all exercises all, assignments,

and all challenges, well then I'll say well based on what you've sent, you

know you have worked for this category and this is how you've done it

> and then I evaluate what they've done and how well they've come along
>
> so...and usually I make it very clear for them at the beginning of the course,
>
> make sure they're aware that this is the way it's done.

It would appear that this method of evaluation provides students with a

sense of control over the evaluation process.

In this course, students were required to submit weekly assignments to the

instructor. These assignments were basically focused around having students

develop their skills with Logo programming: "it would take you through step-by-

step on different processes of Logo programming and then you would have a few

little exercises to try on the computer print-off and a challenge to do at the end."

However, the instructor emphasized that in order to receive an "A" grade: "to

send in everything and we have a little plus it has to be ... not just sending in

everything it has to be above and beyond, ... creative ... inventive somewhat."

Students were also required to complete a project:

> that's what their final project usually is to create some kind of a... program
>
> for display purposes or something they can use in their classroom and I've
>
> had things from umm solar systems taking a tour through the solar system
>
> and also the planets coming up and they draw them and all these little men
>
> flying by... I find you can just go so far with it... depending on your

imagination and the time you want to put into it... you can create a lot of fun things.

This quote seems to indicate that this project requires more than simply the application of skills. The instructor stresses that the students are to "create" something and that students can "just go so far with it... depending on your imagination". Therefore, the method of assessment encourages students to Synthesize the components of their Logo course in order to create something whole in the form of a creative project.

The instructor of the *Learning and Behavioral Problems in Children* course described the methods of assessment used in her course in relation to the structure of the exams:

There are two exams, there's a midterm, and a final exam... essentially composed of true-false questions, in which if it's false, they have to make the statement true. .... And they've got to match... basically the theoretical presentations and ... important concepts. And then there's short essay questions. Now, they're exposed to all three ... types of questions and examples throughout the course because they also have about four... unit activities which they have to complete throughout the entire course.... So all

of the material comes from there. It's all familiar. The exam, again, is based

on all of these questions, so it's nothing new.

This quote suggests that the exams emphasise students' ability to transmit and

demonstrate Comprehension of the course information. Students in this course were

also required to complete a paper:

> When it got to their paper, then that's the practical... because the type of ...
>
> paper that they're required to do is one which they look at an exceptionality
>
> of their choice, I send them a reading package, especially for students that
>
> don't have a library, you know like an educational library of some kind close
>
> by. And then they research on a particular...teaching strategy... and how
>
> would you apply it to an exceptional child. So there's the practical aspect
>
> and the application.

This quote indicates that the paper required students to Apply their knowledge to a

given situation. This suggests that students were encouraged to use thinking skills

beyond simply demonstrating comprehension of information. It is interesting to

note that while the instructor described the exams, which emphasise the transmission

and understanding of information, in terms of their structure, the paper, which

stresses a higher order thinking skill (i.e. the application of information), was

described in relation to the type of learning it demanded from students.

According to the instructor of the *Effective Written Communication* course, the method(s) of assessment used in the course are in the form of standard assignments. This method of assessment was selected in order to:

> To give them [the students] some guidelines.... because if I said... you have to design three assignments for yourself ...... I wouldn't be able to switch papers between students, the interaction would be- you see, that's the problem. You have to have some kind of ... format. But other than that, those things are so flexible, and I mean the students have done all kinds of things. They've said I'd like to do this one first and I'd like to change this into that and I have no problem with that.

Although the method of assessment is standard, the instructor emphasizes that "it's as flexible a course as you could ever find." The learning "process" and Self-Evaluation are highlighted throughout the instructor's description of the method of assessment:

> My assignments come in packages. The first package is the writing self-evaluation, some pre-written journals and maybe some samples of their former writing. The next three packages are direction assignments which include all the rough work, a lot of the process, any feedback they've received from other writers, ... a self-evaluation. So they evaluate

> themselves every single step of the process including at the end and
> ...those packages are just ... whatever it took to get all of this together, as
> well as the journals.

Evaluation of student learning is based on set criteria given to the student and students are expected to Evaluate their learning in relation to this set criteria:

> On the student criteria, on the ... student responsibilities... coupled with
> that it's the process, and then coupled with that the product which would
> be "In order to qualify for a 'C' you have to do the following,.... so in order
> to get an 'A' you have to set challenge in writing goals, you have to fulfill
> all of your responsibilities as a student, of course, you have to produce
> writing that is publishable ... and you have to have complete control over
> the language.... So the criteria is given to the student, it's in their hands and
> they have to give themselves a mark and if I don't believe that- they have
> to justify their mark for the course.

Overall, it seems that the method of assessment in this course is geared towards fostering the learning process and putting control of the learning process in the hands of the students.

The differences in the selected methods of assessment described above seem to suggest that the course instructors/developers determine the method(s) of

assessment based on both the type of course and the type of learning expected in the course. A summary of the results in relation to course type, expected level of learning, design emphasis and Bloom coding for method(s) of assessment is provided in Table 1.

4. How do students evaluate the various course design components and the method(s) of assessment used in their course?

Student evaluations of their course design and the method(s) of assessment were analyzed quantitatively using the subscale scores for "positive impression of the course" and "negative impression of the course". Subscale questions addressed various course design components such as student impressions of the course study guide, course administration and structure, tutor feedback, and the course activities and assignments. (See Appendix B for DESP questions.) Positive impression of the course was evaluated within a range of scores from 0 to 4 with 0 indicating a low positive impression and 4 indicating a high positive impression. Mean scores for the positive impression subscale for each of the three courses were $\underline{M}$= 3.289, $\underline{SD}$= 0.401 for *Introduction to Logo*, $\underline{M}$= 3.000, $\underline{SD}$= 0.456 for *Learning and Behavioral Problems in Children* and

Table 1

Summary of Course Type, Expected Learning Level, Design Emphasis, and Bloom Coding for Method(s) of Assessment

Description	Introduction to Logo	Learning and Behavioral Problems in Children	Effective Written Communication
Course Type	Application	Knowledge	Process
Expected level of learning:			
SOLO	Relational SOLO	Probably Relational SOLO	Relational SOLO
Bloom	Synthesis	Application	Evaluation
Design Emphasis	Hierarchy of Learning	Structure	Learning Process
Bloom Coding of Assessment	Application of Skills and Synthesis	Comprehension and Application of Knowledge	Evaluation

$\underline{M}$= 2.920, $\underline{SD}$= 0.575 for *Effective Written Communication*. Negative impression of the course was evaluated based on a range of scores from 0 to 4 with 0 indicating a low negative impression and 4 indicating a high negative impression. Mean scores for the negative impression subscale for each of the three courses were $\underline{M}$= 1.001, $\underline{SD}$=0.3900 for *Introduction to Logo*, $\underline{M}$= 0.9400, $\underline{SD}$= 0.2498 for *Learning and Behavioral Problems in Children* and $\underline{M}$= 1.1490, $\underline{SD}$=0.2892 for *Effective Written Communication*. Examination of the mean scores indicates that for the three groups, students had higher subscale scores for positive impressions of their course than they did for negative impressions of their course.

In order to determine whether this was a significant difference, one way analyses of variance were performed. The analysis of positive impression by group indicated a nonsignificant difference with $\underline{F}$(2, 27)= 1.5, $\underline{p}$=0.240. A nonsignificant difference was also determined for negative impression by group with $\underline{F}$(2, 27)= 1.24, $\underline{p}$=0.305. These findings indicate there are no significant differences in student's positive and negative impressions across courses. In other words, students' positive and negative evaluations of course design components and the selected method(s) of assessment were similar across courses.

Student Learning Approach

Analysis of student approach to learning was addressed by the following questions:

5. Is there a difference between students' general approach to learning and their approach to learning in a specific course?

The Chi Square Test for Goodness of Fit was used in order to determine whether significant differences existed between general and specific approach to learning in each course. The results indicated that in the *Introduction to Logo Course*, there was no significant difference between general and specific learning approach: $chi\chi(1, n=9) = 1.00$, $p<0.05$. A nonsignificant difference was found in the *Learning and Behavioral Problems in Children* course: $chi\chi(1, n=11) = 0.82$, $p<0.05$. Lastly, there was no significant difference between general and specific approach to learning in the *Effective Written Communication* course: : $chi\chi(1, n=10) = 0.00$, $p<0.05$.

6. Is there a difference in the learning approach reported by students at the end of the semester between the three different distance education courses?

One way analysis of variance was conducted in order to determine whether there were significant differences between the three courses in specific approach to learning. Specific approach to learning was assessed using student Deep

Approach and Surface Approach subscale scores from the DESP inventory contained within the Post-Questionnaire assessment package. Analysis of Deep Approach by group indicated nonsignificant differences with $F(2, 27)=1.78$, $p=0.189$. Analysis of Surface Approach by group also indicated nonsignificant differences between courses with $F(2, 27)=1.89$, $p=0.171$.

Student Learning Outcome

Student learning outcomes were analyzed using both quantitative and qualitative measures. Student learning outcomes were examined in relation to the following research questions:

7. How do students describe the learning they think was *expected* in their distance education course and what qualitative level of learning outcome did they actually *achieve*?

Students' *perceptions* of their course learning expectations were derived from their responses to Bloom's Taxonomy. Students' *actual* qualitative differences in learning outcomes were analysed based on their responses to the SOLO Taxonomy. Student perceptions and their actual learning outcomes will be discussed separately under each course heading.

