

ONTARIO'S DISTANCE EDUCATION NETWORK: CONTACT NORTH

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The human, capital, and operational resources required to provide distance education delivery and support services in communities as geographically dispersed as those in Canada are often beyond the resources of any single educational institution. As a response to these high costs, several multi-purpose delivery networks have been established. These include the Alberta Teleconferencing Network, Contact North in Ontario, the Open Learning Agency (OLA) in British Columbia, and the Saskatchewan Communications and Access Network. The establishment of these networks in Canada is documented in a limited literature. Relevant articles often are embedded in more general discussions of educational technology (e.g. Mugridge & Kaufman, 1986). It is apparent, however, that these networks have assumed an important role in the delivery of distance education programs to Canadians. Because of their scope and complexity, they are examples of significant technological and administrative innovation. More important perhaps, is their contribution to improved educational opportunity.

The range of services offered by these delivery networks varies considerably. Some networks develop their own course materials. The Open Learning Agency even has the status of a degree-granting

institution. Others function as carriers only, and are limited to the delivery and distribution of programs from accredited educational institutions. These delivery networks provide some or all of the following services: administrative information to enrolled and prospective learners; learning centres for interactive distance delivery of courses; technical troubleshooting and instruction in use of delivery technologies; and informal student support and referral services.

The purpose of the paper is to describe the organization and operation of one of the more recently established telecommunications networks, the Contact North project in Ontario. The paper has three sections: the first discusses the mandate of Contact North; the second outlines the organizational structure of the network and its capacity to serve a variety of learners with a wide array of courses and programs; and the last section discusses the operation of the network in terms of the broad purposes underlying the original mandate.

Mandate

The mandate for the Contact North project was designed primarily to increase access to formal and informal educational programming to the residents of Northern Ontario. At the same time, the project was expected to establish or enhance the expertise of northern education personnel in the design, development and delivery of distance courses and programs. Finally, the project was to act as a vehicle for technological innovation and the development of educational communication technologies.

These three themes - improved access, the development of technical expertise, and technological innovation - may be seen in the stated objectives of the four year, 20 million dollar pilot project:

- 1) To improve access to formal educational opportunities at the secondary and post-secondary level for residents of Northern Ontario.
- 2) To establish a long-term capacity to improve access to training and other informal educational opportunities.
- 3) To meet the ongoing and emerging educational needs of residents in communities remote from conventional delivery sources by use of new information and communication technologies.
- 4) To meet the special needs of francophone and native peoples in Northern Ontario.

- 5) To create new and expand existing expertise in the design and operation of technologically enhanced distance education programs in Northern Ontario.
- 6) To create models for the alternative delivery of educational services capable of:
 - a) application more broadly throughout Ontario, and
 - b) application to the needs of other jurisdictions, including developing countries.
- 7) To create a "test-bed" to evaluate the effectiveness of various technologies in delivering distance education.

Structure, Governance and Use

Structure

The Contact North project has two components:

- 1) a network of electronic classrooms and support personnel across Northern Ontario, and
- 2) a fund to which postsecondary institutions can apply for the development of distance education programming.

To accommodate the widest variety of delivery modes currently in use by distance education delivery institutions in Ontario, Contact North has configured its network with a heterogeneous collection of educational delivery technologies. A 40 port digital teleconferencing bridge as well as a CoSy computer conferencing system was purchased for each of the two regional coordinating centres. In addition, each of the 32 community access sites is equipped with a teleconferencing convener, a facsimile machine, a video tape playback system and television, an IBM AT and a Unisys ICON microcomputer as well as an audiocassette recorder and telephone answering system. Telewriter II audiographic devices are also used at each site to enhance the teleconferencing capacity of the network.

In the various northern communities, the Contact North learning sites consist of small multi-purpose classrooms which function both as study and information centres and as reception points for teleconferenced program delivery. The access points are located in a variety of sites including college extension offices, public schools, and community training centres. The communities are required to provide a rent free site facility as their contribution to the project. Various community groups and local educational

institutions must then develop collaborative arrangements to share the local Contact North resources.

