FACULTY PERCEPTIONS OF TELECOMMUNICATIONS NEEDS FOR DISTANCE EDUCATION

by

Brendan J. McCaskill

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Approval

Permission

Abstract

Research in distance education has rarely focused on faculty or on the elements of telecommunications technology required to maintain a quality distance education teaching environment. This study focuses on faculty perceptions regarding audio, graphic and motion video needs in distance education, with emphasis on the component most difficult and expensive to implement - live motion video. Also investigated was the balance of importance between the advance preparation and delivery of content, live classroom contact, and follow-up support, as well as the extent to which faculty believe that high quality instruction can be achieved at all with fully and properly implemented telecommunications technologies. The influence of university teaching experience, distance education experience, students' academic maturity, class size, and subject area were analyzed. The stability of faculty perceptions was evaluated.

The survey data collected was both analytic and descriptive. Available communications technologies were illustrated and faculty opinions regarding the importance of each of the component technologies solicited. Likert scales were used to collect the analytic data. Discursive follow-up questions were used to collect the descriptive data.

Faculty perceptions regarding their need for motion video broadcast and interaction were found to be very strong, but associated rationales obscure and of questionable stability. Distance education experience appeared to be an important influence on faculty perceptions. The influences of several other variables were found to be counter-intuitive. Further research is warranted.

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This thesis would not have been completed had it not been for the patience and support of many friends, teachers and advisors. My deep appreciation is extended to my committee: Dr. Eric MacPherson, Dr. George Porozny, and Dr. Paul Madak. Despite many years and many attempts to begin a thesis, no one gave up on me.

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The most important thank you must go to my parents, who have been more patient and supportive than I deserved.

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Chapter 1

Introduction

Universities are soon to face changes in their instructional environment. Traditional instructional methods evolved over centuries must be adapted to new communications technologies, and these methods and technologies adapted to the needs of instructors and students. Where 20th century transportation brought a new clientele to the university, 21st century communications will transport the university to a new clientele - a clientele now excluded for reasons of physical distance, disability, or other reasons not related to academic ability.

This accommodation, pressured by attention to issues of higher education quality and access (Black, 1992), will be accompanied by unavoidable tensions and compromises as technical and political ideals confront practical realities. Foremost among these realities are the perceptions of university faculty who must do the accommodating. These perceptions are the focus of this study.

The Technical Context

North American technological initiatives, most notably the American and Canadian Information Superhighways, are setting the stage for "coopetition" between educational institutions north and south of the Canadian border. Global communications standards are evolving which will make institution and client access feasible on a broader international scale.

Local initiatives are providing improved access for Manitobans to Manitoba educational institutions and to other institutions on the electronic highway. These include Internet access, instructional television via cable or microwave systems, interactive video clusters of rural secondary schools, and the

linkages of these systems with post-secondary institutions. In general, commercial telephony infrastructures are evolving towards making available high quality, cost effective, fully interactive audio/video and data communications links to communities and homes across the province.

Distance education and communications infrastructures at the University of Manitoba are under development. Campus telephone systems are now fully digital. Interactive video links with other institutions have been proposed. The integration of these facilities with provincial and national systems is inevitable, leading to the interconnection of University of Manitoba resources and clientele with alternative resources and markets abroad.

The Political Context

The Federal Government infrastructure development program includes the development of the Canadian Information Superhighway. It is intended that this electronic superhighway help provide the educational access needed for Canadians to develop the skills required to meet the economic needs of the future (Angus & McKie, 1994).

At the provincial level, the Roblin Commission (1994) report gave the Universities notice that expectations for community access will rise, that funding will not, and that telecommunications are seen as the key to improved access and cost effectiveness. Examples of initiatives of the kind suggested by the Roblin Commission are the Western Universities Telecourse Consortium and the First Year by Distance Education program.

At The University of Manitoba, the Task Force on Alternative Forms of Course Delivery (1994) noted that communications technology is likely to play an

important role in alternative strategies and recommended that a high priority be given to developing technological alternatives.

The Problem

This convergence of technological and political incentives leads to pressure for the immediate implementation of communications technologies, potentially resulting in poorly rationalized projects and rushed expenditures. Given the high expectations and modest accomplishments typical of past media innovations in education, and the unprecedented monetary and human resources to be dedicated to this venture, there is an immediate need for detailed research into the needs and priorities to be served by such technologies before they are installed, faculty are expected to use them, and the public expected to pay for them.

The Approach

These needs and priorities could be studied from several perspectives: that of educational service providers, who must provide and deliver instructional content by the best and cheapest means possible; the educational market, which must pay for both content and delivery; and communications vendors, who must provide adequate capacity and quality of service, at the right price, to meet the needs of both the service provider and the market. As communications needs and priorities may be considered part of the product definition that normally precedes market research and the development of communications systems to meet market needs, it seems logical to focus first on the educational service provider.

Educational communications needs and priorities could be assessed by "expert" consultation or by a survey of faculty expected to provide the educational services. However, the results of expert analyses must eventually be

sold to the academic community - which will be difficult or impossible if such analyses do not appropriately consider faculty perceptions. It is likely to be more productive to focus first on the perceptions of the mainstream faculty who will be expected to deliver their content via alternative technological means.

Perceptions are a starting point for the development of technological and human resources. McNeil (1990) stated, "attitudinal issues - how people perceive and react to these technologies - are more important than structural and technical obstacles in influencing the use of technology in higher education." Perceptions are as important as technological potentials or limitations. Whether or not perceived needs and priorities represent actual needs and priorities is moot.

Purpose

The purpose of this study is to investigate the perceived needs and priorities of University of Manitoba faculty regarding the core technologies used for distance education instructional communications.

The three facets of perceived needs and priorities to be explored are:

1. Faculty perceptions regarding audio, graphic and motion video instructional communications requirements.
2. The extent to which (1) may be influence by subject area, students' academic maturity, and class size.
3. The stability of faculty perceptions with respect to perceived needs and priorities regarding instructional communications requirements.

Emphasis is given to real-time video interaction. This is the component with the greatest potential for the support of instructor-student interaction, and the most difficult and costly to implement.

Procedure

The design for this assessment of perceptions is an analytic/descriptive survey and analysis of selected departmental clusters of faculty from The University of Manitoba.

The data was obtained by means of a voluntary mail-in questionnaire. The analytic component data are both nominal and ordinal and would require that non-parametric methods be used if formal statistical tests were to be conducted. Since statistics are used here only as indicators of potentially significant relationships, more familiar t-tests have been used. The descriptive component statements were interpreted subjectively by the researcher.

Significance

This study is intended to provide insights regarding how communications technologies might be most effectively and efficiently implemented so as to make the Manitoba universities more competitive, more quickly, on the Information Superhighway. It may also indicate the degree to which class size, students' academic maturity, and subject area influence faculty perceptions of distance education communications requirements. Third, it may provide indication of the potential and rationale for changes in these perceptions among faculty of The University of Manitoba and how these perceptions might evolve.

Chapter 2

Literature Review

There does not seem to be precedents for this approach to the study of faculty perceptions of distance education communications requirements. The literature, however, does report findings, analysis, and opinions concerning faculty perceptions of both distance education and communications technology. Editorial rhetoric and commentaries were found to be common. Conclusions based upon fresh data are surprisingly rare.

Faculty Perceptions

Despite the impending entry of distance education into the mainstream of higher education (Kirby, 1993), traditional faculty have not been much involved in developing distance education policy and practice (Dillon and Walsh, 1992; Purdy and Wright, 1992; Beaudoin, 1990). Where faculty have been considered, they have often been seen as a barrier to progress due to their frequent resistance to instructional technology (Gunawardena, 1990; Stinehart, 1987).

In their review and analysis of literature relating to faculty participation in distance education, Dillon and Walsh (1992) were able to identify only 24 studies involving faculty, and one (Stinehart, 1987) which involved non-participating faculty. Two subsequent studies (Black, 1992; Clark, 1993) involved faculty not participating in distance education .

Dillon and Walsh (1992) noted that a dominant theme in distance education research has been the learner, rather than faculty. It appears to have been assumed that faculty attitudes are either not relevant or that they can be reasonably induced from research on learners. The later may be true among

distance education faculty, where a learner centered focus is considered the norm (LaBarron & Bragg, 1994), but may be less true in the academic mainstream where the traditional role of faculty has been largely confined to the selection and dissemination of content (Beaudoin, 1990).

Stinehart (1987) found that faculty willingness to teach at a distance was largely unrelated to their perceptions of student performance. Willingness to participate was found to be more related to instructors' sense of control than to teaching and learning. Citing eight studies, Black (1992) noted that typical faculty concerns regarding participation in distance education were the heavy associated workloads, inadequate rewards, and major adjustments in teaching required. Taylor and White (1991), and Pierpoint and Harnett (1988) found that the principal concerns of instructors were the quality of interaction, working with motivated students, satisfaction with the act of teaching, and personal achievement - after which came student performance. It seems apparent that, while a concern for students is implicit in most of the concerns listed above, such concern is not an immediate focus of faculty perceptions.

Innovation and Control

Dillon and Walsh (1992) used models developed by Lindquist (1978) regarding higher education innovation and Rogers (1983), regarding innovation in general, as a framework for their review. This model was used to structure their analysis of 24 studies involving faculty in distance education.

It seems that studies of faculty attitude towards distance education may often be reduced to the study of attitudes towards innovation in general. It seems possible that these findings reflect concerns regarding innovation in higher

education, particularly technological innovation, rather than concerns specific to distance education. Furthermore, it appears that concerns regarding innovation in distance education and instructional technology may have a simple, recurrent, theme - the ability of faculty to maintain their sense of control.

Lindquist (1978) found that for an innovation in higher education to result in change, it must meet four important conditions: ownership of innovations by those affected; adequate informational and personal resources; guiding and evolving rather than authoritarian and dogmatic leadership; an environment open to disparate opinions; and available material and psychic rewards. Rogers' (1983) general theory of innovation states that the factors predicting the adoption and diffusion of an innovation are: the innovation's being perceived as better than its predecessor; its compatibility with the adopters' needs and values; its being simple and easy to understand; testability prior to commitment; and its being easily observable before adoption. Most conditions presented by Lindquist and Rogers contribute to control of the innovation by those adopting it.

