

August 19, 1998

Catalogue N° 89F0103XIE

Literacy Utilization in Canadian Workplaces

by

Professors Harvey Krahn and Graham S. Lowe

Department of Sociology

University of Alberta

The ability to read, write and use numbers is crucial for the labour market success and social well-being of individuals. It is also widely accepted that economies with highly literate populations will be more competitive. Yet little is known about how Canadian workers actually use their literacy skills in the workplace. The main objective of the report described in these highlights is to examine the match between the literacy requirements of Canadian jobs and the literacy skills of Canadian workers.

This study of literacy usage and under-usage in the labour market uses data from the Canadian component of the International Adult Literacy Survey (IALS). Survey participants answered questions that asked how often they performed specific reading, writing and mathematical tasks in their job. Using responses ranging from “every day” to “rarely or never,” the IALS measured workplace literacy requirements for basic reading, writing and mathematical activities.

Defining literacy

The 1994 International Adult Literacy Survey (IALS) defined literacy as the ability to understand and use written information to function in society, to achieve goals, and to develop knowledge and potential. Three types of literacy were measured by the IALS: prose, document and quantitative. They were defined as follows:

- *Prose literacy*: The ability to understand and use information from texts such as editorials, news stories, poems and fiction.
- *Document literacy*: The ability to locate and use information from documents such as job applications, payroll forms, transportation schedules, maps, tables and graphs.
- *Quantitative literacy*: The ability to perform arithmetic functions such as balancing a chequebook, calculating a tip, or completing an order form.

Based on the results of tests administered as part of the survey, respondents were classified into one of five levels for each type of literacy; Level 1 was the lowest and Level 5 the highest. Because of the small proportion of individuals at Level 5, Levels 4 and 5 have been combined.

Reading most frequent workplace literacy task

By far, the most common basic literacy task performed by employed Canadians is reading memos and letters — 52% report that they do so daily. It is less common to read reports, articles and journals (35%), or to work every day with bills, spreadsheets or budget tables (34%).

Writing is required somewhat less frequently than reading on the job. Writing letters or memos daily was a requirement for 35% of workers, and filling out forms, bills, invoices or budgets for 30%. A large number of workers (37%) calculate prices, costs or budgets every day, but only 13% measure or estimate the size or weights of objects with such frequency.

On the other hand, a substantial minority of workers do not regularly perform these literacy activities. The figures are striking: one in five workers rarely or never read letters or memos; about one-third rarely or never write letters or memos; and almost two out of five rarely or never calculate prices, costs, or budgets.

Table 1**Frequency of performing specific workplace reading, writing and numeracy tasks, employed population, Canada, 1994**

Task	Frequency of performing task				
	Every day	A few times weekly	Once a week	Less than once a week	Rarely or never
			%		
Read or use information from					
• letters, memos	52	15	7	6	20
• reports, articles, magazines, journals	35	16	8	12	29
• bills, invoices, spreadsheets, budget tables	34	9	7	12	38
• manuals, reference books, catalogues	30	13	10	16	32
• diagrams, schematics	19	9	6	14	52
Write or fill out					
• letters, memos	35	14	9	10	32
• forms, bills, invoices, budgets	30	11	9	10	40
• reports, articles	25	10	7	14	44
• estimates, technical specifications	13	10	6	10	62
Use mathematics to					
• measure, estimate the size or weight of objects	37	8	3	11	41
• calculate prices, costs, budgets	35	9	6	13	37

Numbers may not add due to rounding.

Few industries or occupations demand strength in all types of literacy

Four indices were developed to measure workplace literacy requirements —reading, writing, reading and writing combined, and quantitative literacy. These indices measure the frequency with which a task is performed, and show that literacy demands vary considerably by industry and occupation.

The lowest reading and writing requirements were for Canadians employed in the primary industries and in construction, with manufacturing also scoring below the average for all workers. In contrast, the finance industry has the highest need for reading and writing, followed by public administration and transportation, communication and utilities.

Interestingly, construction and trade have the highest requirements for quantitative literacy, while public administration has one of the lowest. This “reversal” is to be expected, because the quantitative test consists of two activities commonly found in construction (measuring and estimating sizes and weights) and trade (calculating prices and costs). Only two industry sectors—the finance sector, and the transportation, communication and utilities sector—combine high levels of all three literacy activities. These findings suggest that a sizable proportion of Canadian jobs require reading and writing skills, or mathematical skills, but not both.

