

The marginally literate workforce

Susan Crompton

The pressure to develop a highly literate workforce has intensified in recent years as the skills demanded by employers become increasingly complex. However, employers tend to enhance the skills of those who are already highly literate and leave behind a substantial proportion of workers who are only marginally literate. So although the economy demands increasing numbers of highly skilled workers, present practices may well be limiting economic growth and productivity. Improving the abilities of adults with poor literacy skills may present the biggest human resource challenge of the next decade.

This article briefly profiles the significant minority of Canadian workers who possess only Level 1 or 2 literacy skills, as determined by the International Adult Literacy Survey (IALS) (see *Data source and definitions*). Although no one country is "better" than another in an absolute sense - they differ in their demographic composition, educational organization, social institutions and employment opportunities - useful questions may be raised by studying the literacy skills of foreign workforces. Therefore, this article also looks at workers in the United States, our largest trading partner and primary competitor, and Germany, the principal economic power in Europe.

What does marginal literacy mean for workers?

Workers with only Level 1 or 2 literacy skills - workers "at risk" have quite limited capabilities. In practical terms, their general reading abilities (prose literacy) are restricted to such tasks as identifying dosage instructions on a medicine bottle (Level 1) or answering a simple question about plants based on a brief article about gardening (Level 2). However, they have difficulty summarizing instructions on making sure a bicycle seat is in the proper position for the rider; or reading four movie reviews and identifying which movie was considered the worst, in the absence of a ratings device such as points or stars. These are Level 3 prose tasks.

Workers at risk also exhibit weak skills in working with the types of forms, charts, tables and text they might encounter in the workplace (document literacy). From a chart showing the percentage of teachers who are female in different European countries, they are able to identify the percentage of teachers in Greece who are women (Level 1); or from two charts containing data about fireworks, they are able to select the year in which the fewest people were injured in fireworks accidents (Level 2). However, they are unlikely to succeed at Level 3 document literacy tasks, such as using a bus schedule to find out what time the last bus leaves a particular stop on Saturday night.

Workers with marginal literacy skills also have a limited ability to work with numbers (quantitative literacy). They can complete an order form when the numbers to be added together are already provided (Level 1), or calculate the difference between the maximum daytime

temperatures in Bangkok and Seoul using information printed in a table in the newspaper (Level 2). They are not usually able to successfully complete quantitative tasks of Level 3 difficulty; for example, they are unable to compare two bar charts - one showing the amount of energy produced by selected countries, the other, the amount of energy consumed - and calculate how much more energy Canada produced than it consumed, or estimate the total amount of energy that was consumed by Canada, the United States and Mexico combined.

Compounding the difficulties marginally literate workers likely face in remaining employable are their attitudes toward literacy. They read less, and watch television more, than people with high-level literacy skills, thereby risking further deterioration of their abilities. Moreover, they do not recognize (or acknowledge) that they are at risk: about half the workers with Level 1 abilities, and over three-quarters of those with Level 2, rate their reading, writing and numeracy skills as good to excellent. Given this belief, it is not surprising that the great majority of marginally literate adults do not consider their job opportunities to be limited by their poor literacy skills.¹

Over one-third of Canadian workers have weak literacy skills

Over one-third of the workers in Canada (36%) possess marginal literacy skills. This proportion is consistent across all three types of literacy - prose, document and quantitative. Although most workers "at risk" function at Level 2 literacy, about one in three operate at Level I (Chart A).

In the United States, over 40% of workers have only Level 1 or 2 skills, regardless of the type of literacy being measured. Although this proportion is slightly higher than in Canada, the split between Levels I and 2 is similar; that is, a little more than one-third of American workers with marginal literacy function at the lowest level.

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Germany presents a contrast to both North American countries.² Proportionally more German workers have marginal prose skills (44%), while the same percentage as Canadians have limited document literacy (36%); however, proportionally fewer have weak quantitative skills (27%). More importantly, German workers are much less likely than Canadians to test at the minimal Level 1 for document and quantitative literacy.

Data source and definitions

The data in this article, *Economy and Society: A Report on the first International Adult Literacy Survey*, jointly published by the Organization for Economic Cooperation and Development and Statistics Canada. The international classification conventions used in that publication - for example, industry and occupation classifications - are also used in this article. See "International survey on adult literacy" in this issue for more information about the survey, including its methodology and testing procedures.

