PAPER 4

COMMONWEALTH CO-OPERATION IN OPEN LEARNING: CANADA

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EXECUTIVE SUMMARY

Post-secondary education in Canada faces a major challenge: to provide access to a population scattered across a huge geographic area. Other components to this challenge include the bilingual, bi-cultural nature of the country and the low participation rate of Francophones, the disadvantaged Native population, the questions of federal-provincial jurisdiction over education, the autonomy of Canada's universities and the ever-increasing rate of change.

Distance Education addresses these issues as well as individual ones of job and family commitments and the challenge of self-directed learning.

Distance Education in Canada began nearly 100 years ago, with professional upgrading for teachers. This professional upgrading characteristic continued for many groups including accountants. In Canada over 40 post-secondary institutions now offer distance education programmes.

In recent years, provincial governments have undertaken various initiatives in open learning which have included the creation of TVOntario, the Knowledge Network of the West and the Télé-Université.

Canadian post-secondary institutions make use of all common technologies, including print, audio and video-cassettes, teleconferencing, television and radio. Some experimental work is being done in the newer technologies such as video disc, computers and teletext, videotext and Telidon.

Although most programmes are offered at the diploma, certificate or first level degree level, some masters level work is being done.

Most programmes offered are in the Social Sciences and Humanities, because of the problems involved in offering hard sciences with laboratory components.

Costs for course creation range from $5,000 to over $1 million depending upon the media used.

Most Canadian institutions are "dual-mode", offering both in-person and distance education teaching. Notable exceptions include Athabasca University, the Open Learning Institute and the Télé-Université.

Several new initiatives show promise, including a new Francophone national consortium and a distance education project in Northern Ontario.

Areas of need for future development include first degrees for Francophones, continuing professional education, professional degrees and science training for teachers.

Several Canadian institutions have experience in the utilization of each other's materials and some work in co-operative programme development is underway. Canadian institutions are active provincially, regionally, nationally, and internationally in co-operative ventures but most work is in a very early phase. Much remains to be done.

CHAPTER FOUR

PATTERNS OF DEVELOPMENT

Educational Needs, Priorities and Problems

The main challenge facing Canadian post-secondary education communities is that of easing education disadvantages caused by the vast size of the country and the isolation of hundreds of small human settlements. There is an urgency to open access to post-secondary education to people in the hinterland.

Also very high on this list of challenges is the bilingual nature of the Canadian population. Even though the vast majority of Francophones live within the borders of the province of Quebec, over one million more do live scattered throughout the rest of the country. Furthermore, a majority of those live more in the "fringe" areas than in central urban centres. Finally the overall participation rate of the Francophones at the post-secondary level is substantially lower than that of Anglophones.

Another cultural dimension of the Canadian situation is its native peoples, who are both under-educated and demographically scattered on "reserves" spread across the country. The Inuit population, scattered throughout the high arctic, creates a special challenge. Natives are consistently found at the very low end of the socio-economic scale wherever they are located in the country.

Post-secondary education in Canada falls under 10 separate provincial jurisdictions which are very jealously guarded. These 10 become one in their common opposition to any intrusion by the Federal Government in the field of education despite the fact that the latter has full jurisdiction over the Yukon and North West Territories, as well as the fact that much of the money spent by the provinces comes from the federal treasury through transfer payments. This, needless to say, tends to make progress somewhat slower than could be hoped for at times.

Another reality of the Canadian situation is "institutional autonomy" on the part of individual universities. This has had the unfortunate negative consequence of encouraging duplication of efforts rather than the potentially positive one of uncontrolled cooperation. However, recent stringent economic times have severely challenged the traditional way of thinking of the various institutions, and there is the growing evidence of inter-institutional, inter-provincial, and even inter-national cooperation in the recent past.

Finally, Canadians have been affected by the world-wide phenomenon of rapid change, as knowledge is expanding at an ever increasing pace to the point where the life span of some professions is being measured in years instead of decades. Lifelong learning has become a necessity recognised by federal and provincial governments and institutions. Professionals in various fields require periodical upgrading which often can only be provided adequately through distance education. This movement to distance education

to address the problem is definitely a trend in Canada and all indications are that it will increase in the future.

People's life styles have changed dramatically in the last several years. They demand a greater flexibility on the part of post-secondary institutions which are the providers of knowledge. Some people simply cannot fit into their life styles regular attendance at an institution. Their commitments to professional and home lives leave them no choice but to pursue their studies through distance education. Often the unavailability of programmes at suitable times or the on-going commitment of three hours a week for 13 or 26 weeks required by on-campus courses forces them to study through the distance education mode.