Garrisson & Banyan (1987) defined control to be, in the context of the educational transaction, "the opportunity and ability to influence, direct, and determine decisions related to the educational process." Banyan (1992) has since suggested that the concept of control be extended to consider the inter-dependence of the teaching and learning processes and to de-emphasize the isolation suggested by the concept of "independence" in distance education. Banyan suggested that control "must encompass the interactive aspects of distance education in enabling one to fully communicate the complexity of the teaching and learning situation in interactions between teacher, learner, and other resources." Banyan was speaking

to the learner's perspective, but it seems as essential that such needs for control be extended to the inclusion of faculty in the development of distance education instructional delivery systems. Stinehart (1987) noted that faculty control over the teaching and learning process was a powerful predictor of faculty attitudes towards distance education.

Faculty concerns regarding control in distance education innovation do not appear to have been widely recognized and researched, perhaps precluding an understanding of faculty attitudes towards distance education. That faculty have so often been considered a barrier to progress in distance education (Gunawardena, 1990; Stinehart, 1987) or ignored entirely adds to the need for the perceptions of faculty to be addressed before distance education goes mainstream.

Communications Technology

Most studies of distance education communications technology were found to focus on existing technologies and how to adapt faculty to the limitations of the technologies rather than to determining the actual needs these technologies should be designed to accommodate.

One exception was found. Gehlauf, Shatz, and Frye (1991) studied the teaching methods of instructors who had taught using interactive instructional television. Their study indicated that the most frequently used methods remained traditional; group discussions, overhead transparencies, lectures and lecture notes. The differences between interactive television and traditional environments, as perceived by the instructors, were: that more advance preparation is needed to teach effectively in a televised environment; that preparations need to be of high quality; that an ad lib approach was not acceptable; that pedagogical issues

involving interaction need be addressed in faculty training; and that the facilitation of interaction among students was important. They did not discuss why any of these were thought to be less important in traditional environments.

Interaction

In one of the few analytic discussions of interaction in distance education found, Lauzon (1992) stated that as learners progress to higher levels of learning, as defined by Bloom's taxonomy of cognitive objectives, "there is a greater need for human interaction in order for the learner to facilitate the processing of increasing content density." No evidence for that conclusion was offered. No analyses were found which suggested what kinds or qualities of interaction might be considered sufficient by faculty under various circumstances or need to be considered in the implementation of new technologies.

Hillman, Willis, and Gunawardena (1994) noted that "a facet of distance education that is increasingly overlooked is the effect of high technology devices in interaction." This appears to indicate that effective interaction in distance education has come to be seen as technologically possible and that the use of interactive technologies does not necessarily translate into the effective use of their interactive capabilities.

Moore (1991) noted that "while there is much interest in distance education at this time, and a common view that human problems can be solved by advanced technologies there remains a concept of distance education that is little more than the addition of new telecommunications media to traditionally organized classroom instruction." Moore also noted that there is a need for research in this area, particularly empirical research.

The Need for This Study

There is a need for studies of faculty perceptions of distance education and associated communications technologies. Such studies should transcend issues of receptivity and resistance to innovation and the limitations of existing technologies and focus rather on issues unique to distance education and relevant to emerging technological capabilities. Emphasis need be given to control, interactivity, and the inclusion of faculty in the process of innovation.

Chapter 3

Procedure

The purpose of this study is to investigate the perceived needs and priorities of university faculty regarding the core technologies used for distance education instructional communications.

The three facets of perceived needs and priorities explored are:

1. Faculty perceptions regarding audio, graphic and motion video instructional communications requirements.
2. The extent to which (1) may be influenced by subject area, students' academic maturity, and class size.
3. The stability of faculty perceptions with respect to perceived needs and priorities regarding instructional communications requirements.

Emphasis is given to real-time video interaction. This is the component with the greatest potential for the support of instructor-student interaction, and the most difficult and costly to implement.

Overview of the Design

This exploratory assessment of faculty perceptions takes the form of an analytic/descriptive survey and analysis using data collected from department clusters of faculty from The University of Manitoba. The collection and interpretation of data was guided by a model of instructional communications technologies designed by the researcher.

Data Collection

The data was obtained from a voluntary mail-in questionnaire distributed to selected department clusters of University of Manitoba faculty members.

Personnel in the Distance Education Program of The University of Manitoba provided constructive feedback during the conceptualization and design of the instrument and assisted in the distribution of the survey.

The survey packages were delivered to participants via campus mail and included a pre-addressed return envelope for the completed questionnaire. It was asked that the questionnaire be returned within two weeks.

A follow-up letter was sent on the deadline day, reinforcing that distance education experience was not expected of participants and that their input would contribute to policy regarding technologies adopted for distance education use at The University of Manitoba.

Participants

The participants were selected from the departments of Mathematics & Astronomy and Statistics, combined as one cluster of 44 potential participants, and English and Sociology were combined as a second cluster of 76 potential participants. These clusters were chosen for subject area contrast and were not intended to be representative of the University of Manitoba. Neither area requires physical laboratory equipment that would complicate distance delivery.

Department heads reviewed the questionnaire and granted permission for their department members to be approached. Inquiries regarding the receptivity of faculty to this kind of survey research led to the expectation that returns from the Social Science subject areas might be fewer than from the Natural Sciences. The numerical imbalance between the two clusters was intended to accommodate this possibility. Should return rates have been equal between the clusters, English and Sociology were to have been analyzed separately.

The Data and its Analysis

Five point Likert scales, anchored by "not important" or "very important" were used to assess faculty perceptions regarding communications needs. A discursive follow-up question focused more closely on aspects of communication needs of special interest - real-time motion video. Subject area, students' academic maturity and class size were used as grouping variables.

The numerical data were ordinal and nominal. The t-test was used for determining probable differences. The descriptive data were to be interpreted subjectively by the researcher and emerging themes noted. These themes were to be associated with the Likert scale data. The evaluation of the stability of opinion was to be based upon the direct inquiry of participants regarding recent changes in opinion and upon observations concerning the consistency of responses to the main survey questions.

The Instrument

The instrument was derived from discussions with distance education and communications specialists. It was intended to be a reasonable balance between simplicity and technical accuracy.

Preliminary surveys indicated that there were significant obstacles to the development of a valid questionnaire. These included: discomfort with reference to what faculty might perceive to be complex technologies; the time required to complete such a survey, together with a general aversion to participating in survey research; and concern for possible deception. An attempt was made to deal with these issues in the content of the cover letters, the design of the questionnaire, and in the follow-up letter. A copy of each is contained in Appendix A.

The questionnaire has six components. The order of presentation was arranged to ease participants into the effort required, allowing them the option of minimizing the time required to complete the survey while still contributing at least basic data to the study. The following is a listing of the six components of the questionnaire and a rationale for each.

1. The Instructional Communications Model

The questionnaire begins with defining and displaying the Instructional Communications Model shown on the following page. Its intent was to establish the terminology and context required to answer the questions to follow. It was expected that this model would make the instrument less confusing or intimidating for faculty without distance education technology experience, and facilitate clear answers regarding their instructional communications needs.

An important secondary intent of the model was to establish in advance the relationship between faculty's perceptions of classroom communications needs and the electronic resources needed to meet these needs - minimizing later subjective interpretations.

An Instructional Communications Model

In a modern, largely electronic, distance education environment, communication between instructors and students may be seen to have several components. These components of instructional communication, and their relationships to each other, are described and illustrated below. This model will be referred to throughout the questionnaire.

Advance delivery: Content delivered to students for self-directed study in the form of textbooks, course manuals, or audio-video materials (e.g. disk, tape).

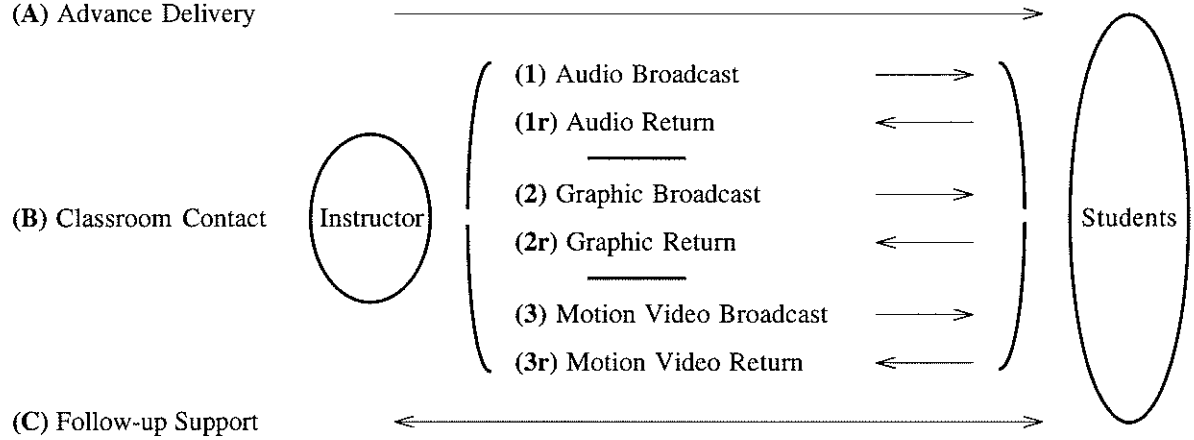
Classroom contact: Direct instruction during classroom sessions by means of **audio**, **graphic**, or **motion video** transmissions, any of which may be in the form of a one-way broadcast or a two-way interaction. A **broadcast** is strictly one-way, instructor to student. Two-way interaction requires an additional student to instructor **return** channel.

Audio refers to radio or telephone/speakerphone applications, the latter frequently in the form of a multi-point teleconference.

Graphic refers to slide or transparency displays with pointing or editing capabilities. These are often referred to as "electronic whiteboard" technologies.

Motion video refers to television quality (or better) video-display applications, in a multi-point configuration if required.

Follow-up support: Assistance provided after **advance delivery** and/or **classroom contact** via telephone or postal service, electronic mail or bulletin board, Internet access, etc.



2. Distance Education Experience

The second component requested information regarding the participant's university teaching and distance education experience. The literature indicates that distance education experience might influence opinions regarding distance education. Some of the faculty involved in this survey might have experience with distance education.

Experience

Instructors' experience is not a focus of this study. However, the following information may be considered should it be necessary to investigate an unusual distribution of data.

How many years have you been teaching at the university level? .....

Do you have experience with distance education at the university level (Yes/No)? .....

If yes: a) How many courses have you taught? ..... Over how many years? .....

b) What communication tools/technologies have you used? .....

.....

