# LEARNER RESPONSES TO TELEVISION IN DISTANCE EDUCATION: THE NEED FOR A QUALITATIVE APPROACH TO RESEARCH

by

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## Abstract

Despite the worldwide growth of distance education and over 30 years of media research, we know very little about the role and effects of television and other media in delivering distance education. Questions such as: "What media should be used to deliver instruction?" or "Does television or any medium or format within a medium have an advantage over any other in terms of student achievement and satisfaction?" have not been properly addressed by research. This study examines approaches that characterize past and present research and offers a model for further research to address unanswered questions about the role of television in distance education.

The study argues that there are two main reasons why research has failed to adequately answer questions about the use of television in distance education: the dominance of experimental or quasi-experimental research methods, and the assumption of a quantitative conception of knowledge. There is a limited amount of experimental research and what there is has methodological flaws. Most research in distance education is classified as quasi-experimental, but much of this is also methodologically weak and is criticized for trading off internal validity for ecological validity. The

hypothetico-deductive paradigm in which most of the research has been conducted assumes a quantitative conception of knowledge which views learning as essentially a reproductive process. As a result, researchers have examined and compared achievement and attitudes in narrow quantitative terms. This has been difficult to accomplish in properly controlled experiments, so we are left with results that not only are inconclusive about the quantity of learning, but also reveal little about the quality of learning.

This study proposes an approach that is based on a qualitative conception of knowledge and that uses both quantitative and qualitative research methodologies. The qualitative approach attempts to examine phenomena from the perspective of the subject as it occurs in the natural setting. The qualitative conception of knowledge views learning as a process in which the learner actively interprets, adapts and applies the knowledge or information he or she acquires. There is less emphasis on "how much is learned" and more on "what is learned".

The study concludes with a proposal that illustrates how qualitative and quantitative methodologies can be combined to examine the processes and outcomes of learning and student attitudes in a multi-media distance

education course. From this exploratory study issues in distance education would emerge providing direction for further research.

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# Chapter I - Introduction

## The Problem

Distance education has become a widespread and accepted method of teaching and learning. In both developed and developing countries it is providing access to higher education for a rapidly growing number of students (Holmberg, 1981; Neil, 1981; Daniel et al., 1982). In Canada, the growth of distance education began in the early 1970's and has occurred at two levels. On one level more and more conventional universities and colleges have created or expanded existing extension departments, while, on another level, three distance education institutions have been established: Athabasca University in Alberta, The Open University in British Columbia, and Télé-Université in Quebec (Burge, Wilson & Mehler, 1984). In the United States, Peterson's Catalog for Independent Study lists 72 universities offering over 12,000 distance education courses (Hunter, 1983); and Lewis (1983) has listed 50 more institutions such as colleges and professional associations that also offer courses by distance education.

Despite the worldwide growth of distance education, we are still at an exploratory stage in terms of distance education research. There is evidence that

learning at a distance is as effective or more effective, in terms of student achievement, than learning in the classroom and research indicates that learning will occur no matter what medium we use to deliver the instruction to students at a distance, whether it is print, television, audio or video tape (Schramm, 1977b; Smith, 1983). But on a practical level distance education research has not been very helpful. "Media research in post-school education has not provided decision-makers with practical, valid, dependable guidelines for making choices on the basis of instructional effectiveness" (Campeau, 1974, p. 62). To make matters worse, the quality of comparative research in distance education has been seriously questioned (Bates, 1981b; Prosser, 1984; Chacon-Duque, 1985; Shavelson, Webb, & Hotta, 1987).

As a result of the shortcomings of research, much of the instructional design in distance education is based on the intuition of the course designers and authors, resource limitations dictated by administrators and the political considerations of the policy makers. In effect, many of the instructional design decisions are arbitrary and not based on any sound theory or research (Campeau, 1974).

In Great Britain, Canada and the United States, for example, television is used heavily in distance education. This is not because it has proven to be more effective than any other medium; the research has been equivocal on this point (Schramm, 1977b). The reason, according to Gallagher (1978), is political. Television is visible and thus was used as a way of raising the visibility of distance education institutions in their early days when political and public support was seen as necessary.

But distance education has matured and should no longer be seriously questioned as a way of delivering instruction. What is important now is to look critically at the design of distance education courses and how students use the course materials. The use of non-print media in distance education can be extremely expensive, yet we know very little about the effectiveness, in terms of student learning and student attitudes, of different media. What media should be used to deliver instruction? Does any medium or format within a medium have an advantage over any other in terms of student achievement and satisfaction? Research, thus far, has not been able to answer these questions yet they need to be answered with some degree of certainty so that instructional design in distance

education can be based on a rational and theoretical research base.

## Purpose

This study is an attempt to begin the process of answering these questions; a process that involves a fundamental reassessment of the approach to research in distance education that has been followed thus far. The study begins with a critical examination of literature and research in this field and concludes with a specific proposal for further research using an alternative approach.

Two aspects of past research will be examined in detail: the approaches taken by researchers, and the findings as they apply to the use of television. In examining the research approaches, two factors stand out clearly: the dominance of experimental or quasi-experimental methodologies; and the assumption of a quantitative conception of knowledge. The significance of the research findings is that they have been neither consistent nor meaningful. This study argues that these three factors, the dominance of the experimental methods, the assumption of a quantitative conception of knowledge, and the lack of meaningful and consistent results are evidence of the need for a change of approach; one that is based on a qualitative conception

of knowledge and that uses both qualitative and quantitative research methodologies.

The study concludes with a proposal for further research that employs this approach. The proposed research would be an exploratory study to examine the processes and outcomes of learning and student attitudes in a distance education course that consists of video tapes, audio teleconferences and a course manual. These aspects would be examined in relation to the different components of the course.

## Definitions

### Distance Education

Holmberg (1977) defines "distance education" as that which:

> covers the various forms of study at all levels which are not under the continuous, immediate supervision of tutors present with their students in lecture rooms or in the same premises but who nevertheless, benefit from the planning, guidance and tuition of a tutorial organization (p. 9).

A somewhat shorter, but more direct definition is provided by Moore (1975) in his description of telemathic teaching, "those teaching methods in which because of the physical separateness of learners and teachers, the interactive, as well as the preactive

phase of teaching, is conducted through print, mechanical, or electronic devices" (p. 5).

Desmond Keegan (1980) provides the most complete definition:

> The main elements of a definition of distance education are:
>
> - The separation of teacher and learner, which distinguishes it from face-to-face learning;
> -the influence of an educational organization, which distinguishes it from private study;
> - the use of technical media, usually print, to unite teacher and learners and carry the educational content;
> - the provision of two-way communication so that the student may benefit from or even initiate dialogue;
> - the possibility of occasional meetings for both social and didactic purposes; and
> - the participation in an industrialized form of education which, if accepted, contains the genus of radical separation of distance education from other forms (p. 33)

Any one of these definitions would suffice, but for the purposes of this study the following will be used: essentially distance education is any form of education in which, for most of the learning, there is a physical

separation of the teacher and the learner. This allows for traditional correspondence courses, telecourses, courses that are delivered entirely by television or other non-print media or instruction that includes occasional face to face meetings.

Videotaped and Audiotaped Lectures

The term "videotaped" or "audiotaped lecture" is used in this study to refer to scripted or "ad libbed" lectures delivered by faculty members in a studio and recorded on video or audiotape. There is minimal use of visual aids or editing to enhance the production value of the videotapes. In general, the only visual aids used are full frame graphics to identify key points or terms and the occasional photograph, slide or other illustrative materials.

Research Paradigms

A paradigm is a framework used to categorize ideas, concepts, events, issues - phenomena - which share some underlying attributes. Achenbach (1978) describes it as a "schematic model for representing phenomena and the relations among them. It provides terms and categories into which complex 'real world' phenomena are translated in order to make them easier to grasp and study" (p. 20).

Two research paradigms are discussed in this study: the hypothetico-deductive paradigm and the qualitative paradigm. The "terms and categories" that each provides are the research methodologies and conceptions of knowledge. In the case of the hypothetico-deductive paradigm this means the experimental or quasi-experimental methods adopted from the natural sciences and a quantitative conception of knowledge. In the qualitative paradigm, it is the qualitative methodologies originating in sociology and anthropology and a qualitative conception of knowledge. However, there is not a clear division between the two paradigms and their associated "terms and categories". A paradigm is only a general conceptual system and often researchers who accept one paradigm may not accept all of the constructs normally associated with it (Achenbach, 1978; Firestone, 1987; Howe, 1988).

The Hypothetico-deductive paradigm. This is the predominant paradigm in educational research and all of the research reviewed in this paper was conducted within it. It has been adopted from the natural sciences and has been referred to as the agricultural-botanical experimental paradigm because of its origins in agricultural experimental research (Parlett & Hamilton, 1972) or the positivist paradigm because of its

philosophical foundations (Howe, 1988). In this paradigm knowledge is viewed as something that can only be objectively discovered by observation that is free of interests, values and purposes. It uses a deductive form of logic in which a hypothesis is formulated as to the effects of a particular treatment; an experiment is conducted, usually following the scientific experimental method; and the hypothesis is either accepted or rejected (Campbell & Stanley, 1963). According to Entwistle (1984) this paradigm implies "reductionism and the use of formal or mechanical models which embody assumptions about chains of causality" and it attempts to explain "student behaviour from the outside, as a detached, objective observer"(p. 12).

The Qualitative paradigm. The qualitative paradigm (also referred to as humanist or interpretist) views knowledge as subjective and socially constructed. There is not an objective reality but multiple realities constructed by individuals interpreting the phenomena they encounter. Observation cannot be free of human intentions and beliefs because these are considered part of the individual's reality (Hirschman, 1986). Instead of attempting to explain student behaviour from the outside, it "involves approaches to research rooted in phenomenology which derive from a direct exploration of

students' experiences of learning...[it] seeks an emphathetic understanding of what is involved in student learning derived from students' descriptions of what learning means to them. It involves a shift not just of methodology, but of perspective" (Entwistle, 1984, p. 12). In contrast to the agricultural and botanical origins of the hypothetico-deductive paradigm, the qualitative paradigm derives from methods used by sociologists and anthropologists who were seeking to understand different cultures (Bogdan & Biklen, 1982; Smith, J.K. 1983; Jacob, 1987; Fetterman, 1988)

Methodologies

The Experimental method. This method is closely associated with the hypothetico-deductive paradigm. A treatment is applied under controlled conditions; effects are measured and the results are analyzed using statistical procedures to determine significance.

The Quasi-experimental method. This is a variation of the experimental method in which the researcher does not have complete control over all variables or where samples cannot be drawn randomly from the population (Campbell & Stanley, 1963). This method is used heavily in educational research because of the amorphous nature of learning (in contrast to something such as the growth of corn or wheat). Use of the quasi-experimental method

usually involves trade-offs between internal and external validity.

Qualitative research methods. There are several different qualitative methods but all place the emphasis on "what is learned" rather than "how much is learned". Becker (1968) and Perry (1970) followed a social anthropological method in their attempt to understand student social and academic life and intellectual and ethical development. In Becker's study, the researchers became participant observers by attending classes and social functions, taking detailed field notes and discussing their observations with the students. "Their analyses involved reading and re-reading their field-notes and also lengthy discussions among the research team to establish their main conclusions. They illustrated their findings through the use of comments made by students which had been selected as typical of a generally expressed view" (Entwistle, 1984, p.14).

In Perry's (1970) study, open-ended interviews with hundreds of students were conducted and then analyzed using a method similar to that of Becker (1968).

Miller & Parlett (1972) refined the methods of Becker and Perry and developed what they called "illuminative evaluation". In addition to participant observation, they used semi-structured interviews and

questionnaires. The analysis was similar to that of Becker and Perry, but they used a panel of independent judges to cross-check the researchers' interpretation of the common themes.

Researchers of the phenomenographic tradition in Sweden have gone one step further and developed what they call "rigorous qualitative analysis".(Entwistle, 1984) Their data is derived from semi-structured interviews with students discussing their learning experiences. The learning takes place either in "naturalistic" or "natural" settings. Naturalistic settings are experimental settings using realistically complex learning materials. "They resemble normal studying in important respects, but retain elements of experimental control and manipulation." (Entwistle, 1984, p.17). Natural settings are those in which there are no experimental controls. In this method, the content of learning is examined before consideration is given to how the learning takes place. The "rigorous" aspect of this method relates to its attempt to "identify concepts which describe important differences in the ways in which students learn and study. The specific differences give rise to distinct categories and each category is defined, or delimited, in terms of those extracts from the interviews which together

constitute its meaning. In this way other researchers are able to follow similar procedures and then make detailed comparisons between the concepts and categories identified in the various studies. This procedure thus carries the 'hallmark' of scientific research, while not following the methods of the natural sciences" (Entwistle, 1984, p. 17).

## Conceptions of Knowledge

The Quantitative conception of knowledge. The quantitative conception of knowledge views learning as essentially a reproductive process whereby knowledge is passed from teacher to learner and stored in the memory of the learner for later use. Testing consists of determining whether or not the learner can reproduce or remember the knowledge. This view implies that learning will be occurring mainly at the beginning levels of Bloom's (1956) Taxonomy of Educational Objectives - Knowledge, "the recall of specifics and universals, the recall of methods and processes, or the recall of a pattern, structure or setting...The knowledge objectives emphasize most the psychological processes of remembering" (p. 201). This conception of knowledge may allow for some learning at the second level of Bloom's taxonomy, comprehension, but nothing at the higher

levels of application, analysis, synthesis, or evaluation.

