Training for the New Economy

A Synthesis Report

Gordon Betcherman
Kathryn McMullen
Katie Davidman

1998

ISBN 1-896703-29-1

Available from:

Renouf Publishing Co. Ltd.
5369 Canotek Road
Ottawa, ON K1J 9J3
Tel.: (613) 745-2665
Fax: (613) 745-7660
Home Page: http://www.renoufbooks.com

Contents

Foreword

Canada is well into the Information Age and, some would argue, well on the road to a knowledge-based economy. Some of the characteristics of this new economy are clear – the growing predominance of information andcommunications technology, fast-paced change, increasing skill requirements, changes in the employment contract, and signs that the "good job, bad job" gap continues to fracture the labour market.

It has been an article of faith in Canada that education is the great equalizer. And, indeed, the evidence shows that individuals with a postsecondary education have the basic tools to assist them as they navigate the knowledge-based economy. But, not all Canadians enter the labour market with the same educational base. Those without a postsecondary education have less access to the well-paying jobs that require advanced education and skill development.

And, since we live in a world of change, a solid educational basis, though necessary, is not sufficient to see an individual through his or her working lifetime. Skills upgrading, training, and adaptability have all become the watchwords for today's worker. In the new economy, much essentiallearning takes place outside the public education system, after one becomes an adult worker – in the workplace, in the community, and in the burgeoning industry of private training institutions. The evidence shows that those who already have a solid educational base are the ones who acquire more skills, either because employers focus their training efforts on those individuals or because they seek out their own training. But, access to this essential learning is problematic for many Canadians, especially for those with a weak educational base and for the growing number of Canadians who do not have a long-term attachment to an employer.

This report offers a portrait of the labour market in the new economy of the late 1990s. It documents the emerging training market in Canada, and describes the strengths and weaknesses of that market. The report concludes, in section 4, by mapping a new role for governments in the adult learning system, where individuals are asked to shoulder more and more of the responsibility for learning. This role includes a number of dimensions, including maintaining a strong commitment to, and support for, accessible and affordable formal education for all Canadians; supporting efficiency in human capital markets, by assisting in the identification of occupational and training standards, for example; brokering collaborative relationships among and between the education system, training providers, and industry; and facilitating the labour market entry of youth, in part by creating skill acquisition opportunities for the lesser educated among this group.

Gone are the days when governments funded, designed, and delivered training programs. The emerging role for governments is one in which they must act as broker for divergent interests, foster collaboration, create innovative credit instruments, and encourage the development of more robust information and signalling systems to guide the choices of both students and training providers. Can governments perform these roles? What are the tools? Some tools are obvious, others still require careful feasibility work. But one thing is clear: the new economy demands new behaviours.

What is also clear is that there are genuine payoffs to employers who invest in training and to individuals who undertake training. At the same time, however, the life chances of those who do not have access to lifelong learning are seriously diminished. Inequality in access to the training market exacerbates existing inequalities arising from differences in individuals' initial educational attainment and skill base.

The ideas presented in this report are a synthesis of the research and policy analysis undertaken for the Employment and Training Project, which was designed and coordinated by Gordon Betcherman and Kathryn McMullen, who were later joined by Katie Davidman. Mr. Betcherman and Ms. McMullen have been research partners since the early 1980s and have worked together on a number of projects relating to the changing labour market. The details of the research that was undertaken as part of this project can be found in a series of five background studies that have been published

by CPRN over the past 18 months (see Appendix A).

I wish to thank the federal and provincial governments and agencies that provided the funding for the project. I also thank the members of the Advisory Committee, which, in addition to representatives of the project funders, included labour and academics; their advice throughout was extremely valuable. I wish to thank as well four very helpful reviewers for their insightful comments and suggestions on an earlier draft of this report.

Judith Maxwell
June 1998

Acknowledgments

This report is the culmination of a multi-year CPRN project on training and the changing employment structure. Over the course of the project, there have been too many people to cite who have influenced our thinking and helped to shape the ideas we have put forward in this report. Most obviously, we have learned from the different researchers who contributed the studies for CPRN that provide the basis for this synthesis. These individual studies have been published by CPRN over the past two years (see Appendix A).

We also wish to specifically acknowledge the Training Project funders and Advisory Committee members, both listed at the end of this report. Also, we would like to thank four anonymous reviewers, as well as Abrar Hasan, Education and Training, Organisation for Economic Co-operation and Development (OECD), Lenore Burton, Canadian Labour Force Development Board, and Hans Schuetze, Centre for Policy Studies in Education, The University of British Columbia, for their helpful comments and advice on an earlier draft of the report.

At CPRN, many people contributed to the preparation, production and release of this report. We want to particularly acknowledge the efforts of Gisèle Lacelle, Sylvia Burns, Jacques Fortin, Louise Séguin-Guénette and Elisabeth Richard. Most importantly, we want to acknowledge Judith Maxwell, who made the CPRN Training Project happen and who contributed substantially to many of the ideas that are central to this report.

1. *Human Capital in the New Economy*

This is a report about preparing Canadians for the new economy.

First the "new economy." Pundits quibble over the term and exactly what it means, but, fine points aside, there is consensus that a major economic transformation has taken place over the past two decades. This has involved an extension of markets and a retrenchment of government, more open economic borders, a new "technological paradigm" based on microelectronic information and communication technologies, and an ongoing shift to service- and information-based activities. This restructuring, coupled with a range of social, cultural, and demographic changes, has had a significant impact on our working lives. Patterns of labour force participation have changed. Traditional industries, occupations, and communities have declined while new ones have emerged. And the content of work and how it is organized have been evolving rapidly.

Canadians and their governments are uncertain about this new economy and its labour market for two reasons: first, the mediocre performance of the 1990s – the persistently high rates of unemployment, the slow growth in output and productivity, and the stagnant real earnings; and, second, recognition that the "rules of the game" have changed and that no one is quite sure what the new ones should be.[1] What individual strategies make sense for finding a good job and for building financial security? What should firms be doing to enhance competitiveness and business performance? What public policies will support aggregate growth, job creation, and an equitable income distribution?

Economic theorists and business gurus alike agree that the key to the new economy is *intangible assets*. While forests, mines, and "physical" capital (i.e., plants and equipment) continue to generate income and some jobs, they are no longer the main sources of growth. Knowledge generation, innovation,

networking capabilities, the ability to invent new products, research and development – these are the intangible factors that increasingly determine economic success for individuals, for firms, and for communities, regions, and entire nations. Physical capital still matters, but invisible forms of capital, including human capital, matter just as much and probably more.

The key thing about invisible capital is that it is driven by the skills and knowledge of people. Thus it is a short step from acknowledging the primacy of intangible assets in the new economy to emphasizing the importance of human capital investments through education and training.[2]

But beneath this consensus lies a number of troubling paradoxes that raise questions about the most appropriate education and training strategies:

- Why have productivity and income growth barely budged in spite of the large increases in the stock of human capital (as measured, for example, by the educational attainment of the population) over the past two decades?

- Why do business strategies that are based on "just-in-time" principles and not longer-term investment in people seem to have diffused so widely at a time when management strategists and economic theorists are touting the importance of concepts like "lifelong learning" and "learning organizations"?

- Why do there seem to be underemployment problems for some educated workers, especially young workers? Are we underutilizing the human resources we already have?

These paradoxes make it difficult for individuals, employers, and governments to decide how much they should invest in human capital development, what investments should be made, and how.

In this report, we draw together the results of a recent CPRN project on training and the changing employment structure to address the following questions:[3]

1. What are the employment patterns and skill requirements in the emerging labour market?

2. What are the implications of these trends for human capital investment?

3. What should individuals, employers, and governments be doing to ensure that Canadians are prepared for, and benefit from, employment in the new economy?

Our specific concern is with labour force preparation throughout the work life, and thus we have chosen to focus on the ongoing education and training of adult Canadians. However, we do recognize that the most important human capital investments are those made early in life. Strong basic skills are an absolute prerequisite for effective participation in the labour market and providing these skills must be the first priority of education systems in every jurisdiction. They set the foundation for the adult education and training systems addressed in this report.

The next section analyses the employment structure in the postindustrial economy. We last looked at this at the beginning of the decade in two Economic Council of Canada reports, *Good Jobs, Bad Jobs* (1990) and *Employment in the Service Economy* (1991). At that time, based on data through the 1980s, we documented the various ways in which the labour market had evolved since the first few decades following World War II. Most obviously, this included an ongoing shift to service industries and white-collar employment, a labour market segmented into "good" and "bad" jobs, and higher levels of skill and education as a prerequisite for employment in the "good jobs" sector characterized by high wages, fringe benefits, and career development opportunities.

Since 1990, the broad lines of the postindustrial labour market have become clearer. In short, the trends we documented at the beginning of the decade have intensified since then. The shift to services has continued, as has the labour market segmentation. The 1990s have also been characterized by the decline of low-skilled work. And the importance of human capital as a determinant of employment outcomes has strengthened. Now, a strong basic education coupled with ongoing investment in human capital are simply essential for navigating through the labour market. Individuals without them

– and there are far too many Canadians in this group – are almost certainly relegated to the "bad jobs" sector or to the margins of the labour market. In essence, then, we ultimately endorse the truisms of the "postindustrial" economy – upskilling and the increasing economic importance of intangible assets based on the skills and knowledge of people.

Obviously, once one accepts this profile, it follows that human capital must be seen as a critical factor in determining the economic well-being of individuals as well as the performance of firms and the economy more generally. What we attempt to do in section 3 is to examine Canada's current training activities in light of the labour market changes documented in section 2. Special attention is paid to workplace training, in part because this is probably the least well documented component of the overall human resource development system. And, in fact, our own research shows that workplace training can generate high rates of return both for employees and for employers.

In the final section, we consolidate our argument around four conclusions.

The first is that the "postindustrial" labour market differs from the industrial-era labour market in three important ways that matter for workforce preparation:

- Labour demand has shifted toward the highly skilled. *This has raised the stakes for gaining access to training.*

- New participation patterns are altering the rhythms of learning and working. *This requires more flexibility in terms of both delivery methods and when people can access training*.

- The changing nature of employer-employee relationships is altering the economics of human capital investment. *This downloads the responsibility on to individuals to ensure that they invest in themselves.*

Our second and third conclusions relate to the training infrastructure and training patterns:

- Second, a *training "market"* has emerged in Canada. Compared to two decades ago, a "supply side" consisting of a diverse range of commercial and non-commercial training providers now exists. The variety and dynamism of this supply side offers considerable potential for lifelong learning in the future.

- Third, one segment of the labour force – largely composed of those who already have substantial human capital – is well served by the current state of affairs. This group finds itself in a *virtuous circle* of a strong skills base, challenging job requirements, and additional human capital investments. However, too many Canadians, including many young people, are in a more *vicious circle* of skills deficits, underinvestment, and declining employability. If Canada is to avoid creating an underclass of poorly educated people, it will have to give more serious attention to the distribution of training.

Fourth and finally, we argue that, while the evolution of a training market is a positive response to the requirements of the new economy, there are *failures in that market.* The polarization trend is the most obvious evidence of this. These failures stem from investment barriers that ultimately boil down to problems involving information, time, and money. It is these market failures that governments must now address – not through the traditional approach of direct funding and delivery, but through carefully selected initiatives to improve information and access. Governments also have an important role in ensuring that Canadians have a strong basic educational foundation and that the proper incentives exist for everyone to continue investing in their human capital throughout their lives. However, within this general framework, much also will depend on the commitment of individual Canadians and their employers to invest in skills formation.

2. *The Postindustrial Labour Market*

Understanding the labour market trends is a key first step in considering how Canadians should be investing in their human capital. This chapter addresses this from three perspectives.

First is the shape of the emerging employment structure, what economists call the "demand side." Where are the jobs? What kinds of skills are required? The second involves the "supply side," specifically labour force participation patterns. People are making time-use choices about paid work, schooling, family responsibilities, leisure, and retirement that are very different from those made a generation ago. Thus the rhythm of learning is changing accordingly. The third concerns the nature of the employment relationship (i.e., the matching of supply and demand), which is also undergoing changes, including a growing incidence of self-employment and nonstandard employment.

The Changing Structure of Employment

Obviously, training and adult education systems must be responsive to the demand for labour. Unfortunately, it is difficult to specifically pinpoint the future areas of job growth. Demand projections are fraught with technical limitations and with the inevitability that their predictions will never come true because the labour market will continuously adjust to demand (and supply) conditions.

However, at a general level, it is clear that the transition to a post-industrial economy is being marked by a continuing shift of employment into service industries, white-collar occupations, and information-intensive activities.[4] Moreover, as we will see, technological change is contributing to an upskilling process that is reducing the demand for unskilled workers and

raising the stakes for investing in education and training. This process is being reinforced by organizational changes that many employers are introducing, often in conjunction with the adoption of new technology.

The upskilling has various aspects. Certainly it includes a growing demand for sophisticated technical skills. But it has also raised the premium for more general skills, often referred to as "employability" skills. These include literacy and numeracy, plus other social and cognitive abilities (see Box 1). The importance of these general competencies cannot be overstated in the postindustrial labour market.

In *Good Jobs, Bad Jobs* and in *Employment in the Service Economy* (Economic Council of Canada, 1990; 1991), we found that the shifts to service industries, white-collar occupations, and information work were well underway in Canada. Returning to these issues in the late 1990s, we find that the trends have accelerated so that, for all intents and purposes, Canadians are now working in a postindustrial labour market. This does not mean that resources and manufacturing are no longer important to the economy. They still are, both in terms of their share of total output and in their role in generating demand for services. However, from an *employment* perspective, their significance has diminished considerably.[5]

The Industrial and Occupational Composition of Employment

Between 1976 and 1997, employment grew in the service sector at an average annual rate of 2.3 percent, while employment growth in the goods sector was negligible, at an annual rate of 0.4 percent (Table 1). As a result, the share of total national employment in services increased from slightly below two-thirds in 1976 to close to three-quarters in 1997. During the slow-growth 1990s, goods sector employment has actually shrunk by 0.2 percent annually, while services have expanded at 1.2 percent per year.

The service sector, in fact, consists of a wide range of diverse industries. In our analysis, we use the following classification of the sector:[6]

- *Distribution services*: transportation, communication, utilities, wholesale trade

Box 1

Employability Skills

As skill requirements change in response to technological and organizational change, employers are placing an increased focus on "employability skills." The education system, too, is re-examining the kinds of skills taught in schools as it seeks to ensure that the skills of school leavers keep pace with changes that are taking place in the workplace.

Analysis of changing labour demand often leads to the identification of a common set of basic employability skills. As set out by the Conference Board of Canada, these include:

1. Academic skills – communication, thinking, learning

2. Personal management skills – positive attitudes and behaviours, responsibility, adaptability

3. Teamwork skills.

Strong literacy skills are often perceived as a fundamental basis for the development of basic employability skills. They more generally stand as a proxy for a range of other skills. Commonly cited organizational benefits associated with a workforce with strong employability skills include an increased ability to undertake training, better team performance, improved labour-management relations, and increased quality. Employees with these skills benefit from increased self-esteem and self-confidence, and a sense of empowerment. They take greater ownership of their work, become more effective decision makers, and tend to become more engaged and participatory in the organization. Employees with a range of employability skills tend to enjoy higher incomes, to be employed full time, to receive further training, and are less likely to be unemployed (McLaughlin, 1992; Bloom et. al., 1997).

- *Information services*: finance, insurance, real estate, business services
- *Traditional services*: retail trade, accommodation and food, other services
- *Non-market services*: education, health and social services, public administration.

Table 1

Employment by Industry, Canada, 1976-97[1]

	Employment share			Annual change	
	1976	1990	1997	1976-97	1990-97
			(Percent)		
Goods sector	35.5	28.9	27.0	0.4	−0.2
Service sector	64.5	71.1	73.0	2.3	1.2
Distribution services	12.2	11.2	11.1	1.2	0.8
Information services	8.4	11.6	12.9	3.8	2.4
Traditional services	21.8	25.4	26.1	2.6	1.2
Non-market services	22.0	22.9	22.8	1.9	0.8
All industries	100.0	100.0	100.0	1.7	0.8

1 Distribution services include transportation, communication, and utilities; and wholesale trade. Information services include finance, insurance, and real estate; and business services. Traditional services include retail trade; accommodation, food and beverages, and other services. Non-market services include education; health and social services and public administration.

Source: Based on data from the Labour Force Survey, Statistics Canada.

Job creation has been concentrated at both the high-skill and low-skill ends of the spectrum.

The fastest growth over the 1976-97 period occurred in the information services industries, with an annual growth rate of 3.8 percent. This subsector, which includes a substantial proportion of "good" jobs, also has had the highest rate of increase in the 1990s (2.4 percent annually). Within information services, growth has been most rapid in business services, where employment expanded by 5.8 percent per year between 1976 and 1997. Certain high-technology industries have also grown rapidly. One example is

software services and development, where growth has created a number of human resource challenges (see Box 2).

As Table 1 indicates, however, employment gains have not been limited to dynamic service industries with high skill requirements. Over the past two decades, job growth has been strong throughout most of the service sector. Actually, in terms of the absolute magnitude of job growth, the most important subsector has been the traditional services like retail trade and

Box 2

Growth in the Software Sector

The software industry is an example of a rapidly growing area of the economy that raises new human resource challenges. Definitional limitations and rapid change within the sector make it difficult to measure, but the available statistical evidence points to employment growth within the sector that has far outpaced that in other industries. Between 1988 and 1996, the numbers of people employed within the industry grew by an annual average rate of 7.9 percent compared to 1.4 percent across all industries. The software industry has experienced similarly rapid levels of growth internationally, with some of the biggest players being the United States, Germany, and the United Kingdom (Organisation for Economic Co-operation and Development, 1997).

High demand worldwide for talented software workers has led to global competition for human resources. Human resource practices such as compensation levels have become important points of leverage for attracting workers. For Canadian employers, competition with their American counterparts for skilled software workers has been particularly important. As Katie Davidman will show in a forthcoming CPRN discussion paper, the need to develop ample talent for the industry has also stepped up pressure on universities, colleges, and private training schools to produce top-quality technical and innovative minds capable of adapting to changing technology in a sector where the skills in highest demand could change by the time students graduate. Once in the labour force, individuals must stay abreast of changing industry needs, particularly if they are part of the significant proportion of software professionals working on contracts, meeting the preferences of employers to hire skills on a project basis. High job mobility in the sector due to nonstandard work forms and competition for human resources creates an environment in which employers may be reluctant to invest in training an employee who they may lose, often leaving workers to seek self-directed learning opportunities.

accommodation and food where most jobs are lower paid and relatively unskilled.

Over two-thirds of employment is now in white-collar occupations. This trend follows from the shift to services; however, even within the goods sector, white-collar employment has risen substantially. Since 1976, the single fastest growing occupational group has been the managerial and administrative category, which has expanded at an annual rate of 5.3 percent. Relatively high rates of growth have also been experienced by a number of professional and technical groups, including occupations in the natural sciences, engineering and mathematics; medicine and health; the social sciences; and artistic, literary, and recreational occupations. Most of the traditional, blue-collar occupational groups have declined in both relative and absolute terms, especially over the 1990s. For example, by 1997 fewer people were employed in construction and primary occupations than at the beginning of the decade. However, employment decreases have not been confined to blue-collar positions. During the 1990s, the largest single decline has been in clerical occupations, with losses of about 265,000, which represents about one out of every eight positions existing at the start of the decade.

What Are the Skill Trends?

The occupation and industry trends show the transition to a labour market dominated by white-collar, service sector jobs. But what is happening to skill requirements? Is labour demand shifting to a more highly skilled profile? Is human capital becoming more essential for achieving success in the labour market? The answers to these questions are not obvious from the data presented to this point. On the one hand, employment has increased rapidly in some service industries that require highly skilled workers and in managerial, professional, and technical occupations. Yet the traditional services, where relatively low-skilled jobs dominate, account for the largest proportion of service jobs and have actually increased their share of total employment over the past two decades.

Skill trends change over time because of the interrelated forces of structural change to a service- and information-based economy and

technological change. The conventional wisdom has been that this new economy requires increasingly skilled workers and thus that human capital investment underpins economic progress.

