WHAT EDUCATION AND TRAINING FOR WHICH FUTURE? A COMPARATIVE PERSPECTIVE

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Introduction

The 1993 Federal Election campaign witnessed an incredible proliferation of uninformed rhetoric purporting to validate diametrically opposed perspectives on what types of jobs are likely to predominate in Canada and the types of education and training required by these jobs. The irony is that both extremes of opinion were partly correct, as well as partly incorrect! As an educator with professional experience in both education and training, I particularly resented the vacuous rhetoric that marked the 1993 election campaign and which continues unabated. I believe that it is time for those of us with opinions grounded in reality to endeavour to educate politicians and business leaders. Whether or not this is possible is problematic!

An examination of current trends in job creation indicates that between 60 and 75 percent of jobs created during the past decade have been in the service and informatics sectors, while jobs in the "traditional" manufacturing, mining, forestry and agricultural sectors have been in net decline. This trend parallels economic restructuring of the Canadian economy in the structure of the Canadian labour force.

Technological modernisation of the manufacturing and other productive sectors has *both* replaced workers with robotic equipment *and* increased the levels of educational attainment and training necessary to understand, operate, maintain and repair such equipment. If any aspect of current economic modernisation and its implications for education and training is misunderstood by politicians it is this aspect.

The global movement of unskilled and semi-skilled employment from high-labour-cost to low-labour-cost nations is another trend which is taking place, regardless of whether or not nations belong to closed trading blocks. In reaction, those developed nations which exported jobs to newly-industrialising (NIC) and least developed (LDC) nations have been motivated to reform their education and training infrastructures in order to train -- and in most cases also to re-train -- the

higher skilled workers demanded by their increasingly knowledge-intensive labour markets. The new Canadian Labour Force Development Board (CLFDB), The Ontario Training and Adjustment Board (OTAB) and training boards in other provinces are examples of this reform trend.

However, by way of balance it must be noted that such reform and restructuring is not an either-or proposition, since labour market demand for lower-skilled labour is not about to "disappear." While "hosers" (e.g., Bob and Doug MacKenzie)¹ may no longer have the 'luxury' of dropping out at Grade Ten and expecting a lifetime of employment in mining, fishing, forestry, agricultural and other such occupations, there will still be positions available for such 'underachievers.' However, a new equilibrium, tilted in favour of higher-skilled jobs, is evolving. Another salient -- and disturbing -- trend has been the increasing shift from permanent full-time to a variety of part-time employment positions, including the phenomenon of "contracting out" previously full-time positions.

This paper draws upon the author's previous research, professional writing, and extensive field experience to examine this complex issue by means of the comparative examination of trends from Germany, Sweden, Great Britain and several newly-industrialising nations, such as Singapore and Brazil. These insights will be focused upon the post-secondary (and post-compulsory) education and training sector in Canada in order to respond to the question: What education and training for which future?

The Canadian Reality

Article 93 of The Canadian Constitution (1867, amended 1982) reserves education as an *exclusive* responsibility of the (since 1949) ten Provinces. In contrast to other federal states, Canada has no Federal "office," or Ministry of Education. In fact, this Constitutional provision means that Canada actually has *twelve* educational systems. However, having said this, the realities of a federal state are that the federal government has encroached upon provincial powers, particularly in education, health and occupational training, since about 1910.

While exclusive provincial control over education is enshrined in the constitution², the situation with regard to training has been different. The Constitution also empowers the Federal Government to *promote economic growth, equity and stabilisation*. Under these powers federal funds, initially for occupational training and subsequently for post-secondary education, have been transferred to the provinces under what have become known as Established Programmes Funding, or EPF fiscal transfers. In 1966, then Prime Minister Lester Pearson justified Federal involvement as a response to the current and anticipated future needs of Canada:

to reduce unemployment, to increase the productivity and earnings of Canadian workers, and to maintain and improve the competitive position of Canada in relation to other countries.

Unfortunately, from 1984 the Mulroney Government began to reduce EPF transfers to training, education and health, which markedly affected these burgeoning sectors and placed greater financial burdens upon the provinces. The failed Charlottetown Accord to amend the constitution proposed devolving responsibility for training to the provinces.

Other Mulroney initiatives shifted the burden of paying for occupational training from the federal government to both employers and employees through the diversion of Unemployment Insurance (UI) funds and cessation of federal UIC funding. Sectoral Training Initiatives, also initiated by the Mulroney Government, are also intended to shift labour force training costs to the private sector. The initiatives of the Bourassa and Johnson Liberal governments in Québec to assume full provincial control over labour force training appear to be a continuation of trends initiated by Mulroney. The irony in the Québec position, however, is that the Johnson government desires control but also expects the federal government to continue to pay for training.

Educational Development

A brief history of the development of the educational and occupational training infrastructures in Canada will help to establish the context for our response to the question of what education and training for which future.

Vocational and technical education were relatively slow in developing at the Provincial level. Nineteenth century curricula stressed academic subjects and only limited practical instruction was available in agriculture, art, home-making and commercial studies. Manual training was not taught in day classes until 1900, although evening classes for working people were available from the 1840s.

A 1901 meeting between The Canadian Manufacturers Association, The Dominion and Labour Council, Boards of Trade and then Prime Minister Wilfred Laurier proposed a Federal Ministry of Vocational Education which never materialised. Instead, a Royal Commission was appointed to determine technical education needs for Canada in 1910. However, this was the first instance of a tripartite (government, business and labour) approach to education and training in Canada.

The 1913 Report of The Royal Commission on Industrial Training and Technical Education recommended that the federal government allocate funding to the provinces to encourage the provision of vocational education and experimental science in the elementary school grades. This grant was to be divided among the provinces on the basis of population, but was not to be used for capital construction. Implementation of these recommendations did not take place

until after World War I. Subsequent federal legislation extended such grants to secondary and post-secondary education.

Meanwhile, in 1911 The Province of Ontario passed the Industrial Education Act, based upon the recommendations of a comparative educator, Dr. John Seath, who had studied technical and vocational education in Europe and the U.S.A. The result was that Ontario was ready to take full advantage of federal financial assistance when it became available. This pattern remains valid to this very day -- to the chagrin of the other Provinces. Dennison and Gallagher noted that:

In fact, access to federal funds through the Technical and Vocational Training Assistance Act (TVTA) of 1960 was especially influential on the course that Ontario colleges would take... The federal government agreed to reimburse the provinces 75 percent of the cost of new buildings and equipment to a limit based on the provincial population, and thereafter at 5 percent of the cost. The total appropriation for the programme was \$920 million. The TVTA became the catalyst for a massive programme of construction in most provinces, but particularly in Ontario ...³

Such Federal assistance began with the Agricultural Aid Act of 1912 and was followed by a succession of Acts, which provided federal assistance, first, to elementary, and subsequently, to secondary and higher education, culminating with the National Training Act of 1982. Precedents established from 1912 were:

1. National training needs were encouraged to be met by an influx of federal funds;
2. These federal funds were contingent upon some type of federal control;
3. Federal funds were given directly to both the Provincial Governments and training institutions.
4. Federal funds were allocated to provinces on the basis of population.