Literacy: three types of literacy were measured by the IALS - prose, document, and quantitative. All three measure the information-processing skills of the reader - the ability to locate, integrate and generate information - but the emphasis is somewhat different for each type. Prose skills involve the use of text; document, the use of text, charts, graphs, maps, or schedules; and quantitative, the use of arithmetic operations when the necessary information is embedded in material such as text, order forms, tables, charts and so on. After being tested, readers were classified into one of the five levels for each literacy type based their results, with Level 1 being the lowest and Level 5 , the highest.

Marginal literacy: refers to Level 1 or Level 2 on the IALS literacy tests, whether prose, document or quantitative. Readers at Level 1 literacy have serious difficulty dealing with many printed materials and most likely identify themselves as people who have trouble reading. Readers at Level 2 have weak test scores, but do not generally report having reading problems. Synonyms for *marginal literacy* used in this article include *weak, limited, low-level, and at-risk*.

Major occupational groups: this article uses the Standard International Classification of Occupations (ISCO). The following list shows ISCO categories used here, followed by their approximate equivalents in the Canadian Standard Occupational Classification:

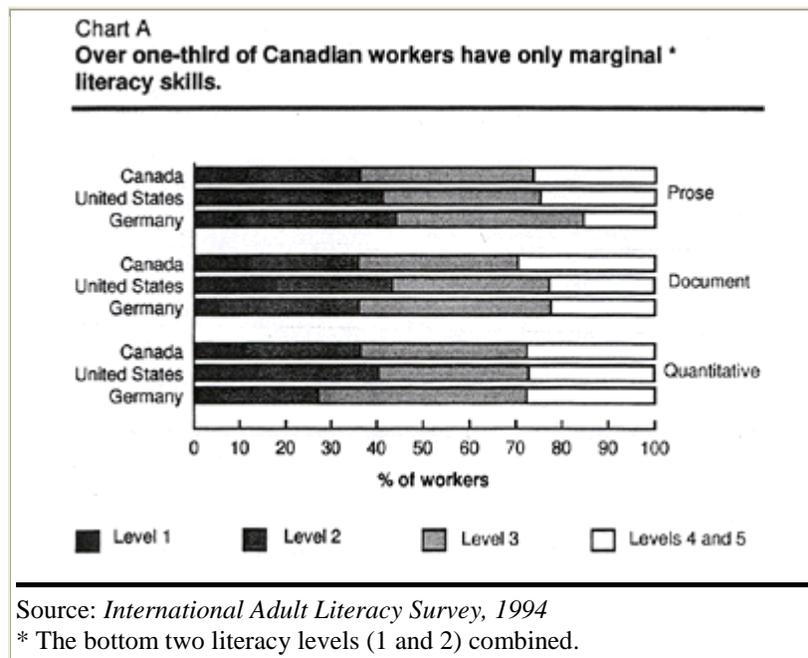
- managers = managerial and administrative occupations
- professionals = occupations in the natural sciences, engineering and mathematics; social sciences; religion; teaching; some medicine and health (for example, physicians, dentists, registered nurses); artistic, literary and recreational occupations
- technicians = some occupations in medicine and health (for example, physiotherapists, nutritionists, dental hygienists); some sales (for example, insurance and real estate agents, sales supervisors)
- clerks = clerical occupations
- service workers and sales workers = some sales (for example, sales clerks); service occupations
- craft workers = some occupations in machining; fabricating, assembling, and repairing; construction; some other crafts
- machine operators and assemblers = some occupations in processing; transport equipment operating; material handling; machining; fabricating, assembling, and repairing; construction; some other crafts
- agricultural and primary workers = farming, horticultural, and animal husbandry; fishing and trapping; forestry and logging; unclassified
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Blue-collar occupations: craft workers; machine operators and assemblers; agricultural and primary workers.

Major Industrial groups: this article uses the International Standard Industrial Classification (ISIC). The following list shows the ISIC categories used here, followed by their approximate equivalents in the Canadian Standard Industrial Classification:

- agriculture = agriculture; logging and forestry; fishing and trapping
- mining and quarrying = mining, quarrying, and oil wells
- manufacturing = manufacturing
- electricity, gas, and water = other utilities
- construction = construction
- transport, storage, and communication = transportation and storage; communication
- trade and hospitality = wholesale and retail trade; accommodation, food and beverage service
- financing, insurance, real estate and business services = finance and insurance; real estate operators and insurance agents; business services
- community, social and personal services = educational services; health and social services; government services; other service industries.

