

## What does PIAAC say about skills and digitalisation?

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INSIDE: A 14-PAGE SPECIAL REPORT ON TECH STARTUPS

The  
Economist

JANUARY 18TH-24TH 2014

Economist.com

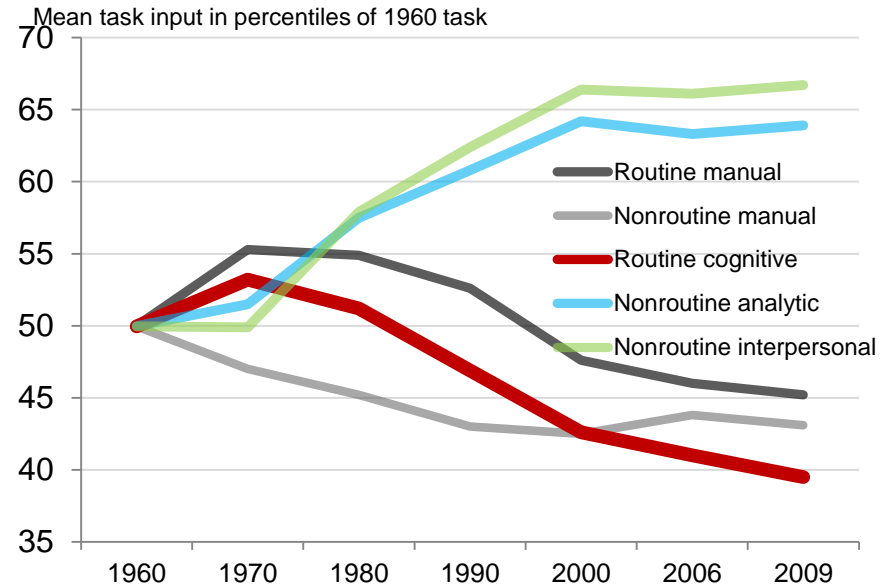
If the French ran America  
China cracks down on microblogs  
New opportunities for organised crime  
Regulators go soft on Europe's banks  
Google and the internet of things

Coming to an office  
near you...

What today's  
technology will do to  
tomorrow's jobs



The kind of things that  
are easy to teach are  
now easy to automate,  
digitize or outsource