Introduction to Logo. Of the nine students who participated from this course, two did not provide a response to the SOLO question. The remaining

seven students had learning outcomes that were categorized as falling into Uni-structural, Multi-structural and Probably Multi-structural levels of response. Figure 1 contains the distribution of SOLO responses for this course.
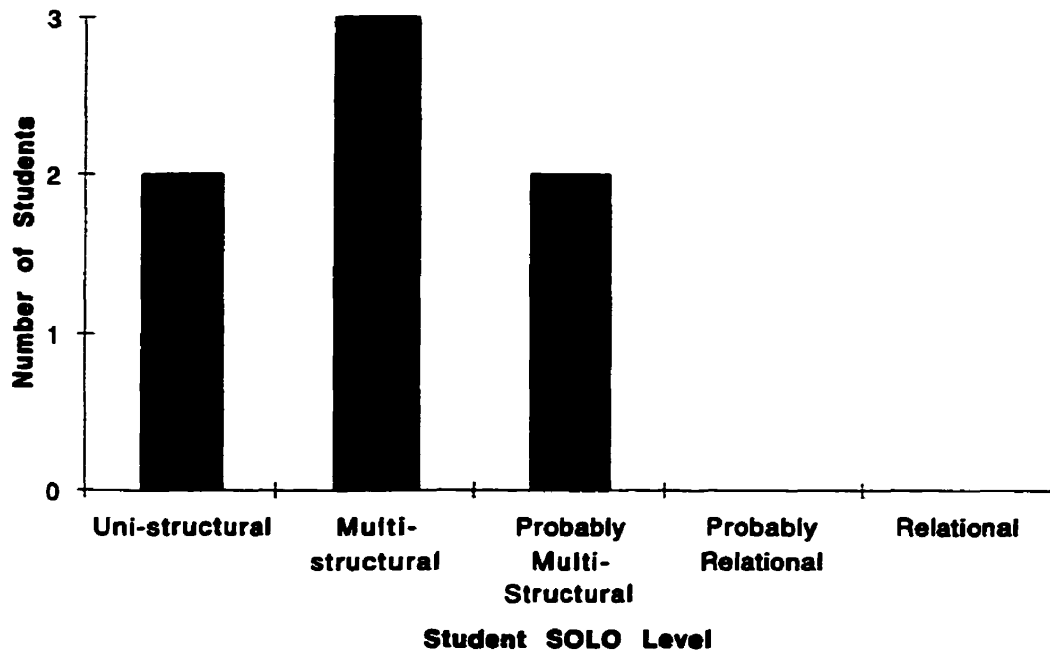
Figure 1. Distribution of Student SOLO Taxonomy Levels For Introduction to Logo (n=7)

Students were also asked to respond to the following question using Bloom's Taxonomy as an indicator: "In your opinion, what kind(s) of learning do you think the tutor expected in this course?" The highest levels of learning that students selected were Synthesis and Evaluation, with the majority of responses

indicating Synthesis. Figure 2 contains the distribution of responses to Bloom's

Taxonomy for this course.
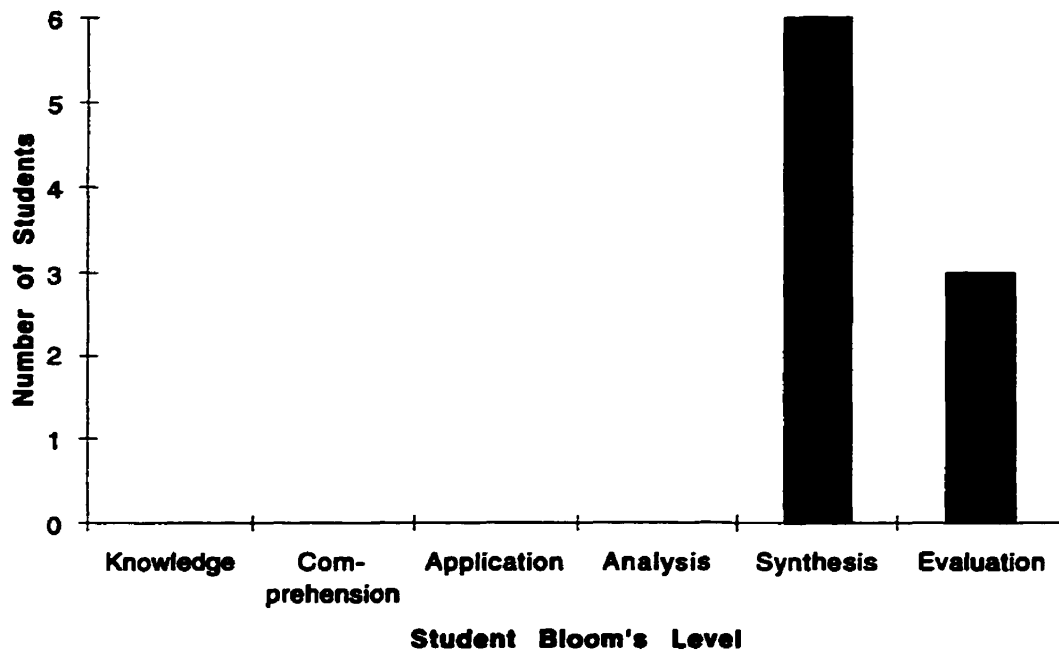
Figure 2. Distribution of Student Bloom's Taxonomy Levels For Introduction to
Logo (n=7)

Learning and Behavioral Problems in Children. Eleven of the students

enrolled in this course participated in the study. Two students did not respond to

the SOLO question. The remaining nine students had responses to the SOLO that

were divided among the Multi-structural, Probably Multi-structural, Probably

Relational and Relational levels. The distribution of SOLO responses in this

course are illustrated in Figure 3.
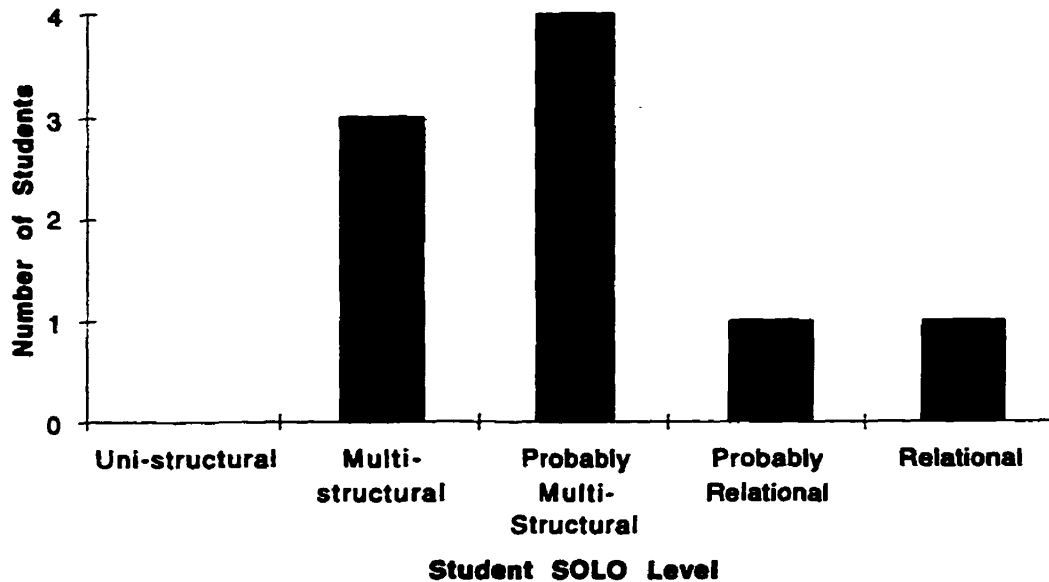
Figure 3. Distribution of Student SOLO Taxonomy Levels For Learning and

Behavioral Problems in Children (n=9)

One student did not complete Bloom's Taxonomy. The ten responses to

Bloom's indicated that students selected either Comprehension, Synthesis, or

Evaluation as the highest level of the kinds of learning the tutor expected in the

course. The distribution of responses to Bloom's Taxonomy in this course are

illustrated in Figure 4.
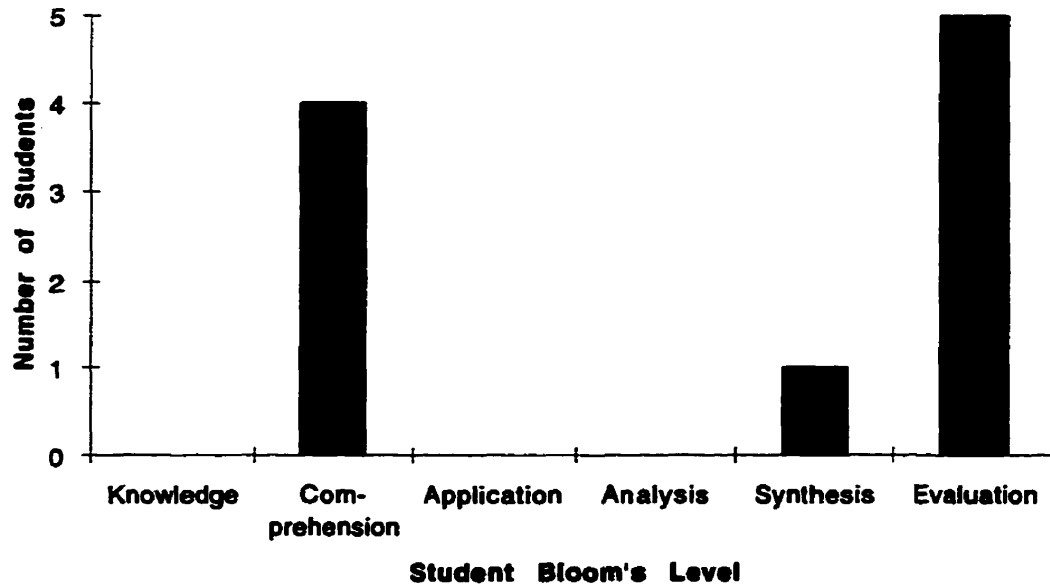
Figure 4. Distribution of Student Bloom's Taxonomy Levels For Learning and

Behavioral Problems in Children (n=9)

Effective Written Communication. The ten students who participated in the

study had responses to the SOLO taxonomy that were distributed among the

Multi-structural, Probably Multi-structural and Relational SOLO levels. The

distribution of SOLO responses in this course are illustrated in Figure 5.
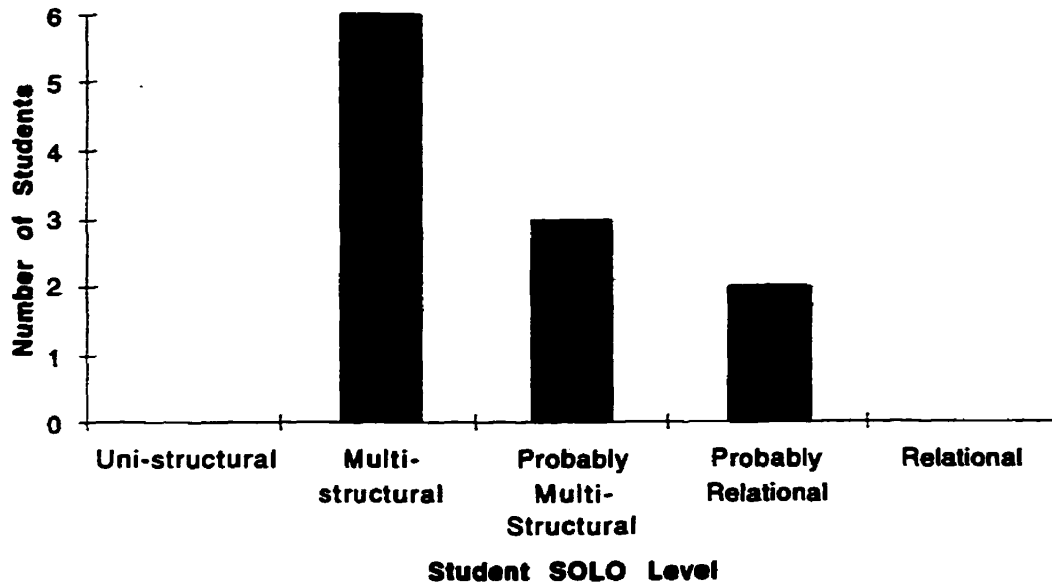
Figure 5. Distribution of Student SOLO Taxonomy Levels For Effective Written

