

January 2020

## Proceed With Caution on Soft Skills...

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One does not need to dig very far or very deep to find impassioned pleas from employers for workers who are able to work and solve problems collaboratively, to communicate effectively, to use a range of digital technologies, to think critically and who are entrepreneurial (IRPP, 2019). I have no problem believing that additional supplies of such “soft” skills are desperately needed.

A rising global supply of skilled workers is allowing a much larger number of countries to match our quality and to beat us on price. At the same time, the globalization of markets for key inputs – capital, raw materials and advanced production technology – and falling trade barriers have reduced barriers to market entry. Concurrently, the diffusion of digital technologies throughout the production process is driving a rapid decline in the global demand for workers with low skill levels and placing downward pressure on their wage rates. In many economies, including Canada, technical advance is increasing the demand for highly skilled workers with the full range of technical, cognitive and soft skills.

Government policy did not anticipate the rapidity of these changes nor the negative impact that they will have on our competitive position going forward. Given that our future economic success will depend on increasing the supply of these skills as rapidly as our competitors, there is a need for a fundamental rethink of public policy related to skills. A failure to do so will make it difficult for Canada to maintain employment and wages at current levels.



The first question that must be addressed is why our education system – one of the most expensive per capita in the world – isn't already generating an adequate supply of the skills needed to support our economy.

Canada has one of the highest levels of educational attainment in the world. How is it possible that employers report that large proportions of graduates don't have productive levels of these technical and soft skills, particularly when 85% + of all youth go on to some form of post-secondary education?

Canada's post-secondary educators and training providers are haranguing the federal and provincial/territorial governments to finance the delivery of skill upgrading programs. This in and of itself is not a bad thing, as employers are unlikely to step up to the plate with the required funding. What is highly problematic is the assumption that meaningful levels of these skills can be acquired without addressing the underlying weaknesses in the language, literacy and numeracy skill levels of a large proportion of working age Canadians.

It is well known that having advanced language, literacy and numeracy skills allows one to acquire the key soft skills more efficiently and independently (Wylie et al, 2007). Less well known is the fact is that having advanced language, literacy and numeracy skills is a prerequisite to the efficient application of these "soft skills". For example, workers without the literacy and numeracy proficiency levels that support fluid problem solving end up applying inappropriate rules of thumb that drive up error rates, leading more to more rework and lower productivity. Understanding how language, literacy and numeracy skill conditions the efficient application of the soft skills is central to a policy response that generates the needed increases in the supply of economically important soft skills.

Problem solving involves developing a clear understanding of the problem to be solved, identifying and evaluating potential solutions, choosing a solution, executing the chosen solution whilst monitoring implementation. All of these elements require the acquisition of information either verbally, or through reading. The evaluation and monitoring phases demand that the problem solver draw low level inferences through the integration of information or draw high level information through the generation of new information, tasks that demand at least level 3 literacy proficiency on the 5 level literacy scale.<sup>1</sup>

Roughly half of Canadian working age adults aged 16 to 65 lack this level of literacy skill and the average literacy scores of Canada's secondary graduates have been falling (Statistics Canada, ESDC and CMEC, 2013; CMEC, 2019). Thus, any investment in upgrading the problem-solving skills of Canadian workers will fail to yield the intended benefits unless and until adults with Level 1 and 2 literacy skill are upgraded to at least Level 3. Adults with Levels 1 and 2 proficiency levels face much higher probabilities of experiencing poor labour market, health, educational and social outcomes.

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<sup>1</sup> Tasks at literacy Level 2 require respondents to make matches between the text and information, and may require paraphrasing or low-level inferences. Some competing pieces of information may be present. Some Level 2 tasks require the respondent to:

- Cycle through or integrate two or more pieces of information based on criteria
- Compare and contrast or reason about information requested in the question
- Navigate within digital texts to access and identify information from various parts of a document.

In contrast texts at literacy Level 3 are often dense or lengthy, and include continuous, non-continuous, mixed or multiple pages of text. Understanding text and rhetorical structures become more central to successfully completing tasks, especially navigating complex digital texts. Level 3 tasks require the respondent to identify, interpret or evaluate one or more pieces of information, and often require varying levels of inference. Many Level 3 literacy tasks require the respondent to construct meaning across larger chunks of text or perform multi-step operations in order to identify and formulate responses. Often Level 3 tasks also demand that the respondent disregard irrelevant or inappropriate content to answer accurately. Competing information is often present, but it is not more prominent than the correct information. For a complete description of PIAAC literacy skill levels see OECD (2016) Skills Matter: Further results from the Survey of Adult Skills, Paris.



Problem solving also often requires the application of advanced numeracy skills. The application of numeracy skills depends, in the first instance, upon the individual understanding what problem they are required to solve, often by understanding verbal or written instructions. Again, roughly half of Canadian working age adults have numeracy skills below Level 3, the level demanded by most workplace tasks. This implies that any investment in upgrading the problem-solving skills of Canadian workers will fail to yield the intended benefits unless and until adults with Level 1 and 2 numeracy and literacy skill are upgraded to at least Level 3 and, in some cases, Level 3 speaking and listening skills.

By definition, collaborative problem solving involves the exchange of information among team members. Information exchange occurs both verbally and in writing and often involves negotiation. Research suggests that collaboration requires at least Level 3 language, literacy and numeracy skills (Fernandez, 2018). Workers without these skill levels will not be effective collaborators.

Creativity is best thought of as the highest form of problem solving i.e. instances where the problem solver comes up with a novel solution. Adults with low levels of literacy and numeracy skill can be creative but may have more difficulty working through the pragmatics of implementation. Creativity is also often a collaborative activity that requires high levels of communication, writing, negotiation and persuasion.

