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Cindy Gordon

Date of Birth — Date de naissance

Jan 14, 1954

Country of Birth — Lieu de naissance

Canada

Permanent Address — Résidence fixe

Suite 1004
10155 114th Street, Edmonton Alberta

Videotex and Education

Title of Thesis — Titre de la thèse

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Dr Craig Montgomerie

Name of Supervisor — Nom du directeur de thèse

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Videotex and Education

by

(C) Cindy M. Gordon

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

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FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled Videotex and Education submitted by Cindy M. Gordon in partial fulfilment of the requirements for the degree of Master of Education.

.....

Supervisor

.....

.....

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ABSTRACT

The purpose of this study was to examine the future developments of Videotex and its relationship to education. This was approached in two ways. One, Videotex developments and applications were surveyed. Two, a two part Delphi questionnaire was developed. The questionnaire that was designed consisted of three sections. Section one asked respondents to estimate the year in which they thought a number of events would occur. Section two compared respondent's level of agreement to a series of statements. Section three addressed a number of questions specifically related to education .

Findings of this study determined that Videotex is still a technology looking for a market. A number of factors were identified that could affect Videotex's successful entrance into the market. Factors such as the type of transmission system and the amount of government intervention were identified as constraints.

This study also found that the future role of Videotex and its potential role in education can not be determined until other markets such as: the home, military and industry have successfully adopted Videotex. Also, Videotex as it exists today will not be adopted by educators. Findings supported that the interactive or computer managed capabilities of existing Videotex systems are of poor quality for educational use.

This study also determined that the role of the school school administrator, teacher, and student will change as computer technologies, such as Videotex are introduced into education. A number of concerns were generated by respondents that educators are moving too slowly in planning for the usage of computer related technologies in their schools. Findings supported that a serious gap could evolve between those who are computer literate and those who are not.

This Delphi study pulled together some very real concerns regarding the future role of Videotex in education, and also identified some of the problems with the current Videotex technology and marketplace.

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Chapter I

ORIENTATION TO THE PROBLEM

A new world is evolving where the production of information will be the major driving force behind the formation and development of society (Masuda, 1981). The information revolution will affect our educational institutions, will challenge our basic values and will influence key elements in our life style. The information society will create a new world in which economic growth is derived from the exchange of information and the creation of knowledge systems rather than the accelerated consumption of natural resources (Hald, 1981; Cornish, 1981; Tofler 1980). The Canadian economy now meets one definition of the information society with about 50% of job activities being information related (Parkhill, 1981; Wilson, 1981).

The merging of computer and communication technologies will help shape the new society, and the market for these kind of products will grow by an estimated 15 to 20 per cent per year for at least the next decade (Science Report #33, 1982:15). The wired home of the future will have electronic newspapers, a virtually limitless selection of entertainment, teleshopping, homebanking, and centralized control of energy consumption and home appliances (Anderson, 1981).[1]

The widespread penetration of technology will also affect our schools. In the information and data rich

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[1] See Appendix 8 and 10 for more information on markets for home electronic delivery.

environment, numerous electronic resources will be available to the student, teacher, and school administrator. As a result, traditional roles in a school will be transformed (Tydeman et al, 1982:258).

Emerging from the computer and communications industry are a variety of new technological mediums, one of which is Videotex. Videotex is the generic name used internationally to represent a group of home and office information services which involve the electronic distribution of information from information providers to the home or office (Bown and Sawchuk, January, 1981:22). Some speculators believe that Videotex and teletext systems will become as common as television in the normal household (Madden, 1979; Parkhill, 1981).

The International Resource Development Corporation predicts that by 1985, there will be 800,000 telecommunications equipped home computers and 1,200,000 Videotex adapted television sets in the United States. In addition, they predict that 400,000 integrated video terminals (combination of keyboard, computer, videotape machine, and television screen all in one unit) will be in use (Tursek, 1981).

Strategic Incorporated estimates that 45 million American households will have Videotex services of some kind by 1990 (*Business Week*, June 29, 1981). The Hough Report (1980) projects that 84,000 to 190,000 Telidon terminals, the Canadian Videotex System, will be in operation in Canada

by 1986; and by 1991 there will be approximately 260,000 to 750,000 terminals in use among businesses, educational institutions, and homes.

New technology generally requires five to fifteen years to diffuse throughout society on a significant scale (Bright, 1972) hence educators have time to recognize and adjust to the technological progress of Videotex. If these projection rates are accurate, educators must anticipate the development of Videotex in society and attempt to understand how education might be affected.

This study has been conducted to help educators understand the implications of events and conditions surrounding Videotex developments and also to provide an indication of a time frame of various developments surrounding this technology. While no claims are made that the future can be predicted with any certainty, Helmer (1966: 36) has stated, "future studies can reveal general trends and provide warning signals of potential changes to our society that might be avoidable."

A. Statement of the Problem

This study examines the future developments of Videotex and attempts to assess the extent to which Videotex will be used in education. More specifically, the objectives of the study are:

1. To survey Videotex developments in industrialized

countries, particularly with respect to education.

2. To survey expert attitudes on a number of statements relating to Videotex and the role of Videotex in education.
3. To establish probable dates by which a number of events affecting the development of Videotex will occur.

B. Significance of Study

Few people would argue that we are moving into a new era of education; an era where microelectronic technology and intelligent networks will create an information revolution, which in turn will play a major role in transforming education. The manner in which educators choose to participate in this information revolution will have far reaching implications (Science Report #33, 1982:52). The Council for Educational Technology of the United Kingdom and France's Ministry of Education have both stressed the urgent need for education to help people develop knowledge and skills in technology which will make them able to adapt to our rapidly changing world (Large, 1980).

It is also significant that nearly every industrialized country has embarked on its own program to develop Videotex. If educators make no attempt to understand this technology, there will be little hope that the full benefits of the technology can be tailored to meet their needs, when it does diffuse into education.

Often educators do not use expert opinions external to education. Frequently educators are criticized for their lack of awareness of emerging societal trends, and in turn, a lack of understanding of how new trends may affect their organization (Tofler, 1980; Papert, 1980). Educators need to ensure that Videotex is examined so that its incorporation into education will be systematic.

The body of literature linking education and Videotex is minimal. The delphi research methodology offered one means of collecting information and opinions from a cross section of experts on the applications of Videotex to education. The cross section selected included: educators, information providers, Videotex hardware suppliers, and information carriers.

These experts helped provide some valuable opinions as to how Videotex might be used in education and described some of the problems that educators will have to face with the introduction of new electronic technologies. In addition, a study examining Videotex and its application to education is significant because many experts believe that "Videotex has potential as an educational medium" (Hurley and Cioni, 1981).

C. Assumptions

The study is based on the following assumptions:

1. There are persons who are knowledgeable about Videotex, and who are able to identify future developments in Videotex.
2. The knowledge of persons participating in the study is able to provide valuable information on the future role of Videotex in education.
3. The Delphi forecasting methodology is an appropriate means for measuring the future role of Videotex and its potential role in education.

D. Delimitations

The study is delimited in the following ways:

1. Respondents selected to participate in the Delphi study were asked to answer the questions based on their association and knowledge of Videotex or computer technology.
2. The group of educators selected to participate was not a true representation of their population because they were specialists in a very narrow field.

E. Limitations

The study is subject to the following limitations:

1. The effectiveness of the study in identifying the future development of Videotex and its effect on education was limited by the knowledge and foresight of the population

selected.

2. The effectiveness of the respondents in making judgements about questions on Videotex is limited by personal variables beyond the control of the researcher.
3. A major limitation is the use of mailout questionnaires to measure a respondent's perceptions of the development of Videotex and its potential role in education.
4. A final limitation is the nature of the study itself. Recent writers (Doyle and Goodwill, 1971) have pointed out the shortcomings to the effectiveness of the Delphi technique.

Chapter II

Literature Review

A. Videotex Defined

A Videotex system is essentially a mass market information delivery system in which users can display information from a remote computer system on their television screen or terminal using a keyboard or hand-held keypad. The information can be transmitted using a variety of technologies: telephone line, two way coaxial cable, microwave, satellite or fibre optics. Currently, the two most frequently used carriers are the telephone line and coaxial cable.

A Videotex network can connect businesses and homes creating an "electronic highway" out of two way video communication. Users can communicate with other users to make purchases, make reservations, pay invoices, participate in opinion polls, access a wealth of stored information, and exchange electronic mail (Larratt, 1980). Some of the educational applications being researched are: course listings, computer assisted instruction, tutorial programs and library services (Tydeman, et al, 1982).

B. Videotex Business Elements

There are several major components that comprise the developing Videotex business:

1. Equipment manufacturers - which manufacture

Videotex-adapted television receivers, access terminals for users, provide terminals for page creation and other hardware components essential to the medium.

2. Information providers - companies that provide information to be stored for user access. There are, potentially, a vast number of information providers, although certain firms, like Infomart (a Toronto-based joint venture of Torstar and Southam) are taking the lead in acting as both data base managers and sales agents. Theoretically, the information providers are unregulated and operate in a climate similar to the free newspaper press.
3. Information distributors - so-called "electronic highway" operators: the telecommunication carriers, cable companies and broadcast operators who distribute the information. These distributors are few in number and are virtually all regulated monopolies or near-monopolies.
4. Other service organizations - provide a variety of support for the Videotex industry and include public data base operators, page creation companies, electronic mail distributors, directory service providers, billing and record keeping companies and, possibly, even new publishing and retail organizations that will manage or provide services in various electronic publishing or teleshopping service areas.

C. Classes of Videotex

Tydeman (February, 1982:57) defined five classes of likely applications for Videotex:

1. information retrieval - the most fundamental Videotex service. Information retrieval involves linking users with one or more data bases from which they can select material of interest.
2. transactions - includes such interactive services as making reservations, paying bills, transferring funds and teleshopping. Because transactions require the user to interact with an external computer, the service depends on having a two way capability.
3. messaging - a Videotex computer acts as a switchboard to store and forward messages from one user to another. A messaging service can provide either one-to-one communication or one-to-many communication.
4. computing - at the most basic level, a Videotex system can permit a person to answer yes or no, or respond to multiple choice questions by using a simple numerical keypad. At a more advanced level, Videotex systems could be used to transmit computer programs (software) directly from a large computer to a small personal computer.
5. telemonitoring - a continous link between a host computer and a user's terminal results in two kinds of automated service: security, such as remote sensing for the detection of fire or intruders; and the automatic

control of home devices, such as an energy management system which might optimize efficient switching of appliances off and on at appropriate times.

D. Videotex - Two Forms

Today, two forms of Videotex exist: interactive Videotex, frequently called "viewdata", and broadcast Videotex usually called "videotext" or "teletext".

Interactive Videotex - Viewdata

Interactive Videotex is a two-way information delivery system. The essential elements of Videotex are (Sigel, 1980:18):

1. A large computer that can store many thousands (perhaps even millions) of pages of textual information.
2. Computer programming (software) that permits the accessing and rapid retrieval of specific items of that information, and the billing of customers who use the system.
3. Transmission lines for sending information back and forth between the customer and the computer; these lines can consist of the public telephone network, a cable television system with two-way capabilities or special microwave facilities.
4. Display and retrieval terminals. These can be color TV receivers with a decoder attached to translate digital signals into the TV display, or modified computer

terminals capable of color display. With phone lines, the terminal must contain a modem that converts an analog telephone signal into digital form for display. The retrieval device may be a simple calculator-like keypad with buttons for numbers 0 through 9, or a full typewriter-like keyboard.

In its present stage of development, Videotex utilizes a telephone line or two-way coaxial cable to carry demands for information to the computer from the user. The amount of material available for retrieval is limited only by the storage capacity of the host computer, and the imagination of those writing and drawing in this medium. There are a number of existing interactive Videotex systems: Prestel (Britain), Antiope (France), Captain (Japan), Bildschirmtext (Germany), and Telidon (Canada).

Broadcast Videotex - Teletext

Broadcast Videotex offers similar services to interactive Videotex, except that it is a one-way system; hence, it does not have transactional capabilities. Broadcast Videotex transmits content from a computer to a modified television set in the home or office using a standard television signal. Television Broadcast Videotex is a "system consisting of a central data store (data base) from which digital data representing text and pictorial information is transmitted in the active portion of available TV lines through a broadcast delivery system"

(Marsh, 1981:1). Approximately 300 screens of broadcast Videotext or teletext can be sent in the vertical blanking interval[2] of a standard television picture transmission or approximately 5,000 screeens can be accomodated by using the full television channel capability. For a user to choose a page of information, there will be an initial investment for adapting the home television set to accept the transmission and for a simple keyboard or keypad for the limited manipulation that such a system allows.

Teletext was developed in the United Kingdom by British Broadcasting Corporation (BBC) engineers who were working on an early closed caption service for the hearing impaired. This led to the BBC's commercial CEEFAX system. The competitive Independent Broadcasting Authority (IBA) produced a similar system, called ORACLE. The first test of these systems took place in 1973 and 1974, with commercial operation began in November, 1976 (Tursek, 1981:146). Other teletext services are: Weta and Quebe (U.S.A.) and Project Iris (Canada).

Throughout the remainder of this thesis where the term Videotex is used, it will refer to interactive Videotex. This is because of the limitations of broadcast teletext; it's content capacity, and limited user facility. It is in

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[2] vertical blanking interval - is a blank line or space between the individual frames of the TV picture. Physically, the lines are located at the top of the TV screen, on the part of the tube hidden by the cabinet. They will not be visible on a properly tuned TV receiver. Hence, the presence of the digital data or teletext signals is not noticed by a viewer watching a normal program.

this capability that interactive Videotex exhibits one of its major advantages over broadcast or cable teletext. In addition, the interactive capabilities of Videotex could potentially enable it to become a new educational medium. There are numerous activities around the world researching applications of interactive Videotex and these applications should not be overlooked.

E. Videotex in the World

At present, many countries are researching and implementing Videotex technology for a number of diverse applications. A variety of systems, each with its own limitations, have been developed.

Britain

Prestel, the pioneer of Videotex service was first developed by the British Post Office in 1970-1971, under the name of Viewdata. Prestel acts as a large central computer warehouse. The service began with over 150 information providers; today, there are over 300.

Prestel offers users three classes of services. The first class is general interest and business databases. Users typically have a printed directory to assist them in accessing various information services, as well indication of the access cost per page (Tydeman, et al, 1982:19). The second class is closed user group services in which a group has exclusive access to a database. A third class of

Videotex is in house applications or private systems. These may be information or message services for international corporations. Some of the Videotex services being offered by Prestel are: information retrieval, messaging (system wide to all users), transactions without payment, games and educational applications. The educational applications are few and those that are accessible consist of course listings, advertisement, or electronic story books (Tydeman, et al, 1982:24).

The British Videotex system uses an alphamosaic picture display method for displaying graphics.[3] The resolution of this display method is quite coarse and pictures appear square edged and rough (Bown, et al, 1979:3). The Prestel quality of graphics is a severe constraint, since television audiences have become accustomed to high quality graphics (Bown, 1979:4).

France

Videotex emerged in France as the result of the French Center for the Study of Telecommunications and Television (CCETT) establishing a research center in Rennes to develop new techmologies for the French PTT, (Postal Telephone

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[3] alphamosaic- is a picture display method that divides each video frame into a number of blocks, namely, 24 rows of 40 blocks in European systems. Within each block, an alphamosaic terminal generates a 8 x 10 matrix of pixels (picture elements) and a 3 x 2 matrix for graphic elements. Thus, the total number of pixels for a full frame alphanumeric text display would be 76,800 and 5,760 for graphic displays (Tydeman et al, 1982:29). Associated with each character are attributes such as: foregound, background color, and whether or not the character is to flash.

Telegraph) which operates telephone services, and for the Telediffusion de France (TDF), the national television network. The outcome of this work was Antiope, a system incorporating both teletext and interactive Videotex services.

In 1978, France started to implement a national plan, based on the recommendations of Nora and Minc (1980), to develop an integrated information services network using the Antiope system. The first major implementation was the PTT's Teletel Videotex service which began in 1981 as a home based trial in Velizy, a Paris suburb near Versailles. The project involves 2,500 homes connected via interactive communication channels with the database information and services of nearly 200 organizations. In 1982, a start was made to equip all telephone subscribers in the Ille et Vilaine region with an electronic telephone directory as a substitute for paper directories.

The French Videotex system presently offers services for: information retrieval, messaging (system wide to all users), transactions with and without direct payment, games and entertainment, and electronic information directories (Tydeman et al, 1982:20). To date, there are no educational applications for Antiope.

The Antiope system, like Prestel, uses alphamosaic codes. However, Antiope incorporates a transmission process called Didon, which offers more flexibility than Prestel.[4]

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[4] Didon - is an associated error detection/correction capability. The main features of the Didon transmission

Japan

The Japanese PTT (Nippon Telegraph and Telephone Public Corporation) developed a telephone based Videotex system called Captain (Character and Pattern Telephone Access Information Network). Captain is similar to the British Prestel system, but because of the need to generate up to 3,000 different characters to accomodate the use of Chinese characters (Kanji), the character pattern generator is located at the Videotex service rather than in the decoder unit in user's terminals (Tydeman et al, 1982:15). The first public trial began in December, 1979 and involved about 1000 user terminals (Yasuda, 1980).

Commercial services for Captain were scheduled to start in the metropolitan Tokyo area in 1983. The Videotex services offered on Captain are: information retrieval, transactions without payment, games and entertainment. The educational applications consist primarily of course listings. Large collections of information called "Think Tanks" are being developed and classified for various levels of educational users (Masuda, 1982). The Japanese are developing "Think Tanks" for other professions as well. The main objective of these is to disseminate information easily and readily.

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[4](cont'd)process is its complete independence from the bit frequency, and its ability to use any video line within the frame. Any kind of digitally coded message can be transmitted via Didon, and the useful data flow can exceed 4 bits second in full channel (625 line standard) capacity (2.8 Mbits/sec in 535 line standards) (Gullermin, 1980:30).

Other Developments in Europe

By the end of 1981, West Germany, Switzerland, Sweden, Finland, Norway, Austria, the Netherlands, Belgium, and Italy were all conducting Prestel-based Videotex trials, and Sweden, Austria, Belgium, the Netherlands, Finland, and West Germany all had British standard teletext services underway (Tydeman et al, 1982:15).[5]

Canada

During the mid 1970's, the Department of Communications in Canada became interested in teletext/Videotex developments. In August 1978, an integrated teletext/ Videotex system called Telidon was announced. Telidon is a second generation Videotex system which is basically a graphics communication protocol which can transmit text (Phillips, 1980:1). Godfrey and Chang (1982) carefully differentiate between Telidon as a graphics protocol and Telidon as a Videotex system.

> The basic Telidon technology consists of a graphics protocol, a way of describing two dimensional colored pictures in a manner that allows a microprocessor and a TV terminal to deal effectively with them. A Telidon Videotex system, however requires a number of other elements, including database software, a communications link, and a means of creating the original pictures (Godfrey and Chang, 1981:2-3).

Telidon's unique contribution to Videotex is a language for storing and transmitting graphics in a compact and device independent manner. Telidon's approach, called

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[5]See Appendix 6 for an overview of European Videotex market and field trials.

picture description instructions (PDI), is a definite departure from the Alphamosaic approach. Telidon graphics are built up from 'geometric primitives' such as points, lines, arcs, rectangles, and poylgons. The PDI's mathematically define the structure of the entity, which may be drawn in outline form or filled in with a solid color or pattern (Bown and Sawchuk, January 1981:23).

Most Videotex systems, including Telidon, use menu selection as the principal means of data retrieval. Menu selection involves the presentation of a sequence of menu pages each containing a number of selections. The user indicates his choice by keying in a number on the keyboard or keypad, upon which the next menu will be presented until the desired page is retrieved (Ball and Gecsei, May 1981:12). The user can also directly access any desired page, by keying in the page identifier.

Telidon databases use tree structured indexes for information retrieval. This type of index has been proposed as the best index system for information retrieval by naive information users of a database, and therefore best for Telidon (Whalen and Mason, May 1981:17). Recent experiments (Lee and Latremouille, 1981; Whaler and Latremouille, 1980; McEwen,1981; Van Ness and Tromp, 1979) have found evidence that members of the general public experience difficulty in retrieving information of interest on first generation tree indexes.

Telidon and the Canadian Market Place

The Canadian government has been active in supporting Videotex trials of Telidon.[6] In 1979, the Canadian government approved a ten million dollar program to develop Telidon field trials and further development of the system's components (Ferrarini, 1981). By the end of 1981, however, the total number of participants in these trials remained quite small. Early in 1981, the Canadian government reaffirmed its commitment to Telidon by approving $27.5 million for further development and marketing efforts (International Videotex/Teletext News, February, 1981). An other announcement was made by the Department of Communications (DOC) in March, 1983 for further funding of $47 million. In addition to government support, private industry in Canada has been responsible for much of the Telidon software and hardware developments. In November, 1980, the International Telephone and Telegraph Consultative Committee (CCITT) approved Telidon, along with Prestel from Britain and Antiope from France as three world Videotex standards. AT&T's acceptance of Telidon as their Videotex standard also placed Telidon in the forefront of this new technology. Tandy Corporation (Radio Shack), in the United States, have already designed, manufactured and offered for sale throughout the world a "Videotex terminal". Apple Incorporated has also announced a Telidon interface board for installation on the Apple II microcomputer. Videotex

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[6] See Appendix 6 for information on the Canadian field trials.

linked with microcomputers creates a powerful new tool.

1981 marked a year of rapid growth and accomplishments for the Canadian Videotex community. In less than twelve months, fourteen new Telidon databases had been created in Canada and dozens of organizations became involved with Telidon for the first time. The field trial program gave information providers a chance to access the use of Telidon in education, retailing, agriculture, business, tourism, and a range of other applications.

Canadian manufacturers of Telidon equipment (such as Infomart, Hemton and Norpak) have made significant sales to influential customers such as Time Incorporated and Cox Cable in the United States, Siemens in Germany, S.T.R. in Switzerland and the Graham Poulter group in England (Juneau, May, 1982:5).

There have been advances in the state of the art. New equipment and software have expanded the capabilities of Telidon and have allowed a diversity of new services to be developed. Telidon can now interface with a wide range of micro computer systems, including IBM, AES word processors, and Apple home computers. The price of the end user terminal seems to be one of the major blocks in the implementation of Telidon technology. The Norpak decoder is now just under $1,000, but this may be too much for the user who is uncertain of both the function and value of access to Videotex.

At present, Telidon terminal penetration stands at about "5,000 in Canada, compared with original estimates for 1983 of 40,000. An early goal was 500,000 terminals for 1985" (Globe and Mail, Oct. 14, 1983).

United States

Unlike many new computer communication technologies, teletext and Videotex first emerged in Europe rather than in the United States. From 1976 to 1978, as Videotex services were underway in Britain and France, United States companies and government officials watched at first with little, then increased interest (Sigel, 1980:87). According to the new adhoc committee representing Videotex/teletext developments, the United States is moving ahead in this industry at an increasingly rapid pace (Strauch, 1981:221). There are numerous approaches to Videotex being developed in the United States market.[7]

A common element in the United Kingdom, France, Canada, and Japan has been the provision of substantial government support in teletext/Videotex developments. Furthermore, the PTT (Postal Telephone and Telegraph) administrations in Japan, Europe and Bell Canada, the dominant telecommunications carrier in Canada, have undertaken leading roles in promoting the development of new information technologies.

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[7] See Appendix 6 for information on field and market trials in the United States.

In contrast, in the United States, neither of these elements is present. There is no government mechanism for developing a nationally coordinated teletext/Videotex system and AT&T (American Telephone and Telegraph), the dominant telecommunications carrier, has moved slowly in this area because of regulatory uncertainty about its role in providing information services (Tydeman, et al, 1982:5). There are, however, two important points not to be overlooked. One, is that there still exists a great deal of conflict between AT&T and various cable companies because both groups are striving to be carriers for Videotex services. Second, the legal process is very formal and judicial in the United States such as modifying existing telecommunications policy (example: Consent Decree of 1956) (Godfrey and Chang, 1981:40).

There are two announcements worth noting which had direct impact on the North American Videotex environment. On May 20, 1981, AT&T announced that their Videotex system would be fully compatible with Canada's Telidon system. This was followed by the announcement in June, 1982 of the joint American National Standards Association Draft/Standard for a Videotex/Teletext Presentation Level Protocol Syntax (Draft Standard, "North American PLPS" June 18,1982). This standard is to graphic information what the ASCII standard is to textual information. A better example would be the morse code. Knowledge of morse code enables an operator to send and to receive a message. The same applies to the coding of

characters in the computer. The NAPLPS standard describes the formats, rules and procedures for encoding of alphanumeric text and pictorial information for Videotex and teletext information.

F. Videotex and Education

The present applications of Videotex in education exist only in the industrialized world. Available applications are fairly limited and conventional, involving library information and general information packages. The few educational courses that are available concentrate on disseminating information to students. Usually, these courses are not highly interactive nor do they appear to offer computer managed instructional capabilities.

Library Reference Service

Specialized libraries and information banks are beginning to allow users to electronically retrieve information. The Source[8], a large electronic database provides subscribers limited access to the "New York Times" information bank. On Line Computer Library Center (OCLC), an American nationwide on-line library cataloging service, is testing the viability of Videotex for library service. In Columbus Ohio, OCLC is operating a field test whereby participants can access the card catalog and request a desired book. The Academic American Encyclopedias were also

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[8] Appendix 6 contains a description of the Source.

made available in a viewdata test for OCLC in Dublin, Ohio during October and December of 1980 (Harnish, 1981).

In the Netherlands, a trial called Viditel[9] has designed an information bank of public library materials allowing users to search for information.

The Calgary Public Library in Calgary, Alberta, Canada, was also involved in a field trial with Alberta Government Telephones in testing the feasibility of using Videotex for library information services. The results of the field trial, as reported by Alberta Government Telephones, is that the high costs for supporting this field trial were prohibitive for the trial to continue. The success of the library service was also inhibited by the tree indexing system (Belzile, 1983).