Communication (n=10)

Student responses to Bloom's Taxonomy indicated that students selected

Application, Synthesis and Evaluation as the highest level of learning the tutor

expected in the course. The distribution of responses to Bloom's Taxonomy in

this course are illustrated in Figure 6.
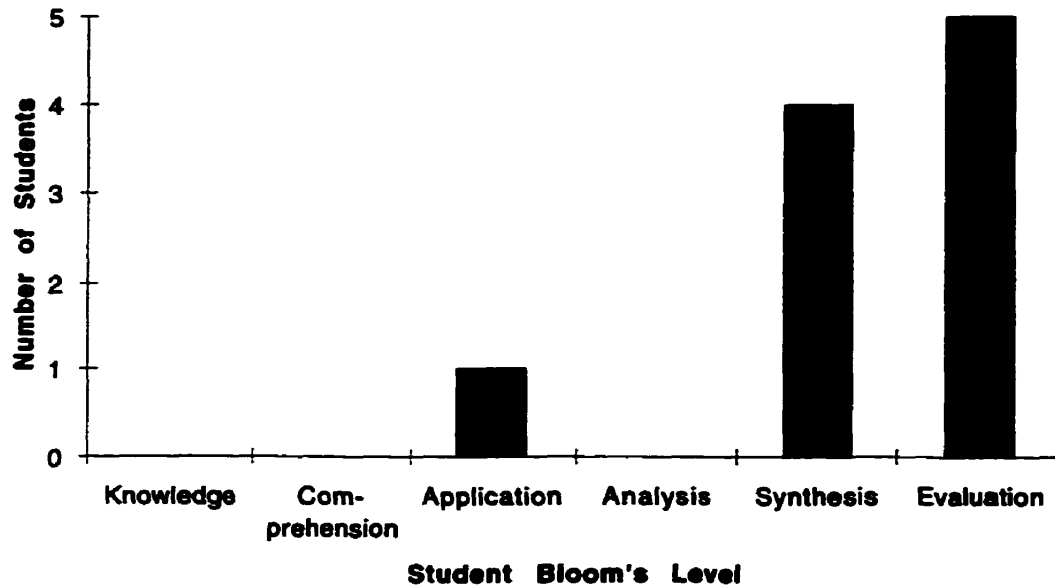
Figure 6. Distribution of Student Bloom's Taxonomy Levels For Effective Written Communication (n=10)

8. Is there a correlation between qualitative and quantitative measures of student learning outcomes?

In the present study, students' actual learning outcome was measured *qualitatively* using the SOLO Taxonomy. In order to assess whether there was a correlation between this qualitative variable and the *quantitative* measure of student learning outcome, student grade in their course, it was necessary to

convert levels of response on the SOLO to rank scores using an ordinal scale. Student grades were also ranked according to the same ordinal scale used for the SOLO. The Spearman correlation was then calculated between student grade and their SOLO level. Correlations were obtained for the three courses overall and for each of the individual courses. Overall in the three courses, a weak positive correlation was found between the between the qualitative and quantitative measure of student learning outcome ($r_s = 0.280$).

Spearman correlations were then calculated between these variables for each individual course. Weak positive correlations were determined between student SOLO level and student grade in the *Introduction to Logo* course ($r_s = 0.418$) and the *Effective Written Communication* course ($r_s = 0.404$). A weak negative correlation was found between student SOLO level and student grade in the *Learning and Behavioral Problems in Children* course ($r_s = -0.234$).

9. Is there a relationship between students' perceived course learning expectations and the qualitative or quantitative measures of student learning outcome?

In the present study, students' *perceived* course learning expectations were assessed qualitatively using Bloom's Taxonomy. The SOLO Taxonomy was used in order to obtain a qualitative measure of their *actual* course learning

outcomes. The *quantitative* measure of student learning outcome was student final

grade in their course. In order to compare these measures, it was necessary to

convert levels of response on the SOLO and the Bloom's to rank scores using an

ordinal scale. As well, student grades were ranked according to the same ordinal.

Spearman correlations were then calculated in order to determine whether

significant correlations existed over all three courses. They were then calculated

for each individual course.

The Spearman correlation was calculated for student SOLO level and

student Bloom's Taxonomy level. The results indicated that overall, there was no

correlation (r_s= 0.042) between students' perceived course learning expectations

and their actual learning outcomes. A weak negative correlation was found

between student grade and student Bloom's Taxonomy level (r_s= -0.238). These

findings indicate that for the three courses overall, there was no relationship

between students' perceptions of course learning expectations and a qualitative

measure of student learning outcome nor was there a relationship between student

perceptions of their course learning expectations and their final grade in the course.

Spearman correlations were next calculated between between students'

perceptions of course learning expectations and a qualitative measure of student

learning outcome for each of the three courses. In the *Introduction to Logo* course

a weak negative correlation was determined between student SOLO level and student Bloom's level (r_s= -0.418). Weak positive correlations were found between these variables in the the *Effective Written Communication* (r_s= 0.449). and *Learning and Behavioral Problems in Children* (r_s= 0.180) courses.

Lastly, Spearman correlations were calculated between student grade and student perceptions of their course learning expectations in each of the three courses. Weak negative correlations were found between Student Bloom's level and their course grade in the *Introduction to Logo* (r_s= -0.449) and *Learning and Behavioral Problems in Children* (r_s= -0.401) courses. A weak positive correlation was found between these variables in the the *Effective Written Communication* (r_s= 0.327) course.

Interrelations Between Variables

Relationships between learning context, student approach to learning and student learning outcomes will be examined in the following section.

10. Overall, is there a relationship between students' general approach to learning and their evaluation of the course design and method(s) of assessment used?

Student's general approach to learning was measured using Deep Approach and Surface Approach subscale scores from the Distance Learning Pre-

Questionnaire students completed upon entering their course. Student evaluations of their course design and the method(s) of assessment were analyzed by post-questionnaire subscale scores for "positive impression of the course" and "negative impression of the course". Subscale questions addressed various course design components such as student impressions of the course study guide, course administration and structure, tutor feedback, and the course activities and assignments. (See Appendix B for DESP questions.)

In order to determine whether a correlation existed between general approach to learning and students' impressions of their course overall in the three courses, the Pearson correlation was calculated for general use of *deep* approach and *positive* impression of the course. The results indicated that there was a weak positive correlation between these two variables ($r = 0.284$). No correlation was found between general use of *surface* approach and *positive* impression of the course ($r = 0.065$).

The Pearson correlation was also calculated for general use of *deep* approach subscale scores and subscale scores for *negative* impression of the course. The results indicated that there was a weak negative correlation between these two variables ($r = -0.134$). A weak negative correlation was found between

general use of *surface* approach subscale scores and subscale scores for *negative* impression of the course (r= -0.238).

11. Is there a relationship between students' specific approach to learning and their evaluation of the course design and method(s) of assessment used in each of the three courses?

Specific approach to learning was assessed using student Deep Approach and Surface Approach subscale scores from the Post-Questionnaire assessment package. Student evaluations of their course design and the method(s) of assessment were analyzed using the post-questionnaire subscale scores for "positive impression of the course" and "negative impression of the course". Subscale questions addressed various course design components such as student impressions of the course study guide, course administration and structure, tutor feedback, and the course activities and assignments. Pearson correlations were calculated for learning approach and course impression for each of the three courses.

In the *Introduction to Logo* course, a moderate positive correlation (r=0.654) was found between adopting a *surface* approach to learning and having a *positive* course impression. There was no correlation between adopting a *deep*

approach and *positive* course impression (r=-0.036). No correlation was found

between adopting a *deep* approach and having a *negative* course impression

(r= -0.023). A weak negative correlation was found between *surface* approach

and *negative* course impression (r=-0.358).

In the *Learning and Behavioral Problems in Children* course, a weak

positive correlation (r=0.526) was found between adopting a *deep* approach to

learning and having a *positive* course impression. A weak negative correlation was

determined between adopting a *surface* approach to learning and having a *positive*

course impression (r=-0.129). A weak positive correlation (r=0.514) was found

between adopting a *surface* approach to learning and having a *negative* course

impression. A weak negative correlation was determined between adopting a *deep*

approach to learning and having a *negative* course impression (r=-0.528).

A strong positive correlation (r=0.840) was determined between adopting

a *deep* approach to learning and having a *positive* course impression in the *Effective*

Written Communication course. A weak positive correlation (r=0.447) was found

between adopting a *surface* approach and *positive* course impression. A weak

negative correlation (r=-0.190) was found between *deep* approach and *negative*

course impression and a weak positive correlation (r=0.307) was found between

surface approach and *negative* course impression.

12. Is there a relationship between students' specific approach to learning in their course and their perceptions of the course learning expectations. Is there a relationship between students' specific approach to learning in their course and their actual learning outcomes?

Students' specific approach to learning was measured using the Deep Approach and Surface Approach subscale scores from the post-assessment package. Student perceptions of the course learning expectations were measured qualitatively using Bloom's Taxonomy. Students' actual learning outcomes were measured qualitatively using the SOLO Taxonomy. In order to determine whether there was a correlation between student learning approach and the qualitative measures , it was necessary to convert student levels of response on the SOLO and the Bloom's to rank scores using an ordinal scale. As well, student learning approach scores were ranked according to the same ordinal scale used for the qualitative measures of student learning outcome. Spearman correlations were then calculated for the three courses overall and for each individual course.

The results indicated that for the three courses overall, there was no correlation between adopting a *deep* approach to learning in a course and student SOLO level (r_s= 0.02). It was also found that the adoption of a *surface* approach to learning overall and student SOLO level were weakly correlated in the negative

direction (r_s= -0.136). When Spearman correlations were calculated for approach to learning in a course and student perception of course learning expectations, a weak positive correlation (r_s= 0.232) was found between adoption of a *deep* approach and Bloom's level. As well, a weak negative correlation (r_s= -0.120) was found between adoption of a *surface* approach and Bloom's level. Although the correlations were weak, they were in the expected direction with a surface approach negatively correlated with student SOLO and Bloom's Taxonomy levels.

Correlations were then calculated for each individual course. In the *Introduction to Logo* course, a moderate positive correlation was found between adopting a *deep* approach to learning and student Bloom's level (r_s=0.671). A weak negative correlation (r_s= -0.277) was determined between adopting a *surface* approach and student Bloom's level. A weak negative correlation was determined between adopting a *deep* approach to learning and student SOLO level (r_s=-0.180). There was no correlation (r_s=0.000) between adopting a *surface* approach to learning and student SOLO level.

In the *Learning and Behavioral Problems in Children* course, no correlation was found between adopting a *deep* approach to learning and student Bloom's level (r_s=0.000). As well, no correlation (r_s=0.000) was determined

between adopting a *surface* approach and student Bloom's level. A weak positive

correlation was determined between adopting a *deep* approach to learning and

student SOLO level (r_s=0.354). There was a weak negative correlation (r_s=-0.354)

between adopting a *surface* approach to learning and student SOLO level.