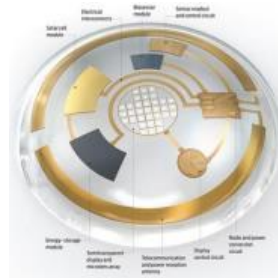


# Robotics



The Auto-auto  
>1m km,  
one minor accident,  
occasional human intervention

# Augmented Reality



# Digitalisation



Democratizing



Particularizing




Empowering



Concentrating

Scale without mass

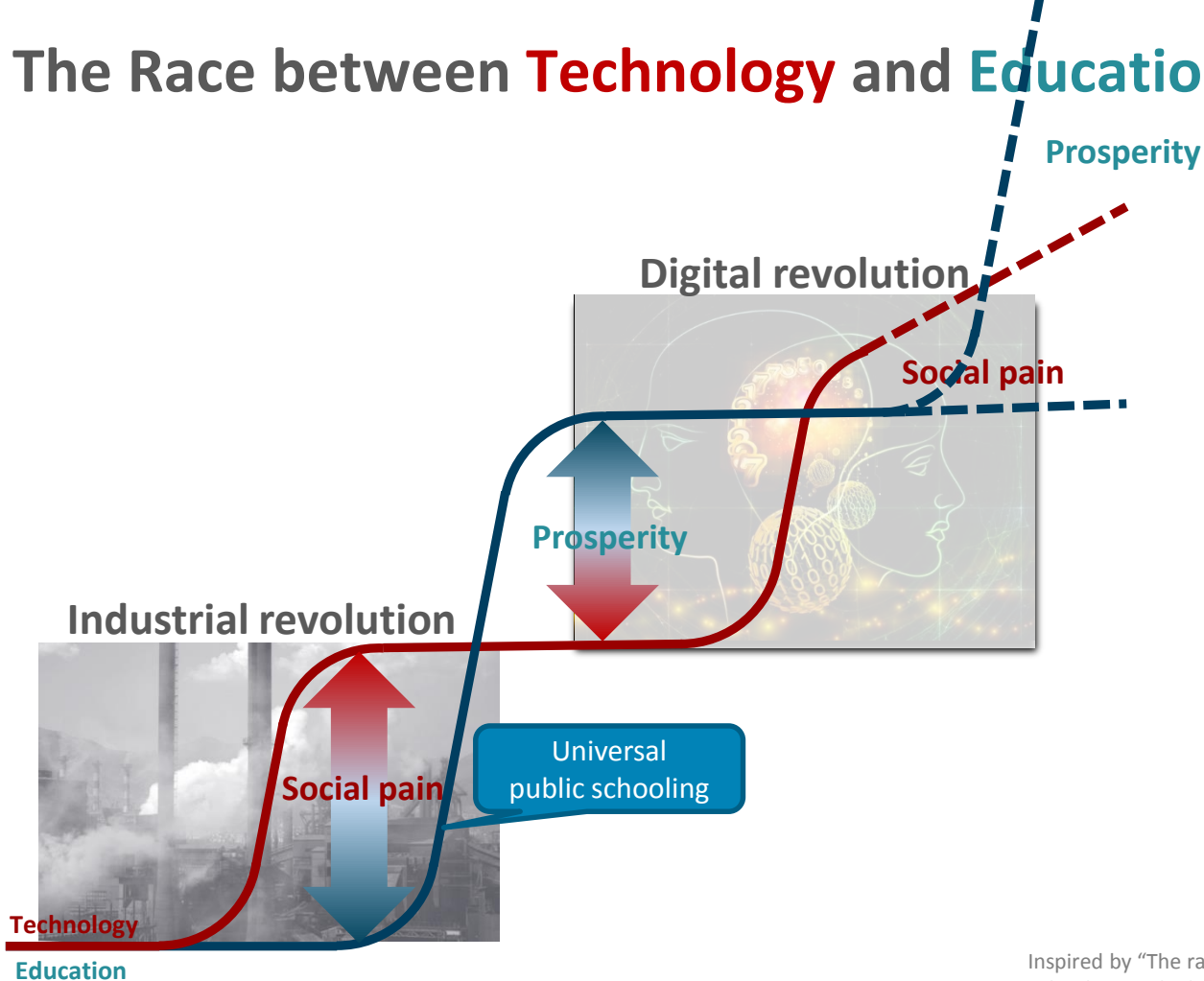
**Google** 1m \$ / employee

 120 k\$ / employee



Disempowering

# The Race between **Technology** and **Education**

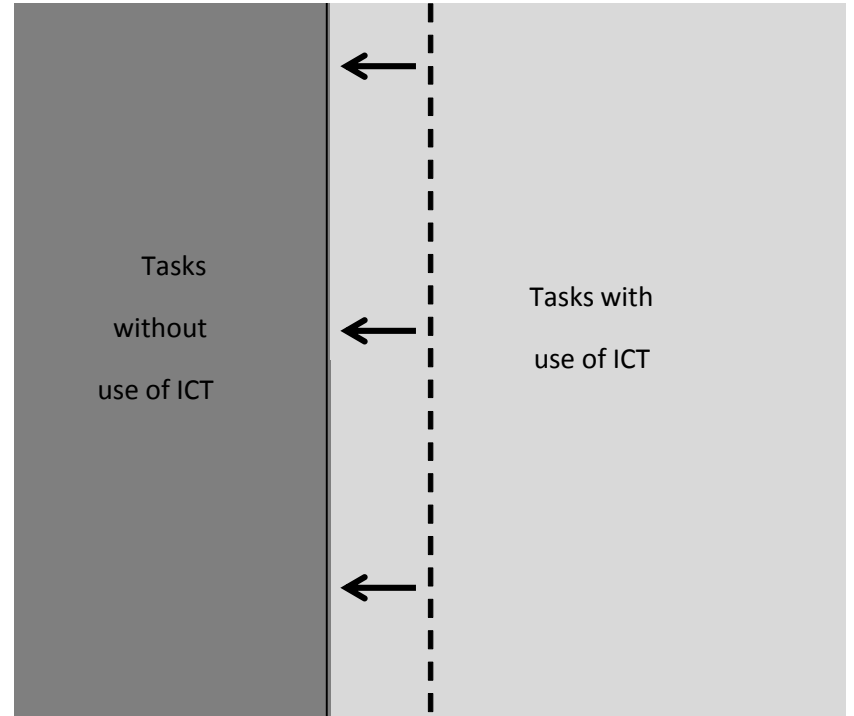
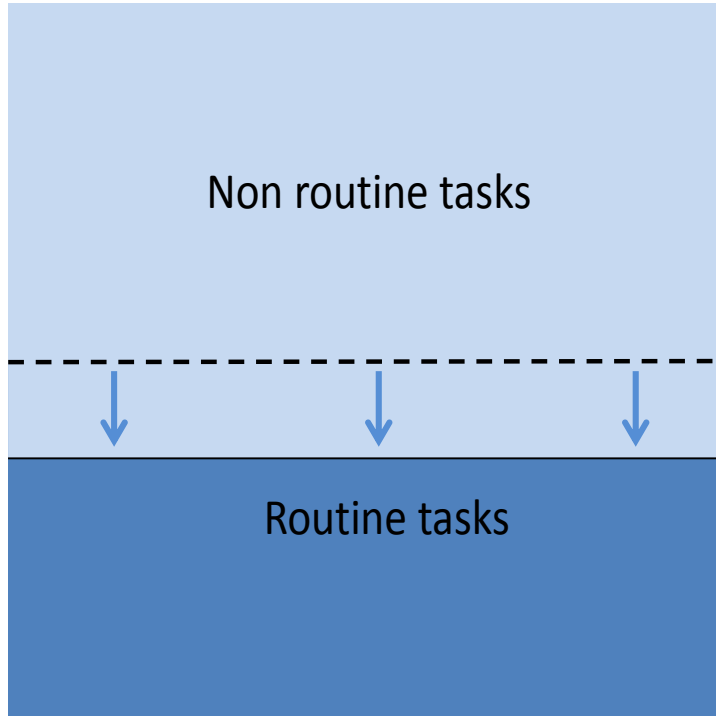


Inspired by "The race between technology and education"  
Pr. Goldin & Katz (Harvard)

