Why are we (apparently) *sooo* bad getting our youth skilled for the labour market?

Yves Bourgeois, PhD
Director, Urban and community studies institute
University of New Brunswick

Skills and literacies for the 21st century
Mathematics education forum
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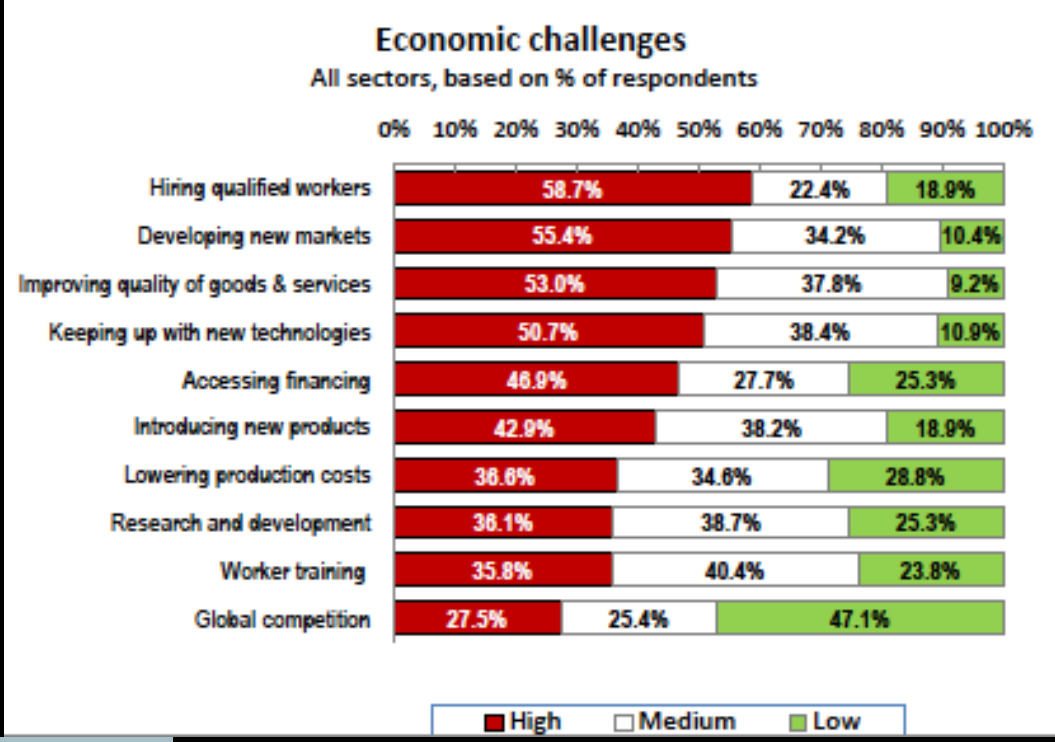
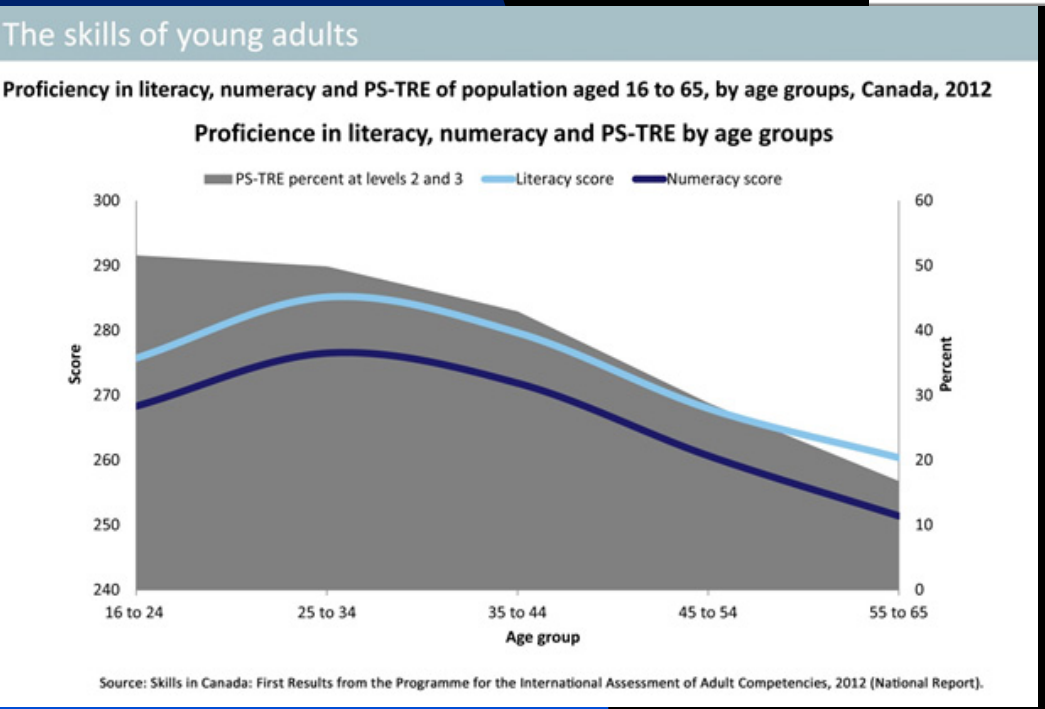
Head scratcher





- Unempl rate 15-24 / 25-54yr = 1.7X (1992)
- = 2.4X (2012)
- *Why is youth unemployment getting worse?*
  …despite their higher literacy, numeracy, and prob-solving
  …while Biz complain they cannot find qualified workers