Lastly, in the *Effective Written Communication* course, a weak positive

correlation was found between adopting a *deep* approach to learning and student

Bloom's level (r_s=0.491). As well, a weak positive correlation (r_s=0.127) was

determined between adopting a *surface* approach and student Bloom's level. No

correlation was determined between adopting a *deep* approach to learning and

student SOLO level (r_s=0.000). There was a weak negative correlation (r_s=-0.378)

between adopting a *surface* approach to learning and student SOLO level.

13. Is there a relationship between how the instructors describe the

expected learning and students' perceptions of course learning expectations or

their actual learning outcomes?

Instructors' learning expectations for students were based on the coding of

the interview data using both the SOLO Taxonomy and Bloom's Taxonomy.

Student perceptions of their course learning expectations were based on their

responses to Bloom's Taxonomy. Actual student learning outcomes were

determined using the SOLO Taxonomy.

Introduction to Logo. Based on the coding of the instructor's response to the SOLO question, the instructor's student learning expectations were categorized at the Relational SOLO Level. Of the seven students who answered the SOLO question, no students had actual learning levels that were coded as Relational. The highest level of learning students achieved in the course was at the Probably Multi-structural level.

The instructor's description of the kind of learning expected from students was determined to be in the category of Bloom's Taxonomy referred to as Synthesis. Six of the nine students who completed Bloom's Taxonomy indicated Synthesis as the highest level of learning the instructor expected in the course. The remaining three students indicated that Evaluation was the highest level of learning expected in the course.

Learning and Behavioral Problems in Children. In this course, the instructor's student learning expectations were coded at the Probably Relational SOLO Level. Nine of the students in this course responded to the SOLO question. One student had a response that indicated they had achieved a level of learning outcome that corresponded with the Probably Relational category and one student's response indicated their actual learning outcome was at the Relational

SOLO level. The other students' actual learning outcomes were almost evenly scattered between Multi-structural and Probably Multi-structural levels.

The instructor's description of the kind of learning expected from students was determined to be in the categories of Bloom's Taxonomy referred to as Knowledge, Comprehension, and Application. Of the ten students who completed Bloom's Taxonomy, five students indicated that their perception of the highest level of learning expected was Evaluation, four students categorized the highest level as Comprehension, and one student indicated that their perception of the highest level of learning expected was Synthesis.

Effective Written Communication. The instructor's student learning expectations for this course were coded at the Relational SOLO Level. Six of the ten students who answered the SOLO question had learning outcomes that were categorized at the Multi-structural SOLO level. Three of the students had learning outcomes coded at the Probably Multi-structural SOLO level and one student had a learning outcome at the Probably Relational SOLO level.

The instructor's description of the kind of learning expected from students was determined to be in the category of Bloom's Taxonomy referred to as Evaluation. Five of the ten students indicated that their perception of the highest level of learning expected in their course was Evaluation. Four students responded

that Synthesis was the highest level of learning expected in their course, and one

student indicated that the highest level of learning expected was Application.

CHAPTER V

Discussion

Traditionally, student achievement has been defined in relation to the quantity of information students learn. However, current research and theory in the area of higher education has argued that if the aim of higher education is to produce high quality learning outcomes in its students, student achievement must be measured in terms of qualitative differences in learning outcomes. If the goal of distance education is consistent with that of higher education in general, qualitative measures of student learning must also be addressed in that context..

The research on student success in distance education has primarily focused on persistence/attrition rates as the most significant measure of success. A shift in the definition of student success from measurement of progress/drop-out rates to measurement of qualitative differences in student learning outcomes, is needed. The present study constituted a preliminary step in this direction by exploring qualitative differences in student learning outcomes in distance education courses.

Higher education theory has emphasized the relationship between qualitative differences in student learning outcomes, learning context and

student learning processes. Current research examining qualitative differences

in student learning outcomes can be classified into two basic categories;

studies examining the relationship between student learning processes and

student learning outcomes, and studies investigating the relationship between

learning context and the approach to learning that students adopt. Very little

research to date has examined the relationship between all three variables. In

the area of distance education, Kember has proposed a model of student

drop-out from distance education that relates student outcomes to learning

context and student learning processes. However, qualitative measures of

student learning outcome are not included in the Kember model. In the

present study, relationships between learning context, student approach to

learning and student learning outcomes were examined within the context of

three distance education courses varying widely in content and instructional

goals.

In the present study, learning context was evaluated from the

perspective of both the course instructor and the students enrolled in the

course. The variables that constituted learning context in this study included

the instructor's learning expectations for their students, the course structure

and design, and the selected method(s) of assessment. Student approaches to

learning were examined in order to determine their relationship to the learning context constituting each of three distance education courses. Measures were taken of both students' general learning approach and the approach to learning students' adopted in their course. Student perceptions of the course learning expectations and their actual learning outcomes were assessed qualitatively using Bloom's Taxonomy and SOLO Taxonomy. Student learning outcome was also assessed using a quantitative measure of student final grade.

This chapter is structured in such a way that relationships between learning context, student approach to learning, and student learning outcomes are discussed within the context of each of the three distance education courses under investigation: Introduction to Logo (IL) , Learning and Behavioral Problems in Children (LBC) and Effective Written Communication (EWC). Similarities and differences between the courses will be addressed under a separate heading. For the sake of clarity, in this chapter the use of the term "student learning outcome(s)" refers to the *qualitative* measure(s) of student learning unless otherwise indicated.

Introduction to Logo (IL)

The coding of the content of instructors' statements regarding student

learning expectations using Bloom's Taxonomy indicated that for the

Introduction to Logo course, Application and Synthesis were the levels of

learning that students were expected to achieve. The coding of of the

structure of the instructor's statements regarding student learning

expectations indicated a SOLO level response at the Relational level,

indicating that students were expected to see the areas of study as parts of a

whole rather than as distinct parts. The course structure supported the

hierarchy of learning skills required to learn the Logo program and was

designed in such a way that the creative potential of the program, as opposed

to the more basic skills involved in programming, were emphasized. Course

structure and design supported the instructor's learning expectations for the

course. The method of assessment selected by the instructor suggests that

students were provided with the incentive to develop higher levels of learning

that reflected the expectations of the instructor. In this course the final

project required students to create a Logo program for display purposes or

for use in the classroom. To accomplish this task, students had to synthesize

the various course components.

When student perceptions of the course learning expectations were compared with the expectations held by their instructor, responses to Bloom's taxonomy indicated that the majority of students perceived that Synthesis was the highest level of learning expected. This corresponds to the instructor's statements concerning course learning expectations. Analysis of students' actual learning outcomes was conducted using the SOLO Taxonomy which showed learning at the Uni-structural, Multi-structural and Probably Multi-structural levels. Student SOLO levels were therefore not consistent with the instructor's Relational SOLO level. A weak negative correlation was found between student perceptions of the course learning expectations and their actual learning outcome in the course.

In relation to the approach to learning that students adopted in the IL course, a moderate positive correlation was found between a deep approach to learning in the course and students' perceptions of course learning expectations. A weak negative correlation was determined between approach to learning in the course and students' actual course learning outcomes. The quantitative assessment of student learning outcome (student grade) was strongly positively correlated with the adoption of a surface approach to learning in the course. A fairly strong negative correlation was found between

student grade and adopting a deep approach to learning in the course. These findings seem to indicate an inconsistency between students' course learning expectations and their final grade in the course based on the fact that students who adopted a deep approach to study received a lower final grade than did students who adopted a surface approach to study. However, the correlation between student perception of course learning expectations and their final grade was weak. Although these variables were not strongly correlated, they were in the negative direction. Lastly, neither students' general learning approaches measured at the beginning of the course, nor the approach to learning they adopted in the IL course were correlated with students' positive and negative impression of the course.

Learning and Behavioral Problems in Children (LBC)

In this course, the coding of the instructor's statements regarding student learning expectations suggested that *the Learning and Behavioral Problems in Children* course is primarily Knowledge-based although it can also be described as an Application course for those students who possess practical experience in the content area. The coding of the instructor's statements about student learning expectations indicated a SOLO level of Probably Relational. At this level, the instructor's student learning

expectations display some elements of relation, such as linking content areas

together in some way, although these elements are not strong enough to say

with certainty that they are relational. In this course, where the transmission

of information about children with special needs is the main focus, a key

factor in the course design was structure. In fact, the course structure is

based on the structure of the student textbook, supporting this instructor's

expectations regarding student learning outcomes. Based on statements from

the course instructor, it appears that the methods of assessment used in this

course require students to demonstrate comprehension of the course

information in the form of exams and to apply their knowledge in the form of

a project. The coding of selected methods of assessment and the levels of

learning expected by the instructor indicates an inconsistency between these

two variables.

When student perceptions of the course learning expectations were

compared with the expectations held by their instructor, responses to

Bloom's taxonomy indicated that students selected either Comprehension,

Synthesis or Evaluation as the highest level of learning expected in the LBC

course. The fact that students indicated higher levels of expected learning

outcomes than those indicated by the course instructor is significant given

that the instructor stated that student learning would vary depending on whether or not students possessed practical experience as teachers in a classroom (see Question 1 in the Results chapter). Although differences in subjects' teaching experience was not accounted for in the present study, given that the McGill Distance Education program is composed of teachers seeking professional development and on-campus Education students who are not teachers, previous experience may be a significant factor influencing student perception of expected level of learning outcome.

Students' actual course learning outcomes were analyzed using the SOLO Taxonomy. The levels of actual learning outcomes were determined to be Multi-structural, Probably-Multi-Structural, Probably Relational and Relational. Here again, it would be interesting to determine if previous experience influenced students' actual learning outcomes. The correlation between students' perceived course learning expectations and their actual course learning outcomes was weak.

In relation to the approach to learning that students adopted in the LBC course, no relationship was found between specific learning approach and students' perceptions of course learning expectations. A weak correlation was determined between approach to learning in the course and

students' actual course learning outcomes. Although this correlation was not

strong, it was in the expected direction with a surface approach to learning

negatively correlated with students' actual learning outcomes and a deep

approach positively correlated with students' actual learning outcomes.

Lastly, the relationship between student grade in their course and their

specific learning approach in the course was weak. It was, however, in the

expected direction with the adoption of a surface approach to learning

negatively correlated with course grade and adoption of a deep approach

positively correlated with course grade. The adoption of a deep approach to

learning in this course was moderately positively correlated with a positive

impression of the course and no correlation was found between deep

approach and a negative course impression. Adoption of a surface approach

was weakly negatively correlated with both a positive and negative course

impression.