But there has also been a more critical perspective contending that technological change, in particular, has an overall "deskilling" effect. This view argues that, while there may be some very highly skilled jobs created as a result of increasingly sophisticated technological change, for the most part work becomes routinized, with much of the skill content of economic activity taken over by the technology. This deskilling thesis naturally leads to very different implications about the importance of human capital investment.[7]

In part, the persistence of these divergent views reflects problems in conceptualizing and measuring the notion of "skill." Skill is, in fact, a multidimensional concept that involves both a technical component (i.e., "know-how") and a social component (i.e., autonomy and discretion). Structural or technological changes may have conflicting effects along these various dimensions. Moreover, neither of these forces are determinate in the sense of inevitably leading to specific skill effects. The work literature offers examples of how a specific technology has been applied in different cultures or even different organizations, with substantially different skill impacts.[8]

Our own research reinforces these complicating factors. In fact, we find evidence of both upskilling and deskilling in the sense that there has been employment growth at both ends of the continuum. Indeed, the "good jobs, bad jobs" theme emphasized on our earlier work still seems appropriate after weighing the evidence collected during the 1990s. However, while endorsing this polarization story, *we conclude that labour demand overall is shifting in favour of skilled workers*. There are two reasons for drawing this conclusion: first, the relative share of employment requiring low levels of skill is declining and, second, the competition for these jobs is growing and, increasingly, includes well-educated people. Thus the labour market is becoming more and more inhospitable for unskilled Canadians.

To support this conclusion, we present four lines of evidence below.

1. *Decomposing "information" work*

The structure of employment has been shifting increasingly into "information" occupations – that is, occupations that are involved in the production, transmission, and interpretation of data. Following a methodology used by Osberg, Wolff and Baumol (1989) and the Economic Council of Canada (1991), we have grouped occupations into four categories – services, goods, data, and knowledge. The latter two are what are considered to be information occupations. "Data" occupations (for example, clerical workers and bookkeepers) deal with the production of data and are generally considered to be lower-skilled. "Knowledge" occupations (for example, engineers, managers, and writers) are concerned with the development and interpretation of information and are considered to be higher-skilled.

Trends in the employment of information workers over the 1971-95 period are shown in Table 2. Two key points stand out. First, the share of employment in the information occupations grew substantially over the period, rising from 45 percent of employment to reach almost 60 percent. This increase was evident in all sectors, but most notably in the goods sector and the dynamic services sector (which consists of both distribution and information services). Second, the nature of information work has been shifting from the lower-skilled data occupations to the higher-skilled knowledge workers. Overall, this ratio dropped from just over 5 data workers for each knowledge worker in 1971 to about 2 in the 1990s. Thus, as the share of information workers is increasing, so too is the employment share of highly skilled occupations within that group.[9]

2. *"Occupational traits"*

Some evidence on trends in the skill dimension of employment is available from detail that is embodied in occupational classification systems. The Canadian Classification and Dictionary of Occupations (CCDO), for example, assigns measures to five dimensions of "skill" for each occupation: specific vocational training required, general educational development required, cognitive complexity, task diversity, and responsibility.[10] While there are limitations with this approach, the CCDO data do offer an

Table 2

Information-based Employment, Canada, 1971-95[1]

	Proportion of information workers				Ratio of data-to-knowledge workers			
	1971	1991	1995L[2]	1995C[2]	1971	1991	1995L[2]	1995C[2]
	(Percent)							
Goods sector	22.1	34.3	34.4	37.8	2.51	1.01	1.03	0.94
Service sector	59.2	63.8	63.7	64.1	6.80	2.93	2.89	2.67
Dynamic services[3]	63.8	72.7	73.2	73.7	5.81	2.32	2.29	2.06
Traditional services	50.6	53.3	52.5	53.0	24.24	3.34	3.23	3.05
Non-market services	62.3	66.5	66.9	67.0	4.84	3.46	3.49	3.26
All industries	45.1	57.3	57.4	58.5	5.35	2.48	2.48	2.27

1 Information workers are involved in the creation and transmission of information. They include data workers who are involved in the production of data and knowledge workers who are involved in the creation and use of data.

2 1995 "L" refers to linear projections (based on fixed occupational coefficients) and "C" to curvilinear projections (based on occupational coefficients that reflect recent trends). These projections were made by COPS.

3 Dynamic services include distribution and information services.

Source: Economic Council of Canada (1991, Table 6-5) and calculations by Ekos Research Associates based on Census data supplied by COPS.

interesting perspective on how the occupational composition has changed in terms of these five traits.[11]

Applying these trait measures to the occupational employment data from the Census, Leckie (1996) finds support for the skill upgrading thesis. The results, summarized in Chart 1, show that, for each of the five skill dimensions, the proportion of employment in occupations requiring the highest level of skill increased by 5 to 7 percentage points between 1971 and 1991 while the share in occupations requiring the lowest skill levels declined by a similar amount.

3. *Effects of computer-based technologies*

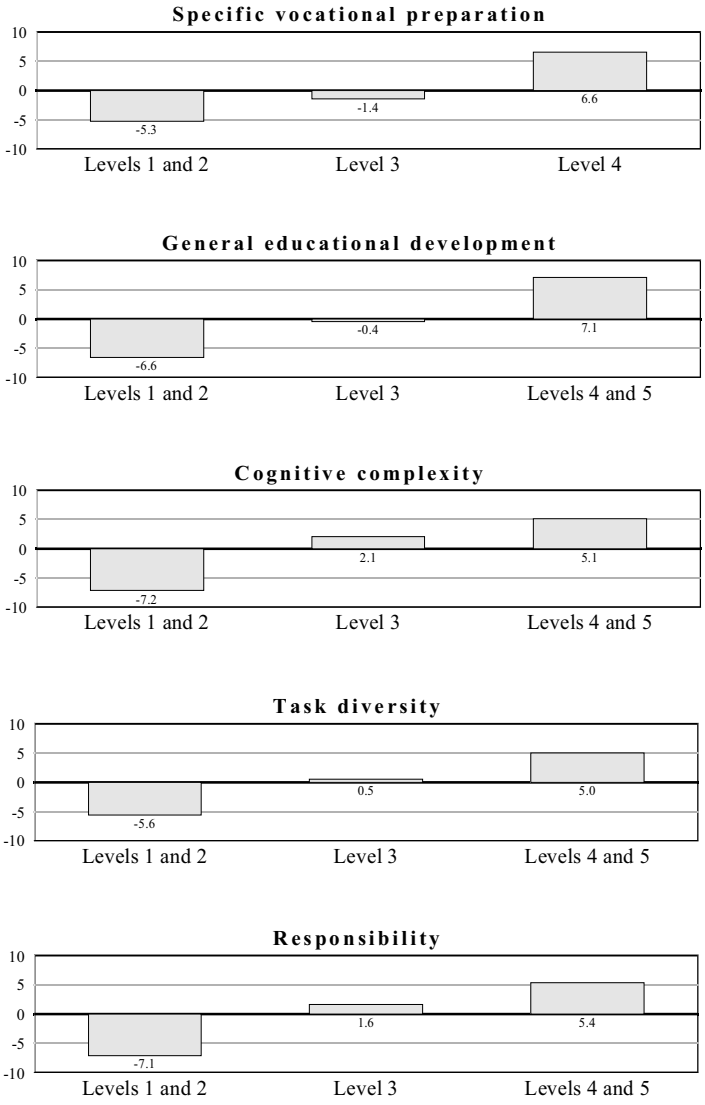
Technological change enters into our story in a number of ways. At the most aggregate level, changes in the industrial composition of the economy are propelled in part by technological innovation. New technologies also change the employment profile within industries both by altering the demand for different occupations and by affecting the content of work done by a given occupation.

Relevant evidence on these impacts has been generated by the Working with Technology Survey (WWTS), which we have carried out three times over the 1980s and 1990s.[12] The WWTS tracks the adoption of computer-based technologies (CBT) in Canadian establishments and it documents the ways in which skills and employment are changing as organizations transform themselves around the technology. Admittedly, the diffusion of computer technology does not represent the sum total of technological change in the economy; nevertheless, most observers agree that it is the fundamental or "general purpose" technology of this age.[13]

By the 1990s, almost all firms participating in the survey had CBT applications in their workplace and many, in fact, had adopted the technology much earlier. Our estimates, supported by other sources, indicate that, by the middle of this decade, almost one-half of employees in this country were regularly using computers in their jobs.[14] What has been striking in the 1990s has been the "deepening" of computer use within establishments, including the ongoing process of networking, which has integrated diverse applications. Where this deepening is taking place, the effects of CBT on the

Chart 1

Changing Skill Requirements: Change in Employment Shares, 1971-91



Note: Skill measures increase with rising skill level.
Source: Based on data from Leckie (1996).

demand for labour are becoming increasingly significant. What we have found is that employment impacts of the technological change have become more consequential with each successive wave of the survey.

These impacts are occurring via two channels: through the effects of CBT on the occupational composition of employment and through its effects on job content.

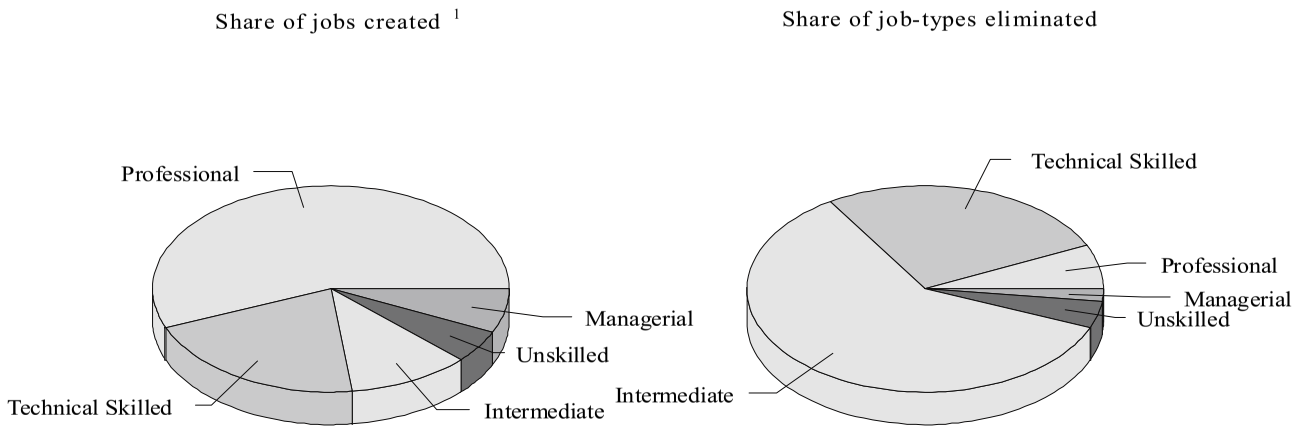
Technological change alters the occupational makeup by destroying certain types of jobs and creating others. There has long been debate about what these precise effects are and it has been very difficult for researchers to isolate them. The WWTS asked responding companies directly what types of jobs had been created and eliminated by the adoption of CBT in their workplaces. While the survey's relatively small sample (n = 263) should be kept in mind, the results strongly support the conclusion that the sorts of positions created by computerization have been very different from those that have been eliminated (Chart 2). Professional positions accounted for over half (56 percent) of all the jobs created, whereas intermediate and unskilled positions accounted for only 16 percent. In sharp contrast, intermediate-level occupations represented close to 60 percent of the job-types that were eliminated; less than 10 percent were professional or managerial.[15]

The more detailed employment data collected in the WWTS indicate that the bulk of the positions created because of CBT were, in fact, in occupations directly related to the technology itself – computer programmers and systems analysts, and managers of information systems and data processing. Thus the survey evidence suggests that, while CBT does create new opportunities within organizations, these tend to be narrowly concentrated. On the job destruction side, just over half of the job-types eliminated consisted of clerical occupations, predominantly those requiring general office skills, office equipment operators, and finance and insurance clerks. The threat of CBT to clerical work has long been forecast and the latest results of the WWTS clearly suggest that this displacement is now occurring.

These patterns of job creation and destruction, coupled with differences in the types of workers who use computers, lead to very different occupational profiles in organizations that are major users of CBT and those that

Chart 2

Distribution of Job-types Created and Eliminated, 1992-94, WWTS III
(Percentage Distribution)



1 Weighted by number of jobs created.
Source: Based on data from McMullen (1996).

are not. Comparing "high-CBT" and "low-CBT" WWTS respondents reveals that managers and professionals account for roughly twice as much employment among the former group of companies than the latter while the employment share of unskilled employees is over three times as large in the "low-CBT" group (McMullen, 1996).[16]

As we have noted, the employment effects of CBT become more pronounced as establishments deepen their use of these technologies. Therefore, it can be expected that the occupational shifts – in favour of professional, technical and managerial employees, and away from less-skilled workers – that we have observed in workplaces that have computerized most intensively will continue as more and more organizations expand their use of CBT.

The second way in which technological change can affect skill requirements is by altering the content of work. Depending on the features of the technology and the organizational setting into which it is introduced, a technological change can either increase or decrease the skills involved in a particular job. Or, given the multidimensional nature of "skill," it can have multiple effects.

The most recent wave of the WWTS addressed this question of job content by asking establishments how the job requirements for their "core" employees had been affected by CBT over the three years covered by the survey.[17] Three components of skill were considered: know-how, problem solving, and autonomy. The results suggest that, along each of these dimensions, CBT had had a modest upskilling effect. This finding holds for the five occupational groups considered – managerial, professional, skilled technical, intermediate, and low skill.

Two other points are interesting to note from these data. First, upskilling was most evident in terms of "know-how," which refers to technical, specialized knowledge. While, on balance, respondents also reported increased requirements for problem solving and autonomy, these were not as large. Second, the upskilling was most pronounced in establishments that ranked high in terms of the extent of use of CBT, which, again, may provide some glimpse into likely future trends.[18]

In the final analysis, a key factor in determining the skill impacts of CBT is the organizational setting in which the new technology is introduced. Many researchers have noted the differences across countries or across companies in terms of how technological change has affected employment. In some situations, jobs have been redesigned in ways that require a high level of skill and compensation has been structured to reward skilled workers; in other situations, the redesign has had the opposite effect. Finegold (1992) has labelled these "high-skill equilibriums" and "low-skill equilibriums," respectively. Thus the impacts of technological change are not predetermined – to some extent, employers can choose a high-skill or a low-skill outcome. Innovation, then, has social as well as technical dimensions.

4. *Human capital and employment outcomes*

Added evidence of the shift in labour demand comes from trends in employment and earnings for workers with different levels of human capital, as represented by experience and education. In general, they show that the labour market advantages long experienced by skilled employees have been growing. This is especially noteworthy given the increasing supply of skilled workers – as evidenced by rising levels of educational attainment and the experience accumulated by the aging workforce – which, other things being equal, would be expected to result in decreasing returns to skill.

Research clearly indicates that the returns to experience have increased in Canada over the past two decades. These are manifested in the widening wage differentials between older and younger workers, especially in the case of males (e.g., Morissette, Myles and Picot, 1994; Beaudry and Green, 1997).

The evidence on the returns to education is less consistent. Some studies have found increasing wage differentials between the better and less educated (e.g., Freeman and Needels, 1992; Gottschalk and Joyce, 1995; and Riddell, 1995) while others have found no change (e.g., Bar-Or et al., 1995; Morissette, 1995). However, even where increasing returns have not been found, most analysts believe that the strong growth in the supply of

well-educated people has offset the rising skill composition of labour demand.[19]

One important aspect of the story linking human capital and employment outcomes concerns young people. This is the cohort that most directly experiences the leading edge of labour market change. And, on a number of counts, it seems that the differences in employment outcomes by educational attainment are widening for young Canadians. For example, researchers who have not observed increasing returns to education for the labour force as a whole have found them for the youth group.[20]

Also, within the youth cohort, labour market indicators such as the participation rate and the employment-to-population ratio have been diverging for the well educated and the less educated. As Table 3, Panel A indicates, while participation rates have dropped since 1980 for the 15-24-year-old group as a whole, the decline has been especially large for those who did not complete high school; on the other hand, secondary school graduates and those with postsecondary schooling had participation rates in 1997 that were only slightly lower than those at the beginning at the decade. Panel B of Table 3 tells a similar story with respect to trends in youth employment-to-population ratios by level of educational attainment. Over the 1980s and 1990s, then, the employment structure has evolved in ways that leave less and less opportunity for the unskilled and poorly educated.

A cautionary point should be made here. We have interpreted the observed widening of employment outcomes for different levels of schooling as evidence of a shift in labour demand toward skilled workers. It is possible, however, that these labour market trends could have occurred without an upskilling of the employment structure. That is, the deteriorating outcomes for the less educated may reflect a situation where there are not enough "good" jobs to accommodate the well educated who then have little choice but to compete for less-skilled positions, thereby squeezing out the poorly educated. In fact, some researchers have made this "overeducation" argument.[21]

It is difficult to sort all of this out empirically. Some interesting new evidence has been presented by Krahn and Lowe (1997) who have used data from the 1994 International Adult Literacy Survey (IALS) on the

Table 3

Panel A – Labour Force Participation Rates of Youth Aged 15-24, by Educational Attainment Level, Selected Years, 1980-97

	Primary school education (0-8 years)	Some or completed high school[1] (9-13 years)		Some postsecondary school	Postsecondary certificate or diploma	University degree
1980	48.5	67.8		66.5	82.1	81.3
1985	44.8	67.6		67.5	82.7	82.8
		Some[1]	Completed			
1990	45.5	59.1	81.7	69.4	83.6	83.3
1997	30.8	47.4	76.3	64.0	79.1	78.7

Table 3 (cont'd)

Panel B – Employment-to-population Ratios, Youth Aged 15-24, by Educational Attainment Level, Selected Years, 1980-97

	Primary school education (0-8 years)	Some or completed high school[1] (9-13 years)		Some postsecondary school	Postsecondary certificate or diploma	University degree
1980	37.7	58.3		60.3	75.0	75.6
1985	32.6	55.3		59.5	74.2	74.8
		Some[1]	Completed			
1990	34.1	49.3	71.9	62.9	76.3	77.8
1997	20.9	35.8	65.4	55.2	70.2	72.0

1 Note that prior to 1990 the Labour Force Survey included those with some high school together with graduates; from 1990 on, these two groups were separated.

Box 3

Literacy and Youth

According to the International Adult Literacy Survey (IALS), the literacy skills of Canadian youth compare well relative to older age groups. The most recent school-leaving cohort, aged 16 to 25 years, contains relatively few individuals at the lowest literacy levels, with most being at levels 2 and 3. Literacy skills are closely associated with education level and so, we find that the share of different age groups at the lowest literacy level increases with age – a reflection of the fact that educational attainment was lower for previous generations, especially those born in the pre-war years.

At the same time, lower proportions of those aged 16 to 25 are found at the highest literacy levels (levels 4/5) on the scales measuring prose and quantitative skills. This is attributable to the fact that many in this age group have not yet completed their schooling. In fact, higher proportions of those aged 26 to 35 score at the highest literacy levels, a reflection in part also of the greater work experience of this group compared to younger Canadian adults.

The Willms study from the IALS series (1997) allows interprovincial comparisons of the literacy scores of youth aged 16-25 in Canada. Willms finds that youth in the four provinces of Ontario, New Brunswick, Newfoundland and Prince Edward Island scored the equivalent of around one year of schooling below the national average. British Columbia, Alberta, Nova Scotia and Quebec scored near the national average, and youth in the provinces of Manitoba and Saskatchewan scored the equivalent of over one year of schooling above the national average. Most striking is that the interprovincial contrasts are determined largely by the performance of youth from lower socio-economic backgrounds. In other words, provinces that raised the performance of youth from less advantaged backgrounds were those which performed well overall.