# Some premises

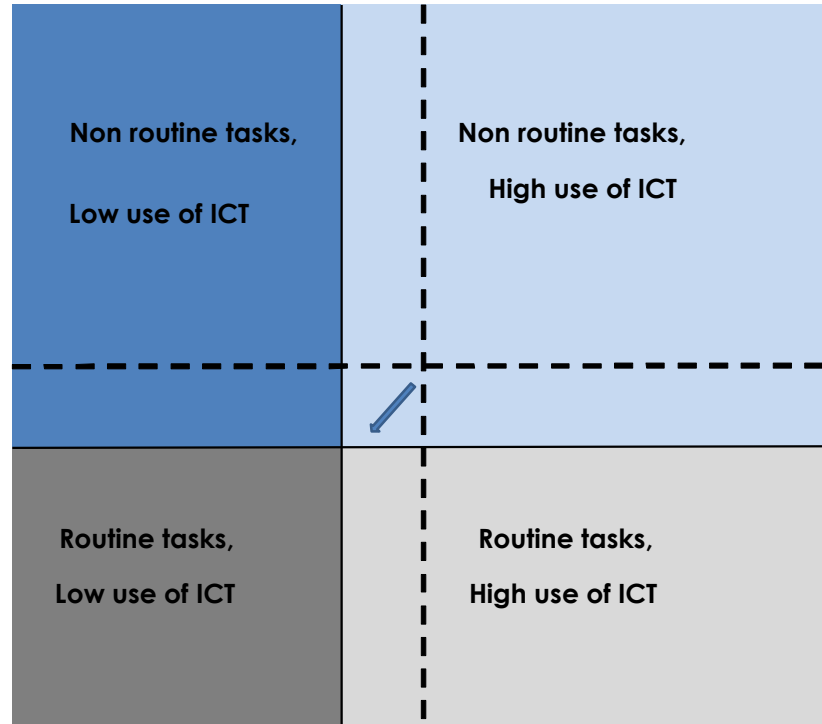
- Technology **substitutes** workers in the performance of some tasks (routine ones) but also **complements** workers.
- Skills are **multidimensional**; skills **evolve** with experience and with technology.