Because of the increasingly technological world evolving around us, equality of access to work will be based not only on skills and education, but on skills and education that are continuously updated. That is why we feel that professional continuing education will be a long term trend for this country.

Moreover, we have discovered in Canada over the last several years that a growing number of people who could study in the traditional classroom environment freely choose the distance education mode for reasons ranging from a greater control of "learning times" to the challenge of self-directed learning.

The greatest challenge in Canada is the provision of educational services to a small population of 256 million dispersed over a vast land of 3,851,809 square miles (9,976,186 square km.). Canada's demographic distribution is extremely uneven. More than 80% of the people can be found in a band of land 100 miles wide along the Canada-United States border, a strip which constitutes less than 10% of the land mass of the country. As an example, Ontario, the central province and the most populous one (eight million) has 91% of its population occupying approximately 9% of its surface. Even in this small area more than five million live in a small strip of land on the northern shore of Lake Ontario, a region referred to as the "Golden Horseshoe".

THE DEVELOPMENT OF DISTANCE EDUCATION IN CANADA

History

In Canada distance education at the university level started before the turn of the century, at Queen's University in Kingston, Ontario, with a programme of correspondence courses, which, in conjunction with its summer school, permitted adult students (mainly teachers) to earn a degree. This model was subsequently adopted by many other Canadian universities such as the University of Toronto, the University of Saskatchewan and the University of Ottawa. The latter, because of its bilingual nature provided some programmes to the Francophone population of the country.

The need to provide uniform standards of education across provincial borders by professional organizations led also to the development of print-based distance education programmes. University involvement in these programmes was at first concentrated at Queen's and the University of

Toronto. Within many professional groups and in particular in the various organizations of accountants, print-based course training became a requirement even for university graduates preparing for professional examinations.

The late 1960's and early 1970's saw the birth of a large number of distance education facilities including the Télé-Université du Québec, the Open Learning Institute of British Columbia (OLI) and Athabasca University. In addition, during the same period a variety of provincial communications authorities were created and given access and control over broadcast television networks. In the western part of the country ACCESS-Alberta was created and later in the '70's the Knowledge Network of the West (in British Columbia) (KNOW). In Ontario, the Ontario Educational Communications Authority, better known as TVOntario, was born. In Quebec, the major Francophone area of the country (with more than 80% of Canada's Francophone population) Radio-Quebec was launched with an education mandate.

More recently, in March 1984, the Ministers of Education of British Columbia, Alberta, Saskatchewan, Manitoba, the Northwest Territories, the Yukon and the Federal Ministers of Inter-Governmental Affairs signed a letter of agreement to create a Distance Education Committee to consider collaborative development and acquisition of distance education materials.

The "**Interprovincial and territorial distance education committee**" was created and is currently actively exploring potential projects.

In September of 1984 the British Columbia government created the Open University Consortium which included the three provincial universities, the Knowledge Network of the West and the Open Learning Institute. The Open University Consortium of British Columbia makes it possible for students to combine classroom-based and home-study courses from all member institutions in order to obtain a recognized university degree through the Open Learning Institute.

In the east, the Atlantic Provinces Commission of Higher Education created the new position of Director of the Office of Educational Communications. Work is still going on in that area to put in place an operational network to bring together the various post-secondary institutions in joint effort to make programmes available to the population at large.

Although the community college system has been slower to move into distance delivery, several large and innovative programmes exist. North Island College on Vancouver Island, Seneca College in Toronto and Confederation College in Thunder Bay have developed specialized programmes based largely on their geographic location.

At this time, over 40 Canadian universities and colleges offer distance education programmes, varying from selected courses to full diplomas, certificates and degrees.

Current Trends

Media Use

It would be fair to state that most currently-used technologies, being very familiar to most users, are not threatening, require little or no training for use and are often not even acknowledged to be technologies. These low-technology, high usability media include print, audio and video-cassettes, radio, television and telephone. The more sophisticated technologies involving video-discs and computers are still very much in an experimental mode and, while computers are gaining in acceptance, they are generally seen to be unfamiliar and difficult to use.