3. Situational Parameters

The third component requested information on a specific classroom and subject area situation chosen by the participant. It was expected that class size and students' academic maturity might affect perceived communication needs, particularly with respect to the interaction between instructors and students. Subject area might also be significant. Participants were therefore asked to select a milieu, as shown on the following page, and respond with that milieu in mind. Given the possibility that faculty might teach courses not easily or necessarily identified by department, the participant's home department was openly pre-coded on each questionnaire.

Classroom Situation

Responses to this questionnaire may vary according to classroom situation. Please choose a course with which you are experienced, and keep it in mind as you proceed.

What is the course (mathematics, English, ...)? .....

What is the year classification (1st, 2nd, 3rd, 4th, graduate)? .....

On average, how many students attend? .....

4. Focus Questions

The fourth component of the questionnaire directly addressed instructional communications requirements. Each employed a Likert scale and a subjective follow-up component. Likert scale questions were presented first in order to focus subjects' attention on the issues at hand and to provide a means of evaluating the strength of concerns expressed in the follow-up question. The number and nature of questions asked was a compromise between obtaining the most detailed and meaningful information possible and maximizing return rates.

The questions were intended to determine: the receptivity of participants to distance education communications technology in general; the importance of the main components of communication presented in the model, with emphasis on the modern "electronic classroom"; the importance of the various sub-components of "electronic classroom" communications shown, with emphasis on those most expensive and difficult to implement - broadcast and interactive motion video. These questions are shown on the following page.

Instructional Communications Requirements

1. Supposing that you were to teach your chosen course at a distance, and presuming excellent levels of technical capability, reliability and support: To what extent do you believe that high quality instruction could be achieved via technologies fully implementing the **Instructional Communications Model** described?

(not at all)				(entirely)
1	2	3	4	5

To the extent that high quality instruction could not be achieved, why not?

2. Considering only the three main components of the model (**A**, **B** and **C**), please rate each component according to its expected importance to the effectiveness of your instruction:

	(not important)				(very important)
A) Advance Delivery	1	2	3	4	5
B) Classroom Contact	1	2	3	4	5
C) Follow-up Support	1	2	3	4	5

What purposes do you believe that component **B** (Classroom Contact) can serve that **A** and **C** cannot?

3. Component B, Classroom Contact, has three broadcast (instructor to student) sub-components. Please rate the importance of each of the **broadcast** sub-components (**1**, **2**, and **3**) of component B:

	(not important)				(very important)
1) Audio Broadcast	1	2	3	4	5
2) Graphic Broadcast	1	2	3	4	5
3) Motion Video B/C	1	2	3	4	5

What purposes do you believe that sub-component **3** (Motion Video Broadcast) can serve that **1** and **2** cannot?

4. Component B, Classroom Contact, has three interactive return (student to instructor) sub-components. Please rate the importance of each of the interactive **return** sub-components (**1r**, **2r**, and **3r**) of component B:

	(not important)				(very important)
1r) Audio Return	1	2	3	4	5
2r) Graphic Return	1	2	3	4	5
3r) Motion Video Return	1	2	3	4	5

What purposes do you believe that sub-component **3r** (Motion Video Return) can serve that **1r** and **2r** cannot?

5. Stability of Opinion

A direct approach was taken to assessing possible evolutions of opinion. Question five was:

5. Have your opinions regarding the use of distance education technology changed over the last several years? If so, how have they changed and why?

6. Other Comments

Participants were queried regarding relevant opinions not captured by the instrument. Feedback was also solicited regarding the clarity of the questionnaire. Question six was:

6. Should you have any other comments that you would like to make, please do so now. Comments on the clarity of this questionnaire would also be appreciated.

Cover Letters

There were two cover letters. The first was from the principal researcher, meeting ethics criteria and addressing the issue of distance education experience not being required to complete the survey. The second was from the Director of the Distance Education Program of the University of Manitoba, emphasizing the need for and significance of the study and assuring respondents that it would contribute to strategic planning at the University of Manitoba.

Testing the Instrument

Following conceptualization and design, the instrument and cover letters were reviewed by several staff members of The University of Manitoba who were professionally familiar with distance education and associated communications technologies. It was agreed that the model and questions accurately represented potential distance education communications needs and priorities.

A second round of reviews was conducted. The cover letters and the instrument were checked for clarity, form and grammar. Modifications were incorporated as suggested.

Finally, the instrument was piloted on ten faculty members who had not yet seen the questionnaire and had consented to assist with its testing. Five of the faculty members selected were familiar with distance education technology and five were not. The readers were asked to note any concerns they might have regarding the impact or clarity of the questionnaire which might impede returns or confound results. Three such rounds of edits were conducted. The last three readers raised only minor concerns.

Chapter 4

Results

This chapter contains a summary of returns, tabulations of Likert scale and discursive data collected, an evaluation of the usefulness of the instrument, preliminary observations regarding the data and necessary modifications to the original plans for analysis. A complete analysis of these results is contained in Chapter 5.

Return Rates

The returns are summarized in Table 1. Comments made by department heads indicated that 10 - 20% of faculty were on leave or otherwise unavailable to receive and return the questionnaire within the time limit. The rate of return, adjusted for undeliverables, was approximately 33%.

Due to confusion regarding wording, three respondents did not complete questions three and four. Their responses to all of the other questions are included in the analysis. Two respondents indicated opposition in principle to distance education and provided no data beyond question one.

Table 1.

Summary of Returns

	Math	English	Sociology	Total
Mailed	44	38	38	120
Completed	13	7	7	27
Incomplete	1	1	1	3
Opposed				2

Tabulation

Non-discursive responses to the questionnaire are summarized in Table 2 at the end of the chapter. Each line of the table contains the responses from one questionnaire. The Likert scale and discursive responses to questions 1 and 2 are summarized in point form in Table 3 and the responses to questions 3 and 4 in Table 4. A summary of the responses to questions 5 and 6 of the questionnaire are summarized in Table 5.

The discursive responses were collated by apparent theme. Responses appearing to address some previous or following question were recorded as if in response to that question. Comments made which were unrelated to any question asked were recorded as "other comments" in response to question 6. Comments regarding the clarity of the instrument are discussed in the following section.

Usefulness of the Instrument

The questions were evaluated for clarity and consistency regarding how respondents perceived and answered the questions asked. Except as indicated below, the clarity and consistency were found to be adequate.

Clarity

The three incomplete returns appeared to be the consequence of not having provided sufficient explanation of broadcast and return. This problem was also noted on several completed returns, but these respondents appeared successful in working through their initial difficulty. There were four cases of confusion regarding "graphic" versus "motion" video. In each case, the respondents stated what he or she thought it meant, and were correct in their assumption.

The remaining 23 returns indicated no serious frustrations or confusion. Two respondents suggested "cutting the jargon," but completed the questionnaire. There were several comments that although the model and questions were clear, care was required to keep the model in mind while completing the questions and more time than expected was therefore required.

Consistency

There was some confusion with respect to the interpretation of the audio scales. Some respondents considered the scales to be a query concerning the value of audio independent of other technologies that might be in use at the time, resulting in 4 or 5 (very important) responses. This is how the scale was intended to be interpreted. Others regarded the scale as a query concerning the value of audio alone as compared to being used in combination with graphic or motion video support, in which case it was rated a 3, 2 or 1 (not important). The audio, 1 and 1r, scales were therefore considered to be seriously confounded and were dropped from the analysis. There was no evidence of any similar confusion involving the graphic or motion video scales.

Responses to Likert scales 2 and 2r, graphic broadcast and return, and 3 and 3r, video broadcast and return, were consistent. The 3 and 3r responses were found to be bimodal, respondents either attaching a high value to motion video or being ambivalent. However, the corresponding discursive responses indicated that this bimodality was due to actual differences in opinion rather than confusion regarding the intent of the question. The patterns of response to the Likert scale questions are precisely indicated in Table 11.

One respondent recognized that "graphic" transmission is only a limited case of motion video transmission. The respondent completed the 2, 2r, 3, and 3r scales appropriately - identically. This technical complication was considered in the design of the model and disregarded for the sake of simplicity. In fact, the only difference between graphic and limited motion video is cost, given that graphic technologies can be supported by ordinary telephone lines rather than higher capacity video data services.

Preliminary Observations

Three observations were made:

1. Return rates were lower than expected. The return rates from Mathematics & Astronomy and Statistics were twice those from English and Sociology.
2. Discursive responses regarding motion video, the special interest of the study, were very nebulous.
3. An unexpectedly high proportion of responses, approximately 30%, came from faculty with some distance education experience.

Consequences for Analysis

These observations forced deviations from the original plan of analysis, although the purpose and focal points of the study remain unchanged. These deviations are as follows:

Subject Area Groupings

The low return rate left an insufficient number of responses per subject area for useful statistical analysis. Apparent subject area differences precluded merging the responses into a single group. Given the proportions of returns, it seemed reasonable to combine English and Sociology into a "Social Sciences"

group for comparison with the "Physical Sciences" Mathematics & Astronomy and Statistics group. At n=16 and n=14, respectively, these groups are still too small for confident statistical conclusions.

Reordering of Objectives

Given the available number of returns, and nebulous discursive responses, the potential for firm conclusions pertaining to faculty perceptions regarding instructional communications requirements was seen to be limited. Analytic focus was shifted to model clarification - the influence of variables.

Speculations regarding faculty perceptions were still possible but limited to inferences drawn from the Likert scale data and insights drawn from the associated discursive responses. The nebulous responses regarding motion video also suggest that the third focus of the study, assessment of the stability of faculty perceptions, may be more important than anticipated.

Experience as a Variable

The proportion of respondents reporting distance education experience, probably due to return bias, was not expected. The intent had been, if necessary, to exclude these respondents and focus on the opinions of the majority without such experience.

The low number of returns, and the high proportion indicating distance education experience, left no option but to consider the influence of experience in the planned analysis of class size, academic maturity and subject area differences. The influence of experience needed to be analyzed and the confounding of other analysis due to the influence of distance education experience considered.