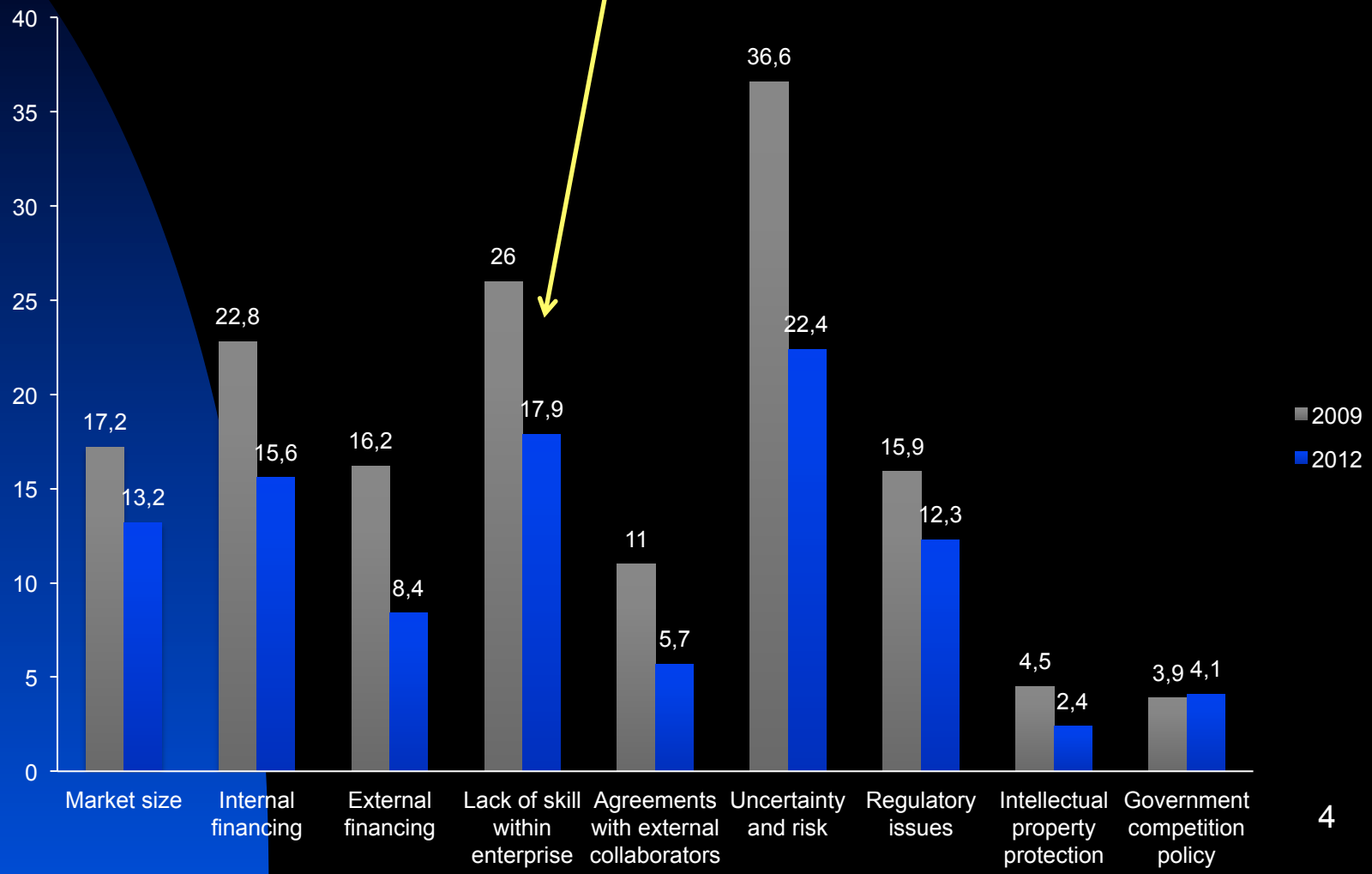
What skin do I have in this game ?

1. Researcher
   innovation systems – relationship between skills and innovation

- *"practical and effective growth policy advice is likely to come out of empirical work that is more disaggregated, context-specific, and detailed than the cross-country growth regression research." (Schaffner 2014)*
- …most of what we have is macro stuff: x % increase in educational attainment increases GDP by y%

Skill shortages as 2nd biggest barrier to innovation

Obstacles to innovation by Canadian businesses
(StatCan 2012 Survey of business innovation)



What skin do I have in this game ?

1. Researcher
   innovation systems – relationship between skills and innovation
2. Future retiree
   - Working age cohorts hollowing out
   - Low-growth, ageing population will spell demise of welfare state > globalization
   - The longer it takes to get 20-35 yr olds experienced, the more we lose in lost productivity and business start ups

StatCan population projections 2014-2034

	Canada		NB	
	2014	**2034**	**2014**	**2034**
% < 20 yrs	22.9	25.0	20.7	21.8
% 20-64	61.7	52.9	61.2	50.7
% 65 +	15.4	22.13	18.1	27.5

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3. Father

Nature of digital skills (retrieval, link)
Nature of learning (home, library)
How will they secure jobs & income
…< life expectancy, < wealth, < social prog

So why are we sooo bad getting skilled youth into the labour market?

Skills mismatches

Collective regression (absence of regime)

Skills mismatches

- Dissonance between skills supplied by workers and those needed by employers
- If so, who do we blame?
  - Schools producing illiterate children ?
  - Parents leaving everything to teachers ?
  - Guidance counselors far from labour market ?
  - Ivory tower universities and academics ?
  - Businesses expecting job-ready graduates ?
  - Retreating governments ?
  - Unrealistic Millenials / Peter Pans / Digital Natives ?

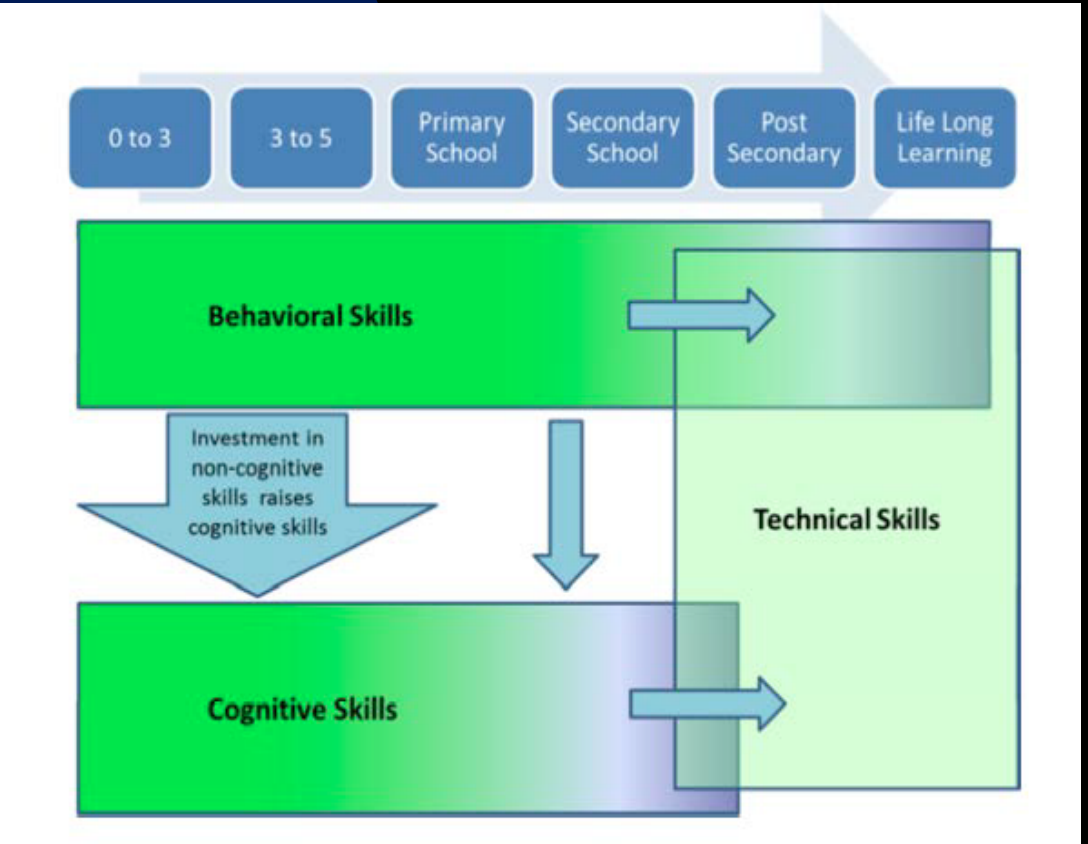
Before arresting anybody, let's take stock of the nature of skills and of mismatches