What is interesting is how little appears to have changed since 1912! If one were looking for consistency in education and training policies, this is certainly indicative of a consistent approach to federal-provincial relationships. However, expansion of post-secondary education -- and with it an increasing federal government role -- did not take place until the 1960s. According to Dennison and Gallagher:

high unemployment in the 1950s prompted the Diefenbaker government to introduce the Technical and Vocational Training Assistance Act

(1960). This legislation placed major emphasis on the vocational and technical training required for workers to adapt to changes in technology and to meet the demands of industry. Eight hundred million dollars was provided for such training by the Canadian government over a ten-year period, under a cost-sharing arrangement with the provinces. A 75 % federal - 25 % provincial formula was developed which applied to capital costs, but under certain conditions to operating costs as well. Another series of legislative changes increased the amount of federal financial support, which culminated in 1967 with the introduction of the Adult Occupational Training Act and The Canada Manpower Training Programme.⁴

The 1982 National Training Act implemented many of the recommendations from two landmark reports published in 1981: *Labour Market Development in the 1980's*, which was produced by a Task Force within the federal Ministry of Employment and Immigration, and *Work for Tomorrow: Employment Opportunities for the 1980's*, which was produced by a Committee of Parliament. These publications continued that fine Canadian tradition of in-depth (and often lengthy) study, prior to action, usually undertaken by Royal Commissions.

Post-secondary education in Canada is delivered at 82 universities and 160 community or technical colleges or institutes. In 1990, full-time university enrolment was 532,096 and part-time was 39,531, while college enrolment was 324,550 full-time and 186,830 part-time. Although provincial Ministries of Education, or post-secondary education, have operational responsibility for universities and colleges, the institutions exercise considerable autonomy by means of their boards of governors. In 1991, public sector spending on education comprised 6.7 percent of the GDP, the second highest level among OECD countries after Norway. Public spending on education grew from \$8.4 billion in 1961 to \$36.6 billion in 1991 (in constant 1986 dollars).⁵

The Canadian Labour Force Development Board

In 1989, the federal government initiated extensive consultation with business, labour, social action groups and educational and occupational training representatives, as part of the federal Labour Force Development Strategy. These consultations were organised by The Canadian Labour Market and Productivity Centre (CLMPC) on behalf of Employment and Immigration Canada. The CLMPC established seven Task Forces to examine: older workers, unemployment insurance beneficiaries, social assistance recipients, apprenticeship, co-operative education, entry-level programmes and human resource planning.

The primary objective of the federal Labour Force Development Strategy was to ensure that the Canadian labour force of the 1990s will be "highly skilled and capable of adapting to an evolving work environment brought on by technological and demographic change." The 1990 *Report of the CLMPC Task Forces on the Labour Force Development Strategy*⁶ contained a main conclusion indicating the "need to reform existing labour market policies and programmes" and that "new mechanisms be created to implement needed labour market reforms." The second phase of their study culminated in the July 1990 report: *A Framework for a National Training Board*.⁷

In January 1991, the Federal Minister of Employment and Immigration announced the establishment of The Canadian Labour Force Development Board (CLFDB). The CLFDB was established administratively by CEIC and reports to the Minister, rather than through enabling legislation.⁸ In addition, a series of provincial and local training boards was recommended, in order to "shift greater responsibility for programme implementation to the local and/or sectoral levels."

In addition, "broad provincial jurisdiction in the area of education and training means that the precise makeup and functions of these Boards in specific regions of the country can only be determined after extensive federal-provincial discussions and negotiation." This means that Canadian training boards adopted the quadra-partite (government, employers, labour and education) participation model which has evolved in Germany and Sweden. The CLFDB and provincial and local training boards are to advise both levels of government on the expenditure of training funds.

To date, six provincial training boards have been established, in British Columbia, New Brunswick, Newfoundland, Ontario, Québec and Saskatchewan. I shall only deal with Ontario in this paper. The Ontario Training and Adjustment Board (OTAB) was created by legislation which received royal assent in July 1993, and is, thus far, the most viable of the provincial training boards. At the present time, OTAB is engaged in the establishment of 25 local training boards throughout the province.

The CLFDB has 22 seats:

8	for employers representatives
8	for labour representatives
2	educators/trainers
4	for social action groups: women, disabled, visible minorities and Aboriginal peoples.

Plus *ex officio* representation for governments:

2	Federal Government:
	HRD Canada Commissioner for Workers (ex officio)
	HRD Canada Commissioner for Employers (ex officio)

- 5 Provincial Government Representatives:
 - 1 British Columbia
 - 1 Ontario
 - 1 Québec
 - 1 Atlantic Provinces (New Brunswick, Newfoundland, Nova Scotia, and Prince Edward Island)
 - 1 Prairie Provinces (Alberta, Manitoba and Saskatchewan)

At the provincial level, The Ontario Training and Adjustment Board (OTAB) has a Governing Body of 24 members, co-chaired by business and labour, with the following composition:

- 8 business representatives
- 8 labour representatives
- 4 social action organisation representatives
- 2 education and training representatives
- 1 provincial representative (ex officio)
- 1 federal representative (ex officio)

The inclusion of the term *adjustment* in the OTAB title is considered important, since the term implies assistance to communities and individuals "affected by economic change and restructuring, such as plant closures, layoffs, or technological change." The implications for education and training appear to be more significant than previous provincial programmes.

OTAB is also currently establishing five permanent councils, or sub-committees, "to support the governing body and provide leadership to the agency." Each council is to "have the latitude to establish task groups or committees where required." The councils are "to be highly interactive with one another," and are:

- Workplace and Sectoral Training Council
- Apprenticeship Reform Council
- Labour Force Adjustment Council
- Labour Force Entry/Re-entry Council
- Public Sector Council

Sectoral Training Initiatives

The federal Sectoral training Initiative, which dates from the mid-1980s, is yet another alternative to federal funding of training. This initiative has now been integrated into the CLFDB and provincial training boards in cooperation with

the CEIC, now named Human Resource Development Canada. The central objective is to:

create stronger sectoral partnerships among labour, management and governments to develop comprehensive human resource development strategies within the various Canadian industrial sectors by:

- (a) building a consensus among all labour market partners;
- (b) establishing a forum for co-operation;
- (c) developing clear occupational/skill standards through an industry; and
- (d) promoting high quality training and leading edge skills for workers.⁹

Fifty-five industrial sectors, representing approximately 60 percent of the labour market, or about 8 million workers, will be covered by the Sectoral Training Initiatives \$250 million funding package during the 1994-1999 period.¹⁰ The sectoral approach is relatively new, having been adopted from France, where it was pioneered in the retail food sector by the Centre d'études et de recherches sûr les qualifications (CEREQ) and l'Agence nationale pour le développement de l'éducation permanente (ADEP).¹¹

The definition of a *sector* was based upon several decades of CEIC and Statistics Canada development of the Canadian Classification and Dictionary of Occupations (CCDO) [now renamed the National Occupational Classification (NOC) and the Canadian Occupational Projection System (COPS)].¹² A sector comprises:

a national group of companies, organizations, or workers which share some relevant combination of products, services or technology which results in their having common human resource concerns.¹³

The importance of this approach is that it signals a departure from federal focus upon industries, *per se*, and the recognition that employee knowledge, skills, competencies and standards are common to many enterprises, even if those enterprises are not in the same economic sector.

The key programme and funding components are:

1	sectoral studies	100 percent HRDC
2	sector council	100 percent HRDC - one year development phase - 90 percent HRDC/10 percent industry - first year - 70 percent HRDC/30 percent industry - second year - 50 percent HRDC/50 percent industry - third year - 100 percent private sector - subsequent years
3	occupational standards	50 percent HRDC/50 percent private sector
4	skills upgrading	costs shared between HRDC and private sector.