Table 2

Experience, Classroom Situation, Likert Scale Data, and Change

	U Exp	D Exp	#	Yrs	Dep't	Year	Size	Extent	A	B	C	1	2	3	1r	2r	3r	Change
101	36	yes	3	4	M	2	40	3	5	5	5							no
102	20	yes	0		M	1	120	5	5	5	5	5	5	5	5	5	5	yes
103	10	yes	3	2	M	1	15	4	3	5	3	4	3	5	4	3	5	no
104	27	no			M	2	90	5	5	5	5	5	5	1	5	5	1	no
105	25	no			M	1	90	4	4	4	4	4	3	4	4	2	4	no
106	31	no			M	1	100	4	1	4	3	3	4	5	4	3	4	yes
107	40	no			M	1	120	5	4	5	5	5	5	5	5	5	5	no
108	21	no			M	2	170	3	5	5	5	3	5	5	4	1	1	no
109	25	no			M	1	125	3	4	5	5	1	5	5	4	4	4	no
110	11	no			M	1	120	3	2	5	4	1	4	4	2	4	1	yes
111	25	no			M	2	170	2	3	5	4	2	3	4	3	4	5	yes
112	22	no			M	1	250	4	4	5	5	5	5	5	5	3	5	no
113	3	no			M	1	90	4	4	5	5	5	5	3	5	4	2	no
114	25	no			M	2	35	4	2	4	3	4	4	4	4	3	4	yes
201	14	yes	1	3	S	2	70	4	5	3	5							no
202	15	yes	1	2	S	1	170	4	3	4	5	3	2	4	3	2	4	no
203	8	yes	1	1	S	3	60	3	4	4	4	3	3	5	3	3	5	no
204	8	yes	2	6	S	2	15	4	5	3	5	5	2	4	5	2	2	no
205	24	yes	2	5	S	2	120	4	5	4	2	5	2	4	4	1	4	no
206	1	no			S	3	60	3	3	5	4	5	4	4	5	4	3	no
207	4	no			S	1	95	4	4	5	5	5	5	5	5	5	5	yes
208	26	no			S	2	60	3	3	5	4	4	3	5	4	1	5	yes
301	2	yes	0		E	1	40	4	4	5	5	5	2	5	5	2	5	(yes)
302	23	yes	2		E	2	50	5	4	4	4	4	4	4	4	4	4	yes
303	33	no			E	2	35	3	4	5	5	5	5	2	5	5	2	no
304	23	no			E	3	40	3	1	5	5	5	1	5	5	1	5	yes
305	7	no			E	2	13	3	3	3	5	3	4	4	1	2	1	yes
306	28	no			E	1	42	5	5	4	5	5	4	4	5	4	2	no
307	32	no			E	1	50	3	3	4	3							(yes)
308	34	no			E	1	50	4	5	5	5	5	5	5	5	2	5	yes

Table 3

Limitations of Technology/Advantage of Classroom

	Extent	Why not possible?	B	Advantage of Classroom
101	3	Peer contact - even occasional	5	Feedback/vary pace/innovate
102	5	-	5	Feedback/clarify/efficient
103	4	Faculty contact - one on one	5	Feedback/immediate response
104	5	-	5	Feedback/student questions
105	4	-	4	-
106	4	Peer contact	4	Delivery/unable to read texts
107	5	-	5	Feedback/eyes; weak students
108	3	Demonstration/involve fully	5	Feedback/vary pace
109	3	Peer contact; faculty contact	5	Feedback/body language
110	3	Faculty contact; activity hard	5	Learn/imitate active process
111	2	Socratic interaction difficult	5	Feedback/vary pace/clarify
112	4	Faculty contact/subtle clues	5	Feedback/clarify; peer disc
113	4	-	5	Feedback/clarify; efficiency
114	4	-	4	-
201	4	Just "old fashioned" merits	3	Feedback/clarify; peer disc
202	4	Peer contact - even occasional	4	-
203	3	Socratic interaction difficult	4	Delivery; force application
204	4	-	3	Faculty contact; peer disc
205	4	Faculty contact	4	Interactivity/inspecific value
206	3	Emotional effects/environ	5	"Here and now" discussion
207	4	Limitations to interaction	5	Feedback/test; "reality check"
208	3	Peer contact; class dynamics	5	Delivery; content feedback
301	4	Limitations to feedback	5	Dialogue/inspecific value
302	5	-	4	Faculty contact; enthusiasm
303	3	Depersonalizing; dynamics	5	Feedback/clarify/elaborate
304	3	Personal contact/subtle cues	5	Need context and presence?
305	3	Collaborative learning hard	4	Feedback/eye contact; peers
306	3	Content requirements	3	To demonstrate visually
307	5	-	4	Efficient presentation (A/V)
308	4	Peer contact	5	Feedback/adaptability

Table 4

Video Broadcast Advantages/Video Return Advantages

	3	Motion Video Broadcast	3r	Motion Video Return
101		-		-
102	5	Content delivery - animation	5	Content feedback
103	5	Faster ??	5	More personal
104	1	-	1	-
105	4	-	4	-
106	5	Spontaniety ??	4	Spontaniety ??
107	5	Eye Contact	5	-
108	5	Serves other purposes ??	1	-
109	5	-	4	-
110	4	-	1	None
111	5	Just best ??	5	Just best ??
112	5	Content - animation	5	Feedback - cues important
113	3	More interesting	2	Illusion - instructor comfort
114	4	-	4	-
201		-		-
202	4	Very important ??	4	Closest to live ??
203	5	Essential ??	5	Essential ??
204	4	More interesting	2	Not much
205	4	Student comfort	4	Closer to live
206	4	-	3	See student reactions
207	5	-	5	-
208	5	Closer to live	5	Closer to live
301	5	Video content material	5	Crucial ??
302	4	Video content; presence	4	Illusion of presence
303	2	Illusion (questionable)	2	(Prejudicial; distacts)
304	5	Dynamic delivery	5	Eyes contace, coaxing
305	4	Help create context	1	-
306	4	Attention; stage drama	2	No idea
307		-		-
308	5	Non-verbal delivery cues	5	Non-verbal feedback cues

Table 5

Change in Opinion, Clarity and Other Comments

	Change	Reason	Clarity	Other Comments
101	-	-	-	-
102	Pos	New technologies	-	-
103	No	-	-	-
104	No	-	-	-
105	-	-	-	-
106	Pos	New technologies	-	Improved access
107	No	-	-	-
108	-	-	-	-
109	No	-	Jargon	-
110	Pos	New technologies	-	-
111	Pos	Exposure	-	-
112	-	-	-	-
113	No	-	-	Good teaching 1st
114	Pos	New technologies	-	-
			-	-
201	No	-	-	-
202	No	-	-	Improved access
203	No	-	Jargon	-
204	No	-	-	-
205	No	-	-	-
206	No	-	Clear	-
207	Yes	New technology	-	Fiscal reality
208	Yes	New technology	-	-
301	Neg	Relocation value	Clear	Access opportunities
302	Pos	New technology		
303	No	-	-	-
304	Pos	New technology	Clear	-
305	Pos	New technology		
306	No	-	Clear	-
307	Neg	Cost cutting plan	Jargon	Diminishes quality
308	Pos	New technology	-	Thinking about it!

Chapter 5

Analysis

This chapter contains an evaluation of the influence of faculty experience, subject area, students' academic maturity, and class size differences on faculty perceptions, a summary of perceptions regarding instructional communications requirements, and an assessment of the stability of these perceptions.

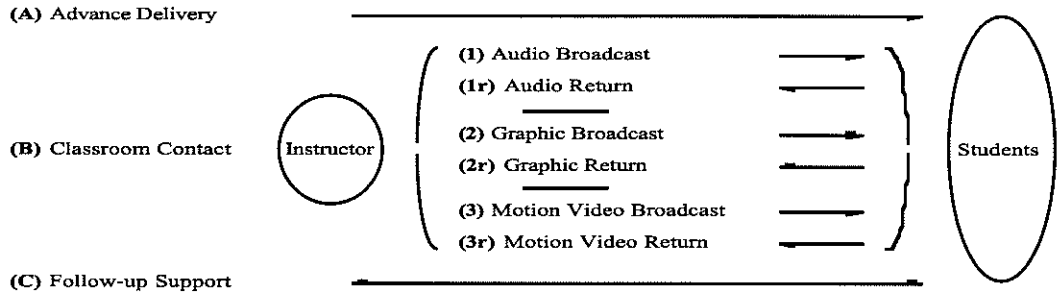
A preliminary review of the data, discussed in Chapter 4, led to a shift in the first focus of the analysis to the evaluation of the influence of variables on faculty perceptions. Faculty experience was added to this list of variables. This was not planned, but was found to be necessary due to the number of respondents reporting distance education experience, too few returns to permit the isolation of these returns, and the confounding effect this might have. Faculty experience was therefore analyzed first and the results of this analysis considered in observations of all subsequent analysis.

Independent t-tests are used for comparisons of the Likert scale data. This is intended for model clarification purposes only, as a means of enhancing simple visual observations of the data and conveniently expressing the character of any patterns observed. Further research is required to properly establish the statistical significance of any differences suggested.

For model clarification purposes, the possible significance of differences are considered to begin at $p = .2$. This high value of p was considered appropriate given the exploratory nature of this research. More rigorous discrimination will be left to subsequent, truly statistical, follow-up research.

Comments are made where inspection indicates possible correlation with variables other than that being tested. Again, formal tests will be left to more rigorous follow-up research. Observations are also made regarding the nature of possible relationships and any notable points of interest such as the lack of apparent differences where differences would intuitively be expected.

Numeric variables 'Extent,' A, B, C, 1, 2, 3, 1r, 2r and 3r, and discursive responses associated with 'Extent,' B, 3 and 3r, addressing the emphasis on real-time video, were analyzed. 'Extent' refers to the degree that faculty believed that high quality instruction could be achieved via technologies fully implementing the Instructional Communications Model shown below. All other variables refer to the channels of communication illustrated in this model.



The audio scales, 1 and 1r, were found to be confounded due to misinterpretation of the instrument and were therefore dropped from analysis .

The Influence of Variables - Faculty Experience

Two comparisons were used to evaluate the influence of faculty teaching experience. These were respondents' university teaching experience and their reported experience with distance education.

University Teaching Experience

Responses were grouped by a median split based on university teaching experience. The senior group had 23 years of university teaching experience or more, averaging 28.5 years. The junior group had 22 years or less, averaging 10.5 years.

The 5-point Likert scale averages are compared in Table 6 below.