Skills (to an economist)

1. General skills
   (literacy, numeracy, behavioural)
   Workers reap full productivity benefit in the form of increased wages (more demand)
   - Public key as danger of poaching
2. Industry-specific skills
   Less risk of poaching, but employers may bump up wages to minimize turnover
   Shared worker-empl benefits and investments
   Trust? Post-secondary financially accessible?
3. Employer-specific skills
   More valuable to single employer than to others
   - Cooperation among employers may improve their motivation for investment in training.

   - Where are the cut-offs ?
   - Which skills ?!

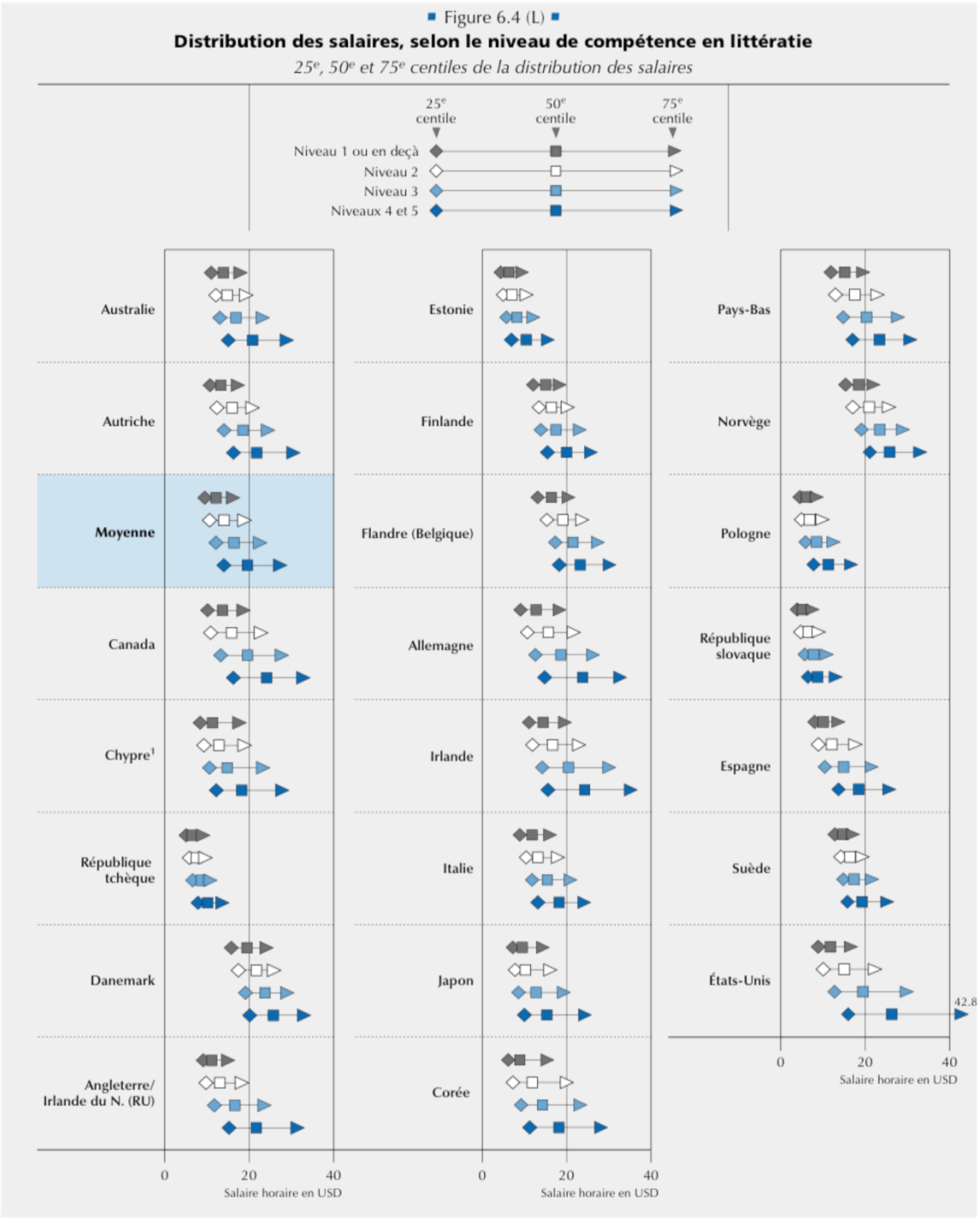
- World Bank (2013) study on skills pathways slices skills differently: behavioural, cognitive and technical
- Connected
- Intensity varies during lifelong learning process
- Breaks down skills into ability to complete tasks



Better than generic "skills" label – UNESCO education for all (EFA) framework = 400 pages where skills are conflated with education

First pause on the nature of skills mismatches

- Conflation of education and skills
  - Education: behavioural and cognitive skills, foundational building blocks
  - Not job-ready skills, but room to role-play (entrepreneurship in 5th grade → risk, math) 8-yr old and NHL salary caps, gamification
- Occupational mismatches
  - We should not confuse occupations with skills "We have a shortage of pipefitters!"
  - Engineers make good mgt consultants; musicians/mathematicians make good…
  - Those with autism excel at…
- Employers don't need occupations as much as they need skills, but labour economists are only now moving towards *skills* mismatches[12]



Like World Bank, OECD has moved towards skills-centred measures

- literacy
- numeracy
- problem-solving in technology-rich environements (PS-TRE)

- Task-based assessments

Second pause on the nature of skills mismatches

- Moving towards skills rather than educational attainment or occupations in terms of defining *shortages*, *mismatches*

1. Can we identify which skills are …?
   - Flagships (represent others)
   - Portable (apply in different environments)
   - Enabling (unlock others, ex cognitive to technical, basic to advanced)

   …Freiman et al (2014-17)

2. Can they be recognized and implemented by employers in context-specific environments ?

Revisiting the line-up

- Schools producing illiterate children ?
- Parents leaving everything to teachers ?
- Guidance counselors far from labour market ?
- Ivory tower universities and academics ?
- Businesses expecting job-ready graduates ?
- Retreating governments ?
- Unrealistic Millenials / Peter Pans / Digital Natives ?

Should businesses expect job-ready graduates ?