The IALS also allows the literacy skills of Canadian youth to be placed in an international context. Data are published showing literacy by age on the document scale. Here we find that, compared to a number of European countries, Canada has higher shares of individuals aged 16-25 and 26-35 in the lowest literacy category. However, it is also the case that larger proportions of young Canadian adults score at the highest literacy levels. These findings parallel the results for the population as a whole, which point to a polarization in literacy skills in Canada relative to European countries, which tend to have larger shares of individuals in the middle of the literacy scale. The greatest contrast, however, is with the United States where the data suggest that a

Box 3 (cont'd)

greater proportion of young people score at the lowest literacy level and proportionately fewer score at the highest level.

Overall, the results of the IALS strongly suggest that there is little cause for alarm with respect to the literacy skills of young adults who have completed school, especially those with a postsecondary education. However, the literacy skills of leavers who did not complete secondary school are markedly poorer than the skills of others in their cohort, a factor that plays a large role in reducing their lifetime social and economic chances. This is especially the case today as skill requirements continue to rise for many occupational groups, reducing the size of the pool of jobs that do not require strong literacy skills.

literacy skills of employed Canadians and compared these with the literacy requirements of their jobs.[22] While their analysis includes just one aspect of skill, it seems reasonable to expect that the reading, writing, and numeracy abilities that they have covered are a valid proxy for a wider measure of human capital.[23] Krahn and Lowe conclude that the substantial majority of employees – about 7 in 10 – are in jobs that roughly match their literacy abilities. While roughly 1 in 10 report they have deficient literacy skills for their jobs, the remainder – about one-fifth – rate their skills as significantly greater than their job. It is this last group that is the focus for concerns about "overeducation."

This study is important because it provides quantitative evidence relevant to overeducation, or what Krahn and Lowe call a "literacy surplus," when the official policy debate tends to focus almost exclusively on the "literacy deficit." And if overeducation is indeed a widespread problem, then this casts doubt on the conventional wisdom – and our central thesis – that the labour market is evolving such that importance of human capital investment is increasing.

However, on balance, we find the the Krahn and Lowe analysis – even with the evidence of literacy surpluses – to be consistent with our "upskilling" view of the changing employment structure. Most fundamentally, as the IALS data show, there are large returns to literacy (and human capital, more broadly) and serious disadvantages for those, especially younger people, who report low skill levels. (See Box 3 on the problem of low literacy among some youth.)

What about the evidence of "literacy surpluses"? At any point in time, we can expect some people to be in jobs where they do not have the opportunity to use all of their skills. However, for a variety of reasons, this does not necessarily indicate "overeducation." In the first place, there are social and cultural benefits to education and training that should not be ignored. Second, mismatches between current employee skills and current job requirements should not be viewed in a static sense because of the dynamism of the labour market. In other words, a worker's skills cannot just be assessed against the demands of the current job but, rather, against future job prospects. It is interesting to note that the IALS data indicate that the "literacy surplus" problem is most serious among young people. Some of this would be expected as a normal feature of how careers evolve, with workers expected to move into more challenging jobs as they accumulate experience.[24] Also, once those who are unemployed or not in the labour force are factored into an analysis of literacy and job requirements, undereducation clearly emerges as the dominant problem.[25] And, finally, the quality of the labour force can influence the nature of employment in the economy; in other words, where they have access to highly educated workers, many employers will move to more challenging job designs because of the eventual productivity benefits.

In summary, the evidence reported here shows that the employment structure is changing in ways that make investments in human capital increasingly important. Moreover, a skilled labour force is significantly associated with employment growth, especially growth in the knowledge-based, dynamic sectors of the economy. The IALS data, for example, show that industries with the highest rates of job growth also have the most literate workforces (Statistics Canada et al., 1996). And, analysis of employment location patterns conducted by Coffey (1996) for CPRN concludes that employment growth in urban centres has been positively related to the educational attainment of the local labour force.

Human capital investment is absolutely essential for the employability of individual Canadians. While there unfortunately are no guarantees, skill is the key asset for participating in a postindustrial labour market, and we can only expect this to increase in the future.

New Participation Patterns

The "supply side" is also important in considering training arrangements. Here, the key issue involves the changing patterns of participation in society – through paid and unpaid employment, schooling, undertaking family responsibilities, leisure, and retirement. In the industrial era, life-cycle patterns typically involved three largely distinct stages – schooling; employment (paid in the workforce or unpaid in the home); and retirement. Formal learning was usually time bounded in childhood and youth.

Over the past three decades, however, these patterns have been changing due to both changes in individual preferences and new constraints that are affecting people's choices. As a result, we can speak of quite different participation models as we approach the end of the century. Perhaps most striking has been the dramatic rise in the labour force participation rates of women. But the new participation models are also much more fluid. Individuals often move back and forth between different "states" – between work, school, family, and retirement. These trends have important implications for the need for training and skills acquisition, and for the ability of individuals to gain access to training.

Increasing Female Labour Force Participation

The increase in labour force participation of women has, in part, been a response to economic necessity and, in part, the result of socio-cultural change. Prior to 1955, fewer than one in five women 25 years and older were in the paid workforce. In 1997, their participation rate was 57 percent. More dramatically, over two-thirds of women with preschool-aged children are now in the labour force and the majority are working full time. This change has had a major impact on overall participation rates, which have risen more than 10 percentage points over the postwar period. These long-run participation trends have heightened the importance of access to training and job-related education, especially for women.[26]

While the increasing labour force participation of women has had economic benefits for families, it also has raised issues of a social nature

that ultimately have implications for training and when it is available. Most specifically, working families face the increasing likelihood of being affected by "time-crunch" where too many, and often conflicting, work and family demands exist. This situation is exacerbated by the fact that, for growing numbers of families, the time and energy spent at work have been increasing.[27] While most often these demands affect women and their availability for education and training opportunities, it is increasingly the case that men are being affected as well.

Changing Youth Participation Patterns

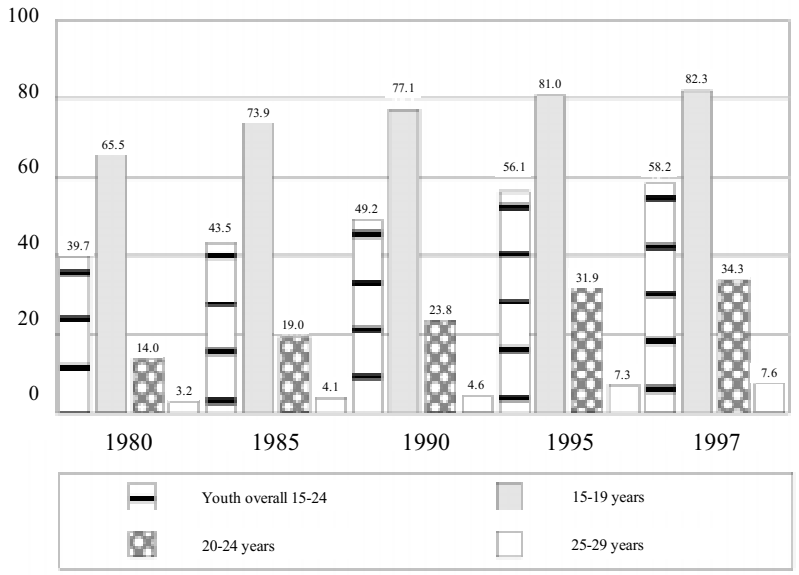
The activity patterns of young adults have also changed dramatically. Compared to a generation ago, youth are more likely to be combining school and work in some fashion. In other words, the traditional two-stage pattern of completing one's education and then entering the workforce has become less descriptive of the reality for young Canadians.

The biggest reason for this has been the increased number of young Canadians who are staying in school longer. In the late 1970s, less than 45 percent of Canadians between the ages of 15 and 24 were in school; by the 1990s, this figure had risen sharply to about 60 percent (Statistics Canada, 1997*a*). This is due both to higher secondary completion rates and increased numbers going on to postsecondary institutions. Because of the latter trend, the percentage of "older" youth – i.e., in their 20s and even up to 30 years of age – who are enrolled in school has more than doubled since 1980 (Chart 3).

The school-to-work transition has been blurred further by changes, over the past generation, in the labour force participation patterns of students. Despite the substantial declines in the overall youth participation rates during the 1990s, which we have already discussed, there still has been an increase in the participation rates for students. As Chart 4 shows, this latter rate has declined in recent years but nevertheless remains much higher than it was a generation ago. Moreover, the drop in the 1990s (from a high of about 45 percent at the beginning of the decade) almost certainly has been due to deteriorating job opportunities for students, rather than a declining interest in working.

Chart 3

Youth Full-time School Enrollment Rates, by Age Group, Selected Years, 1980-97[1]
Percent of Age-group Population

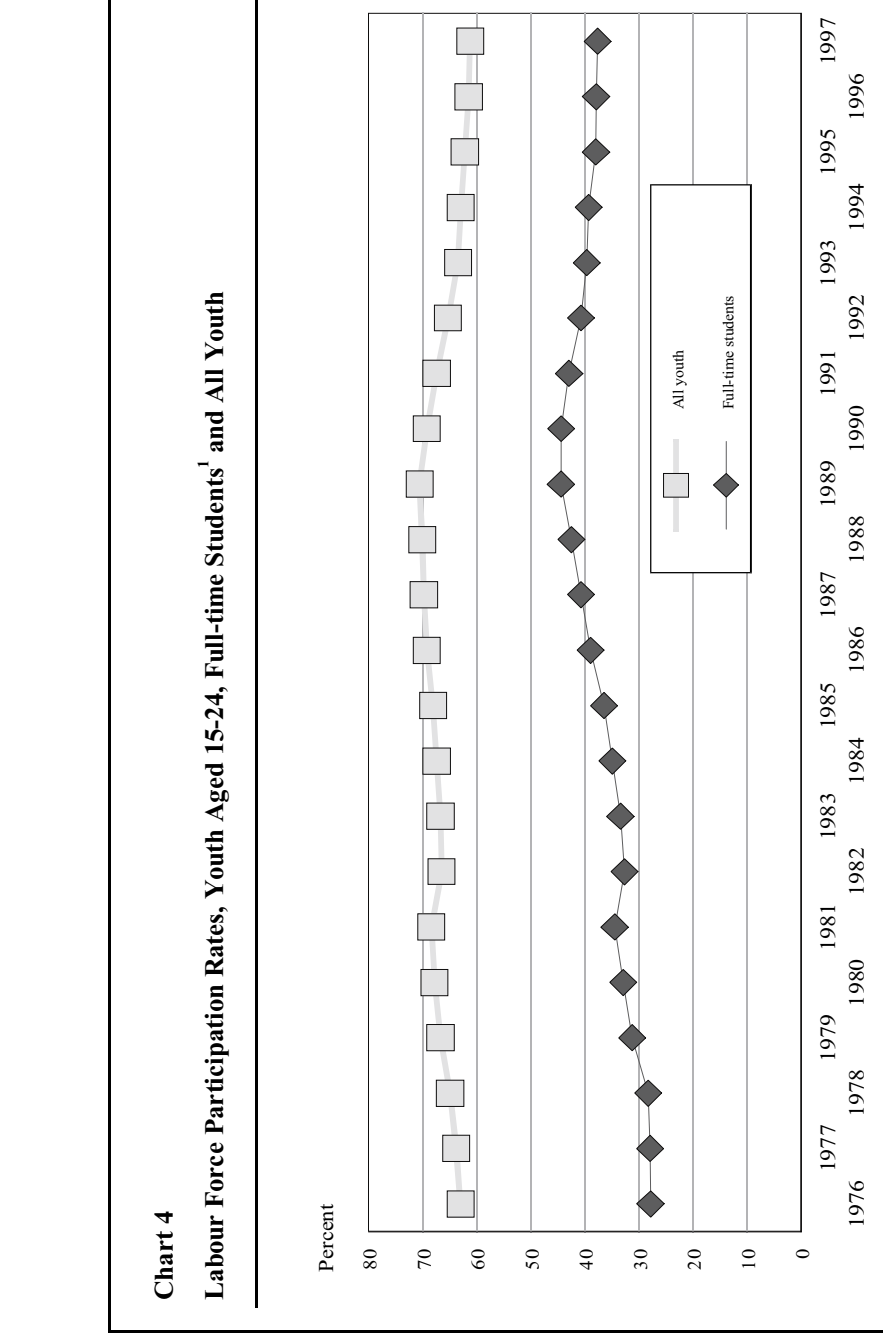


1 Eight-month averages covering the school year (January-April, September-December).
Source: Calculations based on Labour Force Survey data obtained from Statistics Canada.

These enrollment and labour force trends, then, illustrate the changes in how young people are participating in different aspects of society. In his review of the school-to-work transition carried out for CPRN, Marquardt (1996) concludes that, for many young adults, the traditional pattern of a straight-line transition from school to work has been replaced by a much more prolonged and circuitous path that often involves an extended period enrolled in formal education; periods of unemployment; employment on a part-time basis, even after completion of formal education; more movement between periods of school and work; and participation in both simultane-

Chart 4

Labour Force Participation Rates, Youth Aged 15-24, Full-time Students[1] and All Youth



1 The participation rates for full-time students are calculated using 12-month annual averages.
Source: Based on data from the Labour Force Survey, Statistics Canada.

ously. This observation is supported by Statistics Canada (1997*a*) data showing that the typical school-to-work "transition period" has lengthened by two full years since the mid-1980s.[28]

Transitions Throughout the Work Life

Changes in the cycle of formal learning are not limited to a longer school-to-work transition. It is generally agreed that the forces of technological and organizational change and market liberalization are contributing to a more rapid pace of economic restructuring. The implication of this is that workers must upgrade their skills throughout their working lives.

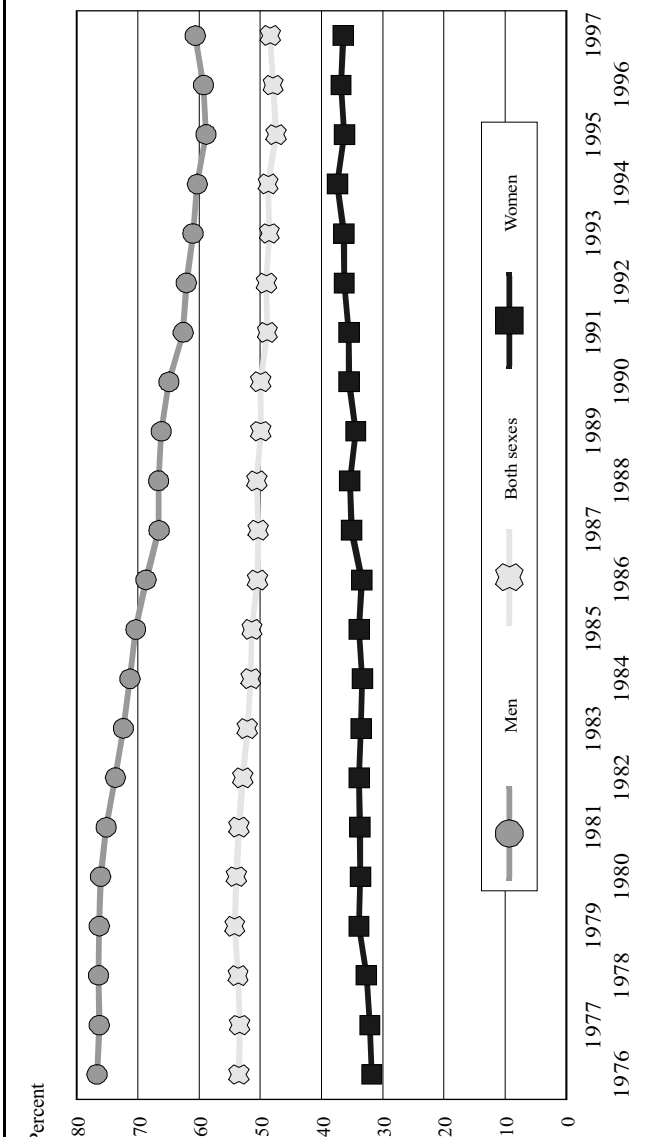
While it is difficult to provide direct statistical evidence of this, there are various trends that support the notion of more rapid change and the need for lifelong re-tooling. For example, there has been an increase in the percentage of jobs that are temporary or of short-tenure.[29] We will return to this development in the next subsection of the report.

Perhaps the most relevant circumstantial evidence, however, concerns the labour force participation trends of older workers. And, unfortunately, as Chart 5 illustrates, these trends suggest the difficulties older Canadians are experiencing in adjusting to the pace of change. Over the past two decades, the participation rate for those in the 55-64 year age group has been steadily declining. This overall figure, though, masks a much more dramatic decline in the rate for older males, which has dropped nearly 20 points over the past generation.

The declining participation of older males has been closely linked to skill levels. Drops have been greatest, by far, for those with relatively low levels of education.[30] These statistics support the labour demand shifts associated with economic restructuring that we have already discussed. At the same time, however, they highlight the importance of providing means for workers at all ages to adjust to shifting skill requirements and to re-tool for emerging industries and technologies. Ongoing access to training opportunities is essential if Canadians are to participate in the labour force throughout their working years.

Chart 5

Participation Rates, Workers Aged 55-64, 1976-97



Source: Based on data from the Labour Force Survey, Statistics Canada.

The Changing Employment Contract

Taken together, these changing "supply" patterns, coupled with what we have already learned about the upward shifts in "demand," raise a set of new imperatives for lifelong learning. The third key development in the postindustrial labour market concerns the changing nature of the employment relationship – in other words, the matching of supply and demand. This is reflected in the increasing numbers in "nonstandard" work forms, including the growing ranks of the self-employed. The effect of this development has been to increasingly place the responsibility for training onto individual workers themselves.

Increasing Nonstandard Employment

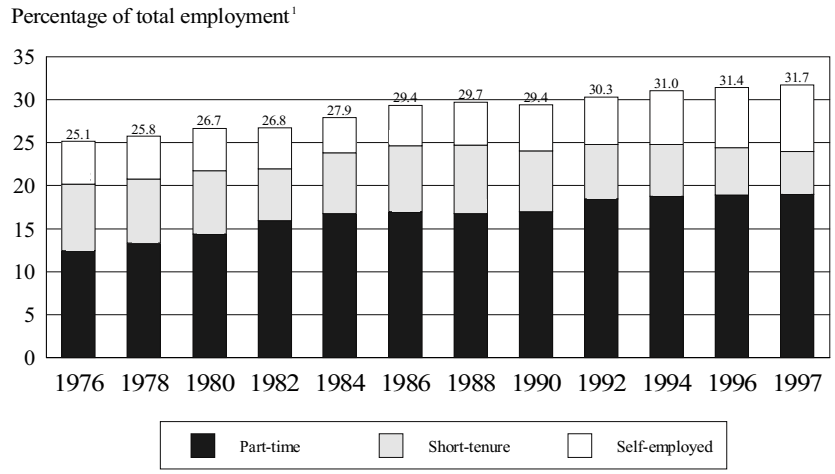
Over the past 20 years, there has been a moderate, but consistent, shift in the composition of work forms. The prototypical job of the industrial era – a full-time position of indeterminate length with a single employer – remains the norm, but it increasingly shares the stage with a host of alternative work arrangements that, in one way or another, depart from the old standard. This trend has been caused by a variety of economic, managerial, and social developments. It has also created significant constraints for workers in nonstandard work forms in gaining access to training.

The expansion of nonstandard employment is illustrated in Chart 6. "Nonstandard" workers – i.e., in jobs that are part-time or short-term, and the "own-account" self-employed – now represent 32 percent of all employment, compared to 25 percent in 1976.[31] While this increase has been gradual, the trend becomes more dramatic when we note that these nonstandard work forms accounted for about one-half of the overall job growth over this period.

As Chart 6 shows, the largest component of nonstandard employment is part-time work, which now represents about 19 percent of all employment. In 1976, its corresponding share was just over 12 percent. The rate of involuntary part-time employment – i.e., part-time workers who would rather be in full-time jobs – increased substantially from 12 percent of all

Chart 6

Nonstandard Employment as a Percentage of Total Employment, 1976 to 1997



1 Persons in more than one type of nonstandard work are counted only once. Data for part-time employment use Statistics Canada's new definition of part time, which includes individuals working two or more part-time jobs.
Source: HRDC calculations based on Labour Force Survey, Statistics Canada, annual averages and unpublished data.

part-time workers in 1976 to 36 percent in 1995. This reflects the increasing propensity of employers to structure their payroll in ways that minimize fixed costs, maximize flexibility, or both.