To date, the Initiative has undertaken eleven (of the proposed 55) human resource sectoral studies and established twelve sectoral councils, of which the Automotive parts Sectoral Training Council (APSTC) appears to be the most promising, since it is the only council that has opted to develop and deliver its own training instead of "purchasing" training from either public institutions or private consultants.¹⁴

The APSTC is bi-partite in its structure at all levels with full support from both the Canadian Auto Workers (CAW) and the Auto Parts Manufacturers Association (APMA). The Council Board of Directors is made up of four CAW nominees, four APMA nominees, and three *ex-officio* members: one federal government representative, one provincial government representative and one representative of the Ontario Colleges of Applied Arts and Technology (CAATs).¹⁵

The Council has developed and is delivering a 120-hour training programme to production workers, leading to the receipt of an "Auto Parts Certificate." Although only 13 of the 300-400 auto parts manufacturers presently participate (since many small enterprises are non-union), the three Council training sites have been operational since January, March and April 1994, respectively and the first phase of certificate training will be completed by the end of the year.¹⁶

A formative evaluation of this innovative initiative is expected within the next few months.

Where Does Canada Stand in Terms of Global Competitiveness?

We have all read articles on the global economy, been assaulted on the CBC by "experts" decrying Canada's lack of competitiveness and been told by politicians that our labour force is not sufficiently competitive, which we are also told is why Canada is losing thousands of jobs. It is claimed that it costs 40 percent more to produce goods in Canada than the U.S.A., a statistic which has changed significantly from productivity parity with the USA in 1980.

Well, for every "gloom and doom" guru I have found that there may be several others who conclude that Canada is, at the very least, holding its own globally, and at best may even have (34 percent) higher labour productivity than Japan, according to the Japan Productivity Centre. What we have here is an interesting range of productivity indices: 40 percent below the USA and 34 percent higher than Japan. I won't even venture to guess which index reflects reality.

With the exception of "Venture" on the CBC it seems to be "the nature of the (media) beast" to report only the bad news. There are quite a few "bright spots," or good news items which indicate that Canadian enterprises and workers are -- and can be -- internationally competitive. The rhetoric, noted to have pervaded the 1993 federal election campaign, reflected this good-news/bad-news dichotomy.

I suggest that part of the problem faced by the media, politicians, business leaders and educators -- and caused by some "experts" -- is that they are too close to one narrow field of expertise. In short, they suffer from terminal professional myopia! Or, in the parlance of Canada's forest industry, they can't see the forest for the trees.

Any discussion of global competitiveness must first recognise that Canada is one of the ten largest industrial economies in the world and is a major trading nation. At the end of World War II Canada was the fifth largest industrial nation in the world. Some critics charge that Canada has become a post-industrial society without ever having fully industrialized. Personally, I think that this latter charge is patently unfair and definitely untrue. Such statements reflect the Canadian propensity for self-deprecation.

In fact, Canada *exports* about 25 percent of its Gross National Product -- the total of all goods and services exchanged in our economy. In monetary terms, this means that Canada annually exports \$5,300 per person! In comparison with other OECD countries, the Canadian economy actually out-performed the economies of the other OECD countries between 1983 and 1988 and has continued to do so throughout the 1989-1993 recession/depression, albeit at a lower rate of growth.

Unfortunately for global competitiveness, Canada's major trading partner is the U.S.A., to which about 75 percent of our exports are destined. Canada exports over \$200 billion to the U.S.A. each year. This factor has both advantages and disadvantages, since the recent recession in the U.S.A., coupled of course with the unbalanced Free Trade Agreement and its equally unbalanced successor, The North American Free Trade Agreement, plus our current misadventure in taxation -- the GST -- has impacted quite hard on the Canadian economy. However, a longer-term examination of our trade relations with the USA suggest that our long-standing two-way traffic in ideas, as well as goods and services, has usually operated to the disadvantage of Canada.

Canada has historically relied upon the export of basic resources: minerals, timber, agricultural produce and fish. This resource-dependency for Canada's historic income growth resulted in a high standard of living. This suggests that there is limited substance to the charge of Canada never having fully industrialised.

During the past three decades these basic commodities have been produced cheaper by dozens of other nations. This has led to weak demand for our resources. What is needed to maintain Canada's competitive advantage are high-value-added (in production processes), export-oriented industries using the newest technologies. In turn, this industrial strategy *requires* better-trained workers. It may also require a more forward-looking management. The federal government *Learning Well ... Living Well* discussion paper stated that:

As the world moves towards a knowledge-based economy, Canadian jobs are being threatened by a new kind of competition -- low-wage, low-skill competition is being replaced by high-wage, high-skill competition. Although we are still successful exporters of energy and raw materials, Canada is losing ground to industrial competitors who are simply better at inventing, designing, manufacturing and marketing. Our competitors will gain not by undercutting us, but by outsmarting us.¹⁷

The shift from resource-based economies to service and informatics-based societies has intensified both capital and labour inputs. A "horse-and-buggy" education is anachronistic in a high-technology workplace environment which demands informed employees. Nations with an under-skilled work force are increasingly incapable of competing with those nations which have invested in the knowledge and skills of their employees. Actual and functional illiteracy and innumeracy can no longer be tolerated for reasons of both productivity/competitiveness and safety.

The safety aspect was poignantly illustrated about five years ago by the death of a Japanese labourer, who unknowingly strayed into the programmed path of an industrial robot. This hapless worker was the first recorded casualty of the informatics age!

On the positive side, the Canadian performance in industrial restructuring and adjustment appears to have maintained our international competitiveness. While accounting for only two percent of global production, Canada accounts for 3.1 percent of world trade in goods and services.¹⁸

Let's examine some of the "gloomy" statistics on unemployment and endeavour to get below the surface to understand their dynamics. Currently, unemployment is at 11.2 percent of the labour force, or 1.5 million persons. Our federal government would prefer that we focus upon the 90 percent -- or 12.4

million -- who are employed, but that is little comfort to those not earning incomes and suffering the concomitant loss of self-esteem!

Canada has lost about 260,000 jobs since the Free Trade, NAFTA and GST misadventures, combined with the current recession -- or depression; with 150,000 of those jobs lost in the manufacturing, or productive, sector of the economy. Yet, while 1.5 million are unemployed there are about 300,000 jobs which cannot be filled each year because they are in high-skill, high-technology areas for which Canadians have not trained. Further, a Statistics Canada survey showed that 14 percent of Canadian manufacturers were facing production problems due to a lack of skilled labour. Talk about a paradox!

Educational and Training Implications

Employees must be able to learn -- during their entire lifetimes -- in order to adapt to the changing world of work. This will require skill upgrading, the acquisition of new skills, and broadening the range of employees' existing skills. These new learning requirements have necessitated the reform of the educational and training systems which deliver such skills and knowledge. The *Prosperity Through Competitiveness* report from the federal government stated that "the challenge is to build a system of lifelong learning that provides all Canadians with relevant skills."¹⁹ We must accomplish this in spite of demographic changes that have resulted in a declining number of youth entering the labour force.

In 1991, over 5.5 million Canadians over age seventeen pursued adult education or a training course, which is 27 percent of that age group. Unfortunately, the majority of these adult students had post-secondary levels of educational attainment, whereas the need for adult education and re-training is more likely among those with lower levels of educational attainment. While only 16 percent of those with some high school took adult education and/or training courses, 51 percent of Canadians with university degrees pursued additional education and/or training.²⁰

Unfortunately, Canadian manufacturers invest less in both training and research and development than most other industrial nations. This sector has failed to adopt what is known as a "training culture." In addition, Canadian manufacturers are relatively slow in the adoption of new technologies. The Canadian Labour Market and Productivity Centre noted that the lack of a "training culture" in Canada was so pervasive that only about 25 percent of firms -- mostly larger employers -- offer formal training to their employees.²¹ Even this pittance is "concentrated in short-term courses which are ... primarily delivered to managerial, professional and higher technical staff." Their studies also indicated that "Canadian business spends less than 0.5 percent of payroll on formal training programmes ... less than half the level in the U.S., which in turn spends less than other advanced industrial nations." The *Prosperity Through Competitiveness* paper also noted that:

The number of research scientists and engineers in Canada (4.5 per thousand members of the work force) is well below that of our key international competitors, particularly Japan (8.1 per thousand). The low level of university and college enrolment in engineering and the sciences and technology appears to be based upon public attitudes that undervalue these fields as career options, especially for women.²²

The piece-meal planning and co-ordination of economies and education/training systems must give way to shared responsibility for matching workers' skill levels with the requirements of the productive, service and informatics sectors. Integrated planning requires the participation of all involved bodies: governments, employers, educators and employees. One effective mechanism to achieve such participation has been through the establishment of effective training boards at national, state/provincial and local levels, or alternatively at the horizontal level for entire industrial sectors.