Table 6

Comparison of mean Likert Scale Responses of Junior and Senior Faculty Members

Group	Extent	A	B	C	2	3	2r	3r	n
22-	3.71	3.86	4.43	4.64	3.77	4.46	3.08	3.39	14
23+	3.75	3.63	4.56	4.19	3.79	4.07	3.14	3.86	16
p	.904	.597	.601	.149	.973	.313	.903	.431	

Observations:

The only apparent difference is found in scale C, follow-up support. The follow-up support of students appears to be more important to junior faculty than to senior faculty. However, one would expect that senior faculty are more experienced with both content and students and therefore able to compensate in their instruction for problems likely to require follow-up.

Distance Education Experience

Responses were grouped by distance education (DE) experience. Ten out of 30 respondents reported distance experience, all of which was with radio or television, audio or video recording, teleconferencing or correspondence. Two had

taught using Internet. Two reported having taken distance education courses rather than having taught them. No respondents indicated experience with interactive video technologies.

The 5-point Likert scale averages are compared in Table 7 below.

Table 7

Comparison of mean Likert Scale Responses of Faculty With and Without DE Experience

DE Exp	Extent	A	B	C	2	3	2r	3r	n
Yes	4.00	4.30	4.20	4.30	2.88	4.50	2.75	4.25	**10**
No	3.60	3.45	4.65	4.45	4.16	4.16	3.26	3.37	**20**
p	**.193**	**.060**	**.089**	**.659**	**.010**	**.420**	**.384**	**.174**	

Observations:

Apparent differences are found in the Extent, A, B, 2 and 3r scales.

Faculty with DE experience appear to believe more fully in the Extent to which high quality instruction could be achieved at a distance using modern distance education communications technologies.

The differences in A, advance delivery, and B, classroom contact, appear to indicate that faculty with DE experience place more emphasis on the advance preparation and delivery of course content and less on classroom delivery.

The lessor importance of graphic broadcast, 2 (instructor to student), among faculty with DE experience is consistent with lesser emphasis on classroom contact, the point being that whatever can be delivered graphically in

class can be prepared and delivered in advance. Other analysis will indicate that subject area differences may account for a portion of this difference.

Faculty with DE experience are also seen to attach greater importance to video return, 3r (student to instructor).

The Influence of Variables - Instructional Situation

Subject area, students' academic maturity, and class size differences were analyzed. Given the limited data available, the influence of subject area, academic maturity, and class size on faculty perceptions cannot be isolated. Comments are made where it appears that confounding may be a problem.

Subject Area Differences

Responses were grouped by subject area. Mathematics & Astronomy, combined with Statistics (M+S) were compared with Sociology and English (S+E). Seven S+E faculty reported distance education experience as compared with three in M+S.

The 5-point Likert scale averages are compared in Table 8 below.

Table 8

Comparison of mean Likert Scale Responses of M+S and S+E Subject Area Selections

Subject	Extent	A	B	C	2	3	2r	3r	n
M+S	3.79	3.64	4.79	4.36	4.31	4.23	3.54	3.54	**14**
S+E	3.69	3.81	4.25	4.44	3.29	4.29	2.71	3.71	**16**
p	**.739**	**.700**	**.029**	**.802**	**.026**	**.888**	**.120**	**.771**	

Observations

Apparent differences are found in the B, 2, and 2r scales. The 3 and 3r scales are notable for their lack of difference.

Classroom contact, B, was seen to be more important to M+S faculty than to S+E faculty. Some of this might be accounted for by the greater number of faculty with distance education experience in S+E as compared with M+S. The complexity of content matter and inadequacy of textbooks and other instructional materials were several times indicated as reasons for the emphasis on classroom contact by M+S faculty.

Graphic broadcast and return, 2 and 2r, were considered more important among M+S faculty than S+E faculty. This is expected where the importance given to classroom contact is greater. It is notable that in M+S, graphic communications are considered almost equal in importance to motion video. In S+E, motion video appears to be considered more important than graphics - although this difference was not tested.

The importance of motion video broadcast and return, 3 and 3r, appear to be identical in the two groups. While M+S faculty tend to refer to physical content needs, and S+E faculty to emotional or dramatic needs, each group appears to be convinced of a need for motion video.

Students' Academic Maturity

Responses were grouped by a median split based upon students' year of instruction. Respondents having selected 1st year classes were compared with those selecting 2nd or 3rd year classes. Only three faculty members chose 3rd year classes, and none 4th year or above.

The 5-point Likert scale averages are compared in Table 9 below.

Table 9

Comparison of mean Likert Scale Responses of 1st Year and 2nd/3rd Year Class Selections

Year	Extent	A	B	C	2	3	2r	3r	n
1st	4.00	3.67	4.67	4.47	4.07	4.57	3.43	4.00	15
2nd/ 3rd	3.47	3.80	4.33	4.33	3.46	3.92	2.77	3.23	15
p	.061	.761	.186	.6777	.200	.087	.217	.195	

Observations:

Apparent differences are found in the Extent, B, 2, 2r, 3 and 3r scales. The differences in 2 and 2r are to be ignored, their source having already been discussed.

The differences in Extent and 3, video broadcast, appear to indicate that faculty believe quality instruction can be more easily achieved using technology at a 1st year level than at higher levels and that motion video broadcast, 3, is more important at the 1st year level.

The differences in B, classroom contact, and 3r, motion video return, appear to indicate that faculty believe classroom contact to be more important in teaching 1st year classes than higher level classes, and that visual feedback is also more important in dealing with 1st year classes. Although the difference was not great, it is unexpected given that interaction is commonly thought to be more necessary, and in greater demand, at higher levels of instruction.

Class Size

Responses were grouped by a median split based on reported class size. Respondents reporting a small class size (85 students or fewer - averaging 42) were compared those who selected a large class size (86 students or more - averaging 131). In the small class group, 13 of 16 classes were S+E. In the large class group, 11 of 14 were M+S. Seven faculty members teaching small classes had distance education experience, as compared with three teaching large classes.

The 5-point Likert scale averages are compared in Table 10 below.

Table 10

Comparison of mean Likert Scale Responses of Small and Large Class Size Selections

Class Size	Extent	A	B	C	2	3	2r	3r	n
85-	3.63	3.69	4.31	4.38	3.39	4.31	2.77	3.69	**16**
86+	3.86	3.79	4.71	4.43	4.14	4.21	3.43	3.57	**14**
p	**.429**	**.824**	**.109**	**.868**	**.108**	**.811**	**.217**	**.841**	

Observations:

Apparent differences are found in the B and 2 scales. Again, the 3 and 3r scales are notable for their lack of differences.

The differences in B, classroom contact, and 2, graphic broadcast, are most probably due to the effect of disproportionate subject area and distance education experience representation between groups. There is no apparent difference in the importance of motion video due to differences in class size. This was unexpected given the large difference in average class size and the effect this is likely to have on the potential for meaningful interaction between instructors and students.

Instructional Communications Requirements

Faculty perceptions regarding instructional communications requirements were investigated by examination of the Likert scale and associated discursive responses to survey questions 1 - 4. This examination is limited to the scales of greatest interest, Extent, B, 3 and 3r.

The distribution of responses is shown in Table 11 below.

Table 11

Frequency of Likert Scale Responses

Likert Value	Extent	B	3	3r
1	0	0	1	4
2	1	0	1	4
3	11	3	1	1
4	15	9	11	7
5	5	18	13	11
Average	**3.73**	**4.5**	**4.26**	**3.63**

The value of the Likert scale averages as an indication of faculty opinion is limited given the variables involved. The distribution of, and rationale behind, the associated discursive responses were found to be more useful.

Considerable subjectivity was involved in interpreting and summarizing the discursive responses. They were reduced to the most general and obvious terms, as shown in Tables 3 and 4, and reviewed for validity. Responses were grouped by theme. Single responses which were not seen as being a part of any such theme were ignored in the analysis.

Given the relationship between questions 1 and 2 , and questions 3 and 4, discussion will follow the analysis of responses to questions 2 and 4.

Question 1

The Likert scale question was:

1. Supposing that you were to teach your chosen course at a distance, and presuming excellent levels of technical capability, reliability and support: To what extent do you believe that high quality instruction could be achieved via technologies fully implementing the **Instructional Communications Model** described?

The discursive component was:

To the extent that high quality instruction could not be achieved (via technologies implementing the **Instructional Communications Model** described), why not?

There were twenty-one discursive component responses. The themes are summarized as follows:

- In fifteen cases, there were indications of concern for subtle aspects of instructor/student interaction; body language, eye contact, control of dynamics and "humanizing" personal contact.
- In six cases, there were indications of a general concern for student peer interaction.
- In four cases, there were indications of a concern for some fundamental aspect of content delivery.

Question 2

The Likert scale question was:

2. Considering only the three main components of the model (**A**, **B** and **C**), please rate each component according to its expected importance to the effectiveness of your instruction:

The discursive component was:

What purposes do you believe that component **B** (Classroom Contact) can serve that **A** and **C** cannot?

There were twenty-seven discursive component responses. The themes are summarized as follows:

- In nineteen cases, classroom contact was said to provide necessary interactivity or feedback; for reasons of teaching ease and efficiency, opportunity for clarification and innovation, and control of pace.
- In four cases, classroom contact was considered necessary for peer interaction; no details were offered.
- In four cases, classroom contact was considered necessary to convey various aspects of content; i.e. the dynamics of a mathematical process, emotion or drama, etc.
- In three cases, classroom contact was seen necessary to support weak students or to compensate for the poor quality of study materials.

Observations:

The perceived need for classroom contact is seen to be overwhelmingly for the purpose of immediate instructor/student interaction. With respect to the extent that quality instruction is considered possible using distance education technologies, faculty concerns appear to be focused on the degree to which immediate interaction can be maintained.

Secondary purposes of classroom contact are seen to be support for peer interaction and effective content delivery. Again, opinions regarding the extent to which quality can be maintained using distance education technology appear to be focused on the degree to which support for peer interaction and effective content delivery can be maintained.

There were several unanticipated responses:

The first was several responses indicating that quality instruction could be fully achieved via distance education technologies. Does this indicate belief that sound technologies and teaching skills can overcome the obstacles to interaction, or does it indicate that immediate interaction is not necessarily considered a prerequisite for high quality instruction?

The second was the concerns expressed for effective peer interaction, given that the Instructional Communications Model implies that students are grouped at their end of the communications "channel." Does this imply that grouping alone is considered insufficient, and that instructor facilitation is seen to be required for adequate peer interaction?

The third surprise was the general lack of concern regarding the delivery of content. The ease and efficiency with which content can be delivered appear to raise some concern, as does the need to be able to compensate for weaker students or instructional support materials. In most cases, however, content does appear to be considered deliverable via distance education technologies. Alternatively, faculty who thought otherwise might not have responded to the questionnaire.