Governance

The governance of the project (see Figure 1) is complicated, with a number of government departments, delivery institutions and community representatives having input into policy making, governance and operations of the project (see Roberts et al, 1987). The governance structure, designed to ensure ownership and participation by the key stakeholders, has built-in mechanisms that demand collaboration between the major stakeholders in most management areas. On occasion this enforced collaboration has worked at the expense of efficiency; however, this collaboration has also fostered the development of a wide cross-section of institutional, government and community support.

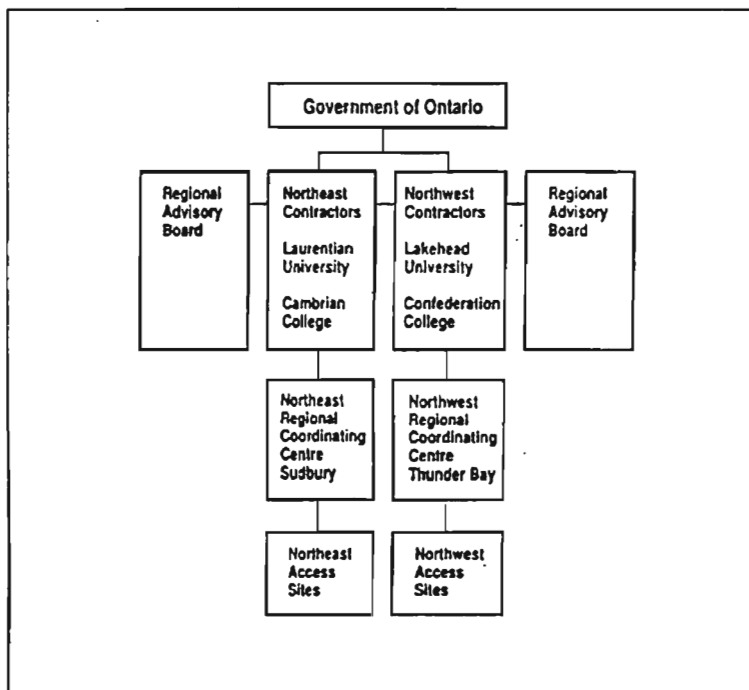


Figure 1

Use

To date the major users of the Contact North network have been northern colleges, universities and secondary schools delivering credit programming (see Figure 2). The network is also used by non-profit community organizations (Boy Scouts, literacy groups) and professional groups (Law Society of Upper Canada, Canadian Association for Distance Education) for meetings and training activities. In addition to students enrolled in the teleconference supported courses listed below, many students use the Contact North site for information services, registration in correspondence courses, test invigilations and as study and work centres.