Course Listings

A number of field or market trials have been using Videotex as a course information service. Extension courses, night school classes, and private school offerings are being advertised on Videotex systems and usually include information on subject, location, fee and enrollment dates. Project Mercury, Canada (1981), Project Ida, Canada (1982) and Venture One, United States (1982), are providing course listing services.[10] The Green Thumb test in Kentucky provides extension/education information to farmers in two

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[9] See Appendix 6 for further information on Viditel
[10] For further information on Project Mercury, Project Ida and Venture One see Appendix 6

rural counties.

Educational Information Packages

Another application for Videotex which appears to be quite suitable for education is an information package. The information package may come in a variety of forms, and is usually designed to appeal to a specific target group. For example, The Genesis Research Corporation, a Canadian electronic information company, is producing children's stories for the Grassroots market trial, and the Vista field trial.[11] Apparently, these children's stories are the most popular item on both databases (Telidon Report, March, 1983). As well, Cox's Index System (U.S.A.) includes an "Electronic School House" which offers math drills and other educational materials (Tydeman, et al, 1982:54). Other examples of information packages being made available are: nutritional guides, cookbooks, medical dictionaries, and language dictionaries.

Direct Instruction

Telidon Distance Education Field Trial

This Alberta field trial examined the use of Telidon as a delivery vehicle for computer based distance education in an introductory high school mechanics course (Montgomerie, 1982). Key areas examined

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[11] Grassroots and Vista are delivered using the Canadian Videotex System, for further information see Appendix 6

in this study were:

1. the relative effectiveness of Telidon
2. computer assisted learning capabilities of Telidon
3. ability of the Telidon Videotex System to provide and maintain data on student use
4. the amount of training required to use the Telidon Information Provider System by program developers
5. the amount of training required to use Telidon terminals
6. the costs of developing and delivering Telidon programs.

Some of the major findings, conclusions and recommendations of this study were (Montgomerie, 1982):

1. Instruction utilizing Telidon was as effective as traditional correspondence instruction and conventional in-school instruction
2. There was a significantly higher completion rate for the Telidon group than for the other correspondence groups combined.
3. The Alberta Correspondence School Mechanics 12 Telidon course was a very primitive form of computer based learning.
4. Students and staff were very supportive of the use of Telidon and computer based learning in distance education.
5. Recommendation - The Telidon graphics protocol should be used in the delivery of computer based

distance education.

6. Recommendation - Alberta education should make the Telidon interface for the Apple II microcomputer available to schools.

7. Recommendation - The Telidon Videotex System should be replaced with a true computer based learning system.

A study was also completed by Alberta Government Telephones Company (AGT) (Belzile, 1983) which examined the cost for delivering Telidon. Findings of this study determined that delivering Telidon for the Correspondence field trial was an expensive investment of AGT's financial resources; and if educators were to use this technology, they would need to be prepared to allocate financial resources for electronic communications.

Telidon at the University of Victoria, B.C.

The University of Victoria is taking a different approach to Computer Assisted Learning and Telidon with their Natal/Telidon Project. The Natal language for CAI which included Telidon as a display device, and mechanisms for generating Telidon pictures is being implemented for the IBM CMS Operating System (Chang, 1983:3) With this type of system and a higher CAI language, Chang asserts that "it is feasible to conceive of a system in which users can generate a picture, send it to another user over a communications network and

receive text or pictures from each other" (Chang, 1983:4).

TV Ontario (1980-81)-Educational Field Trial of Telidon

The fundamental objective of the Telidon education field trial was to give participants the opportunity to explore the potential of Telidon technology for educational applications. TV Ontario has been running a fixed trial experiment consisting of a broadcast Telidon trial and an interactive Telidon trial. The initial aim of the Telidon trial was to demonstrate the system for educational information providers and encourage them to create educational content for it. TV Ontario considers Telidon to have many educational applications:

- Telidon has the potential of delivering educational experiences to anyone, regardless of location or time.
- Telidon's interactive capability allows each learner to proceed at his or her own pace with periodic feedback on progess. Computer assisted learning over a distance therefore becomes possible.
- Telidon's graphics capability can provide a wide range of educational illustrations like music scores, charts, graphs, and maps.
- Telidon has the ability to provide pages of information that unfold at a controlled rate, focussing the viewer's attention and pacing the learning experience.

While Telidon can be used simply as a means of retrieving information over distance, its graphic capability suggest the possibility of a more illustrative role in the learning process.[12]

TV Ontario has also recently developed a Telidon-based career guidance system. The new service offers 10,000 pages of career and guidance information for students and counsellors. By April 30, 1983, more than 20,000 pages of information were to be available. (Telidon Report, March, 1983).

Distance Education

Distance Education has become an area of rapid growth in Canadian education. The introduction of media and telecommunications has been recognized as a means for overcoming some of the problems and barriers to effective student - teacher interaction. "Videotex is a new medium which has shown great promise in Canada as an adjunct instructional system, especially suited to support distant learning (Hurley, 1980). Computer technologies, such as Videotex, provide new opportunites for distance education; the concept of "life-long" learning could become a reality in the information society (Hurley, 1980; Lowe, 1975; Faure, 1972).

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[12]Some examples of educational applications outlined by TV Ontario are provided in Appendix 7

Telidon at Athabasca University, Alberta

Telidon applications were also introduced at Athabasca University in 1979 by Bob Abell and Don Cowper (Telematics, September, 1983:3). The current software utilized a HIPAD digitizer and runs under the Unix operating system on a VAX 11/780. In the spring of 1982, Athabasca University received a Department of Communications grant of approximately $25,000 to purchase Telidon hardware. This money was spent in setting up a Telidon terminal network.

The major application of Telidon at Athabasca is the development of Telidon pages for distance education courses. Presently, plans are being implemented for a complete set of Telidon pages for courses in economics, biology, philosophy, music, and small business management.

Telidon is also being combined with some of Athabasca University's teleconferencing courses. This combination of technologies allow the teleconference instructor to present Telidon graphics to students as the lecture is delivered (Telematics, March, 1983).

Telidon at the University of Calgary, Alberta

A pilot program at the Faculty of Education and Continuing Education at the University of Calgary is using Telidon with the University's teleconferencing system. A number of teleconferencing courses are integrating Telidon generated graphics with the

instructor's presentation. (Telidon Report, March, 1983).

Other Educational Applications for Telidon

The University of Manitoba has developed several interactive short courses and is presently investigating the integration of Telidon with the existing correspondence program, the design of a keyword searching system, and large scale networking configurations (Hylnka, 1982:39). Sask Tel's Videotex Service Trial, Pathfinder, has included in their urban/residential market segment a graphical display of a school bus route and an additional page which indicates where the real bus is. This type of application would be very useful to students and parents, especially in the winter.

A number of other institutions who are currently researching educational applications of Telidon include: Sheridan College, Memorial University, University of Quebec, and the Ontario College of Art. As well, an educational advisory committee to the government and industry has been formed.

Videotex and Education - Social Impact

Numerous discussions of computer technology have focused on the anticipated social impact. Nevertheless, we are witnessing a social transformation in this decade which is being propelled by the microprocessor revolution (Masuda,

1980). Yet, it is still unclear how Videotex will influence education. This is complicated by the fact that Videotex is still searching for viable markets in industry (Tydeman, 1982).

The success of new technologies, such as Videotex, will be determined by the ability of society to counter balance machine automation with appropriate human socialization (Naisbitt, 1981). A great deal of work remains to be done to spread awareness of the potential and problems of Videotex technology in educational sectors and the public at large (Hurly and Hylnka, 1981).

There is need for concern regarding the computer literacy level of people in using and accessing computer information. These skills are presently not widespread, but in the future will become increasingly important as telecommunications plays a larger role in everyone's life (Weinstein, 1981). There exists though a fear of technology for many people, not only among educators but also in society. Whether or not we like it, it is almost inevitable that computer communications will impinge on many aspects of our social and cultural interactions. Those lacking the ability to come to grips with computer technology may well find themselves unskilled to function in society (Papert, 1980; Toffler, 1980; Weinstein, 1982; Hurly, 1982; Masuda, 1982).

Computer technology is changing education and with this change many conflicts will arise (Bork, 1983). If Videotex

is to achieve its fullest potential as an educational medium, many policy issues will have to be dealt with. Some of these include: the issue of public versus private control, cost of the service, provision of quality hardware, software and courseware, provision of sufficient funds for education programs, development, and evaluation (Tydeman, 1982; Hurly, 1982; Purdy, 1980; Cory, 1980; Montgomerie, 1983). The educational use of Videotex requires strong political support, a high degree of skill and competence and a broad educational support system (Cory, 1980).

G. Where is Videotex Heading?

The emergence of Videotex has initiated a diversity of activity around the world. Many field trials of various Videotex systems are underway, only some of which have developed into marketable services.

> The diversity of field trials underway in Canada, United States and Europe indicates a fragmented market approach to technological development. The variety of communication networks, lack of standard for display format, and various combinations of services offered only add to the complexity of marketing Videotex. It is as if these trials are searching for the right packages that will appeal to home consumers (Tydeman, 1982).

There also seems to be a major difference in the way the Videotex market is developing in Europe and North America. The Institute of the Future claims that the reason for the development is the difference in pricing methods used for the two telephone systems. (Nyhan, Johansen, and Plummer, 1980:10).

> In Europe, charges for telephone service are a basic fee plus a user sensitive factor. In North America, by contrast, basic telephone service in the majority of cases is a flat rate if calls are made in a local area. Thus, in Europe, those who control the telephone system have a constant incentive to develop increased phone usage. This is not present in the North American market.(Belzile, 1983:56).

Other major issues which will affect Videotex's successful entrance into the market are well summed by by Madden (1979):

> Is the Videotex highway, whether cable, telephone, or hybrid (broadcast-telephone, cable-telephone) accessible to all information providers who choose to use it? If not, who should make the choice? Who should decide on barriers to entry? What criteria should be used?

Currently, guarantee of access is determined by the type of delivery system or communication network used for Videotex service (Tydeman, 1982). However, there are varying government regulatory frameworks in content and structure for delivery systems; and they may act as barriers to entry for information providers (Tydeman, 1982). There have already been a number of conflicts with information carriers regarding who will be the dominant carrier for Videotex. For example, a 1982 settlement by the United States Justice Department enabled AT&T greater freedom to offer Videotex services without as much concern about its monopoly over the communications network. However, cable services such as QUBE and INDAX have been opposing AT&T's apparent dominance in the Videotex market (Tydeman, 1982).

John Tydeman claims that "The only certainty about Videotex is that the move toward the electronic household is

irrevocable" (Tydeman, 1982:1). In North America, the pressure for the implementation of Videotex "will not be because of a passive desire by the consumer to 'go electronic'. The pressure will come from manufacturers, bankers, wholesalers, or retailers, who realize that the electronic option offers them a more economical way to provide services (Tydeman, 1982:61).

The real opportunity for Videotex, according to a recent Wescom report, appears to be in direct information to special user groups and to design data bases around a specific application. Information content must be highly directional and offer utility to users (Globe and Mail, Oct. 14, 1983).

H. Market Surveys

In 1982, Communication Studies and Planning International Incorporated, a telecommunications consulting firm undertook the first detailed profit analysis of Videotex. They reported that Videotex stood a good chance of success because of the large profit margin under optimistic assumptions and the small loss under pessimistic assumptions. In the study, two types of systems were examined:

> Cabletext, with two way capability in which the system operator supplies the terminals, has projected return from seven to 37 percent. Telephone based Videotex, in which the system operator does

not pay for the terminals has projected returns from 10 percent to 47 percent. (Padden, Sept. 2, 1982:5).

A recent market analysis report by Creative Strategies International, a market research and consulting firm in San Jose, California reported a $250 million market for Videotex technology. The study stated that total revenues for Videotex services and associated hardware and software are expected to grow at a compound annual rule of 93.9 per cent to approach $7 billion by 1987. (Computing Canada, April 28, 1983:15).

Chapter III

Studies of the Future

This chapter examines methods of forecasting because this research study used the Delphi technique. The objective of examining the future is to enlighten us on the probability, feasibility and possibility of events and conditions on various time horizons (Dyck, 1970:9). Studies of the future are forecasting exercises. The information collected should not be regarded as prophecies. Forecasts are statements about the future which may or may not come true, depending on a variety of factors. Generating statements about the future frequently take the form of technological forecasting studies.

A. Technological Forecasting

Technological forecasting has been defined by Jantsch (1967:68) as the probalistic assessment on a relatively high confidence level of future technology transfer. Bright (1972:31) defined a "technological forecasting as a quantified prediction of the timing and of the character of the degree of technical parameters and attributes associated with the design, production, and use of devices, materials, and processes, according to a specified system of reasoning". Forecasting attitudes of future conditions are regarded as essential to planning wisely or to deal effectively with coming changes (Bright, 1972).

Today, one of the most powerful forces in an environment is technology. New technology, generally requires five to fifteen years to diffuse throughout society on a significant scale; hence, a company or institution has time to recognize and adjust to technical progess (Bright, 1972:13).

Many problems surround the methodology by which future studies are conducted. Each method, has its own set of problems. These problems are more clearly understood when one understands the credibility of future studies. Future studies, cannot uncover the "unexpected" or provide a definite picture of the future; instead, one must view the future as an extension of the present. A forecaster is like

> "the scientist who begins in the middle of things, and forecasts what seems to be obvious and compelling to him. As he works progressively to refine and improve his forecasts, he can only take it on faith that his starting point, and his choices along the way, will not too much distort the projection of reality that he eventually achieves (Martino, 1972:8).

One popular way of making a technological forecast is to gather a group of experts in a wide range of disciplines and ask them to make predictions, playing one event against another until a pattern emerges. This technique is called the Delphi.

B. The Delphi Forecasting Technique

The Delphi forecasting technique derives its name from a famous oracle at Delphi in ancient Greece. According to legend, an individual with a question or problem would

journey to the temple at Delphi and ask the oracle to provide an answer. While the oracle seemed to go into a hypnotic trance, the priests assembled some distance away and used augumental reasoning to select an appropriate answer. The answer was passed to the oracle, who would then reply (McLouglin, 1970:153).

A major contributor to the development of the Delphi was Olaf Helmer. In 1959, Helmer presented the classical definition of Delphi (Peterson, 1976).

> Delphi is a carefully designed program of sequential individual interrogations best conducted by questionnaires interspersed with information and opinion feedback.

Another contributor to the development of the Delphi was the Rand corporation where Helmer, Dalkey and their colleagues extensively used the Delphi technique in their research (Bright, 1972:5).

The Delphi technique may also be viewed as a polling technique employed for the systematic solicitation of expert opinion (Centron, 1969). Most methods designed for opinion sharing require assembling groups of people. Face to face discussion is the casual procedure for combining expert opinions. However, for some time, it has been known there are serious problems associated with this type of communication:

1. Group Opinion is highly influenced by dominant individuals who usually talk the most, yet there is very little correlation between pressure of speech and knowledge (Kelly, Thibaut, 1959).

2. Much discussion in group situations, while appearing to be problem orientated; is irrelevant or biasing because it is usually more concerned with individual and group interests rather than with problem solving (Kelly, Thibaut, 1959).
3. Group pressure to conform can distort individual judgement (Asch, 1958).

The objective of the Delphi technique is to obtain a consensus of opinions without a face to face encounter; this is achieved by sending a panel of experts a series of questionnaires to complete, interspersed with controlled feedback.

The general procedures for the Delphi technique are (Uhl, 1971:8):

1. the participants are asked to list their opinions on a specific topic such as scientific predictions or recommended outcomes.
2. the participants are then asked to evaluate the total list by a criterion, such as importance, chance of success.
3. each participant receives the list and a summary of responses to the items and, if in the minority is asked to revise his opinion or indicate his reason for remaining in the minority.

The Delphi technique is also designed to improve the use of expert opinion by taking into account characteristics designed to reduce the undesirable aspects of group

response. The procedure has three distinctive characteristics (Bright, 1972:153):

1. Anonymity.
2. Controlled feedback.
3. Analysis of results

Anonymity is a device used to reduce the effect of the socially dominant individual. It is maintained by eliciting separate and private answers to prepared questions. Ordinarily, the procedure is carried out by a series of questionnaires; although on-line computers have been used for some exercises. All other interactions between respondents is through formal communication channels controlled by experimenters.

Controlled feedback is a device used to reduce problems with face to face discussion. A Delphi exercise will usually consist of several iterations where the results of the previous iteration are "fed back" to the respondents, normally in summarized form.

As a representative of the group opinion, some form of statistical data are reported. For cases where the group task is to estimate a numerical quantity, the median of individual estimates is suggested as the most useful index (Linstone and Turoff, 1975). Thus, there is no particular attempt to arrive at unanimity among the respondents, and a spread of decisions on the final round is the normal outcome. This is a further opportunity to reduce group pressure toward conformity.

C. Applications of Delphi

The Delphi technique has become a fundamental tool for eliciting opinions about the future. It has also become a major tool for those in the area of technological forecasting. Helmer (1966), aimed to assess the direction of long range trends with science and technology, and their probable effects on our society and our world. The study covered six topics: scientific breakthroughs, population control, automation, space progress, war prevention, and weapon systems. Individual respondents were asked to suggest future possible development, and the group was to estimate the year by which there would be a 50 percent chance of the development occuring.

Parsons and Williams Inc., an international consulting firm, conducted a Delphi study "Forecast 1968-2000 of Computer Development and Applications in 1968". This study examined the future applications in business, the home, government and institutions and aimed to project the future of specific computing and technological development. ("Computers in the Crystal Ball", August 1969:15).

A Danish Delphi study examined thirty seven areas, some of which were: technology, travel, education, and predicted how society would be moved in certain directions by 1980 (Lachmann, June 1972:21). The Institute for the Future has conducted a large number of studies using the Delphi technique. Several of these studies (Buran and Lipinski, 1971; Salancik, Gordon and Adams, 1972) have been concerned

with the impact of the computer/communications revolution. The Delphi technique has also been applied in the medical area by Williamson (1970) and Sheldon (1970).[13]

Canadian government agencies have used the Delphi as well. Agowal(1974) used the Delphi technique to explore and delineate the specific options for citizen participation in planning the the Canadian Federal Health Policy (Brockhaus and Mickelson, 1975).

The most common use of Delphi in education has been in setting goals and in organizing them in order of priority. Examples include: Landini and Gold (1970) to determine goals for a community college in California, Rasp (1972) to identify a broad range of desired outcomes in the State of Washington and Pfiffon (1973) to discover the relations among objectives of high school students, staff and the Board of Education in Ohio.

D. Advantages of the Delphi Technqiue

One of the major advantages of the Delphi (Linstone and Turoff, 1975; Kelly and Thibaut, 1959; Asch, 1958) is that it tends to minimize extraneous communication among respondents which may function to decrease an individual's capacity to express independent judgements.

A second advantage of the Delphi (Linstone and Turoff, 1975) is that the time and cost factor is relatively low. A Delphi study utilizes the expertise of participants without

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[13] See Linstone and Turoff, The Delphi Method, p. 79 for a description of these two studies.

the need for face to face meeting which may be infeasible due to time and budgeting constraints.

A third advantage of Delphi is more effective research results. Dalkey (1969:54), reported that "more often than not, face to face discussion tended to make group estimates less accurate, whereas more often than not, the anonymous controlled feedback prodecures made the group estimate more accurate."

E. Failures of the Delphi technique

Even though the Delphi has a number of advantages, the common reasons for the failure of a Delphi should not be overlooked. Linstone and Turoff (1975:6) outlined these reasons:

1. imposing monitor views and preconceptions of a problem upon the respondent group by overspecifying the structure of the Delphi and not allowing for the contribution of other perspectives to the problem.
2. assuming that Delphi can be a surrogate for all other human communications in a given situation.
3. poor techniques of summarizing and presenting the group response and using common interpretations of the evaluation scales utilized in the exercise.
4. ignoring and not exploring disagreement, so that discouraged dissenters drop out and an artifical consensus is generated.

Sackman (1975) and Weaver (1970:71) also criticized the Delphi on the following points:

1. Delphi's reliance on the opinion of experts is unjustified,
2. attempts to achieve a convergence of opinion among respondents is dysfunctional,
3. suppression of adversary relations is inhibitory,
4. questioning techniques and the responses they generate are inadequate and
5. Delphi's researchers lack precision in reporting results.

However, even Weaver (1971:270), one of Delphi's most negative critics, presents a review of the Delphi forecasting method and concludes that it holds considerable promise as a pedagogical tool to be used to get educators to think in more complex ways about the future.

In order to explore the potential future role of Videotex in education, the Delphi technique was selected as the research methodology.

F. Hypothesis Statements

A series of hypothesis statements were generated prior to the design of the research instrument in order to narrow the scope of this study.

Hypothesis 1

Numerous barriers will inhibit Videotex's entrance into the market place.

Sub Hypothesis 1.1

Existing conflicts between information carriers will play a major role in inhibiting Videotex to successfully emerge in the market.

Sub Hypothesis 1.2

Videotex is still a technology looking for a market.

Hypothesis 2

The availability of other computer related technologies will help promote Videotex's entrance in the market place.

Hypothesis 3

Increased marketing of Canadian Videotex systems will help secure its place in the market.

Hypothesis 4

Simplicity is the whole secret behind Videotex.

Hypothesis 5

The transmission system used to deliver Videotex will change over the next 20 years.

Hypothesis 6

Videotex, as it exists today, will not be adopted by educators.

Sub-Hypothesis 6.1

The interactive or computer managed capabilities of existing Videotex system is of poor quality for educational use.

Sub-Hypothesis 6.2

The cost factor for acquiring Videotex services will be major drawback to educators.

Hypothesis 7

Education will be one of the last markets to use Videotex in a production environment.

Hypothesis 8

The introduction of Videotex in education will create many changes and conflicts.

Sub Hypothesis 8.1

Life long education will become a reality.

Sub Hypothesis 8.2

Centralized Databanks will create conflicts among educators.

Sub Hypothesis 8.3

The role of the school administrator, teacher and student will change if Videotex is integrated into education.

Sub Hypothesis 8.4

Legal issues will evolve as parental access to educational courseware increases.

Sub Hypothesis 8.5

Parental interest and involvement in curriculum will increase with home access to courseware via Videotex.

Sub Hypothesis 8.6

Educators will need to hire specialized personal knowledgeable in instructional system design, computer systems, and electronic information dissemination.

Hypothesis 9

Distance Education will be a major market for Videotex services.

Chapter IV

Research Design

This chapter contains a description of the procedure followed in this study. As previously stated, this study has been designed to research the potential of Videotex in education, and to examine the implications if Videotex is integrated into education.

A. Procedure

The Delphi Technique was used in designing the research instrument. Two rounds of the Delphi were used to generate an informed consensus about a series of questions.

Round One

A questionnaire was designed which consisted of three sections.

Section One asked respondents to estimate the year in which they thought a number of events will most likely occur.

Section Two compared respondent's level of agreement to a series of statements.

Section Three addressed a number of questions specifically related to education in order to forecast the potential implications of Videotex.

In mid August, 1982, Round one questionnaires accompanied by stamped return envelopes were mailed out to 168 respondents. Each questionnaire also had a covering

letter [14] to clarify the nature of the study and to ensure respondents of personal anonymity. The time allotment for Round one was mid August, 1982 to early January, 1983.[15]

Round Two

The Round Two questionnaire consisted of a copy of the Round 1 questionnaire which summarized results of the first questionnaire. The objective of Round Two was to generate an informed consensus and allow respondents an opportunity to alter their previous response, if they wished to do so.

Round Two questionnaires were mailed in February, 1983 with a stamped envelope and a covering letter.[16] In early May, a reminder letter[17] and an additional copy of the second questionnaire was mailed to those respondents whose reply had not been received. The time frame alloted for Round Two was six months, from early February to July, 1983.

B. Population

Nature of the Population

The population for this study consisted of respondents from a wide variety of fields, each with recognized expertise in Videotex. Respondents were selected to participate in the Delphi study and were classified into one

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[14] See Appendix 3 for Round 1 covering letter.
[15] A tabulated Copy of Round 1 and Round 2 questionnaire results is included in Appendix 2.
[16] See Appendix 4 for Round 2 covering letter.
[17] See Appendix 5 for Round 2 reminder letter.

of four groups based on their position of employment. The four groups were:

1. Educators (educ)- any person in an educational organization who is involved in administrating, training, or developing the knowledge and skill in Videotex or computer related technologies.
1. Information Carriers (i.c.)- any person or organization involved in transmitting electronic information; the medium used to carry information can be: telephone, cable, optical fibre, satellite, or laser(examples:AGT, Bell Canada, AT&T, Cableshare)
2. Videotex Hardware Support (v.h.s.)- any person or organization involved in developing hardware or software for Videotex. This would include: programmers, technicians, system analysts, manufacturers.
3. Information Providers (i.p.)- any person or organization involved in creating or putting up pages on Videotex.

An attempt was also made to identify an equal number of people for each of the groups. Approximately, Forty-one people were selected for each of the four groups; the total population identified consisted of 163 potential respondents.

Selection of the Sample

Two general assumptions were made with respect to selecting the individual respondents:

1. There are persons knowledgeable in their area of

interest who are able to answer questions on Videotex and its application to education.

2. Such Knowledgeables can be identified on the basis of their reputations.

C. Analysis of the Data

In Part 1 of Round one, the respondents were asked to indicate the year in which a number of events will most likely occur. Three statistical measures were selected for displaying the results of Part 1 in the second questionnaire. These measures were the median, lower quartile, and upper quartile. In addition, the respondent's previous response was displayed.[18]

The results for Part 2 (respondents were asked to indicate their agreement to a series of statements) and Part 3 (a) (respondents were asked a number of questions relating to education) were displayed by indicating the response distribution of all respondents and by giving the respondents previous response. The respondents were also given the opportunity to alter their previous response if there was a significant difference between their response and the median response. Respondents were encouraged to provide reasons if they believed that their answer was more reasonable than the group median. Respondents were asked in Round One (Part 3, b) to respond, in their own words, to

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[18] Median is the point below which half of the observations fall. Lower quartile defines the point below which the bottom quarter of observations fall. Upper quartile defines the point above which the top quarter of observations fall.

five open-ended questions. The open-ended questions were categorized by using a frequency count.[19]

In the Round Two, Part 3 (b), the respondents were asked to agree or disagree to the generated statements from the open-ended questions. In the analysis of Part 3 (b), every response category was entered in the second questionnaire. This was done because there is no way of validating that one person's response is more accurate than the next persons. The awkward factor encountered with this procedure is that the length of the second questionnaire was considerably longer than the first. A total of 193 statements were categorized in this section.