- No

1. Primary, secondary and post-are not just preparing workers
2. Need to prepare learning-enabled workers, resilient and perhaps versatile

- LanguageS, math, arts – problem-solving and creativity – digitally-enabled
- Risk and unlearning

Can post-sec be + responsive to industry?

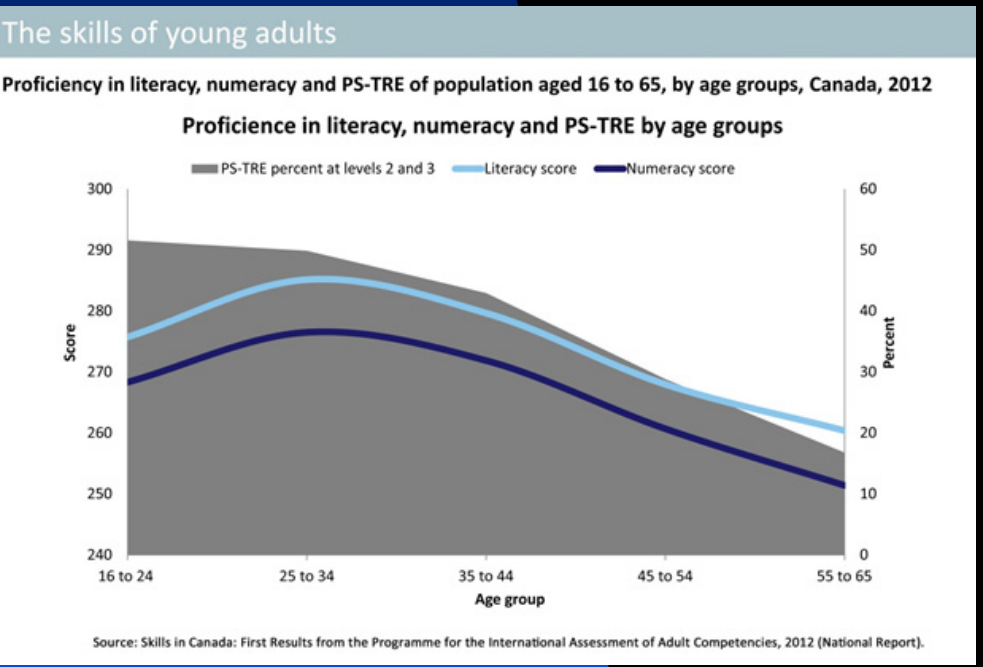
- Yes
- While education need not be at industry's beck and call, children make study and career choices while somewhat sheltered
- Field trips, entrepreneurship at primary
- Apprenticeships and internships starting at secondary
- German system

Are employers investing enough in employer-specific training ?

- Rise of SMEs → creative destruction, but with fragmentation of innovation capabilities …and HR capacity – 1st budget to get cut
- Skill-signaling problem
- Does a company of 7 employees have the capacity to
  1. identify skills brought by potential new hires, including digital skills ?
  2. identify skillsets of existing workforce if to implement new technology ?
  3. Reconcile disruptive and vintage skills ?
  4. deliver missing training ?
  5. understand Millenials, changing values, habits, social connectedness

Question / Hypothesis

- What kind of wave ?
  - Tsunami? buoying creative destruction, productivity and growth, redefining landscape
  - Spillers? Slow upskilling
  - Breakers? Crashing onto labour market Inability to leverage new and youth's skills



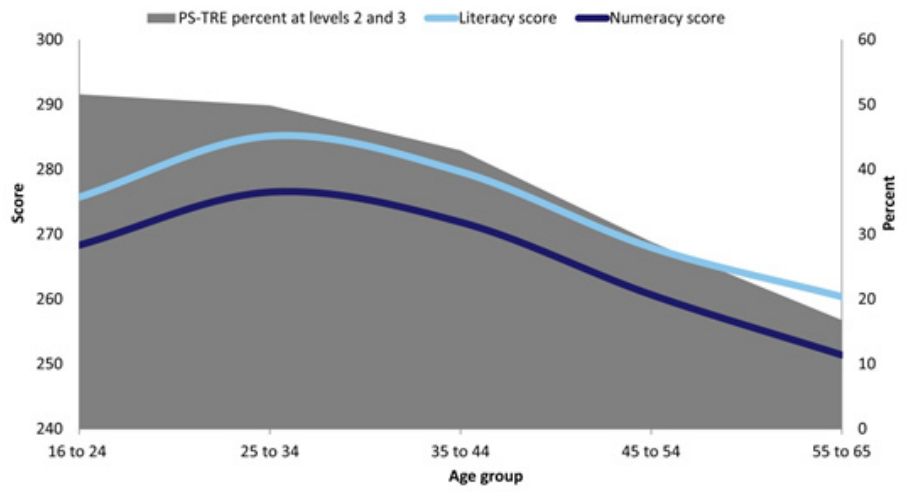
- How are companies assessing and leveraging these skills ?
- How are they overcoming obstacles ?
- What distinguishes them ? Age of entrepreneur ? Sector ?
- Stay tuned.

Racing with the machine?

- Brynjolfsson and McAffee (2012) Race against the machine: “Great restructuring” = techno change > human ability to adapt
- Google’s driverless car and IBM’s Watson as examples of automating complex tasks
- “Jobless” recovery and rising income inequality → deskilling or upskilling ($15 or 25 / hr)

The skills of young adults

Proficiency in literacy, numeracy and PS-TRE of population aged 16 to 65, by age groups, Canada, 2012