Following is a brief description of technologies currently in use in Canadian institutions. Not all are used in each institution, but various institutions have extensive experience in using each of these.

i) Print and Audio Cassettes

Some of the inherent characteristics which have maintained printed materials as the most widely-used resources in distance education are their virtually universal accessibility; the general availability and ease of use by students; and a less obvious but important practical advantage which is found in few of the other permanent media: additions, revisions and up-dates can be readily distributed to students and integrated with existing material while it is used. The advent of word processing, computerised design, typesetting, desk-top publishing and sophisticated high-speed duplicators and ink-jet and laser printers has greatly improved the potential for efficiency in the editorial and production processes which range from extreme simplicity to massive complexity in response to widely varying requirements in course design.

Audio-cassettes have some of the advantages of print media since recording/playback equipment is universally available. They are widely used both for essentially "one-way" and "interactive" communication, and provide an important advantage over most other media in that they are compatible with the automotive and "walkman" life styles. Various techniques for voice-compression to enable accelerated playback have been developed, and are now available in inexpensive portable equipment suited for home use. Production of small quantities of cassettes can be done by copying at high speed from a master to blank cassettes using moderately priced equipment, while efficient duplication of large quantities requires costly equipment and is usually done by commercial firms supplying the entertainment market. The University of Waterloo is Canada's largest user of audio-cassettes.

ii) Teleconferencing

Specialised equipment is a major consideration in successfully linking groups of individuals in separate locations via telephone circuits so that all can participate in common class meetings or tutorial discussions. Adding a visual linkage can be done in various ways, with monitors and cameras arranged in simple or complex arrays depending upon the size of the group and available resources. Various modes of visual data transmission

can be used, with separate audio and visual lines from the bridging points. Obviously until standard telephone equipment embodies the requisite features the possibilities for individuals to participate are somewhat restricted, and for group activities specialized equipment is a necessity. Typically, microphones, camera and speakers, monitors and some associated wiring and connecting equipment must be available to each site, while transmission lines and bridging facilities at a central point are either owned or leased. Private firms as well as telephone companies offer a wide range of equipment and services, at costs which compare in some cases favourably with alternatives involving extensive travel time for students and instructors. The social dynamics of groups involved in this mode of distance education is a complex study in itself. The University of Ottawa has developed expertise in this area and has teleconferenced programmes in French across the country.

iii) **Television and Video-Cassettes**

This is the technology most commonly associated with distance education perhaps because of the influential example of the British Open University, which both legitimised and provided a model for the use of a combination of these media and others in higher education. One element in this pattern is the utilization of publicly-supported facilities for broadcasting the television component of educational programmes, either on regular or cable channels and then encouraging repeated use of the programmes recorded on video-cassettes and the related "courseware" through wide-ranging distribution to other educational institutions, learning resource centres and other broadcasters. Production costs for original programme materials are very high, but are often justified by subsequent volume of use. In terms of overall cost effectiveness, it may be difficult to determine whether the educational value of the television programmes is always worth the additional costs. Wilfrid Laurier University and Huntington College, Laurentian University, produce their own television material, and then must pay for access to private distribution systems. The University of Victoria also produces telecourses for distribution on the Knowledge Network of the West.

The availability of existing materials becomes an important factor in determining the feasibility of using a television component in a multi-media course. This is referred to as a "wrap-around" package. Utilizing these resources and organisation and administration, particularly if original production are undertaken, can be complex, challenging and costly.

Because of the vast expanse of the Canadian geography, it is both impractical and expensive to distribute television signals via cable television which, by definition, will never reach the myriads of small communities scattered throughout the country especially in the North which comprises 80% of the land mass. However mainly through the initiative of local residents small communities, even small hamlets, have developed home-spun cable systems and are linked to the outside world via satellites from which they draw signals through medium priced parabolic "dishes".

Despite its geography, Canada enjoys one of the highest levels of homes linked by cable in the industrialised world. Satellites do offer the technical possibility of reaching upwards of 80% of the population through

a vast network of cable companies ranging from the very large metropolitan distributors to the minute systems operating more or less on the margin of the law in small remote hamlets.

Widespread availability of home video recorders with timers and retail outlets for video-cassettes has recently added another dimension to the established patterns and creates new opportunities for direct distributions of video-cassettes to students, as well as enabling them to copy and store broadcast programmes. Unfortunately, incompatible cassette formats continue to complicate this medium, with both Beta and VHS systems in use.