Two statistical packages were used to analyze the results of Round Two. The SPSS (Statistical Package for Social Sciences) cross tabs was used to analyze and compare the final results between groups for Part 2 and 3. The BMDP (Biomedical Data Processing) was used to calculate the median, lower quartile and upper quartiles for Part 1 and to analyze the differences between the four groups.

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[19] Frequency count is a total count of how many times a particular statement was made.

Chapter V

Reseach Findings

A. Results of the Delphi Study

The return rate for this study was high in comparison to other mail Delphi studies. In a recent Link Resources Corporation Report(1982), a 34% return rate for their worldwide Delphi study of Videotex and Teletext was considered a high return. The results of this two round Delphi are shown in Table V.1:

Table V.1
Round 1 and Round 2 Delphi Results

	Round 1	Round 2
Questionnaires Sent	163	97
Questionnaires Returned	118	70
Wrong Address	7	0
With a Reason*	14	5
Questionnaires Completed	97	65
Change in Respondent	3	1
No Response	50	32
Percentage of Total Sample (163) Return	57.4	42.9

*Round 1 - 5 respondents had no time to complete questionnaire, 7 respondents had moved, 2 respondents returned questionnaire because they disliked Delphi studies.

Round 2 - 3 respondents had no time to complete questionnaire, 2 respondents had moved.

B. Research Findings

The following definitions have been used to simplify the analysis of the data and will be used in the discussion of the findings.

1. consensus- a degree of agreement between respondents.
2. strong consensus- more than 75% of the respondents agree to a single criteria.
3. medium consensus- more than 50% and less than 75% of the respondents agree to a single criteria.
4. weak consensus- less than 50% and greater than 35% of the respondents agree to a single criteria.
5. controversy- arises when a single criteria is in disagreement with the respondents.
6. strong controversy- when 20% of the respondents are in disagreement in each of the extreme categories.
7. weak controversy- when 30% of the people are on both sides of the division line.

C. Hypotheses Analysis

In this section, the specific questions that were asked in this Delphi study can be found in Appendix 2.

Hypothesis 1

Numerous barriers will inhibit Videotex's entrance into the marketplace (Questions: 1, 8, 13, 18, 19, 20, 24, 27, 28, 45, 46).

Findings

The psychological willingness of the majority of Canadians to use Videotex as a technological means of information retrieval was not perceived by respondents to be

a major caveat. There was little difference between groups and the median response projected by the total group was the year 1990.

The projection forecasts for the pricing of a Videotex decoder had a medium consensus between and within groups. One point worth noting is that Videotex hardware suppliers projected in all of the pricing estimates a lower median than the other groups. This is not surprising since a number of respondents in this category are marketing or manufacturing decoders and are aware of the international pricing differentiation for decoders (example: Prestel's decoder is selling for $250, and a Telidon decoder, manufactured by Norpak is just under $1000).

One respondent also commented that a Videotex decoder would never sell for $100, because of the research underway in developing a decoder with audio and switching capabilities; instead the cost of a decoder would increase with enhanced features.

The involvement of the government in monitoring rate regulations for the delivery of electronic information was a weak controversial issue with the respondents.

Table V.2

Analysis of Question 20

"Rate regulations for the delivery of Electronic Information should be closely monitored by the government."

Round 2	SA	A	D	SD	DK
Educ	3	8	4	0	1
IP	0	6	4	3	0
IC	0	3	9	9	0
VHS	3	6	4	2	0
TOTAL	6	23	21	14	1

As indicated by Table V.2, 48% of the respondents agreed that the government should be involved in monitoring the rate structures set by information carriers. It is not surprising that there was more disagreement by the information carriers than the other groups, since they would have the most to lose with governmental intervention. Yet, on the other hand, the educators were over 75% in favor of the government monitoring rate regulations. Their responses to this question also reinforces other findings of this study which indicated that the cost for the transmission or reception of Videotex or other linked computer technologies will be a major caveat to educators, unless low rate structures are in place.

The issue of whether the private sector or government should have ultimate control over electronic communications reached medium consensus in favor of the private sector.

Competition between existing computer time-sharing facilities and Videotex's adoption in the Canadian marketplace was not perceived to be a major caveat. The total group reached medium consensus (73%) and agreed that existing computer-time sharing facilties would not inhibit Videotex's adoption.

The issue of whether Telidon will be a major worldwide standard was a controversial question. Fifty-one percent of the respondents agreed that Telidon would become the worldwide standard and 49% disagreed. This divided support for Telidon is understandable since AT&T's announcement of the NAPLPS standard. The marketing of Telidon as an accepted worldwide Videotex system remains an even more controversial question, since other major Videotex systems are implementing alpha-geometric coding into the design of their own systems.

Sub-Hypothesis 1.1

Existing conflicts between information carriers will play a major role in inhibiting Videotex to succesfully emerge in the market (Questions: 16, 23).

Findings

The results of question 23 did not support this sub-hypothesis. There was medium consensus (71%) by the total group that Videotex's successful entrance into the market would not be inhibited by conflicts between carriers.

There was also strong consensus (91%) by the information carriers.

Question 16 which asked whether there should be a separation of carrier and content in any Videotex system was a controversial issue. There was medium consensus (57%) by the total group that there should be a separation of carrier and content. The differences between the information carriers and information providers are worth noting. Strong consensus (85%) existed within the information carriers that their role should not only be in transmitting information for Videotex. On the other hand, there was strong consensus (99%) within the information providers that there should be a separation of carrier and content. Two points of view worth considering are:

1. The information carriers have traditionally been recognized for supplying the means of transmitting and receiving information. However, with the recent developments in computer based technologies (information retrieval systems) and the need for content development for databases, information carriers see another viable market to enter. However, government regulations restrict information carriers from moving into the information providing market.
2. The information providers strongly support the separation of carriers and content because it ensures that they have will have little competition from the information carriers.

Sub-Hypothesis 1.2

Videotex is still a technology looking for a market (Question 15).

Findings

This sub-hypothesis is a frequent statement in the Videotex literature and is supported by the results of this study. There was strong consensus (81%) by the total group that Videotex is still a technology looking for a market.

Hypothesis 2

The availability of other computer related technologies will help promote Videotex's entrance (Questions: 3, 4, 6, 11, 17, 22).

Findings

There was strong consensus (84%) by the total group that games will play an intregal role in securing Videotex as a medium in the marketplace. The popularity of video games have already increased the successful marketing sales of the personal computer.

Another cross relationship supporting Videotex is that all the major personal computers (Apple, IBM, Radio Shack) are able to support Videotex. Videotex 83 provided a showcase for dozens of new product introductions supporting their compatability with Videotex. The IBM Series 1 Videotex System was announced on June 21,1983; it uses a common

database and command structure to access data. It can operate using either the NAPLPS or the Prestel Protocol, depending on the nature of information accessed. Also, announced by Radio Shack was its Videotex and Office Information System, which "will be sold at a fraction of the cost of comparable systems" (Computing Canada, July 21, 1983:8).

There are other technological applications which will likely support Videotex's entrance. Fifty-one percent of the respondents projected that Electronic Publishing will be a major form of publishing in Canada by the year 2000. The median response of the information providers was the year 1995, considerably lower than the other three groups. The median projection for the usage of electronic mail by 50% of Canadians was 1988. Seventy-five percent of Canadian homeowners were also projected to use teleshopping by 1990.[20]

There are numerous activities in the market place which seem to indicate a growing diffusion of acceptance for Videotex. The increased availability of products compatible with Videotex and electronic means of information retrieval cannot be overlooked.

Hypothesis 3

Increased marketing of Canadian Videotex systems will help secure its place in the market (Questions: 5, 7).

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[20] See Appendix on teleshopping and research on home market trials

Findings

In order for Canada's Videotex system to secure a position in the competitive marketing of technological product, it was assumed that Canada would have to actively pursue the export industry. Question #5 supported this assumption with 50% of the respondents projecting that an active Canadian export business supplying Videotex hardware systems would be in operation in 1985. Also, an announcement by the Genysys group to support a three year marketing agreement for Telidon with Japan's Mitsui Corporation at the June Videotex 83 conference reinforces Canada's pursuit of exporting Telidon.

Another marketing issue is the saturation level of products in the market. One criterion to determine a product's success is whether or not it is available as over the counter retail merchandise throughout most of the country (Kotler, 1981). In this study, 50% of the respondents agreed that Canadian manufactured Videotex terminals and adaptors will be available as over the counter retail merchandise throughout most of the country by 1985.

Hypothesis 4

Simplicity is the whole secret behind Videotex (Question 14).

Findings

This statement is a frequently occuring comment in the Videotex literature and there was strong consensus (70%) by the total group to support it. The primary reason Videotex has been heralded as a simple technology is because of its use of the tree indexing retrieval system. However, as indicated in the literature review, usage of this technique is not as "simple" as the market would like us to believe.

Hypothesis 5

The transmission system used to deliver Canada's Videotex system will change over the next 20 years (Questions: 25, 26).

Findings

The results of Question #26 support this hypothesis. There was strong consensus (95%) by the total group that the telephone was the primary delivery method in 1982. In 1985, the suggested competition between delivery methods is evident by the split projection for telephone and cable usage. 45% of the total group indicated that telephone would be used and 52% indicated that coaxial cable would be used.

In 1990, 46% of the respondents agreed that coaxial cable would be the dominant medium for delivery. 23% agreed that the telephone would be used and other delivery systems such as sattelite (23%) and fibre optics (28%) were projected to be the dominant means of delivery. The changes

in transmission methods are more striking when one examines the total group's projections for the year 2000. Sixty-nine percent of the total group projected that fibre optics would be the dominant method and 23% projected that it would be satellite.

Hypothesis 6

Videotex, as it exists today, will not be adopted by educators (Questions: 9, 10, 30, 33, 34, 46, 47).

Sub-Hypothesis 6.1

The interactive or computer managed capabilities of existing Videotex systems is of poor quality for educational use (Questions: 33, 47(z), 47(ad)).

Findings

A major concern of educators examining the usefulness of Videotex as an educational tool is its ability to provide good computer assisted instruction or computer managed instruction. There was strong consensus (93%) by the total group that good CAI or CML must be part of the Videotex software and 100% of the total group agreed that good courseware must be available.

The results of Question #3 support this sub-hypothesis. There was strong consensus (76%) by the total group that CAI capabilities on Videotex are, presently, not acceptable. A recommendation by Montgomerie (1982:124) that "The current

Telidon Videotex system is totally inadequate to provide CAI or CML" reinforces these results.

The primary weakness of current Videotex systems is that they primarily use the tree structure form of information retrieval. There was strong consensus (91%) by the total group that Videotex information retrieval techniques need to be improved; and that the tree structure is not as efficient as other retrieval systems.

One respondent, a senior executive of a telecommunication's systems manufacturing company reinforced the importance of efficient information retrieval:

> The information retrieval technique is crucial to success. Thier seems to be a tendency to use methods that are cheap to implement, but therefore difficult to use. This is asinine, since the costs of hardware are declining to roughly 25% per annual(p.a.), while the value of people's time is rising at 10-15% p.a. compound. The successful system will be keyword/phrase driven and will be very forgiving or "user friendly". Simple, so called tree structures are simple and cheap to implement, but offer the poorest level of interactivity. (Try climbing from branch to branch, in the dark)

Presently, there are efforts underway to incorporate key word searching as a means of information retrieval for Videotex; therefore present information techniques used may not inhibit Videotex's future.

Sub-Hypotheses 6.2

The cost factor for acquiring Videotex services will be a major drawback to educators (Questions: 28, 29, 37(a), 47(1), 47(ac), 51).

Findings

It was expected that there would be strong consensus by the total group to this sub-hypothesis. Instead, there was a weak controversy. 36% of the total group agreed that cost would be factor and 40% disagreed. However, there was strong consensus(88%) by the total group that hardware and software costs need to be low in order for educators to adopt Videotex. In addition, 87% of the total group agreed that for Videotex to become a cost-effective system to educators, access to all databases must be shared as much as possible by all educators.

Hypothesis 7

Education will be one of the last markets to use Videotex in a production environment (Questions: 2, 12, 38).

Findings

The results of Question #12 do not support this hypothesis. The time difference between Videotex's usage in education and other production environments was minimal. The median projected for Videotex's usage in schools was 1985 and 1986 for home usage. Other production environments such as: banks, retailers, and real estate were also projected to use Videotex in a production environment in 1985. The early users of Videotex were the government (1983) and advertisers (1984).

The researcher is highly sceptical of these projections, since current educational applications of Videotex are limited and are usually of poor quality. In addition, "Technological change in education is slow, primarily because technology is transferred after it has been invented, developed, and used elsewhere. Research and development in technology are for larger and more lucrative markets: the home, military and industrial applications" (Hollaway, 1982:132).

One respondent, an information carrier reinforced Holloway's statement:

> The rate of adoption of Videotex in education will be slow because of entrenched interests; people will not want to give up power or status readily- so any revolutionary changes in education will have to await the demise of one generation and the emergence of another with a different world view. Videotex will be largely used as an ancillary until there is large structural change in the system. Having said this- economic reality may change this rate of adoption by forcing the establishment of cost-effective delivery training systems especially for new and burgeoning areas such as: job training and retraining, life-long education etc. Videotex will be most easily accepted and established in new areas rather than in traditional educational systems. We may see a conflict between those who argue for the necessity of a classroom and its interactive and socializing functions and those who push for cost-effective delivery training systems. Who will win will depend, initially on economic circumstances.

In addition, respondents did reach strong consensus (77%) that Videotex would be used in industrial training before it would be used in K-12. Respondents consensus is logical, if one traces back the usage of training tools such as computer assisted instruction or videodisc. The cost and

time factor to implement technology in industrial training is not as a severe constraint as it is in existing school systems.

Hypothesis 8

The introduction of Videotex in education will create many changes and conflicts.

Sub-Hypothesis 8.1

Life long education will become a reality (Questions: 21, 32, 44, 47(g)).

Findings

There was strong consensus (79%) supporting this sub-hypotheses. Also, 87% of the respondents agreed that educators needed to realize that technology provides an opportunity for all ages to continue learning.

Sub-Hypothesis 8.2

Centralized databanks will create conflicts among educators (Questions: 35, 47, 48).

Findings

There was medium consensus (66%) by the total group that centralized databases would become a reality in education. Some of the conflict situations described by respondents and which had strong consensus were:

1. Students' horizons may become broader than their teachers and teachers may then feel threatened (84%).
2. Policy conflicts will develop in respect to who has control over the centralized database (83%).
3. Centralized databases must allow teachers to supplement, modify and update the database at the local level. If this cannot be done, frustration will result from teachers not being able to adapt the curriculum to self and student needs (81%).
4. Problems will develop in defining curriculum content, such as normalization and assimilation (75%).
5. Confusion will result by the users unless paper directories are supplied and users can directly access or search for their requests (73%).
6. Problems of unequal allocation of resources or access to urban and rural areas (63%).

Conflict areas where there was weak consensus were:

1. Provincial rights over education will inhibit or prevent Canadians from accessing centralized curriculum databases (53%).
2. Federal governments intervention into the provinces jurisdiction over education (44%).
3. Language conflicts will develop regarding the selection of content for the database -French vs English content (42%).

Sub-Hypothesis 8.3

The role of the school administrator, teacher and student will change if Videotex is introduced into education (Questions: 34,49, 50, 51).

Findings

There were a number of statements and responses by the total group that supports this sub-hypothesis and the influence Videotex or other computer based technologies will have on education.

Administrator

Changes which related to the school administrator and had strong consensus were:

1. School administrators will have to address changes in class structure, redefine the requirements or skills for teachers and implement plans to accommodate for change (96%).
2. Administrators will have to become more sensitive to the changes that teachers will have to make (88%).
3. The means of reporting student's progress will change (88%).
4. Administrators will have more global contact with other educators (86%).
5. School boards and administrators will have to respond to parents and taxpayer demands for an improved system (86%).

6. Administrators will become coordinators of computer and human resources (85%).
7. Administrators will require more technical ability and knowledge about technology in order to make good decisions (84%).
8. Senior administrators will have to relate better to industry and to government (80%).
9. Administrators will need to feel more comfortable with conducting and receiving fees through remote access(CRT) (76%).

Other changes which had medium consensus were:

1. School administrators will lose independence and the entire educational community will become more interdependent (70%).
2. There will be changes in decision making. The easy access and speed to information will enable administrators to spend more time in decision making (67%).
3. There will be a management increase in team orientation (60%).

Also, one respondent, a renowned futurist in technology, stated that managerial techniques of school administrators will change:

> There will be enormous pressure on exisitng institutions to implement some response to all new computer orientated technologies. Most educational institutions, to date, are not organized to deal with these pressures. Most institutions seek autonomy as a measure of success. Most departments within institutions also seek autonomy. Such autonomy is antithetical to [redacted] networking concept

> of computer based technologies. It is likely that managerial techniques will have to alter to emphasize greater internal cohesion. Educational institutions will shift to a horizontal organization structure, rather than a vertical organizaton.

The responses to Question #49 indicate that the role of the school administrator will undergo some changes. Primarily, the ready access to information that computer technology provides nessitates the need for school administrators to become competent and knowledgeable about technology in order to make good decisions.

Teacher

Like changes found in the role of the school administrator, there was strong consensus by the total group that the teacher's role will change. Most of the questions achieved strong consensus; some changes worth noting are:

1. Teachers will have more flexibility in their teaching techniques (98%).
2. Teachers will have increased coordination responsibilities; they will be called upon to orchestrate the combinations of learning resources to form a learning system (94%).
3. Teachers will become facilitators or resource consultants to students instead of central disseminators of information (72%).
4. Teachers will require more training in understanding technology; they will have to learn to interact with computers (90%).

5. Teachers' roles have already changed with other media, but they will now change from teachers to students in their own classroom, as they will be learning in a new environment (89%).
6. Teachers will become involved in the curriculum design for databases and will be involved in the evaluation process (89%).
7. Fear will be experienced by the poor teachers and expansive opportunities will exist for the creative teacher (87%).
8. Teachers will have an increased ability to vary lessons to meet student needs (77%).

There were few differences between groups, except there was medium consensus (64%) by the total group that "Teacher's role will become more client centered than subject centered." However, the educators reached strong consensus (84%).

Student

In most of the questions which addressed change in relation to the role of the student, strong consensus was achieved by the total group. There was strong consensus (81%) by the total group that the student's role will change. Eighty-one percent of the total group also agr[illegible] that Videotex is not just another tool like textbooks films. Strong consensus was reached in the following:

1. Students will be able to use Videotex to study at home

(98%).

2. Student Learning will become more self-paced and individualized (96%).
3. Students will have more flexibility and greater freedom in their learning (94%).
4. Student Learning will be of a higher quality if they have access to superior software (94%).
5. Students will form computer groups outside school (90%).
6. Student research will be made easier because they will have access to a wide variety of data banks (89%).
7. Students will be better prepared for the real world by being exposed to computers and data communications (88%).
8. Students will be more active in learning and express a greater desire to learn (85%).
9. Students will need to adapt to a machine interaction in their learning (84%).
10. Rigid schedules and curricula should become more relaxed - particularly for advanced and slower students (83%).
11. Students will have a widening of achievement levels in classes (82%).
12. Student's work will be more closely monitored. In order to do this, Videotex must offer good CML (82%).
13. Students will become more responsible and independent; they will learn to think on their own and rely less on their teacher (76%).

Medium consensus was found in the following:

1. Students will have more consistent learning experiences (72%).
2. Students will require typing skills (70%).

There were few differences in the responses, but those that existed are worth noting. Sixty-four percent of the total respondents agreed that students will have access to quality education across the country. However, there was some disagreement between the educators and the information carriers. There was strong consensus (84%) by the educators that students will be able to access quality education. The information carriers were mildly supportive (63%). A comment made by an information carrier might help substantitate the difference between the two groups:

> Students will have difficulty accessing good courseware throughout the country, unless an effort is made by Bell Canada, AT&T and other information carriers to develop similar policy guidelines for the receival and transmission of electronic information. There are still major problems in international telecommunications that have to be resolved before information can be accessed anywhere. A major concern recently addressed at the 1983 Pacific Telecommunication's Conference is how Third World countries will compete in the electronic revolution. There is a real danger they will be left behind. The present networking systems in place are concentrated in the industrialized world. And, the jurisdictional nightmare and competitiveness between collosal information carriers will be a problem. Educators must not forget that other markets will have to be operative, before their needs will be addressed.

Sub-Hypothesis 8.4

Legal issues regarding the educational rights of children will increase, as parental access to Videotex eduational courseware increases (Question 43).

Findings

There was some controversy over this sub-hypothesis. 50% (weak consensus) of of the total group agreed with this sub-hypotheses and 50% disagreed. There was medium consensus (70%) between educators that legal issues regarding the educational rights of children will increase as parental access to educational courseware increases.

In the past decade, educators have been exposed to an increasing number of legal cases addressing the educational rights of children. Parents have also become more assertive in questioning the quality of education that their children are exposed to. The difference between the two groups can possibly be attributed to the educators' sensitivity to this issue and their intimate awareness of the current educational system.

Sub-Hypothesis 8.5

Parental interest and involvement in curriculum will increase with home access to courseware via Videotex (Questions: 31, 40, 41.)

Findings

There was strong consensus (94%) by the total group in support of this hypothesis. Some of the reasons supporting parental interest and involvement in using Videotex at home were:

1. The easy access to courseware that Videotex provides (91%).
2. The home environment is a non-threatening environment in comparison to the potential threatening environment of a school (91%).

In addition, there was strong consensus (95%) by the total group that the quality of educational courseware will be increasingly questioned as audience exposure increases.

Sub-Hypothesis 8.6

Educators will need to hire specialized personnel knowledgeable in instructional systems design, computer systems, and electronic information dissemination (Question: 36).

Findings

This sub-hypothesis was supported by strong consensus (77%) for the total group. One difference among the groups was that 85% of the educators agreed that they would need to hire specialized personnel. In addition, 87% of the educators agreed that they need to revise current administrative and organizational structures in light of

technology.

Hypothesis 9

Distance Education will be a major market for Videotex services (Questions: 31, 32).

Findings

This sub-hypothesis was not supported. There was weak consensus (39%) by the total group that distance education would be the most likely application of Videotex. It was assumed that there would be more support for this sub-hypothesis since a number of Videotex field trials were developed for distance education.

D. Hypothesis Summary

Hypothesis 1

Numerous barriers will inhibit Videotex's entrance into the market place.

Summary

Findings supported that there will be barriers to Videotex. These barriers were: pricing of hardware, government involvement, conflicts between information carriers, the availability of high quality data base information and the instability of Videotex in the market.

Hypothesis 2

The availability of other computer related technologies will help promote Videotex's entrance.

Summary

Findings supported that the increased availability of computer products compatible with Videotex indicates a growing diffusion of acceptance for Videotex.

Hypothesis 3

Increased marketing of Canadian Videotex systems will help secure its place in the market.

Summary

Findings supported that Canada's Telidon will have a more secure market place if there is an increased marketing effort to pursue the export industry, and if Telidon becomes more accessible to consumers.

Hypothesis 4

Simplicity is the whole secret behind Videotex.

Summary

The literature and research findings strongly supported this hypothesis. The primary reason Videotex is characterized as a simple technology is because it uses the tree indexing retrieval system, one of the most simple

retrieval designs.

Hypothesis 5

The transmission system used to deliver Canada's Videotex system will change over the next 20 years.

Summary

Findings strongly supported that the transmission system used to deliver Canada's Telidon will change over the next 20 years. The first delivery methods to be used will be telephone and cable. The next methods will be coaxial cable, satellite and fibre optics. These findings are not surprising; they merely indicate an evolution in the types of transmission devices that will be used for communication. Videotex is only one of many computer communication mediums that will change as transmission methods evolve.

Hypothesis 6

Videotex, as it exists today, will not be adopted by educators.

Summary

Findings supported that the limitations of Videotex in education are: the poor quality computer managed capabilities, and the cost factors associated with using this technology.

Hypothesis 7

Education will be one of the last markets to use Videotex in a production environment.

Summary

Findings did not support this hypothesis. However, the researcher disagrees with the finding. Technological change in education is traditionally slow; and technology has always been adopted first by larger and more lucrative markets before it is used in education.

Hypothesis 8

The introduction of Videotex will create many changes and conflicts.

Summary

Findings supported that there will be definite changes and conflicts as technologies, such as Videotex are introduced into education. Major findings strongly supported were: the role of the school administrator, teacher and student will change and that educators will need to hire specialized personnel in order to successfully introduce and implement technology.

Hypothesis 9

Distance Education will be a major market for Videotex services.

Summary

Findings did not support this hypothesis. The researcher was surprised by this finding. Respondents may have evaluated this question in comparison to other profit generating markets. In this respect, distance education will not be a major market. The researcher thinks that if Videotex is successful in finding a market in education, one of the most viable applications is distance education.

Chapter VI

Implications of The Findings

The results of the two round Delphi Study provided educators with new information; new information that will hopefully prompt us to think in more complex ways about the future. Definite trends and warning signals are evolving in the Information Society that educators need to be aware of. One of the major trends is the increasing availability of computer related technologies (video games, personal computers) in the home.

A. Where Does Videotex Fit In?

Much of what is happening now with Videotex in the market can be categorized as the 'technology push'. There are numerous pilot projects, tests and field trials which are intended to convince the public and the project promoters that a viable market exists. This is a view supported by this study. Eighty-one percent of the respondents agreed that Videotex is still a technology looking for a market. Borrowing from the media prophet, Marshall McLuhan, it might be true to say that Videotex is a new medium looking for new messages.

