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ABSTRACT

This report examines access to lifelong learning opportunities on Canada's information highway. The report begins with a glossary and a learner-centered model in which the information highway links learners with learning opportunities provided through educational institutions, community organizations, government, and business and industry. Presented next is an overview of the economic, technological, social, and education and training-related factors that have led to recognition in Canada and worldwide of the leading role that lifelong learning must play in preparing individuals for the competitive, information-based global economy of the 21st century. The following three challenges facing Canada as it develops a lifelong learning system are discussed: (1) economic and social restructuring; (2) situational, dispositional, and institutional barriers to lifelong learning; and (3) learning models in response to new learning technologies. Trends and best practices in lifelong learning, the formal education sector, and nonformal education sector are reviewed. Next is a "made in Canada" response to the challenges. Included in the response are a conceptual framework and goals for lifelong learning in Canada. Appended are the following: barriers to learning identified in a 1982 survey; goal summary of a lifelong learning framework; overview of lifelong learning in the formal and nonformal sectors; and selected bibliography. Contains 39 references.

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# LIFELONG LEARNING ON THE KNOWLEDGE HIGHWAY

## ACCESS TO LIFELONG LEARNING OPPORTUNITIES ON CANADA'S INFORMATION HIGHWAY

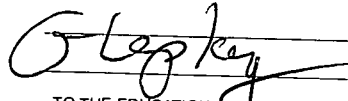
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## HIGHLIGHTS

Canadians must prepare for successful participation in the emerging competitive, knowledge-based global economy of the 21st century through creative and affordable access to lifelong learning opportunities on the information highway.

Leading OECD (Organization for Economic Cooperation and Development) nations are making major financial commitments to create readily accessible information highways and associated lifelong learning systems.

A major challenge will be to transform a significant portion of the information highway into a knowledge highway in which data is informed and organized by human intelligence in order to give meaning and enable learning.

Learners, regardless of their geographic location, socio-economic status, gender, racial origin or disabling condition, are empowered by new technologies to gain increased access to learning systems and support services.

Lifelong learning is enabled by the infusion of telecommunications and information technologies into the learning system so that learning may occur at times, in places and in ways that meet learners needs throughout their lives.

Access to the information highway will enable more cost-effective, productive and relevant education and training through increased opportunities for:

- home-based learning;
- training opportunities closer to home;
- training in the work place;
- customized training services to industry;
- just-in-time learning; and,
- school-to-college or to-work linkage.

World-wide telecommunication systems and information technologies will, in the near

- future, enhance access through global:
- recognition and portability of vocational and academic credentials;
- data banks for records of student achievement and program information;
- advisory and counselling services; and,
- distance learning systems using world-class resources.

## PREFACE

Powerful economic and technological forces are at work throughout the world. Leading ECD ations have responded in remarkably similar ways. They are restructuring their industries, including education and training, and their workplace organization. They are all laying the foundations for information highways that are part of an international network. All are applying telecommunications and information technologies to ensure a more flexible, responsive and productive working and learning force - in short, a world class work force prepared for the emerging knowledge-based economy of the 21st century.

In this competitive environment there are a number of recently initiated federal government responses. For example, an Advisory Council on the Information Highway was announced by the Hon. John Manley, Industry Minister, on March 16, 1994. The three policy objectives of the Council are to:

- create jobs through innovation and investment in Canada;
- reinforce Canadian sovereignty and cultural identity; and,
- ensure universal access to the information highway at reasonable cost.

Five Working Groups, including one on Learning and Training, will provide input to the Advisory Council. The Working Group on Learning and Training will contribute information and advice to the Advisory Council on measures to ensure that the information highway is developed and used to meet the comprehensive learning and training needs of all Canadians. In sum, the goal is to establish lifelong learning as a defining feature of Canadian society. Hence the most pertinent Working Group principle is that lifelong learning shall serve as a key design element of the information highway. Lifelong learning is also central to the reform of the Canadian social security system as outlined in a recently released discussion paper, "Improving Social Security in Canada" Yet, the term "lifelong learning" has become a popular and ill-defined concept. To some it means lifelong education, to others continuing professional education, and to yet others all learning which occurs outside of the formal education and training systems. The definition adopted in this report is based on the principles and concepts initially enunciated by Unesco some twenty years ago, and refined not only by that body, but also by the OECD in the intervening years. Indeed, a lifelong learning conceptual framework based on the work of these organizations is proposed in Part Three as a key design element of both the Working Group and the Advisory Council.

The issue of this background paper - access to lifelong learning opportunities through the learning highway - has been identified as a crucial concern in the construction of the highway. The European Commission has, in regard to the global information society debate of the G -7, raised the spectre of a two-tiered society based on diverse and inequitable citizen's access to enabling technologies. The OECD has also warned of

increased polarization of the educated and undereducated, based largely on social class background. Clearly, unless equitable access to the information technologies is a reality, a techno-apartheid society is inevitable. This nightmare scenario is one in which those in greatest need and, ironically, those who could benefit most greatly- the disabled, the economically and socially disadvantaged - will live in even deeper shadows of our society.

The issue of access to lifelong learning opportunities is framed within the context of international and national access. At both levels major drivers of change are found in economic/technological, social, and education and training domains. The powerful forces of globalization, which are merging with rapidly changing means of telecommunications and information technology, are described, as are major initiatives of leading OECD nations regarding their information highways. Equally impressive training reform measures are identified in many nations as they prepare for the global economy of the 21<sup>st</sup> century.

The impact of economic and technological changes on education and training needs in Canada is described. The responses of government and private sectors, as they restructure to meet these, as well as major social changes, are discussed.

The goal of access for all to the learning opportunities on the information highway is identified. The developmental stage of learners provides the framework for assessing learning opportunities throughout one's lifespan. Many of the current barriers to participation are identified as well as the new techno-economic paradigm we face - a paradigm which demands an equally profound and imaginative response.

Major trends and best practice in Canada and abroad regarding the application of telecommunications and information technology to the provision of learning programs and services are identified. Leading-edge practice in projects involving lifelong learning systems, and formal and non-formal sectors are highlighted.

Finally, a "Made in Canada" response to the challenge of increasing access to lifelong learning opportunities is proposed. Based on lifelong learning as an organising principle and social goal, a lifelong learning conceptual framework is described in which learning opportunities are provided throughout one's lifespan. The information highway is the means which will enable a new paradigm of learning to become a reality. It is the communication web which enables a truly learner-centred, lifelong learning society to emerge (see model on page iv).

Unless and until the information highway becomes a knowledge highway in which data is informed and organized by human intelligence in order to give meaning and enable learning, the issue of access is neither crucial nor urgent. However, as the information highway evolves into a knowledge highway, the issue of access to learning opportunities is critical in ensuring that learning continues to propel our economy, enrich our lives, and build a nation of intelligent Canadians.

### **Learning Organisation**

A metaphor for any human collectivity, whether in the formal or non-formal sector, in which the lifelong learning of its members is systematically appreciated, encouraged, invested in, and used as a central corporate strategy.



## GLOSSARY

### **Lifelong Learning**

A conceptual framework and organizing principle for imagining, planning and implementing reform of the existing education and training systems to enable:

- purposeful and systematic learning opportunities for individuals throughout their lives;
- individuals to learn wherever, whenever, and in modes appropriate to their learning styles and needs; and,
- use of the total education and training resources (both formal and non-formal sectors) of the nation.

It is also a social goal which envisages a learning society in which the pervasive culture values, facilitates and celebrates learning in all forms.

### **Formal and Non-formal Sectors**

In Canada the formal sector is comprised of the public sector, systematic providers of education and training, and related credentials, while the non-formal sector is the private or voluntary sector, systematic providers of education and training

### **Informal Learning**

Learning which individuals engage in outside of formal and non-formal settings. The learning can, on occasion, be serendipitous, but is often self-initiated and self-directed or acquired through the mass media or natural social settings.

### **Information Highway**

A metaphor for the myriad opportunities for human interaction enabled in the capture, storage, transmission and reproduction of information through use of telecommunications and information technologies for purposes such as learning and training, commerce and customer services, cultural and community activities, health care and government services, entertainment and home shopping.

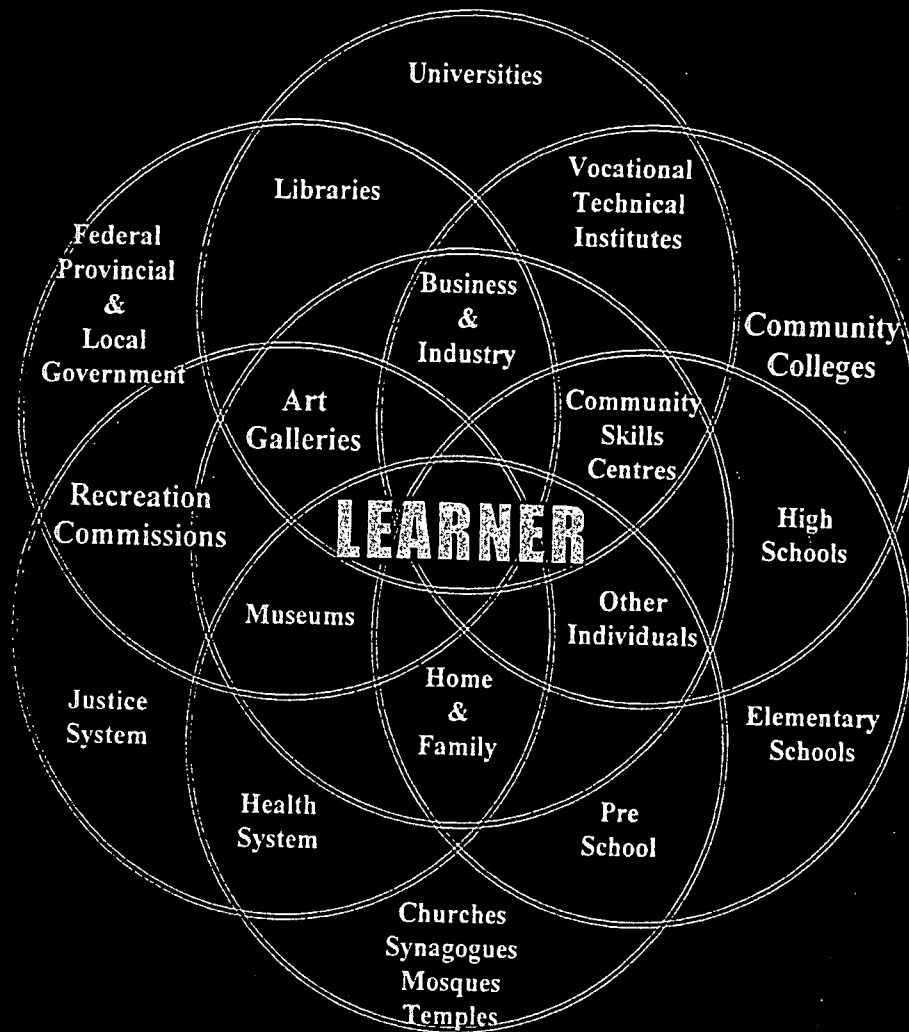
### **Learning System**

The formal and non-formal ways learning (education and training) is systematically provided - pre-school, school, colleges, and universities, apprenticeship, work place training, and other means.