While the substitution of nonstandard for standard work forms may be a gradual phenomenon, the growth of self-employment has been more dramatic, at least in the 1990s. Between 1990 and 1997, three out of every four new jobs were self-employed positions. Currently, self-employment accounts for about 18 percent of total employment in the country. There are various explanations for the increasing self-employment. In part, this is due to the limited opportunities for paid employment during much of the decade. But it also reflects non-cyclical developments, including the growth of service industries, which have high concentrations of self-employment, and the increasing tendency toward out-sourcing, which creates new business opportunities for independent contrac-

tors. These independent contractors – the "own-account" self-employed – have been growing particularly quickly and now represent about 11 percent of total employment.

A related development has been the rapid job growth in small firms. Statistics Canada data show that, between 1978 and 1992, the annual net job creation rate for firms with less than 20 employees was at least twice the rate for the economy as a whole (Picot and Dupuy, 1996). This trend, too, has been driven to some extent by the growth of services and by the growing use of contracting out by large companies and governments.

The growth of employment in nonstandard work forms and in small firms has attracted a lot of attention, especially with regard to the implications for earnings, benefits, and economic security. Less appreciated have been the implications for human capital investment.

- The temporary or low-commitment nature of these nonstandard employment relationships minimizes the interest of employers in training investments and also limits the ability of employees to pay for their own training.

- For the self-employed, problems stem from limited access to financing, potentially serious opportunity costs (associated with training downtime), and financial uncertainty, which makes it difficult to estimate expected returns from investing in human capital.

- And small firms tend to be less able to make training investments than their larger counterparts because of financing limitations, downtime costs, and the fact that they cannot benefit from economies of scale in delivering training programs.

Thus, in a labour market where lifelong learning and skills upgrading are becoming increasingly important, more workers find themselves without the attachments to employers that are likely to lead to employer-sponsored training. Moreover, as we will see in the next section, employers typically are concentrating their investments on a core of already skilled employees. As a consequence, individual responsibility for job-related skills training is increasing. This is a new issue both for individual Canadians and for policymakers. But, as the structure of the postindustrial labour market continues to evolve, it is an issue that will assume larger proportions.

3. *Adult Education and Training*

We have argued that the "postindustrial" labour market is a segmented one, with access to good jobs heavily dependent on human capital investments, including both initial education and ongoing skills development through training. In this section, we examine patterns of adult education and training. We know that much of this ongoing investment occurs through workplace training but, unfortunately, knowledge of this training has been patchy. Recently, however, we have expanded our understanding in this area with the results of the Ekos Workplace Training Survey, which was carried out in collaboration with CPRN.

Ultimately, our review leads us to conclude that the "training market" that has emerged in this country is working very well for some Canadians, especially those who already possess a lot of human capital. These people tend to find themselves in a virtuous circle of training, challenging job requirements, and further skills development. However, for others, especially those without much human capital to begin with, the circle is more a vicious one of little access to ongoing training, less challenging work, and the risk of marginalization in a labour market that demands human capital investments. The net effect is to exacerbate labour market polarization, which creates social and economic difficulties and also reduces the country's productive capacity.

A Profile of Adult Education and Training

Adult education and training can be pursued in a variety of ways. Sponsorship and funding can come from individuals themselves or from their employers, governments, or other sources.[32] The potential options for when and where Canadians can take training have expanded in recent years. In part, this is because new information and communication

technologies have extended the possibilities for flexible, self-directed interactive learning. Another important development has been the proliferation of suppliers outside the public education system over the past decade. These include community- and sector-based training providers, equipment (including software) vendors who increasingly are integrating training into their service, and a burgeoning industry of private training schools (see Box 4).

The most complete picture of formal learning activities is available from Statistics Canada's Adult Education and Training Survey (AETS). The latest results are from the 1994 survey, which collected information on the programs and courses that Canadians had taken in 1993. The major findings of this survey are supported by the results of the International Adult Literacy Survey, which collected similar data for Canada (and six other countries) over a 12-month period spanning 1993 and 1994.[33]

According to the AETS, 28 percent of the total adult population 17 years and over (excluding full-time students) participated in some education and training activity in 1993. Unfortunately, it is not possible to determine whether these levels of participation are increasing over time because the 1994 AETS can be compared only with one version that was carried out two years earlier. These two surveys yielded very similar participation rates.

Most adult education and training is directed toward a current or future job.[34] About one in five adults reported they had undertaken some job-related course or program during the year. Among the working population, this incidence rate was 27 percent. The AETS results highlight the importance of employer sponsorship in job-related training. Of the slightly more than 4 million Canadians who received some training in 1993, 72 percent had employer support. Overall, 19 percent of the labour force reported some employer-sponsored training; another 8 percent acquired training through other means.

Who Participates?

An examination of the AETS results underlines how uneven training patterns are across the adult population. This is true whether the training is

Box 4

Private Training Institutes

For a growing number of adults, private institutes represent a source of targeted, job-specific training. They offer a variety of programs, including job preparation; academic upgrading; trades and technical training; and other vocational training. T he programs are generally targeted at intermediate rather than basic skill levels and attract both individuals seeking to upgrade their high school education and college and university graduates in search of job-specific and technical skills.

Unfortunately, we know very little about the private training sector as it currently exists. The most recent information is provided by Statistics Canada's 1992/3 Survey of Private Training Schools. At that time, there were 2,440 schools in Canada, with enrolment of 1.2 million students (though the actual head count would be somewhat less because some students were enrolled in more than one course). These numbers are likely to be considerably higher now.

Unlike public educational institutions, most private training schools offer programs focussed on a single theme; according to the Statistics Canada survey, about one-quarter were business schools and just over 20 percent were technology and trades schools. They tend to be small, with almost half reporting fewer than 100 students. These characteristics enable private training schools to be flexible and responsive to the changing skill demands of business. Indeed, the concentration of students in business, technology, and community/personal services matches the areas of employment growth. Courses tend to be relatively short and intensive, especially compared to college-based courses, which are organized on a term basis.

The lack of current data on private training schools also extends to their performance. We know relatively little about entrance requirements, selection criteria, program content, graduation rates, and the success of graduates in finding suitable work in their field of study. There is an urgent need for such an evaluation, especially given government's increasing reliability on the private training sector and the increasing onus being placed on individuals to seek out their own training sources. An important outcome of such an evaluation would be to assess whether there is a need for improved regulatory and certification standards that would assist individuals in their search for relevant and effective training in the private training market.

done with or without employer support; however, the patterns between the two are not identical. In general, the distribution of employer-supported training is skewed heavily toward employees who already have a lot of human capital. On the other hand, training done without employer support is more frequent among individuals with less human capital, presumably because they have little access through their work. Because employer-sponsored training accounts for the bulk of the total training effort, a disproportionate amount of activity is concentrated on the already skilled.

Table 4 shows training participation rates by various individual characteristics. The first column presents the overall rates for the adult (non-student) population, while the second and third columns focus on the working population, showing the participation rates for employer-sponsored training and then for activities that were not employer-supported.

The wide variation in the distribution of training is evident along all of the dimensions included in the table:

- Participation increases with education. Canadians with a university degree were twice as likely to report training as high school graduates and over four times as likely as those who had not completed their secondary education. These differences also existed for employer-sponsored activities.

- The IALS data extend this association between human capital and further training by demonstrating the link between literacy and training participation (not shown in table). Employees with high levels of prose, document, and quantitative literacy (levels 3-5) were 61, 85 and 96 percent more likely to have taken training than employees with low literacy skills (levels 1-2).[35]

- Overall, job tenure is not related to training. However, it does matter in terms of employer-supported training, with participation rates increasing with tenure. Short-tenure employees, on the other hand, have relatively high participation rates for non-employer-supported training.

- There are substantial differences by income, with overall participation rates and employer-sponsored rates rising as income increases. The

Table 4

Participation Rates in Adult Education and Training, 1993, AETS

	Participation rates (percent)		
	Overall	Working population	
	Adult population	Employer supported	Other
Education			
0-8 years	2.4	3.6	2.3
Some education	9.1	8.3	5.4
High School graduate	17.0	15.4	6.5
Some postsecondary education	25.6	21.5	15.7
Postsecondary education certificate	27.0	24.7	9.3
University degree	36.7	32.0	11.0
Job tenure			
1-6 months	28.5	12.5	17.0
7-12 months	26.0	12.6	14.5
1-5 years	29.7	22.7	8.2
6-10 years	33.5	28.5	6.5
11-20 years	32.6	29.8	4.0
Over 20 years	29.0	26.4	3.1
No tenure	14.1	3.9	10.3
Total income			
No income	7.0	1.1	11.4
Less than 15,000	11.0	7.1	13.2
15,000 - 19,999	11.4	9.4	7.5
20,000 - 24,999	16.4	13.4	7.6
25,000 - 29,999	24.5	20.7	7.1
30,000 - 34,999	27.0	24.2	5.5
35,000 - 39,999	31.0	28.2	4.8
40,000 - 49,999	35.6	32.7	6.2
50,000 - 59,999	41.8	38.8	6.8
60,000 - 74,999	50.3	48.0	5.3
75,000 plus	45.1	43.9	4.8

Table 4 (cont'd)

	Participation rates (percent)		
	Overall	Working population	
	Adult population	Employer supported	Other
Age (years)			
17-24	19.1	13.1	17.6
25-34	27.1	21.2	9.5
35-44	28.8	24.2	8.0
45-54	23.5	21.5	6.2
55-64	8.2	9.6	2.2
65 plus	0.8	3.4	0.7
Labour market status			
Employed full time	30.9	26.1	6.7
Employed part time	20.7	12.9	14.0
Unemployed	16.0	5.1	12.7
Not in labour force	4.5	3.5	8.4

Source: Based on data from Human Resources Development Canada and Statistics Canada (1997).

highest rates for non-employer-supported activities were reported by low-income Canadians who presumably benefit from access to publicly-sponsored programs. However, these rates are still very low when compared with employer-sponsored ones.

- Participation in training varies by age, rising gradually from young to prime-age categories, and then declining sharply for the older age groups. The moderate increase between the younger and prime-age groups, however, becomes more dramatic in the case of employer-sponsored training. For example, workers between 35 and 44 years of age are almost twice as likely as those under 25 to report training sponsored by their employers. Within the youth cohort, training participation is particularly low for the less educated. This is particularly true

for the 20-24 and 25-29 age groups. Fewer than 20 percent of people in their 20s who have not gone beyond high school reported any job-related training (Betcherman and Leckie, 1997). This is a striking statistic for a group that clearly require access to skills development opportunities in the early stages of their careers.

- Consistent with the other trends reported in Table 4, full-time employees have a significant advantage in accessing training, especially when it is employer-supported. Part-time workers, the unemployed, and those outside the labour force must rely more heavily on other sources of support, but, again, these non-employer-sponsored programs represent a relatively small share of overall training.

What lies behind the differences in the training participation rates? Because of its overall importance, what really matters is employer-supported training. As we have seen, the distribution of these activities closely parallels the distribution of human capital that already exists. This primarily reflects three factors. The first two – and, in our view, the most important – pertain to employer choices about who to train. First, most training investment decisions are made by management. And measures of human capital such as education, full-time status, tenure, and experience are all signals to employers that they are likely to get a return on their investments. Second, a large share of training in the workplace is now being triggered by the introduction of information technology and, as McMullen (1996) has shown, it is higher-skilled employees who are now the principal users of these technologies and thus the primary recipients of related training.

The third factor has to do with employee decisions. According to the AETS, two-thirds of training decisions are made by the employer, but this still leaves a certain amount of scope for worker initiative. As Kapsalis (1996) argues, some employees do initiate training that is sponsored by their employer and others sponsor their own programs or courses, or find someone who can. The AETS data indicate that there is wide variation in how people perceive their need for training and in their desire for additional training. In general, an individual's interest in further training rises with education and skill levels. In other words, human capital investments have a "seeding" effect. Thus, to the extent that individual initiative matters in the skills investment process, it is reinforcing the distribution of employer-

initiated training and contributing to a more polarized distribution of skills.

Before leaving the polarization issue, it is important to "square the circle" by introducing the "use it or lose it" notion that has emerged from recent work using the International Adult Literacy Survey (Statistics Canada, Human Resources Development Canada and the National Literacy Secretariat, 1996). Essentially what this means is that individuals in jobs that require the regular use of literacy skills are able to hone those skills, making them capable of taking on more challenging tasks. On the other hand, the IALS data also suggest that individuals who are employed in jobs that make few literacy demands are likely to experience a deterioration in those skills. Since workers in the more demanding jobs are also likely to have a disproportionate share of the training opportunities, this skill enhancement/deterioration syndrome aggravates the distributional concerns that emerge from the AETS data.

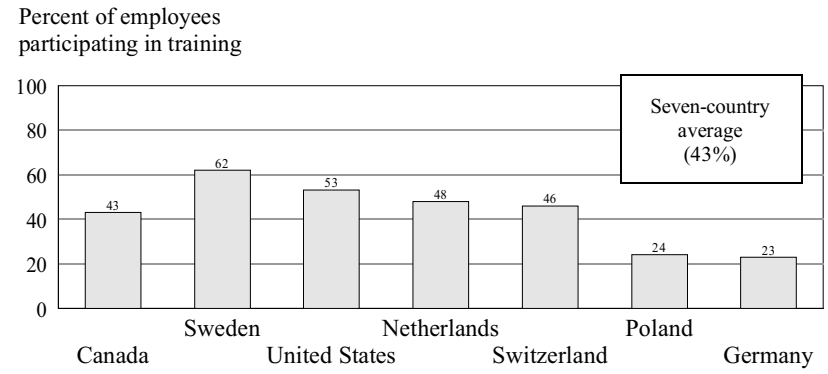
How Does Canada Compare?

As recognition of the positive role of training increased over the past decade, it became conventional wisdom to declare that Canada, and particularly Canadian business, did not have as strong a training culture as some other countries.[36] However, it has been difficult to assess the validity of this claim because of a lack of comparable international data.

With the IALS, however, the Canadian data can be considered relative to the data reported from the other participating countries. Caution does need to be taken in comparing these results across countries because of institutional differences in how human resource development occurs. With this caveat in mind, the IALS results show that the level of training activity in Canada is roughly average, at least in relation to the countries included in the study.[37] As Chart 7 indicates, this is true in terms of both the incidence of training and hours of training per employee.[38] Notwithstanding the differences in level of activity, the IALS results suggest that composition of training activity is quite similar everywhere: most people take training for job-related reasons; the majority of training is employer-sponsored; and the probability of taking training increases with the individual's education and literacy (Kapsalis, 1997).

Chart 7

Training Activity in Canada and Other Countries, 1994



Source: Based on data from Kapsalis (1997).

Training in the Workplace

While the workplace has always been a key locale for developing new skills, many business and economic observers now believe that it is increasing in importance as a setting for learning. The pace of technological innovation, combined with a variety of managerial and organizational changes, is creating demands for more ongoing skills retraining. There has been a growing belief, buttressed to some extent by empirical evidence, that the return to training investments is greater when training occurs in the

workplace rather than in the classroom. And the apparent benefits of strong training cultures in countries such as Germany and Japan has encouraged other nations to follow suit.

Unfortunately, gathering information on training in the workplace is not a simple matter. The informal learning that is attached to any job experience is, by its very nature, difficult to document. And even formal training is not easily captured because of a lack of consensus on what should be included and because few employers systematically track these activities. As a result, workplace training has long been a "black box" in terms of our understanding of the overall human resource development system.

During the 1990s, however, our picture of workplace training has been improved by various surveys including the AETS and the IALS. One other new source of information is the Workplace Training Survey (WTS) carried out in 1995 and 1996 by Ekos Research Associates and CPRN. Incorporating surveys and case studies, the WTS collected data from employers and employees in every part of the country and virtually all industries. In many respects, the findings of this survey corroborate the main points from the AETS that we discussed in the preceding section. However, the WTS data allow us to extend our understanding by analyzing employer training patterns as well.[39]

Formal and Informal Training

Some form of training does take place in most firms. The WTS results, which have been weighted to be representative of Canadian industry, indicate that 70 percent of establishments undertook some training over the preceding 12 month period. But, in many of these firms, this training was exclusively informal. Just over 40 percent sponsored some "formal" training – that is, training with predefined objectives, a structured format, and a defined curriculum.

The statistical research based on the WTS data (and earlier training surveys as well) focuses primarily on these formal activities. This is because informal training is so intrinsically linked to the day-to-day operations of the organization that it virtually defies quantitative measurement. However, the survey did attempt to collect evidence from participating

firms on the relative importance of informal versus formal activities in their overall training effort. While these data are admittedly subjective, they suggest that informal training accounts for the majority of training, even in firms that conduct formal training as well. According to these estimates, informal training accounts for nearly three-quarters of the overall training effort in a typical Canadian establishment.

Through our case studies, we have been able to qualitatively observe informal learning processes in the workplace, such as mentoring relationships, experiential learning, and the informal sharing of knowledge that goes on between employees. It was clear from our research that these activities can be very efficient and flexible forms of learning. Nonetheless, lacking survey data on informal training, our statistical profile of training in the workplace remains somewhat incomplete.

However, we believe that capturing formal training is disproportionately important, for two reasons. First, not all training is equal. Our research suggests that formal training tends to have a higher return than informal training, especially for the employee.[40] Second, we have found that the importance of informal training is more or less even across firms of similar types. What really varies, and what accounts for the unevenness in overall training patterns, is the distribution of formal training. The most committed formal trainers are the most committed trainers overall and the employees who receive the most formal training receive the most training overall. In other words, formal training is a reasonable proxy for training in general.

Where Is Workplace Training Taking Place?

The WTS results are consistent with the AETS and other survey results in finding that the more highly skilled and educated employees are most likely to get training through their employer. Employees with a post-secondary education and in management or professional positions reported the highest training rates. This was true on an overall basis and for a wide range of specific types of programs, including training for teamwork, problem solving and communication, for management and supervisory skills, and for new technology.

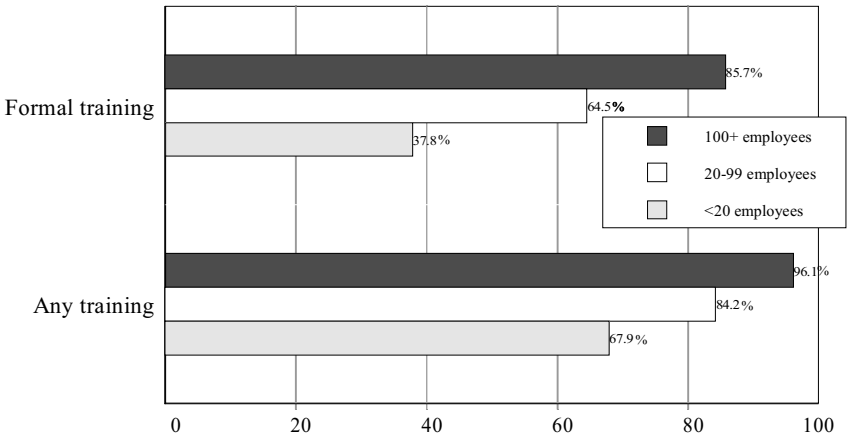
Where the WTS results can extend our picture of training is in terms of

portraying what firms provide training:

- The strongest determinant is firm size (Chart 8). Large organizations train more than small ones and more of their activity involves formal training. The barriers for small firms involve a number of factors. First, in comparison to larger organizations, they do not have access to good information on training opportunities, such as potential suppliers. Second, they are less capable of taking employees "off the line" in order to receive formal training. And, third, small firms cannot exploit economies of scale when providing workplace training that larger ones can. It is difficult to make precise comparisons because many employers – especially small ones – do not systematically track training expenditures; however, the WTS data suggest that the cost per trainee may be up to two times higher in small establishments than in larger ones.

Chart 8

Differences in Training by Establishment Size, 1995



Source: Based on data from Betcherman, Leckie and McMullen (1997).

- There are also industry and regional differences, with multivariate analysis showing the incidence of training to be highest in "non-market" service industries (e.g., health and education) and in Ontario and the West.

