

Literacy and Growth: Policy Implications of New Evidence From PIAAC

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This report summarizes an analysis of the impact that differences in average adult literacy and numeracy skill, and differences in the distribution of literacy skill by proficiency levels, have had on long-term growth rates of GDP per capita and labour productivity. These rates are important because they determine the rate at which we are getting wealthier.

What's the problem?

Rates of economic growth are below the level needed to support Canadian's collective economic and social objectives. Thus, Canada's governments need to find ways to increase economic growth rates.

There is also growing evidence of rapid increases in skill-based wage and income inequality¹. Canada's governments also need to find ways to reduce the rate at which these inequalities are growing.

In both cases, increasing the supply of literacy skill represents a promising avenue for achieving both goals.

What the new analysis reveals

Average literacy scores goes up, growth rates rise

The new analysis suggests that the impact of differences in average literacy skill on differences in rates of national growth rates of inter-country GDP per capita and labour productivity growth have doubled since 2003.

In 2003, analysis revealed that a 1% increase in average adult literacy scores precipitated a 1.5% increase in GDP per capita and a 3% increase in labour productivity, once the economy reached its steady state i.e. the point at which the economy has absorbed all of the productivity benefits generated by higher literacy levels.

As of 2012, a one-percent increase in literacy skills translates into a three-percent increase in national GDP per capita, and a five percent increase in labour productivity

Small increases in literacy skill precipitate large increases in growth rates

This relationship suggests that the skills generated by one additional year of schooling (8 PIAAC points or 3 percent of mean PIAAC skills) would lead to a nine-percent increase in GDP per capita once the economy reaches its new steady state.

¹ See for example First we Learn to Read, the Canada West Foundation, 2018

Current instructional technology is capable of realizing a 24 point gain in as little as 15 hours of high quality adult literacy instruction, a gain that would generate a 27% increase in GDP per capita if the relationships hold.

Higher proportions of adults with low literacy skills reduce growth rates

The analysis also suggests that higher proportions of adults in Level 1 and 2 – the two lowest proficiency levels – reduce national GDP per capita and labour productivity growth rates significantly. Thus, investments in skill upgrading that focus on increasing the average skill level by increasing the skill levels of the least skilled would yield both significant economic growth and material reductions in skill-based inequalities in employment, wage rates and incomes.

Higher proportions of adults with high literacy skills have no impact on growth rates

Interestingly, differences in proportions with high literacy proficiency levels – Levels 4 and 5 – appear to have no impact on comparative growth rates at the national level. This finding should not be interpreted as a sign that the supply of highly literate workers do not matter to growth, but rather than none of the 31 countries in the sample have² managed to extract a comparative advantage from this end of the skill distribution.

Together, these results suggest that countries that manage to raise their average literacy skill levels by improving the literacy skills of low skilled workers will realize even higher levels of downstream growth.

Women's literacy skill matters more to growth than those of men

The current analysis finds that differences in the skills of women have had a larger impact on observed differences in national growth rates than the skills of men have had.

Literacy skill differences drive growth

Importantly, increases in literacy skill have led increases in the growth rates of GDP per capita and labour productivity rather than literacy skills rising after the economy has grown by some other means. This relationship implies that literacy skill is a fundamental determinant of economic growth, an interpretation that, a finding that fits with the results of a recently conducted randomized controlled trial of adult literacy skill upgrading. This study, funded by the Government of Canada, generated a 25% first year rate of return on investment for workers and firms in the food and accommodation industry.

² See SRDC (2011) **Upskill: A Credible Test of Workplace Literacy and Essential Skills Training**, Ottawa

The economy realizes the benefits of higher literacy scores rapidly

Finally, the Weiderhold and Schwerdt analysis also suggests that economies reach a new steady state after an increase in literacy skill averages rather quickly by economic standards. Specifically, the analysis suggests that it would take between six and nine years to close half of the gap to the new economic steady state i.e. the point at which all of the benefits of higher skill levels have all been realized. Were a way found to increase average literacy skill levels Canadians would reap the benefits relatively rapidly.