The Qualitative conception of knowledge. With a qualitative conception of knowledge, there is less emphasis on "how much is learned" and more on "what is learned". Learning is not viewed as a reproductive or remembering process but one in which the learner actively interprets, adapts and applies the knowledge or information he or she acquires. Where the quantitative conception deals with educational objectives mainly at the beginning levels of Bloom's taxonomy, the qualitative conception is concerned with the complete range of objectives from the lower levels of the taxonomy to the higher level objectives of application, analysis, synthesis and evaluation. The qualitative conception expands the perspective of the researcher and allows differences in learning to be detected that are hidden when quantitative measures of knowledge are applied. For example, a qualitative study by Johansson et al. (cited in Dahlgren, 1984) revealed that undergraduate mechanical engineering students enrolled in a course in mechanics had two fundamentally different conceptions of force. The students were asked the following relatively trivial question: "A car is driven along a motorway in a straight line at a high constant

speed. What forces act on the car?". By analyzing (qualitatively) the students' answers, Johansson et al., found that most held the correct Newtonian conception of force (force is only involved when there is a change in velocity or direction) but a significant proportion held an Aristotelian conception of force (force is always involved in physical events and the relative strength of the forces determines the outcome). Furthermore, most of the students who held the Aristotelian conception of force before the course also held that conception after the course. The researchers concluded that these differences would not have been detected by traditional quantitative tests: "When the questions asked of students are at base quantitative or fail to penetrate beyond what can be more or less unreflectively retained in memory, students' misapprehensions are disguised within spuriously satisfactory answers or cloaked in technical jargon" (Dahlgren, 1984, p. 35).

## Sources of Research Literature

The research and literature reviewed was obtained from three main sources:

1) A computer search of Educational Resources Information Center (ERIC), Current Index to Journals in Education (CIJE), and Research in Education (RIE). The search concentrated on literature that dealt with

student achievement in distance education courses, comparisons of distance education courses with face to face instruction and studies that dealt with the effectiveness, in terms of student achievement and satisfaction, of different components of distance education courses.

2) A manual search of the card and microfiche catalogues of the University of British Columbia libraries for publications dealing with distance education, telecourses, educational television, media selection, instructional design and correspondence education.

3) Personal and departmental files at the University of British Columbia, Guided Independent Study; and Department of Educational Psychology and Special Education. The latter consisted of literature obtained from faculty members in the department.

## Organization of the Review

The search yielded over 400 titles of which about 80 were reviewed. The literature has been organized into three broad categories:

1) Theory: Several attempts have been made to provide a theoretical framework to explain how learning from television or video occurs.

2) Research problems. Many reviews critical of the research in this area have been written. This study attempts to summarize some of the more frequently mentioned and relevant areas of concern.

3) Experimental Research. Despite the problems with conducting this type of research, some investigators have persevered.

4) Quasi-Experimental Research. Most of the research in this field is of this nature where random assignment is not possible, and variables are difficult to control.

The author was unable to find any research which employed a qualitative methodology or which appeared to approach the research questions with a qualitative conception of knowledge. In the absence of this type of research, this review will attempt to demonstrate how the experimental and quasi-experimental studies could have been improved if a qualitative approach had been followed or incorporated as part of the study.

# Chapter II - Review of Related Theory and Research

## Theory

### Introduction

Unfortunately, much of the theoretical literature in this field focuses on the teaching effectiveness of instructional television rather than on how television affects learning or how learning from television occurs; that is,it attempts to explain how instructional television can best be used to present lesson material without trying to explain how it may be affecting learners and how it may interact with their mental processes. Nonetheless, several attempts have been made to provide a conceptual framework to explain the process of learning from television.

### Interaction of Media,Cognition and Learning

Salomon (1976) has provided the most comprehensive theory, which, while it deals with learning from all media, has clear implications for television or video learning. According to Salomon, there are three major factors which may make a difference in learning from media. These are the technology of transmission, the content transmitted, and the symbol systems used by the medium. There is considerable research evidence to suggest that there is no significant difference in learning when only the technology is changed (Chu &

Schramm, 1968). In fact Salomon (1974) is critical of many of these studies because he says they purport to compare the effectiveness of learning from different media, when really they are studying the technology of transmission. This is caused by holding constant all aspects of the presentation being studied except the technology of transmission. Salomon (1976) gives an example to illustrate this point.

> Children who face difficulties with reading do not read any better or worse if the material is printed rather than projected. Changing the technology through which the material is transmitted to them makes no difference. Similarly, a televised instructional session is no more effective than a live one simply by virtue of its being televised (p. 25)

As for content, "the difference in learning which different contents.make are either self-evident or unrelated to media" (Salomon, 1976, p.25). The self-evident differences are when, for instance, television is used to show movement or dynamic processes which would be difficult or impossible to convey in another medium.

According to Salomon (1976), it is the symbol system of the medium which makes the crucial difference to

learning. Unfortunately he is somewhat ambiguous about what he means by "symbol system". He seems to use the terms "symbol systems", "symbolic codes", "modes of presentation" and "formats" interchangeably. In analyzing the work of Salomon (1974, 1976, 1979) and the work of Bates (1981a), who refers to Salomon, it would appear that these concepts can be viewed hierarchically from general to specific. The symbol systems are the most general and each employs particular symbolic codes to convey meaning. The codes can then be used in different formats or modes of presentation.

There are three basic symbol systems: digital, analogic, and iconic. In the digital system meaning is conveyed by such codes as written language, musical notation, and mathematical symbols. In the analogic system meaning is coded in continuous elements that have reorganized meaning and form. Voice quality, performed music and dance are some examples. In the iconic system, the code is pictorial representations which have a variety of possible visual experiences and meanings (Salomon, 1979; Bates, 1981a). The formats or modes of presentation are at the bottom of the hierarchy. Zooming, and cutting are examples of television formats (a moving image or film code in the iconic symbol system); narrative or dialogue are examples of formats

used in novels (a written language code in the digital symbol system).

According to Salomon (1976), learning is a four-way interaction between the symbol system (along with its codes and formats), the content, the task and the abilities of the learner. The symbol system and the accompanying codes and formats used in a presentation affect different mental processes. These mental processes, in turn, affect how the information in the presentation will be processed. "Thus a verbal description of an object and a picture of it do not differ only in appearance, they also call upon different mental skills which are then used to process the conveyed information" (Salomon, 1976, p. 26). Because learners will differ in terms of their mastery of the different mental skills, "the cognitive effects of media attributes interact with individual differences" (Salomon, 1976, p.26).

Television, according to this theory, is particularly powerful because it can use all three symbol systems along with a variety of codes and formats to convey a message. This allows it to call upon and thus activate a particular mental process, as well as overtly simulate a mental process which might otherwise have to be covertly executed by a learner.

> Take for instance the act of zooming in. This is a transformation by means of which a particular detail is being singled out from a wider and richer array. The zoom provides the link between the long shot view and the close up. In the absence of the zoom, the viewer is required to provide the same link covertly on his own. The zoom, when used, simulates overtly the same process. Gradual changes of angles, rotation in space, rapid shifts, split screens, and the like, have the potential of accomplishing the same function: they *overtly supplant* a mental skill, transformation or, if you wish, process for the learner (Salomon, 1976, p.27)

Finally, Salomon makes a distinction between the mental skills that a medium "allows" and those which it "demands". He says that the symbolic codes used by television may allow the learner to get away with "shallower" processing, than a book or a verbal description because the message requires less recoding and mental elaboration (Salomon, 1979).

This theory, then, does not suggest that television learning is distinct from verbal learning, observational learning or any other "conventional" theory of learning. Instead, Salomon seems to be suggesting that the critical aspect of all learning is the symbol systems

used by the medium and the codes and formats employed to convey the message. Television, he concludes, offers greater potential for learning because it is able to employ a greater variety of symbolic codes. Many of these codes are unique to television and activate and cultivate different information processing skills which interact with the learner and the task.

Criticism of Salomon's theory. Bates (1981a) is critical of Salomon's theory because of its generality. He says Salomon has failed to identify the different symbol systems used by different media or which mental skills are developed by which media. But it seems that the value of a theory is precisely its generality, and surely which symbol systems are employed by which media are self-evident. Finally, Bates' criticism that Salomon failed to identify which mental skills are developed by which media seems to miss the point. Salomon maintains mental skills are not media-specific, but code- or format-specific, so a particular mental skill may be activated or supplanted by several different media if the appropriate code or format is employed.

While Salomon has made an ambitious attempt to explain how we learn from media, he has not revealed anything unique about learning from television. His

theory attempts to explain all learning, no matter what the medium. According to his theory, it would seem that learning from television involves fundamentally the same process as any other type of learning. The differences occur in the symbolic codes of the medium (e.g., written language - digital code; music - analogic code; still pictures - iconic code etc.), not in the actual process. Thus learning from print, television, or the classroom lecture involve the same process with varying symbolic codes, and thus varying interactions between the medium, the content, and the learner.

Mental Skills and the Media

Olson and Bruner (1974) have taken an approach to television learning similar to that of Salomon. They contend that content is not medium specific, and therefore makes little difference to learning from television or any media. In their view, "instructional means converge as to the knowledge conveyed, but diverge as to the [mental] skills they assume and develop" (Olson & Bruner, 1974, p. 149). In other words content or knowledge can be taught effectively by any medium, but the mental skills required to understand and apply that knowledge can be cultivated more effectively by some media than others. This seems to contradict Salomon who maintains that the mental skills called upon,

activated, or supplanted depend on the codes or formats of the medium, not necessarily the medium itself. For instance, a verbal description by a teacher and a televised verbal description would employ the same codes, although they involve different media. However, this contradiction may be more apparent than real, because it would appear that Olson and Bruner are referring to the formats which are unique to a specific medium. For instance, television and a classroom lecture have some formats in common, but each has it own unique formats - television has cuts, zooms, and other production techniques which would favor certain mental skills, whereas a lecture has interactivity which might enhance others.

Olson and Bruner (1974) say television has the advantage that it can tap skills that are more readily available than those required for verbal learning which conveys information through a symbolic system that requires a high degree of literacy in that medium. This relates to Salomon's (1979) assertion that verbal learning may demand "deeper" processing than television learning, depending on the format employed by the television presentation. For Olson and Bruner, television does not require a high degree of literacy and so it is ideal for modelling or observational

learning. It can show what to do as well as what not to do and can make explicit the decisions made in the course of the activity. "Technological media can greatly facilitate these processes by highlighting in various ways the critical points in the performance. Slow motion or stopped action as well as descriptions and drawings (including caricatures) may have this effect" (Olson & Bruner, 1974, p. 148). Once again this is similar to Salomon's view that some of the formats employed by television such as the zoom, can activate or supplant certain mental processes by showing transformations.

One note of caution should be made here. It should not be assumed that because some of the formats of television may allow for "shallower" mental processing that television is necessarily an easier medium for the learner to access. A study at the British Open University concluded that students needed to learn television watching skills in order to properly understand the case-study documentaries used in a Social Science course (Bates & Gallagher, 1977). The study found that the television programs were being used to encourage students to use higher level skills such as analyzing the television material using the theory provided in the print material, applying what they

learned in the print to the situations in the television programs, generalizing from the specific examples in the television programs, and evaluating the value of the principles presented in the print as they related to the examples provided in the television programs. However, in examining the student evaluations of the course, the researchers found that "Less than one-third of students, for any programme, both understood the purpose of such programmes and appeared able to use the programme material in the ways suggested...above." (Bates, 1981a, p. 18). Schramm (1977b) also reminds us that all coding systems must be learned. We learn to use the digital coding system in school (e.g., language and mathematics) but little or no instruction is provided in analogic and iconic coding systems. Because television uses the iconic code which is densely packed and concrete, it can offer "something to everyone regardless of his ability to deal with abstraction" (Schramm, 1977b, p. 89). But we should not mistakenly assume that learning from television requires no special skills. Salomon (1979) also makes this point.

Criticism of Olson and Bruner. Bates (1981a) is critical of Olson and Bruner's (1974) theory because of its failure to clearly distinguish between content and skills and because he believes some content is more

effectively taught through some media than others. He says different media may present knowledge of the same subject area or concept in a different way. "Thus the experience of 'heat' can be represented by words ('it is hot'), by numbers (110°F), physically by touch (feeling the heat), by concept ('form of energy arising from random motion of molecules of bodies') or symbolically (a man dragging himself through the desert). Each way of 'knowing' heat is different" (Bates, 1981a, p. 9). Furthermore, he says, how easily we learn content depends to some extent on the control characteristics of the medium and therefore "learning from print, in terms of content would seem, on a priori grounds to be more effective than learning from broadcast television, other things being equal" (Bates, 1981a, p. 11). While Bates' criticism seems valid, Olson and Bruner's hypothesis is valuable in the sense that it emphasizes the importance of looking at both content and mental skills when choosing the medium of instruction.

The Concreteness of Television

Gagné in discussion with Schramm (1977a), identified television's ability to deal with concreteness as its major contribution to learning:

> Television can provide a concrete and meaningful context against which to learn names, definitions,

> and other verbal knowledge. It can provide concrete reminders of the components of intellectual skills. It can provide concrete illustrations of how cognitive strategies can be applied to new problems and new situations...and it can provide concrete examples of situations of choice that put flesh and blood on the abstractions of values and attitudes (Schramm, 1977a, p. 14).

Motion, Simultaneity, Dimensionality

On a more specific level, Burns (1976) has theorized that television facilitates learning when it is used for three specific purposes: 1) for showing motion, 2) simultaneous presentations, 3) illustrating three dimensional concepts. These all seem to make intuitive sense and they fit with Salomon's theory. These are all areas in which television could activate or supplant some of the mental skills required of the learner.

Bates' Characteristics of Television

Distribution and social characteristics. Thus far we have made reference to Bates (1981a) only for his criticisms of Salomon and Olson and Bruner. In doing so we have begun to look at his framework in which he identifies three characteristics of television that affect learning: distributional and social, control, and symbolic. The distributional and social characteristics

have little to do with how one actually learns from television, but it could be argued that they do affect learning and so they do merit some mention. Television is a familiar medium for most people. It is relatively easy to use and has the power to be attractive and entertaining. Thus, Bates argues, it can provide access to learning, although this alone will not ensure that learning will take place, and of course this is not unique to television. This notion of "access" is similar to the view of Olson and Bruner (1974) that television is more accessible to learners because it does not require a high degree of literacy.

Control characteristics. The second feature of Bates' (1981a) framework is control, and this comes a bit closer to dealing with the actual learning process. Unlike print, broadcast television does not give the learners any control over how they pace their learning. They have little choice as to when they can watch the programs and when they are watching, they are locked into a pace that has been determined by the producers of the programs. They cannot stop the broadcast and go back to a point they missed. In addition, broadcast television cannot accommodate different levels easily, "The continuous and fixed pace of a programme does not allow for individuals to re-work or jump in their

thinking to the level which best suits them" (Bates, 1981a, p. 4). However, this problem can be eliminated through the use of videotape, which unlike television, gives learners a high degree of control because the tape can be stopped at the learners' discretion, broadcasts can be taped for later viewing at a more convenient time, and segments can be reviewed for clarification.