- Training is strongly associated with innovation. Firms reporting significant technological change, "high performance" human resource practices, and organizational changes to increase flexibility are firms that also report a lot of training. Training and these types of innovation are strongly complementary activities.[41]

- The WTS multivariate analysis also consistently finds two other factors that are associated with high levels of training activity within establishments. One is competing in global markets. The other is having a union. More specifically, our analysis indicated that the presence of a union is associated with a more formalized approach to training even when other factors such as firm size are controlled for.

Is There Polarization in Workplace Training?

For a subsample of employers surveyed, we had data on their training experiences for both 1993 and 1995.[42] While this admittedly is not a long time period, the trends between the two years offer some tentative evidence that firms may be increasingly becoming segmented into two groups, one with a strengthening commitment to formal training and the other with a weakening commitment. In 1993, 72 percent of the establishments in this panel group reported formal training, compared to only 63 percent in 1995. Almost 20 percent of the panel reported dropping formal training over the two-year period.

Establishments that dropped formal training were more likely to be small, single-establishment firms, without unions. They were less likely to have reported that technological change was important or to have introduced high-performance human resource practices. During the same period, many firms that continued formal training appear to have deepened their commitment to it. This stronger commitment was suggested by two sets of results: first, continuing trainers increased their share of the total training effort accounted for by formal activities and, second, they

increasingly had formalized training arrangements with more reporting the existence of personnel dedicated to training, a formal training plan, and formal training-needs assessments.

Training Impacts

There has been relatively little analysis in the past on the impacts of workplace training on employees and on firms. Various data problems and methodological complexities have contributed to this. Obviously, these difficulties are especially challenging with respect to the informal component, but they are also formidable in the case of formal training.[43]

The WTS design involved a number of features intended to improve our understanding of the impact of training. While we did not overcome all of the obstacles to measuring impacts, the results do identify benefits from training, both for employees and for employers.

- Employees who had received formal training benefited in terms of significant wage gains. After controlling for individual and establishment characteristics, the wage premium received by workers who had undertaken formal training with their current employer was in the order of 10 percent. An additional premium was associated with training received from previous employers.

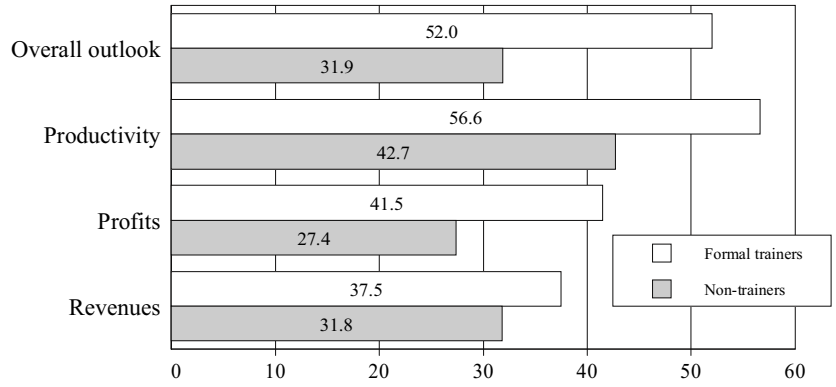
- The qualitative evidence identified a number of other benefits reported by employees who had undertaken formal training. Interestingly, the highest ranked advantages, especially for women, were "intangibles" – increased self-confidence, greater employability, improved job performance, and increased job satisfaction.

- The analysis also found positive outcomes for firms that trained. Organizations with training programs had more favourable performance trends than non-trainers in a number of areas including revenues, profitability, employee relations, quality, and productivity and their business viability and outlook (Chart 9).[44]

- Multivariate analysis sustained this link between training and firm performance. Even after controlling for other establishment characteristics, we

Chart 9

Employer Performance Trends: Trainers and Non-trainers
Percent of Establishments Reporting Significant Improvement
from 1993-95, Based on 1993 Training Commitment



Source: Based on data from Betcherman, Leckie and McMullen (1997).

found that establishments with the strongest commitment to training were significantly more likely than other firms to report positive revenue and productivity trends over the previous two years.[45]

From Incidental Learning to Learning Organizations

One theme we have emphasized has been the unevenness of employer-sponsored training. The significance of this is magnified by the fact that the workplace remains by far the most important arena for Canadians to continue investing in their human capital.

The variation in training experiences is due to (i) differences *within* the workplace in the probability that workers with different skill levels will access training and (ii) differences in the overall training effort *between* workplaces. Moreover, there is an interaction effect as well since highly skilled workers are more likely to be employed in organizations that emphasize training.

The Workplace Training Survey – including both the quantitative survey data and the more qualitative case studies – has provided new insights into the variation in training activity between establishments. The evidence suggests three general approaches to workplace training, which are reflected in differences in the level and nature of the investments organizations do (or do not) make and, at a more fundamental level, differences in overall competitive strategy and the role human resources play in that strategy.

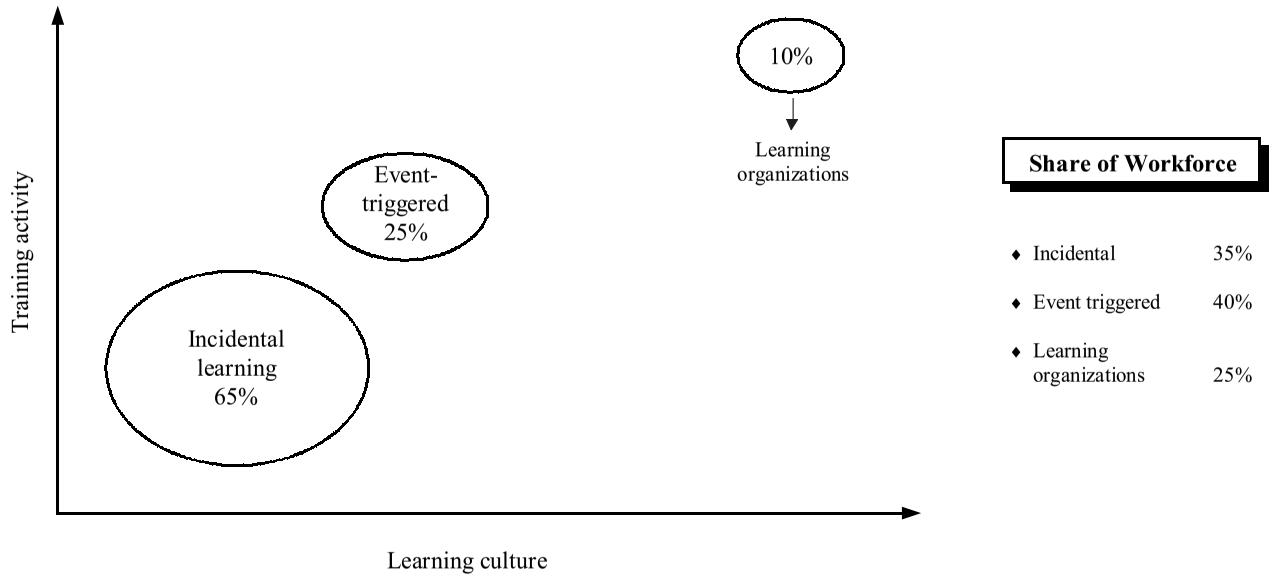
We have labelled these three training types as *incidental learning only*, *event-triggered training*, and *learning organizations*. These types differ in many ways, but we have chosen to represent them in Figure 1 according to the level of training investment and the degree to which training is part of the organizational culture. As one would expect, these characteristics are positively related in the sense that more training goes hand in hand with a stronger training culture. However, where the organization has not internalized a learning culture, the extent to which it will sponsor training for its employees is ultimately quite limited. That is because, at heart, training activities are seen as costs and not as investments. We found few firms that have crossed this threshold and become "learning organizations."

The first approach characterizes firms in which *incidental learning* takes place, but where there is rarely any formal investment in training. In other words, the only training that does occur takes place through informal learning on the job. These companies tend to perceive their environment as stable, relying on processes and practices that have existed for a long time. When combined with a low-turnover workforce, this stability means that neither management nor employees see much need for formal training. According to our estimates, about two-thirds of establishments fit into this incidental learning category; however, because a disproportionate number are small, their share of the workforce is only 35 percent.

The *event-triggered training* approach describes organizations where, in addition to incidental learning, formal training is undertaken, but only in response to specific triggers. The most common examples of these triggers are the introduction of new technology or new equipment, some type of workplace reorganization, or turnover. The training that results is essentially seen as a necessary cost associated with the event. About one-quarter

Figure 1

The Learning Continuum[1]



1 Percentages within the circles represent estimates of the share of establishments within each group. These figures and the workforce shares are based on estimates derived from the Workplace Training Survey data.

of establishments, employing approximately 40 percent of the labour force, conforms to this model.

Learning organizations see continuous learning as an integral part of the workplace and, indeed, business strategy. The commitment to training is likely quite formalized in the sense of having an accounting framework for training activities; an explicit process for assessing training needs both for the employer's succession planning and for the employee's career development planning; benchmarking and environmental scanning capabilities; and procedures for evaluating learning outcomes. But there is also a premium placed on a stimulating environment where self-directed learning and interaction among colleagues is encouraged. In a sense, then, while these organizations often have a formal framework for training, it is very difficult to actually identify training because of the way in which learning is integral to the culture. The consistent factor linking these companies is a strongly held commitment by senior management to the long-run competitive benefits of investing in people. There are not many firms that can be characterized a "learning organizations." Our estimate is that, at most, 10 percent are; however, because these tend to be large organizations, learning organizations employ roughly one in four workers. The polarization revealed by our panel analysis suggests that there may be a growing number that are pursuing these practices.

Given the positive links between training and performance, why do not all firms seek to become learning organizations? In fact, this strategy does not make sense in all situations. For some organizations, investments in formal training are unlikely to generate significant returns. They may operate in markets where competitiveness is determined by other factors such as low cost or access to physical resources. Or they may have job requirements that can generally be filled by the existing workforce. So it is a mistake to assume that "one size fits all."

However, a stronger commitment to training within the employer community would benefit many organizations – and undoubtedly would provide substantial advantages to many workers. There are a number of keys here:

- One would be a wider and deeper understanding among decision makers of the potential performance improvements that can be tapped by a

learning culture in the workplace. Thus information and education on the benefits of training are important for this group.

- But information can also be an obstacle in other ways. For many organizations, especially smaller ones, the information needs are diverse: access to information on how to identify training needs, finding the best sources of training, modifying job designs to exploit the skills acquired through training, and measuring the impacts of these investments. Information is also critical to workers, particularly those without a lot of human capital, many of whom have not adequately recognized the imperative of skills development in today's economy.

- Time and modes of delivery can also be issues. Many firms find it difficult to work training in with regular production or service delivery. Again, this can be a particular problem for small firms. Flexibility is also an important need for many workers who must juggle training with other work and personal responsibilities.

- Finally, there are funding issues involved. For some firms and most employees who must sponsor their own training, up-front expenses can be a concern and, especially in the case of small firms, unit costs can seem formidable. Unfortunately, financial markets for human capital are very limited.

Ultimately, then, the barriers affecting the emerging training market revolve around information, time, and money. These are the issues that employers, workers, governments, and other stakeholders must address if the Canadian workforce is to be prepared for the demands of the new economy.

4. A Training Market for the New Economy

The postindustrial economy is no longer a subject for futurists. It's here. Knowledge work, service production, and hi-tech sectors now represent the mainstream of the national economy. Even the traditional industries that have been so important to this country's development have been swept along. In a sense, there are no "old" industries in the new economy.

In the new economy, the prospects for sustained growth will increasingly depend on "social" innovation – changes in our institutions, policies, and practices. Canada still has some distance to go in inventing the "new rules" needed to ensure that the training system meets the needs of workers, employers, and society as a whole.

The framework guiding our discussion of these "new rules" is depicted in Figure 2. The starting point is the postindustrial labour market. We have argued that the nature of this new labour market demands more skill, that people are choosing to participate in work and school in different ways, and that the new employment relationships shift more of the responsibility for training to individuals. All of these changes compel innovation in how we invest in human capital. The key issues are access, delivery, information, and incentives. We have labelled these the new "system imperatives."

The human resource development system has begun to respond to these new imperatives as a result of the growing demand for skills development and public policy decisions that have deregulated the field.[46] In the early 1980s, choices were limited. Now individuals and firms have a range of training suppliers to choose from – including private institutions, community- and industry-based providers, and other suppliers of training (Figure 3). This emerging "supply-side" has the potential to form the basis for a dynamic market in training.

Figure 2

The Training Market: Framework for Lifelong Learning in the New Economy

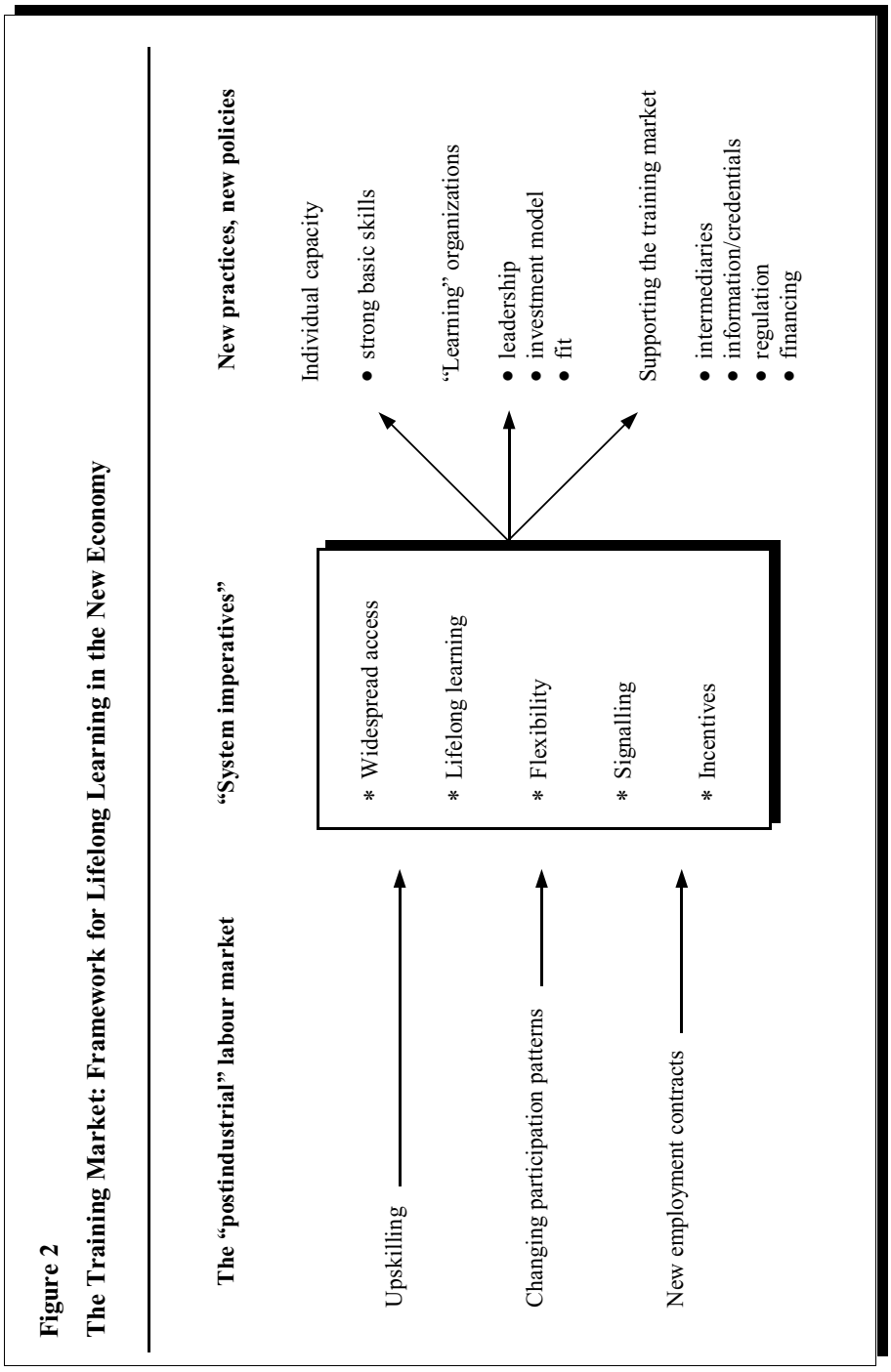
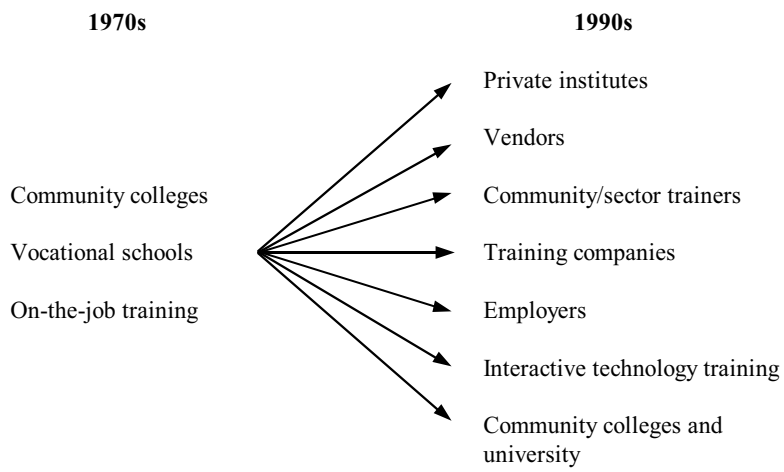


Figure 3

The Emergence of a Training Market



A market approach is not the only approach to training.[47] Systems vary across countries and there is no evidence pointing conclusively to the superiority of one type of strategy over another for all segments of the labour force. But in the Canadian context, where German- or Japanese-style institutions and responsibilities do not exist, it makes sense to build on the emergence of this dynamic supply of training options. As we will outline below, however, there are problems in the operation of this training market that must be addressed if the system imperatives listed in Figure 2 are to be achieved. This will require action not only from governments but also from employers and individual Canadians.

How Well Is the Training Market Performing?

How well is the training market functioning?

1. *There can be positive and concrete benefits from training.*

   The Workplace Training Survey results suggest that firms that train – and especially those with a deep commitment to training – report

significantly better performance trends than firms that invest little or nothing in developing the skills of their workers. Employees who receive training report higher wages and also intangible benefits such as improved employability.

Why do organizations not train if training could offer them benefits? Despite our overall conclusion, there are employers for whom formal training is not a sound investment. For example, business strategies in some industries, including the large traditional services sector, are rationally based on competing through low costs. Most jobs in these industries involve low-skill work and there is limited scope for training to lead to the productivity gains that would justify employer investments. Many employers, as well, have easy access to workers with the required skills. This is especially true in labour markets where unemployment is high.

Nonetheless, our results suggest that many more employers could ultimately benefit from the positive returns that workplace training can offer. Part of the problem is a lack of understanding of the potential benefits of training and the delivery options that are now available. As we describe under the next point, there also are key pre-conditions in the organization that need to be in place for these benefits to be realized.

2. *There are a number of keys to a successful training program.*

The first is *fit*. There are no magic formulas. An effective training strategy depends very much on the nature of the organization, its culture, its employees, and the industry and market it operates in. Firms must clearly identify what they need from training and then carefully canvass their environments to identify the overall philosophy and programs that will work for them. Training can alter the organizational culture and strategy – it can be a tool for redirecting an organization toward a higher value-added competitive strategy based on the contribution of human resources and a more constructive labour-management relationship.

The second is *buy-in*. Firms often talk about human capital as their most important capital, but this is often not the way they behave. While

buy-in throughout the organization is important, our case studies have demonstrated that it is nowhere more important than at the top. Only where the owners or senior management genuinely place a strong value on training will investments be made on a sustained basis. Where this commitment does not exist, neither will the training. Many decision makers are inherently skeptical about the value of training, especially in an era of intense cost competitiveness. Thus it is important for champions within the organization to develop information systems that allow management to identify the costs and benefits of training, just as they can with physical forms of investment.