### **Learning Culture**

A way of life which values, fosters and celebrates lifelong learning in all its forms whether in the home, during recreation, at school or work.

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A learner-centred model in which the information highway acts as the communication web of the future knowledge-based society.

## **PART I - INTRODUCTION**

### **A - ENVIRONMENTAL SCAN**

Complex and potent forces of globalization and technological change are working their way through economies and societies, industries and firms, creating a new techno-economic paradigm. This new paradigm is evolving domestically and internationally. It is manifested in new structures, roles, relationships and processes in all societal aspects - not least in the fields of education and training.

The traditional barriers to lifelong learning are being overcome in many leading nations as access to new learning technologies, models and opportunities are evolving. The challenges are not only from international competitors who are applying telecommunications and information technologies to the programs and services of their education and training systems, but also from many government, business and educational leaders in Canada who have not yet done so. Such a lack of vision will ensure that inequitable access to learning resources and opportunities locally will soon be exacerbated by unequal access to world-class resources globally. It is in such an environment that the challenges of providing access to lifelong learning opportunities in an evolving knowledge-based global economy will be addressed.

Major changes are occurring at the national and international level in at least three interrelated domains:

- economic/technological;
- social; and,
- education and training.

#### **1 - International Scene**

It is at the international level that some of the most powerful and pervasive forces appear to be influencing every aspect of the political economy and social systems of nations. Nowhere is sudden, unanticipated change clearer than in this sphere. The sudden demise and disintegration of the USSR and its eastern European empire has left the United States as the dominant world power. Its hegemony is challenged only by the European Union and the growing powers of Southeast Asia regional blocs, still struggling to create unified policy, and countervailing economic and technological impact. For example, the recent G-7 discussion of the objectives of the international information highway has been dominated by American policy initiatives and associated values. These include a boundless faith in both market allocation processes and a preoccupation with technological infrastructure which discount social/cultural considerations - assumptions which could well affect a host of access issues.

### **a) Economic/Technological**

Powerful forces of globalization dominate the economic/technological sphere. Globalization is characterized by a number of economic/technological processes, including: - increasingly complex, global capital markets;

- integration of national financial and production sectors;
- increased mergers, take-overs and transnational corporations;
- influx of foreign competitors into domestic markets;
- importation of new products, technologies, and approaches; and
- increased specialisation, economies of scale, and trade interdependence.

New technological, scientific and organizational know-how is driving economic globalization. The interaction of economic and technological elements is causing major strategic and organizational change across whole industries. The fusion of information technologies and telecommunications is presenting competitive opportunities and threats to industry, creating new industries and fundamentally restructuring existing ones - including education and training.

Three major trading blocs, the European Union, the U.S.A. and Japan, are responding to this changing environment with major technological initiatives.

The European Union has recently approved the budget for its 1994-98 Research and Development program, which includes U.S. \$3.8 billion in support of a new information infrastructure and development of distance learning in health care. The Europeans believe that this new information infrastructure will provide a platform for more efficient government administration and promote more balanced economic, social, and cultural development.

The Clinton Administration announced the National Information Infrastructure (NII) initiative in September, 1993 calling for a national broadband information infrastructure. The NII will be built by the private sector. The federal government plans to allocate up to U.S. \$2 billion per year for advanced R&D, the development of education, health care and government service applications, and computer network access and training programs. In January 1994, U.S. vice president Gore challenged U.S. industry to connect all of the nation's schools, libraries, hospitals, and clinics to the information highway by the year 2000.

In Japan, the Nippon Telegraph & Telephone Corporation has announced its intention to wire every school, home, and office with fibre optic cable by the year 2015 at a cost between U.S. \$150 and \$230 billion.

The Uruguay Round of the General Agreement on Trade in Services has resulted in an

international market for education services. These services may be openly exchanged in a number of categories, permitting the operation of a supplier in a foreign country (this includes distance education services). Therefore, not only technological developments but also international trade law and regulations will enhance the possibilities of distance learning at the international level. Canadians will have access to world-class learning resources and, in turn, will be able to share their educational expertise world-wide.

Industrialized nations are often responding to the global challenge in similar ways. Older labour intensive industries are giving way to new knowledge-based ones. Organizational structures are flattening. Work is being re-organised. Recent estimates indicate that almost 20% of some European and American industries has been organised into team or co-operative work structures.

A recent Ottawa meeting of the **Public Policy Forum** discussed the preliminary research finding of Prof. Tom Kochan's MIT study of human resource management and industrial relations practices. The study concludes, among other matters, that:

- Canadian firms lag behind their Japanese and European counterparts in workplace innovation;
- in comparison to other countries, Canada and the U.S. under-invest in workplace training;
- Canada and the U.S. lag behind other OECD nations in integrating human resource and industrial relations strategies within overall management strategies; and,
- in every country basic education, measures to facilitate school to work transitions and continuous workplace training are seen as vital ingredients for success in the global market.

World competitiveness rankings of Canada in the **World Competitiveness Report** over the last five years are equally disturbing. Canada's overall competitiveness slipped from 5th in 1990 to 16th in 1994. Further, in 1994 of 41 nations Canada ranked 21st in quantity of skilled labour, 28th in retraining, and 31st in in-company training (employer training investment). Clearly a significant challenge of adult learning and training faces Canadians

#### **b) Social**

Complex and contradictory social trends dominate the international scene. Greater secularization and multi-culturalism are found in the richer, industrialized North while the increasingly poor South is too often witnessing the revival of religious extremism and tribalism. Women in many nations are playing more important roles due to increased educational opportunities. Yet, there appears to be a global trend toward a widening gap between the rich and poor, the educated and the undereducated - such gaps will be either diminished or exacerbated by not only the use of, but also the access to, information technologies.

American culture and values are being spread by its mass media to all but the most

underdeveloped nations. Thus, combined with its economic domination, an international culture based on English language for business, science and technology has developed. Yet, Canada, with two official languages and a multi-cultural society, has links with not only the Commonwealth but also la Francophonie, as well as familial connections with over 100 nations - a major competitive advantage in the global economy.

### c) Education/Training

International comparative studies indicate that Canada lags behind many leading OECD nations in the reform of its education and training systems. A federal study in 1990, **An International Perspective on Human Resources Development**, revealed that all eight OECD nations it surveyed had

- established national goals and objectives;
- committed to a lifelong learning strategy;
- geared up for international competition;
- established national curriculum and standards;
- developed closer links between education and the economy;
- promoted social equity/cohesion; and,
- encouraged greater system efficiency through use of information technologies.

A follow-up study in 1994, **Major Reforms in Training Systems in Five Countries**, documented the extent to which five of the OECD countries with a common Anglo-Saxon training heritage had restructured their learning systems in preparation for a competitive, knowledge-based global economy. All the nations, Australia, New Zealand, England and Wales, and Scotland had adopted learning outcomes-based or competency-based national standards as the basis of international articulation and portability of credentials. The U.K., Australia, and New Zealand have applied information technologies to create national student information and program databases as well as open learning systems as a central part of their training reform initiatives. Every vocational student in the U.K. is now in its database. Every learner in Australia and New Zealand will soon be in theirs. Information on the coherent, modularized competency-based systems of each country is readily available to learners, advisors, and employers. Access to such information is fundamental to not only more rational labour market adjustment but also more informed and empowered learners.

The contrast to Canada is stark. Our nation has no agreed upon national goals or objectives. National training standards exist in some trades and professions but are lacking in most. Articulation of post-secondary academic courses interprovincially can be a creative, if not haphazard, process. A coherent national occupational qualifications framework, based on a learning outcomes-based approach does not appear to be a priority on the public agenda. Thus, from a comparative, competitive perspective, Canada's learning systems face a major challenge.

## 2 - Canadian Scene

Under the Canadian constitution, education is a provincial responsibility. Yet the federal government has been responsible for the education of native Indians since confederation, and has been involved in training in some fields such as defence, fisheries and agricultural extension for almost a century and other fields such as technical and vocational training since 1960.

The federal government has historically played a key role in promoting the use of new technologies- radio and films- for educational purposes. A survey of Canadian adult education in 1935 emphasized the work of the Canadian Radio Commission, the forerunner of the Canadian Broadcasting Corporation (CBC). Indeed, with the creation of the CBC not only school radio broadcasts but also world-renowned adult education series were initiated. The **National Farm Radio Forum** commenced in 1941 under the co-sponsorship of the CBC, the Canadian Association for Adult Education (CAAE), and the Canadian Federation of Agriculture was to win an UNESCO award and be replicated in African and Asian nations. Its urban counterpart, **Citizen's Forum**, was to, with the sponsorship of the CAAE, serve as a model of public affairs education for several decades after its inception in 1943. Similarly, **the National Film Board**, formed in 1939, was to, as a result of collaboration with librarians and other adult educators, gain international recognition for the work of its early film circuits, and later for its **Challenge for Change** community education programs.

A survey of **Partners and Interest Groups on Human Resource Development in Canada** in 1990 identified more than 200 principal partners and interest groups involved, in varying degrees, with education, training or the promotion of learning in Canada. Over 40 federal government agencies, departments, crown corporations, boards and councils at that time had either broad or specific interest in learning or training. Over 150 non-governmental organizations (NGOs) were involved in seeking project or core funding for their activities as well as the opportunity to influence government policies and programs. What the study was unable to identify at that time was any organizing principle, overarching policy, or co-ordinative mechanism within the federal government to achieve coherent or efficient response to the increasingly complex issues and demands it faced in the field of learning and training.

Two recent federal initiatives, reforming social security and building Canada's information and communications infrastructure, have recognized the central role that lifelong learning must play in preparing Canadians for the competitive, information-based global economy of the 21st century. The discussion paper **Improving Social Security in Canada**, while focusing on lifelong learning as a way of life for adult learners, has also recognized the importance of a jobs policy and social service reform which fosters a positive early childhood learning environment for children and their families. The Information Highway Advisory Council has adopted lifelong learning as a key design element of the highway. The Council's Working Group

on Learning and Training will be developing recommendations to be included in a national strategy on learning and training which will stress the importance for Canada of creating a lifelong learning culture.