B. Is There a Market for Videotex?

There is no 'single' correct answer to the current market problem of Videotex. However, there are indications that there may be an alternative to presenting information

to the consumer market. The most successful field trials of Videotex services, which were, or are in operation are those that focus on a closed user group. As indicated in the literature review, the recent Westcom report concluded that successful information content for Videotex must be highly directional and offer utility to users. One example of a service which supports Westcom's research findings is Manitoba's Grassroots.

Grassroots is a Videotex service that is aimed at the farming market and allows users to access a databank of farming information. Some examples of information that are available include: stock market reports, weather maps, and grain reports. The success of Grassroots and its appeal to the farming market is evident by its increasing list of subscribers.[21]

Another direct application which appears to be successful is the use of electronic directories. For example, Teleguide is a service that has been designed to serve visitors in Toronto. Terminals are located in public places such as: hotel lobbies, tourist sites, transportation centers, shopping centers; basically, any location which has a substantial flow of traffic and where people require assistance. Even though Teleguide primarily concentrates on answering questions such as 'What to do?', or 'What to eat?', it is also designed to be a prototype service that residents will be able to receive in their homes.

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[21]See Appendix 6 for further information on Grassroots.

Teleguide's approach to publicly available Videotex services in a shared terminal approach may prove to be a valuable marketing strategy. Public services minimize the cost to the consumer; in fact there is no direct cost to the consumer. However, a more substantial benefit from this approach is that people are learning what this technology can or cannot do. Perhaps if these services are useful in critical places, there will be an increased opportunity for a positive response to the marketing of similar home Videotex services.

Another area in the Videotex market that should not be overlooked is the increasing usage of personal computers. Relatively conservative studies today are predicting that there will be about 3.6 million desktop computers sold to businesses in the United States by 1988 and over 8 million personal computers to the home market (FutureViews, 1983). It is evident that the microcomputer market is rapidly growing. However, microcomputer owners are finding that data services and software firms are not delivering products that make full use of their micromputer's capabilities. The July, 1983 issue of The Wall Street Computer Review reported results from a survey conducted by the American Association of Independent Investors and summarized:

> The majority of computerized investors complained of one of two basic problems: the lack of suitable investment orientated software and the difficulty of acquiring historical data on a large number of stocks (Manson, 1983).

In the Videotex market, companies have primarily concentrated their computer software efforts on data

storage, indexing and searching, page creation, and managing communictions. Also, a number of microcomputer systems are now compatible with Videotex. This initiative to integrate Videotex with major microcomputers could help Videotex secure a place in the market.

A tremendous opportunity exists for integrated computer software which will run on micros, minis and mainframes and which takes advantage of the computing power available on each machine. However, not every one will need all this computing power all the time. Rather, users will access information in the format appropriate to their needs.

For Videotex systems to become effective, there is also a need to develop public policy from the point of view of the system rather than that of the distribution medium. Developmental issues such as: standards, guarantee of access, competition, content regulation and copyright are only some of the issues which will need attention. At present, there are few government standards for regulating content for electronic information delivery systems (Tydeman, 1982).

A key driving force for Videotex's success will be the extent to which advertisers are persuaded to adopt the new medium, since advertising revenues will subsidize the cost of the serivce, helping to reduce subscription charges to users. The ultimate acceptance of Videotex systems may depend less on the specific information available on these systems than on their "user friendly" characteristics. In

terms of word processors and micro computers, ease of access has become a critical factor.

Videotex, of the future, will probably not look like the Videotex of today. It will likely merge with existing services and as an entity will not exist. The major question addressing Videotex and its relationship to other technologies is: How to put them together, and who to sell them to, and for how much?

C. Is There a Future for Videotex in Education?

The future of Videotex in the educational community will not likely be determined until the future of Videotex in the general market sectors such as business and industry are successfully evolving. Current educational applications of Videotex are limited and are usually of poor quality. Also, technological change in education is slow, and any investment in technology is targeted for larger more lucrative markets such as the home, military and industrial sectors.

Seventy-seven percent of the respondents indicated that Videotex will be used in industrial training before it is used in grades K-12; and if one traces back the usage of other training tools these findings are not surprising.

Videotex will probably not have a major impact on education, until it becomes commercially viable in North America. The success of interactive Videotex and and of its derivatives will largely depend on its acceptance in the

United States. In terms of Telidon, it has already made one giant leap by being recognized as an international standard. However, the bottom line is hard dollars, an area where even Telidon has yet to prove its success.

In addition, the present interactive or computer managed capabilities of existing Videotex systems are of poor quality for educational use. To support this view, 76% of the total group agreed that CAI capabilities on Videotex are, presently, not acceptable.

This study also addressed a number of questions which examined Videotex and its potential future relationship to education. The responses were significant not only to examining Videotex as an information medium, but the responses also reflected attitudes to the role of interactive technologies in education.

The respondents frequently expressed frustration in regard to the rate of adoption for computer related technologies by educators. One respondent, an electronic publisher, even included a separate typed page expressing his frustration:

> I have taken a fairly radical stance, because the introduction of computer related technologies (ie: Videotex, computers, videodisc, or whatever) to education is a radical act. Computers are the first universal educational toolkit; they can crunch/record marks for teachers, provide CAI/CML, they monitor science experiments, do word processing, access remote information...truly an information toolkit. However, the perception of education is to tame new media and media educational technology. They want to make sure it serves the system, the bureaucracy, rather than the students. This is not a conscious act, or even a cynical act; it is the nature of mass education reacting to a

> system that can work very well and inexpensively one on one with students. Unfortunately, it is a threat to the status quo, and as such will be integrated and grudgingly brought into the system with a fair amount of suspicion. The students do not have the problem. They will adapt and adopt. The problem lies in the system itself, which by nature is not open to effective, meaningful change, unless by a slow inevitable evolutionary process. Education, structurally must change- because the ability to adopt ideas now comes in a nanosecond.

Another respondent reinforced this attitude by stating:

> The rate of adoption in education will be slow because of entrenched interests; people will not want to give up power or status readily...We may see conflict between those who argue for the necessity of a classroom and its interactive socializing functions and those who push for cost-effective delivery training systems. Who will win will depend, initially on economic circumstances.

These respondents' attitudes can most likely be understood by an educator who believes in interactive technology and forsees that there is a need for educators to begin changing in order to keep pace with the information society. A society, inwhich it would seem logical to assume that our students are more well equipped and prepared to live than the majority of educational administrators or teachers.

D. Changing Roles of the School Administrator, Teacher and Student

One sub-hypothesis stated that "The role of the school administrator, teacher and student will change if Videotex or other computer related technologies are introduced into education." The results strongly supported this sub-hypothesis and a number of recommendations were implied

or explicitly stated by respondents. The following recommendations are based on the results of this study.

Recommendation 1

A long term training program for school administrators, teachers and students should be in place for every school district and aim to foster awareness, comprehension and competency in interacting with computer related technolgies.

Eighty-four percent of the respondents strongly supported the statement that "Administrators will require more technical ability and knowledge about technology in order to make good decisions" and 90% agreed that "Teachers will require more training in understanding technology ; they will have to learn to interact with computers." Also, "Students must be prepared for the real world by being exposed to computers and data communications (88%).

Recommendation 2

Educational Institutions must reevaluate their educational organizations in light of the impact computer related technologies are having on society.

Computers, in general, are expected to drastically alter the Canadian and world economy during the next two decades. The increasing dependance upon and importance of electronic information processing has raised many critical issues for our society (Godfrey and Chang, 1982; Toffler, 1980; Hurly and Hylnka, 1982). Concern has been expressed as

to how educators are viewing computers; "We think of computers as helping schools in their task of teaching an existing curriculum, instead on confronting the fact the the computer puts the very idea of schools into question" (Papert, 1980). What are the implications of this possiblility for the Canadian school system? It seems inevitable that the computer in one form or another will have a major impact on schooling.

Educators need to reexamine their present educational structures which are at present antithetical to the networking concept of interactive technologies. The increased access to banks of information that computer based technologies have provided has already prompted numerous corporations to reevaluate or restructure their organizational structures. For example, the elite data processing departments which were previously isolated in most organizations are now being decentralized because over time users have increased their ability to access information. As a result, a more sophisticated user has evolved. A user who is: educated in accessing information, feels comfortable in using technology and is not afraid of articulating requests for system improvement. This new sophisticated user is evolving throughout numerous organizations and is developing an "installed base" for working with technology. The computer neophytes are still here. However, the increasing acceptability of computers in the home, office and in our schools can not be overlooked.

What happens structurally to the data processing department when it is faced with sophisticated users? Logically, one scenario could be that the autonomous structure of a data processing department weakens and fear or discomfort is experienced by those who are unwilling to change. A second scenario could be that those who are willing to change experience growth and satisfaction with the increased involvement of users initiating or making decisions regarding their automated environment.

When data processing departments are confronted with sophisticated users, a few facts remain. Data processing departments are being reallocated. Instead of being isolated appendages to organizational structures, they are being decentralized and are now acting as resource consultants or information facilitators.

This simple example can also be transferred to the Educational System. However, the power of a data processing department lies in an organization's goals, but in education the real power resides in society and in the homes of students. What happens here?

A future scenario could unfold positively for educators, if they develop a mandate that all educators must become competent in using computer based technologies and develop support structures to assist educators. On the negative side, if educators do not change they could be forced to change by external forces (political, legal, public) or perhaps the educational institution as it exists

today will experience a slow death.

In order to accommodate for the integration of computer related technologies, a number of activites should be initiated. Managerial techniques will have to be altered to emphasize greater internal cohesion. Instead of a top down, Weberian model for decision making, educators need to develop a more horizontal structure for decision making. Administrators will have to address changes in class structure, redefine the requirements or skills for teachers, and implement plans for change. A new model of education must evolve, based not on the industrialized age but one which reflects the survival skill required in our new evolving society. This skill will be the ability to access and retrieve information; it will be a knowledge skill and whoever posesses it will better be able to function and survive in the combined world of computers and electronic communication.

Teachers will need to change and become more flexible in their teaching techniques. They will become facilitators or resource consultants to students instead of central disseminators. Perhaps, the strongest fact supporting the urgent need for educators to reassess their educational structures is that the world of the student is changing.

Students are forming computer groups outside school. Students are attending summer computer camps to improve their ability to interact with computer systems. They are excited about using computer technology and are making

demands of parents and teachers that they have access to computers in school. With the increasing access to a variety of information, the role of the student is changing. Instead of a passive role, student learning will become more flexible and active. Students will become more intelligent, more knowledgeable and skillful. They will be better equipped to solve problems.

The changing role of the student is creating pressure on educational institutions. As supported by this study, fear will be experienced by the poor teachers and expansive opportunities will exist for the creative teachers (87%).

A possibility exists for an enormous gap to evolve between those school administrators and teachers who are trained in understanding technology and those who fear technology. Failure to take an interest in technology could set education back, not by a few years, but a whole civilization. We must determine how certain aspects of technology apply to education. These include ensuring equal access to information, continually retraining adults and teachers, and coordinating the various levels of the educational system.

What the real future is of Videotex, or of any other computer based technology, is impossible to accurately predict. However, this Delphi study provided a useful vehicle to generate a wealth of valuable opinions from a number of technological sectors; it provided an opportunity to examine some very real concerns regarding the future role

of Videotex in education.

With every decision we face, we must not only look at the trade-offs, but we also must remember that in the actively evolving information age, time or procrastination is educator's worst enemy. And unfortunately, time in education has frequently been a "comfort zone"; an opportunity to sit back and watch while other instrumental players orchestrate our future.

Today, even "Tomorrow is Too Late". A sense of urgency is needed by all educators in order to move our educational system forward into the Information Age. Computer technology will force people, individually or as a group, to develop or choose. The role of education is important. It can either promote dialogue, self-expression, and support for technology, or it can impose silence, repress thought, stifle communication and encourage passivity.

The Information Age requires assertiveness by all educators thoughout the world to collectively strive to move education into the "electronic world." If this responsibility is not carried out by educators, they could ultimately lose control over their organizations. Educators must lead, rather than trail their way in dealing with computer technology.

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Appendix 1 - Definition of Terms

ASCII characters - The American Standard Code for Information Interchange, an acronym pronounced "as-key", is a binary code using 8-bits to represent 128 text and control characters. (Coburn, Kelman, et al, 1982, p. 252).

Antiope - (Acquisition Numerique et cet Televisualisation d'Images organisees en Pages d'Ecriture).

CAI programming language - Computer Assisted Instruction is a language used by authors to tell a computer to display a lesson, receive and process responses, and for branching to appropriate portions of the lesson as required by the logic of instruction. (Charp, Bozeman, et al., 1982, p. 55).

Captain - (Character and Pattern Telephone Access Information).

cathode ray tube (CRT) - otherwise known as a monitor or video display unit, the CRT is an output device that is essentially a TV screen, although it will generally have much finer resolution than an ordinary television. (Coburn, Kelman, et al., 1982, p. 253).

Ceefax - broadcast Videotex (teletext) service run by the British Broadcasting Corporation.

central processing unit - The "brains" of a computer. The CPU controls what the computer does. It contains the circuits that interpret and execute instructions. (Coburn, Kelman, et al., 1982, p. 253).

central terminal - A hardware unit which coordinates communications between a computer and a number of outlying terminals. It may receive messages at random from the terminals, store them, until they can be handled by the central processor and then return them to the terminal concerned. (Chandor, 1970, p. 63).

chip - a single device, containing integrated electronic ciruit components (usually silicon). (Bozeman, Charp et al., 1982, p. 54).

coaxial - on a common axis. A coaxial pair is one with a central conductor surrounded by insulant which in turn is surrounded by a tubular outer conductor which is covered by more insulant.

coaxial cable - a cable with one or more coaxial pairs under one outer sheath. (Telephoney's Dictionary, June 1982).

code transmission system - sends coded information that is converted into characters and patterns at a pattern generator at each terminal.

communication - In computers, the scores of transfering information from one device to another. Often referred to as "communication" called telecommunications or teleprocessing when done over telephone lines. (Birnbaum, Sickmon, 1983, p. 132).

communications network - The connection of several individual computers so that files or messages can be sent back and forth between them. Communications network can provide multiple connections to large information

systems or connections to share ideas and programs between individual users. (Coburn, Kelman et al., 1982, p. 253).

compatability - The ability of a program or piece of hardware to operate different computers. (Birnbaum, Sickmon, 1983, p. 132).

Computer Assisted Instruction - is the body of knowledge about practise of the application of the computers to the instructional act. CAI consists of three basic processes in a variety of combinations:

- present and structure information
- accept and evaluate each student's responses, and
- route the student through one of several instructional paths.

control - The part of a computer which directs the operations of all the other parts of the computer. (Bozeman, Charp et al., 1982, p. 55).

data - a representation such as characters, to which meaning might be assigned - for example, a representation of information expressed in printed form. (Charp, Bozeman, et al., 1982, p. 55).

database - A collection of data fundamental to an operation organized in same predefined structure. (Bozeman, Charp, et al., 1982, p. 55).

data management - The procedures and programs associated with planning, organizing, maintaining and controlling the database. (Birnbaum, Sickmon, 1983, p. 133).

data processing - any operation or combination of operations on data, usually in accordance with a specified or implied set of rules, as a series of discrete steps, including operations such as: compute, assemble, compile, interpret, generate, translate, store, retrieve, transfer, select, extract, shift, search, sort, merge, read, write, print, erase, punch, etc. (Bozeman, Charp et al., 1982, p. 55).

data processing, centralized - The processing of all data pertaining to a given activity at a single location, usually with a given configuration of equipment in one building. (Bozeman, Charp et al., 1982, p. 55)

data processing, decentralized - The processing of data within each subdivision of an organization or at each geographical location of the parts of an organization. (Bozeman, Charp et al., 1982, p. 55).

documentation - All paperwork, manuals, and documents used to maintain a complete record of a systems' design, user responsibilities, programs, data entry and operating instructions. (Birnbaum, Sickmon, 1983, p. 133).

electronic mail - The term electronic mail does not have a single meaning. In its most limited form, it means that at least part of the transportation of a message or document is performed electronically. There are generally accepted three functional categories of electronic mail, each with increasing capabilities:

a. document distribution systems - provide only the

message distribution function electronically and often involves facsimile and copier technologies.

b. computer message system - provides message creation and message recipient services as well as message distribution services.

c. computer conferencing systems - are aimed at providing non-simultaneous communications with in a group and usually allows users only to access conference information.

electronic publishing - systems for the widespread dissemination and display of text and graphic information by wholly electronic means for display.

fibre optics - the branch of optical technology concerned with the transmission of radiant power through fibres made of transparent material such as: glass, fused silica, or plastic. Communication applications of fibre optics empty flexible fibres. Either a single discrete fibre or a nonspatially alligned fibre bundle may be used for its information channel. (Telephoney's Dictionary, June 1982).

graphics - nontext pictures (lines, circles, etc.) displayed by a CRT terminal or pointer. (Birnbaum, Sickmon, 1983, p. 135).

hardware - A term used to describe the mechanical, electrical, and electronic elements of a data processing system. (Bozeman, Charp et al., 1982, p. 55).

information carrier - is the medium used to transmit

electronic information on Videotex: the information carrier can be: telephone line, cable, optical fibres, satellite, or laser.

information provider - any person or organization involved in creating or putting up pages on Videotex.

information retrieval - the technology and methodology concerned with the storage of and search through large quantities of information. (Birnbaum, Sickmon, p. 136).

input - The data to be processed. The device or collective set of devices used for bringing data into another device. A channel for impressing a state on a device or logic element. The process of transferring data from an external storage to an internal storage. (Bozeman, Charp, et al., 1982, p. 56).

instructions - A set of characters (normally consisting of a command which when interpreted by the control unit, causes a data processing system to perform one of its operations. (Bozeman, Charp, et al., 1982, p. 56).

interactive system - a system designed to facilitate human-machine interaction by providing immeduate responses to the person communicating with the computer. Procesing data in this manner is called interactive processing. (Birnbaum, Sickmon, p. 137).

interface - (1)To match or interconnect systems or devices having different functions. (2)The cables and electronics that physically make the interconnection. (Birnbaum, Sickmon, p. 137).

keyboard - A set or panel consisting of an array of keys. Depressing a key causes the input of the specific character or symbol printed on the key. (Bozeman, Charp, et al., 1982, p. 57).

laser - a device that produces optical radiation to provide light amplification by stimulated emission of radiation and or optical resonant cavity to provide positive feedback. (Telephoney Dictionary, June 1982).

microcomputer - A small computer system whose central processing unit (the part of the unit (the part of the machine that can automatically carry out the instructions in a program) consists of a single chip or a small number of chips. (Bozeman, Charp et al., 1982, p.58).

microwave - a term loosely applied to those radio frequency wavelengths which are sufficiently short to exhibit some of the properties of light. (Telephoney Dictionary, June 1982.

modem - is a device that modulates and demodulates an electrical signal that is used to transfer data between two computing devices, or "peripherals". Modulation is defined as the process of modifying some characteristic of an analog signal (called a carrier) so that it varies in step with some other analog signal (called a modulating wave or signal). (Nichols, E., Musson, Keith etal., 1982, p. 226).

network - a set of devices or computers interconnected by

communication channels. (Birnbaum, Sickmon, 1983, p. 139).

offline - The operation of the peripheral equipment or devices in a system in which such equipment is not under control of the CPU. (Birnbaum, Sickmon, 1983, p. 139).

online - The operation of the peripheral equipment or devices in a system in which such equipment is under control of CPU. (Birnbaum, Sickmon, 1983, p. 139).

Oracle - broadcast Videotex (teletext) service run by the independent television companies in the United Kingdom.

pattern transmission system - transmits to users information that is already converted into characters and patterns in a pattern generator at a center.

Prestel - proprietary "broad name" of the interactive telephone-based Videotex service of the British Post Office.

retrieve - To find and select specific information from a file, especially a record or group of records. (Birnbaum, Sickmon, 1983, p. 139).

satellite communications - a satellite with a self-contained energy source designed to transmit radio communication signals back to earth. (Telephoney's Dictionary, June 1982).

search time - The average time required to identify an item of data satisfying a specified condition. (Chandor, 1970, p. 336).

telecommunications - The transmission and reception of data

over radio circuits or transmission lines by means of electromagnetic signals. (Chandor, 1970, p. 376).

telephone system - is a telecommunications system set up for the transmission of speech or other sounds. (Telephoney's Dictionary, June 1982).

teleshopping - is an interactive electronic shopping service which allows home users to request information on products, prices, etc., and to place orders.

teletext generic name for broadcast Videotex services.

Telidon - incorporates the most recent development in computer graphics and telecommunication technologies. Telidon refers not to the Videotex service, but to a particular idea of how Videotex can operate- to a computer protocol, or set of instructions. The Canadian Videotex system consists basically of three components:

a. data bases connected to a central computer
b. a modified TV set with a push button keypad unit like a pocket calculator or a keyboard like a typewriter for retrieving or sending information.
c. a transmission link, such as telephone lines, cable, optical fibres, television broadcast, satellites or even laser.

timesharing - the servicing of multiple terminals to process their separate requests during the same overall interval of time, as dictated by a scheduling formula (Birnbaum, Sickmon, 1983, p. 143).

timesharing service - A company that provides a processing

service to customers by connecting them via terminals directly to a company computer capable of doing time sharing (Birnbaum, Sickmon, 1983, p. 143).

Videotex - is the generic term used internationally to represent a class of home and business information services which disseminates information from information providers into the home or office. A Videotex system is essentially a mass market, two-way system in which users can call up information on a TV screen from a control computer database. The information carrier can be a telephone line, coaxial cable, microwave link, satellite, optical fibre or laser.

Viewdata - the United Kingdom term for interactive Videotex.

vertical blanking interval - blank line space between the individual frames of the television picture.

Videotex Questionnaire 1982

In the previous questionnaire, you were asked to indicate which of the categories listed below you would classify yourself. If you worked in more than one area, you were asked to indicate the percentage of time you spent working in each category. A blank space has been provided beside each of the categories, if you wish to alter your previous response.

There have also been a few changes in the wording of definitions and questions; these new changes are indicated in italics.

1. consultant
2. technician
3. generalist
4. educator
5. information provider
6. information carrier
7. other (please identify)

For the purpose of this study, a few common definitions have been established. These definitions will provide all participants with the same base to answer questions addressing these terms.

Videotex - is the generic term used internationally to represent a class of home and business information services which disseminates information from information providers into the home or office. A Videotex system is essentially a mass market, two-way delivery system in which users can call up information on a TV screen from a control computer database. The information carrier can be a telephone line, coaxial cable, microwave link, satellite, optical fibre or laser.

Telidon - *incorporates the most recent development in computer graphics and telecommunication technologies. Telidon refers not to the videotex service, but to a particular idea of how videotex can operate- to a computer protocol, or code, or set of instructions. The Canadian Videotex system consists basically of three components:*

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Electronic Publishing - systems for the widespread dissemination and display of text and graphic information by wholly electronic means for display.

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a. present and structure information
b. accept and evaluate each student's responses, and
c. route the student through one of several instructional paths.

Information Provider - any person or organization involved in creating or putting up pages on videotex.

Information Carrier - is the medium used to transmit electronic information on videotex; the information carrier can be: telephone line,cable, optical fibres, satellite, or laser.

PART 1

In this section, you were asked to indicate the year in which a number of events will most likely occur. Your previous response is indicated beside each question. As well, the median and the lower and upper quartiles are given for the completed group.

1. median- the point below which half of the observations fall.
2. lower quartile- defines the point below which the bottom quarter of observations fall.
3. upper quartile- defines the point above which the top quarter of observations fall.

A space has been provided for you if you wish to alter your previous response. If there is a significant difference between your response and the median response of the group, it would be of value to me if you would provide reasons why you believe your answer is more reasonable than the group median.