Symbolic characteristics. Finally, Bates deals with what he calls the "symbolic" characteristics of television. This is essentially a reworking of Salomon's (1976) theory discussed earlier. There are two aspects to Bates' version: what he calls the general audio-visual characteristics of television which are roughly similar in concept to Salomon's "formats", and the symbol systems used by television, which are the same as those identified by Salomon. The general audio-visual characteristics allow it to present or represent knowledge or experiences in a particular way. Bates has gone further than Salomon and actually identified ten characteristics with their related "modes of representation" which he feels have educational implications. They are presented in Table 1.

Table 1
General Characteristics of Television and Modes of Representation

| TV Characteristic | Modes of Representation |
|---|---|
| Continuous and sequential | Movement, animation, slow motion, representation of changes over time |
| Spatial | Representation of spatial relationships; (combined with camera movement: representation of three dimensions); physical models; graphical representation. |
| Variation in size (zoom) | Magnification; exploration of detail; attention focussing. |
| Storage and recording | Recording of people, places and events; historical archives; accessing new learning resources (people, places). |
| Editing | Selection; reordering; restructuring. |
| Dramatization | Restructuring of events; representing human relationships |
| Aural | Words; noises; music - emotive aspects |
| Symbolism | Ambiguity |
| Multi-channel | Simultaneous viewing listening; focussing; interpretative |
| "Live" (broadcast TV only) | Immediacy; news and current affairs; sport. |

Note: From Some unique characteristics of television and some implications for teaching and learning by A.W. Bates, 1981a, *Journal of Educational Television and Other Media, 8*(1).

The symbol systems, as discussed earlier, are digital, analogic, and iconic. Like Salomon (1976),

Bates says the main distinction between television and other media is its ability to combine all three symbolic systems which makes it a "rich" medium because "it can convey meaning in a wide variety of ways" (Bates, 1981a, p. 15).

Summary & Conclusions

The theoretical literature suggests that television has potential to facilitate learning, by activating or supplanting specific mental processes, and because of this, learning from television will vary with the abilities of the learner. Salomon (1974, 1976, 1979) has provided the most comprehensive theory. He suggests that the symbolic code of the medium is what affects learning. These can activate or supplant specific mental skills. Furthermore, there is an interaction between these codes, the content, the learning task, and the abilities of the learner. Effective learning from television requires the matching of the symbolic code to the critical features of the learning task and the abilities of the learner (Salomon, 1979). For Olson and Bruner (1974), mental skills are also the critical aspect of learning from television and media in general. They believe content can be learned effectively from any medium, but the mental skills developed will vary from medium to medium. Bates (1981a) attempts to incorporate

the work of both Salomon and Olson and Bruner by providing a broad framework with three general characteristics that affect learning from television; distributional and social, control, and symbolic. Gagné (cited in Schramm 1977a) suggests the critical feature of learning from television is the medium's ability to provide concrete examples of abstract or complex concepts, ideas, and processes, and Burns (1976) suggests it facilitates learning to the extent that it deals with concepts of motion, simultaneous action, and three-dimensional concepts.

The only area of disagreement in the theory appears to be over whether some content can be taught more effectively by some media than others. Bates (1981a) says it can; Olson and Bruner (1974) disagree. However, Salomon's (1976) position that both content and skills depend on and interact with the symbolic codes of the medium, the abilities of the learner and the learning activity seems to provide the most sensible and comprehensive explanation of learning from television. If this position is combined with Bates' control and distributional and social characteristics of television and his detailed "General Characteristics of Television and Modes of Representation" (Table 1), we have the

beginning of a workable theory. It remains to be seen whether it can be supported by empirical research.

## Research

### Research Problems

Introduction. The literature reveals both problems inherent to conducting research in this field and problems with much of the research itself (Chacon-Duque, 1985). Several reviews seriously question the value of much of the comparative research that has been done in distance education (Stickell, 1963; Barbatsis, 1978; Richardson, 1981; Bates, 1981b; Prosser, 1984; Shavelson, Webb & Hotta, 1987).

Inherent problems. In his monograph, Chacon-Duque (1985) identified the following inherent problems with conducting research in distance education:

> 1. There are practical limitations for the observation of student's responses, as they occur far away from the institution;
> 2. The instructional conditions are difficult to appraise, since a wide variety of strategies and media are used to teach and inter-personal contacts are restricted;
> 3. An homogeneous environment like the campus is lacking, which adds complexity to the variables involved in the process (p. 2).

This list is indicative of the domination of the hypothetico-deductive paradigm in distance education research, for these three issues are only problems if one is conducting this type of research. It could be argued that this preoccupation with experimental and quasi-experimental research is the most fundamental problem facing distance education research (and perhaps all education research) because attempting to perfect the experimental method may be an unachievable goal. This type of research requires the control of all variables, random samples and random assignment of subjects to treatment and control groups. This may be difficult, if not impossible, to achieve while maintaining the contextual reality of the events or behaviors being observed.

Research conducted in the qualitative paradigm, however, does not seek to arrange conditions to suit the researcher. It does not necessarily attempt to reject a null hypothesis. Instead it seeks to construct meaning from the observation of naturally occurring behaviors or events. Control of variables, random assignment, and external and internal validity are not as crucial. This does not mean that "anything goes". As discussed earlier, qualitative research has its own set of rigorous conditions.

Methodological problems. This predominance of the hypothetico-deductive paradigm and the inherent problems this carries with it are a major reason for what appears to be a generally unimpressive body of research. The overwhelming finding of studies comparing the effectiveness in terms of student achievement of television-based instruction with traditional classroom instruction, for instance, has been that there is no significant difference (Wilkinson, 1980). But these results are suspect because the methodology used in many of these studies has been called into question. Wilkinson identified the following deficiencies:

1. Imprecise definition of terms
2. Poor research questions
3. Faulty experimental designs
4. Research which trades off internal validity for external validity.

Richardson (1981) focuses on some fundamental problems of the newer technologies:

> their glamor often prevents people from thinking clearly about them. As Clark (1980b) points out, one result is that developers too rarely distinguish between technology as a mode of transmission of messages, instructional or otherwise, and technology as a set of specific techniques employed in the

> instructional act. Technologies of transmission refers to those technologies which transmit messages. They are simply delivery devices which transmit instructional programs, in the same way that a postman or a carrier pigeon delivers a letter. Technologies of instruction, on the other hand, are the set of research-derived principles for the design of instructional strategies which make up the teaching-learning process: strategies such as cueing the learner so that he/she attends to the appropriate instructional task, designing the instructional message so that it activates existing information-processing skills, reinforcing and providing feedback, or building appropriate amounts of novelty or humor into instruction (p.11).

This supports Salomon's (1976) contention that the most important variable in learning from media is not the technology itself, but the symbol systems, codes and formats used in the presentation.

Of the experimental and quasi-experimental studies which attempt to assess media effectiveness in distance education, Bates (1981b) identifies four major deficiencies:

1) important variables were ignored such as the quality of the media production.

2) organizational and contextual variables were ignored such as class scheduling or viewing times

3) differences between the quality of treatment and control conditions were not accounted for, and

4) individual differences in responses to tele- and traditional courses were not examined.

The methodological problems identified by both Bates and Wilkinson are to a large extent only problems for hypothetico-deductive experimental research. Wilkinson (1980), like Chacon-Duque (1985) implies the answer lies in eliminating these problems. Only Bates (1981b) in his concern for the qualitative aspects of some variables and the context involved comes close to suggesting that perhaps the approach itself is inappropriate.

Shavelson, Webb & Hotta (1987) go the next step and state that the traditional randomized experiment is not appropriate for evaluating telecourse effectiveness, "Telecourse populations typically differ from traditional course populations; treatments vary almost as much within telecourses as between tele- and traditional courses; and attrition is normal" (p. 27). However, Shavelson et al. do not reject the hypothetico-deductive experimental approach itself. Instead they propose several modified, quasi-experimental designs.

A more fundamental criticism of the research has been raised by Barbatsis (1978) who questions the almost total dominance of the summative model. In her review of instructional television research from 1950 to 1970 she found that the summative research fell into four categories: comparative effectiveness; analyzing studies which examined variables such as teacher training, opportunity for feedback, second viewing and so on; utilization studies which compared one method of using TV with another; and basic studies which looked at the effect of production variables on learning from television. In reviewing these studies, Barbatsis concludes "there is a preponderance of inconsistent and statistically non-significant results" (p. 399)

By contrast the formative research done primarily by researchers at the Children's Television Workshop provided "a pattern of consistent and statistically significant results" (p. 403). Whereas summative research is concerned with effects that are hypothesized a priori and depends on empirical and statistical procedures that provide replication, formative research is oriented towards providing information to improve products or practices. Summative studies ask research questions in an either-or manner. Either the hypothesis is rejected or accepted. In the formative studies,

instead of manipulating the conditions to represent a hypothesis, the research question is posed in a context that accepts the existing variables and attempts to single out those that are relevant to the research question. External validity is not a central concern because the formative studies are aimed at improving a particular product or practice, not contributing to the body of knowledge in the sense that traditional academic research is.

Barbatsis claims that the summative research has failed to produce meaningful results. This view is supported by many published research reviews (Stickell, 1963; Chu & Schramm, 1968; Campeau, 1974, Smith, J., 1983) However, what is not as evident is her claim that the formative approach used by the researchers at the Children's Television Workshop has produced meaningful results in instructional television research: a principle of presentational learning along with a testable theory, and a research model. The principle of presentational learning states that gains in achievement are related to emphasis in programming, manner of presentation, and extent to which presentation elicited an overt response. The testable theory postulates that "the activity producing potential of the medium is the basis for its instructional value" (p. 10). The

model includes categories of independent variables (major program attributes), dependent variables (viewer outcomes), and principles of program design (statements linking specific independent variables and dependent variables). The fact that these aspects of instructional television have been supported by formative research is reassuring, but they are all elements that could be studied experimentally without the preliminary formative research. The problem with research to date has not been a lack of testable theories, principles of learning or research models. The problem has been the research methodologies employed and the quantitative conception of knowledge they have assumed.

The formative approach suggested by Barbatsis is similar in methodology to the qualitative approach advocated by researchers of the phenomenographic tradition (Dahlgren, 1984; Entwistle, 1984; Marton, 1988). Both are phenomenological approaches which rely on "a direct exploration of the students' experiences of learning." in naturally occurring situations for their data (Entwistle, 1984, p. 13). However, there are important philosophical differences between the formative approach of Barbatsis and the qualitative approach of the phenomenographic researchers.

Barbatsis' approach does not reject the quantitative conception of knowledge. So while this research method is rooted in phenomenology, it still does not attempt to examine qualitative differences in learning. In addition, this research model is only viewed as preparatory to experimental research. "Formative research can be viewed as a method of inquiry which identifies the appropriate hypotheses to be tested by summative research" (Barbatsis, 1978, p. 412). The qualitative approach of the phenomenographic tradition is not only phenomenological in nature, but it assumes a qualitative conception of knowledge and it is not considered a preliminary step in a larger experimental approach.

The formative approach advocated by Barbatsis is a step in the right direction. However, if it is simply a preliminary step to studying learning in an experimental setting from a quantitative perspective, it is not likely to yield results that are any more meaningful than what research has already provided.

Summary. It is clear, then, that in reading and interpreting the distance education research one has to be cautious. It is easy and tempting to make sweeping generalizations about the effectiveness of distance education and about certain media components based on

the research that has been conducted. But as the preceding criticisms reveal, there are serious methodological weaknesses in much of this research. Indeed, as Barbatsis points out, it is quite possible that researchers have been trying to achieve the impossible by using a summative research model to produce meaningful results when circumstances make controlled experimental studies extremely difficult. Certainly this does not mean that research and the results that have been produced to date can be dismissed as meaningless. It simply means the limitations of the research must be recognized before it is used to draw conclusions and make decisions in distance education policy and in terms of future research. It also means that researchers have to be more creative in how they conceptualize the research problems and more open minded about the methodologies employed to seek the answers. After all, if over 30 years of predominantly quantitative, experimental research has produced such meagre results, it is reasonable to question whether the approach taken in these studies is appropriate.

## Experimental Research

Introduction. With the preceding comments in mind, it is appropriate to continue the literature review by examining the most problematic and least common type of

research in distance education - experimental studies. In the ideal scientific experimental design, subjects are assigned randomly to treatment and control groups and the experimenter manipulates variables and observes their effects. The researcher has complete control and schedules treatments and measurements in the most efficient way. By and large educational research has tried to adopt the experimental method from the physical sciences with few modifications (Fetterman, 1988). But this method is extremely difficult to employ in the field of distance education and instructional television and when it is, the experimental conditions often end up creating an unnatural learning situation. Both qualitative and some experimental researchers have argued that there is very little use for the true experimental design in education (Bantock, 1961; Parlett & Hamilton, 1972; Shavelson et al., 1987).

In general, from the experimental researchers point of view, the strength of experimental studies is internal and external validity. Because the variables are controlled, we can draw conclusions about causal relationships and we can generalize the results to other groups with a higher degree of confidence. However, what is viewed as a strength from the experimental perspective is seen as a major weakness from the

qualitative perspective. Researchers who are looking for qualitative differences in learning argue that any explanations or theories of learning must have "ecological validity"; that is they must be "derived from the settings to which they are to be applied. Otherwise there can be little confidence placed in the utility of the theory" (Entwistle, 1984, p. 10). Thus the random assignment and strict control of variables which makes the experimental study externally valid also can make it ecologically invalid. Even quantitative, experimental researchers are questioning the value of the external validity of such experimental studies. In their study of *The New Literacy* telecourse, Shavelson et al. (1986) found that the implementation of the telecourse varied considerably across the five sites at which it was offered. Thus to impose random assignment and strict control of treatment conditions "may very well distort this 'natural' phenomenon and drastically limit the generalizability of the evaluation findings" (Shavelson, Webb & Hotta, 1987, p. 32). In effect these experimental studies can only be generalized to other groups from the same population under the same conditions but because the conditions are often so artificial, in practice this means very little. The

experimental studies must then be examined with these specific cautions in mind.