The most positive note in this area is that the cost of both the playback units and the tapes have continuously dropped over the last several years and appear to be continuing in that trend. This means that in the very near future the video-playback unit will have become a common feature of the average Canadian home.

iv) **Radio**

Next to print, broadcast radio is the most generally accessible technology, and it has been used in education for many decades at all levels from provision of basic pre-literacy education in developing countries to university credit courses. As in the case of television programmes, materials can be distributed for re-use in print and audio cassette formats. While for some applications radio has yielded ground to television, it remains a potent resource, and in one sense it remains a unique mode of communication, since aside from the broadcast form, it also encompasses various interactive modes made possible by the availability of cheap and readily available transmitter receivers for individual use in the "ham" and CB frequencies. Some activity in these "bands" resembles teleconferencing without the switching and bridging components, as people in different parts of a city or continent discuss matters of common concern, regulating their participation by voluntarily-accepted protocols. Radio is not heavily used in Canada, partially because in metropolitan areas there are so many signals within small areas, while in rural areas only the CBC cover the country. In the past "Farm Forum" provided informal educational opportunities for farmers to discuss specific areas of interest. Currently, Open College Ryerson offers programmes by radio and Athabasca University uses radio.

v) **Video-Disc**

As in many other innovative technologies, widespread commercial distribution and hence general availability of reliable, low cost reproduction equipment has been delayed by lack of a standardised format for full size video-discs, although its audio counterpart, the compact disc had quickly overcome these difficulties and is now reasonably well established as an attractive alternative to audio-cassette tapes and conventional records. Educational applications of the video-disc have so far exploited its ease of indexing and quick retrieval of selected content through rapid controlled movement of the laser "pick-up", rather than its impressive potential for permanent information storage and economical mass production. Production costs for the small quantities currently used in educational applications, such as Computer Assisted Learning (CAL) systems,

remain relatively high and are likely to remain so until a mass-market format is standardised. Among the competing formats are a few which may permit low cost duplication of "direct-to-disc" recording. Recently announced technical innovations may threaten the development of this technology.

vi) **Computers**

While the development of programmes for educational purposes remains relatively costly, authoring software now exists to facilitate the process of computer/student interaction which is seen to be essentially an individualised diagnostic remedial process. The proliferation and gradual standardisation of home computers creates wider opportunities for distance education applications. Computer users already have access via telephone lines to a wide range of data banks, information services and electronic "mail", "bulletin boards", etc and such services can readily be developed or adapted to educational uses. Several software manufacturers are seeking educational partners for the development of courseware, but there remains much room for progress in this area in Canada.

vii) **Teletext-Videotext-Telidon**

Various systems have been developed to use telephone transmission lines or small bands of radio-frequencies to transmit text and in some cases simple colour graphics using computers for preparing, storing, coding and decoding text pages or lines of text and displaying them on video monitors or printers. Some of these can be multiplexed, i.e. transmitted simultaneously with other information on a single transmission. Thus they are usually employed in combination with other systems in such applications as teleconferencing and computer-assisted learning. Variations have been proposed for a variety of information retrieval and marketing functions in conjunction with home telephones and broadcast or cable TV, and if these are widely adopted, educational applications will doubtless follow. Only experimental applications to education has so far seen the light in this area in the Canadian post-secondary sector. The Telidon experiment, supported by the Federal Government, appears to have been a failure, as no economical applications could be found. Recently "Grassroots", the Agricultural Telidon Network, was shut down.

Academic Level

Even though the vast majority of courses and programmes which are currently offered by Canadian universities are at the baccalaureate (or first degree) level, some are offered at the Master's Level. There are even advanced short courses in such specialised fields as Pediatrics, or engineering which are not being offered on an international basis by Canadian institutions. (University of Ottawa - Jamaica) (Hydro - Quebec - Columbia).

As far as the colleges of applied arts and technology are concerned they offer both courses of general interest as well as courses leading to a certificate or diploma, in programmes in applied health sciences, gerontology and business, to name only a few.

Type of Education

Although the majority of courses offered by Canadian institutions are in the areas of social sciences and humanities, there are a number of science courses which have been offered by some institutions such as the University of Waterloo.

The main difficulty yet to be overcome in teaching hard science courses at a distance is the whole section of the course related to laboratory work. Computer technology has made possible the creation of what has been called "dry lab conditions", but this has not replaced the hands-on dimension of a science course which is deemed essential by most faculty.

A concentrated, on-site (campus) summer session of laboratory work is seen by some as satisfactory solution to the problem. It is fair to say, however, that many science faculties still hold to the belief that the laboratory session must immediately follow the theoretical exposition of the material.

Home "kits" have managed to provide inroads into satisfying some of these pedagogical concerns but this is certainly an area where many difficulties still exist and where consensus is still far from being achieved.