### **a) Economic/Technological**

The confluence of powerful forces of globalization and technological change is resulting in profound change in nation-states throughout the world, including Canada. Whole national economies and industries are being restructured, in both planned and unplanned ways, to meet the challenge of the more globally competitive markets.

Canada's labour force has been directly affected. In the late 1940's, 60% of the Canadian labour force worked in the goods sector - natural resources, manufacturing and construction. By 1990, over 70% of workers were employed in the service sector.

Two major demographic trends are affecting the labour force. There is a trend towards "middle-aging" of the work force. The proportion of people under 35 years of age (15 to 34 age groups) has decreased from almost 60% of the labour force in 1980 to less than 50% in 1990 and it is expected to be under 40% by 2005. It is noteworthy that a large number of educators are approaching retirement age. Within the next 10 years, approximately one third will retire.

A second significant labour force development is the dramatic increase in the participation of women, which has risen steadily since 1976. By the year 2000, 47% of the labour force will be female (compared to 33% in 1971). Of all women of working age 61% will be at work or looking for work in the 1990's.

Change is pervasive. Even the workplace - with new technologies and new skill demands - is being reinvented. For example, the home is becoming the worksite for an increasing number of Canadians. A 1993 study revealed that:

- Over 1.4 million households in Canada, 13.7% of all households, included a member who operated a business from home;
- 21% of Alberta households, 15% in Ontario, and 8% in Quebec had a home-based business;
- 21% of rural households compared to 12% of urban operated a business; and,
- 58% of home-based business had a head of household in the 25-44 age range.

These figures do not include the growing number of tele-workers who spend one or more days working and learning at home via information technologies, and working in their offices the balance of the time.

Clearly, self-employment, at home or elsewhere, is a growing trend. In 1971, 540,000 workers were self-employed; in 1991 the number was 1,109,000, reflecting a growth that outpaced paid workers (105% - 70%). Overall, self-employment accounted for 8.4% of total employment in 1991.

At the same time the old pyramidal corporate structure is being challenged. An "emerging model" of the workplace, a flatter less hierarchical organizational structure, has been identified by the Industrial Relations Centre at Queen's University as a superior, more productive approach. The two models are contrasted as follows:

### Organization of the Workplace

Traditional model	Emerging model
◆ Mass production	◆ Small batch production
◆ Jobs defined in terms of a limited number of tasks	◆ Self-directed multiskilled teams
◆ Clear distinction between conception and execution	◆ Workers required to use judgement and make decisions
◆ Hierarchical management structures	◆ Workers autonomy based on mastery of high-level skills
◆ High level of education requested for management and technical positions; no specific demands for workers' education	◆ Few management layers
◆ Workers reliable, steady and willing to follow directions	◆ Emphasis on continuous training: the "learning enterprise"
◆ Technology leads to improvements in productivity	◆ Involvement in decision-making on investment and work organization
	◆ Productivity gains from appropriate meshing of technology and work organization

-cited CLFDB Task Force on Transition into Employment, 1994.

The challenge of the 1990's to the Canadian workforce is clear. A federal study, **Learning Well...Living Well**, predicts that:

- the skill and knowledge requirement of jobs will rise;
- individuals will have to master more skills and use them more frequently; and,
- individuals can no longer expect to acquire one set of lifelong skills.

The demand for continuous skill training and upgrading will in turn lead to demands for state-of-the-art equipment and technological systems - the advanced technologies which are in operation in leading OECD nations. A recent Canadian report projected that 60% of new jobs to the year 2001 require some post-secondary education or training, while about 15% will require university degrees.

The private communications sector has announced initiatives which will eventually provide significantly increased access to lifelong learning opportunities. The Stentor telecommunications companies announced The Beacon Initiative (1994) which included:

- an \$8-10 billion upgrade over 10 years of the local telephone networks to build a broadband network for multi-media services;
- a \$500 million network enhancement program over six years to provide a seamless national network;

- creation of a new company to supply multi-media services and applications; and,
- a venture capital fund to assist companies developing multi-media applications and products, the total amount of which could reach \$50 million.

The Canadian Cable TV Association (CCTA) is forming a not-for-profit organization, "Canadian Cable for the Classroom", which will provide free connection to cable TV service through local cable companies. They will distribute educational programming to French and English schools, royalty free. Teachers will be able to record the programs and present them in their classrooms at a later time.

#### **b) Social**

Social trends provide a major challenge for Canada. They will have an increasingly profound effect upon its economic, cultural and educational sector in the coming years.

The following are some of the significant issues:

- Demographic trends;
- Immigration;
- Changing family structures and income;
- Literacy; and,
- Aboriginal population.

Demographically, Canada is rapidly greying. It is also not reproducing itself so as to maintain a stable work force. The future implications of the present population and fertility rates are numerous:

- with current trends, the population will start declining next century;
- an aging population will require increased health and social services;
- a relatively smaller work force will face a growing tax burden; and
- over 70% of the work force of the year 2000 are already in the workforce and will require recurrent education.

While the proportion of post-war immigrants has remained stable at just over 15% of the total population, the composition of arriving immigrants has changed dramatically. Some key factors are:

- Canada has a richer and more diverse multi-cultural society than ever before;
- there is a significant backlog of unmet official language training needs, especially outside Quebec;
- the ethnic structure of B.C. is unique, with a more diversified and growing non-European influx;
- overall, recent immigrants have a higher share of university degree holders compared to Canadian born persons; and,
- most immigrants are absorbed into the labour force remarkably quickly. Their participation rate generally exceeds that of "native-born" Canadians.

There has been a dramatic increase in women's labour force participation. Even among mothers with children of 5 years of age or less, nearly two-thirds are working. This work pattern has implications on the ability of women to continue their education. Family obligations and other time-demands have led to women's increased participation in education on a part-time basis. Approximately two-thirds of all part-time students and of all distance learners are female.

There are increasing stresses upon the traditional family structure. Real family income has not grown since the early 1980's. While about 10% of two-parent families with children are low income families, the corresponding rate among female lone-parent families is five times as great. A disproportionate number of the 1.2 million children in low income families in 1991 are in female lone parent families. The growth of single parent families is significant. In 1991, nearly one marriage was dissolved for each two new marriages.

International test scores and comparative education participation rates place Canada in the middle to upper ranges. Yet various surveys have indicated a significant, persistent illiteracy problem in our nation. A recent Statistics Canada survey defined level 4 literacy as the ability sufficient to deal with most every day reading requirements in one of our two official languages. Only some 60% of the Canadian population over age 16 had this fundamental skill. The implications are serious. Literacy is the key element in international competitiveness. There is an increasing importance of labour force adaptability and on the growing use of information technology. Businesses incur costs related to the difficulty of retraining workers, and diminished capacity for productivity improvement.

Much needs to be done to improve the quality and effectiveness of the education system solely within federal jurisdiction - that of the native Indians. The proportion of native persons with less than a grade 9 education, including those with no schooling, is more than twice that of the total Canadian population. At the other end of the continuum, the proportion of aboriginal persons having a university degree is only 20% as high as the Canadian average.

The native population is younger than the non-aboriginal. About 57% of the aboriginal population was under 25 year of age in 1991, compared to 35% of the Canadian population as a whole. A related statistic indicates a chronic unemployment situation: unemployment among native Indians adults was conservatively estimated at 25% in 1991, two and one-half times the Canadian average.

### **c) Education/Training**

Canada's formal education and training system has been one of the world's most richly endowed. A 1975 OECD External Examiners' Report on Educational Policy in Canada characterized Canada as a nation

"...with an array of exceptionally active programmes for vast quantitative expansion and significant qualitative change of the education system that are, however, derived from no explicitly stated, overall national conception of the country's interest."

Indeed, recognizing education as a provincial matter, the Report commented that, with the exception of Quebec, there was no clearly formulated concept of education set in the context of a comprehensive framework of general social policies.

Then, as now, Canada led OECD nations in educational expenditure and in many measurements of student participation. The last report of the Economic Council of Canada was on **Education and Training**. The study revealed, among matters, that:

- historically (1909-1988), education has contributed positively to economic growth (on an annual basis approximately one-half percentage point);
- the education sector was a major contributor to the level of gross domestic product (between 5 and 8% (in 1986 dollars) in the period 1961-91);
- education is a highly labour-intensive industry. In 1991, over 850,000 persons - 1 out of every 14 Canadians employed - worked in the education industry;
- the absolute number of employees in the education sector increased 30% between 1976 and 1991 while the total school enrollment (all levels) remained relatively stable since 1976, although its composition changed (e.g. more disabled and ESL students);
- expenditures on primary and secondary school sectors since 1971 have stabilized, even though student enrolments continued to decline in both absolute and relative terms; and,
- impressive post-secondary enrolment increases since 1971 have not been matched by corresponding increases in expenditures.

The Council report concludes with a number of guiding principles for sustained, long-term, future action including:

- creation of a training culture in Canada;
- development of a stronger skill training system to complement a general academic orientation;
- increased business-education partnership in general and vocational training;
- transformation, by employers, of their business operations into "learning enterprises"; and,
- systematic co-ordination of government efforts at all levels regarding education and training.

Federal efforts to promote reform of education and training have been set in a context of international competitiveness. A series of reports for a Steering Group on Prosperity focussed on needed reform. An initial discussion paper, **Learning Well...Living Well** (1991) called for a Decade of Achievement which would be accomplished by:

- building a stronger learning culture at home, school, and at work; and,
- building a system of lifelong learning that is among the best in the world.

Possible End-of-Decade Targets were established for both objectives.

Response to **Learning Well...Living Well** and further deliberations resulted in a final report, **Inventing Our Future: an Action Plan for Canada's Prosperity**, which contained a wide range of key recommendations, including the development of "a high-speed, broad-band electronic 'information highway' to link Canadians to one another and to the world of ideas". It also recommended action regarding the expanded use of telecommunications and information technologies such as computer-assisted learning, distance education and video/television by:

- increasing the number of computers and variety of software in schools by 30 percent a year to ensure that all students have access to computers and are using computers as an integral part of education within five years;
- ensuring that every classroom has a cable drop and telephone line;
- preparing teachers and staff to use computers effectively as they are introduced into classrooms;
- setting up or using existing centers; in communities as learning resource centers; equipping these centers with the latest learning technologies; and opening them for use by employers, unions, schools, and individuals;
- incorporating technology in the design and delivery of educational and training materials, courses and programs;
- encouraging greater use of computer-based approaches in upgrading, literacy and numeracy programs; and
- changing policies and practices to encourage more technology-based training methods, and eliminating barriers or disincentives to the purchase and use of technologies-based approaches.

The Action Plan also recommended that a coordinated plan be developed to encourage the identification and use of leading technologies by aboriginal enterprises by establishing models, joint ventures and pilot projects to promote technology use.