Live vs.video in a traditional setting. Sullivan et al. (1979) were acutely aware of the inadequacy of experimental research in distance education when they conducted their comparison of four methods of instruction: live lecture, live videotape, studio-produced videotape, and videotape of live lecture. This study attempted to rectify two of the deficiencies that they identified with previous experimental research: inability to control student learning outside of lecture (treatment) conditions; and lack of precision in measuring the dependent variable - student learning.

Three hundred and thirty eight first year Psychology students were randomly assigned to each of the four experimental groups. Each group was given a pre-test, and post-test, a retention test (parallel to the post-test) and an attitude survey using semantic differential scales. The treatment consisted of one lecture on the topic of cognitive dissonance given according to one of the four methods:

1. Live lecture.

2. Live videotape. This is the same as the live lecture except the production crew was present. In other words this consisted of the group of students who

attended the live lecture which was being videotaped for use by the "videotape of the live lecture" group.

3. Videotape of the live lecture.

4. Studio-produced videotape which incorporated more visual material such as slides and film clips.

The same instructor and the same script was used for all groups.

The results indicated that there was no significant difference in terms of student achievement between the four groups, but when the two live conditions were combined and compared to the two videotaped conditions, the students in the live conditions scored significantly higher.

Student attitudes towards the instructor were measured on three dimensions: general evaluation, integrity, and intensity. The results indicated that in the live conditions the instructor was rated higher in terms of general evaluation, but there was no difference on the other two dimensions.

Sullivan et al. (1979) concluded that their results were impressive because they had used such a tightly controlled experiment. However, they admit, albeit implicitly, that external validity may be in question when they specified the following conditions for their type of studies: the subject matter must be novel but

interesting; its achievement must be able to be measured precisely (presumably this would not allow for qualitative differences); the subjects' initial level of prior knowledge must be low; and the experimental design must permit both teaching and testing during the one class period. Clearly, these types of conditions are not normally found in either classroom or distance education contexts. Learning is not something that begins and ends in one class period, not all subjects are novel and interesting to all students, students background knowledge of any subject will vary considerably, and the qualitative researcher would argue that knowledge cannot be measured precisely (Dahlgren, 1984, p. 24). Furthermore, the ecological validity of this study has been totally ignored. The use of a particular method of presentation is something that students may have to get used to. The lecture is a familiar format, but, for many, videotapes are not. It may take time for students to get comfortable with videotaped instruction and to become familiar with its particular instructional qualities. Unless students will face random assignment to a particular method of instruction in the real world, then imposing it on them in a experimental situation is unnatural and could therefore have an effect on the students' achievement.

Instructor contact. Hult (1980) conducted a similar, although less rigorous, study which included an additional variable, instructor contact. Three different treatments were used: live instruction, videotaped instruction with no instructor contact, and videotaped instruction with instructor contact.

In terms of student achievement, the results indicated there was no significant difference among the three groups, but in terms of student attitudes the group that did not receive instructor contact expressed significantly more negative attitudes towards the course than the two groups which had instructor contact. Hult suggests that this finding indicates that television or videotaped instruction at the college level should be combined with some instructor contact so that students can benefit from the high degree of structure and organization of instructional television courses but also retain the opportunity for interaction and immediate feedback with an instructor.

Hult's (1980) study was not as rigorous as that of Sullivan (1979). It is not clear if random assignment was used and learning outside the treatment situation was not controlled. However, its advantage over the study of Sullivan et al. is that it used a complete course as the unit of comparison. So while it be may be

criticized from an experimental perspective because of its lack of internal validity, this study has more meaning for the qualitative researcher because the experimental situation was kept as "natural" as possible by using a complete course. This meant students were able to become familiar with their particular mode of instruction, thus making the results more generalizable to other similar situations.

Television/video format variables. The other aspect of televised instruction that has been examined experimentally is the effect of different presentation variables within a video or television treatment. Are student achievement and attitudes affected by different television formats, different types of presenters and is there any interaction between these variables and characteristics of the learner? Brown, Brown & Danielson (1975) conducted one such experimental study in an attempt to answer these questions. They examined instructional treatment variables; that is, differences in how the content was presented, differences in presenter types, and such differences in learner characteristics as age and reading ability as factors which might potentially affect student achievement and attitudes. The subjects in this experiment were shown three 6 to 8 minute television segments focussing on

three distinct topics in accounting. The three television segments were varied along three presentation dimensions:

1. Learner involvement- active/passive
2. Presenter involvement - a part of and apart from.
3. Direction to the learner - cued and not cued.

Within each presentation type, three different presenter types were used. The presenters varied according to their sex, age and style of presentation. Some were designed to appear like professional actors, others were meant to be more like instructors, but varied according to their level of seriousness. Some used humor, others were much more formal and businesslike.

With such a complex combination of factors, it is not surprising that the results are somewhat ambiguous. Unfortunately, it is not clear if the appropriate analyses were performed given the many factors involved. In terms of the three types of presentation variables, learner involvement, presenter involvement, and directions to the learner, only the presenter involvement revealed significant differences. In this case, student achievement was significantly higher when the presenter was a part of the presentation. In other words, the students performed better when the

presenter/instructor was actually an actor in an instructional vignette rather than a third party describing the vignette. The other two presentation variables produced no significant differences in either achievement or attitudes.

Because the presenter types were not the same for each presentation type, the results are somewhat confounded. However, Brown et al. (1975) do draw three general conclusions in this regard. The first two are not particularly revealing. First of all they conclude that adult learners are more responsive to an enthusiastic presentation; it is important that the presenters appear interested in and knowledgeable about the subject matter: "A bland presentation or one marked by apparent confusion yields negative attitudinal responses and can affect achievement. A friendly, self-assured and confident portrayal is more positively received by the adult learner" (p. 402). It is also important that the presenter not suggest that the material is difficult either for the learner or the presenter. But perhaps the most significant conclusion drawn by the researchers was the importance of context to the whole question of the effect of presenter types. In one case the same actor received the lowest rating from one group of students while receiving the highest

in another. It would appear this was due to the fact that the type of presentation varied. "As one interviewee noted, 'he fit the part' in the segment in which he received the positive ratings. Thus the overriding message from this study with regard to presenter type is the need for credibility. Responses to other presenter variables, such as sex or attractiveness, are called into question because of the uniqueness of the experimental condition. Brown et al. were aware of the limitations of their study as they cautioned, "that these results were obtained from adults seeing very short segments in a one-exposure situation. Whether the results generalize to a longer learning exposure setting or to a series of programs is undetermined" (p. 402).

The interaction of learner characteristics with the different presenter and presentation types is less revealing. Not surprisingly, age, educational level and reading ability are related to student achievement levels after having watched the short segments. It is worth noting, however, that the results indicated that older people and those weak in reading ability were more likely to complain about the pace of the programs. They preferred a slower pace with more redundancy built into the programs. Here too, however, the context must be

taken into account. These results are based on 6 to 8 minute television segments. It is quite possible that, over a longer term, motivation and persistence of the older learner might outweigh the disadvantage that their age appears to play in the short term.

This is the clearest example of the distinction between the quantitative and qualitative conception of knowledge and the clearest example of experimental rigor limiting the ecological validity of a study. Learning does not normally occur in six to eight minute segments and while details of the assessment procedures are not given, it is clear that the quality of student responses was not examined. Even student attitudes were assessed quantitatively using Likert scale questionnaires. Brown et al. are aware of some of the shortcomings of their study because they conclude by suggesting that their study be replicated in the context of a complete college telecourse program.

Summary. The experimental research is limited both in quantity and in quality. It would appear from the studies reviewed here that there is reason to believe that face to face instruction may be more effective, in terms of student achievement, than videotaped instruction. Another study concludes that a certain degree of instructor contact combined with videotaped

instruction might provide an effective alternative to face to face instruction. Finally, in terms of presentation variables, researchers have found that perceived credibility of the presenter in videotaped instruction is crucial to student learning and videotaped segments in which the presenter is an active participant rather than an objective host are more effective.

All of these conclusions must be viewed with caution given the way in which the research has been conducted. None of the studies reviewed attempted to probe possible qualitative differences in learning that might result from using different media for instruction. Student attitudes were also approached from a quantitative perspective. The experimental situations were often unnatural and unrepresentative of real learning situations and the random assignment of subjects may have meant that students were forced into treatments they would not normally choose. Even if the studies are looked at strictly from an experimental perspective, there are still serious shortcomings because proper control of extraneous variables was often absent or not apparent. In brief, very little can be learned from such studies.

## Quasi Experimental Research

Introduction. Problems inherent in conducting research in the field of distance education and instructional television have already been discussed. In view of these problems, it is not surprising that there is very little experimental research in the field. Instead researchers have concentrated their efforts on quasi-experimental studies. These are studies in which the experimenter does not have complete control over the experimental environment (Campbell & Stanley, 1963). It means, for instance, that the learning situation or task cannot be completely manipulated to suit the experimenter. The experimenter is thus forced to accept a more natural learning situation.

While the results of the quasi-experimental studies are certainly more numerous, the lack of experimental control often raises serious questions about their internal validity. On the other hand, the fact that the studies have been conducted in natural settings makes them applicable to more than just the experimental condition.

Telecourse-face to face comparison. The most prevalent type of quasi-experimental research in this field appears to be that which attempts to compare the effectiveness, in terms of student achievement, of complete telecourses with equivalent on-campus courses. The degree

of quantitative experimental rigor varies considerably. Some studies are merely tabulations of student marks with virtually no statistical tests of significance applied, while others come much closer to a true controlled experiment. None attempt to examine and/or compare the *quality* of learning in the two situations.

Mount and Walters (1983) made a direct comparison between an on-campus introductory psychology course and the telecourse version of the same course. In addition to student achievement they examined student attitudes and personality characteristics. The same instructor was used for both versions of the course and the same instruments were administered to both groups. To measure achievement, the students in both groups were given three 40-question tests. The results indicate a significant difference in favor of the television group. A one-way ANCOVA was performed with age as the covariate and test score as the criterion. The adjusted means were still significantly different, although the spread was not as great. The study also revealed a significantly higher dropout rate in the telecourse group which may have had an effect on the group mean achievement score because some of the weaker students may have dropped out. The personality tests also

revealed significant differences with the telecourse group being classed as more "happy-go-lucky", conscientious, trusting, astute, controlled and less apprehensive.

It appears that a lot of effort was wasted by not asking a somewhat obvious question: Do initial ability levels have any effect on group differences in achievement? Because random assignment was not possible in this study, it seems essential that initial ability levels be controlled in some way if the purpose of the study is to uncover the effects on achievement of different delivery methods. This was not done in this study, so we are left with rather inconclusive results. We know that the telecourse group performed better than the on-campus group, but we have no way of knowing if this is a statistical error due to the higher drop-out rate in the telecourse group or if the telecourse group began at a higher level. This latter explanation seems quite plausible because the telecourse group was much older, and ,according to the survey, of a different personality type.

From a qualitative perspective, this study has some merits. Like most of the studies in the quasi-experimental category, it uses complete courses and telecourses as a basis of comparison and it does not

impose random assignment on the students. This preserves the ecological validity, but because it appears no attempt is made to assess the quality of learning, it is rather meaningless. Details of the assessment procedures are not provided, but administering a 40 item test to gain insight into how students learn is not an accepted qualitative research practice.

A three-year survey of telecourse and equivalent campus courses in the Dallas County Community College district in Texas revealed that the on-campus students had a significantly higher success rate (Agler & Tinn, 1976). However, there are not enough details of the assessment procedures to determine whether or not student achievement was approached from a qualitative or quantitative perspective. In terms of the experimental design of the study, the results have to be viewed with a great deal of caution. While proportion tests were used to determine the level of significance, there is no indication that there was any control over confounding variables such as different instructors, and different measurement instruments. The grade distributions from one semester were simply compared in eight courses. These eight courses may have been taught by eight

different instructors using different testing procedures and rating methods.

Agler (1976) conducted a quantitatively more rigorous examination of one telecourse in the same college district, an introductory English course, Writing for a Reason. A pre-test/post-test control group design was employed in one semester to assess changes in student writing performance and attitudes from the beginning to the end of the semester. While the students were not randomly assigned to the telecourse and campus groups, a random sample from each group was selected for analysis. It is not clear why this was done; it may have been an attempt to reduce the size of the treatment and control groups while keeping them representative of the larger group from which they were drawn.

Student compositions from the two groups were rated by 4 independent judges in the following areas:

1. content
2. organization of the entire paper
3. organization of individual paragraphs
4. spelling and mechanics
5. diction usage
6. sentences
7. holistic or overall quality.

The results revealed significant differences in favor of the telecourse group in three areas: organization of the entire paper, organization of individual paragraphs, and holistic or overall quality of the paper. In the other four areas there were no significant differences between the telecourse and the on-campus group. In addition, the final grade distributions did not differ significantly between the two groups, and in keeping with most of the other studies, the drop-out rate for the telecourse group was much higher - 52% versus 30%.

At first these results appear somewhat ambivalent. It is easy to relegate them to the familiar "no significant differences" category. But they are more meaningful than that; these results support the view that perhaps what we are trying to measure is not measurable or at least not measurable if approached with a quantitative conception of learning. It is quite possible that one way of delivering a course is more effective in terms of student achievement than another and that if we stop and take measurements at several points in the course we may find significant differences. But it is also quite likely that other factors such as motivation and persistence might outweigh any inherent disadvantages of the mode of the

course and in the end students in the two versions may end up with similar scores. So, in the case of this English course, the campus students who did poorly in the three particular areas of composition, organization of the entire paper, organization of the individual paragraphs, and holistic or overall quality of the paper, may have worked harder in other areas and so we end up with final grade distributions that look much the same. If this is indeed the case, it points out the need to refine our methods in order to accurately pinpoint the effects of different methods of course delivery. It also points out the need to reconsider the type of research questions we are asking. Simply comparing achievement levels may not accurately reveal the underlying differences in the effectiveness of two methods of delivery if they exist. Furthermore, it may be that achievement is not the variable that needs to be examined. If we shift from a quantitative to a qualitative conception of knowledge, we derive a completely different type of question. Instead of asking "Does this or that method of delivery affect student achievement?" we ask "How does this or that method of delivery affect the way in which students approach the writing process?". Achievement levels may not differ significantly because these are often

measured in quantitative terms, but perhaps different methods of delivery affect the process of writing which would be reflected in qualitative differences in the students' writing.