This brings us to the third key – training must be recognized as an *investment*, not simply as an expense. Shifting this optic has two aspects. The first involves the information issue that we have just raised. Without the capacity to evaluate the real returns from their training investments, firms likely undervalue these returns against other sorts of investments where accounting information is more complete. The second concerns the "impatience" that characterizes the environment of most firms whereby managers face pressures from investors to demonstrate benefits immediately. However, training is a long-run strategy that requires time to generate returns.

The final key concerns *work organization and job design*. Firms can only benefit from the skills employees gain from training where the organization of work allows them to apply these skills in practice. Flexible job designs that encourage employee initiative and innovation are a key condition for effective training programs. Where these are in place, employers can build on the capabilities of a well-trained labour force by instituting challenging and flexible job designs that have been shown to improve productivity and quality. This is called a "high-skill equilibrium."[48]

3. *The training market is polarized between high-investment and low-investment segments and the evidence suggests that this polarization is likely strengthening.*

Training, at least in its more structured forms, is most prevalent among large firms and in non-market services and knowledge-intensive

manufacturing and service industries. The amount of training is also closely linked to the pace of technological change. However, we have also found that intangible factors like a people-oriented business strategy and "high performance" human resource practices are significant determinants.

On the employee side, participation in training is also uneven. In short, individuals who already possess high levels of human capital get a disproportionate amount of training while those with low levels of human capital are underrepresented. This is especially true in the case of employer-sponsored training, which accounts for most of the training among adults.

If anything, these uneven distributions appear to be becoming more skewed, not less. While the Workplace Training Survey results only represent a two-year time panel, they nevertheless show large, technologically sophisticated firms strengthening their commitment to training, while many smaller, more traditional firms are reducing or even eliminating their training activities.

It is important to note that educated and skilled workers are overrepresented in the firms with high training commitments. At the same time, survey data show that it is those individuals who already have a lot of human capital who recognize the importance of skills development and who are most strongly motivated to get further training. Thus, in various ways, both training patterns and attitudes towards training are accentuating polarization tendencies in the workforce. This is very disturbing given the importance of training in creating opportunities in the labour market.

4. *Employer-sponsored training has important advantages, including financial support, accommodation of time demands, and the productivity benefits of applying training in a real work situation.*

Adults can accumulate human capital in various ways. One key distinction is whether they receive training sponsored by their employer or whether they sponsor it themselves or through some other means. However, the payoffs are often highest when training takes place in the workplace

because of the immediacy of the learning and its applicability to a real work situation. As well, employer-sponsored training typically occurs during working hours, which alleviates potential time conflicts with domestic and other responsibilities. And, finally, there are the considerable financial benefits of accessing training through work – benefits that are all the more important since capital markets do not exist to help workers finance their own investments.

Thus it is not surprising that the majority of adult education and training is employer-supported. Yet the labour market is evolving in ways that reduce the access of increasing numbers of workers to employer-sponsored training.

These observations, together, suggest that more training would be desirable for achieving economic efficiency goals. And, if training is accessible to all who need it, it can also be a positive force for equity. Our research indicates, however, that access is a problem. There are three barriers to training – information, time, and money. These represent the challenges that confront employers, governments, and individual Canadians.

Reinventing the Training Rules

A system that will meet the emerging needs of Canadians will have to be innovative in a number of ways, including:

- *broadening access* to formal learning opportunities through innovative financing;
- creating genuine possibilities for time out for *lifelong learning*;
- offering the *flexibility* to enable people to combine learning with other activities;
- *signalling* more clearly what people know and what employers require; and
- *clarifying the benefits* of and *strengthening the incentives* for formal learning.

Judged against these imperatives, the effectiveness of the current training system is uneven. It is working well in some parts of the economy and for some parts of the labour force, but it is leading to underinvestment in others. This failure increases the risk of social and economic exclusion for people without skills.

The conclusions set out below focus on how the training system can better meet the requirements of the new economy. We believe that the market that has emerged offers a potentially viable model and our focus is on how that market can function more effectively to boost the productive capacity of the economy and to broaden the participation of individual Canadians. In many respects, this can happen through the decisions of workers, employers, and education and training providers. However, our analysis has identified certain examples of what economists call "market failures" that need to be addressed. Essentially these failures lead to the information, delivery, and financing problems that require attention.

In reinventing the rules, we see a need for new institutions or players outside of government – what we have termed *intermediaries* – to improve the functioning of the market. We also see a need to dramatically redefine the role of governments.

A Role for Intermediaries

The evolution of the training market is creating a demand for *intermediaries*, or brokers, between consumers and suppliers. These intermediaries can help information flow more efficiently and encourage consumers to pool resources to improve economies of scale. Intermediaries can take various forms, including both non-profit organizations and commercial enterprises. Examples include:

- Labour force development boards, sector councils, and community councils already serve a number of intermediary functions including improving labour market information, developing standards and credentials, and pooling resources.

- Some unions are placing greater priority on issues such as standards and curriculum, increasingly working with employers through different

boards and councils. In sectors where independent contracting is important, unions also have a potentially key intermediary role to play in disseminating information on employment and training needs, developing courses, and ensuring quality standards.

- Employment agencies could combine information and training services along with their more traditional deployment function. Indeed, some are already moving in this direction.

- New types of organizations are likely to emerge in response to the demand for intermediaries. For example, in Australia "group training companies" employ and lease out apprentices and trainees. Non-profit organizations along these lines could undertake many of the personnel functions of employment agencies or take on specific training mandates such as working with governments to create training opportunities for the disadvantaged or internships for youth.

- Intergovernmental agencies could take on the task of accreditation of training programs or institutions.

Effective intermediaries can lessen the need for direct government intervention in the training market. In many cases, governments can work with these intermediaries, and with employers and workers, to confront many of the problems that the market by itself cannot work out. One illustration of this is the range of responses recently implemented to address skill shortages in the software sector (see Box 5). In this case, government has been a partner in many initiatives, but business leaders and educators have been the key drivers of change.

Only time will tell which intermediary forms and functions are most useful in the training market. However, we can expect intermediaries to become more prominent in the future as the demand for their services increases.

A Redefined Role for Governments

As recently as the early 1980s, federal and provincial governments set specific priorities for training and financed and designed many of the

Box 5

Multi-stakeholder Development of New Training Initiatives in the Software Sector

In recent years, skill shortages have emerged in a number of software occupations. Employers claim that these shortages are now a significant production bottleneck. However, a number of intermediaries have been serving as a rallying point for the sector around the skill shortage and other human resource issues.

The Software Human Resources Council is one good illustration. It was created in 1992 with support from Human Resources Development Canada (HRDC) as the result of an HRDC-funded study that brought software sector stakeholders together to develop a shared understanding of the human resource challenges facing the sector, and to develop a corresponding action plan. Today, the Council is a membership supported organization that acts as a catalyst that brings together educators, employers, associations and government around software related HR issues. A number of different initiatives have resulted across the country, including university-industry partnerships to enrich the software curricula; employer-trainer partnerships whereby innovative training tools are developed to suit industry needs; government-industry partnerships to generate the interest of youth in the sector through internships; and industry-government cooperation in facilitating the entry of skilled foreign software labour to Canada.

Industry associations are another example of intermediaries that are playing a role in addressing human resource issues in the software sector. The Canadian Advanced Technology Sector (CATA), for example, has been heavily involved in the creation of employer recruitment practices that range from an on-line resumé database to domestic and international recruitment trips. The Canadian Information Processing Society (CIPS) has been involved with Human Resources Development Canada in the development of occupational standards and accreditation mechanisms for the sector.

Finally, the software sector exhibits several instances whereby stakeholders have collaborated in the development of initiatives to address human resource issues. *The Consortium for Software Engineering Research* involves the pooling of resources for research, training, and curricula coordination by six universities, six members of industry, and $3 million in government funding through the Natural Sciences and Engineering Research Council. *O-Vitesse* is an intensive 16-month work and study program to train software engineers for several high-tech firms through collaboration between the National Research Council, the University of Ottawa and Carleton University.

programs. What is the appropriate role for government in human resource development now at the turn of the century?

Clearly, the role changes for different phases of the total education and training system. In the early stages, governments fund the institutions in which basic learning takes place. The centrality of the state here is driven by the fact that basic education is a "public good," which, for well-known reasons, will be underprovided if left solely to market forces. This begins to change at the postsecondary level where the weighting of social versus private benefits starts to shift and, in the process, so does the appropriate balance between state and market.

Once we get to the adult education and training stage discussed in this report, the case for a dominant government role is further attenuated because of the ability of employers and workers to capture many of the returns to the investments they might make. This means that a training market can be an effective way of allocating much of this investment. The state still has an important role to play, but in a different way from its direct provider role at the basic education stage. The key roles for government are listed in Box 6.

In an effective adult training system, governments primarily must be concerned with two things: first, ensuring that the population has access to

Box 6

Roles for Governments in the Training Market

The traditional roles of government for training need to be redefined to take account of the training market and the potential contribution of intermediaries. In this new environment, the government role involves:

- providing basic education;
- supporting better information flows including:
  - basic labour market information;
  - occupational standards and training standards;
  - employer certification and accounting tools;
- creating better credit tools;
- brokering collaborative relationships; and
- facilitating the labour market entry of youth.

good basic education and, second, facilitating the operation of the training market, primarily by addressing market failures that otherwise would have undesirable effects either in efficiency or in equity terms (see Box 7).

We have identified a number of market imperfections in this report – unequal access to training, inadequate quality control, a lack of information to shape training signals, and financial barriers to training by small businesses. These imperfections demand attention by government – either to provide solutions or to encourage others to do so. This raises new challenges. One involves deciding when intervention could be potentially useful and when tools for making an effective intervention are available (i.e., avoiding "government failure"). Challenges also arise because many

Box 7

Failures in the Training Market

In a perfectly functioning training market, individuals and employers would respond to the incentives and make the appropriate human capital investments without any need for state involvement. However, markets do not always function in this way and, as a consequence, governments can potentially improve outcomes by addressing "market failures." Where interventions are effective, the result will be a strengthening of the infrastructure supporting the training market. It should be pointed out, though, that market failure only signals the potential for a government response. Policymakers must then demonstrate that any interventions will have public benefits that exceed their costs. In other words, the possibility of "government failure" must enter into the consideration of the policy initiatives outlined below.

Economists have long been aware of the failures in human capital markets. These involve the "externality" problem and market "imperfections." Externalities occur where firms or employees are uncertain about whether they will capture the returns from training investments because of the future possibility of turnover. This can create disincentives for firms to offer certain types of training and for employees to undertake training, and thus can lead to less investment than would be socially desirable. It is actually unclear how widespread externality problems are. For example, according to the Workplace Training Survey, only about 15 percent of all establishments believe that losing trained workers is a significant obstacle to training. Other surveys as well have found little evidence of extensive externality problems.

of the required skills – e.g., providing leadership, brokering divergent interests, and helping to make sure the market incentives are appropriate – require new competencies on the part of governments.

While state provision and funding of training become less important in a market-driven system, it is important to recognize that governments still remain important financial players through their support for public post-secondary education and for training programs for the unemployed and social assistance recipients. This financial contribution is critical if the training system is going to address the needs of the marginalized or at-risk portions of the population.

We have identified five priorities for governments in supporting the system imperatives identified in Figure 2:[49]

- providing basic education;
- supporting efficient human capital markets through better information;
- supporting efficient human capital markets through better credit tools;
- brokering collaborative relationships; and
- facilitating the labour market entry of youth.

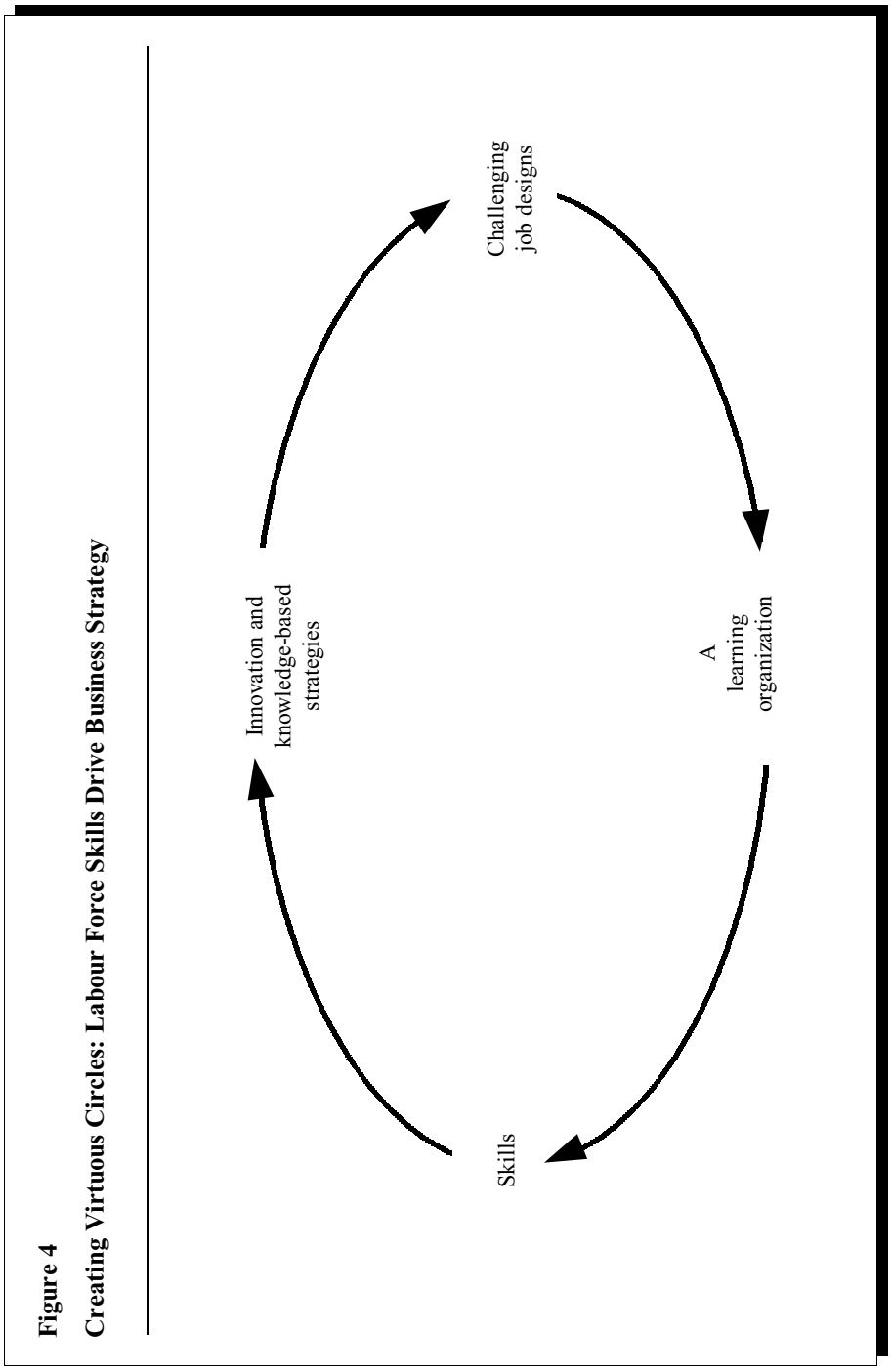
Providing Basic Education

Although we have not addressed this in this report, basic education is the number one policy priority. The economy is evolving in ways that will offer few employment opportunities for people who do not have a good foundation of literacy, communication, and other employability skills. Moreover, evidence is accumulating, which shows that this foundation has an important "seeding" effect in the sense of creating a predisposition to further human capital accumulation and even greater employability.

A workforce with strong basic skills can also trigger virtuous circles that play out at the firm and, ultimately, at the societal level. The stronger the labour force's basic skills foundation, the more likely that employers will build competitive strategies on job designs requiring skilled workers and thus have the incentive to make investments in job-specific training that builds on the basics (Figure 4). Where the workforce has weaker basic skills, on the other hand, employers are more likely to employ business

Figure 4

Creating Virtuous Circles: Labour Force Skills Drive Business Strategy



strategies that are based on other factors such as cost competitiveness. In other words, the level of basic education is a critical determinant of whether our workplaces are characterized by a "high-skill equilibrium" or a "low-skill equilibrium." This supply-side impact is essential for policy-makers to bear in mind.

Supporting Better Information Flows

Imperfect information can lead employers or employees to make investment decisions that they would not make if they had complete information. There are four areas where governments should focus in order to improve the availability and quality of information underlying the training market:

- basic labour market information;
- occupational and training standards;
- employer certification tools; and
- guidelines for employers in terms of reporting human capital investments.

In all of these areas, business, the education and training sector, and intermediary organizations can all make important contributions. However, governments will have to play a leadership role in ensuring clear and efficient signalling in human capital markets.

Basic labour market information pertains to where employment opportunities exist, where future demand is likely, and what skills and experience are required. In many respects, the provision of this information is becoming more difficult as the labour market becomes more fragmented with the growth of small firms, the expansion of nonstandard work forms, the proliferation of training and education supply channels, and the breakdown of traditional occupational boundaries. On the other hand, information technologies obviously expand the possibilities for collecting and disseminating relevant data. For example, in British Columbia, the new Centre for Education Information Standards and Services, a partnership between colleges and institutes and the B. C. Ministry of Education and Training, is making use of the World Wide Web to disseminate labour market information.

Occupational standards and training standards are "infrastructure" that is integral to achieving better information in human capital markets.[50] This is becoming a more critical challenge for two reasons. First, economic growth and restructuring have created many new occupations or radically changed existing ones and, at this point, the specific skills required to do much of this new work are not well documented. This is a particular problem in two booming areas – the caring services and high technology. Second, the proliferation of training channels has raised a host of questions about relevant curriculum and appropriate standards. In recent years in various industries, business and labour (often through sector councils) have worked with educators and trainers and governments to improve standards.

Occupational standards identify the skills and knowledge required to perform competently in a specific type of job. They can help industries and individual businesses assess their human resource capabilities and they can be a tool for future planning. For workers, occupational standards identify relevant skill requirements and help them formulate career development plans. They can identify a target for training efforts and thus are closely linked to training standards, which are the principles by which training providers should be governed.

To be effective in the emerging labour market, standards must ensure that skills acquisition is certifiable and portable. Currently much of the activity has been provincial, but setting national standards is an important priority. Finally, given the range of paths now being followed into the workforce, standards must be flexible and competence- and experience-based. For this reason, there is increasing interest in prior learning assessment as a tool for evaluating what an individual knows and can do.[51] This assessment must be able to incorporate the full gamut of prior experiences from formal courses to informal learning acquired either within or outside the formal economy.

Training standards are a closely linked issue. The Canadian Labour Force Development Board (1995*a*) has identified a number of guiding principles for developing these standards. Training providers should provide information on program objectives, content, resources, and evaluation, and on the availability of student assistance and funding. The program should incorporate a number of monitoring and evaluation practices that provide frequent

feedback to students on their progress, formal assessments and systematic evaluation, and a formal statement of achievement and learning outcomes that can be recognized by other institutions and by employers.

One potentially critical aspect of this concerns the regulation of private training schools (see Box 8). As we have already noted, this sector has grown dramatically and now is an important institutional feature of the human resource development system. This raises various questions that have relevance for public policy. How can quality control be assured? How can accountability be ensured where public funds are being spent? What is the most effective way to operationalize accreditation in this sector? Dealing with these questions is a growing concern, especially for the provincial governments that have primary responsibility.

Employer certification tools represent another area where governments, working with industry, could improve information in the training market. Despite the overall importance of employers as a source of training, there is almost no information available to prospective employees about the commitment of individual firms in this area. It would be interesting for governments to consider establishing – or encouraging industry to establish – recognition or certification programs that identify employers with strong human resource programs. The primary objective of these tools is to help individuals assess the human resource development opportunities offered by different firms. However, this type of program could also create incentives for firms to place more priority on training in order to be seen as an "employer of choice."

In the United Kingdom, an employer certification program, Investors in People, was originated by government, but is now driven by business. This program establishes training targets for firms and certifies those that have met these targets. Over 8,000 organizations employing 30 percent of the total labour force have now achieved the Investors in People standard. A further 20,000 organizations are committed to achieving the standard.