Lest I be misunderstood, I am also concerned about several of the gloom and doom scenarios painted for us by the media and politicians. Among the most disturbing statistics I note that our high school dropout rate, at 30 percent, is the highest of any industrialised nation. Further, I also note with dismay that the current unemployment statistics indicate that the most severe impact is felt by those with the lowest levels of educational attainment. Youth with only some high school education experienced an unemployment rate of 23.9 percent in 1993, compared to those with a university degree with an 11.5 percent unemployment rate.²³

Even the 30 percent high school dropout rate has been unduly misunderstood because Canada has one of the foremost second-chance educational infrastructures in the world. Many of these dropouts have multiple avenues to return to school and upgrade their incomplete levels of educational attainment. In comparison with countries where dropout is truly "terminal," Canada has an institutional infrastructure which significantly reduces the lifetime impact of high school dropout. Unfortunately, no statistics have been collected to enable the calculation of exactly how many former dropouts eventually attain high school equivalence, or post-secondary education.

The *Prosperity Through Competitiveness* report links this high dropout rate with the demographic phenomenon of our "shrinking labour supply," as follows:

Compounding the problem of a shrinking labour supply is the fact that many workers, including those just entering the labour force, lack the basic capabilities required for the retraining and continuous learning that will be essential throughout their working lives.

Despite high participation rates and high levels of funding, some of the results of our educational systems have been disappointing. Our current educational systems are facing major challenges in areas such as high-school dropouts, literacy and numeracy skills and vocational training. Some 38 percent of Canadians have varying degrees of difficulty with commonplace reading tasks. Among high school graduates, approximately 30 percent cannot meet most everyday reading demands. A similar percentage lacks the arithmetic skills to follow a simple sequence of numerical operations.²⁴

The federal Stay-in-school initiative has created an unemployment "hazard index" for workers with less than nine years of schooling which depicts how the numbers of those at risk grew from 1975 to 1989. There is a significant difference between the decline in the numbers at risk during the 1981-83 recession and the current 1989-1993 recession/depression.

Moreover, Canada's record in supporting apprenticeship training does not compare favourably with other industrialised nations. Apprentices comprise 1.1 percent of total employment in Canada, compared to 7.4 in Austria, 7.1 in Germany, 1.4 in the U.K., 1.0 in France and 0.3 percent in the U.S.A.²⁵ At least, we are in better shape than France and the U.S.A! Moreover, Canada has the dubious distinction of having the oldest apprentices of any industrialised nation! In Ontario and Alberta the average age of apprentices is 26 years.²⁶

According to the CEIC policy paper *Success in the Works*, during the next decade "almost half of the new jobs will require more than five years of combined education and training beyond the completion of high school."²⁷

However, in order to remain globally competitive, even these traditional resource-based industries have been forced to modernise technologically. This has meant that many fishermen have had to return to school to learn how to operate electronic fish-finding equipment, and many foresters and miners have had to learn how to operate the automated equipment which will enable these extractive, resource-based industries to remain internationally competitive.

Given the transformation of the Canadian economy, and the fact that, since 1981, 70 percent of all new jobs have been created in the service and informatics sectors, it is necessary to focus upon issues of innovativeness and the education and training which contributes to a climate of innovation and competitiveness.

Canadian Innovativeness

The history of technological innovations pioneered in Canada, but subsequently developed and implemented in the U.S.A. and elsewhere, has prompted many writers (myself included) to conclude that Canadians are great *innovators*, but poor translators of these innovations into viable products and

processes. For example, although the Scots-born Alexander Graham Bell *developed* the telephone in Nova Scotia, it was eventually *manufactured* in the U.S.A. Another industrial "giant" resulting from development of farm machinery in Canada -- Massey-Ferguson (now known as The Varity Corporation) -- relocated its corporate headquarters to the U.S.A. after 144 years in Canada, purportedly because the majority of its stockholders reside in the U.S.A.

The fate of several successful Canadian high-technology companies has also been sealed by take-overs by multi-national corporations. For example, Lumonics, which became the fourth largest laser manufacturer in the world, was bought-out by Sumimoto of Japan in 1989. In marked contrast, two large Canadian industries which have opened branch plants in the U.S.A. (and Europe) are Northern Telecom, a manufacturer of tele-communications equipment, and Magna International, one of the largest manufacturers of automobile components in North America. Another "success story" is Spar Aerospace, which produced the "Canadarm" for the U.S. Space Shuttle and is currently building satellite communications systems for China.

An important lesson for educators, and in particular those concerned with technology is the dictum: "Those who are unaware of their history are bound to repeat it." In this regard, it is shameful that many Canadians are unaware of their nation's performance in technological innovation. Several examples might be useful in making this case.

Lesser known (in Canada) Canadian innovations include the invention of the incandescent electric light bulb by Henry Woodward and Matthew Evans, who patented their more-advanced discovery six years before Thomas Edison. In fact, Edison purchased their patent rights while conducting his own experiments in 1879. The Woodward and Evans discovery utilised nitrogen-filled bulbs, as do those greater than 40 watts today. The first commercial jet passenger airplane was also manufactured in Canada in the late 1940s by the same firm that developed the AVRO Aero, but just look at our commercial aviation industry today! In marked contrast, the development of the snowmobile by Bombardier in Quebec in the 1930's actually led to the growth of another major Canadian industrial corporation.

Another, relatively little known, Canadian innovation in education and training is DACUM, a method for Developing A CURriculum, which originated in community colleges in the Maritimes in the 1960s. Most people believe that DACUM is an American invention and it is refreshing to see its Canadian origins acknowledged in American publications!²⁸ DACUM is a variant of systematic job analysis that produces *terminal performance objectives* used as inputs to curriculum development. In contrast to job analysis systems that send "experts" to the workplace to study jobs, DACUM brings curriculum developers together with industrial, management and union representatives to determine the objectives, subordinate industrial or service tasks and operations to each objective, and determine the most effective sequence and timing for training. DACUM takes

place during three-to-five day sessions, during which each task is written on a 3x5 card and subsequently placed below each performance objective on the wall of the conference room. After protracted discussion, agreement upon the placement of each card is reached and a photograph is taken of the wall. This photograph is then converted into a DACUM Chart for use in training programme design and/or curriculum development, usually by individual community colleges.

The reasons for Canadian lack of follow-through are quite elementary: Canada has a population of 26,991,600 endeavouring to enjoy the same standard of living as our southern neighbour with ten times the population and market size. Furthermore, the concentration of that population is disproportionate, with 9.9 million in Ontario, 6.8 million in Québec, 3.2 million in British Columbia, 2.5 million in Alberta and 1.1 million in Manitoba, with all other Provinces having markets of less than one million. Moreover, the bulk of the Canadian population is concentrated in a 200 km. wide strip just north of the 49th parallel border with the U.S.A.