# TWO EFFECTS OF DIGITALISATION



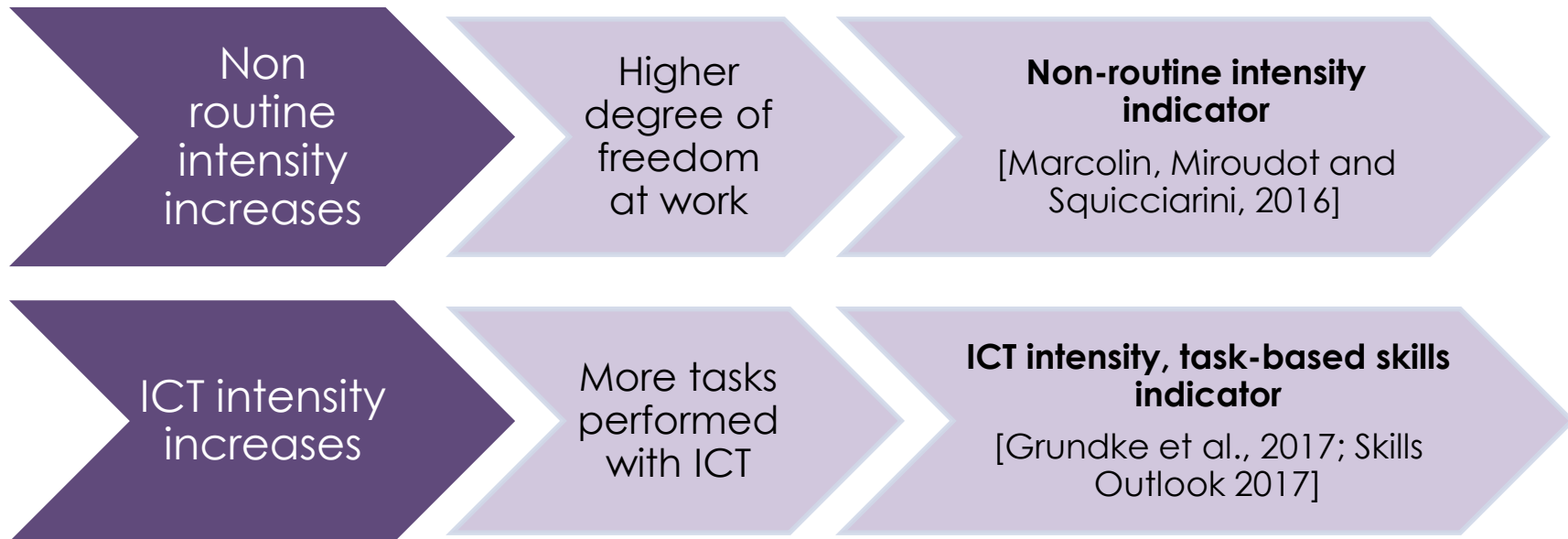


# TWO EFFECTS OF DIGITALISATION



# MEASURING THESE EFFECTS WITH THE **SURVEY OF ADULT SKILLS** (PIAAC)

FROM INFORMATION ON TASKS PERFORMED ON THE JOB



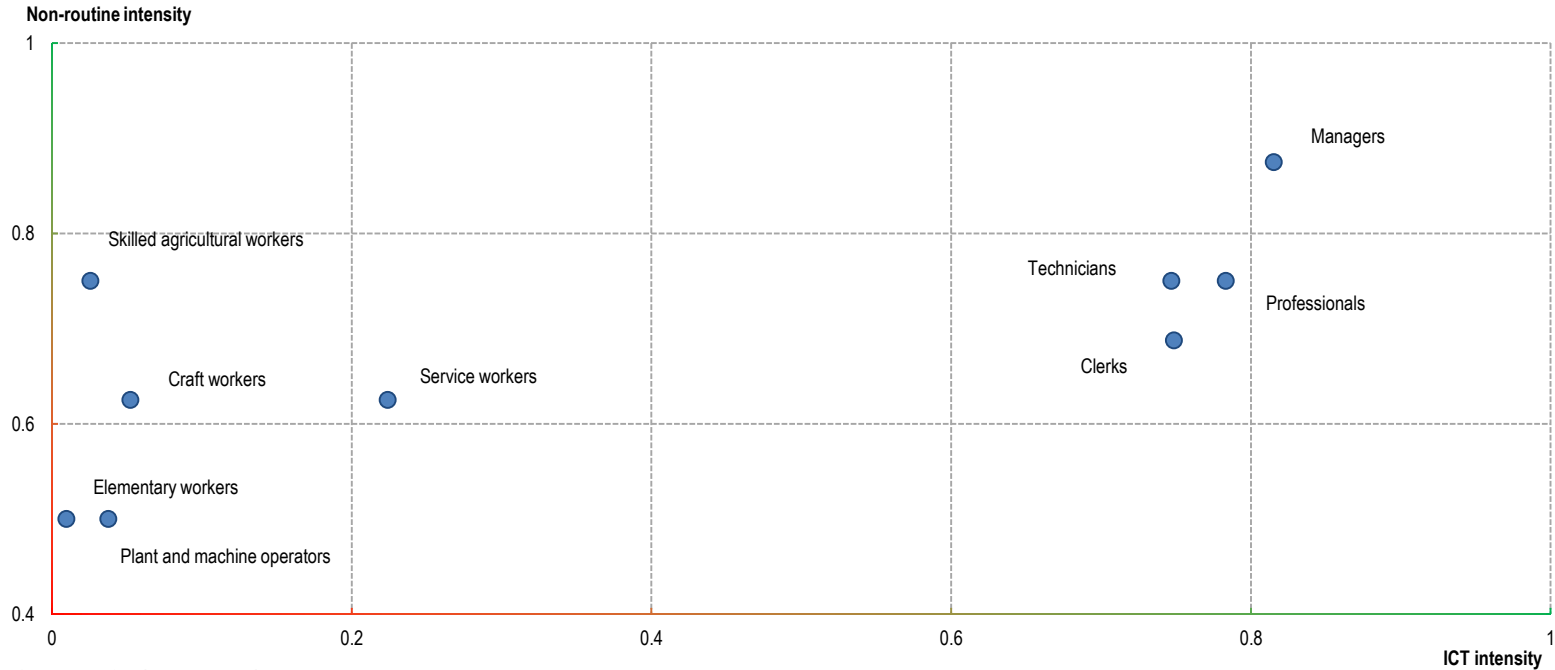


COUNTRIES EXPLAIN  
VERY LITTLE OF THE  
VARIANCE IN DIGITAL  
EXPOSURE

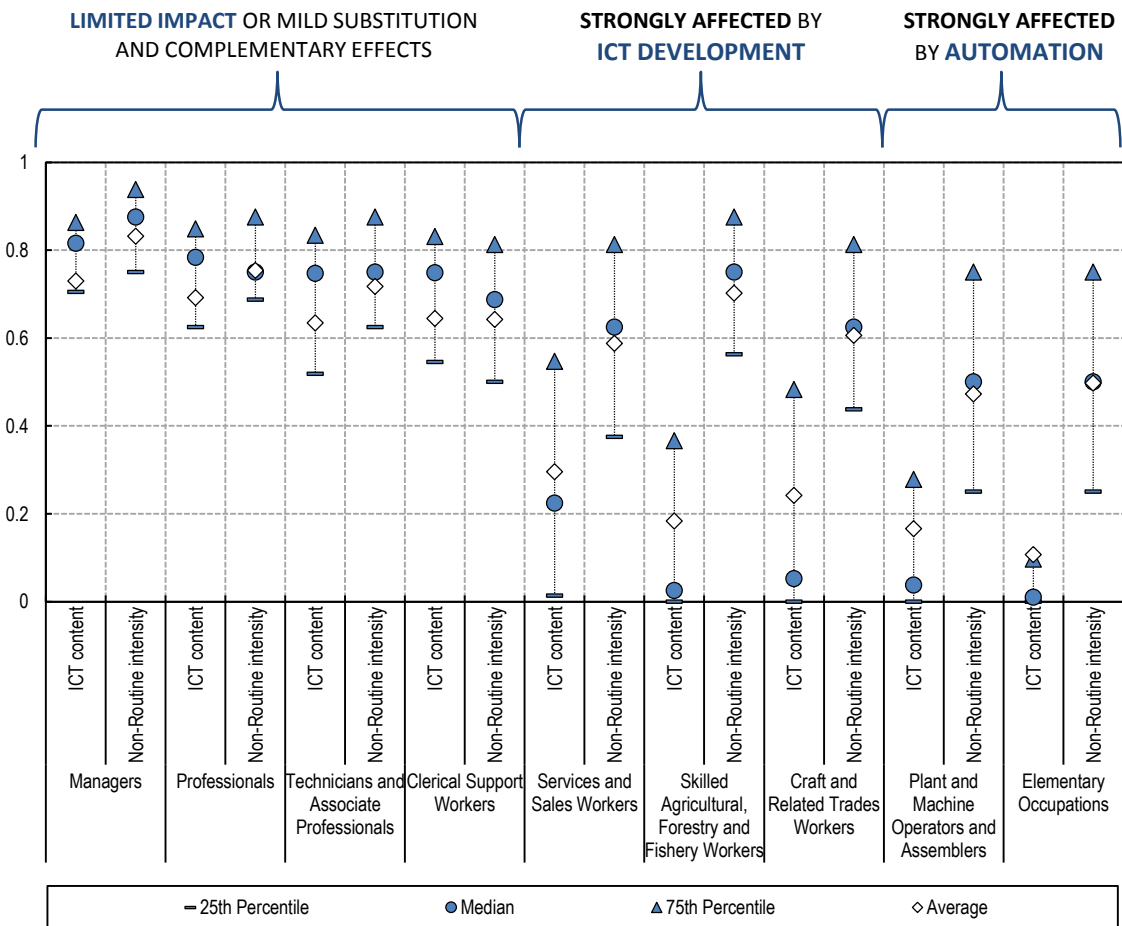
**OCCUPATIONS**  
ARE MORE  
IMPORTANT