Of all the studies reviewed, this one probably comes closest to attempting to assess this type of qualitative difference. The use of four independent judges and seven areas for assessing student progress is a clear departure from the strict quantitative assessment techniques seen in the other studies. Unfortunately, the study did not go far enough in pursuing a rigorous *qualitative* analysis of the student writing. Semi-structured interviews could have been conducted with the students in both groups to probe their writing processes, their attitude towards the course and the way it was delivered and whether this had any effect on how they approached their writing.

One of the most comprehensive and quantitatively rigorous quasi-experimental comparisons of telecourses with equivalent on-campus courses is a study by Smith, J. (1983) conducted at Saddleback College. All telecourse and campus students enrolled in introductory courses in Political Science, Psychology, Music and Marine Science were included. The study was designed to evaluate three aspects of the telecourse program,

student retention, (drop-out), student achievement, and student satisfaction. The same instructor taught both the on-campus and telecourse versions of each course. Outlines of each telecourse and its parallel campus course were inspected to ensure that they were identical and a common test was developed for each course and administered as a pre and post-test.

The comparative achievement levels were tested using ANCOVA at the .05 level of significance. Student satisfaction was evaluated using a questionnaire with Likert-scale questions, which were given weighted values, and mean scores were computed.

Despite this considerable quantitative rigor, the results are somewhat disappointing if one is looking for guidance in distance education course design and delivery. The analysis of covariance indicated that there was no difference in the amount of learning that took place in the telecourse compared to the parallel on-campus courses. In terms of student satisfaction, both groups were generally satisfied with the course and the drop-out rate for the telecourse group was higher than the campus group.

While it is reassuring to have evidence that telecourse delivery is at least as effective as on-campus delivery, this study does not provide any insight

into the question that needs answering: does television or any medium have any inherent advantage in terms of student achievement over any other medium? Indeed, it could be argued that the study did not really try to answer the question it seems it was intended to. As Smith, J. (1983) says, "The comparison in educational achievement between the telecourses and the parallel on-campus courses was intended to provide guidance on what types of courses should be offered via television, and what formats should be employed" (p. 25). The question was asked, but simply comparing achievement levels was not the way to answer it.

Approaching the study from a qualitative perspective may have provided more meaningful results. For instance, it would have been interesting to probe the students' understanding of some of the concepts and issues in the different versions of the courses. There is evidence that in some undergraduate arts courses, students have very different understandings of some of the key concepts. In a 1978 study of university economics students' understanding of the concept of price, Dahlgren (1984) found that they had "two distinct and contrasting conceptions" (p. 30). He did not arrive at this conclusion by comparing achievement levels, rather he asked a very simple question: Why does a bun

cost about one (Swedish) crown? After analyzing the student responses he was able to group them into two "categories of outcome": "A. The price is dependent on the relationship between the supply of and demand for buns. B. The price is equal to the (true) value of the bun" (p. 30). He concluded that the answers in category A represent a conception of price "as system dependent, in that the price of a commodity is unknown until it is subject to a bargaining situation between producers and consumers in the market" (p. 30). The category B answers revealed "a more object-oriented conception of price, for these answers state that the price depicts the production costs and reasonable profits on the various constituents, whether they be products or services" (p. 30). Comparing the students in different versions of the same course in terms of their qualitative understanding of some of the major concepts may have revealed some interesting differences that would have provided answers to the question that Smith, J. (1983) asked in her study.

Clagett (1983) surveyed the final grade distributions of "telecredit" and regular on-campus students at Prince George's Community College in Largo, Maryland, between 1976 and 1982 and found that the telecredit students had a lower pass rate - 69% versus

79%. However the survey also revealed that the telecredit students were more likely to earn A's and C's. The significance of these results is questionable because it does not appear that there were any controls.

Donsky, Vaughn, Burke & Hite (1983) compared student achievement in a business telecourse with equivalent on-campus day and evening courses, but student scores were calculated differently in the two groups. No pre- or post-test observations were conducted and there were significant demographic differences between the two groups. Despite this lack of control, an ANOVA was conducted on the student scores and showed that the telecourse groups performed significantly higher than the on-campus groups. With so few controls, however, this kind of result is rather meaningless. The cause of the difference could be something as simple as statistical error, or something more complex such as the inherent differences of the two populations.

Zigerell & Chausow (1983) compared all of the third-year telecourse results in Chicago's TV College with the equivalent on-campus courses in terms of achievement. Once again, the quantitative rigor was lacking. It is not clear what, if any, variables were controlled such as instructor and marking method. The results are equally ambiguous, with some courses favoring the

telecourse student achievement and others favoring the campus student.

Television on-campus and at a distance. Brown (1976) conducted a quasi-experimental study to compare the effectiveness of telecourses with equivalent on-campus courses at the University of Mid-America. In addition to comparing the effectiveness of the two delivery methods, Brown also tried to determine the effectiveness of including the telecourse television programs in the on-campus version of the course. The course used for the comparison was Introductory Accounting. There were actually four treatment groups, one taking the course by distance education, one on-campus, one on-campus but using the distance education materials, and one on-campus using the distance education materials without the television programs.

The distance education group and two of the campus groups received a textbook, study guide, sixteen 15-to-30-minute audio tapes which presented accounting problems in "a light, dramatic format designed for learner interaction." and 16 newspaper articles which provided a brief journalistic overview of each lesson.

The distance education group and one of the campus groups using the distance education materials also watched 15, 30-minute television programs which provided

"exemplars of key accounting concepts through a variety of visualization techniques such as vignettes." The other on-campus group using the distance education materials did not receive the television programs. Both on-campus groups using the distance education materials also had access to a classroom teacher and interaction with fellow students which were not available to the distance education group.

The regular on-campus group had regular lectures, interaction with their instructor and fellow students and the same textbook, but not the other distance education materials.

The same criterion tests were used to measure learner achievement in all four groups and they indicate that this study approached learning from a quantitative perspective. The measurement of student achievement consisted of three equally-weighted multiple-choice tests with 28-30 items which were given during the course. To assess attitudes towards the courses, students were asked to complete a course evaluation at the end of each unit and at the end of the course.

A comparison of achievement levels between the on-campus students using the distance education materials and the distance education students showed that distance education students had slightly higher grades. Student

evaluations revealed that the campus distance education group rated the course lower in terms of overall appeal and their interest in it than the off-campus group and they rated it as easier than the off-campus group. The use of the 15 television programs appears not to have had any significant effect on the two groups. Achievement levels were not significantly different between the group using television and the group not. In addition, the student course evaluations showed that the use of television did not make the course any more appealing.

A final comparison on appeal was made between the on-campus students using the distance education materials and those enrolled in the traditional on-campus course. The results showed no significant difference in appeal. Unfortunately, no comparison is made in terms of a student achievement between the regular on-campus group and the distance education group.

The study found that drop-out was higher for the distance education group which may point out the need for support, encouragement and pacing for the distance education student because "a course which has forever to be done will never be done (at least by some enrollees), and that external assistance and encouragement is

necessary if a respectable percentage of enrollees are to complete a course within reasonable timelines" (p. 25).

The most significant conclusion of the study has to do with the use of the television component: when such a component presents content which is also presented in other components, it will not have a significant effect on achievement levels nor will it make the course more appealing. Brown (1976) concluded that if this finding is generalizable to other distance education settings then using television in a "supportive or redundancy" role cannot be justified in terms of its positive effect on achievement or attitudes. However it is questionable whether this finding would be generalizable because campus students have instructor and student interaction that may substitute for the television component; distance education students do not and perhaps they may find the television programs fill that redundancy role.

Brown (1976) makes an important observation about how television was used in this course. In his opinion it was not used effectively because the course did not lend itself well to the medium; accounting is not a particularly visual topic. The students also did not rate the television programs a very important component of the course.

While this study provides some interesting results, its major weakness lies in the fact that it examines an unnatural situation: comparing achievement and appeal of distance education students using a distance education course with campus students using the same course materials. As the study revealed, these are two different populations with different motivations for studying, different goals and different views as to what constitutes a good or appealing course. The on-campus student would not normally take a course that involved distance education materials. A more valid and useful comparison would be between the distance education students and the on-campus students enrolled in the regular campus course.

The findings in regards to the value of the television component are also questionable because the distance education students were not used in the comparison. The concept of the telecourse was designed to meet the needs of the students at a distance who do not have access to student and instructor interaction. It is quite possible, and indeed it has usually been assumed by course designers, that the television component *does* play an important role for the distance education student. It is unfortunate that this study

did not take the opportunity to test that assumption, but instead looked at a less meaningful comparison.

If the study had been approached from a qualitative perspective, in addition to examining qualitative distinctions in students' understanding, it could have probed more deeply the appeal of the television component. The findings in this regard are interesting but incomplete. The quantitative measures could have been followed up with interviews with students about their reactions to the television programs. Students could have been observed as they watched the programs to see if the television-watching behavior of the different groups differed. Unfortunately, the nature of the study leaves us with a very one-dimensional and incomplete picture of the student reaction to the television programs.

Classroom instruction using television. Robinson & West (1986) carried out a study to measure the effectiveness of an interactive cable television instruction system used to offer secondary school classes. The system consisted of an originating classroom which had a live instructor and several remote sites which received the instruction by television. Math, shorthand, Spanish and Chemistry were delivered using this system.

The main purpose of the study was to determine if teaching or learning was affected by the use of this delivery system. The study was conducted in the second year of the five year project. The results indicated that the use of the system did not appear to be affecting teaching or learning. Students at the remote sites were achieving as well as students at the originating school and students using the interactive television system performed almost as well as students who took the course in the traditional manner. Student attitudes towards taking the course in this manner were also favorable. Interestingly, the biggest concerns about using this technology were raised by the teachers who feared the loss of their jobs, and had a general fear of the technology.

Learner responses to the television component. The lack of detailed information on how to best employ the different media in the delivery of distance education has already been touched on. It is this type of data that would provide the most useful guidance to course designers and distance education policy makers. Brown (1975) provides the only information that begins to fill that gap. He examined learner responses to the television component of some of the distance education courses offered by the University of Mid-America.

Four courses were studied: Introductory Psychology, Accounting I, Consumer Experiences, and a computer course, Making It Count. The television programs in these courses were not used just to broadcast lectures. Instead vignettes, story lines, animation and other visual techniques to make effective use of television were employed. This decision was based on "prior instructional television research indicating that televised lectures are not particularly effective" (p. 10). In addition, television is used as a principal rather than an adjunct medium in the U.M.A. telecourses and all the telecourses are multi-media packages. For most distance teaching institutions, television plays a limited role. The principal medium of instruction is usually print (Bates, 1984).

The main findings of this study were as follows:

1. Learners consider the television programs to be helpful to very helpful.
2. The broadcast television component served an important pacing function.
3. The television component is less important in learner study than other components.
4. Learners respond positively to television programs where their role is perceived as presenting

material clearly related to explicit course objectives.

5. Learners respond negatively to the aspects of television perceived as entertainment.

6. Learners seem more satisfied with television programs when material of clear importance in the course is presented in a different manner from the way material is covered in other components.

These findings provide significant data for course designers and policy makers. In general they indicate that the television component can be an important part of the course package, but it must be carefully designed and integrated. Its role must be explicit and it must be used differently from other components.

Brown's (1976) study reviewed earlier tends to confirm some of these findings both in terms of student appeal and achievement. These two factors will not be affected when the television component presents content which has already been presented in another component.

The findings of Sell (1976) also tend to confirm Brown's (1975, 1976) findings with regard to the role of television. Sell evaluated student responses to an Introductory Psychology course offered by distance education at the University of Mid-America. He found that students criticized the television programs for

their lack of overlap with the text material. They wanted more substance in the programs and more direct ties to the text material. Taking the findings of Brown (1975, 1976) and Sell (1976) together it appears that students want the television programs to present new material that is explicitly related to the course and is clearly integrated with the other course components.

The Relative importance of distance education course components. The relative importance that students place on the various components of a distance education course is something that many studies and evaluations have examined and the results are fairly consistent.(Dallas County Community College District, 1983; Purdy, 1978). Generally, in a multimedia telecourse, students rate the print material - study guide and textbooks - as the most important. Despite the heavy investment of resources, the television programs are usually rated third or fourth in overall importance.

## Summary and Conclusions

Summary. Taken at face value, the research in this field can be used to support just about any position. Those in favor of distance education can certainly find many studies to support their cause. Those who believe that distance education provides an inferior quality of instruction can also find studies to support their

position. But if one looks at all of the research and attempts to draw some overall conclusions, it would be difficult to support any position. About the only thing that can be said with certainty is that there does not appear to be any significant difference in student achievement and attitudes between distance education instruction and on-campus instruction and that drop-out rates are higher in distance education courses. But even this result is questionable because much of the research suffers from serious methodological problems and all of it has been conducted from a quantitative perspective using experimental or quasi-experimental methods.

The few important findings in the research reviewed here provide some insight on the uses of television. It appears that students prefer their instructional television programs to present material that is explicitly related to the course. They are not pleased when it appears to be entertainment. There also appears to be a need for interaction with the instructor in addition to the instructional television programs and one study questioned the value of television if it only served a redundancy role. Students also appear to prefer television programs in which the presenter is

actually an actor in the vignettes rather than a third party describing them.

Conclusions. Despite the vast amount of research that has been conducted in this field, there are only a few meaningful results. For the purposes of this study, the most important conclusion that can be drawn is that there is no conclusive evidence that one particular method of delivery or medium is significantly better in terms of student achievement and completion. If much of the research was of superior quality and focused on this question, and if at least some of it attempted to examine the qualitative differences in learning from different media, there would be little point in pursuing it. But as has already been discussed, this is not the case. There is a limited amount of truly experimental research and what there is is often flawed. There is much more quasi-experimental research, but it also lacks in quality and often trades off internal validity for ecological validity.