Colleges have offered a number of technical courses at a distance with remarkable degrees of success. Confederation College has provided leadership in this area. Experimentation is continuously going on in order to adapt more courses to the distance education mode of delivery.

Costs

This is a topic which cannot be easily addressed. The range of projects and their related costs can go from fully equipping a broadcast television station with a transmitter (EST 1.5 million dollars) to producing a print based course which can cost approximately $5,000.

Following are cost samples:

- salary costs for the TV station could run as high as $250,000 a year including a chief engineer. In addition, one would have to add space rental, maintenance, insurance, up-keep, etc, to these figures.

- in Canada today a satellite dish to receive existing signals costs between $3,000 and $5,000.

- a teleconferencing bridge costs approximately $60,000 depending on the options. This "bridge" allows up to 20 centres to be linked concurrently or to have four courses, each offered in five centre concurrently.

- convenors (for teleconferencing sites) cost approximately $1,500 per site (four microphones).

- an electronic blackboard which allows direct transmission of material

from the host site to the participating site costs approximately $20,000, while on-site monitors cost approximately $800/site. This device, which is pressure sensitive, resembles a regular blackboard. The signal is sent over telephone lines in conjunction with the convenor unit.

- telephone line costs are directly related to distance, length of time used and hours of day used (different rates often apply to different parts of 24-hour day).

- video-playback units with monitors can be obtained for $500 to $1,000.

- microcomputers are now available on the Canadian market for as low as $1,000 for small basic units to as high as $8,000 - $10,000 for more sophisticated machinery. A $2,500 to $5,000 range provides a user with a fair choice of models with various capacities.

- the production of a television based course will cost anywhere from $25,000 to $250,000 with an average institutional cost of around $100,000 to $150.000 Some sophisticated productions made by some major institutions have exceeded $1,000,000. This translates into costs of between $20,000 to in excess of $100,000 per hour of programming, depending on the level of sophistication.

Constitutional Patterns of Institutions

It would be fair to state that the prevalent pattern in Canada is that of the "dual-mode" institution, that is a regular campus-based university with a distance education component. In these universities or colleges, the distance education programme is usually housed with the Continuing Education Centre.

There are however some notable exceptions such as:

1. **La Télé-Université of the Université du Québec**

La Télé-Université of the Université du Québec is the "distance education" component of the Université du Québec's multi campus system. It has had, however, some difficulty within its own university context to establish itself as an "equal" amongst the other components.

2. **Athabasca University**

Athabasca University was established in 1970 as an undergraduate degree granting institution to remove barriers that traditionally restricted access to and success in university-level studies. Another aspect of its educational mission was to increase equality of educational opportunities for all adult Canadians, regardless of their geographic locations.

Athabasca University was explicitly established as an institution which has no on-campus students. The home-based learning opportunities provided for individual study are supplemented by a variety of group interaction techniques including teleconferencing to include dispersed learners. Athabasca is Canada's only "open university".

3. The Open Learning Institute

Established by the British Columbia government in 1978 to offer a first degree as well as career, technical and vocational studies, OLI only occasionally uses distance education methods solely. Courses and programmes are offered at various educational levels, utilising various technologies with an emphasis on print.

4. The Knowledge Network (KNOW)

Created in 1980, again in British Columbia, KNOW, serves as an electronic classroom for the province. Its 98 hours a week of broadcast are received by over 250 communities through Canada's Anik C-3 satellite. Not only is its signal beamed in BC but it also reaches the Yukon, the Northwest Territories and Alberta. It is not a teaching institute but a carrier of courses for the Open University Consortium of BC.

5. The Open University Consortium (British Columbia)

While the consortium does not itself grant degrees, it has expanded the range of degree options within the existing university system of BC by modifying the Open Learning Institute's university degree to include extended transfer credit allowance from other institutions.

Over the past summer, all three British Columbia institutions were brought under one umbrella organisation called the **British Columbia Open Learning Authority.**

Registrations

No statistics are available which show the magnitude of distance education in Canada, either by itself or in comparison with in-person teaching. However, some figures are available which may be useful:

- the University of Waterloo registers 16,000 distance education students yearly, in over 300 courses.

- Laurentian University registers over 1,000 students in each of three terms every year, in 50 + courses compared to 1,500 to 2,000 students in person.

- Athabasca University registers 10,335 part-time and 178 full-time students, all at a distance.

