



BACKGROUND

What does *Spotlight on Science Learning – A benchmark of Canadian Talent* reveal?

The report reveals that Canada's science talent pool is strong in terms of performance, but is weak in terms of size.

- According to international tests, Canadian students perform above the OECD average in science and math.
- However, fewer and fewer Canadian students are taking math, biology, chemistry and physics in grades 11 and 12, and the drop-off is very pronounced in some cases.
- According to a 2010 national surveyⁱ of 2,600 students, ages 12 to 18, interest in science falls by age:
 - Seventy-eight per cent of 12- and 13-year-olds are very or somewhat interested in science, compared to 67 per cent of 14- to 16-year-olds and 58 per cent of 17- to 18-year-olds.
 - Interest in pursuing a scientific career also declines with age, from a high of 43 per cent among 12 to 13-year-olds to 32 per cent among those 17 to 18.
 - Two in five don't see how science will have relevance in their work. Overall, a little more than half of students (52 per cent) think studying science will be at least somewhat important to the careers they eventually pursue, but 39 per cent say studying science won't be important at all to their future careers
- Findings also reveal that reporting systems are lacking in some areas and this will lead to challenges in tracking our progress in developing STEM talent as a country.

Why is a large pool of science-based talent crucial to keep Canada competitive and Canadians employed?

A background in science, technology, engineering and math (STEM) is essential for many jobs that will be in high demand in the coming decades, from health care to skilled trades. As other countries invest more heavily in science-based learning, Canada can't afford to be left behind.

- Human Resources and Skills Development Canada (HRSDC), in their latest 10-year employment growth outlook, forecasts that some of the biggest growth will occur in STEM-related fields.
 - On the list of 15 categories with the highest labour demand, health care professionals and managers, engineering, science, and technical occupations dominate.ⁱⁱ



- Statistics Canada reports that employment in health, natural and applied sciences and related occupations, and trades and related occupations are all growing.
 - Between 2001 and 2011, the number of people employed in health occupations rose by 35 per cent. In natural and applied sciences, the growth rate was 20 per cent. And in the trades and related occupations, employment rose by more than 10 per cent.
- HRSDC says that almost 75 per cent of new jobs between 2009-2018 will be in high-skill occupations, and two-thirds of job openings will be in management or require some type of postsecondary education.
- A review of numerous sector councils revealed shortages and recruiting difficulties around a range of technology specialists and tradespeople.
- In its April 30, 2012 issue, Canadian Business magazine reported on the top 50 jobs in Canada (demand and recent salary growth). Many on the list, including the top five, require some level of STEM learning: petroleum engineer; nursing supervisor; electrical and telecommunications contractor; data analyst; and chemist and chemical engineer.
- In 2011, the Manpower Group, a leader in workplace staffing, surveyed 40,000 employers in 39 countries about the job categories that were the most difficult to fill. Number one, technicians. Number three, skilled trades workers. Number four, engineers.

What does the *Spotlight on Science Learning* recommend to track and increase Canada's STEM talent pool?

- Establish a national forum for ongoing multi-stakeholder discussion related to STEM talent development.
- Support and scale effective STEM-teaching and learning programs, in and outside school, to: revitalize young people's love of science with compelling programming; and help youth see how science education is relevant, i.e. it will serve them well no matter what career they envision (and in life, too).
- Establish or improve tracking and reporting systems required for effective data collection, around participation in highschool STEM programs, and postsecondary applications, registrations and graduation in STEM programs.
- Build better connections between job forecasts and STEM learning demands – and make this information available to schools in a relevant way – so youth and parents are more aware of future employment opportunities.
- Build awareness about the breadth of career opportunities that are available with STEM learning.



- Conduct a system-wide review of STEM curricula across Canada to develop programs that increase interest and participation in STEM studies (optional high school courses and postsecondary programs).
- Assess the factors that affect the capacity of universities and colleges to support and maintain STEM studies.
- Determine a suite of benchmarks, with public input, that can be used to measure the state of the science culture in Canada.

What are the benchmarks the study used to track progress?

The panel believes that Canada's progress in furthering STEM learning and creating even more of a knowledge-based economy and society can be captured in large part through 11 key benchmarks:

1. Youth attitudes toward STEM, and awareness of related career paths, at ages 14 to 16.
2. Enrolment in optional highschool science courses.
3. Student performance on international science and math tests (PISA).
4. Student performance on national science and math tests (PCAP).
5. Applications (number and percentage) to postsecondary STEM programs.
6. Registrations (by year) to and graduation (number and percentage) from postsecondary STEM programs at all levels (e.g. undergraduate degrees, graduate degrees, diplomas).
7. Apprenticeship (registration, completions, certificates) in STEM-related disciplines.
8. Canada's international ranking in postsecondary STEM degree/diploma attainment.
9. STEM workforce – numbers and proportion of the total workforce.
10. Job forecasts and projected employment shortages.
11. Science culture (suite of indicators).

ⁱ Canadian Youth Science Monitor survey by Ipsos Reid commissioned by Canada Foundation for Innovation

ⁱⁱ Human Resources and Skills Development Canada. Looking-Ahead: A 10-Year Outlook for the Canadian Labour Market (2006-2015).

http://www.hrsdc.gc.ca/eng/publications_resources/research/categories/labour_market_e/sp_615_10_06/page07.shtml Accessed April 13, 2012