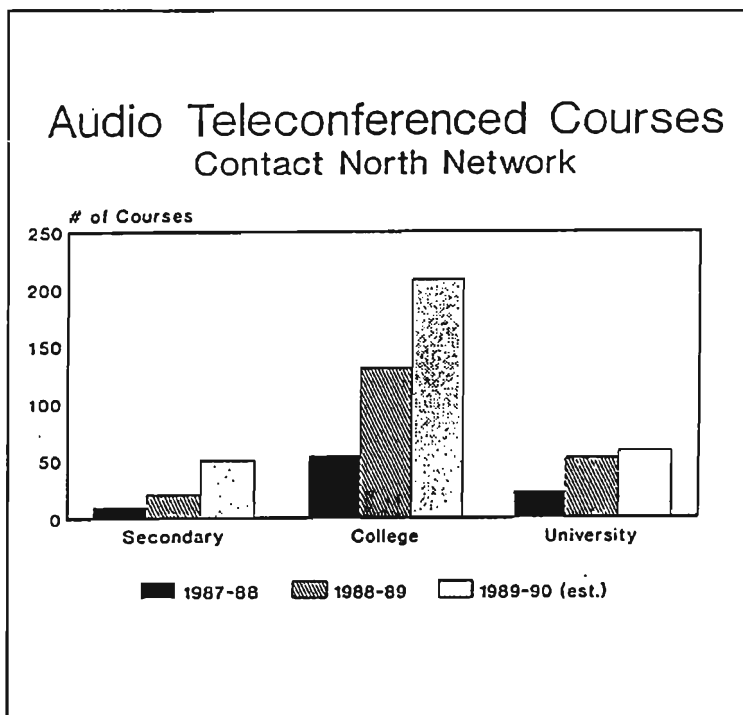


Figure 2

Operating Principles & Practices

Access

The first four objectives of the Contact North mandate related to increasing access to educational programming by the residents of Northern Ontario. The issue of access in distance education is much broader than simply the provision of physical capacity for educational delivery through technologies such as mail boxes or telecommunications networks. Experience within the Contact North project has shown that access necessarily implies a variety of support and promotional services as follows:

Study Centres

The Contact North access sites in small northern communities serve as study and learning centres for distance education learners. Tomlinson (1984) describes the necessity of establishing physical facilities to support distance learners. According to Tomlinson the functions of these study centres are threefold:

- 1) a meeting place for students and tutors
- 2) a place to share the use of equipment
- 3) a place to access library materials.

The Contact North sites do provide meeting facilities and the "warm coffeepot" for students, but due to the very large distances involved, most of the interactions between students and tutors take place via audioteleconference. Equipment such as microcomputers and video machines is used extensively by students. Some of the institutions provide the study centres with kits containing reference materials such as books and tapes. These function as specialized learning libraries. Access by distance education students in Northern Ontario to other library facilities is problematic (Burge et al, 1988). Access to online catalogues, as well as the recent implementation of 24 hour toll free telephone inquiry services at a number of institutions, should help to provide library services to northern learners.

As programming and student numbers increase, a major issue that will face Contact North in the future is the availability of suitable space. The policy stating that rent-free accommodations be provided as a community contribution to the project has strained the capacity of some communities where adequate and secure facilities are in very short supply.

Information Services

It has been our experience that the average resident of Northern Ontario has no or very little idea of the quantity and variety of distance education programming (primarily correspondence mode) that is currently available. The number of educational institutions delivering distance education programming in Canada is large, and is increasing each year. Currently there are 31 universities, 64 community colleges and 49 private sector institutions offering distance education courses in Canada.¹ Calendars and promotional materials from over 50 educational institutions across Canada are displayed in the small reference libraries maintained at the learning centres.

Institutions offering distance delivered courses are encouraged to provide sample packages of study materials for student perusal. The CoSy computer conferencing system is used as a data base and query service by which part time staff and students can make inquiries of other staff and institutional employees relating to available programming.

Advocacy and Referral

Contact North's access sites are staffed by local part time site coordinators. The multi-faceted role, training, and support of these community based support workers is described in detail in Anderson (1989). In brief, front line educational workers such as the site coordinators are confronted with a variety of student issues and problems ranging from lost textbooks to deep personal and community problems. The site coordinators are trained to be good listeners, and to be aware of resources within their local communities and educational institutions that can be focused on these problems. Obviously, they do not provide in-depth student counselling, nor can they speak for the institutions that use the delivery network; yet they can, and do, provide the necessary encouragement and support to help students to help themselves.

Support of Distance Learning Culture

Hughes (1989, p. 117) has documented the importance of a "student learning culture" and contends that "value systems,

¹ University listings from Canadian University Distance Education Directory (1989), community college listings from Community Colleges Association of Canadian Community Colleges (1988) and Information about the private sector from Stale and Sweet (1989).

behavioral norms and customs cannot be effectively conveyed merely through course materials." She goes on to argue that

off-campus students need to establish an identity within a university culture which they can in part achieve through group interaction. In the process... they create their own version of the university culture which may or may not approximate either the academic culture or the on-campus undergraduate culture. Central to this process is the role of the intermediary, a leader who acts as a broker between the university and the students and controls the version of received reality.