- Memorial University of Newfoundland registers 2,100 distance education students and 5,400 in person part-time students.

- The Open Learning Institute registers 17,776 students of which 6,136 are in university programmes.

- Mount St. Vincent University in Halifax registers 296 students via distance education and 1463 in person.

There are no current statistics available in Canada comparing the cost per student in distance delivery as opposed to on-campus. Athabasca has done most of the work on costing and in 1979-80 the estimated cost per course enrolment there was $1,073.

Analysis

All efforts made by Canadian post-secondary institutions to offer programmes by distance education, whatever combination of media are employed, allow accessibility to an ever increasing number of Canadians wanting university and/or college education. Progress is being made, but much more remains to be done to meet the post-secondary educational needs of Canadians. The demographic distribution of the Canadian population is becoming considerably less an inhibiting factor because of advanced technology in the field of telecommunications. However, the current range of programmes available through distance education is still very limited and many needs are not currently being met.

A recent development with regards to the Francophone population augurs well for much progress in this area. On October 20,1986, the basis was laid for the creation of a loosely knit consortium composed of Francophone and bilingual institutions from across the country to share human resources as well as course software. A new non-profit corporation called CANAL with its base in Montreal at the Télé-Université has negotiated an agreement with the Canadian Broadcasting Corporation which will give it access to 10 hours a week (one and a half hours per morning) on the pan-Canadian House of Commons Television Channel. Through the use of this communication mode, any Francophone or bilingual institution will have the opportunity to offer courses to the widely spread French-speaking Canadian population, coast to coast. This is undoubtedly a significant development in the area of meeting the needs of the Canadian Francophone population. Programming on the House of Commons Television Channel is scheduled to start in January of 1987.

Some post-secondary institutions have made limited efforts to offer programmes aimed specifically at the native population. Further development of telecommunication delivery networks will enhance the accessibility of these programmes. However, this is an area where much remains to be done and where many problems exist, mainly resulting from socio-cultural variations.

As referred to in part 1, the economic stringencies under which most if not all Canadian institutions have been forced to operate since the late seventies have tended to weaken the isolation in which they had hitherto developed and have encouraged a greater level of cooperation. Not only do we see very heartening progress within provinces but also across provincial boundaries. We believe this sense of unity will continue as various institutions build a growing number of successful cooperative projects.

Finally as more and more people become familiar with studying at a distance, the whole concept of distance or open learning is gaining both credibility and acceptance. It is becoming more difficult for institutions not to respond positively to demands of people who have completed part or all of their studies via the distance education mode.

Possibilities for the Future

Since distance education viewed from a country wide perspective is still very much in an early stage of development, the needs to be met are much larger than those already met. The task of identifying and listing these needs has barely begun. However, some definite areas of development include professional training and upgrading (nurses, social workers, engineers, accountants, lawyers, medical doctors, agronomists, managers, teachers, etc). In Ontario, the various associations of registered nurses have proposed that the BScN degree should be entry to practice by the year 2000, thereby effectively moving entrance qualifications from the provincial community college sector to the universities. Although the government has yet to approve this move, many nurses have already begun to pressure universities to open access to existing post-basic programmes. As most of these nurses are currently working full-time, their interest is in an open learning format, which will allow them to continue working as they study.

In British Columbia, Alberta and Ontario development is underway for full degree programmes in nursing. In Ontario, Laurentian University recently announced the January 1987 launch of a distance education Post-RN degree, with a projected Northern Ontario registration of 150 nurses. Three hundred (300) are registered. Efforts are underway to work collaboratively with Lakehead University on the programme. At the same time, the University of Ottawa has been offering certain courses for nurses by teleconferencing.

In a similar area, increasing pressure is developing in the social work profession for constant upgrading, both in formal credentials (mainly masters level) and informal. Again, these professionals are unable to leave their jobs despite their awareness of their need for upgrading.

In Canada, there is growing concern about the quality of science education being provided to primary and secondary students. A national movement to increase scientific literacy has not yet begun but we see this area as increasingly important. Again, distance delivery would be the most appropriate to allow access and ensure quality control.

In other health care fields, networks are growing by providing professional upgrading to physicians, applied health practitioner, ambulance workers and paramedics. Telemedicine for Ontario began several years ago as an initiative of the Ontario Ministry of Health and the Royal College of Physicians and Surgeons. Linked to the province's five university medical schools, it provides a teleconference network for professional development. A similar organisation was also established in the North. Teleconferencing allows experts from around the world to participate and share their expertise. International development work has been underway but collaboration on a more comprehensive and systematic basis would allow for large expansion.