What distinguishes Canadian "losers," such as Woodward and Evans from "winners," such as Northern Telecom, Spar Aerospace and Bombardier, was their access -- or lack of access -- to development capital. Thus, capital-formation potential is equally important to technological innovation and smaller nations are often unable to generate sufficient development capital. A major problem is keeping Canadian capital in Canada. A great deal of Canadian money is invested elsewhere, rather than in Canada. The same high interest rates which currently stifle investment and consumer confidence constitute a federal government policy intended to encourage investment in Canada. One interesting exception has been the innovative role played by le *Depôt des Placements* in Québec, which has used its pension funds as development capital for investment in Québec industries. This adds the important issue of confidence in the Canadian economy to the other ingredients of this complex problem.

If these factors are coupled with the small total market size and its uneven distribution, it is not difficult to see why the implementation of technological innovations has been sporadic in Canada. The impact of these realities upon technological education is equally multi-dimensional.

Economists tell us that in addition to the "traditional" inputs of capital and land, economic development is also dependent upon the quality of a nation's human resources. That is, those nations with a more highly educated and trained labour force are better placed to compete in the global marketplace. This is a message which is often neither received, nor understood, by our politicians, entrepreneurs and business people. The importance of education and training in the economic development process is finally being recognised, albeit by too few politicians.

Technological change and the concomitant shift from the productive to the service and informatics sectors imply that re-training of employees will become

an increasingly important feature of competitive economic systems. Success in initial education and training, therefore, is viewed as the "key" to the successful re-training of the workforce. The Canadian Labour Market Productivity centre noted that "technological advances are significantly altering economic activity: and "raising skills requirements." Consequently, "workers already in the workforce will need to be retrained regularly." They further noted that "the effective application of new forms of technology will be the single most important source of job creation, wealth and value-added in the years ahead." During the present decade, it was noted that almost half the new jobs created will require more than five years of combined education and training beyond the completion of high school. Their report concluded that "Canada's ability to compete in a knowledge-based, technology-driven world will increasingly depend on its success in training and retraining workers."

One place to begin changing our perspectives would be by recognising that during a person's lifetime s/he will, most likely, have more than one job! Of course, we will have to get Statistics Canada, the Census, and many other number-crunching agencies to amend their forms to allow people to indicate more than one "job."

Another valuable lesson about finding the "right" solution to the "right" problem I learned several years ago. In 1985, I was asked to assist the Portuguese Interagency Network (PIN) in Toronto with a study of unemployed Portuguese males. Most of those studied were construction labourers who had been in Canada for 10 to 20 years.

PINs original intention was to re-train these unemployed labourers as cabinet-makers and other types of self-employed craftspersons. However, in our study we found that most of these individuals were illiterate -- both in Portuguese and English. They had never needed to learn English, since their forebears were either Portuguese, or Italians.

Therefore, instead of initiating re-training in other occupational areas, PIN began literacy classes in both Portuguese and English, in association with George Brown College. The "right" solution was found, once the "right" problem had been identified!²⁹

This type of myopia has not been confined to politicians, governments and organisations; it also affects many employers. I learned some other valuable lessons in 1979 when I undertook a Manpower Survey -- what we now call a HRD Survey -- for The Canadian Jewellers Institute. I found this industry to be a microcosm of everything that was wrong with employer attitudes towards training in Canada.

While interviewing employers in order to determine future HRD and training requirements, I pointed out to them that most of the craftspersons had been immigrants to Canada and that many of these were now at, or near,

retirement age. I asked them what steps they had taken to address these problems. The answer I received in one large chain manufacturing firm was mind-boggling.

The respondent pointed to one craftsman and said: "Well, Dominic here retired last year, but he comes in and works part-time." This was this forward-looking employer's solution to the problems of recruitment and training! Recall what I said earlier about the lack of a "training culture" among Canadian businesspersons!³⁰

Where the Jobs Are -- and Are Not

The deficit-panic and fiscal conservatism shared by both federal and provincial politicians has had a dramatic impact upon public sector employment. Politicians appear to have become captured by their own rhetoric and have initiated brutal reductions of public sector jobs and salaries, starting with Bob Rae's mis-named "social contract" (only George Orwell could admire Rae's "doublespeak!") in Ontario and extending to Ralph Klein's brutality in Alberta, John Savage's surgery in Nova Scotia and Clyde Wells' cuts in Newfoundland. The impact of this public sector savagery upon the educational systems which must produce the trained human resources to ensure Canada's future can only be disastrous. This is short-term gain which will produce long-term pain! Let us examine the numbers.

After three decades of government expansion, public-sector employment has been attenuated at an alarming rate during the past two years. In total, provincial government cutbacks have eliminated 20,302 jobs in health services, 9,311 jobs in education, and 4,000 in public administration.³¹

In contrast, as Canada emerges from the current recession/depression, private sector employment is expanding, albeit at somewhat discontinuous sectoral rates. The non-government health and social services sector has hired 22,759 at health rehabilitation centres, nursing homes, ambulance services and day-care centres. Large retailers, restaurants and grocery chains have hired 21,499 during 1993/94. Automobile parts manufacturers and assemblers, mainly located in Ontario, have hired 14,516 workers during the past year. The forest products industry has hired 14,351 workers during the same period.³²

However, a disturbing trend has plagued this private-sector employment growth. The majority of these "new" positions actually comprise the re-hiring (or replacement) of workers laid off during the 1990-1993 recession/depression. In the automotive parts and assembly sector, for example, employment is currently at 80,000, but has failed to reach the 1989 employment peak of 96,300. Thus, from a low point of 74,100 positions in 1991 it appears that only 14,516 of the 22,200 workers who lost their jobs during the recession/depression have been re-employed.³³ The deficit of 7,673 lost jobs is not likely to be restored. Perhaps, some of the difficulties which politicians have with these complex issues relates to their misunderstanding of cyclic employment fluctuations and their misreading

of employment -- and unemployment -- statistics. After all, in-numeracy is not confined to the un- and under-educated!

The reason that this net job deficit is unlikely to be restored is that automotive parts and assembly employers have substituted investment in nearly one billion dollars worth of robotic capital equipment for investment in new jobs. In addition, employers appear to be squeezing more output from the existing workforce through overtime. As a result, productivity per worker has risen from \$153,000 in 1989 to \$212,000 in 1993, or nearly forty percent in four years.³⁴ This net job deficit is part of the trend which has seen the Canadian manufacturing sector lose jobs at a consistent rate. In 1990, the manufacturing sector incurred an annual decline of 5.4 percent.³⁵

The education and training aspects of these capital-substitution and labour productivity maximisation strategies deserve our attention. If trends in Japan are replicated in Canada -- and it is apparent that they are being replicated -- what has become known as "cross-training" is likely to become prevalent in Canadian industry. Cross-training refers to the training of production workers in more than one field, or skill area. That is, in addition to training in the mechanics of industrial robots, workers are also trained in the electronic circuitry of this equipment so that they can install, maintain and repair this sophisticated equipment.³⁶

A significant problem with "cross-training" is that it runs afoul of union jurisdictions, since the "mechanical" workers may be in one union while the "electrical/electronic" workers may be in another. Inter-union co-operation is an important aspect of Sectoral Training Initiatives and those which have been successful have also had success in negotiating agreements between unions, as well as between labour unions and management.

Education and training considerations also apply to those employment growth areas identified in knowledge-based and technology-intensive fields, particularly in service and high-technology industries. Economists predict that nearly 60 percent of new jobs created in Canada during the present decade will be in service industries. This continues the trend of shifts in employment from manufacturing and toward services that has been seen during the past decade. Fields with high potential for employment growth are noted to be:

- business and personal financial services
- automotive parts fabrication and assembly
- non-metal (i.e., plastics) fabrication
- office machine manufacture and repair
- computer software production
- communications
- medical laboratory technologists
- pharmaceutical manufacture

- biotechnology production
- environmental protection

The implications for educational inputs and enhanced on-the-job and/or in-service training are quite evident, since all of these employment growth fields require a good basic *technological* education in mathematics, science, computer usage and technology. It is not difficult to conclude that provincial educational systems must improve their curricula, instructional materials, teacher competencies and guidance counselling capabilities in order to upgrade the "outputs" of our educational systems.