Question 3

The Likert scale question was:

3. Component B, Classroom Contact, has three broadcast (instructor to student) sub-components. Please rate the importance of each of the **broadcast** sub-components (**1**, **2**, and **3**) of component B:

The discursive component was:

What purposes do you believe that sub-component **3** (Motion Video Broadcast) can serve that **1** and **2** cannot?

There were twenty-seven discursive component responses. The themes are partitioned and summarized as follows.

Twenty-four responses are associated with Likert scale 3, 4 or 5 values:

- Fourteen responses made reference to the fact that video was somehow, intangibly, better. No reasons were given.
- Five responses indicated the video was necessary only for the sake of student interest or instructor comfort.
- Four responses made mention of content needs, two of which were for the purpose of showing videotapes.
- In one notable case, video was said to provide the illusion of presence which, other than for holding attention, was of dubious value.

Two responses are associated with Likert scale 2 or 1 values:

- In each case, video broadcast was stated to be of little or no value.

Question 4

The Likert scale question was:

4. Component B, Classroom Contact, has three interactive return (student to instructor) sub-components. Please rate the importance of each of the interactive **return** sub-components (**1r**, **2r**, and **3r**) of component B:

There were twenty-seven Likert scale responses. Their average value is meaningless given that the pattern was bimodal. There were eighteen Likert scale 4 or 5 (very important) responses, one 3, and eight 2 or 1 (not important) responses. Respondents either believed motion video interaction to be essential or of little value. The bimodality did not appear to have a specific pattern or association with any other variable.

The discursive component was:

What purposes do you believe that sub-component **3r** (Motion Video Return) can serve that **1r** and **2r** cannot?

There were twenty-two discursive component responses. The themes are partitioned and summarized as follows.

Fifteen responses were associated with Likert scale 4 or 5 values:

- Fourteen responses indicated no reason for the importance of motion video return, other than it was "closer to live." The importance of motion video return seems primarily to be in replicating the feel of a traditional campus classroom.
- Three responses indicated interest in visual feedback from students.

Eight responses were associated with Likert scale 2 or 1 values:

- There appears to be a consensus that video return provides nothing of value beyond the illusion of class presence, which might be of some comfort to the instructor.
- In one case, the point was made that video return might be prejudicial; that having no video feedback would protect students from superficial impressions and help focus attention on teaching and learning.

Observations:

While valued by faculty, the perceived practical benefits of motion video for content delivery or instructor/student interaction appear to be limited. The benefits are seen to be almost entirely emotional or intangible. As such, it may be difficult to probe the attraction to motion video and determine whether benefits are intangible but legitimate or emotional reactions tied to the illusion of presence.

Perceptions regarding motion video may be volatile. The bimodality of responses regarding motion video return is one reason for this speculation.

Stability of Perceptions

Responses were grouped by reported recent change of opinion regarding the use of distance education technology. Eleven faculty indicated changes to the positive and two to the negative. Seventeen respondents indicated no change or made no comment.

Of the eleven opinions shifted to the positive, nine were reportedly due to improvements in the technology, one due to a recognition of fiscal reality, and one due to exposure to distance education by observation of a colleague. Only two faculty members indicated experience with distance education.

Of the two shifted to the negative, one was reportedly due to having seen the value of having students who can leave home doing so to experience a new learning environment. The value of distance education for those unable to leave home was recognized. The other negative response was due to a perceived potential for abuse - i.e. having communications technology used to effect cost reductions rather than to improve the quality and access of education.

The 5-point Likert scale averages are compared in Table 12 below.

Table 12

Comparison of mean Likert Scale Responses of Faculty Indicating Changed and Unchanged Opinions

Change	Extent	A	B	C	2	3	2r	3r	n
Yes	3.62	3.08	4.54	4.23	3.67	4.58	3.00	4.08	**13**
No	3.82	4.24	4.47	4.53	3.87	4.00	3.20	3.27	**17**
p	**.481**	**.005**	**.792**	**.352**	**.680**	**.128**	**.714**	**.171**	

Observations:

Apparent differences are found in the A, 3 and 3r scales.

The apparent difference in A, advance preparation, indicates that faculty members with recently changed opinions consider the advance preparation and delivery of materials to be less important than do those faculty with unchanged opinions. This is what one would expect given that the majority of faculty with distance education experience are found in the unchanged group, although the strength of the difference is greater than one might expect.

The apparent differences in 3 and 3r, motion video broadcast and return, indicate that faculty with recently changed opinions consider motion video, both broadcast and return, to be more important than do faculty whose opinions have remained unchanged. This is despite the fact that the majority of faculty reporting distance education experience are in the unchanged group. Given the results of the comparison of faculty with and without distance education experience, one would expect the difference to be the opposite.

Chapter 6

Conclusions

This chapter contains a review of the purpose and method of the study, comments regarding the adequacy of the instrument and survey procedures, unexpected limitations, conclusions and inferences.

Purpose of the Study

This study investigated the perceived needs and priorities of university faculty regarding technologies used for distance education communications. The three facets of perceived needs and priorities explored were:

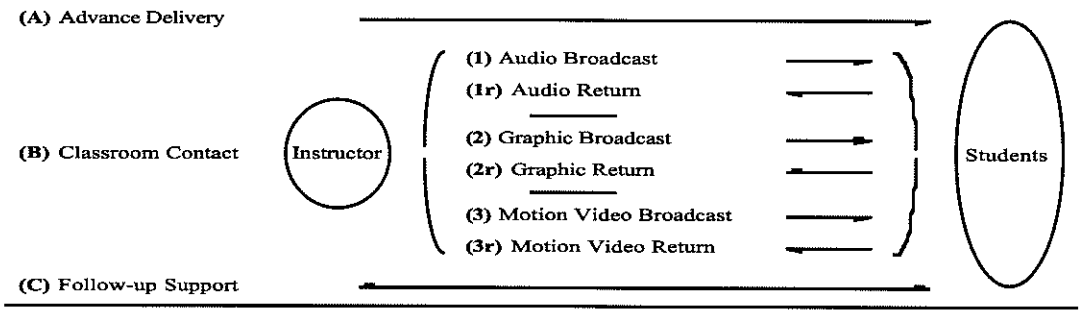
1. Faculty perceptions regarding audio, graphic and motion video instructional communications requirements.
2. The extent to which (1) may be influence by subject area, students' academic maturity, and class size.
3. The stability of faculty perceptions with respect to perceived needs and priorities regarding instructional communications requirements.

Emphasis was given to real-time video interaction. This is the component with the greatest potential for the support of instructor-student interaction, and the most difficult and costly to implement.

The first question was the extent to which faculty believed that high quality instruction could be achieved via technologies fully implementing the Instructional Communications Model below, outlining the communications technologies used in modern distance education. Subsequent questions queried the perceived importance of each component of the model.

Numeric variables 'Extent,' A, B, C, 1, 2, 3, 1r, 2r and 3r, and discursive responses associated with 'Extent,' B, 3 and 3r, addressing the emphasis on real-time video interactivity, were analyzed.

'Extent' refers to the degree that faculty members believe that high quality instruction could be achieved via technologies fully implementing the Instructional Communications Model shown below. All other variables refer to the individual channels of communication illustrated in this model.



Instrument and Method

The instrument was successful in collecting useful data for analysis. Some data was confounded due to the construction of the questions concerning audio broadcast and return. The data associated with variables 1 and 1r were therefore discarded. Other variables did not appear to be affected.

The questionnaire may have been too long and complex to fully achieve its intended purpose. This may have resulted in the lower than anticipated returns and a bias towards more technically inclined faculty or those most interested in distance education. The return rate, adjusted for questionnaires undeliverable within the required time frame, was approximately 33%.

The return rate from natural sciences faculty was nearly double the return rate from social sciences faculty. One third of respondents indicated experience with distance education, which is probably greater than the university average - although comparative data was not immediately available.

The limited data and probable return bias resulted in modifications to the originally planned objectives and analysis, as follows:

1. The first focus of the study was redirected from instructional communications requirements to the clarification of variables. Due to limitations of the data, perceived communications requirements of faculty were assessed less conclusively than originally anticipated.
2. Faculty experience was included as a variable in order to determine the extent of its influence and any possible confounding effects.
3. The third focus of the study, the stability of faculty perceptions, became a more important concern than anticipated given the difficulties encountered in probing faculty perceptions regarding motion video.

The Use of Statistics

Comparisons were made using the t-test. This was for model clarification purposes only, as a means of enhancing simple visual observations of the data. Further research is required to establish the proper statistical significance of the differences suggested.

Limitations

The unexpectedly low return rates and imbalance of returns from subject areas, indicating the likelihood of serious non-return bias, were not investigated. There was also an unanticipated number of responses from faculty reporting

distance education experience, the effects of which could not be easily controlled given the limited data available.

Political events immediately preceding data collection may have influenced the number of returns and been at least partially responsible for the difference in subject area return rates.

The Influence of Variables

The grouping variables were Subject Area, Students' Academic Maturity, and Class Size. Two more variables were added and considered first: University Teaching Experience and Distance Education Experience.

The following summaries reflect findings which have potential statistical significance or are interesting due to the counter-intuitive nature of the results. The implications noted are a synthesis of the results and observations resulting from previous analyses.

University Teaching Experience

Junior and senior faculty, averaging 10.5 and 28.5 years university teaching experience, were compared. The only apparent difference found between them was that junior faculty appear to emphasize follow-up support more than do senior faculty. It is recognized that this could be the result of greater student-related insight among senior faculty resulting is less need for follow-up.

Implications:

Senior faculty appear indistinguishable from their younger colleagues with respect to perceptions of the potential of distance education communications technology and instructional communications requirements. These faculty may be an undervalued resource in distance education practice. They are likely to have

course content better internalized and to be more comfortable with students than junior faculty and therefore more able to focus on communication and interaction rather than content.

Furthermore, if traditional faculty perceptions are thought by some to be an impediment to distance education, these perceptions are not likely to be retiring with senior faculty. A passive approach towards evolving faculty perceptions - waiting them out - is likely to be ineffective. As noted from the analysis of "stability of opinion," positive changes in faculty perceptions are more likely to be catalyzed by information and experience. An active development plan based on providing such information and experience to all faculty may be the preferred approach.