The data on industry and occupation are highly aggregated, which may account for a few surprising findings. For example, in [Table 2](#) the managers/professionals classification is a very broad category that includes supervisors, foremen, store managers and administrative assistants as well as doctors, engineers and high-level managers. This heterogeneity offers one reason why about one in five management/professional workers are reported to have marginal literacy.



Full-time workers generally less literate

In Canada, full-time workers are more likely than part-time to have limited literacy skills: about 39% of full-timers possess limited prose literacy compared with 27% of part-timers. The gap begins to narrow with document literacy and almost disappears when quantitative skills are examined ([Table 1](#)). This erosion probably reflects the composition of the part-time workforce. About one-third are students, who have predictably high general skills (prose literacy). Their limited exposure to materials generally found in the workplace, such as payrolls, schedules and manuals, may account for their having fewer specific skills (document and quantitative literacy).

In the United States, where about one-third of part-time workers are also students, a larger percentage of full-time than part-time workers have marginal prose and document skills, while about the same percentage have limited quantitative skills. In Germany, students make up only 10% of part-time workers and do not appear to have much effect on the literacy levels. Part-timers are just as likely as full-time workers to test at Level 1 or 2 for document literacy, but they are more likely to have limited quantitative skills, and their prose abilities are better.

Half of blue-collar workers are weak readers

Different jobs demand different skills, and there is a discernible relationship between literacy and occupation (and hence between numeracy and income). Surprisingly, almost one in five Canadians in management/professional occupations have only marginal skills - mainly Level 2. (The reason for this result may lie in the occupation classification; see *Data source and definitions*.) The literacy profile of technicians reflects their more job-specific skills: 30% have limited prose abilities, but far fewer perform poorly on document (16%) and quantitative tasks (22%), presumably because they are more familiar with such items as technical manuals, diagrams and specifications ([Table 2](#)).

	Level on prose scale				Level on document scale				Level on quantitative scale			
	1	2	3	4/5	1	2	3	4/5	1	2	3	4/5
%												
Canada												
All workers	12	25	38	26	12	24	35	30	11	25	36	28
Full-time	14	25	37	25	14	24	34	28	13	26	35	27
Part-time	9	18	41	32	8	23	35	34	11	25	41	23
United States												
All workers	15	26	34	25	18	26	34	23	16	25	33	27
Full-time	16	27	33	25	19	26	32	23	16	24	31	29
Part-time	14	22	41	23	16	22	42	19	17	24	43	17
Germany												
All workers	11	33	41	15	5	31	42	22	4	23	45	28
Full-time	12	34	39	16	6	31	42	22	5	23	45	28
Part-time	12	28	43	18	9	27	40	24	6	25	43	26

Source: International Adult Literacy Survey, 1994
 Note: "All workers" refers to those employed at the time of the survey; "full-time" and "part-time" refer to anyone who worked in the previous 12 months.

Many workers in the other occupational groups have limited literacy abilities that deteriorate as the content of the tasks becomes increasingly numerate. Depending on the type of literacy being measured, 34% to 40% of clerks and 40% to 46% of sales and service workers are marginally literate, although a clear majority function at Level 2. But more than half the craft workers and machine operators and assemblers in Canada function at low-level literacy and the proportion testing at only Level 1 is very high: furthermore, they account for most marginally literate blue-collar workers on the prose literacy scale, and for almost half on the document scale.

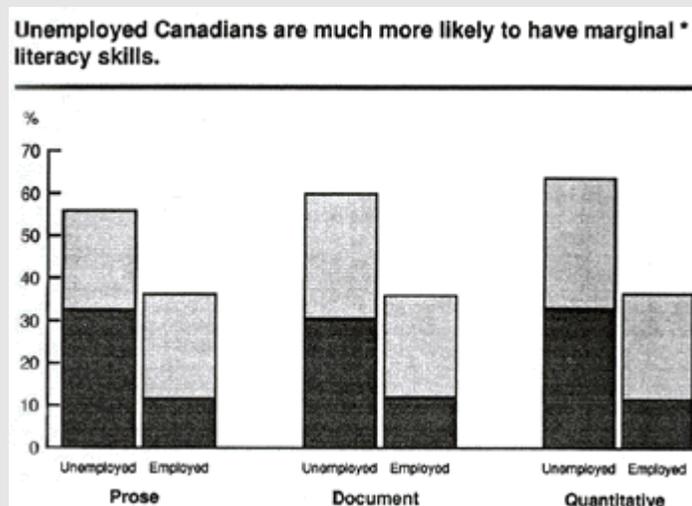
In the United States, as in Canada, about one-fifth of managers and professional workers also have limited skills according to all three literacy measures, but American technicians are less likely to function at marginal levels, at least on the prose and quantitative scales. Workers in the remaining four major groups are more likely to have limited literacy than their Canadian counterparts.