The research also fails to deal with specifics of course delivery. We seem to still be caught up with the need to prove the value of distance education in general. It has already been pointed out that distance education is firmly established as a means of providing access to education to millions of people all over the

world. Even if it could be demonstrated conclusively that distance education students do not achieve as highly as on-campus students, surely the democratizing effect that distance education has on higher education would outweigh this disadvantage. It should no longer be necessary to prove the value of this method of delivery. More important is the need to find out how distance education can be improved. While this review did find some results in this area, in general researchers have failed to adequately deal with this important aspect of distance education.

It is suggested that a major reason for this is the almost total adherence to the hypothetico-deductive research paradigm. This paradigm assumes a quantitative conception of knowledge which views learning as essentially a reproductive process. Consequently, researchers have focused almost exclusively on comparing achievement and attitudes in narrow quantitative terms. As this review has demonstrated, it has been extremely difficult to accomplish this in properly controlled experiments, so we are left with results that not only are inconclusive about the quantity of learning, but also reveal nothing about the quality of learning. The few studies that approached perfection in terms of experimental control have imposed such strict conditions

on the learning situations involved that they are extremely unnatural and thus have questionable ecological validity.

It seems then that conducting this type of research in the quantitative paradigm is almost a "no-win" situation. The more controlled the experiment, the less natural it becomes and the less generalizable it becomes to similar groups of learners in dissimilar conditions. On the other hand, the less controlled the experiment, the less internally valid it becomes.

This points out the need for researchers to shift perspectives from that of the observer to that of the learner, from one that measures "how much has been learned" to "what is learned". As Parlett & Hamilton (1972) and Bantock (1961) observed, just because the "agricultural-botanical" research paradigm works for plants and inanimate matter, is no reason to assume it is suitable for human behavior because human behavior is purposeful. Students, they argued, will not react to different treatments just as plants react to different fertilizers. Research, then, needs to be shifted from this paradigm to the qualitative paradigm. This will ensure "that the explanations of student learning not only have ecological validity within the real university, college or school context, but also enable

the researcher to make an interpretation of the findings which does justice to the totality of the students' own experiences" (Entwistle, 1984, p. 17).

As for the focus of the research, this review makes it clear that there is a need for an examination of if and how different methods of delivery such as print, videotape, television, audiotape etc. affect the quality of learning. Studies need to be launched that examine qualitative differences in how students react to and learn from different media in distance education. More attention needs to be paid to student attitudes towards subject areas and particular courses. Even if there is no difference in either the quantity or quality of learning, it is not unreasonable to question whether different media or methods of delivery might have an affect on students' perception of the course, the instructor, or the subject matter. Highly achieving students who never want to deal with the subject matter again are clearly qualitatively different from students who finish their course with enthusiasm and a deep interest in the subject. These differences in the quality of learning and the quality of student attitudes are best examined from the perspective of the learner without pre-conceived notions of what the outcomes may be. Research conducted in the hypothetico-deductive

paradigm has not provided answers to these questions because the experimental methodology usually associated with it makes it difficult and because it carries with it a conception of knowledge which does not permit these types of questions to be asked.

## Chapter III - A Proposal for a Qualitative Study

### Rationale

The review of literature and research has revealed few meaningful results that can help distance education practitioners in their selection and use of media. It is suggested that a major reason for this is the overwhelming predominance of research conducted in the hypothetico-deductive paradigm from a quantitative perspective using experimental or quasi-experimental methods. The author did not find a single study that was conducted using qualitative research methods.

The qualitative approach to research is employed regularly in sociology and anthropology (Filstead, 1970; Hammersley & Atkinson, 1983; Burgess, 1984); it is gaining acceptance in the field of marketing (Hirschman, 1986); and there is an increasing awareness of its value in education.(Bogdan & Biklen, 1982; LeCompte & Goetz, 1982; Rist, 1982; Minnis, 1985; Fetterman, 1988). In fact, Rist argues that the "hegemony" of the hypothetico-deductive paradigm in education research is quickly dissolving because of its inability to address the *process* of education, particularly from the point of view of the learner. The research reviewed here supports that view and suggests another reason: the inability of the experimental approach to relate

outcomes to process. Research has examined the effect of different media variables on student achievement (with limited success), but no attempt has been made to relate that achievement to the process the learner engages in to learn. To do that requires a change in perspective, one that is not readily afforded by the experimental approach. To understand how learners interact with their learning environment requires an approach that looks at the entire context of learning from the subjects' point of view. That approach is found in the qualitative methodologies.

Two more reasons are offered in support of using the qualitative approach: its ability to reveal qualitative differences in learning (Dahlgren, 1984; Entwistle, 1984; Marton, 1988); and its use of inductive rather than deductive logic (Filstead, 1970; Glaser & Strauss, 1970; Wilson, 1977).

One of the major shortcomings of research reviewed in this study has been the superficiality of the achievement measures. Virtually all of them were paper and pencil tests employing multiple choice or short answer questions. Research which uses qualitative methods to analyze learning has revealed important qualitative differences in student understanding of key concepts in different subject areas that were not

revealed by traditional quantitative tests of achievement. (Dahlgren, 1984; Entwistle, 1984; Marton, 1988).

The final advantage of the qualitative approach lies in its use of inductive rather than deductive reasoning (Filstead, 1970; Glaser & Strauss, 1970; Wilson, 1977). In the hypothetico-deductive paradigm, theories are developed, hypotheses are formulated and then variables are manipulated in an experimental setting in an attempt to test the hypotheses. First of all this assumes that researchers know in advance what the critical variables will be, and secondly, qualitative researchers argue, this preoccupation with a specific hypothesis may result in important events being missed or ignored.(Dalton, 1964; Wilson, 1977; Burgess, 1984). These criticisms are particularly relevant to the study of learning (and more so to learning at a distance) where there are many complex, interrelated and sometimes unobservable factors. The inductive logic of the qualitative approach uses data collected in the natural setting to *generate* hypotheses, develop theories and, ideally, test these theories in the same setting. This cyclical process results in theories that are "grounded" in the empirical world (Glaser & Strauss, 1970).

## Purpose

The purpose of the proposed study would be to examine and describe the processes and outcomes of learning in the distance education course, *Law for Teachers: Introduction to Legal Process.*(Law 497) The use of video taped lectures would be one of the foci of this study, but only one of many. Two reasons are offered for this. First, research to date has produced so few meaningful results that it is not clear what to look for in terms of learner responses to video tapes or television. Second, one of the goals of the qualitative approach is to examine a phenomenon in its natural setting and in the context of its relationship to other phenomena. To isolate one aspect (video tapes) of distance education delivery from the other inter-related aspects would not achieve this goal. Therefore, the proposed study would be exploratory in nature and the use of video tapes would be examined in the context of the complete course. Thus process and outcomes, and factors affecting them, would be examined as they relate to all components of the course: course manual, audio tapes, instructor-student interaction by telephone, student to student interaction, course assignments and examinations.

Examining the processes and outcomes of learning would involve seeking answers to the following questions:

1. How do the students approach each of the components; that is what methods or strategies do they use to learn from each of the components?

2. Do the students use different approaches for different components?

3. What are students' goals and motives for taking this course?

4. Is there a relationship between these goals and motives and their approach?

5. What are the students' attitudes towards the course and its individual components?

6. How well do students achieve based on assignment and examination scores?

7. What does a qualitative analysis of students' learning reveal about their understanding of key concepts in the course?

8. Is there a relationship between the students' understanding of key concepts, as revealed by a qualitative analysis, and their achievement, as determined by assignment and examination scores?

9. Is there a relationship between the students' understanding of key concepts, as revealed by a

qualitative analysis, and the processes of learning engaged in by the students?

10. Is there a relationship between the students' goals and motives for taking the course and their understanding of key concepts as revealed by a qualitative analysis?

As this list of questions reveals, this would be a wide-ranging study. It is hoped that by casting a wide net, direction would be provided to pursue some aspects in more detail at a later date using the most appropriate qualitative and quantitative methodologies.

## Design

The qualitative approach has been applied in diverse fields, in many different ways, and to a wide range of research questions (Jacob, 1987, Fetterman, 1988). Despite this diversity of application, for the most part, researchers agree on the fundamentals of the approach: its epistemological foundations, and its methods for data collection and data analysis. However there is one area where interpretations and opinions vary: research design. The areas of agreement have been discussed in Chapter I. They will be reviewed briefly here followed by a discussion of the different approaches to research design with a rationale for the approach chosen.

At the heart of the qualitative approach is its philosophy of knowledge. It rejects the positivist view that an objective truth can be discovered and instead maintains that, to a large extent, knowledge and reality are socially constructed and are therefore relative (Rist, 1982; Smith, 1983; Fetterman, 1988). To properly understand how people construct reality, the researcher must seek to understand events from the perspective of the people constructing it.

The basic data gathering techniques in the qualitative approach are participant observation, in-depth interviewing, and documentary analysis. In the this study only the first two would be used. There is no standard method of using these techniques; it depends on the situation. For example, participant observation can range from complete participation where the researcher becomes a member of the group under study and takes part in all of its activities, to complete observer, where the researcher sets himself apart from the group under study (Jacob, 1987). In-depth interviewing can be highly structured with pre-determined questions; semi-structured with guiding questions only or completely open-ended with only a starting question.

Data analysis involves classifying data into a scheme that allows themes, concepts and eventually hypotheses to emerge. Researchers use different methods to accomplish this, however Lazarsfeld & Barton (1971) argue that any scheme should have the following attributes: it should be articulated (i.e., moves from the general to the specific); logically correct (i.e., the categories are exhaustive and mutually exclusive); and it should be adapted to the structure of the situation. The concepts, and hypotheses that emerge from this classification will guide further observations to "test" these hypotheses. If disconfirming evidence is found the hypotheses are revised and the process is repeated.

As this process indicates, the stages in qualitative research are not clearly defined and self-contained; they are highly interdependent and integrated. Data collection, data analysis and hypothesizing are concurrent and iterative procedures that drive each other and determine the direction of the research. No matter how well-planned the research is, once the fieldwork begins, many minor or major modifications may be necessary.

In a sense qualitative researchers agree on how to proceed once research begins, but they cannot agree on

how to get started; that is, how much research design is necessary? The nature of the qualitative research process seems to beg an unplanned and haphazard approach. As Hammersley & Atkinson (1983) put it, "At first blush...[it] is deceptively simple: 'anyone can do it', apparently. Indeed some authors have reported being given little more research advice than just that before they set out on their fieldwork." (p. 27). If one takes to heart the inductive nature of the qualitative process, the need to suspend judgment and to let hypotheses emerge from the data, it is easy to rationalize a lack of planning and research design. However, even the most "orthodox" qualitative researchers admit the need for some pre-fieldwork planning. The disagreement is over the extent of this planning.

At one extreme there are those who suggest that qualitative research should begin with nothing more than a general topic or issue and that an explicit statement of the problem or formulation of hypotheses should not begin until some initial field observations have been made. (Bogdan & Biklen, 1982; Hirschman, 1986). They argue that the researcher must approach the phenomenon under investigation with an open mind and without imposing preconceived ideas or theoretical constructs on

the situation. Furthermore they suggest that because the point of qualitative research is to look at things from subject's point view, the researcher will not know what to look for until he or she has spent time in the field as a participant observer.

While few, if any, qualitative researchers suggest that explicit hypotheses *must* be stated in advance and that the research *must* be designed to test these hypotheses, some accept this as a possible approach. Hammersley & Atkinson (1983) suggest qualitative research can be used to test theory which would necessitate beginning with explicit hypotheses. They admit this would not be easy because of the inability to control variables but they say that what would be lost in this respect would be gained in terms of ecological validity. Lazarsfeld & Barton (1971) maintain that if qualitative research is not exploratory, then clear, theoretically derived categories of data need to be formulated in advance. This implies that, at the very least, research would have to begin with a theoretical framework, if not explicit hypotheses.

These two extremes are the exceptions; most qualitative researchers are situated somewhere in between. They do not believe in stating hypotheses but they believe in having a clear plan and an awareness of

the conceptual and theoretical issues that *may* be involved. Dalton (1964) makes the case against stating hypotheses: "Having once made such a statement, one more easily overlooks negative findings, or, on having them pointed out, one's emotional freight often limits creativity to ingenious counterarguments, as in Goethe's long research and brilliant but empty theorizing in opposition to Newton's superior hypothesis on the nature of color" (p. 54). Malinowski (cited in Hammersley & Atkinson, 1983) makes an eloquent defence of the need for planning by distinguishing between preconceived ideas and "foreshadowed problems":

> Good training in theory, and acquaintance with its latest results is not identical with being burdened with "preconceived ideas". If a man sets out on an expedition, determined to prove certain hypotheses, if he is incapable of changing his views constantly and casting them off ungrudgingly under the pressure of evidence, needless to say his work will be worthless. But the more problems he brings with him into the field, the more he is in the habit of moulding his theories according to facts, and of seeing facts in their bearing upon theory, the better he is equipped for the work. Preconceived ideas are pernicious in any scientific work, but

> foreshadowed problems are the main endowment of a scientific thinker, and these problems are first revealed to the observer by this theoretical studies (p. 29).

Burgess (1984) suggests there are five aspects that need to be addressed in this "middle ground" research design:

> 1. a broad indication of the theoretical concepts that are to be used; that is a basic framework within which research questions are to be generated.
> 2. an indication of the kinds of questions that need to be addressed and the kinds of data that are likely to be needed.
> 3. an indication of how the data will be analyzed and reported.
> 4. a clear indication of the field methods that are to be used and the way in which these may be complemented by other research strategies.
> 5. a research timetable to indicate a time budget for the collection and analysis of data together with sufficient time for report writing (p. 37).