Within the community colleges, development potential is seen for computer training programmes covering the spectrum from literacy to software development. As with the universities, the colleges are seeking closer linkages to industry, particularly in high technology areas. Distance

learning packages would enhance these connections by encouraging collaborative development.

For Canada, basic Baccalaureate programmes for the Francophone population have yet to be fully developed and made available in most areas of the country. The recent development referred to in the Analysis (2 (C)) give hope that an early resolution of that problem will be possible. The newly formed consortium offers the best hope of success in that area. This market also displays a great need for basic literacy programmes.

The attention given so far to the native population has been grossly inadequate and this issue as a whole has yet to be faced in a systematic manner. Some examples of potential programme development here include a native social work undergraduate degree and management and economic development for Natives.

However, several ventures augur well for the future:

- the Francophone Consortium - Since it is only in the early stages of formation, it is too early to describe it. The only thing that is certain is the interest manifested by senior administrators of those institutions to cooperate with each other and to set out to do so immediately.

- the Trans-Canada Television Network of the House of Commons TV Channel which has been made available to educational institutions offers for the first time in the history of education in this county a vehicle with the potential to reach people from one end of the country to the other.

- the recent developments in British Columbia could offer the rest of the country a model for inter-institutional collaboration and could eventually be linked via satellites or telephone lines with other provincial networks that could emerge.

- the recently created Distance Education Research Institute at Athabasca University should provide the rest of the country with a growing base of scientifically assessed educational experiments and practices which should favour the development of more suitable and adaptable means of distance education.

- the Northern Ontario Distance Education Network which is in the process of being launched with a commitment by the government of that province to fund the project at the rate of five million dollars a year for four years should have significant impact on the very scattered population of that area of the country and should provide a unique test-bed for new technologies.

- the growing network of hospitals linked with University Teaching Hospitals in the south will provide an increasing set of possibilities for the upgrading of medical practitioners throughout that part of the country. Experiments have been conducted with areas as far as British Columbia with the Telemedicine for Ontario Project with apparently satisfying results.

- CADE's (Canadian Association for Distance Education) creation of a research and development committee for the training of practitioners should have a very positive effect on the attitudes of an increasing number of academics who, to date, have been reluctant to engage in distance education projects.

- in Ontario, five universities are jointly cooperating with TVOntario for the development of a telecourse on the Sociology of the Family. An introduction to Sociology has already been produced. The success of these projects should lead to further progress of such inter-institutional endeavours.

CO-OPERATION IN DISTANCE/OPEN EDUCATION IN CANADA

Experience of Co-operation

There is general agreement amongst people involved that there is a free flow of information with regard to all aspects of distance education in Canada. The willingness to share experience on an informal basis is a feature of the Canadian scene.

Also formal organisations such as CADE (The Canadian Association for Distance Education) provide structured forums for the exchange of ideas, analysis of projects and general education about technologies used in distance education.

The Canadian Association of University Continuing Education has been for years a leader in providing opportunities to share ideas and experiences. In fact, this organisation gave birth to CADE and still produces the country's only inventory of university distance education programmes.

Regional organisations like the Ontario Council for University Continuing Education have not only acted as a forum for the exchange of ideas but have often taken active steps in promoting distance education. Many of its members are sitting on advisory committees to TVOntario as well as participating actively in the standing committee on distance education of the Council of Ontario Universities, created in 1983.

A Western group, which combines the Universities of British Columbia, Alberta, Saskatchewan and Manitoba, also plays a similar role. As well, the Atlantic Provinces Association for Continuing University Education performs a similar task in the Eastern part of the country.

For over ten years some Canadian universities have used course software developed by sister institutions as part of their own programme offerings:

- Laurentian University in Sudbury leased courses from the Télé-Université in Quebec, Athabasca University in Alberta and Wilfrid Laurier University in Ontario.

- courses developed by Laurentian University have been used by the University of Ottawa, Wilfrid Laurier, and Athabasca.

- Cambrian and Northern Colleges utilise distance education courses for the training of ambulance para-professionals developed by Confederation College.

There is a much greater willingness amongst the administrators of distance education programmes of Canadian universities to exchange material than there is amongst faculties of universities to do so. The major problem to date has been reluctance to accept some else's course because the "slant" or emphasis does not correspond exactly with one's own. This type of academic chauvinism has been deemed to be the greatest single negative factor in the slow progress towards greater rationalisation of academic resources.