In Germany, the proportion of managers and professional workers with only marginal literacy skills is similar to that in Canada, a departure from the observation that, overall, German workers have poorer prose, similar document and better quantitative skills. The usual pattern surfaces again among workers in other occupations: almost half the workers in clerical and sales and service jobs have limited prose abilities, but less than one-third have marginal quantitative skills. Blue-collar workers appear, at first glance, to be less literate than their Canadian counterparts. Among craft workers, one-half have marginal prose skills and about one-quarter have limited quantitative abilities; among machine operators and assemblers, three-quarters have weak prose and about one-half, weak quantitative skills. But although a large percentage of German blue-collar workers are at risk, most of them possess Level 2 skills. The same cannot be said of their North American counterparts, of whom a significant plurality (and, in some cases, the majority) function at Level 1.

Majority of unemployed are marginally literate

Workers with poor literacy skills are particularly vulnerable to layoff and displacement, and once unemployed, they may find it exceedingly difficult to find new jobs. There is little demand for workers with weak skills, and the low-level literacy possessed by most unemployed people in Canada may be one factor underlying the current high levels of long term unemployment.

Depending on the type of literacy being measured, between 56% and 64% of unemployed Canadians test at Level 1 or 2 (Chart). These rates are much higher than those for working Canadians; furthermore, at least half of the marginally literate among the unemployed test at a Level 1 for all three types of literacy. In the United States and Germany, the unemployed also have much weaker literacy skills than adults who are working. However, a smaller percentage of unemployed Germans than Canadians or Americans have only minimal Level 1 skills.



Source: *International Adult Literacy Survey, 1994*

* The bottom two literacy levels (1 and 2) combined.

Workers in older industries more likely at risk

Much recent commentary has emphasized that the changing industrial economies demand the development of greater skills, and the IALS data would seem to support this assessment. A high proportion of workers with the highest literacy levels are found in industries where employment has grown in the last 20 years (that is, newer industries), whereas industries where employment has declined, (older industries) are characterized by workers who are marginally literate.

In four of the six major industrial groups, 41% to 52% of Canadian workers have marginal literacy skills, depending on the type of literacy being measured; the results on the quantitative scale are particularly weak. Only in financing, insurance, real estate and business services, and community, social and personal services do fewer than 30% of workers possess limited abilities on all three scales (Table 3).

In the United States, close to half the workers have only Level 1 or 2 skills in three industry groups: manufacturing; construction/ transport, storage and communication; and trade and hospitality. Meanwhile, about one-third of workers in financing, insurance, real estate and business services, and community, social and personal service industries are marginally literate.

In Germany as in North America; workers at risk are concentrated in the older industries. But while German workers are more likely than Canadians to have weak prose skills, they are much less likely to have limited quantitative skills. In addition, the percentage of workers in German industries who function at only Level 1 literacy is quite small compared with Canada and the United States.

Given that older Canadians are more likely to have lower-level literacy skills,³ it seems reasonable to suggest that differences in literacy levels among the major industrial are due to the age of composition of their respectable workforces.