# OCCUPATIONS' EXPOSURE TO DIGITALISATION DIFFERS SUBSTANTIALLY

## MEDIAN DIGITAL EXPOSURE INDICATORS



# SIGNIFICATION VARIATIONS WITHIN OCCUPATIONS

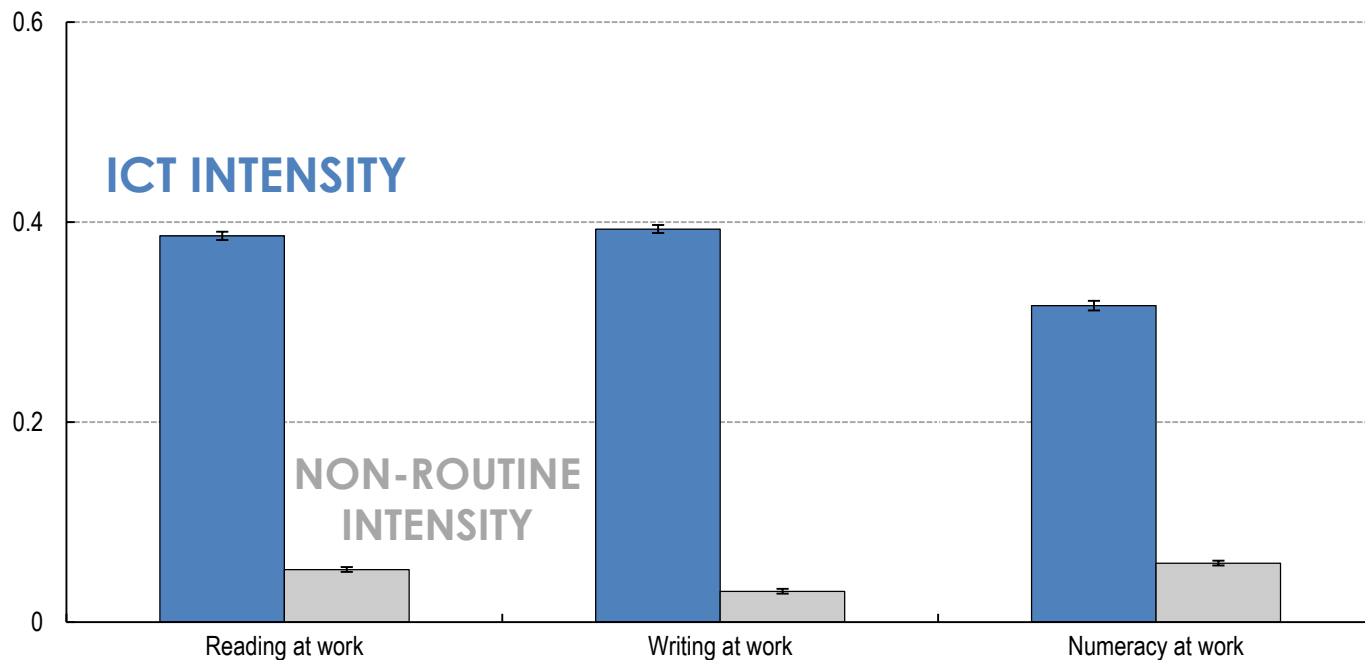


# WHAT DOES **DIGITALISATION** CHANGE FOR WORKERS **ON THE JOB**



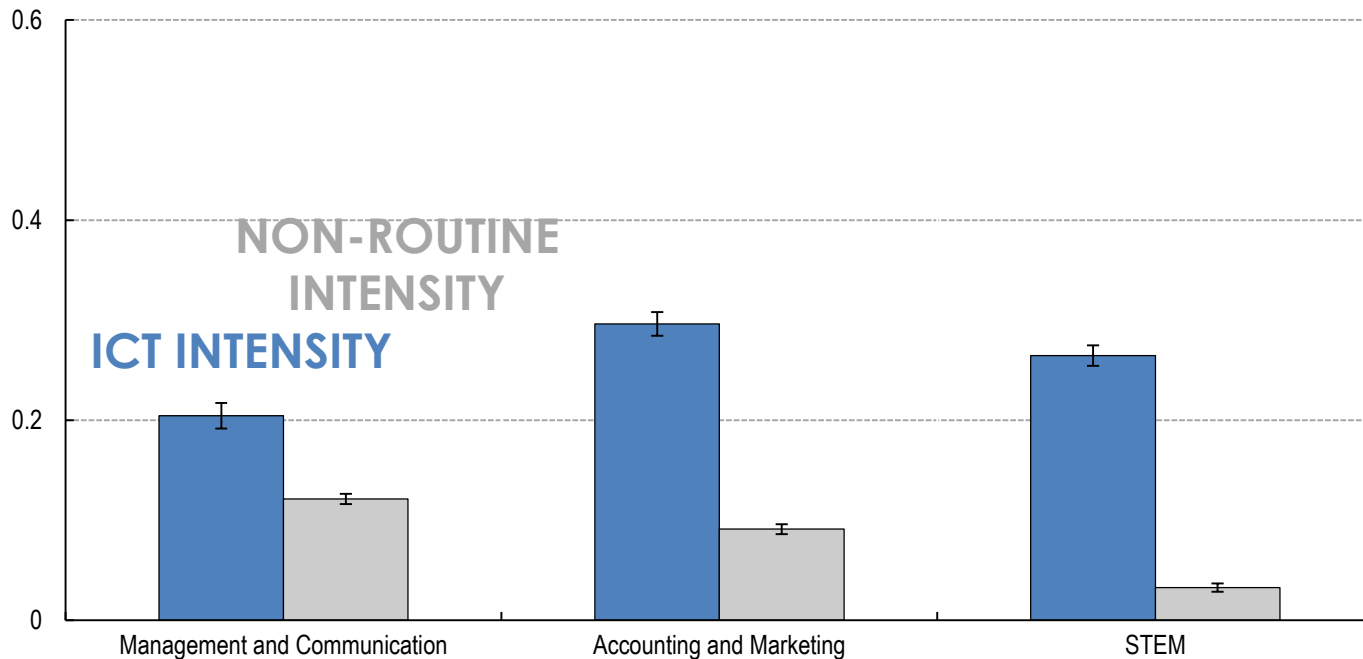
# ICT USE AND NON-ROUTINE INTENSITY INCREASE COGNITIVE SKILL USE

EXPECTED EFFECT OF INCREASE FROM 25<sup>TH</sup> TO 75<sup>TH</sup> PCTILE OF DIGITAL EXPOSURE  