The present Federal Government has announced **Learning Initiatives** which foster the use of technology and innovation in learning, including:

- developing a national infrastructure for networked learning through electronic computer networks (SchoolNet);
- promoting broader use of new technologies in education and training; and,
- assisting provinces, territories, industry and education institutions in creating a science, technology and learning culture.

An Office of Educational Technology will be established by Human Resources Development Canada "to promote the dissemination of new technologies throughout the system".

One thing is clear, there is strong support among Canadians for the educational use of the Information Highway. A 1994 **Gallup Canada Survey** indicated that of six possible types of services, interest in educational services, such as a home study course or programs that would help with school or university, was by far the highest. Almost 60% of Canadians expressed interest in such a service compared to 21% interest in, for example, home shopping. In summary, Canadians want to receive practical rather than frivolous service on the Information Highway.

### 3 - Summary

An environmental scan at the international level reveals a convergence of economic/technological, social, educational and training trends and practice characterized by response to:

- rapid, often unanticipated, change;
- increased influence of market forces;
- diminished power of nation-states, replaced by regional blocs; and,
- attempts to develop basic, if not rudimentary, agreement about political, economic/technological, social, education and training relationships and infrastructures at the international level.

A national scan reveals that Canada has been increasingly influenced by powerful external forces, as well as unique national issues. The federal government is providing leadership in response to some of these forces and trends. Fortunately Canadian response can be informed by international trends and best practice. For example, studies by Michael Porter and others have identified many of the elements of a successfully competitive nation, including:

- a shared, common vision of the nation and its future;
- active co-operation of the social partners (labour and management);
- appropriate forms of collaboration between the public and private sectors including partnerships, strategic alliances and consortia;
- development of a strong basic as well as advanced education and training system; and,
- valuing of learning and learners: development of a coherent, seamless lifelong learning system and an associated learning culture.

Canada, with its bilingual, multi-cultural society, is well positioned to play an increasingly important role in world economic and political affairs. To do so, however, it must prepare for the challenges of the competitive, knowledge-based economy of the 21st century.

### **B - THE CHALLENGES**

At least three major challenges must be faced if all Canadians are to gain access to lifelong learning opportunities on an emerging knowledge highway.

- 1) How can the information highway foster access to learning relevant to the skills, knowledge, attitudes and values needed in a time of major economic and social restructuring?
- 2) Can the application of telecommunications and information technologies remove or reduce barriers to access to lifelong learning?
- 3) Can the infusion of enabling technologies into the learning environments foster increased access to relevant, productive, quality learning opportunities?



## **1 - Economic/Social Restructuring**

The shift from a resource-based, goods-producing economy to a knowledge-based, service economy is gaining momentum. Whole industries have either disappeared or been significantly restructured. There are profound labour market adjustment pressures, including, on the demand side:

- extensive need for retraining and upgrading, especially in the resource sectors and associated sector-dependent communities;
- low growth in unskilled jobs - largest growth in higher skilled jobs; and,
- increased self-employment and contract work.

While on the supply side:

- labour force participation for women has plateaued;
- participation of equity group members is key to labour force growth; and,
- educational attainment of the labour force is gradually rising despite significant numbers of
  - high school drop-outs;
  - illiterate adults; and,
  - low skill, older workers.

To be relevant to the needs of the economy and many workers, access to learning opportunities should be:

- available within local communities;
- accessible at the workplace as well as in community institutions; and,
- when feasible, home-based.

The learners should have access to

- up-to-date labour market information;
- vocational, and academic program information and advice; and,
- an on-going record of their learning achievements.

Small and medium-sized business, which often cannot afford to mount first-class employee training programs should have access, via consortia or other collaborative arrangements, to world-class training programs. Schools, colleges and industry should be linked to share expertise and resources, and provide pathways for learners. All of the above are the challenge and the vision of a learning system served by the information highway. As we shall learn, these and other functions are already being fulfilled in leading nations and in some Canadian communities.

## **2 - Barriers to Lifelong Learning**

Learning is a lifelong process. It is also a developmental and social process which begins with the transition to life and concludes with the senior citizenship. New and different learning occurs throughout the different stages from childhood to adult life. New knowledge, skills, attitudes and values are gained as one learns to more effectively play

adult roles of a worker, citizen, parent, consumer and learner. Yet such learning is not inevitable. Many barriers can exist for learners throughout their lives which inhibit their learning and development.

A recent Ontario study, **Yours, Mine and Ours**, focuses on the developmental process of children and youth. It identifies the transition stages and key determinants that would most help children and youth to navigate the transitions successfully. The first two stages as described and analyzed by the study, are as follows:

### **1- Transition to Life**

- period before birth and early infancy.
- babies born too soon or too small are at increased risk of illness and disability such as cerebral palsy, learning disorders and visual problems.

**Key determinants** in birth of healthy babies are

- health of their mothers, and
- care the mother receives during pregnancy.

Critical components of good prenatal care include health education and promotion.

Research indicates that prevention of low birthweight should focus on modifiable risk factors such as maternal smoking, very young maternal age, prepregnant and prenatal nutrition, maternal education and over the longer term, socio-economic status.

Compared with children from rich families, poor children are 40 to 50% more likely to be born too small or too soon.

### **2- Transition to school**

- period from infancy to early preschool years.
- skills such as language acquisition, social competence, coping, the ability to think critically, and the capacity to learn develop early in life.
- by the time children are four years old, they have already mastered complex language skills.
- number skills and problem-solving abilities are considered an extension of children's early play experiences.
- reading, writing and spelling are directly linked to early language development and early experiences with stories.

**Key determinants** of healthy early child development are:

- safe, stimulating, quality care for infant and pre-school children; and,
- injury prevention among young children .

Research on early schooling indicates that those who start younger and attend a quality pre-school program tend to perform better, particularly on measures of general ability, language and cognitive development, as well as reading and math performance in later years. Twenty years of research shows that high quality child care supports healthy child development, and poor quality child care can harm children. Good early child care and education programs do not substitute for parental care and love: they support parents in their role.

A 1993 working paper of the Canadian Institute for Advanced Research on "Social Economic Factors and Human Development" identifies key relationships between the quality of early childhood and learning, behaviour and vulnerability to poor health in adult life and emphasises, among other matters,

"...the importance of understanding the relationship among economic growth, prosperity, social environment and individual development. This understanding will promote a healthy, adaptable population that is capable of lifelong learning."

While the objectives of early learning opportunities are becoming clearer, the strategies are at formative stages. **The Best Start** 1993 report on "Prevention of Low Birthweight in Canada" identifies the importance of preventive, community-wide approaches, of which public awareness and education are crucial elements. It cites, for example, a French preterm birth prevention program which included patient education, professional education, and public education in its multi-faceted approach. Over a 10-year period, the national low birthweight rate fell from 8.2% to 5.3%. The greatest reduction occurred among women with the lowest levels of education.

A benefit cost analysis of preventative care and education was carried out by the Working Group on Early Childhood Education of B.C.'s Royal Commission on Education (1988). Their study found that 30% of all handicapped children of school age became handicapped during the last six months of pregnancy, delivery or the first week of life. They noted that in 1987 the province expended more than \$200 million on special education services and programs. They also cited European studies which revealed that the educational cost, combined with the reduced earning power, of neurologically impaired children are ten times as great as the investment required to offer preventive programs. Scandinavian research indicated that nations with strong family life education programs have significantly fewer neurologically impaired children.

In addition to barriers to learning in early life, many of which can be overcome by active social policies of which lifelong learning is an integral part, there are a host of barriers to adult learning. The Adult Education and Training Survey, 1992, found that 2 out of 5 respondents would have liked to have participated in adult education and training but lacked the time to do so. Almost 30% identified the cost of education or training or the non-availability of courses or programs as important obstacles to participation.

A study of part time learners at the University of Victoria in 1994 found a similar pattern. The more detailed response of this sample, which included distance learners, revealed that:

- more than 80% of part-time adult learners are balancing multiple responsibilities and time pressures;
- nearly 70% indicated financial difficulties as a problem;
- isolation is a problem for 41% of on-campus and 35.3% off-campus part-time adult learners;
  
- more than 40% indicate having problems with confidence in their abilities

- to fit in to a university environment and to succeed at their studies; for between 35.7% and 45.2% of on and off-campus students, academic skills - study skills, exam writing and library skills - are barriers to their education; and,
- child care is a problem for more women than men, whether on or off-campus. 18.9% of on-campus women and 26.7% of off-campus women report child care is a barrier to learning.

In arguably the most extensive survey of obstacles to adult participation ever conducted in Canada, the Canadian Association for Adult Education indicated that, in 1982, at least 13 specific types of barriers existed to equitable access for all learners (see Appendix I). The relevance of this base-line study today speaks volumes for the glacial speed of educational reform in Canada.

There are many obstacles to training and education. Statistics Canada, to aid analysis and identification of major factors, divided the barriers into three categories: situational, dispositional, and institutional. Situational barriers are related to the financial and personal situation of respondents (i.e. cost of training, and family responsibilities). Dispositional obstacles, which stem from an individual's perceptions include lack of motivation, age, fear of ridicule, health concerns etc. Institutional barriers stem from the provider of the program and are beyond the control of potential learners (e.g. lack of a suitable program or lack of information about the program).

Statistics Canada reported that in 1990 dispositional barriers were by far the greatest deterrent to education, preventing more than half (52%) of all adults from enrolling in a learning activity. Situational barriers ranked second, cited by 32% of respondents. Financial constraints were by far the most important obstacle. Institutional barriers were cited by only 16% of respondents. The most important institutional barrier was the lack of a suitable program.

### **3 - New Learning Technologies: New Learning Models**

Perhaps one of the greatest challenges for Canadians is the new economic-technological paradigm we face. In terms of education and training, for example, we are aware of a number of trends which challenge the relevance and capacity of the traditional system to respond, including:

- the information and knowledge explosion;
- most workers will have to change jobs 5 to 7 times in their career;
- 75% of today's workforce will be working in 2000 and will require continuous learning;
- new work skills such as analytical thinking, teamwork and information technology skills are required for the new workplace; and,
- the new adult learning force is more diverse - older, more part-time, more

female, and more multi-cultural.