Effective Written Communication (EWC)

When the content of the instructor's statements regarding the student

learning expectations in the Effective Written Communication course were

analyzed, student learning expectations were determined to be at the level of

Evaluation. Students were expected to be able to evaluate their strengths and

weaknesses in the writing process. Analysis of the structure of instructor's

statements about student learning expectations indicated a Relational SOLO

level. In this course, students were expected to see the areas of study as

parts of a whole as opposed to distinct learning segments. This course was

designed in such a way that interaction between the students/writers and their

peers was a focus. The course structure emphasizes the writing process, as

opposed to a final product, self-evaluation, and meeting the individual needs

of each student. The course structure and design appear to support the

instructor's course learning expectations. The method of assessment in this

course is self-evaluation and instructor feedback is process-oriented.

Therefore, the method of assessment selected by the instructor matched their

expected level of student learning outcome.

Comparison of student perceptions of the course learning

expectations to the expectations held by their instructor using Bloom's

taxonomy revealed that students perceived Application, Synthesis, and

Evaluation as the highest level of learning expected in the course as compared

to the instructor's expectation of Evaluation. When students' actual learning

outcomes were compared to the instructor's student learning expectations

using the SOLO taxonomy, student learning levels were at the Multi-

structural, Probably Multi-structural, and Relational SOLO categories as compared to the instructor's Relational level. A weak positive correlation was determined between student perceptions of the course learning expectations and their actual learning outcomes.

In the EWC course, a weak positive correlation was determined · between specific learning approach in the course and students' perceptions of course learning expectations. No relationship was found between adopting a deep approach to learning in the course and students' actual learning outcomes. A weak negative correlation was determined between adopting a surface approach to learning in this course and students' actual learning outcomes. Correlations between student grades and approach to learning in their course were weak. However, they were in the expected direction with a deep approach to learning positively correlated with course grade and a surface approach negatively correlated with course grade. Interestingly, a strong positive correlation was found between adopting a deep approach to learning in this course and having a positive course impression. The correlation between specific deep approach and negative course impression was weak and in the negative direction. Adopting a surface approach to

learning was weakly positively correlated with both positive and negative

course impression.

Similarities and Differences Between Courses

Learning context and student learning approach. No significant

differences between specific approach to learning were found in relation to

the three courses. Therefore, regardless of the fact that the three courses

selected for study, Introduction to Logo, Learning and Behavioral Problems in

Children, and Effective Written Communication, varied widely in content and

instructional goals, these variables do not seem to be related to the approach

to study that students adopt in their course. In a 1983 study conducted by

Entwistle and Ramsden, the investigators found a relationship between

contrasting subject specialisms and student approach to learning.

Comprehension learning and a deep approach to study were found to be more

common in Arts and Social Science disciplines than in the Sciences where

operation learning was more common. Based on the findings of the Entwistle

and Ramsden investigation, one might expect that in the present study

differences in students' approach to learning would be found between the IL

course, a product-oriented course, and EWC, a process-oriented course.

However, the results did not confirm these expectations.

Eley (1992) has criticized the Entwistle and Ramsden (1983) study

that compared relatively large but separate samples of students taking

different courses. According to Eley, the fact that Entwistle and Ramsden

make within-student inferences based on between-student findings and infer

that learning approach is related to the between-group differences in

perceived course requirements, is a problem. In the present study, within-

student measures were used in order to examine the relationship between

students' perceptions of course learning expectations and the approach to

learning they adopted in their course. Adoption of a surface approach to

learning was not found to be correlated with students' perceptions of course

learning expectations. However, in the IL course, a moderate positive

correlation was determined between adoption of a deep approach to learning

and students' perceptions of course learning expectations. No correlations

between deep approach and learning expectations were found in the other two

courses. Therefore, using within-student measures, the present study lends

some support to the view that student perceptions of course learning

expectations and learning approach are related.

When differences in the content and instructional goals are examined

between the Learning and Behavioral Problems in Children (LBC) and

Effective Written Communication (EWC) courses, it seems that the LBC

course highlights the transmission of knowledge whereas the EWC course

emphasizes the development of the writing process and interaction between

writing peers. These differences can be said to represent "knowledge

transmission" and "learning facilitation" differences in teaching conception as

described by Gow and Kember (1993). Gow and Kember found that learning

facilitation has a significant negative correlation with the final surface

approach scores. In the present study, a learning approach pretest and

posttest was given to students in order to determine differences within-

students over their course of study. No differences were found between pre

and post measures of approach to learning, indicating students did not make

measurable changes in their general learning approach as reported at the

beginning of the course.

Clearly, the results of the present study do not support those of Gow

and Kember (1993). However, while the LBC course may beseen as focusing

on "knowledge transmission", it seems that some students may have applied

their previous experience to the course information thus changing students'

perceptions of the course learning expectations. It was not possible to

analyze the relationship between student experience and perception of course

learning expectations within the confines of the present study.

Course evaluations and learning approach. No significant differences

between courses were found in relation to students' positive and negative

course impressions. As well, students' general learning approach was

determined to be only weakly correlated with student course impressions.

This would appear to dispute the hypothesis proposed by Prosser and

Trigwell (1991) that "students who enter the course with a particular

orientation to learning may automatically structure their studies according to

those orientations and then rate the course and teaching in ways related to

those orientations."(p.301)

In the EWC course, the specific approach to learning that students

adopted in their course, a deep approach, was strongly correlated with a

positive course impression. The finding that learning approach is related to

student evaluation of their learning environment supports the results of a

study conducted by Entwistle and Tait (1990, second study). Entwistle and

Tait found that students who adopt deep approaches to studying show a

clear preference for an environment which is likely to encourage

understanding, while students with a surface approach prefer an environment that promotes rote learning.

The lack of a correlation between approach to learning and student evaluation of their learning environment in the IL and LBC courses was also found in research conducted by Entwistle and Ramsden (1983), Entwistle and Tait (1990, first study), and Ropo (1993) who found a lack of a connection between good teaching, as evaluated by students, and approach to learning.

Learning approach and qualitative and quantitative differences in learning outcomes. No strong correlations between learning approach and qualitative differences in student learning outcomes were determined in any of the three courses. This finding conflicts with that of Trigwell and Prosser (1992) who found substantial and significant relationships between a deep approach to learning and qualitative differences in student learning outcomes at the course level. The lack of a relationship between learning approach and qualitative differences in learning outcome also opposes the results of a study conducted by Boulton-Lewis (1994), who found an increase in deep approach was related to an increase in student SOLO level.

In relation to learning approach and the quantitative measure of learning outcome in this study, students' final grade, in the IL course a

moderate negative correlation was found between deep approach and final

grade and a strong positive correlation was determined between surface

approach and final grade. Weak correlations were found between learning

approach and final grade in the other two courses. However, they were in the

expected direction with a deep approach positively correlated with grade and

a surface approach negatively correlated with grade.

There was a weak correlation between qualitative and quantitative

measures of learning outcome in each of the three courses. A weak positive

correlation between the two variables was found in the IL and EWC courses.

A weak negative correlation between qualitative and quantitative measures of

learning outcome was found in the LBC course. The weak correlations

between qualitative and quantitative measures of student learning outcome

support the results of a study conducted by Trigwell and Prosser (1992).

These investigators found that student grades do not seem to be a reliable

measure of learning quality.

Instructors' student learning expectations, student perceptions of

course learning expectations, and student actual learning outcomes. In the

present study, the instructors of both the IL and EWC courses indicated their

student learning expectations were at the Relational SOLO level. The

instructor of the LBC course indicated that the expected student learning outcome was at the Probably Relational SOLO level. These two levels represent the two highest levels of learning depicted within the SOLO Taxonomy. The use of Bloom's Taxonomy in the analysis of the content of instructors' statements concerning student learning expectations revealed that students were expected to reach the level of Synthesis in the IL course, Evaluation in the EWC course and Application in the LBC course. These represent the higher levels of learning depicted within Bloom's Taxonomy. Clearly, the instructors of these three courses had high quality student learning expectations.

Analysis of student perceptions of their course learning expectations indicated that in the IL course, the majority of students selected Synthesis as the highest level of learning expected in their course, in the EWC course students selected Application, Synthesis and Evaluation as their perceived highest level of learning expected and in the LBC course Comprehension, Synthesis and Evaluation were the highest levels of learning that students perceived as expected. In all three of these courses, students selected categories representing the higher levels of learning depicted within Bloom's Taxonomy matching their instructor's expectations.

When students' actual learning outcomes were analyzed using the SOLO Taxonomy, the spectrum of SOLO levels were indicated, ranging from Uni-structural to Relational SOLO levels. Correlations between students' perceived course learning expectations and their actual learning outcomes indicated weak positive correlations in the LBC and EWC courses and a weak negative correlation between the variables in the IL course. It is interesting to note that completion of the SOLO Taxonomy requires students to provide a written response, that is, to express in writing their conceptualization of the learning content in their course, whereas Bloom's Taxonomy requires only that students select an appropriate response from six possibilities. Perhaps the discrepancy between student responses to Bloom's Taxonomy and the SOLO reflects a discrepancy between students' receptive and expressive abilities. If this is indeed accurate, then it would confound the results of the study.

The SOLO Taxonomy analyses responses on the basis of their structure. In analyzing the differences between instructor SOLO responses and student SOLO responses, it is conceivable that what was measured was not differences between instructor's student learning outcome expectations and students' actual learning outcomes; rather what was measured could have

been differences in the way that subject matter experts structure their knowledge as compared to novices. This, too, would confound the results of the study.

Assuming that no confounding occurred within the present study, these results do not support those of Boulton-Lewis (1994) who found that the majority of both students and instructors are at a Multi-structural SOLO level in relation to their beliefs about learning. In the present study, although students and instructors were not asked about their beliefs about learning in general, the three course instructors and a significant number of students achieved SOLO levels in the Probably Relational and Relational SOLO categories when asked to indicate the course learning expectations. These findings support the view that high quality student learning outcomes are expected in distance education courses and that students can indeed achieve high quality learning outcomes within the context of distance education.

Limitations of the Present Study

A major limitation of the present study was the small sample size. In order to determine complex interrelations between variables, it is necessary to use multivariate statistical analyses. It was not possible to conduct these

analyses due to the small sample size. Therefore, the conclusions that can be drawn from the findings of this study are limited as well.

Based on the findings from the instructor interview in the Learning and Behavioral Problems in Children course as well as the findings from the qualitative analysis of the student data, it seems that previous teaching experience may have been a significant variable in the present study but this was not measured. The sample was composed of both experienced teachers seeking to upgrade their skills and students completing their Bachelor of Education degree who possess no formal teaching experience. It seems possible that this diverse group of subjects may respond differently to the variables measured in the present study based on whether or not they possess previous teaching experience. Therefore, the lack of differentiation between subjects in this study limits both the interpretation and generalizability of the results.

The results of the analyses of instructor interview statements regarding course structure and design and their selected method(s) of assessment could have been strengthened had these statements been coded according to the same procedure followed with the instructor statements concerning learning (i.e. independently by two individuals).