ON COGNITIVE SKILL INTENSITY



# ICT USE AND NON-ROUTINE INTENSITY INCREASE TASK CONTENT VARIETY

EXPECTED EFFECT OF INCREASE FROM 25<sup>TH</sup> TO 75<sup>TH</sup> PCTILE OF DIGITAL EXPOSURE  
ON TASK INTENSITY





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# SKILLS DEVELOP WITH EXPERIENCE

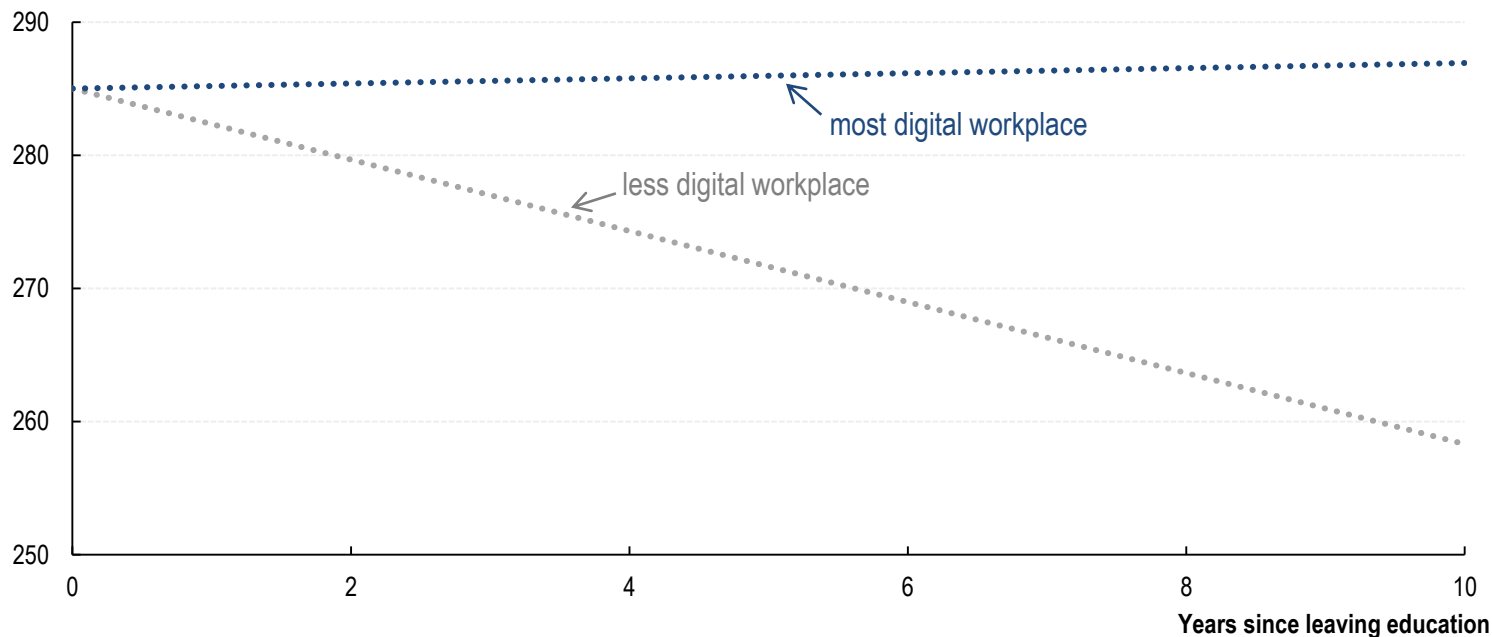
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DOES  
DIGITALISATION  
ENABLE SKILL  
DEVELOPMENT?