Comparisons between Canada and other nations

These remarks have provided some of the background necessary to compare Canadian conditions with those in other countries. We shall now endeavour to describe several "models of excellence" which I shall then compare with the current -- and possible future -- situation in Canada.

The models which I shall examine are from Brazil, Germany, Great Britain, Singapore and Sweden. The feature which these models have in common -- and now share with Canada -- are that they all have National Training Boards. As of 1991, Canada also has a new national training board infrastructure that has completely altered the training situation -- thus far only on paper!

Canada also shares with Brazil and Germany the status of being a federal nation. While Canada has ten provinces and two territories, Brazil is composed of 22 states and four territories and Germany has 13 *Länder*, or states.

In Canada, as noted above, our Constitution reserves exclusive jurisdiction over education to the Provinces. The German and Brazilian situations are nearly identical with the *Länder* and states responsible for education. Both Brazil and Germany, however, have federal ministries of education -- in addition to state ministries -- but Canada has no federal ministry of education. Some might recall that Joe Katz (founding president of the CIESC) lobbied for years for the creation of a National Education Office for Canada.

In contrast, Singapore is a unitary state which is about the size of Metropolitan Toronto. Sweden is also a centralized state with 24 regional and/or county governments, plus Stockholm. In both countries, the central government has had exclusive responsibility for education and training. In 1991, however, Sweden decentralized its infrastructure to the county level.

Great Britain has a central government Ministry of Education, but delivery of education has long been decentralised to Local Education Authorities. Curriculum reform during the 1980s led to the development of a National Curriculum and the National Council for Vocational Qualifications (NCVQ) has modernised technical curricula with the introduction of standards.

Before I present mini-case studies of these "models of excellence," I am certain that some doubters in the audience will question why I chose these particular nations.

Brazil was chosen because it has what I have long called the best national occupational training system in the world. Brazil is currently reforming its SENAI system (with Canadian assistance) to create a post-secondary technician-technologist training capability. In my opinion, Singapore has the second best national system -- and is now engaged in its third reform of that system in three decades! Brazil competes with Canada in the production of commuter aircraft, automobiles, footwear, pulp and paper and probably many more areas which I have failed to recall. Singapore has created internationally competitive industries producing machine tools, electronics, optics, etc.

Sweden is considered to be a model of excellence because it has long been the "social safety net" model for Canada and, yet, has developed a more viable industrial infrastructure than Canada with only one-third the population. Sweden also has similar resource-based extractive industries and produced two indigenous automobiles, while Canada hasn't done that since McLaughlin sold out to General Motors in 1919.

The German economic performance, coupled with low inflation, has made it a model of excellence. Would that Canada could produce automobiles, electronics, machine tools, etc. to compete in quality and price with those fabricated in Germany. Our examination of the training system that produces the educated labour force to facilitate such production may assist us in improving our competitive performance.

Great Britain has probably experienced the most dramatic reform oscillations in its education and training systems of any nation between 1970 and 1992. Britain had a levy grant funding system between 1964 and 1973, in which tax rates varied by industrial sector, but replaced it with a levy exemption system. Canadian unions have consistently argued in favour of a levy, or payroll tax, to pay for training, but have consistently been frustrated by business representatives. Our politicians have also engaged in this dialogue with both Bob Rae and Jean Chrétien expressing preference for a training levy and then promptly forgetting such promises after assuming office!

While I have chosen not to examine Japan in this paper, since training is delivered on-the-job to graduates of secondary and post-secondary education, I did choose to examine Germany, which I find to comprise a much better model to study than Japan. However, since Singapore has decided to replicate portions of the Japanese model -- and combine it with innovations borrowed from other nations -- I don't think that Japan will be missed in my analysis.

Singapore has evolved rapidly from an entrepôt trading economy in the 1950s to a viable and competitive industrial power in the 1980s and is now implementing plans to become a major world business and informatics centre.

With absolutely no natural resources, the Singaporean miracle has been grounded upon its investments in human resources. The power of the Singapore model is, therefore, important to examine.

Brazil

SENAI, The National Industrial Learning Service, was created in 1942 by The Federation of Brazilian Industries. SENAI is the oldest national training board, having been established during World War II when the loss of imports from Europe and North America obliged Brazil to industrialise. Elements of its training system were adopted from Germany and Switzerland in 1938 for the São Paulo State Railway by its founder, Ricardo Mange.

SENAI benefits from an industrial levy comprising a tax of 1 percent on industrial payrolls to finance its training activities. Training is delivered both in pre-service SENAI Centros de Formação Profissional (SENAI Schools) to 14 - 18 year old apprentices, as well as to employees requiring upgrading and/or re-training in industries. SENAI is currently creating 14 high-technology, post-secondary level technician and technologist training centres as part of its reform and modernisation. SENAI is regarded as a non-formal educational institution, although it often resembles formal institutions in many respects.

The SENAI system is held in such high regard in Brazil that when the former military government merely hinted that they wanted to abolish it they were besieged by over 2 million letters. Their students consistently outperform academic secondary students on national examinations. The SENAI performance is so well regarded that six Brazilian states contract with SENAI to operate their secondary vocational schools.

The SENAI model was replicated for the commercial and service sectors with the creation of SENAC (National Commercial Learning Service) in 1946 and SENAR (National Rural Learning Service) in 1976. In addition, the SENAI model has been successfully transferred to 19 other Latin American and 2 Caribbean nations.

The SENAI *serie metodica ocupaçõais* (Shopwork Methodical Series) curriculum has been developed through task analysis.

The method comprises a task sheet describing operations inherent to each task ("what" the trainee should do), an operations sheet showing "how to" perform each operation, a technological information sheet describing the tools and equipment essential for the performance of each operation, and (from 1974) a complementary information sheet explaining the "why" of an operation or set of operations, in order to introduce relevant theory into this practical training system.

The apprenticeship cycle of the SENAI system follows five steps: (1) study of the task, (2) development of a work plan, (3) demonstration by the instructor and/or through individualised multi-media packages and application by the trainee, (4) performance of the task in the workshop and (5) evaluation to assess task mastery.³⁷

The method has been adapted to the service and information sectors in Brazil by SENAC and to activity analysis elsewhere. Activity analysis enables the design of curricula in the service, informatics and social sectors, since it focuses more upon the information and actions necessary to perform jobs than technical knowledge and procedures. In Ontario, similar analyses are undertaken by former Ministry of Skills Development Apprenticeship Division, which has been folded into OTAB, but most actual curriculum development still is performed at the CAATs.

Among the features which set SENAI apart from most other national training systems are its high degree of autonomy, centralised planning and co-ordination of operations, and the fact that nearly every aspect of the system is planned from the curriculum upwards. That is, facility design, equipment procurement, training consumable supplies, instructor training, etc. are all planned to deliver the Shopwork Methodical Series.

The curricula are designed centrally by experts in task analysis and then used to design, build and equip the Centros de Formação Profissional (SENAI Schools) and, subsequently, to order and deliver training consumable materials to each school when needed. This high degree of planned integration does not appear to have been replicated by any other training system.

Sweden

The Swedish experience contributes to our understanding of how long-established systems adapt to changes in economic conditions. Sweden has a clearer distinction between formal educational and non-formal "training" institutions than does Brazil.