Joint productions of courses with four or five universities working with a broadcasting institution like TVOntario seem very promising for the future in alleviating the "not made here" syndrome.

In the community colleges, some exchange of materials has occurred. Confederation College in Thunder Bay, Ontario, has produced over 40 individual distance education courses which it allows other colleges to use, at cost.

To sum up, there has been some exchange of material but not as much as there should be.

On a formal basis there is very little evidence of co-operative training activities in Canada. Individual instances such as the University of Ottawa's open door policy to anyone who wants to spend a day or two studying their network of teleconferencing and electronic blackboard are more the exception than the rule.

Most of the "training" happens in the various forums described in part (a) of this section "Information exchange". Both CADE and CAUCE provide various professional development opportunities to their members and the Northern Initiative in Ontario includes substantial professional development and research programmes.

Our analysis has shown that very little, if any, formal personnel exchange programme exist in this country.

Course and programme co-production have not occurred regularly. However, there have been a number of such experiences in the past and at least two courses in Sociology are currently being developed in Ontario with five universities and TVOntario working as a production consortium. Currently, Laurentian University and Lakehead University are co-operatively creating courses for a Post-RN BScN degree to be launched in January, 1987 and all programmes developed as part of the Northern Ontario Initiative must be done collaboratively.

Examples of Co-operation

Some recent examples of Canadian universities co-operating outside Canada include:

- the University of Ottawa Medical School Children's Hospital has established audio-links combined with slow-scan visual capabilities with the Bustamente Children's Hospital in Jamaica. This allows sharing of most recent discoveries and techniques of treating children as well as general communication between the pediatric staffs of both institutions.

- Jamaica in turn is part of the distance education network of the University of West Indies which links a number of countries such as Trinidad and Tobago.

- through the facilitating endeavours of CANAL the engineers of Hydro-Quebec will be offering upgrading technical courses to the engineers of the Hydro Authority of Colombia, South America. This will be accomplished via satellite with interactive video and audio links. In addition, the courses will be simultaneously translated from the Montreal end of the link.

- a third example of a slightly different type is the University of Ottawa's project to send the director of their distance education programme to Uganda to set up a pilot project of teleconferencing through a 20-site network.

- experimental projects, again through the initiative of CANAL, have been conducted linking Montreal, Shanghi and Peking via satellites. The two 2-hour long audio and visual interactive links both proved to be very successful. Again, through CANAL an agreement was signed on October 22, 1986, in Miami between the Télé-Université du Québec, Global Development Network and Miami Children's Hospital. These will be linked with Costa Rica, Argentina, parts of the US and Canada. It concerns a project to develop a communications model of programming exchanges on organisation and production of medical, agricultural (nutrition and food) and public administration.

- Laurentian University in Sudbury is currently exploring using the MBA material developed and used by Deakin University, in Australia.

Some examples of co-operation across regions of the country can be seen in the University of Ottawa's offering of a course in a nursing programme for students registered at the Université de Moncton in New Brunswick but who were living in scattered communities of that province. It permitted those students to complete their degree in Nursing. Another example would be the course in the use of computers offered by the University of Ottawa to students (mainly teachers) in both New Brunswick and Nova Scotia.

Again from the University of Ottawa, courses were offered to students registered at the Faculté St. Jean in Edmonton, Alberta but living in some 16 communities in that province.

The new network linking Francophone institutions across the country will in all likelihood develop into a multi-lateral complex of inter co-operation where courses originating anywhere in the network will be made available to the students anywhere in the country. In short, it will give access to

French Canadians to the whole range of courses and programmes which will emanate from Canadian Francophone and bilingual institutions.

The consensus that seems to emerge from those involved in co-operative endeavours is that wherever and whenever co-operation did take place the level of satisfaction was fair to high. However, there is also a consensus that not enough is taking place and that many institutional barriers must be brought down.

"The time is here" mood seems to summarise best the attitude gleaned from across the country. There is a very positive attitude toward new co-operation initiatives which characterises those involved in distance education, even though most expressed varying degrees of frustration at the slow rate of progress.

The emerging Francophone consortium offers the most exciting prospect for rapid expansion in an area which had up to now been badly neglected.

Finally, the bold experiments of the University of Ottawa and those orchestrated by CANAL on the international scene would seem to indicate that the possibilities for new initiatives are just beginning to be explored and the only limits to be set are those of the imagination and creativity of the Canadian post-secondary institutions.