	Group	Lower Quartile	Median	Upper Quartile
1. Videotex systems will enable users to access any information in the world by the year	R_1 - All	1990	1992	2000
	R_1 - Educ.	1990	1996	2000
	R_1 - I.P.	1990	1990	2000
	R_1 - I.C.	1987	1992	1997
	R_1 - V.H.S.	1990	1992	2000
	R_1 - All			
2. *Videotex will be a common (75%) household item in Canadian homes used for:*				
a. business by the year	R_1 - All	1986	1989	1990
	R_1 - Educ.	1987	1990	1995
	R_1 - I.P.	1987	1989	1990
	R_1 - I.C.	1987	1990	1991
	R_1 - V.H.S.	1987	1988	1990
	R_1 - all	1987	1990	1990
b. education by the year	R_1 - All	1985	1990	1995
	R_1 - Educ.	1990	1991	2000
	R_1 - I.P.	1986	1989	1991
	R_1 - I.C.	1987	1990	1995
	R_1 - V.H.S.	1987	1989	1990
	R_1 - all	1987	1990	1994
c. recreation by the year	R_1 - All	1986	1990	1994
	R_1 - Educ.	1988	1990	1995

	R_1 · I.P.	1986	1987	1990
	R_2 · I.C.	1987	1990	1995
	R_3 · V.H.S.	1985	1989	1991
	R_4 · all	1987	1990	1994
3. *A Canadian Electronic Publishing Industry will be the <u>major</u> (80%) form of publishing by the year.*	R_1 · All	1990	1995	2000
	R_2 · Educ.	1993	1997	2000
	R_3 · I.P.	1990	1995	2002
	R_4 · I.C.	1992	2000	2000
	R_5 · V.H.S.	1993	2000	2000
	R_6 · All	1992	2000	2000
4. *Teleshopping will be used by (75%) of Canadian homeowners by the year*	R_1 · All	1986	1990	1990
	R_2 · Educ.	1988	1990	1995
	R_3 · I.P.	1987	1990	1993
	R_4 · I.C.	1988	1990	1990
	R_5 · V.H.S.	1988	1990	1990
	R_6 · All	1988	1990	1990
5. An active Canadian export business supplying videotex hardware systems will be in operation by the year	R_1 · All	1983	1985	1987
	R_2 · Educ.	1984	1985	1988
	R_3 · I.P.	1983	1985	1987
	R_4 · I.C.	1984	1985	1987
	R_5 · V.H.S.	1983	1985	1985
	R_6 · All	1984	1985	1987
6. *Electronic mail will be used by 50% of adult Canadians for personal communication by the year.*	R_1 · All	1985	1986	1990
	R_2 · Educ.	1986	1988	1994
	R_3 · I.P.	1986	1990	1993
	R_4 · I.C.	1987	1988	1990
	R_5 · V.H.S.	1986	1988	1990
	R_6 · All	1986	1988	1990

	Group	Lower Quartile	Median	Upper Quartile
7. Canadian manufactured videotex terminals and adaptors will be available as standard over the counter retail merchandise throughout the country by the year	R_1 · All	1984	1985	1987
	R_2 · Educ.	1985	1985	1987
	R_3 · I.P.	1984	1987	1987
	R_4 · I.C.	1985	1986	1987
	R_5 · V.H.S.	1984	1985	1986
	R_6 · All	1985	1985	1987
8. *The psychological willingness of the majority (80%) of Canadian society to use videotex as the major technological means of information retrieval will be in the year*	R_1 · All	1987	1990	2000
	R_2 · Educ.	1990	1991	2000
	R_3 · I.P.	1985	1992	2001
	R_4 · I.C.	1988	1990	1995
	R_5 · V.H.S.	1990	1993	2000
	R_6 · All	1990	1990	2000
9. *CAI systems(see definition) will be incorporated in videotex by the year*	R_1 · All	1985	1986	1990
	R_2 · Educ.	1986	1988	1990
	R_3 · I.P.	1985	1986	1988
	R_4 · I.C.	1985	1987	1990
	R_5 · V.H.S.	1985	1987	1990
	R_6 · All	1985	1987	1990
10. The storage and transmission of auditory responses will be in operation on videotex by the year	R_1 · All	1985	1988	1990
	R_2 · Educ.	1986	1988	1990
	R_3 · I.P.	1987	1988	1990
	R_4 · I.C.	1985	1988	1990
	R_5 · V.H.S.	1987	1989	1990
	R_6 · All	1986	1988	1990
11. Personal Computers will be able to act as videotex terminals by the year	R_1 · All	1982	1983	1984
	R_2 · Educ.	1982	1983	1984
	R_3 · I.P.	1983	1983	1984
	R_4 · I.C.	1983	1983	1984
	R_5 · V.H.S.	19821982	1984	1982
	R_6 · All	1983	1984	

12. In what year will the following industries begin using videotex in a production environment?

	Group	Lower Quartile	Median	Upper Quartile
a. Banks	R_1 - All	1984	1985	1988
	R_2 - Educ.	1984	1985	1987
	R_3 - I.P.	1984	1985	1986
	R_4 - I.C.	1985	1985	1988
	R_5 - V.H.S.	1983	1985	1988
	R_7 - all	1984	1985	1988
b. Direct Mail	R_1 - All	1984	1986	1990
	R_2 - Educ.	1985	1986	1990
	R_3 - I.P.	1984	1985	1990
	R_4 - I.C.	1985	1986	1990
	R_5 - V.H.S.	1984	1987	1990
	R_7 - all	1985	1986	1990
c. Retailers	R_1 - All	1983	1985	1988
	R_2 - Educ.	1985	1985	1988
	R_3 - I.P.	1983	1984	1988
	R_4 - I.C.	1984	1985	1987
	R_5 - V.H.S.	1984	1985	1986
	R_7 - all	1984	1985	1988
d. Newspaper Media	R_1 - All	1984	1985	1987
	R_2 - Educ.	1984	1985	1989
	R_3 - I.P.	1983	1985	1987
	R_4 - I.C.	1984	1985	1990
	R_5 - V.H.S.	1984	1985	1985
	R_7 - all	1984	1985	1987
e. Travel Companies	R_1 - All	1983	1984	1985
	R_2 - Educ.	1984	1984	1987
	R_3 - I.P.	1983	1984	1985
	R_4 - I.C.	1984	1984	1986
	R_5 - V.H.S.	1983	1984	1985
	R_7 - all	1983	1984	1985
f. Education-home	R_1 - All	1985	1986	1990
	R_2 - Educ.	1985	1987	1992
	R_3 - I.P.	1985	1985	1988

	R_1 · I.C.	1985	1987	1990
	R_2 · V.H.S.	1985	1986	1986
	R_3 · all	1985	1986	1990
g. Education-school	R_1 · All	1984	1985	1988
	R_2 · Educ.	1984	1985	1988
	R_3 · I.P.	1984	1984	1986
	R_4 · I.C.	1985	1987	1988
	R_5 · V.H.S.	1984	1985	1985
	R_6 · all	1984	1985	1988
h. Advertisers	R_1 · All	1982	1984	1985
	R_2 · Educ.	1982	1984	1986
	R_3 · I.P.	1982	1984	1985
	R_4 · I.C.	1984	1984	1985
	R_5 · V.H.S.	1982	1983	1984
	R_6 · all	1982	1984	1985
i. Government	R_1 · All	1982	1983	1985
	R_2 · Educ.	1982	1983	1990
	R_3 · I.P.	1985	1984	1985
	R_4 · I.C.	1983	1984	1985
	R_5 · V.H.S.	1982	1983	1984
	R_6 · all	1982	1983	1985
j. Real Estate	R_1 · All	1984	1985	1985
	R_2 · Educ.	1984	1985	1985
	R_3 · I.P.	1983	1984	1985
	R_4 · I.C.	1984	1985	1985
	R_5 · V.H.S.	1984	1984	1985
	R_6 · all	1984	1985	1985
k. Insurance Companies	R_1 · All	1985	1985	1990
	R_2 · Educ.	1985	1987	1990
	R_3 · I.P.	1984	1985	1989
	R_4 · I.C.	1985	1986	1990
	R_5 · V.H.S.	1984	1985	1987
	R_6 · all	1985	1986	1990

13. A videotex decoder (single quantity) will be available for

a. $1000 by the year	R_1 · All	1982	1983	1984
	R_2 · Educ.	1982	1983	1984
	R_3 · I.P.	1982	1983	1984

b. $ 500 by the year

c. $ 250 by the year

d. $ 100 by the year

R_1 · I.C.	1983	1983	1984
R_2 · V.H.S.	1982	1982	1983
R_3 · all	1982	1983	1984
R_1 · All	1984	1985	1985
R_2 · Educ.	1984	1984	1985
R_3 · I.P.	1984	1985	1986
R_4 · I.C.	1985	1985	1987
R_5 · V.H.S.	1984	1984	1985
R_6 · all	1984	1985	1985
R_1 · All	1985	1986	1990
R_2 · Educ.	1985	1987	1990
R_3 · I.P.	1985	1988	1990
R_4 · I.C.	1986	1988	1990
R_5 · V.H.S.	1986	1986	1987
R_6 · all	1985	1987	1990
R_1 · All	1986	1990	1992
R_2 · Educ.	1986	1990	1992
R_3 · I.P.	1986	1987	1990
R_4 · I.C.	1987	1990	1995
R_5 · V.H.S.	1987	1987	1990
R_6 · all	1986	1990	1991

PART 2

In this section, you were asked to indicate your agreement with a series of statements. You responded by circling one of the five points on the scale. The frequency of each response has been indicated on the questionnaire and , your previous response has been indicated. If you wish to alter your answer, please circle your new response.

SA = strongly agree
A = agree
D = disagree
SD = strongly disagree
DK = don't know

	Group	Response Distribution				
14. Simplicity is the whole secret behind Videotex	Group	SA	A	D	SD	DK
	R_1 - All	26	34	22	8	5
	R,Educ.	4	5	3	1	3
	R,I.P.	1	9	3	0	0
	R,I.C.	11	3	7	0	0
	R,V.H.S.	7	2	2	2	2
	R,All	23	19	15	3	5
15. Videotex is a technology looking for a market	Group	SA	A	D	SD	DK
	R_1 - All	25	49	12	9	1
	R,Educ.	5	5	4	1	1
	R,I.P.	1	9	1	2	0
	R,I.C.	7	13	1	0	0
	R,V.H.S.	4	8	1	2	0
	R,All	17	35	7	5	1
16. There should be a separation of carrier and content in any videotex system. (example: Bell Telephone should only be supplying the means of transmitting and receiving of information; they should not be allowed to supply data bases.)	Group	SA	A	D	SD	DK
	R_1 - All	26	26	17	20	6
	R,Educ.	6	2	3	2	3
	R,I.P.	6	6	1	0	0
	R,I.C.	0	3	8	9	1
	R,V.H.S.	6	4	1	3	1
	R,All	18	17	13	14	5
17. Electronic Publishing is so new that its development is hard to predict.	Group	SA	A	D	SD	DK
	R_1 - All	14	46	34	3	0
	R,Educ.	1	8	5	2	0
	R,I.P.	0	9	4	0	0
	R,I.C.	6	9	5	1	0

	R,V.H.S.	1	7	7	0	0
	R,All	8	33	21	3	0
18. Electronic Communications should be controlled by the private sector, not by the government.	Group	SA	A	D	SD	DK
	R_1 - All	29	29	28	6	3
	R,Educ.	2	3	7	3	1
	R,I.P.	5	3	5	0	0
	R,I.C.	11	7	2	0	1
	R,V.H.S.	3	6	3	11	21
	R,All	19	17	4	3	
19. Home Delivery of Electronic Communication should be subsidized by the Government.	Group	SA	A	D	SD	DK
	R_1 - All	1	9	46	35	5
	R,Educ.	0	3	7	3	3
	R,I.P.	0	2	7	3	1
	R,I.C.	0	1	10	9	1
	R,V.H.S.	0	1	7	7	0
	R,All	0	7	31	22	5

	Group	Response Distribution				
20. Rate regulations for the delivery of Electronic information should be closely monitored by the Government.	Group	SA	A	D	SD	DK
	R_1 - All	7	42	26	18	3
	R_2Educ.	3	8	4	0	1
	R_2I.P.	0	6	4	3	0
	R_2I.C.	0	3	9	9	0
	R_2V.H.S.	3	6	4	2	0
	R_2All	6	23	21	14	1
21. Videotex will decrease the isolation of handicapped people.	Group	SA	A	D	SD	DK
	R_1 - All	14	60	12	5	5
	R_2Educ.	2	11	1	0	2
	R_2I.P.	3	6	1	1	2
	R_2I.C.	4	15	2	0	0
	R_2V.H.S.	2	10	1	1	1
	R_2All	11	42	5	2	5
22. Games will play an intregal role in securing videotex as a medium in the marketplace.	Group	SA	A	D	SD	DK
	R_1 - All	32	43	16	3	3
	R_2Educ.	5	7	3	0	1
	R_2I.P.	4	7	2	0	0
	R_2I.C.	12	7	1	0	1
	R_2V.H.S.	5	6	3	1	0
	R_2All	26	27	9	1	2
23. Existing conflicts between Information Carriers will inhibit Videotex's successful entrance into the marketplace.	Group	SA	A	D	SD	DK
	R_1 - All	4	17	53	13	10
	R_2Educ.	1	2	8	1	4
	R_2I.P.	1	3	6	2	1
	R_2I.C.	0	2	16	3	0
	R_2V.H.S.	2	6	5	2	0
	R_2All	4	13	35	8	5
24. Exisiting computertime sharing facilities will strongly inhibit videotex's adoption in the Candian marketplace.	Group	SA	A	D	SD	DK
	R_1 - All	7	20	51	13	6
	R_2Educ.	0	4	9	1	1
	R_2I.P.	0	2	7	4	0
	R_2I.C.	1	6	12	1	1
	R_2V.H.S.	1	3	10	1	0
	R_2All	2	15	38	8	2

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25. Videotex will be delivered in Canada on the following Information Carriers. (check as many as are applicable)

	Group Response	Previous Response
a. telephone	91	65
b. coaxial cable	89	65
c. satellite	75	55
d. microwave	64	40
e. fibreoptics	78	60

26. The major method by which videotex will be delivered in Canada will be (Check one medium for each year)

	telephone		coaxial cable		satellite		microwave		fibre optics	
Year	R_1 Grp. freq.	R_2 Grp. freq.	R_1 Grp. freq.	R_2 Grp. freq.	R_1 Grp. freq.	R_2 Grp. freq.	R_1 Grp. freq.	R_2 Grp. freq.	R_1 Grp. freq.	R_2 Grp. freq.
1982	71	57	8	3	0	0	0	0	0	0
1985	28	24	34	28	2	2	1	1	1	0
1990	10	10	24	21	14	9	4	2	14	13
2000	9	8	5	5	14	10	0	2	30	29

Part 3

In this section, we asked you a number of questions relating to Education in order to forecast the potential implications of videotex in Education. For the first part of this section (A), please respond as you did in Part II. The second part of this section (B) has a series of open ended questions where you were asked to respond, in your own words, to a question. The open ended questions were analyzed and recorded by using a frequency count. A frequency count is a total count of how many times a particular statement was made. In this section, you are asked to agree or disagree with the generated statements. Beside each statement in brackets is the frequency count.

Section A

		Group	Response Distribution				
27.	Videotex will eventually replace individual classroom instruction.	Group	SA	A	D	SD	DK
		R_1 - All	0	6	41	49	1
		R,Educ.	0	0	7	9	0
		R,I.P.	1	1	5	6	0
		R,I.C.	0	1	12	8	0
		R,V.H.S.	0	3	5	7	0
		R,All	1	5	29	30	0
28.	The high cost of acquiring videotex will be a major drawback for educators.	Group	SA	A	D	SD	DK
		R_1 - All	11	29	48	7	2
		R,Educ.	2	4	7	0	3
		R,I.P.	1	3	5	4	0
		R,I.C.	2	11	7	1	0
		R,V.H.S.	0	6	7	2	0
		R,All	5	24	26	7	3
29.	For videotex to become a cost effective system, access to databanks must be shared as much as possbile by all educators.	Group	SA	A	D	SD	DK
		R_1 - All	23	51	12	2	8
		R,Educ.	4	7	2	0	3
		R,I.P.	4	7	1	1	0
		R,I.C.	4	13	1	1	2
		R,V.H.S.	4	8	1	0	2
		R,All	16	35	5	2	7
30.	There is a higher risk of poor quality educational programs being delivered with videotex than with traditional in-class instruction.	Group	SA	A	D	SD	DK
		R_1 - All	2	16	49	19	10
		R,Educ.	0	2	5	4	5
		R,I.P.	0	3	6	4	0
		R,I.C.	0	6	9	4	3
		R,V.H.S.	1	1		7	5
		R,All	1	1	11	27	17

31. The major potential for videotex in Education is in long distance education.

Group	SA	A	D	SD	DK
R_1 - All	6	35	47	7	2
R_2Educ.	0	5	8	2	1
R_2I.P.	0	7	6	0	0
R_2I.C.	2	7	10	1	1
R_2V.H.S.	2	2	8	3	0
R_2All	4	21	32	6	2

32. Videotex Systems will increase the ease of access of educational programs for adults.

Group	SA	A	D	SD	DK
R_1 - All	17	75	2	0	2
R_2Educ.	4	10	0	0	2
R_2I.P.	2	10	1	0	0
R_2I.C.	2	18	1	0	0
R_2V.H.S.	3	12	0	0	0
R_2All	11	50	2	0	2

	Group	Response Distribution				
33. Presently, CAI capabilities are acceptable on videotex.	Group	SA	A	D	SD	DK
	R_1 - All	8	22	39	18	7
	R_2Educ.	1	2	6	5	2
	R_2I.P.	2	1	8	2	0
	R_2I.C.	0	5	8	5	3
	R_2V.H.S.	1	3	10	1	0
	R_2All	4	11	32	13	5
34. Videotex systems will increase the isolation between teachers and their students.	Group	SA	A	D	SD	DK
	R_1 - All	3	21	58	11	4
	R_2Educ.	0	3	10	1	2
	R_2I.P.	0	2	8	2	1
	R_2I.C.	0	10	11	0	0
	R_2V.H.S.	1	2	10	1	1
	R_2All	1	17	39	4	4
35. Decision making by educators will become more complex, if centralized curriculum data bases are available to all Canadian education institutions.	Group	SA	A	D	SD	DK
	R_1 - All	4	27	40	8	16
	R_2Educ.	0	4	6	2	4
	R_2I.P.	0	6	5	2	0
	R_2I.C.	0	6	10	5	1
	R_2V.H.S.	3	7	1	3	1
	R_2All	19	28	5	12	
36. In order to implement videotex in Education, educators will need to hire specialized personnel knowledgeable on instructional system design and electronic information dissemination.	Group	SA	A	D	SD	DK
	R_1 - All	21	45	20	7	4
	R_2Educ.	5	7	2	0	2
	R_2I.P.	1	7	3	2	0
	R_2I.C.	5	10	4	1	1
	R_2V.H.S.	6	6	2	1	0
	R_2All	17	30	11	4	3
37. Videotex has the potential to be integrated in education for two reasons						
a. cost-efficient	Group	SA	A	D	SD	DK
	R_1 - All	14	61	7	4	10
	R_2Educ.	3	10	0	1	2
	R_2I.P.	2	9	1	0	1
	R_2I.C.	1	12	2	2	4
	R_2V.H.S.	3	9	1	0	2
	R_2All	9	40	4	3	9
b. present availability of color TV terminals	Group	SA	A	D	SD	DK
	R_1 - All	4	44	27	8	9
	R_2Educ.	0	8	3	4	1

	R_2I.P.	0	9	4	0	0
	R_2I.C.	0	10	8	1	2
	R_2V.H.S.	3	5	3	1	3
	R_2All	3	32	18	6	6
38. Videotex instruction will be used in Industrial Training before it will be used in Education (Grades 1-12)	**Group**	**SA**	**A**	**D**	**SD**	**DK**
	R_1 - All	22	42	22	1	9
	R_2Educ.	5	5	3	0	3
	R_2I.P.	0	10	3	0	0
	R_2I.C.	5	10	4	1	1
	R_2V.H.S.	6	5	2	0	2
	R_2All	16	30	12	1	6
39. Availability of Educational courseware on a home videotex system will increase parental curiousity and interest in curriculum.	**Group**	**SA**	**A**	**D**	**SD**	**DK**
	R_1 - All	11	73	7	0	5
	R_2Educ.	1	13	2	0	0
	R_2I.P.	1	10	1	0	1
	R_2I.C.	2	17	1	0	1
	R_2V.H.S.	2	12	0	0	1
	R_2All	6	52	4	0	3
40. Easy access to courseware will be the major reason for an increase of parental curiousity and interest in curriculum.	**Group**	**SA**	**A**	**D**	**SD**	**DK**
	R_1 - All	10	66	13	0	7
	R_2Educ.	2	11	2	0	1
	R_2I.P.	1	10	2	0	0
	R_2I.C.	2	17	0	0	2
	R_2V.H.S.	0	13	1	0	1
	R_2All	5	51	5	0	4

	Group	Response Distribution				
41. The home environment is a non-threatening environment to parents in comparison to the potential threatening environment between a teacher and student. This "comfort zone" in which a parent can examine his child's curriculum on videotex will increase parents interest and awareness in curriculum.	Group	SA	A	D	SD	DK
	R_1 - All	4	61	18	1	11
	R_2Educ.	1	8	2	0	4
	R_2I.P.	1	9	3	0	0
	R_2I.C.	1	16	1	0	3
	R_2V.H.S.	0	10	2	3	3
	R_2All	43	8	0	10	
42. The quality of Educational Courseware transmitted on videotex will be increasingly questioned as audience exposure increases.	Group	SA	A	D	SD	DK
	R_1 - All	10	69	9	1	7
	R_2Educ.	1	12	0	0	3
	R_2I.P.	1	10	1	0	1
	R_2I.C.	3	16	1	0	1
	R_2V.H.S.	3	11	0	1	0
	R_2All	8	49	2	1	5
43. Legal issues regarding the educational rights of children will increase as parents perceive an increase in available educational courseware on videotex.	Group	SA	A	D	SD	DK
	R_1 - All	5	31	27	4	29
	R_2Educ.	0	7	3	0	6
	R_2I.P.	1	2	5	2	3
	R_2I.C.	1	6	6	0	8
	R_2V.H.S.	2	4	5	1	3
	R_2All	4	19	19	3	20
44. Videotex offers life-long education for everyone.	Group	SA	A	D	SD	DK
	R_1 - All	17	52	12	2	12
	R_2Educ.	5	4	1	1	5
	R_2I.P.	2	7	1	1	2
	R_2I.C.	2	12	2	1	4
	R_2V.H.S.	1	10	3	1	0
	R_2All					
45. Telidon will be the major accepted worldwide standard for videotex.	Group	SA	A	D	SD	DK
	R_1 - All	15	24	25	11	22
	R_2Educ.	1	4	2	4	5
	R_2I.P.	2	4	5	1	1
	R_2I.C.	1	6	5	5	4
	R_2V.H.S.	6	3	3	0	3
	R_2All	10	17	15	10	13
46. The following are the components of a traditional Telidon system. Circle on the scale of 1 (very good) to 5 (very bad), how good or bad each of the components are:						

a.	information provider system	5 6	4 21	3 34	2 20	1 2	NA 14	2	5	4	3	2	1	NA	6
b.	Telidon communication code(PDI)	5 9	4 5	3 14	2 26	1 32	NA 11	0	5	4	3	2	1	NA	7
c.	Telidon decoder terminal	5 4	4 21	3 44	2 11	1 3	NA 14	0	5	4	3	2	1	NA	8
d.	Teldion information retrieval system	5 15	4 19	3 33	2 15	1 2	NA 13	5	5	4	3	2	1	NA	9

Section B

47. What key factors, do you feel, are important for Educators in adopting videotex as an educational tool?

a. Storage Capacity must be sufficient (R_1 = 2)

Group	Agree	Disagree
R_2Educ.	15	0
R_2I.P.	10	2
R_2I.C.	15	3
R_2V.H.S.	12	2
R_2All	52	7

b. Educators need to be able to forget about the teacher/pupil ratio. (R_1 = 2)

Group	Agree	Disagree
R_2Educ.	10	5
R_2I.P.	3	9
R_2I.C.	11	8
R_2V.H.S.	7	7
R_2All	31	29

c. Educators need to express a willingness to be innovative. (R_1 = 2)

Group	Agree	Disagree
R_2Educ.	14	1
R_2I.P.	12	1
R_2I.C.	18	0
R_2V.H.S.	11	2
R_2All	55	4

d. Educators must avoid a premature introduction of the technology. (R_1 = 2)

Group	Agree	Disagree
R_2Educ.	4	11
R_2I.P.	5	6
R_2I.C.	12	5
R_2V.H.S.	6	8
R_2All	27	30

e. Information retrieval techniques need to be improved. The tree structure form of information retrieval is not as efficient as other retrieval systems. (R_1 = 2)

Group	Agree	Disagree
R_2Educ.	15	0
R_2I.P.	12	1
R_2I.C.	19	1
R_2V.H.S.	12	1
R_2All	58	3

f. Controversies will arise over French/English content in courseware. (R_1 = 2)

Group	Agree	Disagree
R_2Educ.	2	10
R_2I.P.	8	4
R_2I.C.	12	6

	R_1,V.H.S.	9	5
	R_1,All	31	25
g. Educators need to realize that technology provides an opportunity for all ages to continue learning. Life-long learning becomes a reality. (R_1 = 2)	**Group**	**Agree**	**Disagree**
	R_1,Educ.	12	3
	R_1,I.P.	9	2
	R_1,I.C.	18	1
	R_1,V.H.S.	11	1
	R_1,All	50	7
h. Cooperation must exist among educators. They need to be flexible and exhibit confidence in the implementation of any form of technology. (R_1 = 2)	**Group**	**Agree**	**Disagree**
	R_1,Educ.	13	2
	R_1,I.P.	10	2
	R_1,I.C.	18	2
	R_1,V.H.S.	12	1
	R_1,All	53	7
i. Educators will need to keep a balance between man and machine. (R_1 = 2)	**Group**	**Agree**	**Disagree**
	R_1,Educ.	14	1
	R_1,I.P.	10	2
	R_1,I.C.	18	2
	R_1,V.H.S.	11	2
	R_1,All	53	7
j. Educators must support videotex (R_1 = 3)	**Group**	**Agree**	**Disagree**
	R_1,Educ.	9	4
	R_1,I.P.	8	4
	R_1,I.C.	9	9
	R_1,V.H.S.	6	7
	R_1,All	32	24
k. If two way audio is developed, the educational applications of videotex will increase. (R_1 = 3)	**Group**	**Agree**	**Disagree**
	R_1,Educ.	10	4
	R_1,I.P.	11	2
	R_1,I.C.	14	4
	R_1,V.H.S.	8	5
	R_1,All	43	15
l. Videotex must be able to integrate into existing curriculum. (R_1 = 3)	**Group**	**Agree**	**Disagree**
	R_1,Educ.	12	3
	R_1,I.P.	11	1
	R_1,I.C.	14	3
	R_1,V.H.S.	7	7

m.	Competition between videotex delivery of educational material and personal computers. (R_1 = 3)	R_2All Group	44 Agree	14 Disagree
		R_2Educ.	5	7
		R_2I.P.	9	4
		R_2I.C.	13	4
		R_2V.H.S.	7	5
n.	Provincial Governments will need to develop a sharing policy agreement. (R_1 = 3)	R_2All Group	34 Agree	20 Disagree
		R_2Educ.	10	3
		R_2I.P.	9	3
		R_2I.C.	9	10
		R_2V.H.S.	9	4
o.	A sophisticated and standardized CAI language for videotex needs to be developed. (R_1 = 3)	R_2All Group	37 Agree	20 Disagree
		R_2Educ.	10	4
		R_2I.P.	7	5
		R_2I.C.	15	4
		R_2V.H.S.	6	8
p.	Teachers need to be convinced that their role is to lead students to information, not to be the source of information. (R_1 = 3)	R_2All Group	38 Agree	21 Disagree
		R_2Educ.	11	4
		R_2I.P.	7	4
		R_2I.C.	12	5
		R_2V.H.S.	10	3
q.	Support will be required by a number of publics for the effective implementation of videotex in Education. (R_1 = 4)	R_2All Group	40 Agree	16 Disagree
		R_2Educ.	14	0
		R_2I.P.	10	2
		R_2I.C.	16	3
		R_2V.H.S.	10	2
r.	Teachers need to perceive videotex as a tool. (R_1 = 4)	R_2All Group	50 Agree	7 Disagree
		R_2Educ.	13	2
		R_2I.P.	13	0
		R_2I.C.	19	1
		R_2V.H.S.	13	1
s.	Telidon graphical display capabilities are excellent. (R_1 = 5)	R_2All Group	58 Agree	4 Disagree