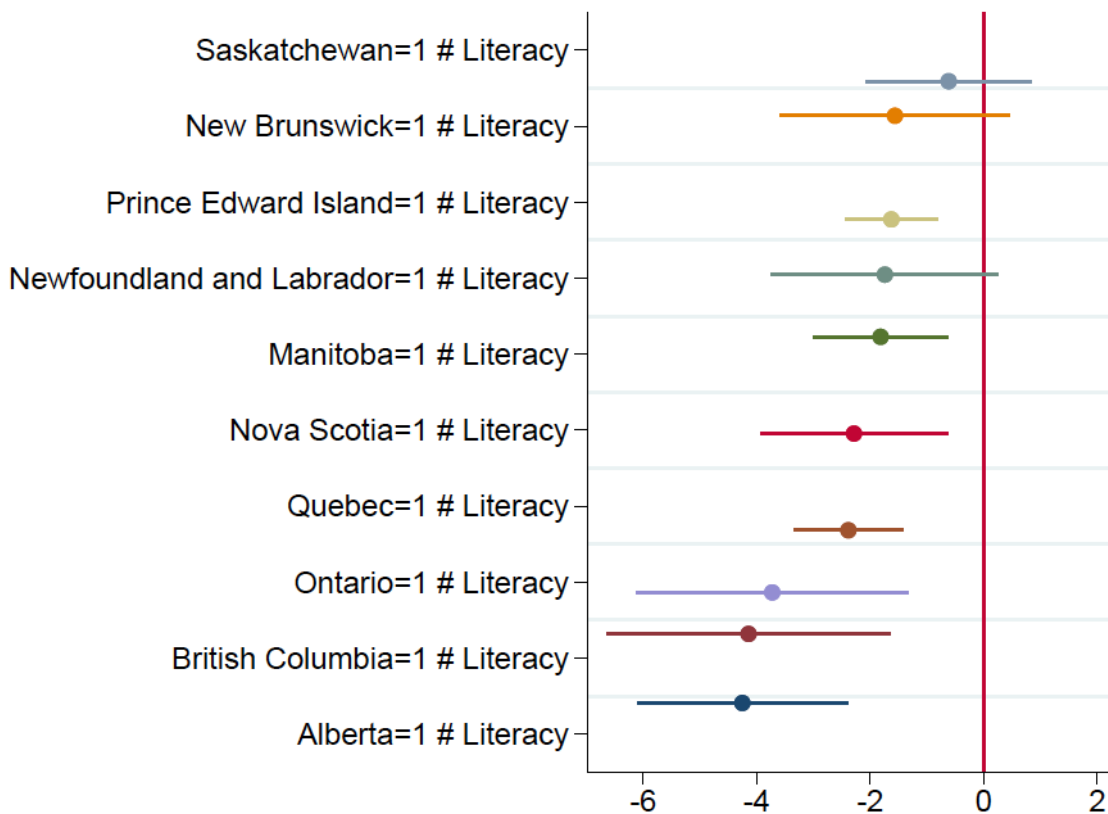
Weiderhold and Schwerdt also extended their analysis to the provincial level for Canada.

Their sub-national analysis reveals several additional insights.

Differences in average literacy scores explain provincial growth differences

First, as revealed in the following chart, the impact of provincial differences in average literacy skills on rates of provincial GDP per capita and labour productivity growth are all statistically significant and positive but are lower than observed across the 31 countries in the sample. The authors attribute this finding to the fact that provincial literacy average scores are relatively high by international standards, so leave less room for skill differences to influence growth.