Distance Education Experience

Faculty reporting distance education experience and those reporting no such experience, numbering 10 and 20 respectively, were compared. It appears that faculty with distance education experience place greater emphasis on the advance delivery of content and less on classroom contact. Faculty with distance education experience also appear to be more convinced that high quality instruction can be achieved via distance education communications technologies and consider motion video feedback from students to be more important than do those without distance education experience. The distance education experience reported was often minimal and based upon such traditional technologies as radio or television, audio teleconferencing, or Internet access.

Implications:

Distance education experience appears to result in shifts in delivery and student interaction preferences, these being a shift towards advance preparation and delivery of content and a greater desire for motion video feedback. In more theoretical terms, experience with distance education appears to promote increased expectations of student independence and facilitate a natural evolution from one-way, content-centered, lectures which might as easily be televised towards an interactive, learner centered, style of instruction.

It also appears that practical distance education experience is required to promote such shifts. Comparison with data regarding recent changes in faculty opinion indicates that while experience with distance education technology may alter perceptions regarding the potential and application of the technology, an increased passive interest does not appear to result in such shifts. Furthermore, exposure to relatively "low tech" audio or non-interactive broadcast video technologies appears to be very effective in promoting shifts in perception and preference with respect to more advanced technological alternatives such as interactive motion video.

In this, there are several implications for the kinds of guidance and support that might be provided for the transition of faculty from a traditional to a distance education-oriented learning environment. The first is that there may be no reason to consider measures to effect such changes in instructional style among faculty, given that the desired changes are likely to occur naturally with the appropriate experience. Given the apparent interest, such opportunities need only be offered. The second implication is that while high quality interactive video may be desired

before some faculty will consider becoming involved in distance education, the evolving effect of distance education exposure on faculty perceptions appears to take place at relatively simple levels of applied technology.

Subject Area

Mathematics, Astronomy and Statistics (M+S) respondents were compared with Sociology and English (S+E) respondents. There appears to be a greater desire for graphic transmission capabilities among M+S respondents than among S+E respondents. There were no apparent differences regarding perceived needs for motion video broadcast or return. M+S respondents appear to consider motion video and graphics equally important while S+E respondents appear to consider graphics to be considerably less important than motion video.

Implications:

Given the subject area clusters tested, and although rationales may differ, it seems likely that the perceived need for motion video technology is strong across all subject areas. It is not clear whether this strength is due to a diversity of subject matter needs or intangible perceptions of communication needs largely unrelated to the subject matter at all. Given the lack of concern found in discursive responses for technological limitations involving content delivery, the latter appears to be the more plausible explanation.

Despite the interest in motion video, motion video does not appear to be sufficient as a substitute for graphic support capabilities - particularly in M+S where content delivery requirements appear to be more of an issue.

Students' Academic Maturity

The perceptions of respondents selecting first, second or third year courses were compared. No respondents selected fourth year or later. It appears that faculty believe that high quality instruction can be more easily achieved using distance education technologies with first year students. Respondents also appear to believe that motion video broadcast is more important at the first year level than later. Finally, classroom contact and motion video return appear to be considered more important for first year than for higher level students, but this difference is less pronounced than differences in perceived need for motion video broadcast.

Implications:

The results are paradoxical. One would expect a greater need and potential for interaction at higher levels of instruction. This expectation is consistent with distance education being seen to have a greater potential where interaction is less typical and video broadcast, or even videotape, is therefore most suitable - as is often the case with first year courses. However, the first year level is also where the greater perceived desire appears to be seen for interactive potential, in the form of real-time classroom contact and return video capability.

These findings appear to reinforce the earlier perceived confusion regarding the perceived purpose and benefits of interactive video and speculations that faculty are most comfortable with distance education technology where it can be used in a traditional mode and changes in teaching style minimized.

These results may also illustrate dissonance between a content-centered approach to instruction requiring little interactivity and a learner-centered

approach involving greater interaction. Some faculty may expect students to be independent and self directed while others expect student dependence and the need for faculty direction. If the case, this issue might be best resolved in a traditional university environment before being transplanted to distance education where technology stands to be unfairly blamed for subsequent dissatisfactions. Decisions may be required regarding expectations of student independence, given the differences in communications resources required to support different expectations. In any case, further research is required to clarify the influences underlying these apparent dissonances.

Class Size

The perceptions of faculty selecting small or large class sizes, averaging 42 and 131 students respectively, were compared. There were no apparent differences, even with respect to motion video interactivity.

Implications:

Interactive motion video classroom communications tools appear to be highly desired regardless of obviously large differences in the potential for effective and equitable classroom interaction between instructors and students due to class size. This apparent illogic reinforces concerns expressed in discursive responses regarding concerns for adequate peer interaction. It seems certain that interaction, whether instructor/student or peer/peer, cannot be effectively facilitated in a class situation involving 131 students.

This might mean several things. It may be that full advantage is not being taken of the potential for interaction in the small classroom environment when it is available. It may also be that classroom interaction in general tends to be more

perceived than actual. Either way, it seems likely that motion video interactivity does not play the role or serve the needs commonly expected of it.

The discursive responses to questions involving motion video give rise to speculations regarding the actual role of interactive motion video and why class size appeared to make no difference to perceived needs. While there was much talk of "interaction," much of this talk referred to subtle feedback provided by body language, facial expression and eye contact. There may be a subtle but powerful difference between the use of interactive technologies for active, student-centered, interaction and for more passive forms of interaction providing only feedback on the success and approval of instructional communications which remain primarily lecture oriented and content-centered. In the latter case, only a sample of class response is required, and this is likely to be only the first few rows of the class regarding of whether the class size in 30 or 130.

Should the above be the case, the implications for the design and cost effectiveness of instructional communications resources might be significant. Likewise the impact of such design on instructors' and possible students' satisfaction. More research is required.

Further research is required concerning the perceptions of communication and interaction existing in traditional classrooms that faculty so strongly desire to replicate in a distance education setting.

Instructional Communications Requirements

Conclusions regarding perceptions of real-time motion video requirements were drawn from the discursive responses regarding B, classroom contact, 3, motion video broadcast, 3r, motion video return, and the Extent to which faculty

believed that high quality instruction could be achieved if the required technologies were fully implemented.

There was insufficient data available to permit partitioning responses by any of the comparison groups previously defined. This is unfortunate as such a partitioning may have yielded interesting results.

The following is a condensed summary of the results pertaining to the four relevant questions, following by their collective implications:

Q1: Extent

The extent to which faculty believed that high quality instruction could be achieved averaged 3.7 on a 5 point Likert scale. The reported reasons for concern regarding quality were strongly associated with concerns regarding the adequate replication of the classroom environment via distance education communications technologies.

Q2: Classroom Contact

The perceived importance of classroom contact averaged 4.5 on a 5 point Likert scale. The advantages of classroom contact were considered to be the opportunity for immediate instructor/student interactivity and feedback. Concerns raised with respect to the quality of classroom contact centered about the limitations posed by the technology on this interaction or feedback. There were secondary concerns for the facilitation of peer interaction and content delivery as well as compensation for weak students and poor quality study materials.

Also notable is that a significant number of respondents believe that high quality instruction can be completely achieved via communications technologies - despite obstacles to interaction posed by the technology.

Q3: Motion Video Broadcast

The perceived importance of motion video broadcast averaged 4.3 on a 5 point Likert scale. The only consistent, albeit nebulous, explanation offered for the importance of motion video broadcast was that it was thought "better" - the specific benefits seeming to be intangible. References were made to student interest, instructor comfort, or "videotape" presentation needs. There were, however, several instances of respondents who believe motion video broadcast to have little value other than perhaps holding students attention.

Q4: Motion Video Return

Opinion was divided regarding the importance of motion video return. Two thirds of respondents considered it equal in importance to motion video broadcast. One third were indifferent. The Likert scale averages of those in support of motion video return was 4.6 out of 5 (n=18). The Likert scale averages of those indicating indifference was 1.7 out of 5 (n=9).

Again, little in the way of rationale was offered. Instructor comfort was mentioned several times. In several cases where motion video return was thought to be unimportant, comments were made regarding how it might help create the illusion of presence, but otherwise to be of little value.

Implications:

The acceptance of distance education by many faculty appears contingent upon the availability of real-time, fully interactive motion video technologies. This is supported by indications that changes in opinion regarding distance education are influenced by improvements in technology relating to motion video. Rationales for such needs appear to be emotional and difficult to articulate.

Perceptions regarding the directional components of real-time motion video are even more difficult to isolate. All that can be concluded regarding underlying rationales is that "interaction is important" and that simulation of a traditional "live" university classroom environment is the apparent objective. The value of this simulation seems to be limited to minimizing changes in instructional style and in being able to involve students in order to keep them motivated.

Stability of Perceptions

Superficially, respondents' perceptions appeared obvious and consistent. Under closer scrutiny, it seems that they may be quite the opposite.

The stability of faculty opinion was evaluated in two ways; directly, by means of inquiry regarding changes of faculty opinion, and indirectly, by means of noting conspicuous absences and inconsistencies in the data which were made apparent from the previous analysis.

Change of Opinion

One third of respondents, generally not yet involved in distance education, changed their opinions regarding the potential of distance education during the last several years. The majority of these changes were positive, apparently due to the potential seen in recent developments regarding video technologies. This, combined with indications of shifting patterns of perception and preference with distance education experience, suggests that there may be mechanisms available for shifting faculty opinion in general.

Some respondents, however, indicated a change to the negative. Combined with the number of respondents indicating complete opposition in principle to the concept of distance education, there may be a potential for a polarization of

faculty opinion regarding the value and feasibility of distance education. Divided opinions regarding motion video indicate potential conflict even among faculty generally in favor of distance education.

There also appears to be a pre-experience period regarding perceived needs for motion video which diminishes as maturity in terms of experience with distance education is attained.

Absences and Inconsistencies

In general, patterns of perceived faculty need regarding distance education communications technology appear to be stable or at least to evolve predictably with distance education experience. Perceptions of need regarding motion video interaction may be an exception.

The apparent stability regarding motion video needs may be largely an illusion. Motion video needs are apparently closely tied to interaction needs and these interaction needs appear to be poorly understood.