	R_2Educ.	10	4
	R_2I.P.	9	3
	R_2I.C.	13	5
	R_2V.H.S.	9	5
	R_2All	41	17
t. Funding-Who will pay? (R_1 = 5)	**Group**	**Agree**	**Disagree**
	R_2Educ.	9	2
	R_2I.P.	9	1
	R_2I.C.	14	2
	R_2V.H.S.	11	0
	R_2All	43	5
u. Educators need to be knowledgeable in the design and evaluation of videotex courseware. (R_1 = 5)	**Group**	**Agree**	**Disagree**
	R_2Educ.	13	2
	R_2I.P.	10	2
	R_2I.C.	13	7
	R_2V.H.S.	11	3
	R_2All	47	14
v. Educators need to revise current administration and organizational structures in light of technology. (R_1 = 6)	**Group**	**Agree**	**Disagree**
	R_2Educ.	13	2
	R_2I.P.	7	5
	R_2I.C.	14	4
	R_2V.H.S.	10	4
	R_2All	44	15
w. Educators need to psychologically accept videotex and display a willingness to overcome any fears they have towards computers. (R_1 = 8)	**Group**	**Agree**	**Disagree**
	R_2Educ.	14	0
	R_2I.P.	11	1
	R_2I.C.	18	2
	R_2V.H.S.	10	3
	R_2All	53	6
x. Educators require supporting research to verify the feasibility of using videotex in Education. Require Field Trials with positive results. (R_1 = 10)	**Group**	**Agree**	**Disagree**
	R_2Educ.	14	1
	R_2I.P.	8	4
	R_2I.C.	17	3
	R_2V.H.S.	7	7
	R_2All	46	15
y. Creation and Availability of quality databases. (R_1 = 12)	**Group**	**Agree**	**Disagree**
	R_2Educ.	14	0
	R_2I.P.	9	1

R,I.C.	17	2
R,V.H.S.	12	1
R,All	52	4

z. Good CAI, CML must be part of the videotex software. Videotex must be able to keep student performance records and provide feedback to students. (R_1 = 12)

Group	Agree	Disagree
R,Educ.	14	1
R,I.P.	12	0
R,I.C.	17	1
R,V.H.S	12	2
R,All	55	4

aa. Simplicity of using videotex will attract educators. (R_1 = 16)

Group	Agree	Disagree
R,Educ.	13	2
R,I.P.	9	3
R,I.C.	15	4
R,V.H.S.	11	3
R,All	48	12

ab. Computer Literacy Programs must be made available to educators. (R_1 = 17)

Group	Agree	Disagree
R,Educ.	15	0
R,I.P.	11	1
R,I.C.	17	2
R,V.H.S.	12	1
R,All	55	4

ac. Hardware and Software costs need to be low. (R_1 = 26)

Group	Agree	Disagree
R,Educ.	14	1
R,I.P.	11	1
R,I.C.	18	1
R,V.H.S.	10	4
R,All	53	7

ad. Good courseware must be available. (R_1 = 31)

Group	Agree	Disagree
R,Educ.	15	0
R,I.P.	12	0
R,I.C.	20	0
R,V.H.S.	14	0
R,All	61	0

48. What issues do you forsee playing an important role in Education, if centralized curriculum databases are accessible to all Canadian Educators?

a. Very few problems at higher educational institutions-more problems at lower levels. (R_1 = 1)

Group	Agree	Disagree
R,Educ.	5	9
R,I.P.	5	7
R,I.C.	4	12

	R,V.H.S.	6	7
	R,All	20	35
b. Every user must have the ability to be a provider. (R_1 = 1)	Group	Agree	Disagree
	R,Educ.	5	9
	R,I.P.	4	9
	R,I.C.	4	14
	R,V.H.S.	8	6
	R,All	21	38
c. Policy conflicts with respect to local control vs central control. (R_1 = 1)	Group	Agree	Disagree
	R,Educ.	9	4
	R,I.P.	11	1
	R,I.C.	16	2
	R,V.H.S.	11	2
	R,All	47	9
d. Threat of major changes in Educational Structure. (R_1 = 1)	Group	Agree	Disagree
	R,Educ.	9	5
	R,I.P.	10	2
	R,I.C.	11	6
	R,V.H.S.	7	6
	R,All	57	19
e. Will Centralized curriculum databases eliminate the duplication of curriculum development and improve instructional development? (R_1 = 2)	Group	Agree	Disagree
	R,Educ.	8	3
	R,I.P.	3	7
	R,I.C.	13	3
	R,V.H.S.	8	4
	R,All	32	17
f. Credibility of information providers. (R_1 = 2)	Group	Agree	Disagree
	R,Educ.	10	2
	R,I.P.	9	2
	R,I.C.	14	2
	R,V.H.S.	10	2
	R,All	43	8
g. Why should centralized curriculum databases be available only to educators-Why not all citizens? (R_1 = 2)	Group	Agree	Disagree
	R,Educ.	13	1
	R,I.P.	8	2
	R,I.C.	13	2
	R,V.H.S.	10	1
	R,All	44	6
h. Courseware royalties. (R_1 = 2)	Group	Agree	Disagree
	R,Educ.	11	2

	R_1I.P.	8	3
	R_1I.C.	12	3
	R_1V.H.S.	9	3
	R_1All	40	11
i. Security (R_1 = 2)	**Group**	**Agree**	**Disagree**
	R_1Educ.	8	5
	R_1I.P.	7	4
	R_1I.C.	9	7
	R_1V.H.S.	6	6
	R_1All	30	22
j. Stronger relationship between industry and education will develop. (R_1 = 2)	**Group**	**Agree**	**Disagree**
	R_1Educ.	8	6
	R_1I.P.	9	3
	R_1I.C.	10	6
	R_1V.H.S.	12	1
	R_1All	39	16
k. There will be a need for unified procedures, definitions and agreement among provinces. (R_1 = 3)	**Group**	**Agree**	**Disagree**
	R_1Educ.	9	4
	R_1I.P.	8	4
	R_1I.C.	10	6
	R_1V.H.S.	9	3
	R_1All	36	17
l. Problem of normalization and assimilation with centralized curriculum databases. (R_1 = 3)	**Group**	**Agree**	**Disagree**
	R_1Educ.	8	4
	R_1I.P.	9	2
	R_1I.C.	12	4
	R_1V.H.S.	10	3
	R_1All	39	13
m. Development of a feasible network to economically facilitate access to databases. (R_1 = 3)	**Group**	**Agree**	**Disagree**
	R_1Educ.	12	1
	R_1I.P.	9	3
	R_1I.C.	16	2
	R_1V.H.S.	12	1
	R_1All	49	7
n. Educators will need to hire CAI professionals, system specialists, or use consultants on Videotex. (R_1 = 3)	**Group**	**Agree**	**Disagree**
	R_1Educ.	10	4
	R_1I.P.	11	2
	R_1I.C.	13	6
	R_1V.H.S.	10	3

	R_2All	44	15
o. Agreement on common standards for measuring achievement. (R_1 = 4)	**Group**	**Agree**	**Disagree**
	R_2Educ.	10	4
	R_2I.P.	3	9
	R_2I.C.	11	7
	R_2V.H.S.	9	3
	R_2All	33	23
p. Teacher's job security will be threatened. (R_1 = 5)	**Group**	**Agree**	**Disagree**
	R_2Educ.	6	9
	R_2I.P.	2	11
	R_2I.C.	3	14
	R_2V.H.S.	3	10
	R_2All	14	44
q. Political frustrations experienced by parents will motivate them to supplement their children's education with their own choice of courseware. (R_1 = 5)	**Group**	**Agree**	**Disagree**
	R_2Educ.	8	5
	R_2I.P.	5	6
	R_2I.C.	9	7
	R_2V.H.S.	7	4
	R_2All	29	22
r. Language issues-French vs English content. (R_1 = 5)	**Group**	**Agree**	**Disagree**
	R_2Educ.	3	10
	R_2I.P.	6	6
	R_2I.C.	7	7
	R_2V.H.S.	5	7
	R_2All	21	30
s. Federal Government intervention into the provinces rights over education. (R_1 = 5)	**Group**	**Agree**	**Disagree**
	R_2Educ.	4	9
	R_2I.P.	8	4
	R_2I.C.	5	10
	R_2V.H.S.	6	6
	R_2All	23	29
t. Centralized databases will never become a reality. (R_1 = 5)	**Group**	**Agree**	**Disagree**
	R_2Educ.	2	12
	R_2I.P.	6	7
	R_2I.C.	8	9
	R_2V.H.S.	3	10
	R_2All	19	38

u. System must allow teachers to supplement, modify, update the database at the local level. If this cannot be done, frustration will result from teachers not being able to adapt the curriculum to self and student needs. (R_1 = 6)	**Group**	**Agree**	**Disagree**
	R_2Educ.	10	4
	R_2I.P.	8	3
	R_2I.C.	15	2
	R_2V.H.S.	12	1
	R_2All	45	10
v. Transmission costs must be kept low. (R_1 = 6)	**Group**	**Agree**	**Disagree**
	R_2Educ.	14	1
	R_2I.P.	11	1
	R_2I.C.	18	1
	R_2V.H.S.	14	0
	R_2All	57	3
w. Ease of access for those people who have equipment and knowledge to access databases vs those who do not. (R_1 = 6)	**Group**	**Agree**	**Disagree**
	R_2Educ.	11	1
	R_2I.P.	5	5
	R_2I.C.	11	3
	R_2V.H.S.	10	2
	R_2All	37	11
x. Educators must accept videotex as a valid tool for Education. In order to do this, training programs will have to be provided to educators on videotex usage and applications. (R_1 = 6)	**Group**	**Agree**	**Disagree**
	R_2Educ.	13	1
	R_2I.P.	8	4
	R_2I.C.	15	1
	R_2V.H.S.	11	1
	R_2All	47	7
y. All costs must be low. (R_1 = 7)	**Group**	**Agree**	**Disagree**
	R_2Educ.	14	1
	R_2I.P.	11	171
	R_2I.C.	10	4
	R_2V.H.S.	52	7
	R_2All		
z. Provincial Rights over Education will inhibit or prevent Canadians from accessing centralized curriculum databases. This could be a jurisdictional nightmare. (R_1 = 17)	**Group**	**Agree**	**Disagree**
	R_2Educ.	3	9
	R_2I.P.	9	2
	R_2I.C.	7	7

		R_7V.H.S.	7	5
		R_7All	26	23
aa.	Do not Know (R_1 = 17)	**Group**	**Agree**	**Disagree**
		R_7Educ.		
		R_7I.P.		
		R_7I.C.		
		R_7V.H.S.		
		R_7All		
ab.	Who will be controlling the database?-be responsible for the instructional content- decide what is important for all Canadians to know and conduct evaluations. (R_1 = 17)	**Group**	**Agree**	**Disagree**
		R_7Educ.	6	5
		R_7I.P.	7	2
		R_7I.C.	9	2
		R_7V.H.S.	10	1
		R_7All	32	10
ac.	Strong Curriculum databases which have quality courseware and meet the individual needs of students. (R_1 = 24)	**Group**	**Agree**	**Disagree**
		R_7Educ.	12	0
		R_7I.P.	9	1
		R_7I.C.	13	0
		R_7V.H.S.	11	0
		R_7All	45	1
49.	If videotex technology is integrated into Education, how will the role of the administrator change?			
a.	Administrator will require more control over teaching methods. (R_1 = 1)	**Group**	**Agree**	**Disagree**
		R_7Educ.	1	15
		R_7I.P.	2	8
		R_7I.C.	2	13
		R_7V.H.S.	4	8
		R_7All	9	44
b.	An administrator will act as a data base consultant for centralized curriculum. (R_1 = 1)	**Group**	**Agree**	**Disagree**
		R_7Educ.	3	13
		R_7I.P.	4	6
		R_7I.C.	6	8
		R_7V.H.S.	8	4
		R_7All	21	31
c.	Problems will develop for administrators in trying to determine what percentage of material students have mastered, since students can learn on their own using videotex. (R_1 = 1)	**Group**	**Agree**	**Disagree**
		R_7Educ.	3	13
		R_7I.P.	6	5

		R_2I.C.	2	13
		R_2V.H.S.	5	7
		R_2All	16	38
d.	Administrators will become publishers. (R_1 = 1)	**Group**	**Agree**	**Disagree**
		R_2Educ.	1	14
		R_2I.P.	3	7
		R_2I.C.	2	11
		R_2V.H.S.	5	7
		R_2All	11	39
e.	Administrators are too remote from the learning process and may become prolific dinasaurs. (R_1 = 1)	**Group**	**Agree**	**Disagree**
		R_2Educ.	6	10
		R_2I.P.	4	6
		R_2I.C.	7	7
		R_2V.H.S.	6	6
		R_2All	23	29
f.	Management increase in team orientation. (R_1 = 1)	**Group**	**Agree**	**Disagree**
		R_2Educ.	9	2
		R_2I.P.	7	2
		R_2I.C.	8	5
		R_2V.H.S.	8	2
		R_2All	32	11
g.	The means of reporting students progress will change. (R_1 = 1)	**Group**	**Agree**	**Disagree**
		R_2Educ.	14	1
		R_2I.P.	9	1
		R_2I.C.	14	1
		R_2V.H.S.	9	3
		R_2All	46	6
h.	Administrators will become more engaged in policy issues. (R_1 = 1)	**Group**	**Agree**	**Disagree**
		R_2Educ.	9	6
		R_2I.P.	9	2
		R_2I.C.	13	3
		R_2V.H.S.	10	2
		R_2All	41	13
i.	Administrators work load will follow a curve which for a short term more work will be required and then as the computer takes over, less work will required. (R_1 = 1)	**Group**	**Agree**	**Disagree**
		R_2Educ.	4	9
		R_2I.P.	5	5
		R_2I.C.	5	9
		R_2V.H.S.	7	5
		R_2All	21	28

j. School boards and administrators wll have to respond to parent and taxpayer demands for an improved system. (R_1 = 1)

Group	Agree	Disagree
R_2Educ.	13	2
R_2I.P.	7	2
R_2I.C.	14	1
R_2V.H.S.	10	2
R_2All	44	7

k. Administrators will lose some independence and the entire educational community will become more interdependent. (R_1 = 1)

Group	Agree	Disagree
R_2Educ.	10	4
R_2I.P.	7	3
R_2I.C.	8	6
R_2V.H.S.	10	2
R_2All	35	15

l. Administrators will have to address changes in class structure, requirements of new skills for teachers and in plans to accomodate for change. (R_1 = 1)

Group	Agree	Disagree
R_2Educ.	14	0
R_2I.P.	10	1
R_2I.C.	12	1
R_2V.H.S.	12	0
R_2All	48	2

m. Administrators will need to feel more comfortable with conducting enrollment and receiving fees through remote access. ex:CRT. (R_1 = 1)

Group	Agree	Disagree
R_2Educ.	10	4
R_2I.P.	6	2
R_2I.C.	10	3
R_2V.H.S.	10	2
R_2All	36	11

n. If videotex means wider access to a substantial information bank, the role of the administrator at the local level may be affected, by the policies of the system in terms of what materials <u>can</u> or <u>cannot</u>. If videotex can deliver courseware, including interaction with students, the entire basis of local autonomy is threatened. (R_1 = 1)

Group	Agree	Disagree
R_2Educ.	3	8
R_2I.P.	5	4
R_2I.C.	8	5
R_2V.H.S.	7	5
R_2All	23	22

o. Administrators role will become easier. (R_1 = 2)

Group	Agree	Disagree

		R_2Educ.	2	11
		R_2I.P.	2	8
		R_2I.C.	0	14
		R_2V.H.S.	3	9
		R_2All	7	42
p.	Administrators will need to become more sensitive to the changes that teachers will have to make. (R_1 = 2)	**Group**	**Agree**	**Disagree**
		R_2Educ.	13	1
		R_2I.P.	8	2
		R_2I.C.	15	0
		R_2V.H.S.	9	3
		R_2All	45	6
q.	Senior administrators will have to relate better to industry and to government. (R_1 = 2)	**Group**	**Agree**	**Disagree**
		R_2Educ.	14	1
		R_2I.P.	7	3
		R_2I.C.	11	3
		R_2V.H.S.	9	3
		R_2All	41	10
r.	Easy access and speed to information will enable administrators to spend more time in decision making. (R_1 = 3)	**Group**	**Agree**	**Disagree**
		R_2Educ.	11	4
		R_2I.P.	7	3
		R_2I.C.	10	5
		R_2V.H.S.	7	5
		R_2All	35	17
s.	Administrators will become more managerial and move away from control. An administrator will become a coordinator of human and computer resources. (R_1 = 3)	**Group**	**Agree**	**Disagree**
		R_2Educ.	13	1
		R_2I.P.	6	4
		R_2I.C.	11	1
		R_2V.H.S.	11	1
		R_2All	41	7
t.	Administrators will have more global contact with other educators. (R_1 = 3)	**Group**	**Agree**	**Disagree**
		R_2Educ.	13	2
		R_2I.P.	8	2
		R_2I.C.	13	2
		R_2V.H.S.	11	1
		R_2All	45	7
u.	Do not Know (R_1 = 9)	**Group**	**Agree**	**Disagree**
		R_2Educ.		

		R_2I.P.		
		R_2I.C.		
		R_2V.H.S.		
		R_2All		
v.	Administrator's role will become more difficult. (R_1 = 15)	**Group**	**Agree**	**Disagree**
		R_2Educ.	7	6
		R_2I.P.	7	4
		R_2I.C.	11	5
		R_2V.H.S.	5	5
		R_2All	30	20
w.	Administrators will require more technical ability and knowledge about technology in order to make good decisions. (R_1 = 16)	**Group**	**Agree**	**Disagree**
		R_2Educ.	13	1
		R_2I.P.	9	1
		R_2I.C.	13	3
		R_2V.H.S.	9	3
		R_2All	44	8
x.	There will be little change in an administrator's role. (R_1 = 26)	**Group**	**Agree**	**Disagree**
		R_2Educ.		
		R_2I.P.		
		R_2I.C.		
		R_2V.H.S.		
		R_2All		

50. If videotex technology is integrated into Education, how will the role of the student change?

a.	Teacher relations will improve. (R_1 = 1)	**Group**	**Agree**	**Disagree**
		R_2Educ.	9	4
		R_2I.P.	4	6
		R_2I.C.	7	7
		R_2V.H.S.	5	5
		R_2All	25	22
b.	Involvement will be on a personal basis unless videotex is supplemented by audio conferencing capabilities. (R_1 = 1)	**Group**	**Agree**	**Disagree**
		R_2Educ.	7	6
		R_2I.P.	4	5
		R_2I.C.	6	7
		R_2V.H.S.	6	5
		R_2All	23	23
c.	There are many variables; probably videotex will not be separated from microcomputer applications; therefore, videotex may not have a separate impact on a student. In general, electronic resources will increase the levels of direct involvement by the student. (R_1 = 1)	**Group**	**Agree**	**Disagree**
		R_2Educ.	15	0

	R_2I.P.	9	1
	R_2I.C.	15	1
	R_2V.H.S.	10	2
	R_2All	49	4
d. Students will require more career counselling. (R_1 = 1)	**Group**	**Agree**	**Disagree**
	R_2Educ.	8	8
	R_2I.P.	4	6
	R_2I.C.	5	9
	R_2V.H.S.	3	7
	R_2All	20	30
e. There will need to be a closer monitoring of students progress; videotex must offer good computer managed learning. (R_1 = 1)	**Group**	**Agree**	**Disagree**
	R_2Educ.	12	2
	R_2I.P.	7	3
	R_2I.C.	12	1
	R_2V.H.S.	8	3
	R_2All	39	9
f. There will be an increased variability in students performance. (R_1 = 1)	**Group**	**Agree**	**Disagree**
	R_2Educ.	6	8
	R_2I.P.	6	5
	R_2I.C.	5	7
	R_2V.H.S.	7	4
	R_2All	24	24
g. Students may form computer groups outside school. (R_1 = 1)	**Group**	**Agree**	**Disagree**
	R_2Educ.	13	1
	R_2I.P.	9	2
	R_2I.C.	14	1
	R_2V.H.S.	10	1
	R_2All	46	5
h. Students will need to adapt to a machine interaction in their learning. (R_1 = 1)	**Group**	**Agree**	**Disagree**
	R_2Educ.	13	1
	R_2I.P.	7	3
	R_2I.C.	13	2
	R_2V.H.S.	9	2
	R_2All	42	8
i. Rigid schedules and curricula should become more relaxed-particularly for advanced and slower students. (R_1 = 1)	**Group**	**Agree**	**Disagree**
	R_2Educ.	13	1
	R_2I.P.	10	1
	R_2I.C.	11	4
	R_2V.H.S.	9	2

j. Students will have the first universal educational toolkit; they will adopt videotex and computing with the alacrity of a starwar's hero. Students role will change because they will have to combat luddite behavior of an educational bureaucracy resistant to change. (R_1 = 1)	R_2All	43	8
	Group	Agree	Disagree
	R_2Educ.	10	3
	R_2I.P.	7	3
	R_2I.C.	8	4
	R_2V.H.S.	8	3
	R_2All	33	13
k. Students will have access to quality education consistent across country. (R_1 = 2)	Group	Agree	Disagree
	R_2Educ.	12	3
	R_2I.P.	7	4
	R_2I.C.	7	6
	R_2V.H.S.	6	5
	R_2All	32	18
l. A depersonalization of learning will evolve. (R_1 = 2)	Group	Agree	Disagree
	R_2Educ.	4	11
	R_2I.P.	1	8
	R_2I.C.	5	10
	R_2V.H.S.	4	7
	R_2All	14	36
m. Student learning will be of a higher quality if they have access to superior software. (R_1 = 2)	Group	Agree	Disagree
	R_2Educ.	14	1
	R_2I.P.	10	1
	R_2I.C.	15	1
	R_2V.H.S.	11	0
	R_2All	50	3
n. Students will have more consistent learning experiences. (R_1 = 2)	Group	Agree	Disagree
	R_2Educ.	12	3
	R_2I.P.	7	3
	R_2I.C.	11	3
	R_2V.H.S.	6	5
	R_2All	36	14
o. Students will require formal training in logic. (R_1 = 2)	Group	Agree	Disagree
	R_2Educ.	3	13
	R_2I.P.	4	7
	R_2I.C.	5	9
	R_2V.H.S.	4	7
	R_2All	16	36

p.	Students will have difficulty deciding whether the teacher or the database should be most respected. (R_1 = 2)	**Group**	**Agree**	**Disagree**
		R_2Educ.	2	13
		R_2I.P.	4	6
		R_2I.C.	4	10
		R_2V.H.S.	2	9
		R_2All	12	38
q.	Students will have to assimilate more information. (R_1 = 2)	**Group**	**Agree**	**Disagree**
		R_2Educ.	7	8
		R_2I.P.	5	5
		R_2I.C.	9	5
		R_2V.H.S.	6	5
		R_2All	27	23
r.	Students will begin feeling like a guinea pig as they become bored with looking at a screen. (R_1 = 2)	**Group**	**Agree**	**Disagree**
		R_2Educ.	0	15
		R_2I.P.	3	8
		R_2I.C.	3	12
		R_2V.H.S.	2	8
		R_2All	8	43
s.	There will be a decrease in communication skills and students ability to socialize. (R_1 = 3)	**Group**	**Agree**	**Disagree**
		R_2Educ.	4	10
		R_2I.P.	2	7
		R_2I.C.	5	11
		R_2V.H.S.	5	5
		R_2All	16	33
t.	There will be a widening of achievement levels within classes as faster students progress. (R_1 = 3)	**Group**	**Agree**	**Disagree**
		R_2Educ.	10	4
		R_2I.P.	8	2
		R_2I.C.	14	1
		R_2V.H.S.	9	2
		R_2All	41	9
u.	Students will require typing skills. (R_1 = 3)	**Group**	**Agree**	**Disagree**
		R_2Educ.	9	5
		R_2I.P.	9	2
		R_2I.C.	12	3
		R_2V.H.S.	6	5
		R_2All	36	15
v.	There will be less distinction between home and classroom learning. (R_1 = 3)	**Group**	**Agree**	**Disagree**
		R_2Educ.	13	2
		R_2I.P.	9	1

		R_2I.C.	13	2
		R_2V.H.S.	11	0
		R_2All	46	5
w.	Students will have less guidance and supervision. (R_1 = 3)	**Group**	**Agree**	**Disagree**
		R_2Educ.	5	9
		R_2I.P.	5	5
		R_2I.C.	10	4
		R_2V.H.S.	6	5
		R_2All	26	23
x.	Do not know. (R_1 = 4)	**Group**	**Agree**	**Disagree**
		R_2Educ.		
		R_2I.P.		
		R_2I.C.		
		R_2V.H.S.		
		R_2All		
y.	Student will be better prepared for the real world by being exposed to computers and data communications. (R_1 = 4)	**Group**	**Agree**	**Disagree**
		R_2Educ.	12	1
		R_2I.P.	10	1
		R_2I.C.	14	2
		R_2V.H.S.	9	2
		R_2All	45	6
z.	Students will be able to use videotex to study at home. (R_1 = 5)	**Group**	**Agree**	**Disagree**
		R_2Educ.	15	0
		R_2I.P.	10	1
		R_2I.C.	14	0
		R_2V.H.S.	12	0
		R_2All	51	1
aa.	No answer. (R_1 = 8)	**Group**	**Agree**	**Disagree**
		R_2Educ.		
		R_2I.P.		
		R_2I.C.		
		R_2V.H.S.		
		R_2All		
ab.	Students will have more flexibility and greater freedom in their learning. (R_1 = 8)	**Group**	**Agree**	**Disagree**
		R_2Educ.	15	0
		R_2I.P.	9	1
		R_2I.C.	14	0
		R_2V.H.S.	9	2
		R_2All	47	3
ac.	Student research will be made easier by having access to a variety of data banks. (R_1 = 9)	**Group**	**Agree**	**Disagree**