A related priority for governments is to work with employers to develop *guidelines for reporting human capital investments*. Conventional accounting frameworks cannot accurately measure the returns on investments in training or other forms of knowledge acquisition. This affects decision

Box 8

Regulation and Accreditation of Private Training in Canada: Issues and Innovations

1. *Quality control for the consumer of private training*

Regulation of private training schools lies within the domain of the provinces and hence differs across the country. Most provinces regulate only a portion of their private training sectors, according to criteria set out in private vocational schools legislation. The criteria generally favour programs that offer a full set of entry-level career-related skills over short-term skills upgrading. Each province sets basic quality requirements for regulated private training schools, which ensure that they are not "fly-by-night" operations. These include consumer protection from bankruptcy of the school; fire/safety inspection; and verification/ assessment of the instructors and curriculum.

Some provinces have begun to experiment with regulations that offer a larger degree of quality control to a potential consumer of private training. British Columbia is implementing new regulations whereby training schools offering a program of 12 weeks in duration or more will have the opportunity to become accredited with an arm's length council. The accreditation will involve an on-site assessment of the quality of instruction, as well as an evaluation of the labour market relevancy of a school's programs based on statistics that track the labour market outcomes of graduates. Several other provinces, including Alberta, Saskatchewan and New Brunswick, have begun to require the submission of statistics tracking what happens after people graduate from private training schools. And many provinces provide public information of some kind that encourages students to investigate programs carefully. It is not always clear that statistics collected are widely distributed to the public, but New Brunswick has begun to promote public education by requiring all students of private training schools to sign a contract indicating their awareness of the level of quality control provided by the state. New Brunswick and British Columbia also include a wider scope of private training schools under their regulatory mandates than most, with the former including all programs exceeding 21 hours, and the latter subjecting the entire private training sector to basic quality requirements.

Box 8 (cont'd)

2. *Quality control for provision of public funds*

Citizens may be permitted to spend some public funds on training programs subject to certain criteria if they are on Social Assistance, Employment Insurance (EI), Workers Compensation, or under student loans programs. Benefit programs generally guarantee quality control by monitoring outcomes of expenditures. Expenditures on a particular training program under EI are more likely to continue if participants thereafter find employment. Loans programs tend to be subject to less stringent levels of quality control, since they are available to a student to take any training program that is registered and is a minimum of 12 weeks in duration. High default rates in many provinces are causing the quality control associated with loans to be re-examined, and British Columbia already has plans to require private training schools to become accredited on the basis of their labour market relevancy in order to enable their students to be eligible for loans.

The Challenge Ahead

Provincial regulators and policymakers in the umbrella association serving the regulated private training sector, the National Association of Career Colleges, are actively thinking about the best way to monitor the quality of private training. The challenge in many provinces remains to find cost-effective ways to provide high quality information that can facilitate a consumer's choice of private training. This might be an important public role in a context where the current market cannot ensure that individuals experience successful transitions from training to employment, and where high rates of default on public

making both within the firm and outside in investor markets. As a consequence, investments in people and their knowledge are probably undervalued.[52]

While efforts by the OECD and others to find ways to fully incorporate human resources into company balance sheets has proven difficult, governments can play a role in helping the business community implement reporting systems that better measure human capital investment activities. This is consistent with a traditional responsibility of the state as the "neutral

collective agent that sets the rules for transactions" (Miller, 1996: 80). Ultimately, establishing accurate ways to evaluate human resource development will encourage training by validating existing assets and increasing the probability that the returns from investments will be recognized in the future.

Creating Better Credit Tools

This report has documented the inequalities in the training market as it now functions. People with substantial education and training are the most likely ones to receive more adult training through their employers or their own initiative. People with little education or training – especially those in nonstandard work or working for small firms – have little or no access to training and lack the means to finance it. As the numbers of these workers increase, more people will face financial barriers to training. This is a particularly troublesome situation for those Canadians in insecure jobs or on the margins of the labour market who see a real need for training but have no access. Ekos Research Associates has called them the "bootstrappers."

Unequal access to training simply reinforces the basic inequalities in employment. Yet, Canadians tend to think of access to education as the great equalizer – the tool that creates equality of opportunity for all citizens. The real challenge is to help the education and training systems do a better job of meeting that expectation. This will require a shift in policy focus and some "out-of-the-box" thinking.

Much of the debate about financing more training in the 1980s and early 1990s revolved around incentives to encourage employers to undertake workplace training. These can include carrots, such as subsidies or grants, and sticks, such as a training tax or a grant-and-levy system.[53] Evaluations have shown that there are risks associated with grants and subsidies, which can result in windfall gains to employers. The training might have happened anyway or it may be targeted to certain types of workers, which can lead to the displacement of others who are not eligible. Similarly, training taxes and levies can disproportionately affect small firms with few training resources, whereas large firms will often already be meeting training requirements. Such instruments should therefore only be used when a

government decides that it must use a stick to force a radical change in the corporate culture.

Based on this evidence, and the increasing mobility of workers, we think that policy should focus more on helping workers to fund training, rather than trying to change the decisions of employers – many of whom may be making rational choices about their training investments (or lack thereof). Assistance to employers should focus more on breaking down the economic and other barriers that make it especially difficult for small firms to organize workplace training. These issues are dealt with in our discussions of intermediaries and brokering collaborative relationships.

How then, should financial assistance be opened up to the "boot-strappers" who need and want training but cannot afford it?

Recent federal budgets have placed a high priority on access to post-secondary education, by making Registered Education Savings Plans more attractive, reforming student loans, extending access to student loans and related education tax and child care credits to part-time students, and so on. The February 1998 budget also promised Millennium Scholarships, to be awarded according to need as well as merit; it will also make it possible for Canadians to use RRSP savings to fund investments in learning. These are important breakthroughs in public policy.

- They will do much to help students and their families to cope with the rapid increases in tuition at most universities.
- They also recognize the changing rhythm of learning – some students have children to care for, millions study part time and work part time, etc.
- They also strengthen the "market" for training by giving students more clout in the marketplace.

However, these measures do not directly address the needs of adult Canadians, especially the ones in disadvantaged circumstances, for access to lifelong learning opportunities. Here are a few examples of ideas that could be tested in the training marketplace:

- Employment Insurance allocates funds for "active measures" to assist in the re-employment of EI beneficiaries. Currently about $2 billion are spent on 400,000 people for subsidies, grants, and loans directed toward job creation, self-employment, and skills development. No investments are made in employed people who wish to avoid unemployment or to qualify for a better job. Yet all workers pay into EI and, in fact, low-paid workers pay a higher percentage of their total wages in EI premiums than do people in well-paid positions. Why could EI contributions not permit workers to accumulate training credits that could be used for the exclusive purpose of funding tuition and related living expenses?

- Many people find it hard to find a paid job that uses their skills and builds their networks to find a better job. Many of these unemployed or underemployed attempt to give more meaning to their lives by doing voluntary work. In fact, many high school students are now able to get a credit for a target number of hours of volunteering as part of their high school program. Why not explore the possibility of permitting charities to offer training credits as recognition for voluntary work that adds value to society? These credits or vouchers could only be used at accredited training institutions, and the cost could be covered by governments or by philanthropists.

- People living on low incomes have relatively few opportunities to develop their entrepreneurial capacity. The Self-Employment Development Initiative (SEDI) is currently doing feasibility work on the notion of Individual Development Accounts (IDA), which enable low-income people to build up assets that can be used to start a business or to finance learning investments.[54] IDAs are a savings account where deposits are matched by private or public sources and earmarked for high-return human investments. Existing programs for low-income Canadians provide funds to support consumption. The notion of supporting savings to build independence would be a radical shift in thinking.

- Governments have periodically considered the viability of initiatives such as educational leave plans, registered training plans within the tax system, learning accounts, and time banks for adult education and training. These are potentially feasible credit instruments that have been discussed for a long time but, for one reason or another, have never been adopted. These are ideas whose time may have come.

- Finally, there is the question of borrowing to pay for training. The Canada Student Loans program and related provincial loan programs have proved to be an effective vehicle for students in postsecondary education – in universities, colleges, and private training institutions. Typically, the loans are focussed on people who already have a high investment in education. It will be important to determine whether the new rules being introduced in the next two years open up access to loans for people who are more economically disadvantaged.

In summary, there is much feasibility work required on each of these ideas. Not all of them will stand the test of scrutiny. But the objective should be to come up with a cluster of savings, grants, credits, and borrowing instruments that permit the "bootstrappers" to invest in their own learning, and gain more equal access to opportunities for better paid jobs.

Brokering Collaborative Relationships

The functioning of the training market is enhanced by linkages between education and training suppliers, on the one hand, and industry, on the other. Such collaborations can support many of the key "infrastructure" features that we have already raised: labour market information on supply and demand conditions, the formulation and acceptance of occupational and training standards, and the development and dissemination of human resource accounting practices. Canada's nearly two dozen sector councils composed of employers, unions, and other stakeholders represents a unique example of a new intermediary institution designed to build collaborative relationships. While governments should not be the central players within these councils or other intermediaries, they can play an important brokering role in getting the key participants together and working with them to identify shared objectives and workable partnership models.

These councils have a special advantage in addressing the training problems faced by small firms. While formal training may not make sense for many of these firms because of short job tenures, low rates of technological innovation or some other reason, other small employers may actually be "underinvesting" because of a lack of information or financial barriers. They are less likely than other employers to be aware of training

supply options and, because of their inability to benefit from economies of scale, they also tend to incur high unit costs in delivering training. Thus "pooling" approaches, such as training networks and councils, may provide benefits that alter the calculations. For example, in the Quebec case where firms have a requirement to invest in training their employees (see Note 53), firms that face barriers to meeting this requirement are permitted to pool their training budgets with other firms facing similar barriers, and invest in employee development by capitalizing on the resulting economies of scale. Our evidence indicates that this kind of approach may not only pay off for the firms, but it would certainly be advantageous for small-firm employees.

The business sector in general could profit by building on the natural advantages that can develop in locations where "clusters" of complementary industries have grown. An example would be cities in which a large number of high-tech companies have been established. Often these clusters develop in locations in which there are also a number of universities, colleges, and research institutions. Companies in such clusters typically have common needs in terms of skills, but for competitive or proprietary reasons, are reluctant to make their specific human resource requirements known. Skill shortages then cause problems for these companies when they find their product development plans are stalled. Too often, firms view other local companies as competitors for skilled personnel, rather than assuming a more cooperative stance in which the industry cluster itself works together with the education sector to address these needs, thus allowing the region as a whole to improve its overall competitiveness. (Recall Box 5 for an example of the software industry.)

Facilitating the Labour Market Entry of Youth

The youth employment experience in the 1990s has been a troubling one – declining labour force participation rates, falling relative wages, and a rising incidence of nonstandard work. Will the difficult context for this generation of young Canadians – stuck behind the huge baby-boom generation and entering the workforce in an era of very slow job growth – spell long-term hardship that follows them throughout their working lives? Time will tell. But the social and economic stakes are too high for policymakers to wait for the answer.

Indeed, politicians across the country are hearing voters of all ages voice their concerns. This has contributed to the emergence of youth employment as a priority issue in virtually all jurisdictions. In a communique issued in late 1997, the First Ministers asked their labour market ministers to pursue an action agenda and report back in June 1998.[55]

What role can governments play in responding to the youth employment problem? A careful analysis of the youth labour market and the specific nature of the difficulties young Canadians are experiencing reveals two distinct types of problems within the youth cohort, one facing the poorly educated and the other the well educated. The implication of this analysis is the need for a two-track solution. Both groups need support in accumulating more human capital, but the nature of the interventions will have to be very different. In each case, governments will need to demonstrate the leadership, brokering, and information skills that are now critical for effective intervention in the labour market.

Many *well-educated young people* are facing difficult transitions into the labour market, as they shuttle between low-paid part-time and contract jobs. Also, substantial numbers are underemployed in terms of the skills they have relative to those required for their job. And only a small number report having access to employer-sponsored training programs and the career development opportunities these afford. Data generated by the National Graduates Survey and other sources indicate that eventually, these young people do establish themselves in the labour market. But the transition is long and often difficult.

Governments need to be concerned about the problems that this group is encountering in establishing a foothold in the labour market. The solutions are not necessarily formal education or training; in many respects this is the best educated cohort this country has ever had, a group that is armed not only with strong basic skills but also with advanced technological capabilities. The key for many is to get into organizations where there is access to the networks, the learning opportunities, and to the work experience that can provide a takeoff to careers in the "good job" sector. Governments need to sponsor internships, work experience programs, wage subsidies, and other initiatives that can deliver this access.

Trends are particularly disturbing for *poorly educated young Canadians*, for whom the employment picture has deteriorated most severely. Young people who have not completed their secondary schooling show big increases in unemployment and dramatic drops in participation rates – a sign that they have simply dropped out of the labour market. High school dropout rates have declined from the very high rates of the 1980s, but the literacy data show that there are still significant numbers of young Canadians – roughly one in three – who do not have the basic skills required to navigate in today's labour market.

In earlier periods, these young people could have found meaningful jobs and economic security in the resource or industrial sector. Unfortunately, there is no room for them in the postindustrial labour market unless they are able to acquire more skill. Thus, for this group, the policy challenge is above all one of formal education or training. Income support programs may provide short-term solutions, but they will not make a dent into the long-term prospects unless they include this learning component.

Undoubtedly, an important part of the solution rests with reforms to primary and secondary education. Early intervention and alternative education channels are important and these require a public funding commitment. "Second-chance" opportunities are also key. The evidence collected both in Canada and elsewhere suggests that the more successful programming includes an emphasis on basic employability skills, an integration between classroom and workplace components, clear signals of what is required and what credentials will result from program completion, and ongoing mentoring and monitoring.

Designing effective programs will not be easy, particularly in light of the fact that this group will tend to have already experienced problems in formal learning situations. It will involve a commitment from government, the education and training sector, employers, and unions to engage in collaborative partnerships. It will also require substantial resources.

Several provinces have been reworking their apprenticeship programs to be more responsive along these lines. In Quebec, sector councils have been collaborating with local employment offices and the Ministry of Education to promote youth apprenticeships. Sector councils identify occupations suitable

for apprenticeship, employment offices help to link employers with apprentices and to monitor the process, and the Ministry of Education issues the relevant diplomas/certification. Eligible participating employers are entitled to reclaim parts of expenditures on the training and salary of an apprentice through the tax system. In both Alberta and Quebec, the apprenticeship system embodies the recognition that young people need to continue to develop basic skills while learning a trade, by allowing high school students to simultaneously complete high school requirements while working toward a trade certification.

Concluding Comments

The new economy is here. While we are living it now, we have not adapted the rules of the labour market to suit the redrawn playing field. How well we can do this will have a lot to do with how successful we are in completing the transition, how strong the new economy is, and how widely its benefits are shared. Given the premium placed on knowledge, innovation, and skills, rules around human resource development are absolutely critical.

Many people are thriving in this new economy. But too many are not. In earlier economic eras, a lack of skills could be overcome by other factors such as a willingness to do manual work. This is less and less the case now. The new economy is an exclusive economy offering little for those without skills that have market value. As a result, the risk exists that the proportion of the population facing social and economic exclusion will continue to grow.

Widespread opportunities to develop human capital through education and lifelong learning must be the top concern, then, for policymakers and, indeed, all Canadians. The training market that has emerged offers a model for delivering these opportunities. This model calls for a changing role for government – less direct funding and direct control and more leadership, more brokering of divergent interests, and more knowledge generation. In many respects, these are subtler and more nuanced roles than the traditional ones. But governments must become more active in these new roles. They cannot retreat. They must invest in learning as well.

Appendix A

Work Network Training Project Publications

Skill and Employment Effects of Computer-Based Technologies – The Results of the Working with Technology Survey III. Kathryn McMullen. CPRN Study No. W|01. 1996.

Developing Skills in the Canadian Workplace – The Results of the Ekos Workplace Training Survey. Gordon Betcherman, Norm Leckie and Kathryn McMullen. CPRN Study No. W|02. 1997.

Youth and Work in Troubled Times: A Report on Canada in the 1990s. Richard Marquardt. Working Paper No. W|01. 1996.

Employment Growth and Change in the Canadian Urban System, 1971-94. William J. Coffey. Working Paper No. W|02. 1996.

Youth Employment and Education Trends in the 1980s and 1990s. Gordon Betcherman and Norm Leckie. Working Paper No. W|03. 1997.

Notes

1 These themes provide the focus for a recent CPRN synthesis report on the future of work. See Betcherman and Lowe (1997).

2 These links have been developed within the context of new economic growth theories by Osberg (1995).

3 This project was funded by Human Resources Development Canada, the provincial governments of British Columbia, Ontario and Saskatchewan, the New Brunswick Labour Force Development Board, and the Canadian Labour Force Development Board. The project's research studies published by CPRN are listed in Appendix A.

4 The notion of the "postindustrial" or "information" economy – and much of what we understand about what that means for employment – originates with Touraine (1971), Bell (1973), Porat (1977), and Machlup (1980). In describing this economy, these writers tended to emphasize the shift from goods to services and from blue-collar to white-collar occupations. They also speculated on the growth of information- and knowledge-intensive employment.

5 The relationship between goods and service activity was considered in detail in the Economic Council of Canada (1990; 1991) reports on employment in the service economy.

6 This classification was originally developed for the Economic Council studies. We sometimes refer to distribution and information services as the "dynamic" services group.

7 Both of these perspectives have been articulated in a long and extensive literature. The widespread adoption of computer-based technology has refuelled the debate over the past two decades or so. Important starting points for the modern incarnation of the controversy are Bell (1973), who provides a largely upskilling perspective, and Braverman (1974), who emphasizes the deskilling effect. Recent empirical research has not been conclusive. For

example, in an analysis of skill transformations in the G-7 countries, Castells and Aoyama (1994) conclude that the long-term trend has been predominantly upskilling. Others, such as Szafran (1996) and Applebaum and Schettkat (1990), argue that the story is more one of skill polarization.

8 For a more detailed review of the literature on the "skill" debate, see McMullen (1996).

9 In a comparable analysis, Lavoie and Roy (1997) came to similar conclusions about the growth of information work. According to their calculations, employment in knowledge occupations and data occupations increased at annual rates of 5.1 and 2.5 percent between 1971 and 1996. The annual growth rate for total employment was 2.1 percent in these years.

10 A new occupational classification system, the National Occupational Classification, which takes a different approach to measuring the skill content of occupations, has been introduced in the 1990s.

11 There are two principal concerns in using this approach. First, the measures attribute the skill profile of an occupation to all jobs in that occupation where, in fact, there may be considerable within-occupation diversity. Second, and potentially more serious, is the problem that the trait measures were based on studies done in the late 1960s, and thus reflect the technology and other biases of that period. Nevertheless, the skill measures attached to particular occupations largely "make sense" even from the perspective of the 1990s.

12 The earliest wave was carried out in 1985, with successive panels in 1992 and 1994. The survey results are reported in Betcherman and McMullen (1986), McMullen, Leckie and Caron (1993), and McMullen (1996).

13 This notion is discussed in various sources, including Lipsey (1996). Computers are critical both as a stand-alone technology and, also, embedded in other forms. The WWTS defines CBT broadly to include a very wide range of applications.

14 The 1994 WWTS estimate was 43 percent, up from 37 percent in 1991, and 16 percent in 1985. The 1995 Ekos Workplace Training Survey data yielded a 46 percent CBT-usage rate (Betcherman, Leckie and McMullen, 1997). Lowe (1996) found that, according to Statistics Canada's General Social Survey, 48 percent of the employed population used a computer in their job in 1994, an increase from 35 percent in 1989.

15 These occupational groups are based on the federal government's National Occupational Classification. Within the intermediate category, examples of jobs created include purchasing and accounting clerks and computer operators; examples of jobs eliminated include a range of types of clerical work, typists, and typesetters.

16 This categorization into "high-CBT" and "low-CBT" groups was based on the percentage of employees working with computer technology. For details, see McMullen (1996).

17 "Core" employees were defined as "the largest group of employees ... directly involved in making or providing the [establishment's] principal product or service."