The industrial age factory model of the economy and education is giving way to an emerging information age model. The directions of the paradigm shift can be better discerned from an understanding of the principal features of the two economies and their associated education systems. C.M. Reizeluth (1994) noted the following differences:

#### INDUSTRIAL AGE

Adversarial  
Bureaucratic  
Autocratic leadership  
Centralized control  
Autocracy  
Representative democracy  
Compliance  
One-way communications  
Compartmentalization  
(Division of Labour)

#### INFORMATION AGE

Cooperative  
Team  
Shared leadership  
Autonomy with accountability  
Democracy  
Participative democracy  
Initiative  
Networking  
Holism  
(Integration of tasks)

#### INDUSTRIAL AGE EDUCATION

Grade levels  
Covering the contents  
Norm-referenced testing  
Non-authentic assessment  
Group-based content delivery  
Adversarial learning  
Classrooms  
Teacher-dispenser of knowledge  
Memorization of facts  
Isolated reading, writing skills  
Books as tools

#### INFORMATION AGE LEARNING

Continuous progress  
Outcomes-based learning  
Individualized testing  
Performance-based assessment  
Personal learning plans  
Cooperative learning  
Learning centres  
Teacher-coach or facilitator  
Thinking, problem-solving  
Communication skills  
Advanced technology as tools

At a time when lifelong learning is a social and economic imperative the means to enable it its fullest form are increasingly available. The infusion of telecommunications and information technologies can support a variety of learning opportunities and models, many of which are learner-centered. New technologies will enable learning when, where in ways that are appropriate to the learner. They will include models such as:

- customized training which tailors content and delivery modes to the client needs;
- just-in-time learning where, for example, discrete, immediate client needs are served;
- the “virtual classroom” which replicates the teaching, learning and support functions of a distributed classroom; and,
- independent learning by which a learner is enabled to find and use learning materials that meet their individual needs, abilities, preferences or interests,

New technologies will also enable a range of improved support services, for example;

- **Administration**  
Learners' records of achievements, program information, student application systems, and credit banking are examples of services already available in some jurisdictions.
- **Learners' support**  
Learners are able to consult with tutors, advisors, or peers. Access to labour market, vocational or academic information is immediate and up-to-date.
- **Curriculum Development**  
Authoring by dispersed teams of content experts and curriculum developers is enabled. On-line data bases are available to authour, review and acquire materials.
- **Just-in-time Distribution**  
Learning materials, texts, graphics etc. are available on demand.

New technologies will enable new learning models. The old pre-Copernican model of the teachers and teaching as the central concern is replaced by a new focus on the learner and learning as a process enriched by learning experiences and resources of a world-class nature facilitated by new technologies.

Such a vision is useful as we develop new learning models where teachers are guides, enablers, mentors and co-learners, and learners will learn how to explore and test themes, ideas, skills and a rich array of information bases and multi-media formats; in sum, learn how to learn - independently and co-operatively.

#### 4 - Summary

In a period of major labour market adjustment the information highway can assist those directly impacted as well as those indirectly affected. That is, training and support services can be made available to workers, industries and communities directly affected by lay-offs and industry shut-downs. Retraining programs and services, including counselling and labour market information, can be quickly introduced prior to and during downsizing processes. Training can be portable, and continue in new locations, if workers choose to move.

The OECD stresses, however, the critical importance of ensuring that measures which would prevent such extreme situations should be emphasized. Namely, worker upgrading and on-the-job training, delivered on a continuous basis can help workers and industries retain currency and competitiveness.

The information highway can also add new resources and approaches to overcoming barriers to lifelong learning. The crucial struggle to ensure that all babies and infants have a healthy transition to life and to school can be reinforced by imaginative application of

new technologies to the learning needs of expectant parents, service providers, the general public, and pre-school children.

Children, youth and parents from disadvantaged backgrounds can have enriched learning opportunities at school and in home-based and community learning centre environments. Indeed, new technologies provide the ability to target and deliver programs and services to clientele previously ill-served on account of situational, dispositional or institutional barriers. For example:

<b>BARRIERS</b>	<b>CLENTELE</b>	<b>PROGRAM/SERVICE</b>
<b><u>Situational</u></b>		
1- Lack of time	- office workers	- interactive computer at work station
2- Transportation	- rural public health educators	- internet learning circle
3- Geographic isolation	- children of light house keeper	- open learning; radio, telephone tutoring
4- Lack of child care	- single mothers	- local storefront/home based learning to suit learners
<b><u>Dispositional</u></b>		
1- Lack of motivation	- drops-outs	- computerized storefront centre
2- Fear of ridicule	- illiterate adults	- computerized learning centre
3- Cultural	- second language for home-bound immigrant women	- home-based learning: visits, audio cassettes and telephone tutoring
4- Health concerns	- visually impaired students	- customized computer network
	- senior citizens	- internet learning circle
<b><u>Institutional</u></b>		
1- Lack of program information and advice	- adults returning to learning	- local library/learning centre database
2- Lack of suitable program	- students in small school or college	- open learning program
3- Inconvenient schedule	- nightshift worker	- "Virtual classroom" via fibre optic network
4- Lack of special course	- professional engineer	- satellite course from MIT
5- Lack of institutional recognition of prior credits	- technicians transferred to another province	- electronic national credit bank

Only the infusion of telecommunications and information technologies into the learning systems can enable the concept of lifelong learning to become a reality for all Canadians. For members of equity groups new technologies will enable access to quality learning opportunities currently only dreamt of. For example, for home-bound persons, especially with disabling conditions, new technologies are a godsend, and for aboriginal persons they may prove to be most effective way to deliver customized, culturally-sensitive programs and services.

Only the application of new technologies will enable learning when, where, and in ways that are appropriate throughout an individual's life. Only advanced technologies will make possible the just-in-time learning and customized training services required in a rapidly changing economic environment. Only telecommunications and information technologies can meet the demands of a learner-centred, lifelong learning system which will enable individuals to play more effective roles as workers, citizens, parents, family members and learners.



## **PART II - TRENDS AND BEST PRACTICE**

Throughout the industrialized world leading nations have responded to the changing technological and economic paradigm in remarkably similar ways. A federal report in 1990 found that all eight OECD nations studied had engaged in reform of their education and training systems in order to gear up for international competition. All had been influenced by the UNESCO concept of lifelong learning as they began to systematically prepare for the knowledge-based global economy of the 21st century.

One common denominator in this reform of national education and training systems has been the application of telecommunications and information technologies to delivery of programs and support services in both the formal and non-formal sectors. Indeed, new technologies are aiding in bridging the traditional gaps between these sectors and enabling new linkages and partnerships as well as new ways to access lifelong learning opportunities. International trends and best practice in this realm can be found world-wide, however examples found in OECD nations will be focused upon in three domains: development of lifelong learning approaches; reform and change in both the formal and the non-formal learning systems. The following are some of the major trends and leading-edge practices which have been identified, many of which are leading to increased access and empowerment for learners.

### **A - LIFELONG LEARNING**

Lifelong learning as an operating principle has been adopted for these reasons:

- facilitates reform of the learning systems
- enables life-time learning for individuals
- promotes a learning culture
- encourages learning organizations
- harnesses the total resources of the formal and non-formal sectors
- includes learning for academic, occupational, personal, and cultural development

#### **Examples:**

##### **Canada**

The Canadian On-line Exploration and Collaborative Environment for Education (COECEE) Alliance is a consortium of public and private sector interests dedicated to the development and operation of an open network of advanced education, training and lifelong learning resources.

The Province of New Brunswick has formed the New Brunswick Distance Education and Training Network, or Tele Education NB. Tele Education NB is a network of community learning centres established in partnership with local communities, educational institutions, industry and NB Tel. Initially, a computer-based teleconferencing system

forms the core of the interactive network, complemented by computer-aided communications, electronic data links, and other multimedia technologies.

The Saskatchewan Communications Network (SCN) is an educational network consisting of several components. The Training Network delivers live, interactive credit and professional development programs while the Cable Network distributes post-secondary educational television via satellite. There are 58 SCN study centre sites located throughout the province.

In Newfoundland the Telemedicine and Educational Resource Agency (TETRA) operates a teleconference network throughout Newfoundland and Labrador with 207 sites in some 112 communities. 65 rural schools also receive distance education programs while post-secondary programs are offered throughout the province.

The Alberta Education Technology and Research Foundation is a partnership of educational and business interests applying educational technology in a number of pilot projects involving over 25 schools throughout the province.

British Columbia is creating a network of Community Skills Centres, housing an array of new technologies, to enable access to learning closer to home. As brokerage mechanisms the centres will work with formal and non-formal partners to provide needed programs and services, including labour market information and counselling.

### **Europe**

In Holland, the Centre for Work and Society is involved in the European Union's DELTA R&D program on distance and flexible learning. As part of the ARTICULATE project, the Centre is assessing the impact of learning technologies, especially upon lifelong learning. The Centre is also involved in the use of telelearning and teleworking for disabled persons, including those in sheltered workshops.

In France, Neuropole lab's JITOL (Just-in-Time Open Learning) Project, supported by the European Commission and Swiss and Norwegian authorities, involves use of telematic network links and computer resources to facilitate access to tutors and learners. Four networks are involved: one for producers of learning materials; one for medical specialists; one for a large multinational corporation; and one for bank employees.

### **Japan**

The Bureau of Lifelong Learning of Japan's Ministry of Education has promoted lifelong learning in a variety of ways including establishment of a computerized information network between Prefectural Lifelong Learning Centres and some 17,000 Community Learning Centres. Information provided by such networks pertains to: program and learning opportunities; educational and cultural facilities; relevant organizations, experts and instructors.

## **United States**

The state of Iowa has dedicated its state-wide fibre optic system to provision of lifelong learning opportunities. Iowa has connected 100 libraries, all formal educational, as well as health, judicial and corrections systems, and government services.

Maryland is initiating a state-wide distance learning system over a fibre optic network. The system will deliver education from pre-kindergarden to doctoral study and connect all schools, colleges, universities, educational and public libraries as well as correctional institutions. Workplace continuing education for public and private sector employees will also be facilitated.

## **B - FORMAL SECTOR**

The formal sector, comprised of the K to 12 and post-secondary systems, has been a focus of reform for over a decade in many OECD nations. The application of technologies has been an integral part of many reform initiatives, including the following:

### a) School

- enables access to quality instruction regardless of geographic isolation
- provides both effective student instruction and teacher in- service training
- enables management and diagnosis of special needs students
- promotes thorough and fast basic skill acquisition
- facilitates school-to-work and school-to-college links

## Examples:

### **United States**

The Boulder Valley Project of Colorado entails co-operation of the Boulder Valley School District and the University of Colorado to use the Internet for elementary and secondary school education. High school students mentor elementary pupils. University students and employees in local industry mentor high school students. A middle school has linked with schools in 5 countries to gather and analyze weather data.

### **United Kingdom**

The Department of Education and Science, in 1987, initiated a three year \$150 million scheme to integrate information technologies across the 5-16 year old curriculum. The number of microcomputers in schools was increased, consultants appointed, and in-service teacher training provided. Special funding assured innovative technologies for special needs children and that every school had at least one CD ROM.