R_2Educ.	13	3
R_2I.P.	9	2
R_2I.C.	16	0
R_2V.H.S.	12	0
R_2All	50	5

ad. There will be no change-videotex is just another tool like textbooks and films. (R_1 = 12)

Group	Agree	Disagree
R_2Educ.	1	13
R_2I.P.	3	8
R_2I.C.	2	12
R_2V.H.S.	4	7
R_2All	10	40

ae. Students will be more active in learning and express a greater desire to learn. (R_1 = 13)

Group	Agree	Disagree
R_2Educ.	11	3
R_2I.P.	9	1
R_2I.C.	11	2
R_2V.H.S.	10	1
R_2All	41	7

af. Students will become more responsible and independent. They will learn to think on their own, instead of relying so much on their teacher. (R_1 =)

Group	Agree	Disagree
R_2Educ.	11	4
R_2I.P.	8	2
R_2I.C.	13	3
R_2V.H.S.	8	3
R_2All	40	12

ag. Student learning will become more self-paced and more individualized. (R_1 = 19)

Group	Agree	Disagree
R_2Educ.	16	0
R_2I.P.	10	0
R_2I.C.	15	1
R_2V.H.S.	10	1
R_2All	51	2

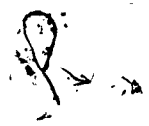
51. If videotex technology is integrated into Education, how will the role of the teacher change?

a. Teacher's instruction will become more general. (R_1 = 1)

Group	Agree	Disagree
R_2Educ.	8	6
R_2I.P.	5	5
R_2I.C.	6	8
R_2V.H.S.	5	6
R_2All	24	25

b. Teachers will experience a decreased work load. (R_1 = 1)

Group	Agree	Disagree
R_2Educ.	2	11



	R_1,I.P.	1	9
	R_1,I.C.	3	12
	R_1,V.H.S.	5	6
	R_1,All	11	38
c. Teachers will need to ensure students respect them. (R_1 = 1)	**Group**	**Agree**	**Disagree**
	R_1,Educ.	4	8
	R_1,I.P.	5	5
	R_1,I.C.	4	9
	R_1,V.H.S.	6	5
	R_1,All	19	27
d. Teachers will adopt videotex and other forms of computing when they see an advantage of these technologies at their personal level. Their role has already changed with other media, but they now change from teachers to students in their own classrooms; as they are learning in a new educational environment. (R_1 = 1)	**Group**	**Agree**	**Disagree**
	R_1,Educ.	11	1
	R_1,I.P.	9	1
	R_1,I.C.	11	2
	R_1,V.H.S.	11	1
	R_1,All	42	5
e. Teacher will require more understanding of his/her target audience's needs. (R_1 = 1)	**Group**	**Agree**	**Disagree**
	R_1,Educ.	11	2
	R_1,I.P.	8	2
	R_1,I.C.	11	4
	R_1,V.H.S.	8	3
	R_1,All	38	11
f. Teacher will place less emphasis on overall class performance. (R_1 = 1)	**Group**	**Agree**	**Disagree**
	R_1,Educ.	9	4
	R_1,I.P.	5	4
	R_1,I.C.	9	5
	R_1,V.H.S.	6	5
	R_1,All	29	18
g. Teachers will be more alert to technology and will be better prepared to relate to the student population who are already accessing computer techonolgies, particularly computer video games. (R_1 = 1)	**Group**	**Agree**	**Disagree**
	R_1,Educ.	14	0
	R_1,I.P.	8	2
	R_1,I.C.	10	3
	R_1,V.H.S.	9	2
	R_1,All	41	7

h.	Teachers will need to be involved in the curriculum design for databases and be involved in the evaluation process. (R_1 = 1)	Group	Agree	Disagree
		R,Educ.	12	1
		R,I.P.	9	1
		R,I.C.	14	1
		R,V.H.S.	9	2
		R,All	44	5
i.	Pressure of student ratios and large classes will decrease. (R_1 = 1)	Group	Agree	Disagree
		R,Educ.	8	5
		R,I.P.	4	5
		R,I.C.	8	6
		R,V.H.S.	7	4
		R,All	27	20
j.	Teachers will not have the ability to vary lessons to meet individual students needs. (R_1 = 1)	Group	Agree	Disagree
		R,Educ.	2	11
		R,I.P.	1	9
		R,I.C.	4	10
		R,V.H.S.	3	7
		R,All	10	37
k.	Teachers will need to decide how videotex can be useful in classroom instruction. (R_1 = 2)	Group	Agree	Disagree
		R,Educ.	13	0
		R,I.P.	10	1
		R,I.C.	14	1
		R,V.H.S.	11	0
		R,All	48	2
l.	Teachers will have greater coordination responsibilities; They will be called upon to orchestrate the combinations of learning resources to form a learning system. (R_1 = 2)	Group	Agree	Disagree
		R,Educ.	13	0
		R,I.P.	8	2
		R,I.C.	15	1
		R,V.H.S.	11	0
		R,All	47	3
m.	Teachers may be transformed into a tele-education technician. (R_1 = 2)	Group	Agree	Disagree
		R,Educ.	3	10
		R,I.P.	0	10
		R,I.C.	2	11
		R,V.H.S.	3	8
		R,All	8	39

n.	Teachers will be threatened that students will outpace their knowledge in computer related technologies; teachers will have less control over students learning. (R_1 = 2)	Group	Agree	Disagree
		R_1Educ.	8	4
		R_1I.P.	5	4
		R_1I.C.	8	6
		R_1V.H.S.	8	3
		R_1All	29	17
o.	Fear will be experienced by the poor teacher and expansive opportunity exists for the creative teacher. (R_1 = 3)	Group	Agree	Disagree
		R_1Educ.	11	1
		R_1I.P.	9	1
		R_1I.C.	14	1
		R_1V.H.S.	8	3
		R_1All	42	6
p.	Teachers will need to have the ability to integrate their lesson plans with the CAI programs available on videotex. (R_1 = 3)	Group	Agree	Disagree
		R_1Educ.	13	1
		R_1I.P.	8	1
		R_1I.C.	14	0
		R_1V.H.S.	10	1
		R_1All	45	3
q.	Teachers will have more flexibility in teaching techniques. (R_1 = 3)	Group	Agree	Disagree
		R_1Educ.	13	0
		R_1I.P.	10	1
		R_1I.C.	14	0
		R_1V.H.S.	12	0
		R_1All	49	1
r.	Teacher will have less interaction with students. (R_1 = 5)	Group	Agree	Disagree
		R_1Educ	3	10
		R_1I.P.	1	9
		R_1I.C.	5	10
		R_1V.H.S.	3	8
		R_1All	12	37
s.	There will be no change in a teacher's role. (R_1 = 5)	Group	Agree	Disagree
		R_1Educ.	2	11
		R_1I.P.	2	9
		R_1I.C.	1	15
		R_1V.H.S.	0	11
		R_1All	5	46
t.	Do not know (R_1 = 5)	Group	Agree	Disagree
		R_1Educ.		
		R_1I.P.		

		R_2I.C.		
		R_2V.H.S.		
		R_2All		
u.	Teacher will become a course designer. (R_1 = 7)	**Group**	**Agree**	**Disagree**
		R_2Educ.	8	4
		R_2I.P.	4	5
		R_2I.C.	11	3
		R_2V.H.S.	8	3
		R_2All	31	15
v.	Teacher will become more client centered than subject centered. (R_1 = 9)	**Group**	**Agree**	**Disagree**
		R_2Educ.	10	2
		R_2I.P.	5	5
		R_2I.C.	11	4
		R_2V.H.S.	5	6
		R_2All	31	17
w.	Videotex will add a new strategy/tool to teaching. (R_1 = 10)	**Group**	**Agree**	**Disagree**
		R_2Educ.	14	0
		R_2I.P.	11	0
		R_2I.C.	17	0
		R_2V.H.S.	11	0
		R_2All	53	0
x.	Teacher will have to learn how to interact with computers. Teacher will require training in understanding technology. (R_1 = 12)	**Group**	**Agree**	**Disagree**
		R_2Educ.	14	0
		R_2I.P.	10	0
		R_2I.C.	15	2
		R_2V.H.S.	8	3
		R_2All	47	5
y.	Teacher will become a medium, a facilitator, a resource consultant to student; instead of a babysitter, lecturer and central disseminator on information. (R_1 = 23)	**Group**	**Agree**	**Disagree**
		R_2Educ.	13	0
		R_2I.P.	8	2
		R_2I.C.	15	1
		R_2V.H.S.	10	1
		R_2All	46	4

52. What problems do you forsee in allowing students across Canada to access common videotex databases?

a. Each student requires individual treatment-if courseware can be made to suit individual needs then common videotex databases will be a positive development; if the courseware cannot meet individual's needs , the usage of videotex databases by students will be negative. (R_1 = 1)

Group	Agree	Disagree
R_1Educ.	9	4
R_1I.P.	7	3
R_1I.C.	8	6
R_1V.H.S.	9	3
R_1All	33	16

b. Increased gap between competent and incompetent students. (R_1 = 1)

Group	Agree	Disagree
R_1Educ.	5	7
R_1I.P.	5	6
R_1I.C	7	8
R_1V.H.S.	8	3
R_1All	25	24

c. Centralized versus Distributed databases (R_1 = 1)

Group	Agree	Disagree
R_1Educ.	8	1
R_1I.P.	8	3
R_1I.C.	5	5
R_1V.H.S.	6	4
R_1All	27	13

d. Common videotex databases made avaliable to students will affect school budgets. (R_1 = 1)

Group	Agree	Disagree
R_1Educ.	10	2
R_1I.P.	7	3
R_1I.C.	12	3
R_1V.H.S.	7	4
R_1All	36	12

e. Videotex will not become viable for at least a decade. CAI has been under development for over 20 years. There is still no major impact. The major difference of a videotex approach is that the cost of terminals is less, cost of information retrieval is lower, and the system is easier to use. Videotex is an extension of CAI not a replacement. (R_1 = 1)

Group	Agree	Disagree
R_1Educ.	8	4
R_1I.P.	7	2
R_1I.C.	12	4
R_1V.H.S.	7	4
R_1All	34	14

f. Introduction of a new innovation and the resistance to change. This might be minimized if the data bases were truly conversational and could be augmented, modified, corrected by the user. (R_1 = 1)

Group	Agree	Disagree
R_2Educ.	10	2
R_2I.P.	8	3
R_2I.C.	10	5
R_2V.H.S.	9	2
R_2All	37	12

g. Students horizons may be broader than their teachers. (R_1 = 1)

Group	Agree	Disagree
R_2Educ.	11	2
R_2I.P.	7	2
R_2I.C.	13	0
R_2V.H.S.	8	3
R_2All	39	7

h. Courseware copyright problems. (R_1 = 1)

Group	Agree	Disagree
R_2Educ.	8	5
R_2I.P.	7	3
R_2I.C.	13	3
R_2V.H.S.	7	4
R_2All	35	15

i. Institutional walls will cease to have any meaning. (R_1 = 1)

Group	Agree	Disagree
R_2Educ.	8	5
R_2I.P.	2	8
R_2I.C.	7	7
R_2V.H.S.	6	5
R_2All	23	25

j. Common videotex databases will enable students to have equal opportunities; there will likely be fewer regional differences among students if equal opportunity is possible. (R_1 = 1)

Group	Agree	Disagree
R_2Educ.	13	1
R_2I.P.	6	4
R_2I.C.	13	0
R_2V.H.S.	8	3
R_2All	40	8

k. Centralized videotex databases will never exist since they deny the cultural base of regional needs. There will, however, be banks of educational software for educational use by provincial or regional systems. For example, an electronic archive to be downloaded for individual tailoring. (R_1 = 1)

Group	Agree	Disagree
R_2Educ.	8	4
R_2I.P.	4	6
R_2I.C.	8	6

		R_1V.H.S.	4	7
		R_1All	24	23
l.	Software must be designed to teach, not to transmit information. (R_1 = 1)	Group	Agree	Disagree
		R_1Educ.	9	4
		R_1I.P.	5	5
		R_1I.C.	13	2
		R_1V.H.S.	7	4
		R_1All	34	15
m.	Conflicts over general versus specific information. (R_1 = 1)	Group	Agree	Disagree
		R_1Educ.	6	5
		R_1I.P.	6	3
		R_1I.C.	8	6
		R_1V.H.S.	5	6
		R_1All	25	20
n.	Providing students with access to videotex databases does not mean they are being educated. (R_1 = 1)	Group	Agree	Disagree
		R_1Educ.	12	1
		R_1I.P.	10	1
		R_1I.C.	16	0
		R_1V.H.S.	10	1
		R_1All	48	3
o.	Students might become the best educated people in the world. (R_1 = 2)	Group	Agree	Disagree
		R_1Educ.	5	5
		R_1I.P.	4	5
		R_1I.C.	5	7
		R_1V.H.S.	5	5
		R_1All	19	22
p.	Videotex databases will offer more benefits to students because they can more easily learn about another country by accesing different databases. (R_1 = 2)	Group	Agree	Disagree
		R_1Educ.	11	1
		R_1I.P.	7	3
		R_1I.C.	11	2
		R_1V.H.S.	7	4
		R_1All	36	10
q.	Unequal allocation of resources to rural and urban areas (R_1 = 2)	Group	Agree	Disagree
		R_1Educ.	9	3
		R_1I.P.	5	4
		R_1I.C.	6	8
		R_1V.H.S.	9	2
		R_1All	29	17

r. Privacy and security problems. (R_1 = 2)

Group	Agree	Disagree
R_2Educ.	7	5
R_2I.P.	4	6
R_2I.C.	6	8
R_2V.H.S.	4	7
R_2All	21	26

s. System Loading-Who will be responsible? (R_1 = 2)

Group	Agree	Disagree
R_2Educ.	9	3
R_2I.P.	7	4
R_2I.C.	12	2
R_2V.H.S.	8	3
R_2All	36	12

t. Provincial jurisdiction over education will not allow this to become a reality. (R_1 = 3)

Group	Agree	Disagree
R_2Educ.	0	10
R_2I.P.	6	5
R_2I.C.	3	9
R_2V.H.S.	1	10
R_2All	10	34

u. Information overload and confusion will develop unless directories are supplied and students can find what they are looking for. (R_1 = 3)

Group	Agree	Disagree
R_2Educ.	10	3
R_2I.P.	8	3
R_2I.C.	11	3
R_2V.H.S.	10	1
R_2All	39	10

v. Do not know. (R_1 = 3)

Group	Agree	Disagree
R_2Educ.		
R_2I.P.		
R_2I.C.		
R_2V.H.S.		
R_2All		

w. The teacher's role will change. They will become facilitators of information, courseware developers and spend less time with individual students. (R_1 = 4)

Group	Agree	Disagree
R_2Educ.	5	7
R_2I.P.	3	6
R_2I.C.	8	5
R_2V.H.S.	5	5
R_2All	21	23

x. Curriculum differences among provinces will create difficulties for establishing common standards for educational materials. (R_1 = 4)

Group	Agree	Disagree

	R_2Educ.	9	3
	R_2I.P.	11	0
	R_2I.C.	13	1
	R_2V.H.S.	10	1
	R_2All Group	43 Agree	5 Disagree
y. Problems will arise in being able to evaluate the quality of information available on common videotex databases. (R_1 = 5)			
	R_2Educ.	10	3
	R_2I.P.	8	2
	R_2I.C.	11	2
	R_2V.H.S.	9	1
	R_2All Group	38 Agree	8 Disagree
z. Input and Output Limitations in accessing common videotex databases. (R_1 = 6)			
	R_2Educ.	6	5
	R_2I.P.	4	6
	R_2I.C.	8	3
	R_2V.H.S.	7	4
	R_2All Group	25 Agree	18 Disagree
aa. Bilingualism and Legal Considerations will pose major problems. (R_1 = 6)			
	R_2Educ.	5	6
	R_2I.P.	8	2
	R_2I.C.	8	5
	R_2V.H.S.	4	7
	R_2All Group	25 Agree	20 Disagree
ab. Homogenization of Canadians-charges that a Big Brother is brainwashing by creating a mind set in students-loss of regional identity if U.S. data bases are used. (R_1 = 10)			
	R_2Educ.	9	2
	R_2I.P.	5	5
	R_2I.C.	10	4
	R_2V.H.S.	5	5
	R_2All Group	29 Agree	10 Disagree
ac. Cost of hardware and software. (R_1 = 21)			
	R_2Educ.	9	3
	R_2I.P.	8	2
	R_2I.C.	14	1
	R_2V.H.S.	7	3
	R_2All Group	38 Agree	9 Disagree
ad. No problem (R_1 = 26)			
	R_2Educ.	0	7
	R_2I.P.	3	4
	R_2I.C.	1	6

	R_1V.H.S.	2	4
	R_2All	6	21

53. What method of rate charges will educators accept for the delivery of information on videotex?

a. Cable operators may bring videotex into areas cheaply by satellite feeds. (R_1 = 1)

Group	Agree	Disagree
R_2Educ.	11	3
R_2I.P.	7	3
R_2I.C.	7	7
R_2V.H.S.	9	2
R_2All	34	15

b. Local institutions will have to budget sums to pay for licenses to access data bases. (R_1 = 1)

Group	Agree	Disagree
R_2Educ.	13	0
R_2I.P.	9	2
R_2I.C.	10	3
R_2V.H.S.	7	4
R_2All	39	9

c. Educators should not tolerate a cost recovery system systems; once costs are recovered by the originator, the videotex information should entirely be in the public domain. (R_1 = 1)

Group	Agree	Disagree
R_2Educ.	4	9
R_2I.P.	2	7
R_2I.C.	1	13
R_2V.H.S.	5	6
R_2All	12	35

d. No idea yet what educators will accept since there is no idea what the costs will be. (R_1 = 1)

Group	Agree	Disagree
R_2Educ.	7	5
R_2I.P.	8	2
R_2I.C.	8	6
R_2V.H.S.	6	5
R_2All	29	18

e. There will be no charge for local access. (R_1 = 1)

Group	Agree	Disagree
R_2Educ.	2	11
R_2I.P.	0	10
R_2I.C.	2	12
R_2V.H.S.	3	7
R_2All	7	40

f. Rate charges will be contigent on the rate structures put in place by the carriers. (R_1 = 1)

Group	Agree	Disagree
R_2Educ.	12	1
R_2I.P.	9	3

		R_1I.C.	10	3
		R_1V.H.S.	6	3
		R_1All	37	10
g.	Delivery of videotex information by wired connections is presently cost prohibitive, but the availability of broadcast distribution and downloading capabilities may address such constraints. (R_1 = 1)	Group	Agree	Disagree
		R_1Educ.	12	1
		R_1I.P.	7	4
		R_1I.C.	5	7
		R_1V.H.S.	10	1
		R_1All	34	13
h.	Educators will accept a rate charge similar to datapac charges. (R_1 = 1)	Group	Agree	Disagree
		R_1Educ.	6	4
		R_1I.P.	6	5
		R_1I.C.	8	5
		R_1V.H.S.	3	6
		R_1All	23	20
i.	Rate charges will be based on 80% for courseware usage and 20% will be based on selling rights for videotex's use. (R_1 = 1)	Group	Agree	Disagree
		R_1Educ.	1	4
		R_1I.P.	2	0
		R_1I.C.	1	9
		R_1V.H.S.	0	10
		R_1All	4	21
j.	Rate charges will be based on whatever taxpayers can afford. (R_1 = 1)	Group	Agree	Disagree
		R_1Educ.	6	4
		R_1I.P.	4	8
		R_1I.C.	4	9
		R_1V.H.S.	5	5
		R_1All	19	26
k.	Rates will vary with different delivery systems. Delivery systems will be selected on rate and traffic considerations. (R_1 = 1)	Group	Agree	Disagree
		R_1Educ.	12	0
		R_1I.P.	9	2
		R_1I.C.	12	1
		R_1V.H.S.	10	43
		R_1All	3	
l.	Rates must only be decided after an indepth analysis of the needs of educators. (R_1 = 1)	Group	Agree	Disagree

	R_1Educ.	6	6
	R_1I.P.	7	4
	R_1I.C.	8	6
	R_1V.H.S.	7	4
	R_1All	28	20
m. Educators will accept a flat rate per minute for long distance. (R_1 = 1)	Group	Agree	Disagree
	R_2Educ.	7	4
	R_2I.P.	4	4
	R_2I.C.	4	9
	R_2V.H.S.	1	8
	R_2All	16	25
n. Student's parents will have to pay a portion of the videotex delivery charges. (R_1 = 2)	Group	Agree	Disagree
	R_2Educ.	7	5
	R_2I.P.	2	8
	R_2I.C.	4	8
	R_2V.H.S.	3	8
	R_2All	16	29
o. Under the current budgeting schemes of educators, they will not accept any rate charges-Look at Plato. (R_1 = 2)	Group	Agree	Disagree
	R_2Educ.	2	9
	R_2I.P.	1	7
	R_2I.C.	1	10
	R_2V.H.S.	5	5
	R_2All	9	31
p. Rate charges will be influenced by the quality and the availability of information. (R_1 = 2)	Group	Agree	Disagree
	R_2Educ.	11	2
	R_2I.P.	10	1
	R_2I.C.	12	2
	R_2V.H.S.	9	1
	R_2All	42	6
q. Educators will not accept any method of rate charge unless they are directly funded by the government. (R_1 = 3)	Group	Agree	Disagree
	R_2Educ.	4	7
	R_2I.P.	7	3
	R_2I.C.	4	9
	R_2V.H.S.	6	4
	R_2All	21	23
r. Very low charges (R_1 = 6)	Group	Agree	Disagree
	R_2Educ.	8	3
	R_2I.P.	6	2
	R_2I.C.	10	2

	R_1,V.H.S.	9	0
	R_1,All	33	7
s. Educators will accept a flat rate adjusted to the number of students and number of terminals. (R_1 = 5)	Group	Agree	Disagree
	R_1,Educ.	9	1
	R_1,I.P.	6	2
	R_1,I.C.	9	6
	R_1,V.H.S.	4	5
	R_1,All	28	14
t. No Answer. (R_1 = 12)	Group	Agree	Disagree
	R_1,Educ.		
	R_1,I.P.		
	R_1,I.C.		
	R_1,V.H.S.		
	R_1,All		
u. Educators will accept a fixed subscription on a monthly, semester or yearly basis. (R_1 = 14)	Group	Agree	Disagree
	R_1,Educ.	9	1
	R_1,I.P.	9	0
	R_1,I.C.	10	3
	R_1,V.H.S.	8	1
	R_1,All	36	5
v. Educators will accept rate charges based on a usage sensitive system . (R_1 = 19)	Group	Agree	Disagree
	R_1,Educ.		
	R_1,I.P.		
	R_1,I.C.		
	R_1,V.H.S.		
	R_1,All		

Thank you for participating in this final questionnaire, your responses are appreciated. If you would like to receive a summary of this final study, please indicate below.

I would like to receive a summary of this study. ___

I would not like to receive a summary of this study. ___

Appendix 3 - Round 1 Letter

InfoTech Consultants
1004 10123-99th Street

April 24, 1984

Ms. C. Gordon
Edmonton, Alberta
Canada

Dear Ms. Gordon;

I am presently enrolled at the University of Alberta where I'm completing a master's program in Educational Administration. For my thesis study, I am examining Videotex, its numerous applications, and potential impact on Education. As part of my study, I'm doing a Delphi study which is directed towards the prediction of future events. The objective of the Delphi technique is obtain an consensus of opinions from a panel of experts without individual encounter; this is achieved by sending each member of the panel a series of questionnaires to complete interspersed with controlled opinion feedback. The Delphi procedures have been designed to reduce the effects of the undesirable aspects of group interaction. The procedure has three distinctive characteristics:

1. anonymity
2. controlled feedback
3. statistical group response

I've selected 180 people from a variety of areas on Videotex to participate in this Delphi study At this point, I'd like to make a formal request to have you volunteer to be a respondent in this Delphi study. If you decide to participate in this study, I have attached the first questionnaire, to this letter. Once you've returned the questionnaire, your answers will be recorded and compared to other respondents. A summary of the results will be mailed to you, in the form of a second questionnaire where you will be asked to agree or disagree with the results.

I hope you decide to participate in this study; your individual responses are of value to my study.

Sincerely,

Cindy M. Gordon

CMG/cz
Encl.

Appendix 4 - Round 2 Letter

InfoTech Consultants
1004 10123-99th Street

April 24, 1984

Ms. C. Gordon
Edmonton, Alberta
Canada

Dear Ms. Gordon;

Approximately three months ago, you took part in the first round of a Delphi study which examined Videotex, and its potential implications in Education. I would like to thank you for your previous participation in my study and request for your continued support in the final questionnaire.

A Delphi study is a systemized collection of expert opinions in order to generate an informed consensus about a series of questions. In the final part of this study, the summarized data for the group (97 respondents) will be displayed beside your response. Given this information , you may wish to alter your previous response.

At the end of the questionnaire, I have provided a place for you to indicate if you would like to receive a summary of the results.

Sincerely,

Cindy M. Gordon

CMG/cz
Encl.

Appendix 5 - Round 2 Reminder Letter

InfoTech Consultants
1004 10123-99th Street

April 24, 1984

Ms. C. Gordon
Edmonton, Alberta
Canada

Dear Ms. Gordon;

Approximately two months ago, I sent out the second round of of a Delphi study which examined Videotex and its potential implications in education. To date, your second questionnaire has not been received, therefore, I'm concerned that the questionnaire has been lost in the mail or been mislaid. In either case, I'm enclosing a second copy of this questionnaire. I would appreciate it if you could complete it at your earliest convenience.