In 1944 a National Board for Vocational Schools was established through co-operation of government with The Swedish Employers' Confederation (SAF) and the Swedish Labour Union Confederation (LO). The reform of upper secondary schools in 1970 integrated vocational and academic subjects under the National Board of Education (NBE). Under the NBE, a system of 24 County Education Committees was responsible for technical and academic education.

In 1991, the National Board of Education was abolished and replaced by a smaller National Agency for Education. The County Education Committees have been replaced by decentralised Municipal Education Authorities, responsible for the planning and execution of education and training. The state subsidy for education is to be given to the municipalities as a lump sum, based upon the

number of students; a system similar to that operating in Canada. This means that a long-established, centralised, hierarchical system has been decentralised to the local government level.

Successive reforms have resulted in the integration of the old apprenticeship system, dating from 1846, into a revised upper-secondary school stage (*Gymnasieskolan*), which enrolls over 90 percent of the secondary school age group. The vocational streams have consistently been the first choice by a majority of students, following the completion of the compulsory junior secondary school. The 1991 reform is reducing the 22 curriculum "lines," or streams, developed after the 1970 reform, to sixteen.

This structure for the delivery of school-based technical-vocational education is paralleled by the National Employment Training Board (NETB) which is responsible for training within industries and enterprises. Prior to 1986, labour market training was under the joint authority of the NETB and the NBE. The AMU Group was created in 1986 as an independent authority to deliver employment training at 24 regional AMU Centres, extending decentralisation to the non-formal sector.

Germany

Under the 1969 Vocational Training Act (*Berufbildungsgesetz*) the Federal Institute for Vocational Training (BIBB) is responsible for national training policy, while the *Länder* (states) have Chambers of Commerce and Industry responsible for *dual mode* apprenticeship training within industry. Administrative autonomy is delegated to BIBB, which is composed of representatives of business and industry, labour unions, employers and vocational training institutions. The Act applies only to on-the-job training, further training and vocational re-training, but not to vocational schools which, since Germany is a federal state, are under the jurisdiction of a Ministry of Education in each *Länd* (state). The *dual system* provides for a division of responsibilities between employers and government in which employers release apprentices to *Länd* (state) vocational schools for one or two days per week, while receiving in-company training during the remainder of the work week.

The Act stipulates that youth up to 18 years may only be trained in a recognised training occupation. The German dual system requires quadra-partite training board participation (i.e., government, employers, labour and education) since part of the training is delivered in institutions and part through in-plant training.

BIBB has the authority to decide, together with appropriate government ministries, the content and length of training for each occupation. Between 1969, when the Vocational Training Act was promulgated, and 1990 the number of trade areas recognised in training ordinances has been consolidated from 600 to 378. The 3 to 3 ½ year training period culminates in a final examination set by a Board

of Examiners with equal employer and employee representation and, at least, one vocational school instructor, established by the Chambers of Commerce at the Länd (state) level.

In marked contrast to those systems which have recently undergone broad-based reforms, the German dual system has merely been fine-tuned during the past two decades. It is interesting to note that the appeal of the dual system is so widespread that it is currently being adopted by Singapore, considered by Israel, and elements appear to have been borrowed by the new Canadian Labour Force Development Board. However, we should also note that BIBB has encountered difficulties in establishing its *dual system* in the new Länder created after the absorption of the former DDR.

Singapore

Following the decision to industrialise in 1960, a vocational stream was introduced at the secondary school level in 1965, just prior to independence in 1965. The Technical Education Division (TED) of the Ministry of Education was established in 1968. The TED adapted transferred elements of TVE aid projects from the U.K., Canada, Australia, Israel and the ILO to create an effective TVE system for Singapore's newly industrialising economy.

In 1973, the Industrial Training Board was created and the apprenticeship system was reformed in 1975. A National Trade Certification (NTC) system was established in 1973 and in 1977 the Ministry of Education introduced a Basic Course for the weakest primary school students, which was to be followed by ITB institutional TVE and employment. In addition, all secondary students falling below the GCE "O" (Ordinary) Level examinations after three attempts were offered a place in the ITB's NTC Grade 3 (semi-skilled) courses. Skills training is delivered by the VITB at the basic, certificate and diploma levels, which are roughly comparable to training offered in Ontario at the CAATs.

The creation of the Vocational and Industrial Training Board (VITB) in 1979 reformed the system by amalgamating the Industrial Training Board and The Adult Education Board. In addition, the Skill Development Fund (SDF) was established to finance TVE by a levy on wages of four percent (later reduced to 1 percent). All TVE facilities were transferred from the Ministry of Education to the VITB and the educational system itself was reformed by the introduction of a comprehensive New Education System. The underlying philosophy of the New Education System was that "the best preparation for employment is a sound education, configured around "bilingual ability, mathematics and science as the core." This system is now the most streamlined educational system in the world (with three primary and three secondary streams, according to language ability) and rivals that of Japan in many respects.

In 1991/92, as part of its third reform, entitled "integrating fronts," the VITB was renamed The Institute for Technical Education (ITE) and the German

dual system was adopted. All students are to be retained in school for ten years to complete a minimum basic secondary education. A fourth secondary stream was added to accommodate students previously retained in primary school for 8 years in the unilingual stream. This stream re-introduced the technical stream phased out and transferred to the VITB in 1979. TVE has been "reformed in parallel" and "will henceforth be purely post-secondary." The objective of the latest reform is to channel 25 percent of secondary graduates to university, 40 percent to the three Polytechnics, and 15 percent to the labour market. "The social objective is to make appropriate training for employment available for every school leaver."

Singapore is a fascinating laboratory for the study of TVE reform, since it has dramatically reformed its system three times in the span of three decades. Each reform has been introduced in concert with transformations of the Singapore economy; initially from entrepôt trading to industrialisation, then in a transition to a high-technology, export-oriented economy, and most recently towards the development of a total international investment and business centre capturing high-end, high-value-added (including R & D) manufacturing and a centre of specialist brain services.

I have labelled the VITB/ITE as the second best national training system in the NICs. The World Competitiveness Report (1990) ranked the Singapore workforce ahead of South Korea, Taiwan and Hong Kong in terms of (1) labour-saving technology, (2) employee turnover, (3) skilled labour, and (4) worker motivation and second to Hong Kong in labour flexibility.³⁸

Great Britain

An example of dramatic shifts from one extreme to another is Great Britain, which has experienced three phases since the 1964 Industrial Training Act. First, a levy-grant system supported Industrial Training Boards (ITBs) established in up to 24 industrial sectors. This was called "the most effective incentive mechanism for both increasing the volume and improving the quality of training."

Then, the 1973 Employment and Training Act introduced central co-ordination and planning of national labour force policy, in order to correct some of the shortcomings of the 1964 Act. The introduction of state funding for the ITBs made them dependent on the exigencies of government, vulnerable to policy changes, and subordinated industrial requirements to those of central government. Many writers have compared Margaret Thatcher and Brian Mulroney in terms of their conservative economic policies, but too few comparisons have been made of their similar education and training policies.

The Manpower Services Commission (MSC) was created to co-ordinate the ITBs and funding was changed from the levy-grant system to a more bureaucratic levy-exemption system. In other words, the balance was upset. While the Thatcher government was initially prepared to subsidise shortfalls in training

costs, subsequent policy changes devolved training to voluntary efforts by employers and/or employer organisations.

Although the Conservative government (1979 to date) attempted to reduce levels of funding, the riots of 1981 and high levels of youth unemployment made it politically expedient to launch the Youth Straining Scheme in 1983 as a one-year scheme, which was eventually extended to 1986.