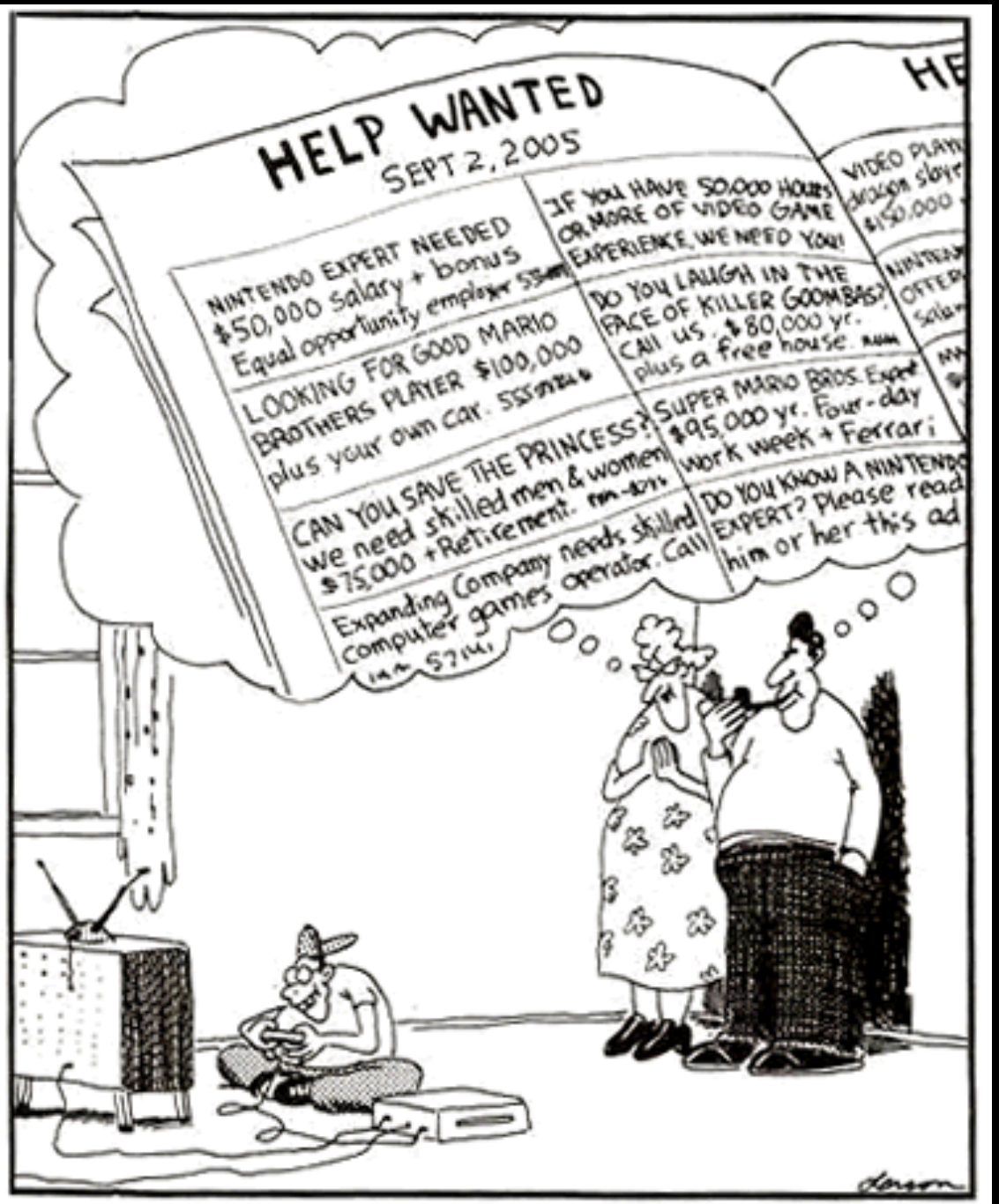
Source: Skills in Canada: First Results from the Programme for the International Assessment of Adult Competencies, 2012 (National Report).

Retreating governments ?

- Yes, they have. No, they shouldn't.
- Biz have an inability to cut their noses to spite their faces → short termism, poaching → underinvestment
  …often because of capacity
- Governments cannot purport to know what businesses need specifically, and we can't force competitiveness upon businesses, but we should ensure the competitiveness of the economy, beyond the entry/exit of firms
- Without *smart* taxation and regulation, public goods are underprovided
  → Gov = network integrator in the employer-employee-gov consortia
- We need to update our 'regime of accumulation'

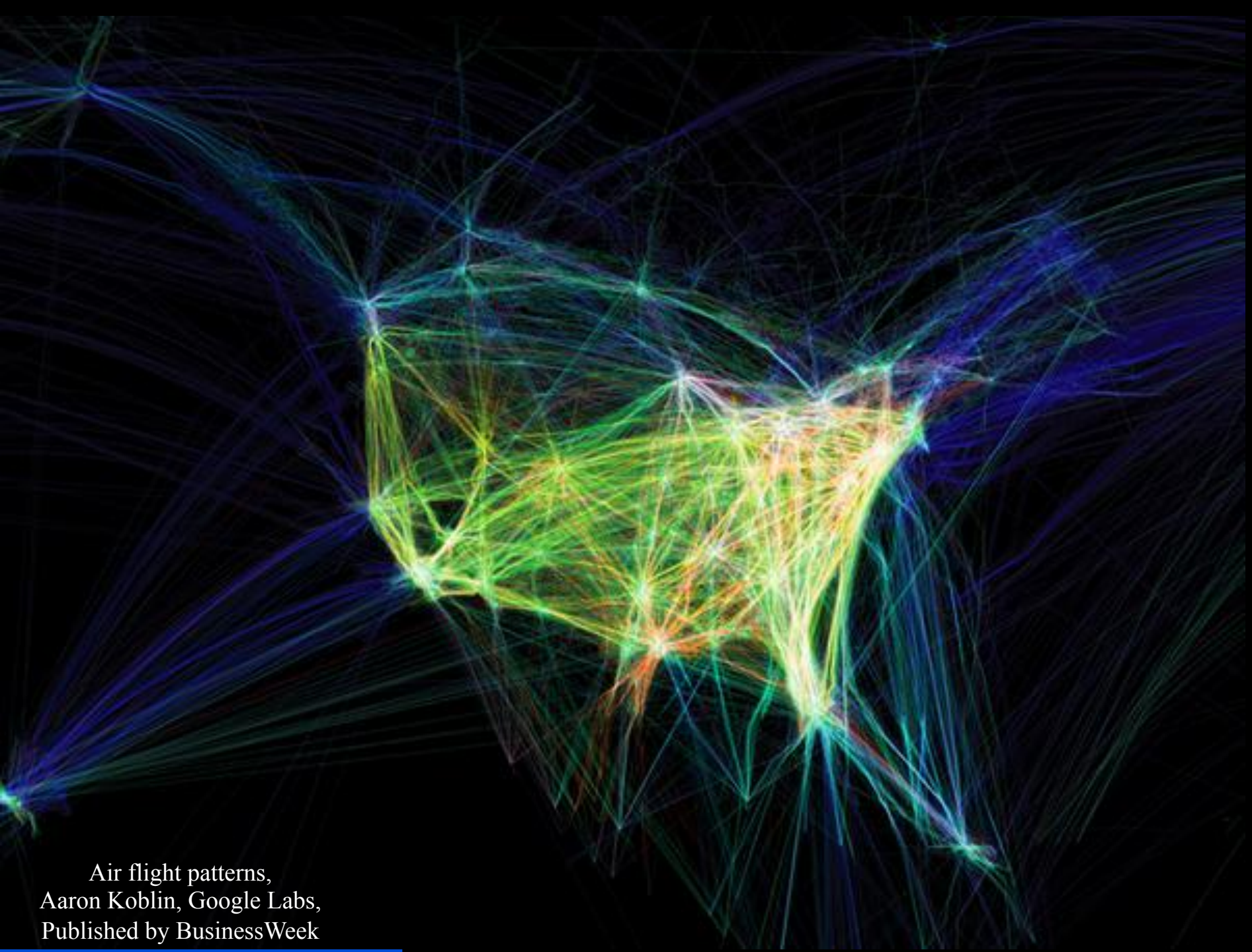
Summary

- We've been trying to link skills and growth at macro level, but we need to look at finer grain
- …and really focus on skills (vs educational attainment or occupations) to understand skills shortages
- Flagships, portable and enabling skills to identify, teach and implement
- We need new skills contract
  - Particles need to collide more, so education "gets" industry, and industry "gets" education
  - So employers see investing in workers and particularly youth where sum > parts