This "middle ground" approach to research design is suggested for the proposed study for three reasons. First of all, despite its specificity, it still respects the underlying philosophy of the qualitative approach

which is to examine the phenomenon from the perspective of the subject and not to impose the preconceived views and categories of the researcher. Secondly, this approach recognizes that it is impossible to completely ignore preconceptions. It is more honest to admit them in advance in the form of a broad framework and in terms of general questions and it is probably more helpful because once admitted they can be more easily ignored, suspended or modified if the field observations make that necessary. The final reason in favor of adopting this middle approach to research design is that it provides focus. In theory it sounds laudable to approach an investigation with a completely open mind and no preconceptions, but in practice we are always making decisions about what to observe and what not to observe. If this were not done we could not possibly make sense of the overwhelming amount of data to which we are exposed. By having a general framework our decisions about what to observe are at least based on something besides pure whim or chance. In the case of the proposed study, this is particularly important because most of the data would be gathered via in-depth interviews. Even at the open-ended extreme of the interview technique (not proposed for this study), the researcher must begin with a pre-determined question.

Of course, no matter how detailed the research design, it does not preclude modifications after the data collection begins. One of the unique features of the qualitative approach is its flexibility. It is constantly being adapted to meet the needs of the situation under investigation. While "experimental researchers hope to find data to match a theory; ethnographers hope to find a theory that explains their data" (LeCompte & Goetz, 1982, pp. 33-34). Thus a well-planned study along the lines suggested by Burgess (1984) provides a firm foundation on which to begin data collection, however the unpredictable events which unfold in the field should ultimately determine the future direction of the investigation.

Setting and Context

*Law for Teachers: Introduction to Legal Process* is a course designed to provide high school teachers of Law and Law-related courses with a background in the constitutional, criminal, civil and administrative law of Canada. The course deals with the origins and meanings of law, the different philosophies of law and the making and application of law in Canada.

The course consists of a student manual, eight 30-50 minute video taped lectures, four 30-50 minute audio taped lectures; and four, one hour audio

teleconferences. Assessment consists of 4 short essays and a final examination. The course manual is divided into 12 lessons. Each contains a commentary written by the course author and readings selected from law and other journals, books and newspapers. The video and audio taped lectures serve to summarize and synthesize the various readings in the course manual. The audio teleconferences are designed to give students an opportunity to discuss some of the issues and concepts of the course. In this sense they are somewhat analogous to a face-to-face seminar. The students are also able to consult the course tutor individually by phone at certain hours of the week.

The course is offered by distance education for group study. This means that groups of six or more students meet on a weekly basis to watch and discuss the video taped lectures. The students also meet in the same groups to take part in the audio teleconferences. The students engage in the other learning activities on their own.

Data Collection

Several qualitative data collection methods would be used in this study. They include participant observation, semi-structured interviews, and a group interview. In addition, quantitative records such as

examination and assignment scores would be used. The nature of distance education means that most of the learning activities take place privately. Therefore the most frequently used data collection method would be the semi-structured interview because direct observation would usually be impractical. This type of interviewing is time consuming to conduct and even more time consuming to analyze. Therefore it is proposed that a random sample of 50% of the students be used for the interviews. Students would be asked to volunteer for the study and the sample would be selected from those volunteering.

Of the 10 research questions identified earlier, four would involve data collection and the remaining seven would involve the analysis of that data. The data collection techniques required to answer those first four questions will now be discussed.

1. How do the students approach each of the components; that is, what methods or strategies do they use to learn from each of the components.?

With the exception of the group meetings to watch the video tapes and take part in the audio teleconferences, data collection here would involve semi-structured interviews. These interviews would be conducted at the conclusion of the course and would be

based on the methodology used by research conducted in the phenomenographic tradition (Marton & Saljo, 1984; Marton, 1988). The questions asked are designed to elicit how the students tackled the particular learning task; for example, reading the course manual, watching the video tapes, listening to the audio tapes. Students would be asked questions such as:

Describe how you went about reading your lesson material?

Did you start at the beginning with the objectives and continue reading through to the end or did you use another approach such as skimming through and then returning to read in detail?

What were you focussing on when you did your readings (or listened to the audio tapes etc.)?

Was there anything in the design of the course manual (video tapes, audio tapes etc.) that caused problems for you?

Did you do the learning activities in the order prescribed?

All questions asked in each interview would not be detailed in advance. However initial questions for each area of investigation would be detailed and follow-up questions would be determined by the responses given.

Some data would be collected for this first question through the use of participant observation. This would take place at the video study group meetings and at the audio teleconference meetings. It is proposed that all four audio teleconferences and all eight video study group meetings be observed. While this would involve a considerable investment of time, it is felt that this would be the only way of obtaining representative data because activities and interactions may vary depending on the topic under discussion. It would be possible to limit these observations if it was found that after several sessions no new data was being gathered. Participation by the investigator would be kept to a minimum. This study would not be sociological or anthropological in nature so it is not felt that thorough participation by the investigator would be necessary or beneficial.

The purpose of the observations would be to study how the students interact with and use the video tapes, the audio teleconferences, each other and the tutor.

In participant observation, the investigator keeps a written record of all the activities that are perceived to be relevant to the questions under investigation. This should be as concrete as possible and inferences should be kept to a low level (Jacob, 1987).

2. What are the students' goals and motives for taking this course?

Semi-structured interviews would be used here as well. These interviews would also begin with several pre-determined questions, but follow-up questions would be determined by the responses. These interviews would be conducted at the beginning of the course after the first lesson.

3. What are the students' attitudes towards the course and its individual components?

Data for this question would be collected from semi-structured interviews, group meetings, and to a limited extent from participant observation. The semi-structured interviews would be conducted at the conclusion of the course and would follow the same format as the other interviews with several pre-arranged questions and a flexible follow-up procedure.

One meeting would be held with each group towards the end of the course as a means of acquiring feedback from all of the students. Some researchers have found that the dynamic of the group meeting results in the emergence of ideas and issues that do not always appear in individual interviews (Walker, 1985). The group meetings may then provide "richer" feedback from the

students while allowing for confirmation of the data gathered from the subsequent interviews.

Some data may be gathered for this question in the observation of the video study group and audio teleconference meetings. This would require drawing inferences from the observed behavior of the students.

4. How well do students achieve based on assignment and examination scores?

Final course grades would be used.

5. What does a qualitative analysis of students' learning reveal about their understanding of key concepts in the course.

While this question deals with analysis, the data must also be collected. This would be done using the phenomenographic approach of Marton (1988) which involves conducting semi-structured interviews with students about their understanding of the key concepts of the subject under investigation. In the case of this study the interviews would deal with general theoretical and philosophical questions of law such as: Who makes law? What is the role of judges, legislators, lawyers? What is the purpose of a constitution? etc. Open questions are used that allow the subjects to frame their responses in a fashion that is most appropriate for them. The interviews begin with set questions, but

the course of the interview may vary. The purpose is to "discover the different ways that people experience or conceptualize a certain phenomenon" (Marton, 1988, p. 198). These interviews would also be conducted at the conclusion of the course.

Data Analysis

In qualitative research, data collection and data analysis are not two distinct steps. Depending on the nature of the study, qualitative researchers often carry out data analysis and collection concurrently. This ongoing data analysis allows the researcher to sharpen the focus of the study, to pursue leads, and even re-direct the study. For practical reasons, this study would not be able to take significant advantage of ongoing analysis. The subjects live in many different parts of the province. If an ongoing analysis revealed a need for follow-up interviews they would be difficult to arrange. Therefore, it is expected that most of the data analysis would be performed after the data has been collected. Furthermore, because the study would be exploratory, there would be no need to "test" hypotheses that might emerge from an ongoing analysis of the data. However, ongoing data analysis would not be ruled out completely. An informal analysis of the transcripts of interviews might prove useful for the direction of

subsequent interviews. Issues and concepts might emerge that could be raised in subsequent interviews. This informal analysis consists of reading the transcripts of interviews and observation logs and keeping a separate diary of reactions to data (Bogdan & Biklen, 1982).

The formal qualitative analysis involves the development of a classification scheme for the interview and observational data. A key feature of this scheme is that the categories emerge out of the data. Ideally, the data should not be sorted into pre-determined categories. However this will vary to the extent that research questions have been detailed in advance. Therefore,in this study, the analysis would begin with the broad categories identified in the ten research questions: approaches to studying or learning strategies for each component; attitudes to the course and its various components; student goals and motives; and qualitative understanding of key concepts. Further refinement of this classification scheme would depend on data.

The process of constructing the classification scheme is an iterative procedure whereby quotes from individual interviews are sorted into appropriate categories and then the quotes and the categories from all interviews are pooled to form categories that cut

across all interviews. Sorting the responses into these descriptive categories involves reducing the unimportant dissimilarities such as terminology, examples and other superficial characteristics, and integrating and generalizing the important similarities such as "the specification of the core elements which make up the content and structure of a given category. This means that the protocols have to be studied with the intention of understanding what the students are expressing irrespective of what words or examples they may use, which may show a considerable variation even between answers belonging to the same category. Starting with a comparatively large number of categories the researcher will gradually refine these, arriving at a smaller set of categories that may finally be difficult or impossible to collapse further" (Dahlgren, 1984, pp. 24-26). Marton (1988) calls this a dialectical analysis because the meaning of the categories is developed by bringing the quotes together while this evolving meaning determines which quotes will be included. The classification scheme should also be be articulated (i.e., moves from the general to the specific); logically correct (i.e., the categories are exhaustive and mutually exclusive) (Lazarsfeld & Barton, 1971).

The small amount of data from the group meeting and observation of the audio teleconferences and video study sessions would also be used to develop and confirm the categories that emerge from the interview data.

Once the data have been sorted and classified, two quantitative analyses would be performed. A cross-tabulation and calculation of the Goodman and Kruskal's Tau would be performed to determine the significance of the relationship between the following variables:

1. student goals and motivation for taking the course and their approach to learning.

2. Approach to learning and qualitative outcomes of learning.

3. Goals and motivation for taking the course and qualitative understanding.

The cross tabulation would be used here because the variables in questions are scaled nominally. Goodman and Kruskal's Tau would be used to determine the significance of the association between the variables because it is not affected by sample size in the way that the chi square test is.

The relationship between course grades and qualitative understanding would be analyzed through the use of analysis of variance. Mean course grades would be computed for each "qualitative understanding"

category and an ANOVA and F test would be performed to determine the significance of the difference between these means. If the F test revealed significant differences a Newman-Keuls test would be performed to identify which pairs of means were significantly different. The purpose of this analysis would be to determine whether or not there is a relationship between the results of traditional assessment procedures and a qualitative analysis of learning.

The ANOVA is proposed for analysis of these variables because course grades are measured on an interval scale and qualitative understanding on a nominal scale and because it is anticipated there would be multiple comparisons between several categories of "qualitative understanding".

To summarize, the ten research questions identified earlier are repeated below along with an indication of how they would be answered through data analysis.

1. How do the students approach each of the components; that is what methods or strategies do they use to learn from each of the components?

2. Do the students use different approaches for different components?

3. What are students' goals and motivations for taking this course?

These three questions would be answered by classifying interview data into descriptive categories that cut across interviews and then examining these descriptive categories for the frequencies of the applicable categories.

4. Is there a relationship between these goals and motivation and their approach?

Cross tabulation and calculation of Goodman and Kruskal's Tau..

5. What are the students' attitudes towards the course and its individual components?

Classification of interview data as described earlier and examination for frequencies of appropriate categories.

6. How well do students achieve based on assignment and examination scores?

Means of final course grades would be used.

7. What does a qualitative analysis of students' learning reveal about their understanding of key concepts in the course?

Classification of responses into descriptive categories as described earlier.

8. Is there a relationship between the students' understanding, as revealed by a qualitative analysis,

and their achievement, as determined by assignment and examination scores?

Analysis of variance, F test, and Newman-Keuls test if necessary.

9. Is there a relationship between the students' understanding of key concepts, as revealed by a qualitative analysis, and the processes of learning engaged in by the students?

Cross tabulation and calculation of Goodman and Kruskal's Tau.

10. Is there a relationship between the students' goals and motivation for taking the course and their understanding of key concepts as revealed by a qualitative analysis?

Cross tabulation and calculation of Goodman and Kruskal's Tau.

Reliability and Validity

The importance attached to the constructs of reliability and validity varies considerably among qualitative researchers. Some dismiss them as largely irrelevant to this approach, claiming that the qualitative researcher's only goal is to accurately and honestly reflect the subjective interpretation of the phenomenon under investigation. Others, such as LeCompte and Goetz (1982), have attempted to present

strategies that allow qualitative researchers to enhance the reliability and validity of their research while admitting that there are serious problems with attempting to apply these constructs to qualitative research. The problem is that these are criteria developed to evaluate the results of quantitative research. They are based on the positivist epistemology underlying the quantitative approach which assumes that a generalized form of objective knowledge can be achieved through systematic, comparative and replicative observation. Hirschman (1986) has found a way out of this dilemma by presenting an alternative set of criteria for evaluating qualitative research. These are credibility, transferability, dependability and confirmability. These criteria and their application to the proposed study will now be described.

Credibility. Because the positivist assumption of one objective reality no longer applies in qualitative research, credibility depends on ensuring that the multiple realities of the subjects have been represented to their satisfaction. This would be accomplished in this study by presenting the final descriptive categories that emerge from the interview and observational data dealing with student attitudes,

approaches and outcomes to the students themselves for their reaction.

Transferability. This can really only be determined on a post-hoc basis because "one must know not only the specifics of the context in which the interpretation was generated, but also the specifics of the context to which the interpretation is to be applied. However, to comprehend the specifics of the second context, one first must construct an interpretation of it. Hence, the only way the transferability of a particular interpretation can be assessed is by comparing it with interpretations constructed in other contexts" (Hirschman, p. 245). Because of the exploratory nature of this study, transferability would not be a major concern The purpose is not to reach conclusions that would have wide applicability, but rather to provide direction for more detailed and refined future studies.

Dependability. This seeks to answer the question, "How does one know the researcher is rendering a dependable construction of the phenomenon being recorded" (Hirschman, p. 245). This would be dealt with in this study by using a two person research team and dividing the data gathering roughly in half. Each investigator would perform his or her own preliminary qualitative analysis in addition to analyzing each

others data. The final analyses and classification of the data would be performed jointly.

Another strategy for dealing with dependability is by using multiple sources of data. This would be difficult to accomplish in this study, but may be used to a limited degree by comparing some interview data with data gathered through observation of group meetings and data gathered in the group interview.