As might be expected, managers and professionals have jobs with above-average reading requirements while workers in all other occupations, except technical and semi-professional, fall below the average. With respect to the writing index, only managers, professionals and clerical workers hold occupations with above-average requirements.

The quantitative index reveals a different pattern. Although managers still score the highest, skilled craft workers come second, followed by professionals and service workers.

Calculating Literacy “Fit” and “Mismatch” in the Workplace

Literacy “fit” or “mismatch” was measured by collapsing the reading–writing combined and the numeracy indices for workplace literacy into four categories, similar to those used to define literacy proficiency (Level 1 to Level 4/5 skills). Then these scores for the workplace requirement (frequency with which literacy tasks were performed) were compared with the individual’s literacy scores. Five outcomes are possible:

- low literacy skills and low literacy requirements in the workplace
- medium literacy skills and medium literacy requirements
- high literacy skills and high literacy requirements
- low literacy skills and high literacy requirements (*literacy deficit*)
- high literacy skills and low literacy requirements (*literacy surplus*)

Results are presented for document literacy, unless otherwise stated.

Literacy “fit” and “mismatch” in the Canadian workplace

Almost three-quarters of Canadian workers are employed in a job appropriate to their literacy skills. About 2 million workers with low literacy skills are in jobs that make few demands on their reading, writing and numeracy abilities; close to 4 million workers with medium-level literacy skills are employed in jobs with mid-range demands; and about 2.8 million Canadians with high literacy skills have jobs that require frequent use of their literacy skills.

However, over one-quarter of workers are a literacy “mismatch” for the work they are doing; specifically, almost 2.5 million have higher level skills than are demanded by






their job (literacy surplus), and as many as 635,000 may not have sufficiently well-developed skills to do their jobs adequately (literacy deficit).

Table 2

Document literacy “fit–mismatch” in the workplace, employed population, Canada, 1994

Document literacy level	Workplace reading–writing requirements %				Total
	Low	2	3	High	
Low	62 (846)	22 (293)	8 (111)	8 (102)	100 (1,352)
2	31 (872)	31 (869)	23 (657)	15 (422)	100 (2,820)
3	23 (959)	32 (1,302)	26 (1,067)	19 (782)	100 (4,110)
High	11 (390)	32 (1,115)	32 (1,095)	25 (885)	100 (3,485)
Column pop. est.	(3,067)	(3,579)	(2,930)	(2,191)	(11,767)

Key to shading

Low document literacy skills and low reading–writing requirements		“Fit” between workers’ skills and job requirements.
Medium document literacy skills and medium reading–writing requirements		
High document literacy skills and high reading–writing requirements		
Low document literacy skills and high reading–writing requirements (literacy deficit)		“Mismatch” between workers’ skills and job requirements.
High document literacy skills and low reading–writing requirements (literacy surplus)		

Although the IALS data confirm earlier research showing that many Canadian workers suffer a literacy “deficit”, the IALS results have revealed that substantially more workers are under-using their literacy skills. For example, about 43% of Canadian workers with high level document literacy (about 1.5 million) have a “literacy surplus” given the job they hold. In contrast, only 15% of workers with low level literacy (about 635,000) are in jobs whose literacy demands exceed their skill level, putting them in a skill deficit situation.

Women and young workers most likely to have literacy surplus

Employed women score slightly higher than men on all three measures of literacy, but they are less likely to use their skills in the workplace. Twenty-four percent of women were “under-employed” in jobs that did not require their literacy skills, compared with 19% of men. On the other hand, men are somewhat more likely than women to fall into the skill deficit category.

Table 3

Document literacy “fit–mismatch” by gender, employed population, Canada, 1994

Worker literacy skills–workplace literacy requirements “fit–mismatch”					
Gender	1 Low–low	2 Medium– medium	3 High–high %	4 Low–high (literacy deficit)	5 High–low (literacy surplus)
Document literacy					
Total	17	33	24	5	21
Females	15	41	17	3	24
Males	19	27	28	7	19

There are equally pronounced literacy mismatches between the different age groups. Since the level of literacy among young Canadians is high, and many have difficulty finding satisfactory employment, it is not surprising that 16- to 24-year-olds are most likely (33%) to have a document literacy surplus. However, there are fewer young Canadians with stronger quantitative skills than required by their jobs, as compared to older workers, perhaps because many young workers are employed in retail trade and in business and community services, where arithmetic calculations are performed frequently.