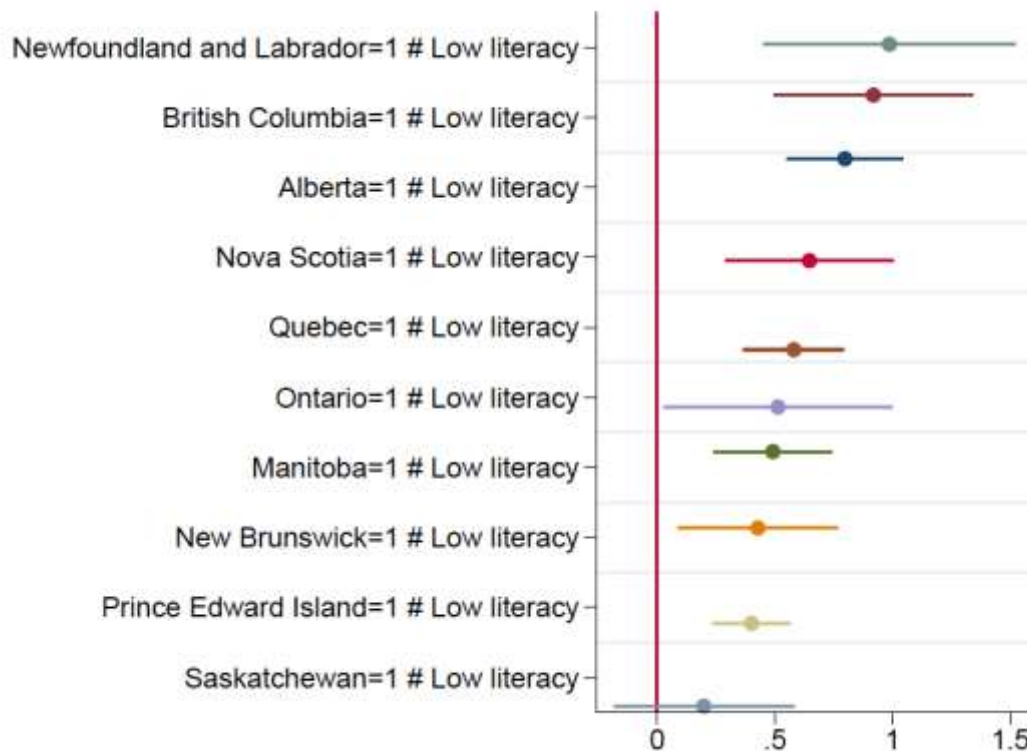
Figure 1: Average literacy effects in Canadian provinces v.s. international mean effect



Higher proportions of adults with low literacy levels reduce provincial growth rates but less than in most countries.

Second, as documented in the following chart, the impact of provincial differences in the proportion of adults with Level 1 and 2 literacy skill on rates of provincial GDP per capita and labour productivity growth are all statistically significant and negative but are lower than observed across countries. The authors attribute this finding to the fact that Canadian provinces have lower proportions of low skilled workers than most countries, so leave less room for low skilled workers to reduce growth rates. Nevertheless, a 10% reduction in the proportion of adults with low literacy skill would eventually increase Gross Domestic Income per capita of all Canadians by \$770 or roughly 1.5% of current average income levels.

Figure 2: Proportion of low skilled workers in Canadian provinces v.s. international mean effect



Given the potential positive impacts on economic growth rates, Canadian governments should undertake an analysis of what mix of policy measures might generate increases in average literacy skills. These measures include, among others:

- Increasing the skills of youth entering the labour market from high school,
- Upgrading the skills of post-secondary graduates entering the labour market
- Upgrading the skills of immigrants entering Canada
- Upgrading the skills of workers already in the labour market.

In all cases, remedial measures would yield the highest return on investment if they focus on raising average scores by raising the scores of individuals with Level 1 and 2 skills.

This is the single most important finding of the study – that all Canadians stand to get wealthier by increasing the skills of the poor.

These measures differ in how much they would cost, how difficult they would be to realize and how long they would take to yield material increases in skill averages.

It is also worth noting that rapid increases in literacy skill supply could also be realized by reducing the loss of literacy skill experienced by workers holding jobs that do not require them to apply their skills in cognitively challenging ways. Between 2003 and 2011, adults aged 16 – 65 lost an average of 13 points on the 500-point literacy scale, an amount that reduced aggregate economic output by an average of \$1,000 per person over the period.³⁴

Material reductions in skill loss could, however, only be realized by finding ways to induce employers to increase the cognitive demands of their low skilled jobs.

Jobs are likely to become more knowledge and skill intense naturally as the diffusion of digital technologies, and the rising global supply of key skills, reduces the number of jobs that only demand the routine application of procedural knowledge. The key questions for policy makers related to skill loss are:

How rapidly employers will adjust their work processes and organizations to reflect this new reality?

Will shortages of key cognitive skills reduce the rate at which employers can adjust?

Given that the supply of key cognitive skills – including literacy – are unlikely to grow rapidly enough, governments will be obliged focus more effort on increasing the supply of key cognitive skills rapidly.

³ See Lane, J. and Murray, T.S. (2018) **Literacy Lost**, The Canada West Foundation, Calgary

⁴ Literacy scores fell by 4 points on average when increased education levels should have increased average literacy scores by 9 points. Thus, net loss experienced over the period is 13 points.