The degree to which Contact North staff "control" the received reality of learners is questionable. However, staff members in the local communities do assist learners to maximize their input into their own educational experiences. Examples of this type of "student animation" include initial support for the chartering of the Distance Education Students of Canada (DEC), as well as support for an electronic student newspaper focusing on issues relevant to distance learners.

Promotions

Contact North has attempted to promote distance learning through a variety of promotion strategies including posters, selling of sweatshirts, distribution of promotional placemats in local restaurants, local newspaper and radio ads, publishing of a free promotional "fax directory", regular distribution of nearly 2000 copies of our newsletter, publishing of an annual report, and regular listings of programming delivered via our audioteleconferencing network. In addition, Contact North staff make numerous presentations to community groups, educators, professional and industry associations.

Developing Expertise

The fifth objective of Contact North mandates the project to assume a proactive role in the development of expertise in the design and operation of distance education programs. To achieve this objective, the project has worked closely with northern educational institutions in the areas described below.

Staff Training and Professional Development

A major task for Contact North was to act as a change agent, assisting institutions and faculties to develop distance education programming, infrastructure and delivery strategies. To assist in this task, developmental staff were hired in each regional coordinating centre. These staff included instructional design officers, secondary school liaison officers and liaison officers working with two special target groups - francophone and native learners.

Northern Distance Education Fund

A key ingredient ensuring postsecondary participation in the project was the allocation of 40% (\$8 million) of Contact North project funds to a new Northern Distance Education Fund (NDEF). The fund was used to develop or purchase distance education programming. A total of 22 projects were approved for feasibility studies. Fifteen full degree or certificate programs have been approved for funding under the program. (See Contact North 1988 Annual Report for a listing of these programs.) The absence of a similar fund for secondary program development has resulted in significantly less programming at the secondary level, as shown earlier in Figure 2.

Feedback to Delivery Institutions

Contact North staff are constantly meeting with and talking to individuals and organizations with diverse educational needs, many of which could be met through distance education. Contact North contacts with course developers and deliverers at all levels of formal education allow these needs and requests to be focused on the institution most likely to have produced, or to be capable of producing, the necessary programming. The fact that Contact North does not develop nor deliver programming on its own behalf, but rather serves as a delivery vehicle for other institutions, puts the organization in a unique non-competitive relationship with the individual institutions.

Nelson and Minore (1987) reported that only 27% of the population in Northwestern Ontario felt that there were opportunities for local residents to influence the ways in which courses are delivered. The same study reported that 91% felt students should have input into what courses are delivered. The study concluded that "Northwestern Ontario residents strongly indicate that they want to have a voice in their education options - in deciding the types of courses, the way the courses are delivered, and even

course content." By opening communications channels between institutions and learners, Contact North works to enhance the relevancy of distance education programming to community learners.

Technological Innovation

The final objective of the Contact North project relates to the development of communications technologies to enhance distance education program delivery. In addition to program delivery, the project has made extensive use of communications technologies in its own administration. The use of these communications technologies represents a major component of the operational expenditures of the project.

Table 1 below illustrates the use of these technologies both as delivery and administrative tools.

Communication Technology	Delivery	Administration
Facsimile	turn around of student assignments examinations	time sheets reports
Audio - Conferencing	tutorials, lectures group discussions	staff meetings guest speakers troubleshooting
Computer Conferencing	experimental use as supplement to face to face delivery	resolution of staff issues memos, announcements policy development

Table 1

Delivery Communications

Audioteleconferencing. Boyd (1989, p. 80) has noted that "cost effective distance education minimizes the use of administratively expensive local study centres and personal tutor telecommunications, in order to save money even at the expense of effectiveness." By providing study centres and audioteleconferencing services to delivery institutions at no cost, Contact North can support the development of more personalized programming and increase the quantity and quality of the "dialogue" component of a course. Kaufman (1989) reviews the literature documenting the importance of dialogue as an essential enhancement to distance education based on course packages and concludes that "an extremely flexible communication system must be provided to permit dialogue among learners and teachers." Besides the audiographic enhanced audioteleconferencing, Contact North provides computer conferencing and facsimile services to learners and delivery institutions.