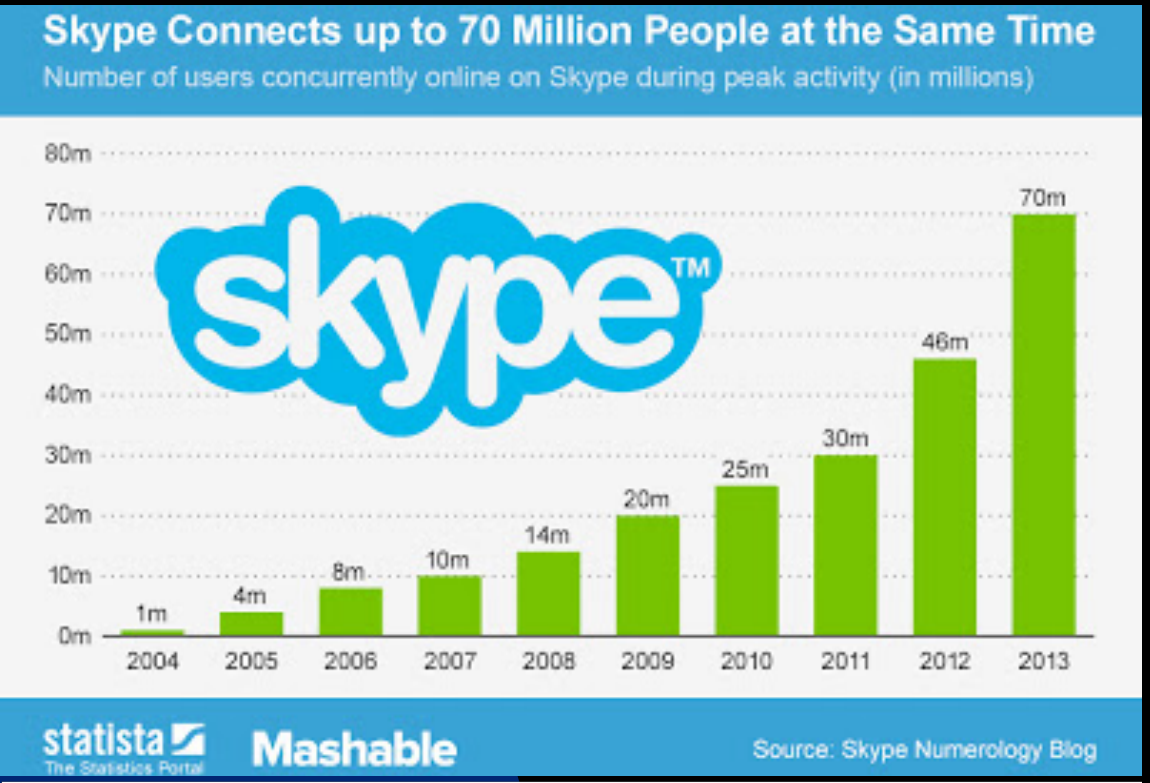


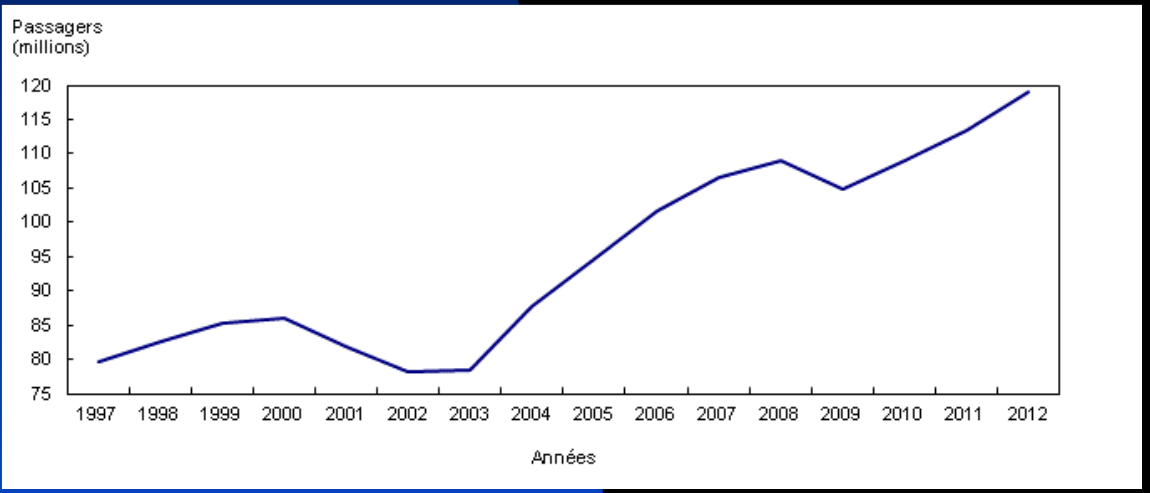
Hopeful parents

Parting shots on digital skills



Air flight patterns,
Aaron Koblin, Google Labs,
Published by BusinessWeek





Digital technologies do not simply replace skills; they enhance them

- *Do 25-yr old logging workers and insurance adjustors make $15 or 25 / hr in NB ?*
- *Digital skills vs IT occupations*
- Based on US labour statistics, 47% of new jobs 2010-2020 expected in mid-skill levels (technicians)