18 These job content findings are largely supported by the 1989 and 1994 General Social Survey data. Using these data, Lowe (1996) finds that these job impacts intensified with greater computer use. He also finds that, in both periods covered by the survey (1984-89 and 1989-94), about 70 percent of workers reported an increase in the skill level required to do their job.

19 The Canadian evidence departs somewhat from the United States data, which consistently have found significantly increasing returns to education. However, unlike the Canadian situation where postsecondary enrolment – and thus the supply of skilled labour – continued to rise through the 1980s and much of the 1990s, enrolment slowed down in the United States.

20 Examples include Bar-Or et al. (1995) and Morissette, Myles and Picot (1994).

21 See, for example, Livingstone (1997).

22 The IALS was conducted in a number of countries, including Canada. The international results are reported in OECD and Statistics Canada (1995) and the Canadian results are detailed in Statistics Canada et al. (1996).

23 This assumption is based, in part, on the fact that the survey provides consistent evidence on the strong linkages between literacy and a range of labour market outcomes.

24 We do recognize that the policy debate around human capital investment must address concerns regarding underemployment as they pertain to youth. We will return to this later in the report.

25 This point is based on the finding from the IALS that the unemployed and those not in the labour force are characterized by low literacy scores. See Statistics Canada et al. (1996).

26 For an in-depth analysis of the challenges of balancing work and family, see CPRN Family Network publications on "What Is the Best Policy Mix for Children?" (forthcoming on www.cprn.com).

27 Over the past two decades, despite the upward trend in unemployment, the proportion of the labour force working more than 40 hours per week has actually increased from 19 to 22 percent. More employees are now working overtime and more are holding more than one job. For an overview of the trends in working time, see Statistics Canada (1997 *b*).

28 This "transition period" has been defined by the OECD as beginning at the first age when less than 75 percent of youths are *only* attending school and ending at the age when more than 50 percent are *only* working. In both 1984 and 1996, the former age was 16, but the transition-ending age rose from 21 to 23 over these years (Statistics Canada, 1997 *a*).

29 Researchers have examined the question of whether average job tenure has increased over the past decade or two. The Canadian studies have concluded that average tenure has remained fairly constant during this period, but that this masks an increase both in short-tenure and long-tenure jobs (e.g., Heisz, 1996).

30 In the 45+ age group, the participation rate for males with 8 years or less of schooling fell 25 points between 1976 and 1997 (from 54.6 to 29.8). In contrast, the rate for the university educated dropped by only 8 points (81.3 to 73.2).

31 The "own-account" self-employed have no employees themselves. The figures on nonstandard work have been adjusted to eliminate any double-counting.

32 These refer to formal means of investing in human capital. According to 1992 time-use data collected by Statistics Canada, adult Canadians (15 years and over) averaged 35 minutes a day in formal educational activities. The bulk of this is undertaken by those under 25. There are also informal means of learning, of course. Time spent on these, however, is much more difficult to measure. See Jones (1995) for information on time-use patterns for both types of activities.

33 The detailed AETS results are presented in Human Resources Development Canada and Statistics Canada (1997). For the IALS training results, see Kapsalis (1997).

34 Among the IALS sample, 90 percent of Canadian trainees took at least one career- or job-related course (Kapsalis, 1997).

35 The IALS analysis includes full-time employees (excluding the self-employed and working students) between the ages of 25 and 60 who were employed for at least 42 of the 52-week period covered by the survey (Kapsalis, 1997).

36 For differing views on this question, see Betcherman (1992) and Kapsalis (1993).

37 In addition to Canada, these were the United States, Germany, Switzerland, the Netherlands, Poland, and Sweden. The results reported here are taken from Kapsalis (1997).

38 The definition of the sample (specifically the lower age bound) means that apprentices, especially in the European countries, were excluded. This is particularly relevant, for example, in interpreting the German results.

39 This section is drawn from the final report of the WTS (Betcherman, Leckie and McMullen, 1997).

40 This is consistent with earlier research, including Holzer (1990) and Bishop (1991).

41 Similar conclusions have been reached by researchers at Statistics Canada who have been studying the innovation process. See, for example, Baldwin, Diverty and Johnson (1995) and Baldwin, Diverty and Sabourin (1995).

42 This subsample included 1,089 establishments that had also participated in an earlier survey undertaken by Ekos Research Associates. More detail of this longitudinal panel is available in Betcherman, Leckie and McMullen (1997).

43 For example, relevant outcome measures such as financial performance or employee performance are often inaccessible. Data tend to pertain to a single point in time, yet these are unlikely to capture true impacts since the effects of training tend to emerge over a longer period. Even where data are available, it is difficult to isolate the impact of training from other factors that might contribute to performance. For a fuller discussion, see Betcherman, Leckie and McMullen (1997).

44 These findings are based on the assessments by managers of the recent performance of their establishment along a number of dimensions and their evaluation of its general viability and outlook for the future. While these data lack the rigour of "harder" business data, they do offer the possibility of comparing results across very different organizations. They also encourage establishments to respond to potentially sensitive questions. Researchers have found that managers are able to provide reasonably accurate assessments of general performance trends (see, for example, Cooke, 1990).

45 This commitment to training was measured by a combination of indicators: a self-assessment of the establishment's training effort relative to others in its industry; the share of the training effort that was formal; the extent to which training functions were formalized; the strategic importance attached to skills; and a subjective self-assessment of the impacts of training on various outcomes.

46 Much of the impetus for change emerged from a series of developments in the federal jurisdiction following the passage in 1982 of the *National Training Act* and as a result of a series of subsequent amendments to the *Unemployment Insurance Act,* and its current version, the *Employment Insurance Act*. One impact of these legislative changes was to progressively remove constraints on how and where federal training funds could be spent.

47 For a more elaborate discussion, see Ashton and Green (1996).

48 See, for example, Finegold (1992).

49 Some of the ideas presented below were initially developed in Government of Canada/OECD (1997).

50 For a discussion of the issues involved in occupational and training standards, see the Canadian Labour Force Development Board (1995*a*; 1995*b*).

51 For more on prior learning assessment, see the Canadian Labour Force Development Board (1997).

52 For a review of these issues, see Miller (1996).

53 The basic idea of these tax schemes is to ensure that all employers contribute to the overall training effort, either by undertaking their own programs or by contributing funds to collective training programs through the tax system. A

training tax has been in existence in France since the 1970s and now one has been introduced in Quebec, whereby firms with payroll accounts exceeding $250,000 must devote 1 percent of their budget to training.

54 For a description of the feasibility work see SEDI Update, Spring 1998, which is available at www.sedi.org. See also Sherraden (1991).

55 The objectives of the agenda included: maintaining and improving access to education and skills; providing more work opportunities; helping youth adapt to an increasingly complex labour market; and helping youth address social and cultural barriers that prevent full labour market participation.

References

Applebaum, Eileen and Ronald Schettkat (1990), *Labour Market Adjustments to Structural Change, and Technological Progress,* London: Praeger Publishers.

Ashton, David and Francis Green (1996), *Education, Training and the Global Economy*, Cheltenham: Edward Elgar.

Baldwin, John R., Brent Diverty and Joanne Johnson (1995), "Success, Innovation, Technology, and Human Resource Strategies – An Interactive System," paper prepared for an OECD Conference on "The Effects of Technology and Innovation on Firm Performance and Employment," Washington, May 1-2, 1995.

Baldwin, John R., Brent Diverty and David Sabourin (1995), "Technology Use and Industrial Transformation: Empirical Perspectives," Research Paper Series No. 75, Analytical Studies Branch, Statistics Canada.

Bar-Or, Yuval, John Burbridge, Lonnie Magee and Leslie A. Robb (1995), "The Wage Premium to a University Education in Canada, 1971-1991," *Journal of Labor Economics* 13(4):762-94.

Beaudry, Paul and David A. Green (1997), *Cohort Patterns in Canadian Earnings and the Skill-Biased Technical Change Hypothesis*, UBC Discussion Paper No. 97-03, Vancouver: University of British Columbia.

Bell, Daniel (1973), *The Coming of Post-Industrial Society,* New York: Basic Books.

Betcherman, Gordon (1992), "Are Firms Underinvesting in Training?" *Canadian Business Economics* 1(1):25-33.

Betcherman, Gordon and Norm Leckie (1997), *Youth Employment and Education Trends in the 1980s and 1990s,* Working Paper No. W|03, Ottawa: Canadian Policy Research Networks.

Betcherman, Gordon, Norm Leckie, Christina Caron and Kathryn McMullen (1994), *The Canadian Workplace in Transition*, Final Report of the Human Resources Management Project, Queen's University, Kingston, ON: IRC Press.

Betcherman, Gordon, Norm Leckie and Kathryn McMullen (1997), *Developing Skills in the Canadian Workplace – The Results of the Ekos Workplace Training Survey*, CPRN Study No. W|02, Ottawa: Canadian Policy Research Networks.

Betcherman, Gordon and Graham S. Lowe (1997), *The Future of Work in Canada – A Synthesis Report*, Ottawa: Canadian Policy Research Networks.

Betcherman, Gordon and Kathryn McMullen (1986), *Working with Technology, A Survey of Automation in Canada*, Economic Council of Canada, Ottawa: Supply and Services Canada.

Bishop, John H. (1991), "On-the-Job Training of New Hires," in David Stern and Jozef M. M. Ritzen (eds.), *Market Failure in Training? New Economic Analysis and Evidence on Training of Adult Employees*, Berlin: Springer-Verlag.

Bloom, Michael, Marie Burrows, Brenda Lafleur and Robert Squires (1997), *The Economic Benefits of Improving Literacy Skills in the Workplace,* Ottawa: Conference Board of Canada.

Braverman, Harry (1974), *Labour and Monopoly Capital,* New York: Monthly Review Press.

Canadian Labour Force Development Board (1995 *a*), *CLFDB Training Standards,* Ottawa.

____ (1995*b*), *Occupational Standards: A CLFDB Position*, Ottawa.

____ (1997), *Prior Learning Assessment and Recognition*, Ottawa.

Castells, Manuel and Yuko Aoyama (1994), "Paths Towards the Informational Society: Employment Structure in G7 Countries 1920-90," *International Labour Review* 133(1):5-33.

Coffey, William J. (1996), *Employment Growth and Change in the Canadian Urban System, 1971-94*, Working Paper No. W|02, Ottawa: Canadian Policy Research Networks.

Cooke, W. (1990), *Labour-Management Cooperation,* Kalamazoo, MI: Upjohn Institute.

Davidman, Katie (forthcoming), "The Status of Human Resource Development in the Canadian Software Sector," Discussion Paper, Ottawa: Canadian Policy Research Networks.

Economic Council of Canada (1990), *Good Jobs, Bad Jobs,* Ottawa: Supply and Services Canada.

____ (1991), *Employment in the Service Economy,* Ottawa: Supply and Services Canada.

Finegold, D. (1992), "The Changing International Economy and Its Impact on Education and Training," *Oxford Studies in Comparative Education* 2(2):57-82.

Freeman, Richard and Karen Needels (1992), *Skill Differentials in Canada in an Era of Rising Labour Market Inequality*, NBER Working Paper No. 38-27, Cambridge: National Bureau of Economic Research.

Gottschalk, Peter and Mary Joyce (1995), "Is Earnings Inequality Also Rising in Other Industrialized Countries?" unpublished mimeo from Boston College.

Government of Canada/OECD (1997), *Changing Workplace Strategies: Achieving Better Outcomes for Enterprises, Workers and Society*, Summary Report of a Conference Sponsored by Human Resources Development Canada and the Organisation for Economic Co-operation and Development, Ottawa.

Heisz, Andrew (1996), *Changes in Job Tenure and Job Stability in Canada,* Analytical Studies Branch Research Paper Series no. 95, Ottawa: Statistics Canada.

Holzer, Harry J. (1990), "The Determinants of Employee Productivity and Earnings," *Industrial Relations* 29(3):403-22.

Human Resources Development Canada and Statistics Canada (1997), *Adult Education and Training in Canada, Report of the 1994 Adult Education and Training Survey*, Ottawa.

Jones, Frank (1995), *Human Capital and the Use of Time*, Family and Community Support Systems Division, Research Paper No. 79, Ottawa: Statistics Canada.

Kapsalis, Constantine (1993), "Employee-Sponsored Training in Canada: Reassessing the Evidence," *Canadian Business Economics* 1(4):3-11.

____ (1996), "The Role of Employers in Training Decisions in Canada," *Canadian Business Economics* 5(1):71-80.

____ (1997), *Employee Training: An International Perspective*, Ottawa: Statistics Canada and Human Resources Development Canada.

Krahn, Harvey and Graham Lowe (1997), *Literacy Utilization in Canadian Workplaces*, unpublished research paper prepared for Human Resources Development Canada, Statistics Canada, and the National Literacy Secretariat.

Lavoie, Marie and Richard Roy (1997), "Employment in the Information Economy: A Growth Accounting Exercise for Canada," *Quarterly Macroeconomic and Labour Market Review*, Human Resources Development Canada (Spring).

Leckie, Norm (1996), "On Skill Requirement Trends in Canada, 1971-1991," unpublished paper, Ottawa: Canadian Policy Research Networks.

Lipsey, Richard G. (1996), *Economic Growth, Technological Change, and Canadian Economic Policy*, Benefactors Lecture, Vancouver: C. D. Howe Institute.

Livingstone, D. W. (1997), "The Limits of Human Capital Theory: Expanding Knowledge, Informal Learning and Underemployment," *Policy Options* July/August:9-13.

Lowe, Graham S. (1996), *The Use and Impact of Computers in the Canadian Workplace*, *1989-1994*, paper prepared for the Centre for Information Technology Innovation, Ottawa: Industry Canada.

Machlup, Fritz (1980), *Knowledge and Knowledge Production*, Princeton: Princeton University Press.

Marquardt, Richard (1996), *Youth and Work in Troubled Times: A Report on Canada in the 1990s,* Working Paper No. W|01, Ottawa: Canadian Policy Research Networks.

McLaughlin, Maryann (1992), *Employability Skills Profile: What Are Employers Looking for?* Ottawa: Conference Board of Canada.

McMullen, Kathryn (1996), *Skill and Employment Effects of Computer-Based Technology – The Results of the Working with Technology Survey III*, CPRN Study No. W|01, Ottawa: Canadian Policy Research Networks.

McMullen, Kathryn, Norm Leckie and Christina Caron (1993), *Innovation at Work: The Working with Technology Survey, 1980-1991*, Human Resources Development Project Series, Queen's University, Kingston: The IRC Press.

Miller, Riel (1996), *Measuring What People Know: Human Capital Accounting for the Knowledge Economy,* Paris: Organisation for Economic Cooperation and Development.

Morissette, René (1995), "Why Has Inequality in Weekly Earnings Increased in Canada?" Analytical Studies Branch Research Paper No. 80, Ottawa: Statistics Canada.

Morissette, René, John Myles and Garnet Picot (1994), "Earnings Inequality and the Distribution of Working Time in Canada," *Canadian Business Economics* 2(3):3-16.

Organisation for Economic Co-operation and Development (1997), *Information Technology Outlook 1997,* Paris: OECD.

Organisation for Economic Co-operation and Development and Statistics Canada (1995), *Literacy, Economy, and Society*, Paris and Ottawa.

Osberg, Lars (1995), "The Equity/Efficiency Trade-off in Retrospect," *Canadian Business Economics* 3(3):5-19.

Osberg Lars, Edward N. Wolff and William J. Baumol (1989), *The Information Economy: The Implications of Unbalanced Growth*, Halifax: Institute for Research on Public Policy.

Picot, Garnet and Richard Dupuy (1996), *Job Creation, by Company Size Class: Concentration and Persistence of Job Gains and Losses in Canadian Companies*, Analytical Studies Branch, Research Paper No. 93, Ottawa: Statistics Canada.

Porat, M. (1977), *Information Economy: Definition and Measurement*, Washington: United States Government Printing Office.

Riddell, Craig (1995), "Human Capital Formation in Canada: Recent Developments and Policy Responses," in Keith Banting and Charles Beach (eds.), *Labour Market Polarization and Social Policy Reform*, School of Policy Studies, Kingston: Queen's University.

Sherraden, Michael W. (1991), *Assets and the Poor: A New American Welfare Policy*, Armonk: Sharpe.

Statistics Canada (1997*a*), "Youths and the Labour Market," *Labour Force Update*, 1(1), Catalogue No. 71-005-XPB, Ottawa: Minister of Industry.

___ (1997*b*), "Hours of Work," *Labour Force Update,* 1(2), Catalogue No. 71-005-XPB, Ottawa: Minister of Industry.

Statistics Canada, Human Resources Development Canada and the National Literacy Secretariat (1996), *Reading the Future: A Portrait of Literacy in Canada*, Ottawa: Minister of Industry.

Szafran, Robert (1996), "The Effect of Occupational Growth on Labor Force Task Characteristics," *Work and Occupations* 23(1):54-86.

Touraine, Alain (1971), *The Post-Industrial Society; Tomorrow's Social History: Classes Conflicts and Culture in the Programmed Society*, translated by Leonard F. X. Mayhew, New York: Random House.

Willms, J. Douglas (1997), *Literacy Skills of Canadian Youth*, Ottawa: Statistics Canada and Human Resources Development Canada (September).

Advisory Committee Members – Employment and Training Project[1]

Judith Maxwell (Chair)
President
Canadian Policy Research Networks
Ottawa, Ontario

Michel Audet
Département des relations industrielles
Université Laval
Québec, Quebec

Ann Bartel
Graduate School of Business
Columbia University
New York, NY

Terry Ann Boyles
Vice-President, National Services
Association of Canadian Community Colleges
Ottawa, Ontario

Valerie Clements
Director, Workplace Innovation and Labour Adjustment
Applied Research Branch
Human Resources Development Canada
Hull, Quebec

Patrice de Broucker
Analytical Studies Branch
Statistics Canada
Ottawa, Ontario

Patrick Flanagan
Executive Director
New Brunswick Labour Force Development Board
Fredericton, New Brunswick

George Gritziotis
Senior Associate
Canadian Labour Force Development Board
Ottawa, Ontario

Robert Hatfield
Director, Education
The Communications, Energy and Paper Workers
Ottawa, Ontario

Ieva Kravis
Senior Analyst
Ontario Training and Adjustment Board
Toronto, Ontario

Sylvain Yves Longvalle
Abitibi Price Inc.
Toronto, Ontario

George Nakitsas
Executive Director
Canadian Steel Trade and Employment Congress
Toronto, Ontario

Stephen Pal
Economist
Policy, Planning and Research Division
B.C. Ministry of Skills, Training and Technology
Victoria, British Columbia

Garnett Picot
Analytical Studies Branch
Statistics Canada
Ottawa, Ontario

Hans Schuetze
Centre for Policy Studies in Education
University of British Columbia
Vancouver, British Columbia

Elizabeth Wagner
Director
Policy, Special Projects and Evaluation
Ontario Ministry of Education and Training
Toronto, Ontario

Kuan Yang
Labour Market Policy Analyst
Planning and Development Services Unit
Saskatchewan Education, Training and Employment
Regina, Saskatchewan

1 Affiliation at the time of the Training Project.

CPRN Funding Sources

CPRN projects are funded by a mix of federal, provincial, foundation and corporate sponsors.

CPRN Core Funders

- Canadian International Development Agency
- Citizenship and Immigration
- Environment Canada
- Fisheries and Oceans
- Health Canada
- Human Resources Development Canada
- Public Works and Government Services Canada (1998-2000)
- Transport Canada

CPRN Funding Sponsor

- The Royal Bank of Canada

CPRN Funding Supporters

- Hongkong Bank of Canada
- IPSCO Inc.
- The Mutual Group
- NOVA Corporation
- Power Corporation of Canada
- Scotiabank
- Sun Life Assurance Company of Canada
- The Toronto-Dominion Bank

Work Network Sponsor

- Noranda Inc.

Project Funder

- British Columbia Ministry of Skills, Training and Technology
- Canadian Labour Force Development Board
- Human Resources Development Canada
- New Brunswick Labour Force Development Board
- Ontario Ministry of Education and Training
- Saskatchewan Department of Education, Training and Employment