Some factors to consider may be:

1. The lack of a coherent rationale for the importance of motion video capabilities - broadcast or interactive. While faculty perceptions regarding motion video are strong, they are also apparently ungrounded, and as such may be subject to rapid change on the basis of new information or ideas.
2. The apparent concern for interactivity, with little indication that this potential is or would be used if available. This might be due to perceived, rather than actual, interaction taking place in traditional classrooms and therefore expected in any alternative setting. This is reinforced by the concerns expressed by faculty for the limitations placed on interaction by the technology, while

significant numbers of faculty believe that high quality instruction could be achieved despite these limitations - casting doubt on the extent of classroom interaction in traditional mode instruction.

3. The apparent desire to use real-time motion video interaction to replicate the traditional classroom environment, while faculty experience with distance education itself appears to have considerable power to altering perceptions of the traditional classroom environment. These perceptions are seen to exist prior to any actual experience with motion video, and given only limited experience with distance education. Faculty opinion appears to be free floating, without benefit of experience and prior to the actual impending revolution in low cost interactive video technologies.

Implications:

A question: Following a very strong initial interest in motion video, which seems to moderate slightly with distance education experience, will there be a significant quenching of the perceived need for motion video as faculty gain first hand experience with real-time, interactive, motion video technologies?

It seem possible, if not likely, that faculty perceptions regarding motion video communications needs will evolve quickly and perhaps unpredictably as experience with the technology accumulates. This evolution of perceptions is likely to continue until faculty with such experience become sufficient in number to form a critical mass of opinion and external technical and political forces begin to stabilize.

Meanwhile, claims regarding knowledge of faculty perception of need associated with distance education communications technologies should be treated with considerable suspicion. Perhaps all that can be said with certainty at this time is that faculty perceptions will evolve quickly with experience and that the perceived need for motion video may be the key to provoking faculty interest in distance education instructional technologies and encouraging the participation which will lead to this evolution of perceptions.

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Appendix A

The Survey Instrument, Cover Letters and Follow-up Letter

THE UNIVERSITY OF MANITOBA

CONTINUING EDUCATION DIVISION

Winnipeg, Manitoba
Canada R3T 2N2

Tel: (204) 474-9921
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November 7, 1994

Dear Faculty Member:

I am writing to request your participation in a survey as part of a research study being conducted by B. J. McCaskill, with the support of the Distance Education Program. Mr. McCaskill is a Master of Education student who has been working with the Distance Education Program for several years on the topic of distance education technology.

Much of the current research in Distance Education is focused on choosing cost-effective technologies for distance delivery. Little attention has been paid to Faculty opinions on how the new technologies will affect instruction and on the pedagogical reasons for choosing specific technologies. As Faculty members will ultimately implement the new technologies, their opinions are critical to the successful introduction of any new technology.

Mr. McCaskill's research is unique in that it focuses on Faculty opinions regarding the kind of communications required to achieve high quality instruction in distance education. The questionnaire has been constructed so that no experience in distance education or communications technology is required to complete this survey.

I request your support in this research and ask that you complete the attached questionnaire. The results of this study will be of value to the Distance Education Program as we work with Faculties to develop strategic plans for the implementation of new distance education technologies.

If you have any questions, please call me at 8013.

Sincerely,

Cheryl McLean
Area Director
Distance Education Program

CM/la

November 7, 1994

Dear Sir/Madam:

I am asking for your participation in a research project examining a number of factors which may be of importance as the university enters the electronic "information highway." This study is undertaken as part of my Master of Education degree program at The University of Manitoba.

Purpose

The purpose of the study is to investigate faculty opinion regarding the application of communications technology in university distance education. Technical experience or expertise is not required. All contributions to this study will be equally valued.

Specific areas of focus are:

1. Audio, graphic, and motion video instructional communications requirements.
2. The extent to which (1) may depend upon class size or students' academic experience.
3. The extent to which (1) or (2) may depend upon subject area.

The Questionnaire

The enclosed questionnaire inquires about needs relating to communication technologies that may not yet be widely available, and with which faculty members may be only casually familiar, if at all. The questionnaire, therefore, introduces a model explaining the terminology and context necessary for the questions that follow. I hope you will find this model useful. If not, I would appreciate your taking the opportunity given at the end of the questionnaire to indicate why it was not.

The questionnaire should require less than one half hour to complete. Should the time required be a problem, very brief answers to the discursive components of the questionnaire will suffice. Whatever time you can contribute will be appreciated.

Confidentiality and Results

Responses will be strictly confidential, stored securely, and destroyed upon completion of the study. Data will not be analyzed other than as stated, and the results will be released in summary form only. Individual comments will not be directly quoted.

Your department is one of four being surveyed. The questionnaire has been coded accordingly on the bottom of the first page. It has not been coded in any other way.

The final results of the study will be available in the Faculty of Education Library Thesis Collection, following its expected completion in January, 1995. Its title will be "Communications Requirements for Distance Education: A Faculty Perspective." On request, a summary of results will be delivered to your department office.

Please complete and return the attached questionnaire in the enclosed, pre-addressed, envelope by **November 18**. For additional information, please contact me.

Thank you.

B. J. McCaskill
Faculty of Education
474-8858 or
BJ_McCaskill@Umanitoba.Ca

November 18, 1994

Thesis study: Instructional Communications Needs: A Faculty Perspective

Dear Sir/Madam:

There have been indications that the cover letters of the first mailing insufficiently emphasized that distance education or communications technology experience is not expected of study participants. Fewer than 5% of university faculty have such experience. This is why the contributions of the 95% are so very important. If you are able to find the time, please do respond. I assure you that the results of this study will be taken seriously by distance education specialists willing to listen to what you have to say - and act upon it.

Some questionnaires were not delivered until later than expected. I will not begin analyzing data before November 28, so if you are still able to mail your return by the 25th, I would appreciate your doing so.

Should you need another copy of the questionnaire, I would be pleased to deliver one to your office. Please call me at 8858, or Cheryl McLean at 8013.

I will have the study results prepared for you as soon as possible. Thank you for your time and patience, and I hope you find the results interesting.

Sincerely,

B. J. McCaskill

An Instructional Communications Model

In a modern, largely electronic, distance education environment, communication between instructors and students may be seen to have several components. These components of instructional communication, and their relationships to each other, are described and illustrated below. This model will be referred to throughout the questionnaire.

Advance delivery: Content delivered to students for self-directed study in the form of textbooks, course manuals, or audio-video materials (e.g. disk, tape).

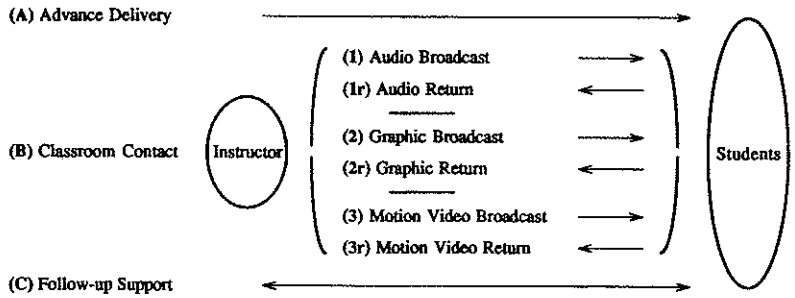
Classroom contact: Direct instruction during classroom sessions by means of **audio, graphic,** or **motion video** transmissions, any of which may be in the form of a one-way broadcast or a two-way interaction. A **broadcast** is strictly one-way, instructor to student. Two-way interaction requires an additional student to instructor **return** channel.

Audio refers to radio or telephone/speakerphone applications, the latter frequently in the form of a multi-point teleconference.

Graphic refers to slide or transparency displays with pointing or editing capabilities. These are often referred to as "electronic whiteboard" technologies.

Motion video refers to television quality (or better) video-display applications, in a multi-point configuration if required.

Follow-up support: Assistance provided after **advance delivery** and/or **classroom contact** via telephone or postal service, electronic mail or bulletin board, Internet access, etc.



Experience

Instructors' experience is not a focus of this study. However, the following information may be considered should it be necessary to investigate an unusual distribution of data.

How many years have you been teaching at the university level? .....

Do you have experience with distance education at the university level (Yes/No)? .....

If yes: a) How many courses have you taught? ..... Over how many years? .....

b) What communication tools/technologies have you used? .....
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Classroom Situation

Responses to this questionnaire may vary according to classroom situation. Please choose a course with which you are experienced, and keep it in mind as you proceed.

What is the course (mathematics, English, ...)? .....

What is the year classification (1st, 2nd, 3rd, 4th, graduate)? .....

On average, how many students attend? .....

Instructional Communications Requirements

1. Supposing that you were to teach your chosen course at a distance, and presuming excellent levels of technical capability, reliability and support: To what extent do you believe that high quality instruction could be achieved via technologies fully implementing the **Instructional Communications Model** described?

(not at all)				(entirely)
1	2	3	4	5

To the extent that high quality instruction could not be achieved, why not?

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2. Considering only the three main components of the model (A, B and C), please rate each component according to its expected importance to the effectiveness of your instruction:

	(not important)				(very important)
A) Advance Delivery	1	2	3	4	5
B) Classroom Contact	1	2	3	4	5
C) Follow-up Support	1	2	3	4	5

What purposes do you believe that component **B** (Classroom Contact) can serve that **A** and **C** cannot?

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3. Component **B**, Classroom Contact, has three broadcast (instructor to student) sub-components. Please rate the importance of each of the **broadcast** sub-components (**1**, **2**, and **3**) of component B:

	(not important)				(very important)
1) Audio Broadcast	1	2	3	4	5
2) Graphic Broadcast	1	2	3	4	5
3) Motion Video Broadcast	1	2	3	4	5

What purposes do you believe that sub-component **3** (Motion Video Broadcast) can serve that **1** and **2** cannot?

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4. Component B, Classroom Contact, has three interactive return (student to instructor) sub-components. Please rate the importance of each of the interactive **return** sub-components (**1r**, **2r**, and **3r**) of component B:

	(not important)				(very important)
1r) Audio Return	1	2	3	4	5
2r) Graphic Return	1	2	3	4	5
3r) Motion Video Return	1	2	3	4	5

What purposes do you believe that sub-component **3r** (Motion Video Return) can serve that **1r** and **2r** cannot?

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5. Have your opinions regarding the use of distance education technology changed significantly over the last several years? If so, how have they changed and why?

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Comments

6. Should you have any other comments that you would like to make, please do so now. Comments on the clarity of this questionnaire would also be appreciated.

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Thank you for your time and cooperation.

Please return this questionnaire by **November 18** to:

B. J. McCaskill
c/o Dr. Eric MacPherson
Faculty of Education
The University of Manitoba

A pre-addressed envelope is enclosed.