Meanwhile, more than one in five older workers—the highest proportion of any age group— have a literacy skills shortage compared to the requirements of their job. This finding might reflect the effect of gender on workers in this age group, since fewer older women (who have higher literacy scores) stay in the labour force while those who do are employed in distinctly different occupations and industries than men.

Table 4**Document literacy “fit–mismatch” by age, employed population, Canada, 1994**

Age group	Worker literacy skills –workplace literacy requirements “fit–mismatch”				
	1 Low–low	2 Medium– medium	3 High–high %	4 Low–high (literacy deficit)	5 High–low (literacy surplus)
	Document literacy				
Total	17	33	24	5	21
16–25	18	31	16	2	33
26–35	12	36	28	4	20
36–45	16	31	29	6	18
46–55	20	30	20	10	20
56 and older	32	43	9	4	12

Workers in non-supervisory jobs most often under-using literacy skills

The amount of interaction a worker has with co-workers also seems to influence the extent of literacy fit. Workers with no or limited supervisory responsibilities, the self-employed and those who work part time or in temporary jobs, are more likely to hold jobs where their literacy skills are under-used.

The “Use It or Lose It” Hypothesis

The large majority of Canadian workers (74%) have jobs where their skills roughly match their job requirements; among these workers, most fit at the medium or high level. Among those who are a literacy “mismatch,” however, the workers with a skill surplus substantially outnumber those with a skill deficit by about two to one. The key to erasing the skills deficit is straightforward – improving existing skills with remedial training – but the problem of under-use presents a different challenge.

Under-usage could have serious long-term consequences, not only for the individuals involved but also for the overall level of human capital in the Canadian labour force. This is due to the belief that literacy skills deteriorate if they are not exercised with sufficient frequency or intensity. This is the “use it or lose it” hypothesis that has received considerable support from the IALS results. But many factors can affect literacy, and it can be difficult to determine the contribution that each factor makes to a literacy-job requirement fit.

The IALS data provide limited support for the hypothesis that spending some time in a job with low literacy requirements is associated with lower levels of literacy. Under-using literacy skills on the job does have a negative effect on literacy scores, but the relative size of the effect is very small. Indeed, the influence of other factors is greater

(even though not as interesting); for example, education has a strong positive effect on literacy fit, while age has a weak negative effect, when the effects of other variables are taken into account.

In summary

The larger number of Canadian workers who are “under-employed” (in a *skill surplus*) compared to those with insufficient literacy skills for one’s job (in a *skill deficit*) forces a re-examination of the term *job-skills gap*. The analysis also provides some support for the “use it or lose it” hypothesis that prolonged exposure to a job with low literacy requirements might lead to some loss of literacy skills. But it is important to recognize that other skills also influence success in the workplace, such as teamwork, oral communication and social skills (particularly in jobs involving extensive customer service). In short, workers’ competencies extend well beyond prose, document and quantitative literacy, however crucial these are to labour market success.

Implications of the Findings

There is a reasonable fit between workers’ literacy skills and their job requirements for about three-quarters of the Canadian labour force. However, large proportions of workers who “fit” are still in “low” and “medium” positions. If Canada is to compete with other nations for the best jobs, and is not to waste its human capital, public policy should aim toward shifting more Canadian workers into the “high” fit category. This will require investing in human capital and creating jobs with higher literacy requirements.

More pressing questions can be asked about those workers who have weaker skills than required for their jobs; for example, are they having difficulty adequately performing their tasks? Does this mismatch translate into costly errors and serious health and safety risks, or just into marginally less productivity? The IALS data cannot answer such questions, yet clearly more research on this subject is required, along with more workplace literacy programs targeted at this group.

However, the percentage of workers who are “under-employed” with respect to literacy skills is two to four times greater than the percentage who lack the skills required (depending on the type of literacy being measured). These findings raise troubling questions, especially in regard to the possible consequences of a poor match between a worker’s literacy skills and the literacy requirements of their job.

The IALS evidence of under-use of Canada’s human resources raises concerns about the potential loss of some of these skills or, put in economic terms, of earlier investments in human capital. Ignoring a situation of literacy surplus may be costly for workers, their employers and the larger economy. Policy should be concentrated on increasing the skill requirements of jobs, with programs that encourage employers, workers and employee organizations, to seek ways to upgrade the literacy (and other skill) requirements of jobs. Avoiding this discussion ignores a problem with serious human resource and productivity costs. The extent to which women and young people are over-

represented in the literacy surplus category is a reminder that any policy responses devised to address literacy mismatch will have to incorporate concerns about employment equity.