	Level on prose scale				Level on document scale				Level on quantitative scale			
	1	2	3	4/5	1	2	3	4/5	1	2	3	4/5
%												
Canada												
Managers/professionals	3	17	37	43	3	15	32	50	2	15	36	46
Technicians	4	26	26	43	4	12	59	26	4	18	33	45
Clerks	6	28	51	15	8	27	37	28	5	35	41	20
Sales and service	11	29	35	25	18	30	29	25	15	31	41	13
Crafts	30	23	33	14	25	31	29	16	22	35	29	14
Machine operators and assemblers	29	20	40	11	28	31	26	15	29	29	34	9
Agricultural and primary	19	28	40	14	18	31	33	18	21	25	36	18
United States												
Managers/professionals	4	16	37	43	5	15	41	39	4	14	37	46
Technicians	2	16	47	34	4	17	49	30	2	11	44	43
Clerks	7	30	42	21	11	34	33	22	11	32	36	22
Sales and service	24	26	32	17	27	25	33	15	25	29	29	17
Crafts	29	38	26	7	30	38	25	7	29	32	29	11
Machine operators and assemblers	29	37	28	6	35	32	26	7	30	31	28	11
Agricultural and primary	32	21	25	23	36	12	27	24	34	10	43	14
Germany												
Managers/professionals	5	19	44	32	2	20	36	42	2	14	37	47
Technicians	4	23	49	24	2	14	54	30	2	15	52	31
Clerks	10	39	39	13	5	31	44	19	5	26	46	23
Sales and service	10	37	36	17	6	37	39	18	5	25	45	25
Crafts	14	36	43	7	7	33	47	14	3	24	48	25
Machine operators and assemblers	22	53	20	6	12	48	32	8	11	41	36	12
Agricultural and primary	37	31	28	4	19	39	29	13	18	27	39	17

Source: International Adult Literacy Survey, 1994
Note: Data refer to anyone who worked in the previous 12 months. For a complete description of occupations refer to Data source and definitions.

Table 3
Distribution of workers aged 16-65 across literacy levels, by industry and country

	Level on prose scale				Level on document scale				Level on quantitative scale			
	1	2	3	4/5	1	2	3	4/5	1	2	3	4/5
%												
Canada												
Agriculture/mining and quarrying	16	25	44	15	17	28	33	23	17	28	38	17
Manufacturing	25	17	43	15	22	24	31	23	20	28	30	21
Construction/transport, storage and communication	22	24	33	21	20	32	27	21	22	27	32	19
Trade and hospitality	12	31	37	20	14	29	32	25	13	34	38	16
Financing, insurance, real estate and business services	2	26	47	25	3	16	34	47	2	20	36	43
Community, social and personal services	7	21	33	39	8	20	40	32	8	20	40	33
United States												
Agriculture/mining and quarrying	21	21	27	31	22	20	26	32	20	6	42	31
Manufacturing	22	32	30	16	25	28	31	16	20	27	31	23
Construction/transport, storage and communication	18	27	38	17	20	30	31	19	17	29	31	24
Trade and hospitality	19	32	34	16	23	28	32	18	21	30	31	19
Financing, insurance, real estate and business services	11	26	35	28	12	25	36	27	13	22	37	28
Community, social and personal services	12	19	36	33	14	21	38	27	14	21	34	32
Germany												
Agriculture/mining and quarrying	31	38	15	16	9	49	19	24	4	22	45	29
Manufacturing	12	38	36	14	6	29	44	22	4	28	45	24
Construction/transport, storage and communication	18	37	34	11	8	41	33	19	7	28	36	29
Trade and hospitality	14	36	38	13	7	33	39	21	7	25	43	26
Financing, insurance, real estate and business services	6	27	54	13	6	20	53	22	3	12	57	27
Community, social and personal services	7	26	45	23	5	24	45	27	4	19	45	32

Source: International Adult Literacy Survey, 1994

Note: Data refer to anyone who worked in the previous 12 months. For a complete description of industries refer to Data source and definitions.

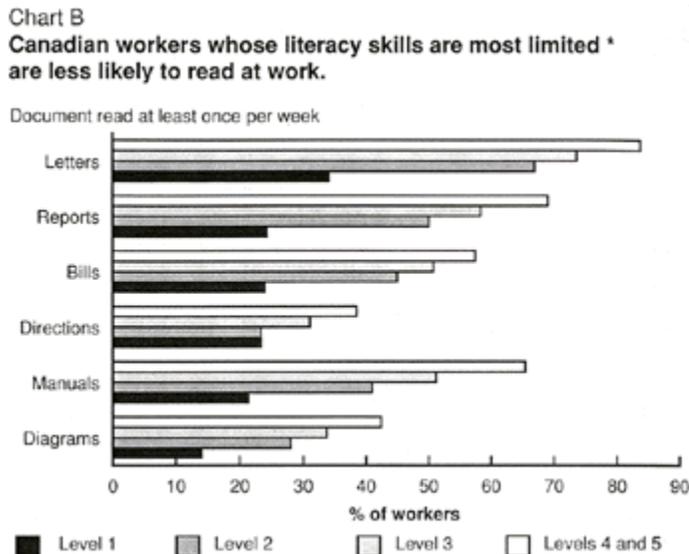
In Canada, almost two-thirds (65%) of community, social and personal service workers are under 45, compared with 77% of agricultural and 81% of manufacturing workers. Almost half (45%) of the People employed in financing, insurance, real estate and business services are even younger (under as are 60% of those in sales. Therefore, the higher concentration of workers with low-level literacy skills in the older industries cannot be attributed primarily to a simple difference in age composition. Other factors may play a more important role; for example, the availability of employer-sponsored training opportunities;⁴ an industry's proportion of part-time jobs⁵ (held by generally more literate workers); and an occupation's need for highly skilled workers.⁶ These factors are more prevalent in service industries or in certain occupations in industries where employment is growing.