Most of the institutions that make use of the Contact North network use audioteleconferencing regularly to provide opportunity for student/instructor interactions and small group seminars. Although the delivery model varies among Contact North users, the audioteleconference usually serves to enhance an individualized learning package. Thus the student is offered an opportunity to engage in real time interactions with other students as well as the instructor. In addition, the weekly or bi-weekly teleconference serves a pacing function in that students have a weekly deadline and usually assignments that will be discussed during the teleconference. The gathering at the Contact North sites also facilitates group learning and support, as students have an opportunity to share experiences and support each other, as well as meet with the Contact North site coordinators.

Each of the Contact North access sites has been equipped with Telewriter II audiographic devices. The addition of graphics enhances delivery options for the instructor, and generally seems to enhance learners' enjoyment of the teleconferencing session. The additional hardware required for the Telewriter, however, limits the number of simultaneous teleconferences which Contact North can host at a single site and restricts access for students at home or in very small sites that are not equipped with this hardware.

Facsimile. Facsimile machines are used by students for course registration, submission of assignments, and return of examinations. Examinations are normally invigilated at the sites by Contact North site coordinators. The facsimile machines have been upgraded with

expanded memory that allows documents to be sent to multiple sites or sent after hours when line costs are reduced.

Computer Conferencing. Although the potential for computer-mediated communication (CMC) as a delivery medium has been documented (Mason and Kaye, 1989; Harasim, 1987), its use within the Contact North network has been very limited. Problems with student and faculty access to hardware, as well as general unfamiliarity with this medium have been major barriers. Ongoing faculty development sessions, combined with increased availability of hardware and interest in this medium, have resulted in two instructional pilot projects that may be expanded in the future.

Administrative Communications

Contact North itself relies on extensive use of communications technologies to achieve its corporate goals (Anderson and Sweet, 1990). It is a distributed organization, operating over two time zones in a very large geographic area. Although the staff meets face to face only once a year, the organization uses a variety of communications technologies to maintain close working relationships and to support synergetic collaboration.

Audioteleconferencing. Biweekly audioteleconferences are held with site coordinators and the regional centre staff. Agendas usually include announcements, technical and administrative troubleshooting, and often a special guest, usually from one of the delivery institutions using the network.

Facsimile. Facsimile is used for submission of time sheets, activity logs, user statistics and other administrative reports. For some administrative tasks such as payroll submissions, the signed paper copy produced by the facsimile is required. Use of facsimile for routine business memos, such as information updates, has in most cases been replaced by electronic mail and computer conferencing.

Computer Conferencing. The use of the CoSy computer conferencing software has become the main administrative and communication tool within the project. The support of collaborative decision making and group discussions, as well as private and closed group mail functions, provides a close match to the administrative needs of the project. The applications, training, and implementation strategy and results of research on acceptance and utilization of CMC within the project are documented in Anderson and Sweet (1990).

Cost Considerations

The telecommunications costs associated with the delivery and administrative support of a modern distance education delivery network can be significant. Approximately 20% of Contact North's operating budget is spent on provision of telecommunications services. In 1989 Contact North commissioned a study (Kirk, 1989) that investigated alternative communications carriers including satellite and leased line delivery. The study determined that dialup lines provided the most cost-effective and flexible delivery carrier - at least in the immediate future.

Audioteleconferencing. The communications costs associated with audioteleconferencing are time and distance sensitive. In order to reduce these costs, learners are requested to travel as many as 30 miles to reach a delivery centre or access point. Students living beyond 30 miles are allowed to dial into the teleconferences directly from their homes or offices. Nonprofit groups generally book the network in the evenings and on weekends when toll charges are discounted. Changes in federal regulations and the arrival of competitive long distance carriers may result in increased options for sharing of dedicated lines, or reduced costs for large telecommunications users.