A Delphi study is a systemized collection of expert opinions in order to generate an informed consensus about a series of questions. In the final part of this study, the summarized data for the group (97 respondents) will be displayed beside your response. Given this information, you may wish to alter your previous response.

At the end of the questionnaire, I have provided a place for you to indicate if you would like to receive a summary of the results. I would also like to thank-you for your previous participation in my study and request for your continued support in the final questionnaire.

Sincerely,

Cindy M. Gordon

CMG/cz
Encl.

Appendix 8 - Videotex Field Trials

VIDEOTEX - CANADA

VIDEOTEX SERVICE	SPONSOR	DELIVERY	CHARGES	USERS	TERMINALS	SOFTWARE	HOST	SERVICES
OECA Education Ontario (9/79) *field trial	OECA DOC	Phone	Free	100	Norpak MARK II&III	Telidon	Dec PDP 11/70	*- course listings *- bus schedules *-educ programs
Vista Toronto, Quebec City, Montreal, Ottawa (4/81) *field trial	Bell Canada	Phone	Free	500	Northern Telecom	Telidon	Dec PDP 11/70	70 IP s (5/82) Examples - teleshopping - news reports - consumer reports - educ, course information - theatre guide - restaurant guides - classified ads
Project Mercury St John, N B (4/81) *field trial	NB Tel	Phone	Free	45	Norpak Mark II&III	Telidon	DEC PDP 11/34	- weather - news reports - teleshopping - electronic director, teleph and yellow pages) - classified ads - home protection devices - police - medic alert alarms - videogames
Newfoundland Tourism (6/81)	Newfoundland Telephone	Phone	Free	N/A	Microtel	Telidon	DEC PDP 11/34	information - hotel/motels - historical parks - shopping
Informant Information Bank (7/81) *commercial	Government of Canada	Phone	Free	100	Electrohome	Telidon	DEC PDP 11/70	news *advertising stock reports
Project Ellie Manitoba *field trial (8/81) *commercial (3/83)	Manitoba Tel	Phone Cable	$10 50/mo	150	Electrohome Norpak Decader	Telidon	DEC PDP	- weather - news reports - electronic director, - home protection devices

VIDEOTEX - CANADA (cont')

VIDEOTEX SERVICE	SPONSOR	DELIVERY	CHARGES	USERS	TERMINALS	SOFTWARE	HOST	SERVICES
Grassroots Manitoba (9/81) *commercial	Manitoba Tel	Phone Cable	$50/mo	330	Electrohome Norpak	Telidon	DEC PDP MARK III	- Winnipeg Commodity Exchange - World Weather Watch - Herald Grain Newsletter - Canadian Grain Commission - Livestock Markets - Home Economics - Farm Safety
Teleglobe (1/82) *commercial	Novatex	Phone	Variable	40	Electrohome Norpak	Telidon	DEC PDP 11/70	
Project Ida Manitoba (4/82) *field trial	Manitoba Tel	Phone (coaxial cable)	Free	40	N/A	Telidon	N/A	- parliamentary coverage - news reports * educ information on course - consumer guides
Pathfinder Saskatchewan (6/82-12/83) *field trial	Sask-Tel	Phone	Free	100				150 IP'S * bus schedules - news - weather - classified ads
INET (7/82-7/83) *field trial *national intelligent communications network	Computer Communications Group Inet	Phone		130		Telidon		Informart Vista National Electronic Directory

VIDEOTEX - U.S.A

VIDEOTEX SERVICE	SPONSOR	DELIVERY	CHARGES	USERS	TERMINALS	SOFTWARE	HOST	SERVICES
Dow Jones (1977) *non-commercial	Dow Jones	cable phone	$1 min $ 20 min	44,000	any P C dumb terminal ASCII	Proprietary	IBM 4341 (3)	- domestic & international news - price/quotation on stock market - sports/weather
QUBE Ohio (1977) *commercial	Wainer cable	cable	n/a	n/a	n/a	n/a	n/a	- teleshopping - poll taking - booking - theatre - sports
Source U.S., Canada Australia *commercial	Telecomputing Corporation of America	phone cable (Indax)	$18/hr $5.75/hr $4/hr	15,500	any P C dumb terminal ASCII	Proprietary	Prime 750's (8)	- news - financial data - games - electronic mail - bibliographic info
Professional Farmers of America (P.F.A.) Elanco, Agvision (1981) *commercial	PFA	phone	free with Elanco purchase	2,000	TRS-80 Videotex	Proprietary	TRS-80 Model II	- weather - stock/grain reports
CitiBank New York (6/81) *commercial	Citibank	phone	$10/mo	350	Transaction Technology Inc	Proprietary	DEC 20/20 40/40	home banking
Chase Home Banking (7/81) *commercial	Chase Banking	phone	free	200	Apple II's	Proprietary	Tandem	home banking
First Interstate Bank San Fernanda, CA (10/81) *commercial	First Interstate Bank	phone	free	250	TRS-80 color	Proprietary	DEC PDP 10	home banking
Green Thumb (8 states) (10/81) *commercial	American Farm Bureau	phone	free	400	TRS-80 2-89 Heathkit	Proprietary	TRS-80 Model II	- weather - stock market - grain/livestock reports

VIDEOTEX SERVICE	SPONSOR	DELIVERY	CHARGES	USERS	TERMINALS	SOFTWARE	HOST	SERVICES
Comp-U-Card (11/81) *commercial over Source network nation/wide acess	Comp-U-Card of America Times Mirror	phone	$22.50/hr	50,000	any P.C dumb terminal ASC11	Proprietary	DEC PCP(10s) (2)	- teleshopping * charges can be made to credit cards
Indax San Diego, CA. (1982) *commercial	CoxCable	cable	$5.95/mo	300	Oak Dimension II	Proprietary	Tandem	- teleshopping - home banking - booking - theatre - sports - trade magazines
Times Mirror Mission Vego Palos Verdes, CA (3/82) *commercial	Times/Mirror Informant	phone cable	$34/mo	350	Electrohome Norpak	Telidon	Dec Vax 11/780	(20,000 pg data base) - home banking - community bulletin board - classified ads - electronic mail - booking services - airline - theatre - sports * instructional materials
Venture One New Jersey (1982) *non-commercial	AT&T	phone	N/A	200	N/A	N/A	N/A	- news/sports - calendars of local info - financial banking * adult educ courses - movies - restaurant guides - theatre schedules
Star-Text Fort Worth, Texas (6,82) *commercial	Tandy	phone	$5/mo	500	TRS-80	Proprietary	TRS-Model II's	- home banking - news - entertainment guides
First-Hand Minneapolis (12/82) *commercial	First Bank System Inc	phone	$20-10/mo	285	French Teletel Magnovox	Steria Videopak 300	Honeywell DPS-6	- agribussiness information - home banking - teleshopping - video games - shopping information

VIDEOTEX - U.S.A. (cont')

VIDEOTEX SERVICE	SPONSOR	DELIVERY	CHARGES	USERS	TERMINALS	SOFTWARE	HOST	SERVICES
Urbanet (proposal/82)	Microband Corp Tymshare Inc.	Multi-channel microwave hybrid/ service	N/A	N/A	N/A	N/A	N/A	- teleshopping - home banking - national/local news - entertainment guides
Viewtron Miami (1983) *commercial	AT&T Knight Ridder	phone	$25/mo	5,000	AT&T	Proprietary	N/A	- financial banking - local advertising * educ programs
Keycom/Keytran Chicago (6/83) *commercial	Keycom Electronic Publishing	phone	$25/mo	300-500	Honeywell	PLP-compnts DPS-6s DPS-8s	Honeywell	- home banking - teleshopping

VIDEOTEX - OTHER COUNTRIES

SERVICE	SPONSOR	DELIVERY	CHARGES	USERS	TERMINALS	SOFTWARE	HOST	SERVICES
Prestel U.K. (10/78)	British Telecom	Phone	30/min (up to $1 page)	17,500	Apple Wolftel Zenith Rediffusion	Prestel	GEC 4080 (7)	Examples IP s - Financial Times - London Stock Exchange - ABC Travel Guides - PanAm/British Airway schedules * MacDonald Educationa (children's stories)
Telesystems France (1979)	Telesystems	Phone	N/A	3,000	N/A	N/A	N/A	N/A
Teletel Velizy (4/81)	French PTT	Phone	Variable	2,500	Matro Thompson-CFS	Steria CapSogeti Telesystems	C11 Honeywell Bull Level 6	- banking - retail transactions - electronic mail - newspapers
French PTT Electronic Directory Ille-et-Vilaine (1982)	French PTT	Phone	Free	280,000	Alcatel	Teletel	C11 Honeywell Bull Level 6s	- electronic directory (white/yellow pages)
Bildschirmtext Berlin, Dusseldorf Germany (6/80)	W. German PTT	Phone	$2 90/mo	6,000	Phillips ITT	Prestel	GEC 4082	- consumer transactions - weather - travel guides - directories (phone) - classified ads
Bildschirmtext German (10 cities) 1982	Deutsche Bundespost	Phone Datex-P	N/A	10,000	N/A	CEPT	IBM 4341 (2)	- consumer transactions - electronic directory - weather - news
Viditel Netherland (1981)	Dutch PTT	Phone	N/A	4,000	Phillips Siercers	Prestel	GEC 4042	* public library materials - reference index - magazines - books - encyclopedia info

VIDEOTEX - OTHER COUNTRIES (cont')

SERVICE	SPONSOR	DELIVERY	CHARGES	USERS	TERMINALS	SOFTWARE	HOST	SERVICES
Teleset Tampera, Finland (1931)	Aamulehi Tampere Teleset	Phone	$14/mo (for modem)	80	Salora Finulux misc	Softplan Ab	PDP 11/34	N/A
Teleset Turku, Finland (3/81)	OY Turin Sanomat TS-Teleset	Phone	$14/mo (for modem)	40	Salora Finulux misc	Softplan Ab	DEC PDP 11/34 (2)	N/A
Teleset Waasa, Finland (1,82)	OY Wastel AB Teleset	Phone	$14/mo (for modem)	20	Salora Finulux misc	Softplan Ab	DEC PDP 11/34	N/A
Teleset Lahti, Finland (1,82)	Paijat-Visio OY Teleset	Phone	$14/mo (for modem)	20	Salora Finulux misc	Softplan Ab	DEC PDP 11/44	N/A
Teleset Jyvaskyla, Finland (1/82)	K-S Teletieto-Palveluoy Teleset	Phone	$14/mo (for modem)	20	Salora Finulux	Softplan Ab	DEC VAX 11	N/A
DataVision Stockholm, Sweden (1981)	Swedish PTT	Phone	Free	30	Phillips Luxor Apple	Prestel	Data General Eclipse	N/A
Bildschirmtext Vienna, Austria (3/81)	Austrian PTT	Phone	$15/mo	600	Phillips ITT	Prestel	GEC 4065	N/A
Videotel Italy (2/82)	Italia Telco	Phone	N/A	1,000	N/A	Prestel	GEC 4082 (2)	- Financial banking
Informatics (Venezuala) (1982)	Informatics	N/A	N/A	N/A	N/A	Telidon	N/A	N/A
Videotex Pilot trial (11,82)	Ministry of Communication	Phone	N/A	10,000	N/A	N/A	N/A	financial banking • educ institution course information

VIDEOTEX - OTHER COUNTRIES (cont')

SERVICE	SPONSOR	DELIVERY	CHARGES	USERS	TERMINALS	SOFTWARE	HOST	SERVICES
Telesep Sao Paulo, Brazil (1982)	Brazil Telesep	Phone	Free	2,000	Matra	Steria	C11 Honeywell Bull Level 6s	- TV Globe - publishing houses - libraries - local advertising
Bank of Thessalia (Greece, 1983)	Bank of Thessalia	Phone	N/A	4,500	TRT terminals to be placed in private firms of its customers	Steria	C11- Honeywell Bull	- buying/selling of - currency and loans - electronic mail - paying visa - bank advertising - stock market informtn

Appendix 7 - TV Ontario - A Description of Educational Telidon Applications

Tag the Flag

Level: Elementary School

Purpose: Introduction to various countries. Motivation of the study of these countries or of some theme to which the country can be linked.

Style: An information game. A flag is presented, and the user is invited to guess the country of origin. In this isn't known, the user can follow clues, ending in a map or other indication of the answer. After the answer is revealed, summary information and a means of follow-up are presented.

Utilization: One approach could be presentation to an entire class. For example, a study of Middle east oil could be prefaced with the sequence on Kuwait, which includes a map of the Persian Gulf countries, and information that should stimulate a good deal of discussion about oil pricing and the like.

Another approach: Divide the class into small project groups, and assign each the number of one of the countries. After the game is played by each group, either a study of the country is done and a report prepared or a set of questions is drawn up for consideration by the rest of the class.

Road Sign Round-up

Level: Introductory (Elementary and up)

Purpose: Review of road signs. Safety.

Style: Multiple-choice quiz. When wrong choice is made, something is taught. Right choices are confirmed and new questions presented.

Utilization: The sequence is instructional but has a game-like quality. Since the subject-matter may not be part of the social studies course, it is suggested it be used as a feature, a break from the usual subject-matter, and the results observed. The Telidon project is interested in hearing what results from exposure to the sequence.

Seeing is Believing?

Level: Secondary/Post-Secondary

Purpose: To launch the study of visual perception.

Style: A visual is presented, and the user is invited to interpret. Information is then given, leading to possible follow-up.

Utilization: Presumably, the subject-matter falls outside the bounds of most courses offered at the Secondary level, but it might be interesting to present it in English or Art classes, and see whether it leads to more general inferences. At the post-secondary level, it links to Graphic Arts, Psychology, and Philosophy.

Tour Ontario

Level: Elementary/Secondary and General

Purpose: (a) To provide functional information to tourists and residents of Ontario who wish to make an informed decision about what part of the province to visit; (b) to motivate the study of the geography and history of regions of Ontario.

Style: A map of Ontario presents numbered choices of regions, leading to maps of these regions. Numbers on the regional maps lead to information on tourist attractions at various centres.

Utilization: In the context of the Ontario curriculum, the sequence presents an opportunity to motivate the study of the province using what amounts to an information game. It is conceivable that an individual could 'explore' the entire province in this way, and at the end of the process, demonstrate a knowledge of place-names, and of geographical and historical features that would reinforce in a number of ways the curriculum objectives of a unit of study on Ontario.

Appendix 8 - Teleshopping - Home Shopping and Transactions Services

The concept of shopping at home is anything but new. Non-store retailing now accounts for an estimated 5% or 6% of total retail sales (a figure about twice that provided by U.S. Government figures, but acceptable if the right alchemy of analysis is applied to public domain information).

Current shop at home expenditures are a long way from the sort of pervasive teleshopping behavior that is hoped for by Videotex proponents. However, rising energy costs and shifts in life styles with respect to mobility and leisure time activities could lead to changes that might increase the likelihood that larger segments of the market will be forced to turn to shop-at-home services that are offered through television.

The Yankee Group's listing of projected Videotex services is not totally supported by available research. For example Arbitron, in its New Electronic Media (NEM) Study (May/June, 1980), Arbitron found that consumers were most likely to accept first-run movies (67% indicating high interest) and automatic fire/burglar alarm protection (56% indicating high interest) from among a variety of potential new electronic media-based services that were listed on a detailed questionnaire.

Also, a recent study by Benton & Bowles Inc. (1982:20) found that only 10% of respondents were interested in shopping-at-home via two-way television. B&B found that the

use of two-way TV to monitor or read utility meters and request shopping or news information did strike a responsive chord. However, the overall impression from the study was that viewers will accept only "passive services" or those requiring little effort on the consumer's part.

These findings parallel research undertaken by Cedar Hill Associates for clients in both Canada and the U.S. They suggest that overcoming viewers' longstanding conditioning to passive acceptance of televised material is one of the major obstacles that must be overcome before the proposed Videotex/retrieval services can enjoy wide market penetration.

There is no doubt that a new generation is now growing up which has an affinity for interacting with video games and for exploring the basics of computer usage. However, a considerable time span will elapse before this group becomes a significant component of the consumer market. A major challenge for Videotex proponents is to bridge this gap and escalate demand for Videotex products.

One area where this gap can be closed is in the use of directories for shopping for those specific items that can be conveniently bought from home and can be easily delivered by the seller.

Another report, The Psychographics of Telephone Shopping (Thomas, 1982) was subsidized by AT&T (American Telephone and Telegraph). Telephone shopping, more commonly referred to as teleshopping is an interactive electronic

shopping service which allows home users to request information on products, prices, etc., and to place orders. Thomas' report provides a national profle (1,300 households were studied) of consumers and their attitudes toward shopping over the telephone. This report indicates that Teleshopping will be strongly accepted by consumers and will grow strongly during the next few years, and forecasts that teleshopping will receive a strong impetus in the mid 80's with the widespread introduction of home information services and as retailers send a picture of their merchanidise directly to the home.

Factors that influence consmer acceptance of teleshopping are primarily a result of new socio-economic conditions. Sarotte (1981:72) outlines some of these conditions:

1. Surveys indicate that most women, particularly working women, feel that shopping is no longer something to be done in leisure time.
2. The traditional home keeper/shopper exists in dwindling numbers. In 1969, 20 percent of all women were gainfully employed. In 1970, the figure rose to 43 percent. In 1980, over 65 percent of all women were working. And, there are predictions that virtually every woman will be working in the year 2000.
3. The high cost of gasoline is limiting shopping trips.

With research studies, supporting consumer acceptance and positive economic analysis reports, Videotex offers

exciting challenges for other agencies outside the residential market. For example, Videotex can enable businesses to communicate with one another by sending documents, letters, or contracts cost effectively and efficiently. Businesses can also use Videotex to display arline schedules, stock market reports, commodity markets, and for advertising. [22]

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[22]For further information on market surveys, see Appendix 9 A worldwide Videotex Evaluation by Link Resources Corporation and Appendix 10 - Some Findings of The Yankee Group Report Survey for the Videotex market.

Appendix 9 - Videotex - An Excerpt from Link Resources Corporation

Link Resources conducted a Delphi Study(1982) which addressed the Videotex environment and attempted to identify key issues. Below are listed some of their research findings:

Finding #1

The LINK Videotex survey results among public systems operators worldwide indicate that while total user population continues to grow, the rate of growth is slowing.

While this is consistent with the growth pattern found in other developing technologies (such as microwave ovens), current user volume suggests that previous projected penetration rates are not likely without specific stimulation of the market.

Given the current base of 50,000 Videotex terminals worldwide, it appears we are a long way from reaching penetration figures likely to produce profit. Thus, identification of other streams of revenue, such as Closed-User Groups (CUGs), private systems, and other high-volume user groups may buy time in the short run. Long-run profitability may demand systems operator strategies designed to increase user penetration. Marketing programs allowing rental of terminals (as in the United Kingdom) may be one way to stimulate penetration, by spreading terminal costs over time.

Finding #2

The LINK survey among public systems operators indicate that half all sampled systems have Closed User Groups (CUGs) connected.

More meaningfully, there seem to be differences between the average user per system rates based on whether a system carries CUGs or not. This factor, the presence or lack of CUGs, influences user and editing port configurations as well. Data indicates that more users per system are found on non-CUG systems. The corollary is that CUGs have fewer users and few ports (both user and editing types) than systems without CUGs. This suggests that CUG users utilize systems differently, given the fact that CUGs are based on common applications that often exhibit high-volume usage patterns. Potential system operators may wish to consider different strategies when planning for systems with CUGs versus systems without CUGs.

CUGs represents high-volume access of limited data base storage yielding earlier return on investment. System operators not envisioning CUGs have to stimulate sufficient penetration to provide return on investment from an increased number of users, rather than increased volume of usage. Thus, the tradeoff between immediate return on investment and long-term stimulation of market strategies may be affected by the provision for CUGs on the system.

Finding #3

In the U.K., where the largest terminal base exists, declining terminal prices are having a demonstrated impact on increased sales.

Further, price/feature relationships are developing -- suggesting a full range of evolving Videotex terminal products that may increasingly be developed to respond to specific user needs. Thus, the match between identification of end-user categories and selection of terminal features suggests an increasingly segmented Videotex user environment. The lesson for Videotex participants is that product positioning must be based on clearly identified user segments.

Finding #4

Results of the study concerning Information Providers (IPs) underscores the recent increase in activity by Videotex vendors to provide banking services.

More systems (12) had at least one more banking IP than any other category. Given the recent developments in gateway capabilities, we might expect the predominance of banking services on the systems to accelerate gateway development. Whether this can pull the full range of transactional services identified with gateway access is yet to be determined (currently only six of the systems reporting had department stores as IPs, half as many as banks). The next three highest categories of IPs are all public sector in

nature. This is significant: the need for immediate return on investment from this IP class is not always present, balancing the rest of the IP categories searching for immediate profit.

Finding #5

A major standardization hurdle has been cleared by the Commission of European Posts and Telegraphs (CEPT) which could result in a pan-European protocol.

This will allow current Prestel and Antiope-based terminals to be preserved in the future pan-European Videotex data base and terminal environments. Implications go beyond the mere standardization issue to possible interconnection of Videotex service centers. The effect could make more data available to any single terminal and more terminals available to any given data base.

This could be a particular boon to any English-language Videotex data bases. At least one Scandinavian Videotex operator has recognized the strategic importance of English as the language of business communications and is currently looking for joint associations with U.S. IPS. A lesson for Videotex participants is that if interconnection is carried to its natural conclusion, it is possible to view English-language data bases as increasingly in utility to both users and system operators.

Finding #6

Results of the survey also demonstrate the clear leadership role of Prestel-based software in Videotex public systems worldwide.

Half the systems operators reporting utilize Prestel-based software. Given the fact that half these systems were local systems with small user populations (such as Telset in Finland), and the balance were centralized systems with large numbers of users, the suitability of Prestel in both large and small-system environments is being demonstrated. It is interesting to point out that six systems were Telidon-based -- primarily test systems also with small numbers of users.

Finding #7

In the U.S., AT&T stands as the major player capable of affecting Videotex progress.

The significance of this is underscored by the lack of current AT&T product in the marketplace, through its Presentation Level Protocol (PLP) has attracted endorsements from all other significant U.S. players. Recent regulatory activity has resulted in the potential separation of local telephone companies (Bell Operating Companies or BOCs) from AT&T. It is now possible to visualize a local Videotex environment that does not include a BOC as a potential system operator. Local Videotex connection can now be provided by a full range of possible joint ventures

employing non-BOC carriers and AT&T data base services.

These actions allow a clear opportunity for cable and newspapers to usurp the local BOC's role as system operator, although the larger specter of AT&T still looms as a possible competitor.

Finding #8

Results of the study also indicate the dominance of Digital Equipment Corporation (DEC) in the provision of host computer hardware.

Half of all systems reporting use DEC equipment. It is important to recognize that DEC, as the leading vendor in the minicomputer marketplace worldwide, has traditionally operated in distributed processing environments. This would help to explain DEC's dominance in Videotex, which is a distributed, real-time interactive environment.

Finding #9

The current Videotex environment in Europe and North America seems unaffected to date by the developing domestic Japanese Videotex technology know as CAPTAIN.

It would appear that the irreconcilable differences produced by language stand in the way of shared learning, except for long-term technology transfer. To date, no environment has demonstrated any real interest in the Japanese CAPTAIN system that would lead towards actual adoption.

Appendix 10 - Yankee Report Survey

The Yankee Group, a Cambridge, Massechusetts, "think tank" has projected several major markets for home electronic delivery in its report, The Wired Home and the Electronic Superstructure (Home of the Future Planning Service Report #1, January, 1981). The markets are listed below with current status reports:

1. Directories. Projected as the first mass market data bases, electronic directories are being tested in the Vista Project and will receive much more emphasis in U.S. and Canadian tests planned for 1982 and 1983.
2. Electronic Newspapers. Available since mid-1980 on services like CompuServe. Low usage levels have been reported to data. Electronic readout of newspaper content is an unlikely future money maker; but delivery of stock quotes, classified advertising sports results and other high interest material holds more promise.
3. Electronic Mail. Currently available as "chat" service on home computer time-sharing systems. Right now, this is strictly a hobby market. Continued deterioration of postal service in Canada and the U.S. may gradually shift delivery of certain posted material to electronic means.
4. Home Banking and Financial Management. Telephone bill paying experiments are now in progress at about 250 banking institutions serving 200,000 customers in the U.S. But, electronic funds transfer is still operating

at very low levels. A large potential for telebanking exists and Bank One's Bank 2000 test in Columbus, Ohio, produced encouraging results. The roll-out of such experiments to broader commerical applications appears at least several years away.

5. Teleshopping. Teleshopping, is an interactive electronic shopping service which allows home users to request information on products, prices, etc. and to place orders. There is a high degree of interest in this concept among retailers and among other market factors, like cable television operators, nearly all of whom are projecting two-way teleshopping channels in major new builds. Viewtron undertook some teleshopping applications but results have not been made public. The Vista Project will also provide a real world test of the concept.

6. Telecommuting. A term that refers to replacement of commuting by "work-at-home" labour pools in what have been termed "electronic cottages" by futurists like ALvin Toffler. While such cottage industries seem to be growing, one only needs to recall the slow adoption of "flex time" to guage that telecommuting will not be a widespread phenomenon . . . even by 1990.

7. Access to Computing Power. The Yankee Group predicts that "large markets exist for interactions with computers outside the home." They cite the number of college students who could study computer programming

using inexpensive intelligent terminals and accessing their schools' computers from a home base. This projection calls to mind the possibility that home computer systems may open up vast opportunities for individuals to access learning resources for self-help, professional development, etc. At this point, the market is limited because operations like Control Data's PLATO System must still be accessed at the source of computing power (i.e. CDC's offices throughout North America). But some forecasters believe that educational users may be a significant driving force behind wider adoption of projected home information systems.

8. Other Data Bases. Important public information is seen as a major Videotex market, including wather forecasts, airline and mass transit schedules, road conditions, traffic reports and so forth. These are all components of the data bases of the Viewtron, Vista, and Ida trials.