Lastly, given small number of subjects who participated in this study, results could have been strengthened had they been corroborated by data from interviews with subjects from each of the three courses.

Implications for Practice and Research

The findings of the present study represent a departure from the existing literature in the area of student success in distance education due to the fact that qualitative differences in student learning outcomes were the focus of the analysis. The results of this investigation suggest that complex interrelationships exist between the distance education learning context, student approach to learning and qualitative differences in student learning outcomes. The results of this investigation also indicate that high quality student learning outcomes are expected in distance education courses and that students can indeed achieve high quality learning outcomes within the context of distance education. As documented within the present study, the question of *how* to achieve high quality student learning outcomes warrants further investigation.

In this researcher's opinion, research in the area of student success in distance education must shift its focus from the study of student persistence/drop-out to the study of the quality of student learning in

distance education courses. If the goal of distance education is to produce graduates with high quality learning outcomes, then research in distance education must include measures of qualitative differences in student learning outcomes.

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Appendix A

<u>Distance Education Pre-Questionnaire</u>

DISTANCE LEARNING QUESTIONNAIRE

How long has it been since you have taken a higher-education level course? _____

PLEASE CIRCLE THE NUMBER THAT BEST DESCRIBES YOUR ATTITUDE TOWARDS EACH STATEMENT. ANSWER EVERY QUESTION- PLEASE DO NOT LEAVE ANY BLANK.

	Definitely Agree	Agree	Disagree	Definitely Disagree	Don't Know	N/A
1. I generally put a lot of effort into trying to understand things that seem difficult at first.	(1)	(2)	(3)	(4)	(5)	(6)
2. I prefer to follow well-tried approaches to problems rather than attempting anything too adventurous.	(1)	(2)	(3)	(4)	(5)	(6)
3. The best way for me to understand what technical terms mean is to remember the textbook definitions.	(1)	(2)	(3)	(4)	(5)	(6)
4. I suppose I am more interested in the qualifications I'll get than in courses themselves.	(1)	(2)	(3)	(4)	(5)	(6)
5. I usually set out to understand thoroughly the meaning of what I am asked to read.	(1)	(2)	(3)	(4)	(5)	(6)
6. I find I tend to remember things best if I concentrate on the order in which the instructor presented them.	(1)	(2)	(3)	(4)	(5)	(6)
7. I am taking distance education courses mainly to improve my chances of job advancement.	(1)	(2)	(3)	(4)	(5)	(6)
8. Often I find I have to read things without having the opportunity to really understand them.	(1)	(2)	(3)	(4)	(5)	(6)
9. My main interest for taking distance education courses is so that I can learn more about subjects that really interest me.	(1)	(2)	(3)	(4)	(5)	(6)
10. When I'm reading I try to memorize important facts that may come in useful later.	(1)	(2)	(3)	(4)	(5)	(6)
11. I find that studying academic topics can often be really exciting.	(1)	(2)	(3)	(4)	(5)	(6)
12. When I'm tackling a new topic, I often ask myself questions about the topic that the new information should answer.	(1)	(2)	(3)	(4)	(5)	(6)
13. I enjoy reading so I am well suited to distance education courses.	(1)	(2)	(3)	(4)	(5)	(6)
14. I usually don't have the time to think about the implications of what I have read.	(1)	(2)	(3)	(4)	(5)	(6)
15. I often find myself questioning things that I read in books or study materials.	(1)	(2)	(3)	(4)	(5)	(6)

Over ...

	Definitely Agree	Agree	Disagree	Definitely Disagree	Don't Know	N/A
16. I generally prefer to tackle each part of a topic or problem in order, working out one part at a time.	(1)	(2)	(3)	(4)	(5)	(6)
17. I generally choose what I study more from the way it fits with career plans than from my own interests.	(1)	(2)	(3)	(4)	(5)	(6)
18. I find it difficult to "switch tasks" when working on a problem: I prefer to follow each line of thought as far as it will go.	(1)	(2)	(3)	(4)	(5)	(6)
19. Instructors seem to delight in making the simple truth unnecessarily complicated.	(1)	(2)	(3)	(4)	(5)	(6)
20. Instructors I have had in the past seem to want me to be more adventurous in making use of my own ideas.	(1)	(2)	(3)	(4)	(5)	(6)
21. I find it better to start straight away with the details of a new topic and to build up an overall picture that way.	(1)	(2)	(3)	(4)	(5)	(6)
22. I spend a good deal of my spare time finding out more about academic/professional topics that interest me.	(1)	(2)	(3)	(4)	(5)	(6)
23. When I have previously taken courses I read other books as well as the study materials and set texts.	(1)	(2)	(3)	(4)	(5)	(6)
24. I find I have to concentrate on memorizing a good deal of what I have to learn.	(1)	(2)	(3)	(4)	(5)	(6)
25. I think that it is important to look at problems rationally and logically without making intuitive jumps.	(1)	(2)	(3)	(4)	(5)	(6)
26. Although I generally remember facts and details, I find it difficult to fit them together into an overall picture.	(1)	(2)	(3)	(4)	(5)	(6)
27. My main reason for taking distance education courses is that it will help my career.	(1)	(2)	(3)	(4)	(5)	(6)
28. I read widely.	(1)	(2)	(3)	(4)	(5)	(6)
29. In the past I have found academic topics so interesting that I have continued to pursue them.	(1)	(2)	(3)	(4)	(5)	(6)

Any comments?

THANK-YOU FOR COMPLETING THIS QUESTIONNAIRE.

Appendix B

Distance Education Post-Assessment Package

DISTANCE LEARNING QUESTIONNAIRE #2

PLEASE CIRCLE THE NUMBER THAT BEST DESCRIBES YOUR LEARNING EXPERIENCE IN RELATION TO THE <u>DISTANCE EDUCATION COURSE YOU ARE NOW COMPLETING</u>:

Remember to answer <u>both sides</u> of each sheet.

	Definitely Agree	Agree	Disagree	Definitely Disagree	Don't Know	N/A
1. For this course, I put a lot of effort into trying to understand things that seemed difficult at first.	(1)	(2)	(3)	(4)	(5)	(6)
2. I read other books in addition to the study materials and set texts.	(1)	(2)	(3)	(4)	(5)	(6)
3. My spouse/family offered support while I was studying.	(1)	(2)	(3)	(4)	(5)	(6)
4. I suppose I was more interested in the qualifications I'd get than in this course.	(1)	(2)	(3)	(4)	(5)	(6)
5. I went out a lot, rather than studying this semester.	(1)	(2)	(3)	(4)	(5)	(6)
6. I found communicating by telephone to be useful.	(1)	(2)	(3)	(4)	(5)	(6)
7. I took this course mainly to improve my chances of job advancement.	(1)	(2)	(3)	(4)	(5)	(6)
8. Personal/family circumstances, unseen at the time of enrollment, affected my progress in this course.	(1)	(2)	(3)	(4)	(5)	(6)
9. My main interest for doing this course was to learn more about something that really interests me.	(1)	(2)	(3)	(4)	(5)	(6)
10. As I read the course materials, I tried to memorize important facts that might be useful later.	(1)	(2)	(3)	(4)	(5)	(6)
11. The type of work required by assignments was very different from what I expected.	(1)	(2)	(3)	(4)	(5)	(6)
12 Telephone conversations with the tutor were a waste of time in this course.	(1)	(2)	(3)	(4)	(5)	(6)
13. I have a busy social life.	(1)	(2)	(3)	(4)	(5)	(6)
14. This course was not offered at the most suitable time in the year.	(1)	(2)	(3)	(4)	(5)	(6)
15. I usually spend a lot of time with my family.	(1)	(2)	(3)	(4)	(5)	(6)
16. I found that the topics in this course were often really exciting.	(1)	(2)	(3)	(4)	(5)	(6)
17. My work mates encouraged me to study.	(1)	(2)	(3)	(4)	(5)	(6)

	Definitely Agree	Agree	Disagree	Definitely Disagree	Don't Know	N/A
18. I usually didn't have the time to think about the implications of what I read for this course.	(1)	(2)	(3)	(4)	(5)	(6)
19. I often found myself questioning things that I read in the book(s) or study guide.	(1)	(2)	(3)	(4)	(5)	(6)
20. I was ill during this course, so I found it difficult to keep up.	(1)	(2)	(3)	(4)	(5)	(6)
21. I chose this course more from the way it fits with my career plans than from my own interests.	(1)	(2)	(3)	(4)	(5)	(6)
22. The time allowed for completing the course is too short.	(1)	(2)	(3)	(4)	(5)	(6)
23. I enjoy reading so I am well suited to distance education courses.	(1)	(2)	(3)	(4)	(5)	(6)
24. My children interfered with my studies.	(1)	(2)	(3)	(4)	(5)	(6)
25. I spoke with the tutor on the telephone often.	(1)	(2)	(3)	(4)	(5)	(6)
26. The course activities and assignments helped me to learn.	(1)	(2)	(3)	(4)	(5)	(6)
27. This course was administered very efficiently.	(1)	(2)	(3)	(4)	(5)	(6)
28. The support of my family meant a lot to me this semester.	(1)	(2)	(3)	(4)	(5)	(6)
29. The tutor in this course seemed to delight in making the simple truth unnecessarily complicated.	(1)	(2)	(3)	(4)	(5)	(6)
30. I often wondered whether all the study was worth the effort.	(1)	(2)	(3)	(4)	(5)	(6)
31. I found the study guide was useful in preparing for this course.	(1)	(2)	(3)	(4)	(5)	(6)
32. I found I had to concentrate on memorizing a good deal of what I had to learn for this course.	(1)	(2)	(3)	(4)	(5)	(6)
33. I am very determined to finish this course.	(1)	(2)	(3)	(4)	(5)	(6)
34. The learning materials were presented in a confusing way.	(1)	(2)	(3)	(4)	(5)	(6)
35. My friends wanted me to go out rather than study.	(1)	(2)	(3)	(4)	(5)	(6)
36. In general, I feel I learned a lot from this course.	(1)	(2)	(3)	(4)	(5)	(6)
37. I preferred to spend time doing things other than studying for this course.	(1)	(2)	(3)	(4)	(5)	(6)
38. This semester, I did not let anything interfere with studying for this course.	(1)	(2)	(3)	(4)	(5)	(6)