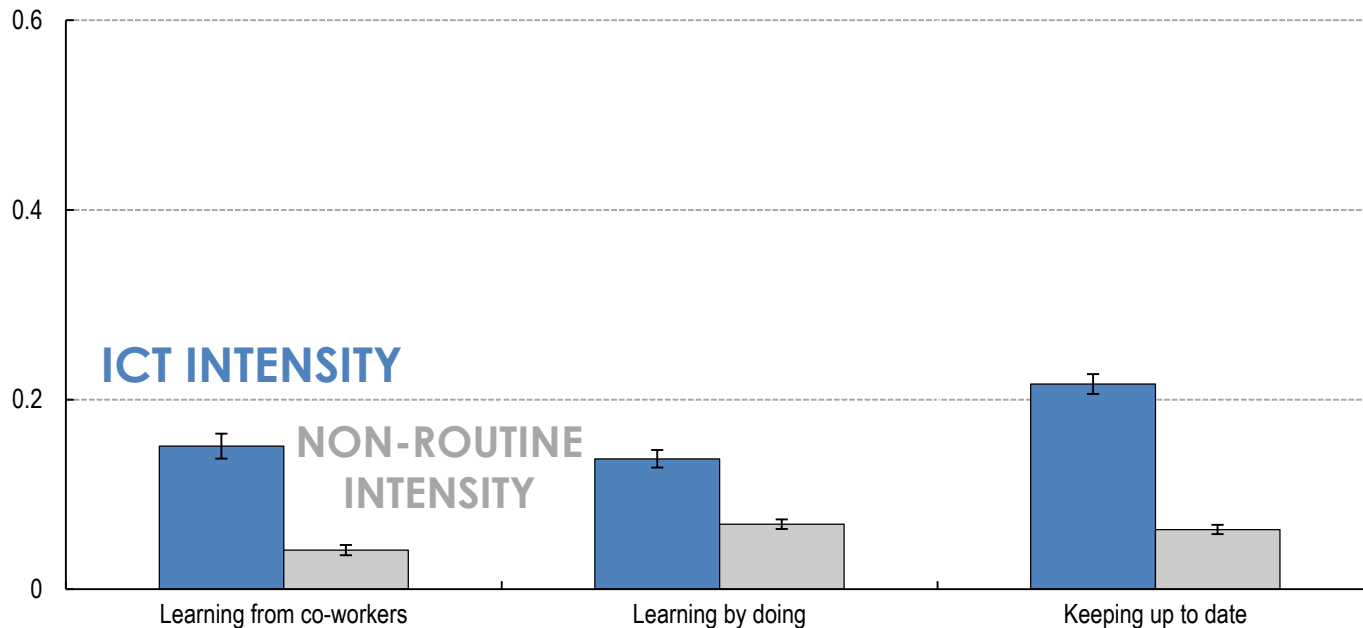
# PROBLEM SOLVING SKILLS **IMPROVE** WITH **PROLONGED DIGITAL EXPOSURE**


Expected problem solving skills



# ICT USE AND NON-ROUTINE INTENSITY ENHANCE FORMS OF LEARNING

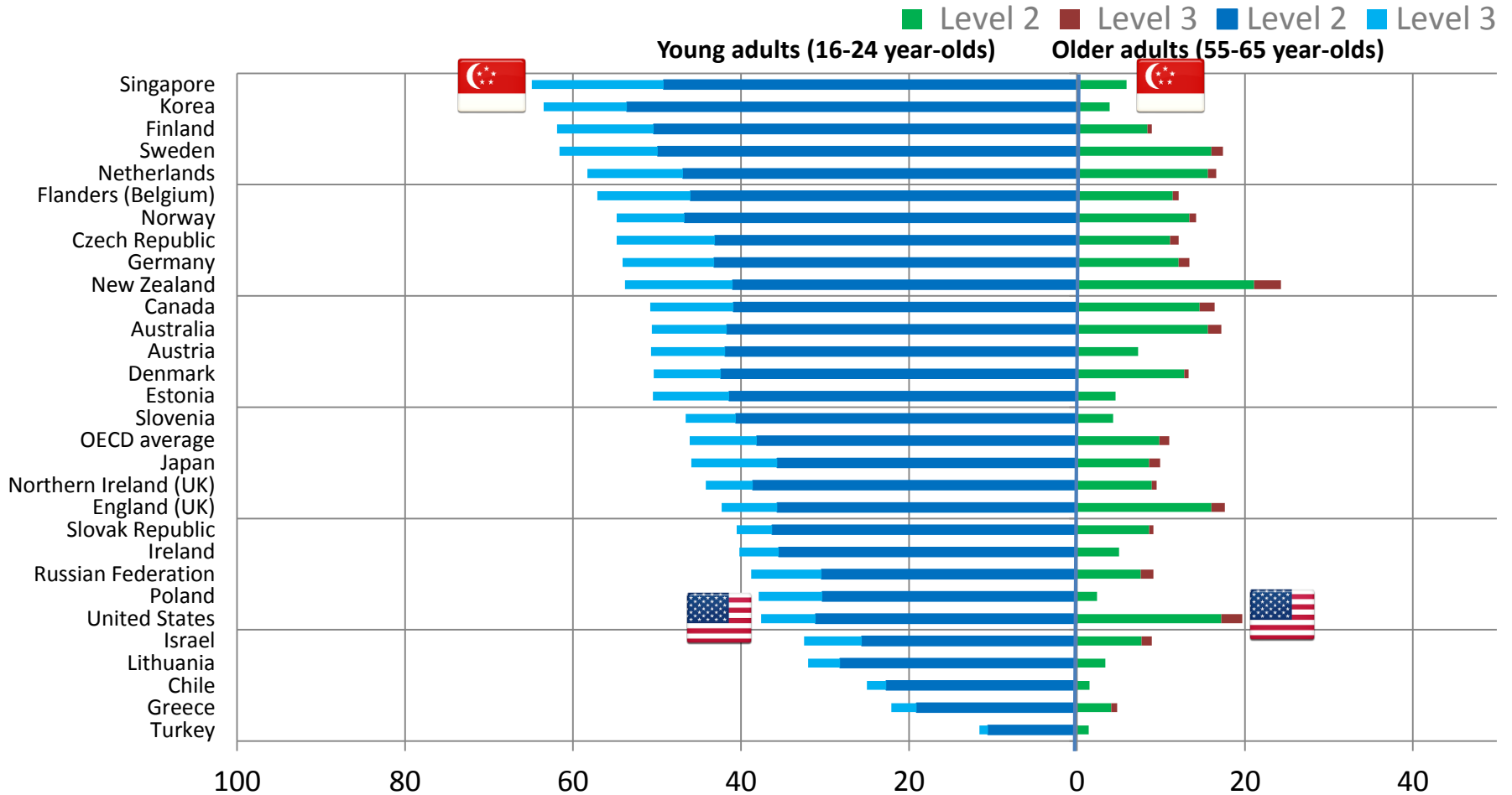
EXPECTED EFFECT OF INCREASE FROM 25<sup>TH</sup> TO 75<sup>TH</sup> PCTILE OF DIGITAL EXPOSURE  
ON PROBABILITY OF LEARNING AT LEAST ONCE A WEEK