The situation with respect to digital literacy parallels that for problem solving. Research suggests that, once one has mastered the syntax of whatever system is being used, the relative difficulty of digital tasks is determined by the underlying cognitive demands of the task being undertaken. As AI and automation reduces the need for workers to apply routine, procedural knowledge, the overwhelming majority of jobs will require workers to solve problems that involve integrating information and generating new information through analysis, often using the tools of mathematics. As noted above a significant proportion of working age Canadians do not have the literacy and numeracy skill levels needed to use digital technologies to solve non-routine problems.



Results from the OECD's PISA 2018 and the IEA's International Computer and Information Literacy Study (ICILS) suggest that large proportions of students leaving the K-12 system lack the digital and critical thinking skills demanded by the emerging economy. The results of PISA 2018, just out, are quite alarming: fewer than 1 in 10 students in OECD countries were able to distinguish between fact and opinion, based on implicit cues pertaining to the content or source of the information. The results of the IEA's International Computer and Information Literacy Study (ICILS), announced recently, are equally disconcerting: over 40% of students were found to have only minimal ability to critically assess information found online.

Thus, any investment in upgrading the digital literacy skills of Canadian workers will fail to yield the intended benefits unless and until adults with Level 1 and 2 numeracy and literacy skill are upgraded to at least Level 3. There is also a need to take steps are taken to ensure that secondary students leaving the K-12 system have adequate levels of all of these skills.

Similarly, being entrepreneurial depends critically upon being able to create and implement a business plan that anticipates the problems that will need to be overcome and that devises ways to overcome them. At a minimum, entrepreneurs need to develop a realistic business plan and associated cash flow projection. Simply teaching adults the mechanics of creating a new business without addressing any weaknesses in their literacy, numeracy and problem-solving skill will accomplish nothing.

The situation with respect to communication is slightly more complex because the demands of the labour market go beyond the simple act of oral fluency, literacy, numeracy to include mastery of report writing, public speaking and persuasion. One can become a master orator without high literacy and numeracy levels. It is more difficult to become a good writer without advanced literacy and numeracy levels. To get full value out of skill upgrading in these skill sub-domains adults with Level 1 and 2 numeracy and literacy skill will need to be upgraded to at least Level 3.



The final commonly cited soft skills that are in short supply are adaptability and openness. Adaptability can be thought of as a special form of problem solving that allows individuals to detect changes in the external environment and to adjust their behaviour accordingly. Having advanced levels of language, literacy and numeracy provides workers with the tools to absorb and apply large amounts of information to the decision process. Recent research by the US Navy suggests that military personnel need at least Level 3 literacy and numeracy to consistently make the right decision about how to adapt their behaviour (The Atlantic, 2019). Again, if we are to get full value out of any soft skill upgrading adults with Level 1 and 2 numeracy and literacy skill will need to be upgraded to at least Level 3.

Openness is a more complex concept as it implies a predisposition to new ways of doing things and to people that are different. In a post-modern Barney world filled with love and good will openness is a given. In a world characterized by high rates of economic and technical change, fierce competition for markets and resources and high rates of immigration from places that are culturally distant from many Canadians, there is a possibility that some groups of Canadians will feel threatened. More directly, they will be far less open to any change that they perceive as diminishing their, or their children's, opportunities and prospects. Our own research suggests that many workers do not trust their employers to fairly share the benefits that accrue to skill upgrading, so resist participation in skill upgrading and, when they do participate, many fail to gain the expected amount of skill (DataAngel 2018). So openness to openness is context dependent and must be actively fostered to counter the view that economic development is a zero sum game in which some groups win and others lose.

So, in conclusion, there is a clear need to increase the supply of a range of "soft" skills is needed to maintain Canada's competitiveness in the global economy.

Clearly, one way to generate the additional skill supply is demand more of our education systems. The fact that most education is publicly financed provides sets the stage for action. Since the available evidence suggests that employers are not likely to invest enough to generate the needed increase in the supply of these skills, there is a need for governments to invest.



More specifically, we need to adopt policies that ensure that:

K-12 educators need to ensure that their graduates leave with at least Level 3 literacy and numeracy skill and advanced levels of problem solving, teamwork, and work-oriented speaking and writing skills.

Post-secondary educators need to assess the language, literacy, numeracy and soft skills of their students and upgrade them as necessary to ensure that all graduates leave with adequate levels.

Employers need to adjust their production processes and work organizations to remain competitive in the emerging digital economy and then assess and upgrade the skills of their current work force, including their language, literacy, numeracy and soft skills. Employers also need to adjust their recruitment and selection processes to ensure that new hires have the full skill set needed to cope with skill-intensive production processes.

Provincial/Territorial governments need to invest in adult skill upgrading. In doing so, it is critically important that they insist that training providers upgrade the language, literacy and numeracy skills of any working age adult as a prerequisite to realizing the expected economic benefits of an increased supply of key “soft” skills.

The federal government, as the primary funder of immigrant settlement services, needs to ensure that new immigrants have the language, literacy, numeracy and soft skill levels needed to get and keep jobs that are commensurate with their technical qualification levels.

The federal government also needs to develop and validate any soft skill assessment and instructional tools that do not currently exist and invest to promote the importance of cognitive and soft skills to our future economic success.



Armed with these tools, all funders of adult skill upgrading need to make funding conditional on performance. Specifically, they need to insist that all instructional delivery meet standards for instructional efficiency and effectiveness. Without such standards, history suggests that much of the delivery will fail to generate the needed skill gain.

A failure to follow this prescription will result in significant job and income loss, not the goal of thoughtful public policy. In addition, focusing soft skills skill upgrading only on workers who already have advanced language, literacy and numeracy skills is likely to drive up skill-based inequality in employment and incomes rapidly to unsustainable levels.

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