	Definitely Agree	Agree	Disagree	Definitely Disagree	Don't Know	N/A
39. I spent a good deal of my spare time finding out more about interesting topics in the course.	(1)	(2)	(3)	(4)	(5)	(6)
40. When tackling a new topic in this course, I often asked myself questions about the topic that the new information should answer.	(1)	(2)	(3)	(4)	(5)	(6)
41. A change in my work situation made it difficult to complete this course.	(1)	(2)	(3)	(4)	(5)	(6)
42. My family encouraged me to take this course because they thought the course would be important for my career.	(1)	(2)	(3)	(4)	(5)	(6)
43. For this course, I often found I had to read things without having the opportunity to really understand them.	(1)	(2)	(3)	(4)	(5)	(6)
44. My spouse became annoyed because I spent so much time studying.	(1)	(2)	(3)	(4)	(5)	(6)
45. In general, I read widely.	(1)	(2)	(3)	(4)	(5)	(6)
46. I found the topics so interesting that I intend to continue learning about them after this course is finished.	(1)	(2)	(3)	(4)	(5)	(6)
47. My employer was supportive while I was studying.	(1)	(2)	(3)	(4)	(5)	(6)
48. For this course, I found that the best way for me to understand what the technical terms meant was to remember the textbook definitions.	(1)	(2)	(3)	(4)	(5)	(6)
49. I didn't need the support of my spouse/family to succeed in this course.	(1)	(2)	(3)	(4)	(5)	(6)
50. A change in my work left me without enough time for study.	(1)	(2)	(3)	(4)	(5)	(6)
51. Because I work long hours I found it difficult to study for this course.	(1)	(2)	(3)	(4)	(5)	(6)
52. The tutor's comments on my assignments helped me to learn in this course.	(1)	(2)	(3)	(4)	(5)	(6)
53. The assignments in this course were too difficult.	(1)	(2)	(3)	(4)	(5)	(6)
54. I seemed to have so many other things to do that there was never enough time for study.	(1)	(2)	(3)	(4)	(5)	(6)
55. A telephone conversation with the tutor provided help when I needed it.	(1)	(2)	(3)	(4)	(5)	(6)
56. The study guide in this course was easy to learn from.	(1)	(2)	(3)	(4)	(5)	(6)
57. I often considered dropping out of this course.	(1)	(2)	(3)	(4)	(5)	(6)

	Definitely Agree	Agree	Disagree	Definitely Disagree	Don't Know	N/A
58. I did not understand a lot of the vocabulary in the study materials.	(1)	(2)	(3)	(4)	(5)	(6)
59. I set out to understand thoroughly the meaning of what I was asked to read for this course.	(1)	(2)	(3)	(4)	(5)	(6)
60. Long hours at work left little time for course work.	(1)	(2)	(3)	(4)	(5)	(6)
61. My main reason for taking this course was that it will help my career.	(1)	(2)	(3)	(4)	(5)	(6)
62. I find that what I learned in this course will be extremely useful.	(1)	(2)	(3)	(4)	(5)	(6)

63. Please describe what you think the content/subject matter of this course was about. (One way of doing this would be to imagine you are telling a friend the sorts of things you thought the instructor was trying to teach you and wanted you to learn in this course.)

64. In your opinion, what kind(s) of learning do you think the tutor expected in this course? (Indicate more than one if appropriate.)

_____   Knowledge   (Recall of Information)

_____   Comprehension   (Interpret information in one's own words)

_____   Application   (Apply knowledge or generalization to a new situation)

_____   Analysis   [Break down information into its constituent parts]

_____   Synthesis   (Bring together parts of knowledge to form a whole and build relationships for new situations)

_____   Evaluation   (Make judgments on the basis of given criteria)

_____   Other   Please explain:

Any comments?

THANK-YOU FOR COMPLETING THIS QUESTIONNAIRE.

Appendix C

Coding Examples of Student SOLO Responses and their Identified Level

<u>Student Responses and Their Identified SOLO Level</u>

1. *Uni-structural:* Those responses that focus on one issue/aspect of the course. For example:

The course I am taking is helping me to improve my writing in

English. Going through different technics [<u>sic</u>], it is easier to write an

article later on. (Effective Written Communication)

2. *Multi-structural:* Responses that describe or list some or all areas of study without linking them in any way. For example:

The course helped you in pinpointing exceptional children. Taught

you approaches and strategies and different types of exceptionalities-

How to test them to evaluate to deal with them what to expect.

(Learning and Behavioral Problems in Children)

3. *Probably Multi-structural:* Responses that have multi-structural elements but cannot with any certainty be described as multi-structural. For example:

The course was about computer programming (Introduction to Logo

Writer). While designed for children in elementary schools and having

done BASIC at times I found the course quite tedious, but overall the

skills learned were quite valuable. In general a turtle figure is used to create

figures or draw lines then these skills are combined to write procedures, then procedures are put together to write programs. (Logo)

4. *Probably Relational:* Responses that exhibit some elements of relational but the elements are not expressed strongly enough to say with certainty that they are relational. For example:

I feel this course was about real world writing as opposed to academic university paper type writing. Being able to choose assignments and topics offered a real opportunity to be autonomous and to work on subjects and products that were of interest/concern to me and to write for real readers- peers, friends, etc. rather than one professor. I loved this course- worked harder than I thought I would but felt proud of the results. (Effective Written Communication)

5. *Relational:* Responses that describe the course as a whole. The areas of study are described in such a way that the student appears to be seeing these areas as parts of a whole rather than as distinct parts. For example:

Learning and Behavioral Problems in Children is an introduction to children who require special education programmes because of physical or mental, or emotional impairment. It examined in detail the special needs, reasons for the handicaps and the factors influencing their

learning and behavior. Instructional techniques and strategies for the classroom were also reviewed. A greater knowledge of the problems faced by these children and the special techniques used to help them will definitely help me in handling such students in the regular classroom. (Learning and Behavioral Problems in Children)

Appendix D

<u>Bloom's Taxonomy of the Cognitive Domain</u>

BLOOM'S TAXONOMY
COGNITIVE DOMAIN

1. KNOWLEDGE: the recall of specifics and universals, the recall of methods and processes, or the recall of a pattern, structure, or setting.

2. COMPREHENSION: refers to a type of understanding or apprehension such that the individual knows what is being communicated and can make use of the material or idea being communicated without necessarily relating it to other material or seeing its fullest implications.

3. APPLICATION: the use of abstractions in particular and concrete situations (i.e., general ideas, rules of procedures, generalized methods, technical principles, ideas, theories).

4. ANALYSIS: breakdown of a communication into its constituent elements or parts such that the relative hierarchy of ideas is made clear and/or the relations between the ideas expressed are made explicit.

5. SYNTHESIS: the putting together of elements and parts so as to form a whole.

6. EVALUATION: judgements about the value of material and methods for given purposes. Quantitative and qualitative judgements about the extent to which material and methods satisfy criteria.

Appendix E

<u>1990 Letter to Instructors</u>

McGill

Nancy

Centre for University Teaching and Learning Centre d'enseignement supérieur   (514) 392-6648
McGill University   Université McGill
3700 McTavish Street   3700, rue McTavish
Montreal, Quebec   H3A 1Y2   Montréal, Québec   H3A 1Y2

October 24, 1990

Dear Distance Education Instructor,

Many of you already have some information about the research project we are conducting concerning the instructional role of communication technologies in distance education. This project is funded by FCAR (Fonds pour la formation de chercheurs et l'áide à la recherche) for a three year period which began September 1990. In this first year, the project has employed two M.A. students from the Dept. of Educational Psychology and Counselling, who will be doing their theses in conjunction with the project (Helene Rogerson and Nancy Price). We are lucky indeed to have this funding and we would like to take this opportunity to further inform you about how you may aid us in carrying out this research. The attached sheet provides you with some background information concerning the research study and a brief outline of the procedures we will follow for each of the three years.

As you will see, one of the procedures we will be carrying out involves the analysis of both E-mail and FAX communications. Peter Burpee has told me that he has asked all of you to save these communications from the courses you are presently teaching - we are interested in both sides of the transmission (i.e., both instructor and student messages). If you choose to allow us to analyze the communications you save, please be assured they will be treated completely anonymously. In fact, we would appreciate your help in removing student names from communications before we look at them. Neither will your name be used at any point in the analysis, we will only need to separate instructor from student transmissions. We are also interested in taking a look at communications which have been saved from courses taught previously.

This letter is meant to provide initial information, we will be personally contacting each of you in the near future to ascertain your permission and to discuss any questions you may have. Thank you very much.

Sincerely,

Cheryl Amundsen

Project Title: An Investigation of the Instructional Role of
Communication Technologies in Distance Education

Background (in brief) to the Research Study:

Distance education has, in the last fifteen years, become a viable and useful instructional mode in postsecondary education. However, distance education has often been criticized for offering only a "second rate" education (Keegan, 1986; Wedemeyer, 1981). Such criticism most often focuses on the lack of interpersonal communication between the student and instructor and among students. This lack of communications is considered to increase the possibility of students being simply "passive consumers of knowledge" rather than active learners (Rumble, 1983). Modern communication technologies have the potential of providing this missing component. Therefore, an investigation of the instructional use of these technologies is an area of critical concern for both distance learners and distance teaching programs and is the focus of this research study.

Progression and Procedures of the Research Study:

During the first year, the research will focus on establishing the role of mediated communication by coding E-mail and FAX communications using a discourse analysis procedure. The focus of the second year will be the investigation of student factors (e.g., computer experience and accessibility, available time, attitudes, etc.) and other factors (e.g., instructor's directions, course requirements, time delay in responding to communications, etc.) which may influence both the quality and quantity of student communications. A questionnaire will be developed and instructional materials will be collected to gather information about student, instructor and course factors. Finally, during the third year, an instructional comparison will be made of the two communication technologies in use. A questionnaire evaluating the effectiveness of various characteristics as they relate to the accomplishment of course objectives will be administered to both students and instructors. The resulting questionnaire data will be viewed against the actual communications resulting from each course.

Both quantitative and qualitative methods will be used in this research but emphasis will be on the collection of data in field situations using multiple sources and multiple methods which can then be triangulated (Miles & Huberman, 1984).

Keegan, D.J. (1986). The Foundations of Distance Education. London: Croom Helm.

Miles, M. & Huberman, A. (1984). Qualitative Data Analysis: A Sourcebook of New Methods. Beverly Hills: Sage Publications.

Rumble, G. (1989). On defining distance education. The American Journal of Distance Education, 3(2), 8-21.

Wedemeyer, C. (1981). Learning at the Back-door. Madison, WI: University of Wisconsin.

Appendix F

<u>1991 Letter to Instructors</u>

Date: October 22, 1991

To: Peter Burpee and Distance Education Tutors

From: Cheryl Amundsen   (Helene Rogerson, Nancy Price)

Re: Distance Education Research Project: Report on the first
             year's activities

September 1 marked the end of the first year (of a 3 year period)
of the distance education research project funded by FCAR (Fonds
pour la formation de chercheurs et l'aide a la recherche). As you
will recall, the primary purpose of this project is to investigate
the communication between instructor and students, especially as
it involves FAX or E-mail. Our specific objectives are as follows:

   1) To identify the different purposes for which students and
   instructors use the communication systems available to them.

   2) To investigate to what extent the communications between
   instructor and student reflect the course learning objectives.