### **Canada**

SchoolNet is a co-operative initiative of Canada's provincial, territorial and federal governments, educators, universities and colleges and industry. Its aim is to link all of Canada's 16,000 plus schools to the Information Highway as quickly as possible (a recent federal announcement and increased allocation of funds will enable it to

accomplish its objective by 1998). SchoolNet enables student and teacher access to services and resources such as:

- the Internet, including the 100 best science, engineering and technology school-related resources on the network;
- a directory of e-mail addresses of all schoolNet participants to facilitate communication amongst users; and,
- access to electronic newsfeeds from government information including E-STAT, the educational statistics program of Statistics Canada and the Job Future information package of Human resources and Labour Canada.

The River Oaks Public School in Oakville, Ontario, is using voice mail to provide information to parents on their child=s progress. Daily activities and homework assignments are also to be transmitted. It is also using Vis-B-Vis interactive computer technology to collaborate with a school in Japan.

Burnaby South Secondary School has three satellite dishes for real time TV broadcasts and video-conferencing from around the world. It also operates its own Gopher site and intends to participate in an Earth Science project on the Internet, using Mosaic, a World-Wide-Web (WWW)- based application. The project involves four U.S schools and NASA.

In Manitoba, the Midland School Division has been operating an interactive television system for the past four years using wireless technologies and the Swan River School Division in 1994 piloted a video-conferencing system using ATM technology on fibre optic lines.

#### **b) Post-Secondary**

- enables ready access to learners records of achievement, program and certification pathways, and counselling services
- enables multi-purpose, multi-client systems
- enables linkages with schools, other post-secondary institutions, and just-in-time learning.

#### **Examples: Canada**

A report of the Council of Ministers of Education (1993) revealed that Canada=s 69 universities had increased distance learning activity by 50% over the previous 8 years, and that almost every one of the 203 colleges across the country provide distance learning courses.

Project North was established in 1986 by the Government of Ontario to meet the special needs of Northern Ontario. A network of more than 30 access sites or "electronic classrooms" are connected through audioteleconferencing and computer conferencing. Educational institutions as well as non-profit groups provide the educational and training

programs while Contact North provides instructional design expertise, and the telecommunications infrastructure.

Télé-Université is a unit of the University of Quebec. It develops and delivers distance programming ranging from social/cultural to professional development and informatics. Print material packages often serve as primary instructional mode while extensive use is made of television in co-operation with Radio QuJbec.

The Open Learning Agency of British Columbia provides open learning opportunities province-wide, often in collaboration with local colleges, school boards or Indian bands. Its Open University and Open College deliver, by a variety of means including audioteleconferencing, and cablecasting over the Knowledge Network, a range of undergraduate, vocational, technical, career and adult basic education programs. The Agency also administers a credit bank and an office for prior learning assessment.

### **England and Wales**

A National Database gives details of the National Vocational Qualifications framework, program qualifications, and the competency-based units which are the building blocks of a coherent modularized national training system. A National Record for each student serves as a record of achievement and a basis for an individualized learning plan.

### **Scotland**

A computerized Record of Education and Training (RET) is updated automatically each time a new award is achieved. RET's also record recognition of a qualification by industry or a professional body. An award gained by Assessment of Prior Learning is also recorded.

### **New Zealand**

The Open Polytechnic of New Zealand serves over 30% of all New Zealand polytechnic students.

### **United States**

Miles Community College (MCC) in Montana operates a fully interactive telecommunications system that includes a satellite dish, fibre optic cable, plus VCRs and television monitors in all classrooms. MCC's system is linked to a community network and another community college.

In Michigan, the Jackson and Lansing community colleges are linked with fibre optic lines in order to share low demand courses. The network has been expanded to include three high schools, an Intermediate school district, and Michigan State University.

In North Carolina, the Vision Carolina distance learning project links, with fibre optic, 16 sites in four counties, connecting high schools, community colleges, universities and a regional medical centre.

Boston University's Home Learning Center Project, aided by IBM, established a computer network through Internet which:

- enabled computer training and tutoring for 12 family childcare providers and linked them to all local childcare organizations; and
- provided accredited early childhood education training for the 12 workers.

The project's evaluation concluded that in its 3 year period, 12 childcare workers not only received university level training but also created friendships across, ethnic and educational lines.

### **C - NON-FORMAL SECTOR**

The non-formal sector, comprised chiefly of the private sector (including telcos and cable companies) and the voluntary sector, has been the source of many innovative applications of telecommunications and information technologies which have enabled access to lifelong learning opportunities. Often a wide range of partners are involved in non-formal sector initiatives, as will be seen in many of the examples which follow.

#### **a) Private Sector**

- enables responsiveness to clients and market forces
- enables customized training
- enables just-in-time learning
- enables strategic alliances and consortia with a range of formal and non-formal partners
- enables a learning culture and "learning organizations"

#### **Examples:**

##### **World-Wide**

IBM Desktop University is a central library repository of selected educational courseware with common applicability to IBM employees around the world. Desktop University provides just-in-time learning at employees workstations regarding a range of computer application skills.

##### **North America**

Ford Motors is commencing use of a FORDSTAR Distance Learning Network in U.S. and Canada. Using satellite technology for data and video transmission to its approximately 6,000 dealer locations, Ford will, for example, reduce training time outside the dealership for Engine Performance Masters Recognition from 21 to 9 days. Time and travel costs will be saved as more workplace self-study, using multi-media such as CD-ROM, occurs.

Discovery Learning Services of B.C. Tel has initiated electronic field trips over the past several years. The latest, **Safari >94: The Barkley Sound Expedition**, enabled selected elementary and secondary school students in Canada and the U.S. to interact with divers

and scientists as they explored under-water life and remote terrain on Vancouver Island's west coast. More than a dozen interactive videoconferencing sites were used, including Science World in Vancouver, the Ontario Science Centre in Toronto, and Smithsonian Institute in Washington D.C.

### **Canada**

Rogers Communications Inc. has pledged \$5 million to establish its school LINK -a high speed link to computer information networks in over 600 Ontario schools. School LINK uses existing two-way broadband cable networks to link personal computers to information networks such as the classroom edition of the Globe and Mail, the Canadian Encyclopedia, and linkups with other schools. Rogers proposes to provide hardware, software and support to participating schools for two years.

The Confederation des Caisses Populaire Desjardins du Quebec uses microcomputers and computer based training to maintain uniform skill standards among employees and to save on training costs of time and travel. Central databases are used more and more extensively and training is customized to meet employee needs.

### **United Kingdom**

British Telecom (BT) develops distance learning material to train 250,000 employees and customers. BT's policy is to use distance learning as a first mode of delivery because of its consistent quality and cost effectiveness. Approximately 10% of BT's training budget is directed to distance learning initiatives and the company is the largest customer of the U.K' s Open University.

### **United States**

Five private corporations in Mississippi - Northern Telecom, South Central Bell, Bell South, IBM, and Apple Computer - and ten state agencies initiated FibreNet 2000 in 1990. The network originally linked four rural school districts and several post-secondary institutions. Another nine nodes have been installed, facilitating connection of more high schools, and 15 colleges to each other and the state university.

### **b) Voluntary Associations**

FreeNets, which are free, public-access computer systems, are operating or developing in growing numbers of Canadian centres ranging from the regional Free-Nets of the National Capital to the Community Information Access Organization in Trail B.C. As of May, 1994 four Free-Nets were in operation, with at least two more, Toronto and Vancouver, coming on-line later in the year. Free-Net organizing committees are active in at least 23 other centers. Usually they operate through a combination of public private and voluntary support. They generally rely on volunteers who donate time and expertise to maintain the network and keep information current. Tailored to meet local needs, they also provide access to the wider world of networking through the Internet.

## **PART III - A "MADE IN CANADA" RESPONSE**

### **A - THE CONCEPTUAL FRAMEWORK: A NEW PARADIGM**

#### **1 - Lifelong Learning Principles**

Lifelong learning is an idea whose time has come. While it was coin of the adult education realm for several generations, the concept only gained credibility and growing acceptance following UNESCO's Faure report, **Learning to Be**, in 1973. UNESCO has subsequently urged the concept be adopted as an organizing principle of education and training reform, and as a social goal, for over two decades. It has viewed the concept as

- enabling programs to be viewed as a continuum within a total education system;
- advocating continuing education through not only the formal system but also the non-formal system and informal learning;
- emphasizing that learning strategies should be flexible and provide alternative approaches to suit individuals and groups in their local conditions;
- ensuring that learning strategies pay attention to groups with special needs such as women, natives, the disabled, and visible minorities;
- encouraging an increasing degree of independence and self-directed learning;
- insisting that learning be integrated with the learners' personal, social and occupational domains of life; and,
- emphasizing the democratic, as opposed to elitist, nature of a lifelong learning system.

These principles and values are the basis of a conceptual framework which focuses upon an individual's access to relevant learning opportunities throughout one's lifespan - the so-called "vertical" dimension.

It is also has a "horizontal" dimension which views the learning resources of the formal sector (schools, colleges and universities) and the non formal sector (private, voluntary and co-operative providers) as parts of a total learning system. Such a view promotes the harnessing of the full learning resources of a nation, and an associated predilection to foster partnerships, consortia and strategic alliances to maximise use of existing resources, including learning technologies. Thus the distinction between the formal and non-formal sectors will become increasingly blurred and learning, however, whenever, and wherever it was gained, will be recognized.

#### **2 - Learning Cultures: Learning Organizations**

A society which purposefully and systematically invests in a way of life which values, fosters and celebrates learning in all its forms, regardless of when, where or how it was acquired, can be said to possess a learning culture.



The leading OECD nations, all of which have committed to lifelong learning as an organizing principle and social goal, have further committed within the last decade to systematically acquire or strengthen their learning cultures. They are establishing national goals, objectives and targets that will ensure that all societal elements; government, the world of work, the learning systems, families, and individuals - all invest in learning. (It should be noted that the European Union plans to make 1996 the European Year of Lifelong Learning).

This is not mere rhetoric, nor is it easy. Over the past ten years most OECD nations have faced difficult economic times. Despite this reality they have shifted significant resources to ensure that their nations develop

- coherent, seamless national learning systems based on national competency-based standards;
- closer formal/non-formal sector links;
- equally valued vocational and academic learning systems with assured bridges; and,
- world-class credentials ensuring global portability.

The application of information technologies has enabled major reforms such as national learner and program information systems, and open learning agencies.

The leading nations have devolved, in one form or other, increased responsibilities to the private sector for work force training provision and skill standard-setting. Employers in leading OECD nations are investing more money and workers more time in training than in Canada. They are also being trained in nationally identified key competencies, including use of information technologies. In sum, leading industries and firms are incubating a learning culture which values, fosters and makes use of the knowledge, skills, values and attitudes of all its employees.