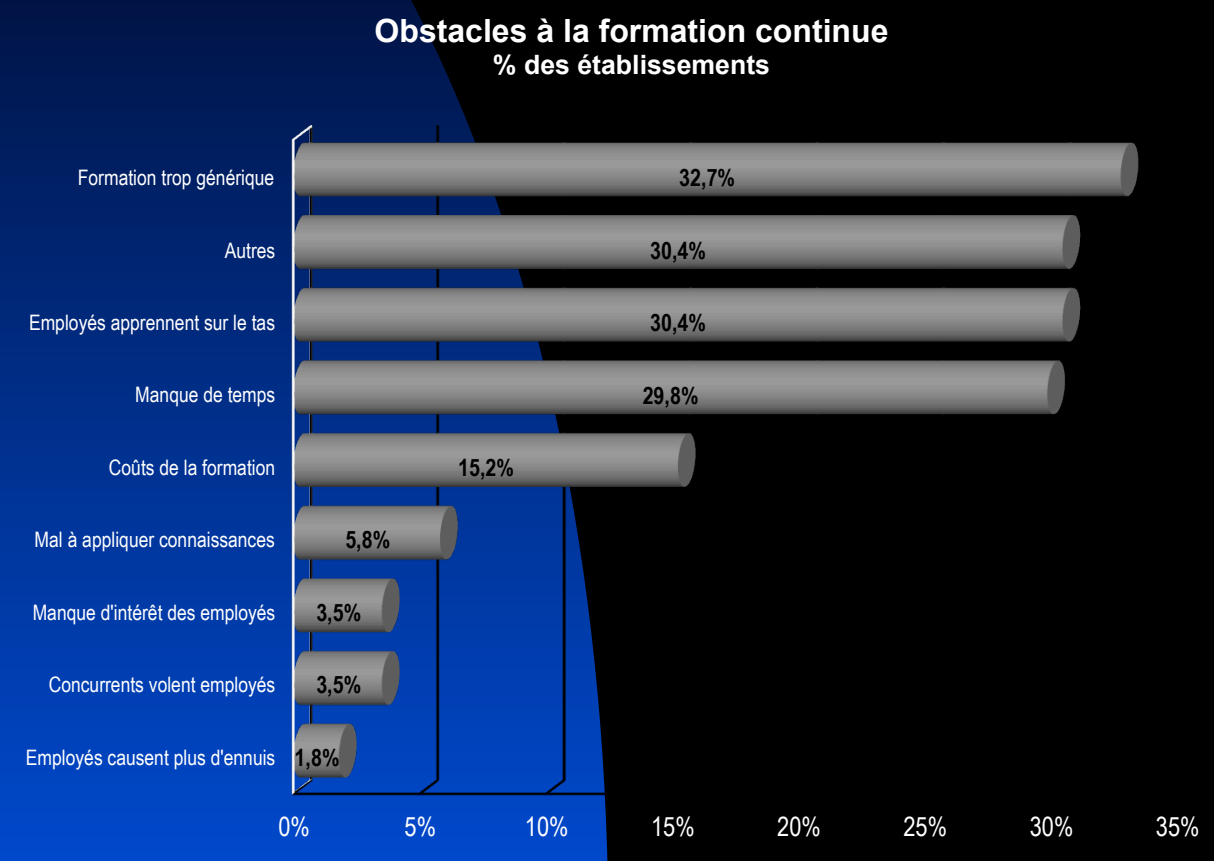
Statistics Canada, Air carrier traffic, 2013

Share of U.S. manufacturing establishments requiring extended reading, writing, math, and computer skills in core production jobs

Extended reading skills (ability to read either complex technical documents; any document longer than five pages; or articles in trade journals, newspapers, and magazines)	52.6
Extended writing skills (ability to write at least one page)	22.1
Extended math skills (ability to perform any of the following math categories)	38
Algebra, geometry, or trigonometry	31.5
Probability or statistics	13.6
Calculus or other advanced mathematics	7.4
Extended computer skills (ability to perform any of the three following functions)	41.9
Use CAD/CAM	28.4
Use other engineering or manufacturing software	29.2
Write computer programs (e.g., programming a CNC machine for a new piece)	18.6

Source: MIT's Production in the Innovation Economy (PIE) Manufacturing Survey (2012–2013)

Programmation générique + apprentissage sur le tas limitent appétit de financer formation continue



Source: Bourgeois (2011) Économie du savoir en Atlantique

Résumé – nature et mesure

Compétences numériques …

1. pénètrent toutes les matières et tous les métiers (beaux arts, plomberie, ingénierie, mathématiques etc)
   - Pour le système scolaire → Ce n'est pas dans un cours d'informatique qu'on apprendra principalement les compétences numériques (robotique, arts digitaux)
   - Marché du travail → Ce sont nos gestionnaires, nos vendeurs, nos usiniers qui doivent les maîtriser; pas informaticiens seulement (eg diplômé UdeM ne reçoit pas de formation en marketing en ligne).

2. Ne peuvent pas être définies statiquement, mais sont en évolution constante
→ logiciels automatisent constamment fonctions
→ codes, logiciels, plate-forme → désuets par le temps qu'ils sont introduits
   - Éducation – désuet pas grave; un mène à l'autre; important = résolution de problème, quand oublier
   - Employeurs → Don't know what they don't know → formation continue, sur mesure, sur place

in the labour force

Portrait of the labour market – Canada and the OECD, 2012

	Canada			OECD average		
	Percent of population	Literacy (average)	Numeracy (average)	Percent of population	Literacy (average)	Numeracy (average)
PSE attainment	60	286	280	35	295	294
Managerial and professional occupations	50	292	286	39	294	293
PSE attainment and Managerial and professional occupations	40	297	292	27	301	301
No PSE attainment	40	255	244	65	261	255
Manual and other service occupations	8	251	241	10	250	242
No PSE attainment and Manual and other service occupations	5	245	234	9	248	239

CD average incorporates proficiency-level results of France. 'PSE attainment' refers to having completed postsecondary education above high school, whereas 'no PSE attainme
eted high school or below.This table presents results for two occupational skills: 'Managerial and professional occupations' and 'Manual and other service occupations'. The re
d manufacturing occupations' and 'Service and support occupations' are not presented. Source: The International Data
nization for Economic Cooperation and Development (OECD), Program for the International Assessment of Adult Competencies (PIAAC), 2012.

Le Canada est un pays où les divergences…

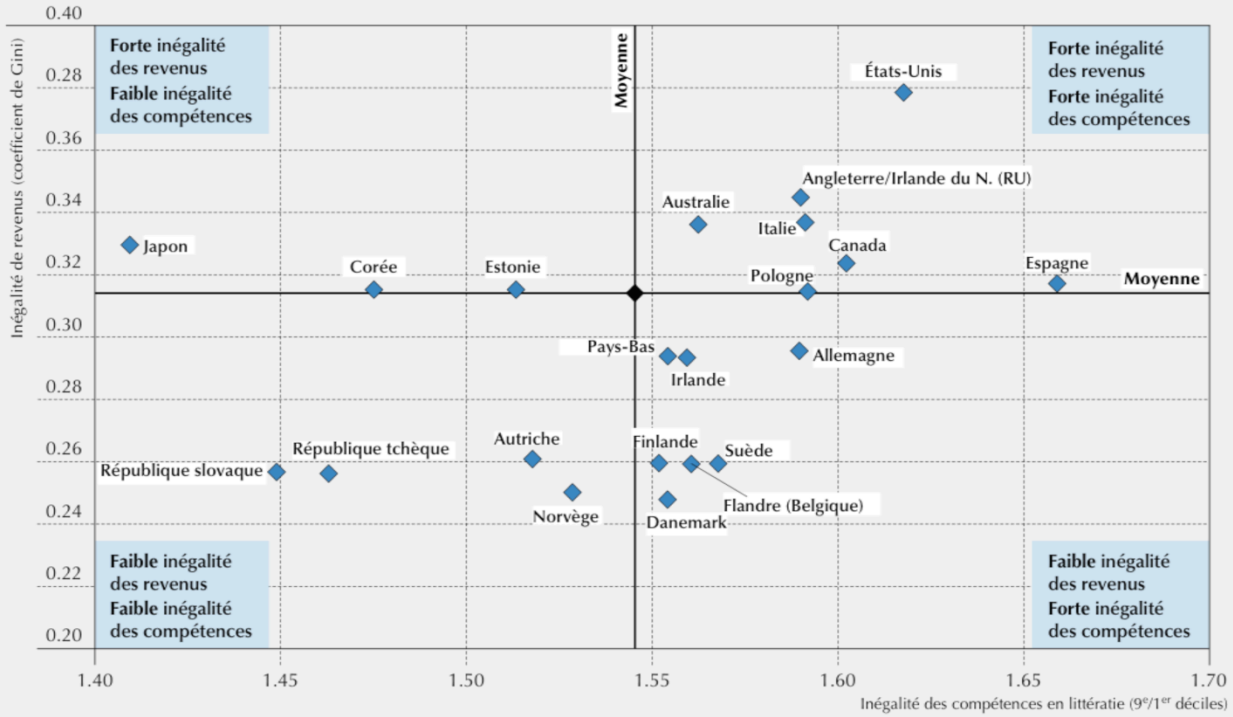
…de revenus entre riches et pauvres (10e et 90e percentile) est un peu plus haut que la moyenne
(en croissance)