Audiographics. The use of sophisticated audiographic devices, including full and slow scan video, requires a telecommunications medium with considerable capacity or bandwidth. Most audiographic systems require at minimum a voice grade telephone line, and many require higher bandwidth satellite, microwave or coaxial cable channels. The Optel Telewriter was chosen for the project because, at the time of purchase, it was the only audiographic device which supported both voice and data transmission on a single, standard dialup telephone connection. Devices which require a separate data line were rejected due to the increased costs associated with double lines.

Line noise on northern telephones presents problems for all telecommunications applications. Relatively slow 1200 BPS modems are used for computer conferencing. Contact North selected the slower 300 BPS Voice-Too Modems for use on the Telewriters. The use of newer modems with built-in error correction protocols could address many of these problems, but such modems were not on the market when Contact North acquired its capital equipment.

Data Communication. Access to packet switching networks for computer based communications offers considerable costs savings

when compared to the use of dialup telephone lines. In Canada, local access to the national data packet system, DATAPAC, is limited to those who live in urban areas with access to local DATAPAC nodes. Users who live outside those urban areas must dial the nearest node, with resulting long distance tolls. The effects of this discrimination against rural users were somewhat mitigated with access to the INET network with its 1-800 calling numbers. Surcharges of \$9.00 per hour for the use of this 1-800 service that were implemented in July, 1989 have again led to a state of discrimination against rural residents with regard to access to low cost information services. This surcharge has resulted in a considerable increase in costs to Contact North (see Figure 3). In an era when access to information services can provide critical economic advantages, this discrimination against rural residents further frustrates efforts to develop rural economic, educational, and social infrastructure.

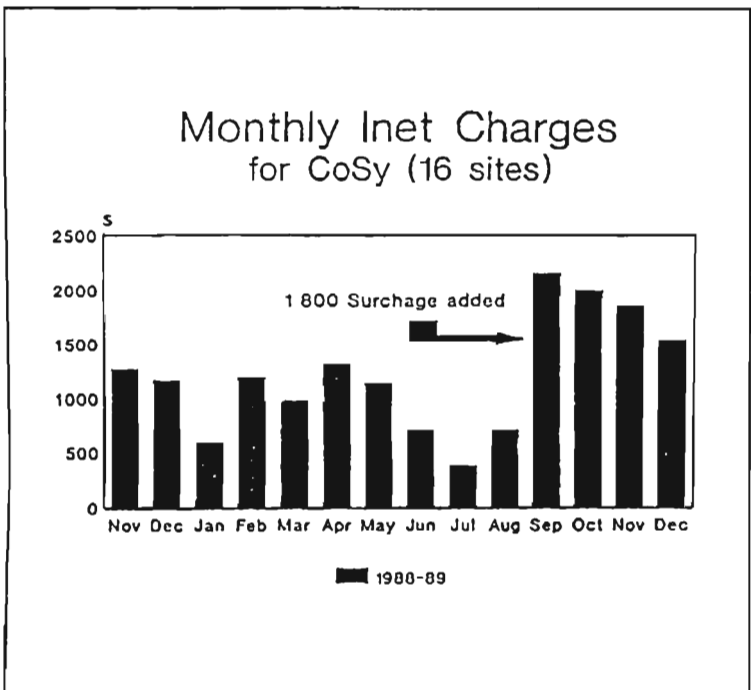


Figure 3

Conclusion

The past decade has seen tremendous growth in the development of programming and institutional capacity to deliver distance educational programming. Distribution networks such as Contact North are finding that the integration of community-based learner support, promotion, feedback and information services is as important as quality courseware in meeting the lifelong educational needs of learners.

The use of communications technologies is crucial to the successful operation of these distribution networks. These technologies are important not only in enhancing delivery by providing mechanisms for interactive learning, but are also crucial for the provision of effective student information and support services. Finally, the use of communications technologies allows organizations such as Contact North, operating over long distances, to maintain effective and cooperative administrative services.

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