The leading nations are investing in the task of connecting their schools, colleges and universities to their national information highways. Most nations have set targets by which time all of their educational institutions will be on networks such as the Internet. Many nations are identifying, and rewarding best practice throughout their learning systems. In some countries the private sector is honouring exemplary practice of school districts or teachers.

Leading nations are also investing in families and children. The Americans have realized that parents are children's first teachers and are initiating steps to promote parenting education, especially among the disadvantaged. France began in 1987 to promote pre-school learning opportunities for all children in economically disadvantaged areas. They also engaged in world-renowned pre-natal and post-natal education programs.

Parents must invest the time to support and encourage their children's learning as well as model the learning attitudes and behaviour which they wish their children to acquire. Parental use of the growing array of technologies in the home for learning purposes is a

powerful example. There is, however, disturbing evidence of the diverse levels of access to computers in Canadian homes. A 1993 statistics Canada survey revealed that, by income, 40% of the top quintile of households had a computer, while 7% of the lowest quintile possessed one. Unless public access policies are in place to ensure availability of modern computers in learning centres, libraries and other public facilities a techno-apartheid information society may become a reality - the antithesis of a learning culture.

The learning culture fosters individual learning activity in a social context. It therefore leads to an associated concept which is gaining wider understanding and acceptance - the Alearning organization.® The metaphor recognizes that all human organizations need to learn, and change, if they are to prosper, let alone survive, in the emerging competitive global economy.

The principles of the learning organization, enunciated at the First Global Conference on Lifelong Learning, in December, 1994 in Rome were as follows:

#### A Learning Organization:

- 1) can be a company, a professional association, a University, a school, a nation or any group of people, large or small, with a need and desire to improve performance through learning.
- 2) invests in its own future through the Education and Training of all its people.
- 3) creates opportunities for, and encourages, all its people in all its functions to fulfil their human potential
  - as employees, members, professionals or students of the organisation
  - as ambassadors of the organisation to its customers, clients, audiences and suppliers
  - as citizens of the wider society in which the organisation exists
  - as human beings with the needs to realise their own capabilities
- 4) shares its vision of tomorrow with its people and stimulates them to challenge it, to change it and to contribute to it.
- 5) integrates work and learning, inspires all its people to seek quality, excellence and continuous improvement in both.
- 6) mobilises all its human talent by putting the emphasis on ALearning® and planning its Education and Training activities accordingly.
- 7) empowers ALL its people to broaden their horizons in harmony with their own preferred learning styles.
- 8) applies up-to-date open and distance delivery technologies appropriately to create broader and more varied learning opportunities.
- 9) responds proactively to the wider needs of the environment and the society in which it operates, and encourages its people to do likewise.
- 10) learns and relearns constantly in order to remain innovative, inventive, invigorating and in business.

### **3 - Learning Technologies and Empowerment**

Perhaps the most striking feature of the emerging lifelong learning paradigm is the way new technologies are empowering learners. In leading OECD nations advanced technology is used to enable learners to progress within coherent, seamless education and training systems. National databases inform learners of the competency-based modules necessary to achieve a specific credential, what the next level of achievement will be, and which modules must be completed and learning outcomes attained to ensure progression.

National databases also inform learners and their advisors of past learning achievements, present learning plans and future pathways. Computer programs can also assist would-be learners in preparing their prior learning assessment portfolios.

Program articulation and course requirements are no longer part of a shell game in which a learners can be victimized by haphazard and arbitrary decisions in institutions when they attempt to transfer from one to another. An open, consistent process is accessible to all learners.

Learners are further empowered as the role of open/distance learning within the traditional post-secondary system changes. Recent analysis of the Open Learning Agency (OLA) of B.C. student participation indicates that most students combine distance and on-campus study, often at two or more institutions. For example, one-third of their Open University students are enrolled at other post-secondary institutions, and the vast majority of OLA students transfer into or out of the Agency.

This trend was confirmed by a recent study by a B.C. university which revealed that almost 75% of its "distance" students are also concurrently enrolled in on-campus day courses. Recent data from the British Open University indicated that about 50% of its students transfer in from other institutions and about 50% of its students transfer out to other institutions.

Thus the freedom to transfer between institutions without penalties, to mix and match courses, and use a variety of learning modes has already been taken advantage of by many learners. Distance learning in B.C. appears to be increasingly integrated into the post-secondary system and serves as a significant bridge or pathway for many learners. In all likelihood the OLA Credit Bank further enhances the facilitating functions of the emerging open learning system.

#### **B - LIFELONG LEARNING GOALS FOR CANADA**

Fundamental to the concept of lifelong learning is the understanding that learning by individuals occurs throughout their lifespan. A growing body of scientific and educational research indicates that from conception to death numerous and complex factors can influence human intelligence and learning.

Creative, caring, productive human beings are more likely to result from nurturing parents and a society with these same qualities. Thus the foundation of a lifelong learning society- a nation of intelligent citizens - is based on a fundamental value that all Canadians should commence their lives with equal opportunity to learning - a fair start. For example, every baby should have expectant parents who have learned good pre-and post-natal care, who practice proper nutrition for mother and baby, and who foster a rich and supportive environment for their babies. Parents must realize that they are their children's first teachers and promote an environment in which children are encouraged to explore and learn - often by their parent's example. Family learning and pre-school learning opportunities will ensure that all children begin school ready to learn. Thus the foundation of a lifelong learning framework/system for Canada is:

### **A FAIR START**

- Goal A: All expectant parents will receive high quality pre-and post-natal education.
- Goal B: All children will begin school ready to learn.

When children begin school they enter at different developmental stages and levels of learning readiness. In fact they will develop at different rates throughout their lives. The foundation skill which will serve them lifelong is learning how to learn. Provision of a range of learning environments and experiences and support to try new learning styles enable children to develop the self-confidence, motivation and skills necessary for further learning. Upon reaching adolescence youngsters will have opportunities to learn adult roles and prepare for their next environment, whether it be the world of work or further education or training. Thus the next stage in the developmental lifelong learning framework/system for Canada is:

### **YOUTH LEARNING**

- GOAL A: All students will have the foundation skill (learning how to learn) which enables them to acquire the basic skills, knowledge and values for productive work, responsible citizenship, creative lives, and lifelong learning
- GOAL B: All students will have opportunities to learn about and prepare for their next environment, whether it be the world of work and/or further learning.

Until recently traditional education systems were what the OECD called a "front-end" education model which appeared to be preoccupied by a K to 12 system which was supposed to "prepare" people for life. Economic imperatives for a work force continuously upgrading or learning new skills, and adult educational research which revealed the folly of concentrating educational resources on the young and a relatively small academic elite, have led to consideration of a new paradigm of recurrent learning opportunities for all who have left the mandatory school system and are playing adult roles.

A growing body of research and thought by OECD and UNESCO point to the importance of enabling all learners to have a strong basic or general education and acquire a wide range of what the Conference Board of Canada calls "employability skills". Such skills include: academic skills focused on communication, critical thinking and use of information technologies; personal management skills related to positive attitudes, self-reliance and adaptability; and teamwork skills.

The International Labour Organization, representing industry and unions, has, in addition to occupational training, recognized the importance of citizenship education and adult education for personal development. It is in this comprehensive sense that Canada's lifelong learning framework/system includes:

### **RECURRENT LEARNING**

**GOAL:** All adults will be enabled to learn throughout their lives in ways and places, and at times appropriate to their needs in order to develop and maintain the skills, knowledge, attitudes and values necessary for the workplace, to acquire or upgrade general education, and to more effectively play roles as world citizens, parents, community members, consumers and learners.

One of the greatest contributions of the lifelong learning concept has been the recognition that learning continues throughout the final stage of life - the third or Troisieme Age of senior citizenship. In this period of retirement increasing numbers of seniors enjoy recreational learning. The world-wide Elderhostel movement testifies to the constant curiosity and learning of many seniors. Research indicates that seniors engaged in various learning opportunities are more likely to have more positive mental and physical health. A major demographic shift at the turn of the century will also mean that a new generation of seniors, both better educated and wealthier than any previous generation, will comprise a significant and growing proportion of the population. These seniors will demand more learning opportunities as well as be a growing body of potential mentors for individuals as widely varied as high school students, and new business persons. Seniors will also be the basis of growing self-help movements related to their specific health and other needs. Thus, the final stage in the development lifelong learning framework/system is:

### **THE THIRD AGE**

**GOAL:** All senior citizens will be enabled to learn in ways, places and times appropriate to their avocational pursuits and to more effectively play roles as world citizens, family and community members, consumers, learners and mentors.

Taken as a whole, the goal of a lifelong learning system for Canada is to maximize the use of the resources of the total formal and non-formal learning system, and the often creative informal learning activities of individuals. Only the infusion of telecommunications and information technologies into the learning systems and ready

access of Canadians to these resources can make lifelong learning a reality. Only advanced technologies will enable learning, sometimes of an informal nature, when, where, and in ways appropriate to learner's preferred styles throughout their lives. Only new technologies can meet the demand for learner-centred, client-driven learning systems which on the one hand enable individuals to play more effective roles as workers, citizens, parents, family and community members, and learners while on the other make possible the just-in-time learning and customized training needed in a modern, changing economy.

Canada cannot afford the human or economic cost of a "techno-apartheid" society in which chiefly an elite have access to information technologies and the information highway. We cannot afford to waste the talent or contribution of one Canadian. We cannot afford to ignore the vast potential of expertise and resources which exist in the present learning system, for example the educational institutions, libraries, private sector trainers - or the growing non-traditional providers of learning access such as the freenets, the community skills or learning centres. Together, they are crucial parts of a communication web of a future knowledge-based society. Together they will enable universal and equitable access for all who can benefit from learning and training on the knowledge highway. Thus the OVERALL GOAL of a lifelong learning framework/system is:

TO PREPARE CANADIANS FOR THE KNOWLEDGE-BASED GLOBAL ECONOMY OF THE 21<sup>st</sup> CENTURY BY ENABLING THEM TO GAIN THE SKILLS, KNOWLEDGE, ATTITUDES AND VALUES NEEDED TO PARTICIPATE FULLY AND PRODUCTIVELY IN THE NATION'S SOCIAL, CULTURAL AND ECONOMIC DEVELOPMENT.