The IALS results also suggest that the organization of work affects literacy. The survey findings indicate that literacy skills must be used regularly if they are to be maintained or improved. Since most jobs in industries such as manufacturing and construction tend to emphasize manual skills, most workers in these industries may have low-level abilities in part because their work does not encourage the maintenance or development of literacy skills.

Marginally literate workers read less on the job

This suggestion is supported by the fact that workers with limited literacy read and write at work much less frequently than those with stronger skills. And even among workers at risk, there is a considerable difference in the amount of reading done. In Canada, those workers with minimal abilities do the least reading; for example, fewer than onequarter of workers testing at Level 1 on the document scale report reading text such as directions, manuals or reports at least once a week. Workers functioning at Level 2 read on the job more frequently, though not as often as highly literate workers (Chart B).

Interestingly, American workers at all literacy levels appear to read more frequently than Canadians. In spite of this, the reading frequency rates of workers at risk are still much lower than those of the highly literate. The disparity is even greater among marginally literate workers themselves, with Level 1 workers doing very little reading in the workplace, and Level 2 workers doing considerably more. In Germany as well, workers with limited abilities generally read less regularly than those with higherlevel literacy; however, they are still required to read more frequently than their Canadian and American counterparts.



Source: *International Adult Literacy Survey, 1994*

* Level 1 document literacy

declining.

Summary

The results of the International Adult Literacy Survey appear to show that literacy and employment are closely interdependent. To obtain the skills required in the most desirable jobs, workers must first be highly literate; the challenges of the job then demand that workers remain highly literate, which enables them to learn new skills for yet more desirable jobs. Consequently, the marginally literate tend to be concentrated in lower-level occupations in industries where employment is declining.

This interaction between low level literacy and employment is common to all three countries described in this study. However, Canadian workers are less likely than American to have weak literacy skills. This is especially true in manufacturing; financing, insurance, real estate and business services; and community, social and personal services. Furthermore, a much higher proportion of U.S. workers function at minimal Level 1 literacy in most major industries, especially in the service-producing sector. In Germany, two findings stand out very clearly in contrast to the Canadian (and American) experience: the consistently good results posted by German workers in terms of quantitative literacy, and the much lower percentage of German workers with minimal Level 1 skills.

Notes

¹ Among Canadian adults (both workers and non-workers), about two-thirds of those with Level 1 and well over three-quarters of those with Level 2 skills do not believe that their job opportunities are hampered by their literacy skills.

² The IALS was conducted after German unification. The literacy results for Poland were the poorest of all participants in the survey - Canada, United States, Germany, the Netherlands, Poland, Switzerland and Sweden -so if Poland is reasonably representative of former East Bloc countries, the results for Germany probably reflect the weaker literacy skills of workers in the former East Germany.

³ Just over half (51%) of Canadians aged 46 to 55 and almost two-thirds (64%) of those aged 56 to 65 tested at Level 1 or 2 literacy. Considerably smaller percentages of younger Canadians have marginal literacy skills: 36% of those aged 16 to 25, 41% of those 26 to 35, and 32% of those 36 to 45.

⁴ About 14% of Canadian workers received training from their employers in 1990. The incidence of training in most of the service producing industries was higher than the national average; for example, over one in workers in the finance, insurance and real estate industries, as well as in the utility industries and public administration, were provided training (Crompton, 1992).

⁵ Part-time jobs are most common in the service industries and agriculture (all above the national average of 23% in 1993), and least common in the manufacturing, other primary and transportation industries (Pold, 1994).

⁶ Employment projections from the organization for Economic Co-operation and development (OECD) suggest that the demand for moderately and highly skilled professional, technical and administrative workers will accelerate, while that for low-skilled workers will fall sharply (OECD and Statistics Canada, 1995:22).

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