In 1988, Britain wound up, or privatised (by increasing employer representation), all but one of the remaining ITBs and shifted responsibility for training to Training and Enterprise Councils (TECs). Although the Thatcher government devolved responsibility for training to employers, in terms of company, sectoral and local level decision-making, the employer-dominated TECs administer government funding for training schemes for youth and the unemployed, as well as pilot-testing Training Credits. The TECs -- known as Local Enterprise Councils (LECs) in Scotland -- which were established in 1990 are also one of the models for the Canadian Local Training Boards. At least, our local board approach includes labour and education/training representation, whereas the TECs/LECs in the U.K. do not.

The 1988 Education Reform Act introduced a National Curriculum, which deals with primary and secondary schools for compulsory education up to the age of sixteen years. The 1983 Technical-Vocational Education Initiative (TVEI) was incorporated into the 1988 reform. The TVEI intended to make education more work-related and provided for work experience in the curricula.

Curriculum reform initiatives also include the 1986 The National Council for Vocational Qualifications (NCVQ) efforts to reform the hodge-podge of traditional qualifications bodies, including The London City and Guilds Institute (1878), Business and Technical Education Council (BTEC) (1983), etc., which set curricula through control over examinations. Since the early 1980s, the City and Guilds has also been converting its conventional curricula to a competency-based curricular format to comply with the NCVQ initiative.

The NCVQ infrastructure established "Lead Bodies" in each industrial and service occupational area to develop competency-based standards and the curricula to instruct to the level of each standard. These Lead Bodies comprise employer, employee and professional representatives to specify the standards of skills and knowledge required and establish these competencies in National Vocational Qualifications (NVQs). Occupational standards are based upon outcomes of learning, regardless of mode, duration or place of learning. NCVQ has accredited the qualifications awarded by City and Guilds, BTEC, etc., by adding a competency-based component to their curriculum development activities, rather than by replacing them.

Prais (1989, 1991) has critiqued the NCVQ approach for (a) adopting lower standards than in Germany, France, Austria, Switzerland and the Netherlands with the long-term consequence that the British workforce will not be

raised to European standards; and (b) the NCVQ standards ignore minimum levels of educational attainment on the one hand, and practical performance measures on the other. He further critiqued the NCVQs by noting that the occupational standards were likely to number in the thousands and be unmanageable.

Similar reforms of occupational training standards have been initiated in Canada as part of the Sectoral Training Initiative and, quite recently, by the CLFDB and OTAB. I hope that our reform efforts prove to be more forward-looking than those in Britain.

Comparisons of Training Boards

How does our new federal/provincial/local training board infrastructure measure up, in comparison to the global models of excellence examined? How can we ensure that what is on paper becomes translated into viable realities?

From this somewhat incomplete juxtaposition of national training board features we can see that the new CFLDB and OTAB:

1. appear to be viable in terms of size;
2. share decision-making by consensus;
3. are quadra-partite with the involvement of government, labour, employers and educational institutions;
4. have Secretariats responsible for co-ordination and research;
5. operate at both centralised national level and decentralised to provincial and local levels;
6. appear to have secure sources of finance.

In addition to these similarities, several differences are evident, including:

1. finance diverted from Unemployment Insurance income maintenance to pay for training/re-training;
2. involvement of social action sectors in addition to the "customary" partners;
3. levels of federal-provincial-local hierarchy appear to be linked;
4. no direct responsibility for the delivery of education and training.

Table 2

	Canada	Brazil	Germany	Sweden	Singapore
Name	CLFDB	SENAI	BIBB	NETB	VITB/ITE
Composition	22	25	50	n/a	19
Affiliation	HRD Canada	Fed. of Ind.	Chambers of Commerce	Government	Ministry of Education
Hierarchy	Federal Provincial Local	Federal State -	Federal Landers Firm: Workers Councils)	National Municipal -	National n/a -
Membership	Government Employers Labour Education Social Action	- Employers Labour	Government Employers Labour Education	Government Employers Labour Education	Government Employers Labour
Executive Committee	Co-Chairs Business & Labour	Directors	-	-	Director
Size of Secretariat	Secretariat (2)	National (2) Council (2)	-	-	-
Secretariat Functions	Research Coordination	-	Research Co-ordination		
Decision-Making	consensus	-	consensus	consensus	consensus
Training delivery	No	Yes	Yes	Yes	Yes
Finance	UIC	Ind. Levy	Employers	Government	Ind. Levy

Comparison of National Training Board

From these preliminary comparisons I shall highlight some significant differences which I suggest may cause problems with the CLFDB and OTAB. First, the fact that both training boards are continuing the Canadian compromise practice of purchasing training seats from autonomous community and technical colleges may cause difficulties. We all know that the colleges jealously guard their autonomy and freedom to devise curricula and offer courses. As I noted above, I can only hope that the local training board infrastructure will work closely with the colleges to revise curricula and courses to meet local HRD needs. Further, this is likely to perpetuate the competition and contention between the CAATs and Local School Board Adult Education activities.

Secondly, the different mechanisms for financing education and training are also likely to cause problems. The diversion of ten percent, or \$775 million, of Unemployment Insurance funds from their social safety net support functions of income maintenance is not the panacea which it appears to be at first glance. All of the other models examined either finance education and training directly from government tax-based revenues, or through employer contributions directly, or indirectly through industrial levies on payroll. No other jurisdiction has chosen the route of combining social support and education/training. In fact, this appears to constitute the subversion of one set of goals and objectives with antithetical goals and objectives.

Labour unions are against using UIC funds to train employed workers, but have no problem with their use to train unemployed workers. I find myself in agreement with that position. I suppose that we have created a laboratory to test such assumptions. In addition, it is reported that the current Minister of Human Resource Development, Lloyd Axworthy, also does not support the training of employed workers, rather, favouring training of the unemployed, and may also not favour the sectoral training approach. Thus, it is conceivable that the current reform of social programmes could also affect the activities of the Sectoral Training Initiative of HRDC and the CLFDB in the near future.

Probably the most interesting aspect of the new Canadian training board infrastructure is that for the first time we have created a hierarchy of structures which should facilitate communication between levels of government, deliverers and consumers of education/training. We can only hope that this reform will make a difference. I hope that I have pointed out exactly what is at stake.

Another problem that I see with the current evolution of Canadian training boards lies in the very nature of business participation. If one of these businesses is foreign owned, I suspect that this might jeopardise local training board participation -- and effectiveness. It is also questionable whether business will continue to support the Sectoral Initiatives once federal funding ceases.

While the current Canadian post-secondary training reform is just beginning, it can be observed that the reform is structural and regulatory in its

orientation. The reform also appears to be focused upon the reorientation of goals and objectives, changing the policy-making and administrative power structures, the financing mechanisms, and the relationships between institutions delivering training and the consumers of training in the extractive, productive, service and informatics sectors of our economy. Even though it is unstated, I believe that another goal is to foster the creation of a training culture in Canada -- similar to those found in Germany, Sweden, Japan and Singapore. The federal and provincial focus upon sectoral training appears intended to create constituencies favourable to the institutionalisation of training as a normal attribute in the workplace.

Finally, the training culture, which has evolved in Brazil, Germany, Sweden and Singapore does not yet appear to have evolved in the U.K., nor has it developed in Canada. I can only hope that it will develop -- but I remain sceptical!

Endnotes

- 1 With apologies to Rick Moranis and Dave Broadfoot, who created the "hoser" characters.
- 2 Originally The British North America Act of 1867 and since the 1981 "repatriation," The Constitution of Canada.
- 3 John D. Dennison and Paul Gallagher, *Canada's Community Colleges: A Critical Analysis*. Vancouver: University of British Columbia Press, 1986, pp. 35.36.
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