Over 100 years ago the Royal Engineers helped construct the communication/transportation infrastructure of their day - roadbeds, canals and railbeds. They built well yet little would they know that over a century later many of the foundations they laid would still be used. Canadians are now called upon to build a knowledge highway that all may use. If we also build upon sound foundations we build for the future, albeit uncertain. Perhaps our greatest challenge is that expressed by the French author-pilot Antoine de Saint-Exupery:

**"As for the future, your task is not to foresee but to enable..."**

## **APPENDIX I**

### **Barriers to Learning: CAAE Survey (1982)**

The following barriers to learning and training were identified in a seminal study which involved commission of a Gallop survey, analysis of Statistics Canada studies, and other relevant data. A series of consultations throughout Canada involving adult learners, educators and administrators was held from April to July 1982. This unique initiative provided a baseline for later studies of adult education participation and associated barriers. The relevance of its findings to access issues today indicates the deeply rooted, intransigent nature of obstacles which many learners face.

#### **Financial**

##### **1. Funding**

- little or no federal or provincial funding for part-time learners.
- inadequate income support programs.

##### **2. Fees and Other Costs**

- financial aid for part-time students is extremely limited.
- fees for evening courses exceed fees for similar daytime courses measured by instructional hours in many institutions.
- post-secondary financial support systems tend to be geared to the needs of young, unattached individuals.
- women are encouraged less than men to take advantage of employer's tuition reimbursement plans.

#### **Providers**

##### **3. Institutional Practices**

- institutions tend to offer courses rather than assess and respond to various learning needs of the adults.
- services to part-time students e.g., counselling, book stores, administrative offices are often closed evenings.
- reluctance of some institutions to accept credits from other institutions.

##### **4. Lack of Co-ordination**

- providers and referral agencies tend not to be aware of each others activities and often do not co-ordinate activities.

##### **5. Scheduling**

- inappropriate scheduling and abrupt changes in schedules occur in some institutions.

##### **6. Residency Requirements**

- many universities require a sustained period of full-time, on-campus study as a basis for completing degree requirements.

##### **7. Accreditation**

- educational institutions are slow to recognize the value of life or prior learning experiences.
- modularized, competency-based curriculum based on national standards is seldom available.

### 8. Attitudinal Barriers

- many adults who have had negative or little experience in education feel uneasy about learning in traditional institutions.
- learning how to learn and study skills need to be acquired or re-acquired
- individuals who accept notions of Amale@ or@ female@ occupations.
- members of equity groups (disabled persons, persons of indian ancestry, visible minorities, and women) are pre-judged.

### 9. Physical Barriers

- not all institutions have removed physical barriers for disabled students.

### 10. Geographic Barriers

- educational opportunities and alternatives are concentrated in urban centres, and among these, the largest are the best served.

### **Unmet Learner Needs**

#### 11. Curriculum/Learning Needs

- some providers do little to recognize the needs of adult learners for curriculum resources, or methods appropriate and relevant to adult roles and developmental stages of learners.

#### 12. Lack of Support Systems

- providing organizations often have inadequate orientation/counselling services, child care and tutoring capacity.

#### 13. Lack of Information

- information on available courses is not easily accessible in all areas, especially on a multi-institution basis.

Source : Canadian Association for Adult Education, **From the Adult's Point of View**, CAAE, Toronto, 1982.



## **APPENDIX II**

### **Lifelong Learning Framework: Goal Summary**

**OVERALL GOAL:** TO PREPARE CANADIANS FOR THE INFORMATION-BASED GLOBAL ECONOMY OF THE 21<sup>st</sup> CENTURY BY ENSURING THAT THEY POSSESS THE SKILLS, KNOWLEDGE, ATTITUDES AND VALUES NEEDED TO PARTICIPATE FULLY AND PRODUCTIVELY IN THE NATION'S SOCIAL, CULTURAL AND ECONOMIC DEVELOPMENT.

#### **I. A FAIR START**

**GOAL A:** All expectant parents will receive high quality pre- and post-natal education.

**GOAL B:** All children will begin school ready to learn.

#### **II. YOUTH LEARNING**

**GOAL A:** All students will have the foundation skill (learning how to learn) which will enable them to acquire the basic skills, knowledge, attitudes and values for productive work, responsible citizenship, creative lives, and lifelong learning.

**GOAL B:** All students will have opportunities to learn about and prepare for their next environment, whether it be the world of work and/or further learning.

#### **III. RECURRENT LEARNING**

**GOAL :** All adults will be enabled to learn throughout their lives in ways and places, and at times appropriate to their needs in order to develop and maintain the skills, knowledge, attitudes and values necessary for the workplace, to acquire or upgrade general education, and to more effectively play roles as world citizens, parents, community members, consumers and learners.

#### **IV. THE THIRD AGE**

**GOAL :** All senior citizens will be enabled to learn in ways, places and times appropriate to their avocational pursuits and to more effectively play roles as world citizens, family and community members, consumers, learners and mentors.

## I. A FAIR START

**GOAL A:** All expectant mothers will receive high quality pre- and post-natal education.

Objectives	Example of Programs	Sectors		Jurisdiction		
		Formal	Non-Formal	Federal	Provincial	Joint
Enable expective parents, public health personnel, and volunteers to gain the skills, knowledge, attitudes and values necessary for high quality pre- and post-natal care.	Early Learning Network (See recommendation #1) - Homebased Learning - Community Learning Centres.	X	X			X

**GOAL B:** All children will begin school ready to learn.

Objectives	Example of Programs	Sectors		Jurisdiction		
		Formal	Non-Formal	Federal	Provincial	Joint
Strengthen pre-school nutrition and healthcare education programs  Increase parenting programs, including a focus on supporting parents as children's first teachers.	Early Learning Network - Homebased Learning - Community Learning Centres.  “ ”	X	X			X

## II. YOUTH LEARNING

**GOAL A:** All students will have the foundation skill (learning how to learn) which will enable them to acquire the basic skills, knowledge, attitudes and values for productive work, responsible citizenship, creative lives, and lifelong learning.

Objectives	Example of Programs	Sectors		Jurisdiction		
		Formal	Non-Formal	Fed	Prov	Joint
Ensure that all students have the opportunity to develop lifelong learning skills and attitudes necessary for future employment and/or learning.	SchoolNet.	X				X

**GOAL B:** All students will have opportunities to learn about and prepare for their next environment, whether it be the world of work and/or further learning.

Objectives	Example of Programs	Sectors		Jurisdiction		
		Formal	Non-Formal	Fed	Prov	Joint
Increase apprenticeship opportunities.	Distance Learning Program for Apprentices in Remote Locations.	X	X			X
Expand work experience programs and partnerships.	School-Company work experience.	X	X			X
Improve students' technological workplace skills.	Workplace simulation.	X	X			X
Expand school to college/university linkages.	School-College Advanced Credit (2+2 program).	X			X	

### III. RECURRENT LEARNING

**GOAL A:** All adults will be enabled to learn throughout their lives in ways and places, and at times appropriate to their needs in order to develop and maintain the skills, knowledge, attitudes and values necessary for the workplace, to acquire or upgrade basic skills, and to more effectively play roles as world citizens, parents, community members, consumers and learners.

Objectives	Example of Programs	Sectors		Jurisdiction		
		Formal	Non-Formal	Federal	Provincial	Joint
Forge new workplace training partnerships.	College-Industry Sectoral Training Network.	X	X			X
Revitalize workforce training in the community.	Community Skills Centres.	X	X		X	
Develop a national learner=s achievement database.	Program similar to U.K. National Database.	X				X
Create a national program information, counselling and advisory service.	Program similar to U.K. National Database.	X				X
Ensure that all new Canadians have the official language skills/citizenship education necessary to participate fully in the economy and society.	College audiographic second language program.	X	X			X

## IV. THE THIRD AGE

**GOAL A:** All seniors citizens will be enabled to learn in ways, places, and times appropriate to their needs for re-creation and avocational pursuits and to more effectively play roles as world citizens, family and community members, consumers, learners and mentors.

Objectives	Example of Programs	Sectors		Jurisdiction		
		Formal	Non-Formal	Federal	Provincial	Joint
Promote mentoring programs for youth, new businesses, women entrepreneurs etc.	Free-Net mentoring exchange.	X	X			X
Aid housebound seniors to enjoy continuous learning.	Develop a virtual "Elderhostel" for those unable to travel.		X			X
Promote seniors health.	Support a Seniors Health Network.		X			X

## **APPENDIX III**

### **LIFELONG LEARNING: FORMAL AND NON-FORMAL SECTORS**

#### **FORMAL SECTOR**

##### **Federal Government**

Almost 30 departments, boards and agencies are involved including key players such as Human Resources Development Canada (HRDC), and Industry Canada.

##### **Pan-Canadian Councils**

- Council of Ministers of Education, Canada (CMEC).
- Council of Science and Technology Ministers.
- Ministers Responsible for Labour Market Matters.

##### **Provincial Governments**

In most provinces there are from 20 to 30 ministries, boards and agencies involved in providing, facilitating, or promoting learning programs, including one or more education ministries.

##### **Formal Institutions**

There are 69 universities, 203 community colleges, and over 16,200 elementary/secondary schools in Canada.

#### **NON-FORMAL SECTOR**

##### **Business Sector**

American studies indicate that from two to three times as much education/training is carried on in this sector, chiefly on the job, as the total formal sector. A recent CAAE study indicates that employers are the largest providers of part-time and short-term training.

##### **Voluntary Sector**

A wide variety of voluntary associations exist at the national, provincial and community levels to provide programs, e.g., pre-school, volunteer bureaus, recreation agencies, etc., or advocate, e.g., Canadian Association for Adult Education, or to represent interests, e.g., Canadian Teacher' Federation, provincial library associations.

A study by David Ross (1989) emphasized the contribution of the voluntary sector to promoting skill development and work experience. Seventy percent (70%) of volunteers identified learning new skills as an important feature of volunteering. Forty-four percent (44%) said it was important that volunteer work offered them an occasion for improving their job opportunities. The study claimed that across Canada in 1986/87 over 16 million separate skill experiences were recorded.

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## FUNDING THEME: INNOVATIVE USES OF TECHNOLOGIES TO SUPPORT LEARNING

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### PROJECT TITLE

Collaborative Online Development with Concept Mapping

### SUMMARY:

Typically, computer conferencing involves using text on a screen. Individuals communicate with one another using a keyboard only. The Collaborative Online Development Project will use visual images, in addition to text, in order to enhance the communication of ideas. The technology involves "concept mapping" software (SMARTIDEAS) as a means of developing computer-based learning modules on the Internet. The project will examine how educators and trainers learn and work collaboratively using visual rather than text-based tools.

Outcomes from this project will include a set of recommendations to further the development of visually-based learning and teaching tools for use on the Internet.

Project results will assist educators and trainers, as well as business and industry organizations seeking to optimize their distance learning activities.

The OLT contribution represents 56% of the forecasted total cost of the project.

### SPONSORING ORGANIZATION:

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