Confirmability. This is analogous to concepts of neutrality and objectivity in positivist science. However in qualitative research, the researcher is assumed to be a part of the phenomenon under investigation and deeply immersed in its interpretation. Thus confirmability depends on the conclusions being supportable by the data gathered. This would involve clearly relating conclusions to specific quotes or observations as in Entwistle's (1984) description of "rigorous qualitative analysis" described earlier. This would be followed by a review of the conclusions and their supporting data by outside auditors, a method used in a study by Parlett & Hamilton (1972).

## Timetable

It is expected that 18 months would be required to complete this study. Six months would be required for data collection; six months for data analysis; and six

months for writing the report. Most of the data collection would take place in the last three months of the data collection period because during the course only the interview data on student goals and observation and group meeting data could be collected. The rest of the interview data, which is most of the data, could not be collected until the course is completed in the fourth month.

## Summary

It is hoped that by using this qualitative approach to examine the process and outcomes of learning, some tentative conclusions can be drawn about how and what students learn from different methods of delivery in distance education. In particular, it is hoped that some insight would be gained into how and what students learn from video taped lectures, course manuals and audio teleconferences. Equally important would be student reactions to and feelings about the different components of the course. However, this study is only proposed as a first exploratory step in the process of attempting to understand learning from different distance education modes from the students' perspective. Its success would be measured by its ability to provide enough direction to allow researchers to begin to examine more specific questions, such as how to utilize

videotapes and other media, using research methods that are likely to produce meaningful results.

## References

Achenbach, T.M. (1978). *Research in developmental psychology.* New York: Free Press.

Agler, L.S. (1976). *Evaluation of the English 101 telecourse "Writing for a Reason"* Dallas County Community College District, Texas. (ERIC Document Reproduction Service No. ED 136 868)

Agler, L.S.& Linn, T.B. (1976). *Telecourses in Dallas: The first three years.* Dallas County Community College District, Texas. (ERIC Document Reproduction Service No. ED 126 969)

Aversa, F.M. (1983). Evaluation of distance learning systems: Selected issues and findings. In L.N.Purdy (Ed.), *Reaching new students through new technologies* (pp 318-330). Dubuque, Iowa: Kendall Hunt.

Bantock, G.H. (1961). Educational research: A criticism. *Harvard Educational Review, 31,* 261-280.

Barbatsis, G.S. (1978). The Nature of inquiry and analysis of theoretical progress in instructional television from 1950 to 1970. *Review of Educational Research, 48*(3), 399-414.

Bates, A.W. (1981a). Some unique characteristics of television and some implications for teaching and learning. *Journal of Educational Television and Other Media, 8*(1), unknown

Bates, A.W. (1981b). Towards a better research framework for evaluating the effectiveness of educational media. *British Journal of Educational Technology 12,* 215-223.

Bates, A.W. (1984) *Broadcasting in education: An evaluation.* London: Constable.

Bates, A.W. & Gallagher, M. (1977). *Improving the effectiveness of Open University television case-studies and documentaries.* Milton Keynes: Open University.

Becker, H.S., Geer, B. & Hughes, E.C. (1968). *Making the grade: the academic side of college life.* New York: Wiley.

Bloom, B.S. (1956). *Taxonomy of educational objectives. Handbook I: Cognitive domain.* New York: Longmans Green.

Bogdan, R.C. & Biklen, S.K. (1982). *Qualitative research for education: An introduction to theory and methods.* Boston: Allyn & Bacon.

Brown, L.A. (1975). *Learner responses to the use of television in UMA courses.* (Working paper No. 8 ). University of Mid America, Lincoln, Nebraska. (ERIC Document Reproduction Service No. ED 149 793).

Brown, L.A. (1976). *Employment of an open learning course with traditional and nontraditional learners: Some comparisons.* (Working paper No. 13). University of Mid-America, Lincoln, Nebraska. (ERIC Document Reproduction Service No. ED 159 966).

Brown, R.D., Brown, L.A. & Danielson, J.E. (1975). Instructional treatments, presenter types, and learner characteristics as significant variables in instructional television for adults. *Journal of Educational Psychology, 67*(3), 391-404.

Burge, E.J., Wilson, J, & Mehler, A. (1984). *Communications and information technologies and distance education in Canada.* (New technologies in Canadian education, Paper No.5). Toronto: Ontario Educational Communications Authority

Burgess, Robert G. (1984). *In the Field: An Introduction to Field Research.* London: Allen & Unwin.

Burns, R.W. (1976). Instructional television, interaction and learning objectives. *Educational Technology, 16*(5), 44-49.

Campbell, D.T., & Stanley, J.C. (1963). Experimental and quasi-experimental designs for research on teaching. In N.L. Gage (Ed.), *Handbook of research on teaching.* Chicago: Rand McNally.

Campeau, P. (1974). Selective review of the results of research on the use of audio-visual media to teach adults. *AV Communication Review, 22*(1), 5-40.

Chacon-Duque, F.J. (1985). *Building academic quality in distance higher education. A monograph in higher education evaluation and policy.* University Park: Pennsylvania State University, Center for the Study of Higher Education.

Chu, C.G. & Schramm, W. (1968). *Learning from television: What the research says.* Washington D.C. : National Association of Educational Broadcasters

Clagett, (1983). *A review of the telecredit program, Fall 1976-1982.* (ERIC Document Reproduction Service No. ED 229-091).

Dahlgren, L.O. (1984). Outcomes of learning. In F. Marton, D. Hounsell & N. Entwistle (Eds.). *The Experience of learning* (pp. 19-35). Edinburgh: Scottish Academic Press.

Dallas Community College District. (1983). Student evaluation of telecourses in the Dallas County Community College District. In L.N.Purdy (Ed.), *Reaching new students through new technologies* (pp 308-317). Dubuque, Iowa: Kendall Hunt.

Dalton, M. (1964). Preconceptions and methods in *Men Who Manage*. In P. Hammond (Ed.). *Sociologists at work.* (pp. 50-95). New York: Basic Books.

Daniel, J.C., Stroud, M., & Thompson, J. (1982). (Eds.). *Learning at a distance: A world perspective.* Edmonton: Athabasca University Press.

Donsky, A., Vaughn, R., Burke, L., & Hite, C. (1983). *Telecourses: A non-conventional approach to education.* Mentor, Ohio: Lakeland Community College. (ERIC Document Reproduction Service No. ED 171 336).

Entwistle, N. (1984). Contrasting perspectives on learning. In F. Marton, D. Hounsell & N. Entwistle (Eds.). *The Experience of learning* (pp. 1-18). Edinburgh: Scottish Academic Press.

Fetterman, D.M. (1988). Qualitative approaches to evaluating education. *Educational Researcher 17*(8). 17-23.

Filstead W.J. (1970). Introduction. In W.J. Filstead (Ed.). *Qualitative methodology: Firsthand involvement with the social world* (pp. 1-11). Chicago: Markham.

Firestone, W.A. (1987). Meaning in method: The Rhetoric of quantitative and qualitative research. *Educational Researcher 16*(7). 16-21.

Gallagher, M. (1978). *Audio-visual media for teaching and training: The contribution of research.* Milton Keynes, England: Open University. (ERIC Document Reproduction Service No. ED 158 769).

Glaser, B.G. & Strauss, A.L. (1970). Discovery of substantive theory: A basic strategy underlying qualitative research. In W.J. Filstead (Ed.). *Qualitative methodology: Firsthand involvement with the social world* (pp. 288-304). Chicago: Markham.

Hammersley, M. & Atkinson, P. (1983). *Ethnography: Principles into practice.* London: Tavistock.

Hirschman, E.C. (1986). Humanistic inquiry in marketing research: Philosophy, method and criteria. *Journal of Marketing Research, 23,* August 86, 237-249.

Holmberg, B. (1977). *Distance education: A survey and bibliography.* London: Kogan Page.

Holmberg, B. (1981). *Status and trends in distance education.* London: Kogan Page.

Howe, K.R. (1988). Against the quantitative-qualitative incompatibility thesis. *Educational Researcher 17*(8). 10-16.

Hult, R E. (1980). The effectiveness of university television instruction and factors influencing student attitudes. *College Student Journal, 14,* Spring, 5-7.

Jacob, E. (1987). Qualitative research traditions: A review. *Review of Educational Research 57*(1). 1-50.

Keegan, D.J. (1980). On defining distance education. *Distance Education, 1*(1) 13-36.

Lazarsfeld, P.F. & Barton, A. (1971). Qualitative measurement in the social sciences. In B.J. Franklin & H.W. Osborne (Eds.). *Research methods: Issues and insights.* (pp. 141-160). Belmont CA.: Wadsworth.

LeCompte, M.D. & Goetz, J.P. (1982). Problems of reliability and validity in ethnographic research. *Review of Educational Research 52*(1) 31-60.

Lewis, R.L. (1983). *Learning through telecommunications.* Washington: American Association for Higher Education, George Washington University.

Marton, F. (1988). Phenomenography: exploring different conceptions of reality. In D.M. Fetterman (Ed.). *Qualitative approaches to evaluation in education.* (pp. 176-205). New York: Praeger.

Marton, F. & Saljo, R. (1984). Approaches to learning. In F. Marton, D. Hounsell & N. Entwistle (Eds.). *The Experience of learning* (pp. 36-55). Edinburgh: Scottish Academic Press.

Minnis, John R. (1985). Ethnography, case study, grounded theory and distance education research. *Distance Education 6*(2). 189-198.

Moore, M.G. (1975). Cognitive style and telemathic (distance) teaching. *ICCE Newsletter, 5*(4), 3-10.

Mount, G. & Waiters, S. (1980). Traditional versus televised instructional methods for introductory psychology. *Journal of Educational Technology Systems, 9* 45-53

Neil, M.W. (1981).(Ed.). *Education of adults at a distance.* London: Kogan Page.

Olson, D.R. & Bruner, J.S. (1974). Learning through experience and learning through media. In D.R.Olson (Ed.), *Media and symbols: The forms of communication and education. The 73rd yearbook of the National Society for the Study of Education. Part 1.* (pp. 125-150) Chicago: NSSE.

Parlett, M.R. & Hamilton, D. (1972). Evaluation as illumination: a new approach to the study of innovatory programs. Unpublished report. (Reprinted in D. Hamilton & co-authors. (1977). *Beyond the numbers game.* Basingstoke: Macmillan.

Perry, W.G. (1970). *Forms of intellectual and ethical development in the college years: a scheme.* New York: Holt, Rinehart & Winston.

Prosser, M.T. (1984). Towards more effective evaluation studies of educational media. *British Journal of Educational Technology, 15,* 33-42.

Purdy, L. (1978). *Telecourse students: How well do they learn?* Paper presented at the Annual Convention of the American Association of Community and Junior Colleges - April 9-12, 1978. (ERIC Document Reproduction Service No. ED 154 851).

Richardson, P. (1981). *Issues in television-centered instruction.* Paper presented at the Annual Meeting of the American Educational Research Association, Los Angeles, April 1981. (ERIC Document Reproduction Service No. ED 205 217).

Rist, R.C. (1982). On the application of ethnographic inquiry to education: Procedures and possibilities. *Journal of Research in Science Teaching 19*(6) 439-450.

Robinson, R. & West, P.C. (1986). *Interactive cable television: An evaluation study.* Paper presented at the Annual Convention of the Association for Educational Communication and Technology, Las Vegas, NV. January 16-21, 1986. (ERIC Document Reproduction Service No. ED 267 789).

Salomon, G. (1974). What is learned and how it is taught: The interaction between media, message, task and learner. In D.R. Olson (Ed.), *Media and symbols: The forms of communication and education. The 73rd yearbook of the National Society for the Study of Education. Part 1.* (pp. 383-406) Chicago: NSSE..

Salomon, G. (1976). A cognitive approach to media. *Educational Technology, 16*(5), 25-28.

Salomon, G. (1979). *Interaction of media, cognition and learning.* San Francisco: Jossey Bass.

Schramm, W. (1977a). *Some notes on research, theory, and production in instructional television.* (ERIC Document Reproduction Service No. ED 157 514).

Schramm, W. (1977b). *Big media, little media.* Beverly Hills: Sage Publications Inc.

Sell, G.R. (1976). *Introductory psychology (Second offering). Course evaluation report.* University of Mid America, Lincoln, Nebraska. (ERIC Document Reproduction Service No. ED 159 964).

Shavelson, R.J., Stasz, C., Schlossman, S., Webb, N., Hotta, J., & Goldstein, S. (1986). *Exchangeability of student outcomes from regular and telecourse instruction: A feasability study.* Santa Monica, California: Rand McNally.Webb & Hotta, 1987

Shavelson, R.J., Webb, N.M. & Hotta, J.Y. (1987). The concept of exchangeability in designing telecourse evaluations. *Journal of Distance Education, 2*(1) 27-40.

Smith, J. (1983). *Evaluation of the telecourse program at Saddleback College: Student retention and academic achievement.* Unpublished Doctoral. Dissertation, Nova University. (ERIC Document Reproduction Service No. ED 239 684).

Smith, J.K. (1983). Quantitative versus qualitative research: An attempt to clarify the issue. *Educational Researcher 12*(2). 6-13.

Stickell, D.W. (1963). *A critical review of the methodology and results of research comparing televised and face to face instruction.* Unpublished doctoral dissertation, Pennsylvania State University.

Sullivan, A.M., Andrews, E.A., Maddigan, R.I., & Noseworthy, C.M. (1979). *The relative effectiveness of live versus videotaped instruction modes on achievement and student attitudes.* Paper presented at the second conference on experimental research in videotaped instruction and its practical implications, Corner Brook, Newfoundland. (ERIC Document Reproduction Service No. ED 264 832)

Walker, Robert (Ed.). (1985). *Applied qualitative research.* Aldershot: Gower.

Wilson, S. (1977). The use of ethnographic techniques in educational research. *Review of Educational Research 47*(1) 245-265.

Wilkinson, G.L. (1980). *Media in instruction: Sixty years of research.* Washington: Association for Educational Communications and Technology.

Zigerell, J.J., & Chausow, H.M. (1983). Chicago's TV College: Summary of third year comparisons. In L.N. Purdy (Ed.). *Reaching new students through new technologies* (pp. 280-282). Dubuque, Iowa: Kendall Hunt.