…de littératie sont parmi les plus importantes des pays industrialisés

■ Figure 6.16 (L) ■

Inégalité de la distribution des revenus et des compétences en littératie

Corrélation entre le coefficient de Gini des revenus et les 9e/1er déciles des compétences en littératie



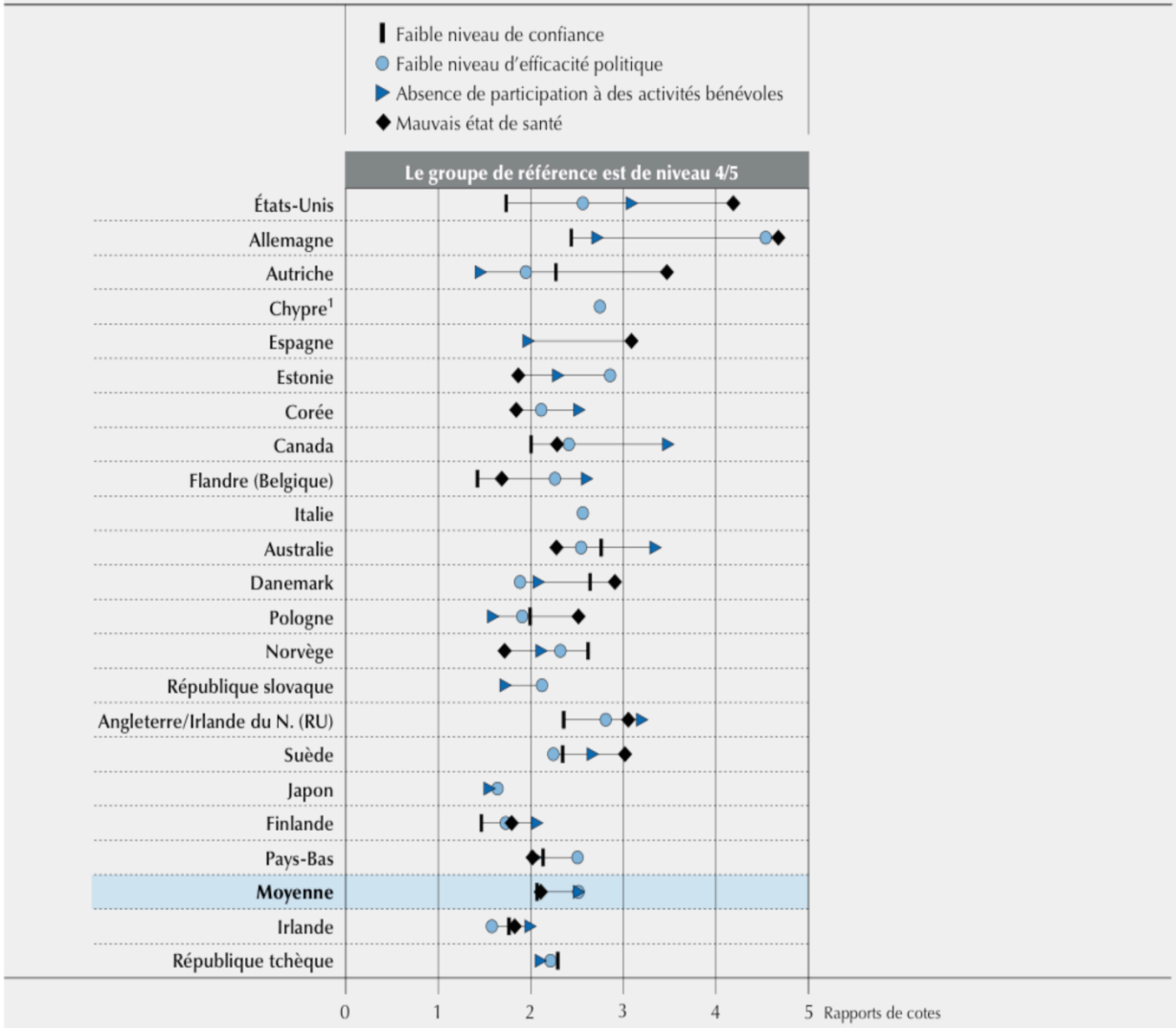
Source : Évaluation des compétences des adultes (PIAAC) (2012), tableau A6.16 (L) et OECD.Stat « Profils statistiques de l'OCDE ».

StatLink http://dx.doi.org/10.1787/888932902721

Figure 6.9 (L)

Faible niveau de compétence en littératie et retombées sociales négatives

Rapport de cotes montrant la probabilité pour les adultes dont le niveau est inférieur ou égal au niveau 1 en littératie d'indiquer un faible niveau de confiance et d'efficacité politique, un état de santé moyen ou mauvais, et une absence de participation à des activités bénévoles (après ajustement)



. Voir les notes en fin de chapitre.

emarques : les estimations non statistiquement différentes du groupe de référence ne sont pas présentées. Les rapports de cotes tiennent compte de l'âge, u sexe, du niveau de formation, du statut au regard de l'immigration et de la langue.

es pays sont classés par ordre décroissant de la différence entre le rapport de cotes maximal et le rapport de cotes minimal des quatre retombées sociales

ource : Évaluation des compétences des adultes (PIAAC) (2012), tableau A6.9 (L).

Au Canada, adultes avec niveau de littératie 1 ou mois (vs niveaux 4-5) sont…

- 3,5X moins aptes à faire du bénévolat
- Presque 2,5X plus probables d'avoir mauvais état de santé et de ne pas faire confiance au système politique
- 2X moins aptes à faire confiance aux autres

Obstacles to providing training

% of establishments