   3) To determine both the internal factors (student attitudes,
   computer experience, etc.) and external factors (nature of
   response, course requirements, etc.) which influence both the
   quality and quantity of communications.

   4) To identify the particular instructional characteristics
   of FAX and electronic mail which may influence their
   appropriateness for various learning outcomes.

Helene Rogerson (a graduate student in Ed. Psych.) is addressing
the first two objectives. She contacted many of you last year
about saving the communications from your class; she may be
following up with some of you again. She has completed a review
of the pertinent literature in this area and we have spent some
time considering the appropriate methodologies for addressing our
research question. She is now in the process of preparing the data
for analysis. She hopes to complete the analysis by the early
Fall. Cheryl and Helene prepared and presented a paper on this
part of the research program at CIPTE (Conseil interinstitutionnel
pour le progrès en technologie éducative). If any of you are
interested in a copy of the paper (it is written in French), please
let Cheryl know.

Nancy Price is addressing the third objective. You will be hearing
from her this coming year as she will need your cooperation in the
formative evaluation of a student questionnaire and in providing
specific information about your course design. Nancy has completed
an extensive review of the literature concerning student factors

in distance education. She has also been collaborating with two researchers in Hong Kong on the adaptation of a questionnaire which they have developed. They are interested in further validation of this questionnaire based on other populations. We plan to have her literature review in a publishable format by January and will certainly make it available to any of you who may be interested.

Dr. Robert Bernard of Concordia University and Cheryl have been lucky enough to receive further funding for research in distance education (i.e., SSHRC (Social Sciences and Humanities Research Council of Canada research grant for 1991-1994). This grant is entitled, "The Development and Validation of a Model of Learning Success in Distance Eduction". This work will provide a theoretical and practical framework for our present FCAR grant and future work of interest to both Bob and Cheryl.

We want to thank you for your cooperation this past year and encourage any of you who are interested in more information about this project to contact Cheryl (398-6648 - McGill Centre for University Teaching and Learning).

Appendix G

<u>**Instructor Interview Questions**</u>

INSTRUCTOR QUESTIONS:

-How did you become involved in the area of distance education?

-Can you go back to when you were designing the course and share your thoughts at that time? (probe: What were your major considerations during the design process?)
-Were there any guidelines given to you for the course design?

-In your course, how important is it for you to have regular contact with your students?
-Why did you communicate with your students?
-Why do you think they communicated with you?
-Would you consider the communication technologies to be effective?
-Why or why not?

-If you were redesigning the course, what would you do the same or differently?
-Why?

-How would you describe the subject matter of the course? (**SOLO:** One way of doing this is to imagine you are telling a friend or colleague what you taught and what you wanted your students to learn in this course.)

-What should students have learned by the end of this course?

-How is student learning evaluated in your course?
-What influenced your decision to evaluate learning in this way?

-Thus far, do you think the students have accomplished the learning goals of the course?
-Why or why not?

Appendix H

<u>Student Letter #1</u>

Dear Distance Education Student,

We would greatly appreciate it if you would complete the attached questionnaire. Because we understand that you are a busy person, we have designed the questionnaire to take a maximum of ten minutes to complete. The information you provide will help us to better understand the process of learning at a distance.

A second questionnaire will be sent to you just prior to the completion of your distance education course. This questionnaire will ask for your perceptions of your own learning process.

Your responses to these questionnaires are strictly confidential and are in no way related to course grades. At no time will names be attached to responses; we are interested in considering responses on a group basis, not on an individual basis. Although both the course instructors and the program director, Peter Burpee, support our work, our findings will not be discussed with them until they are available in final report form. We estimate that this report will be available by September, 1992.

We thank you for taking the time to complete this questionnaire. (Enclosed is a self-addressed, stamped envelope.) If you are interested in receiving a copy of our final report, please indicate so by returning the attached form. If you have any questions, please contact Cheryl Amundsen at the McGill Centre for University Teaching and Learning: 398-6648.

Sincerely,

Cheryl Amundsen, Ph.D., Researcher   Nancy Price, M.A. Student
McGill Distance Education Program   McGill Educational Psychology Department

Please send me a copy of the final report concerning the investigation of learning in distance education.

Name: _____

Address: _____

_____

_____

_____

Appendix I

<u>Student Follow-up Letter #1</u>
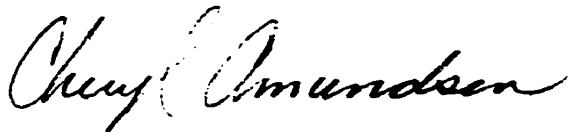
Dear Distance Education Student,

We have already received a number of completed questionnaires concerning learning at a distance. If you have not yet completed and returned the questionnaire, we ask you to please consider doing so.

The questionnaire is designed to take a maximum of ten minutes to complete. Your responses are strictly confidential and are in no way related to course grades. Furthermore, the number at the bottom of the questionnaire ensures that students are not identified by name.
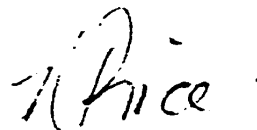
For your convenience, a copy of the questionnaire is enclosed along with a self-addressed, stamped envelope. If you have already returned the questionnaire, we thank you for your participation and remind you that a second questionnaire will be sent to you just prior to the completion of your distance education course. This questionnaire will ask for your perceptions of your own learning process.

We estimate that the findings of our research will be available in final report form by the summer of 1993. If you are interested in receiving a copy of the final report, please indicate so by returning the form attached to the questionnaire. If you have any questions, please contact Cheryl Amundsen at the McGill Centre for University Teaching and Learning: 398-6648. We look forward to your correspondence.

Sincerely,

Cheryl Amundsen, Ph.D., Researcher
McGill Distance Education Program

Nancy Price, M.A. Student
McGill Educational Psychology Department

Appendix J

Student Letter #2

Dear Distance Education Student,

We would like to take this opportunity to thank all of you who took the time to complete and return our first questionnaire concerning learning at a distance. We are now sending you the second questionnaire. This questionnaire is longer than the first but should require no more than fifteen minutes of your time to complete. This time, you will be asked to explore your perceptions of your learning process(es) in the distance education course you are currently finishing. Please complete this questionnaire regardless of whether you have withdrawn from your distance education course.

Because your responses are critical to our research, we will send you a $5.00 bill in return for your completed questionnaire. In addition to the envelope addressed to McGill (put the completed questionnaire in this envelope) you should have received Monopoly money and an envelope addressed to you. Simply place the Monopoly money in the envelope addressed to you and return it along with your questionnaire to McGill. Upon receiving your questionnaire, we will substitute the Monopoly money for a $5.00 bill and mail it to you.

Your responses to the questionnaire are strictly confidential and are in no way related to course grades. At no time will names be attached to responses; the number at the bottom of the questionnaire ensures that students are not identified by name.

Please return the completed questionnaire in the enclosed envelope. We estimate that the findings of our research will be available in final report form in the summer of 1993. If you are interested in receiving a copy of the final report, and you have not already submitted a request for one, please do so by returning the attached form.

If you have any questions, please contact Cheryl Amundsen at the McGill Centre for University Teaching and Learning: 398-6648. Thank you again for your cooperation. Happy holidays!

Sincerely,

Cheryl Amundsen, Ph.D.   Nancy Price, M.A. Student
McGill Distance Education Program   McGill Educational Psychology
                                          Department

Appendix K

<u>Student Follow-up Letter #2</u>

Dear Distance Education Student,

If you have yet to complete and return the Distance Learning Questionnaire #2, we ask you to please consider doing so. This is the last opportunity we have to obtain your input concerning learning in distance education. We would like to emphasize how important your input is to our research. We believe that students can make an enormous contribution towards improving the quality of distance education.

The Distance Learning Questionnaire #2 explores your perceptions of your own learning process in relation to the distance education course(s) you have just finished and it should require no more than fifteen minutes of your time to complete. (Another copy of the questionnaire is enclosed for your convenience.) Responses to this questionnaire are strictly confidential and are in no way related to course grades.

Please return the completed questionnaire in the enclosed envelope. We estimate that the findings of this research project will be available in final report form by the fall of 1992. If you are interested in receiving a copy of this final report, and you have not previously submitted a request for one, please do so by returning the form at the bottom of this letter.

If you have any questions, please contact Cheryl Amundsen at the McGill Centre for University Teaching and Learning: 398-6648. We hope to receive your completed questionnaire shortly and thank you again for your cooperation. Have a great summer!

Sincerely,

Cheryl Amundsen, Ph.D.   Nancy Price, M.A. Student
McGill Distance Education Program   McGill Educational Psychology Department

- -

Please send me a copy of the final report concerning the investigation of learning in distance education.

Name: _____
Address: _____
              _____
              _____
              _____

Appendix L

Coding Examples of Instructor SOLO Responses and their Identified Level

Instructor Responses and Their Identified SOLO Level

Introduction to Logo: <u>Relational</u> SOLO Level

The nicest thing that one student mentioned about this- the way the course is laid out ... it's kind of like building blocks. You build upon what you learn the last time constantly throughout the course so if you were starting a project you could start it with a very simple thing at the beginning and at the very end it could be very complex because as you've gone along week to week you've learned how to refine it further.

They are the programmers ... learning the basics of Logo programming ...being able to put it together to create things. The thing that I want them to get most out of this by the end is being able to manipulate what they've learned with Logo to be able to create tools that are useful for them because so many times you take a course and at the end it's like oh that was fun but ya okay that gets put on the shelf for a while you know it's not something that you're going to use- but this is something that can be used to make- especially for children who having difficulty or to enrich students you can make little programs that they can sit down and you

can design it yourself to meet their needs so it would work, the only drawback is that ... because it is very time consuming to do it.

Learning and Behavioral Problems in Children: <u>Probably Relational</u> SOLO Level

I'd say it's a knowledge course.

Well, first of all, they get... the theoretical aspects in terms of types of exceptionality, the theory part.

It looks at all the exceptionalities and the process... and the emphasis that I have in the course is really to look at the various teaching strategies and curriculum adjustments and so on. Especially those a teacher in a classroom could, you know, use.

Effective Written Communication: <u>Relational</u> SOLO Level

So what we absolutely insist on maintaining is that there is a workshop... which means they will go through the writing process ...Ya, which means that they would share their brainstorming, they would share their organization, they would share the first draft, they would talk about the umm the exercise, they would look

at ... what sorts of things in the larger scheme might impact upon this, they'll look at their goals and their purpose and all that stuff so that every step of their thought process they've discussed with each other. Then they share a draft.

You see every one of them has to fill out a writing inventory where they're talking about their own strengths and weaknesses and what they need to work on and what sorts of work they do on the job and you know, what sorts of problems they've been having and how they dealt with them and they have to answer a whole bunch of things. They're right in our textbook. All our students have to do this and so really the course is an individual order. It's really structured around the individual's needs.

So it's all, the whole course is a process, the assignment is a process, uhh I don't know of any other courses like this.