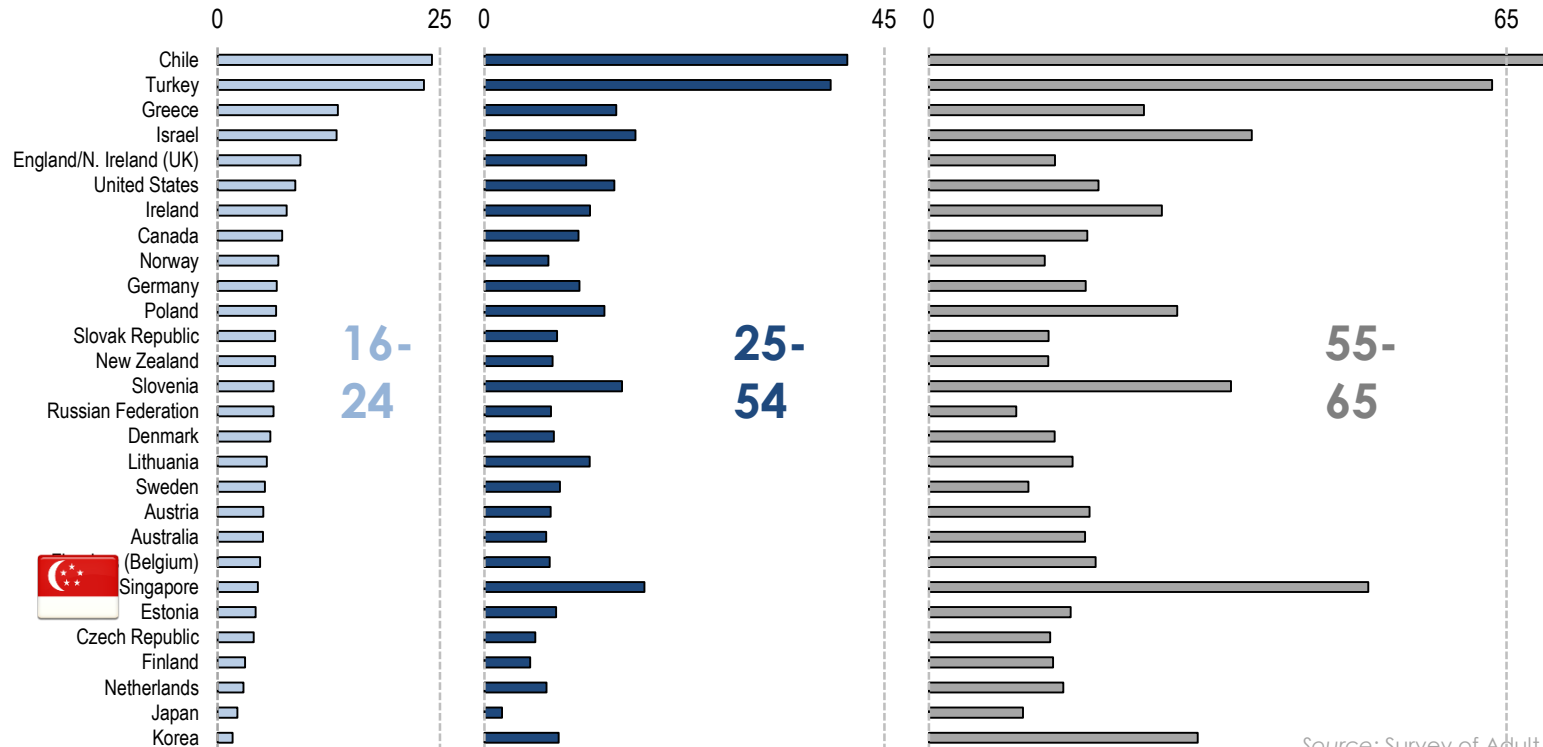
**ARE COUNTRIES PREPARED  
FOR THIS TECHNOLOGICAL  
CHANGE?**

# Skills to manage complex digital information



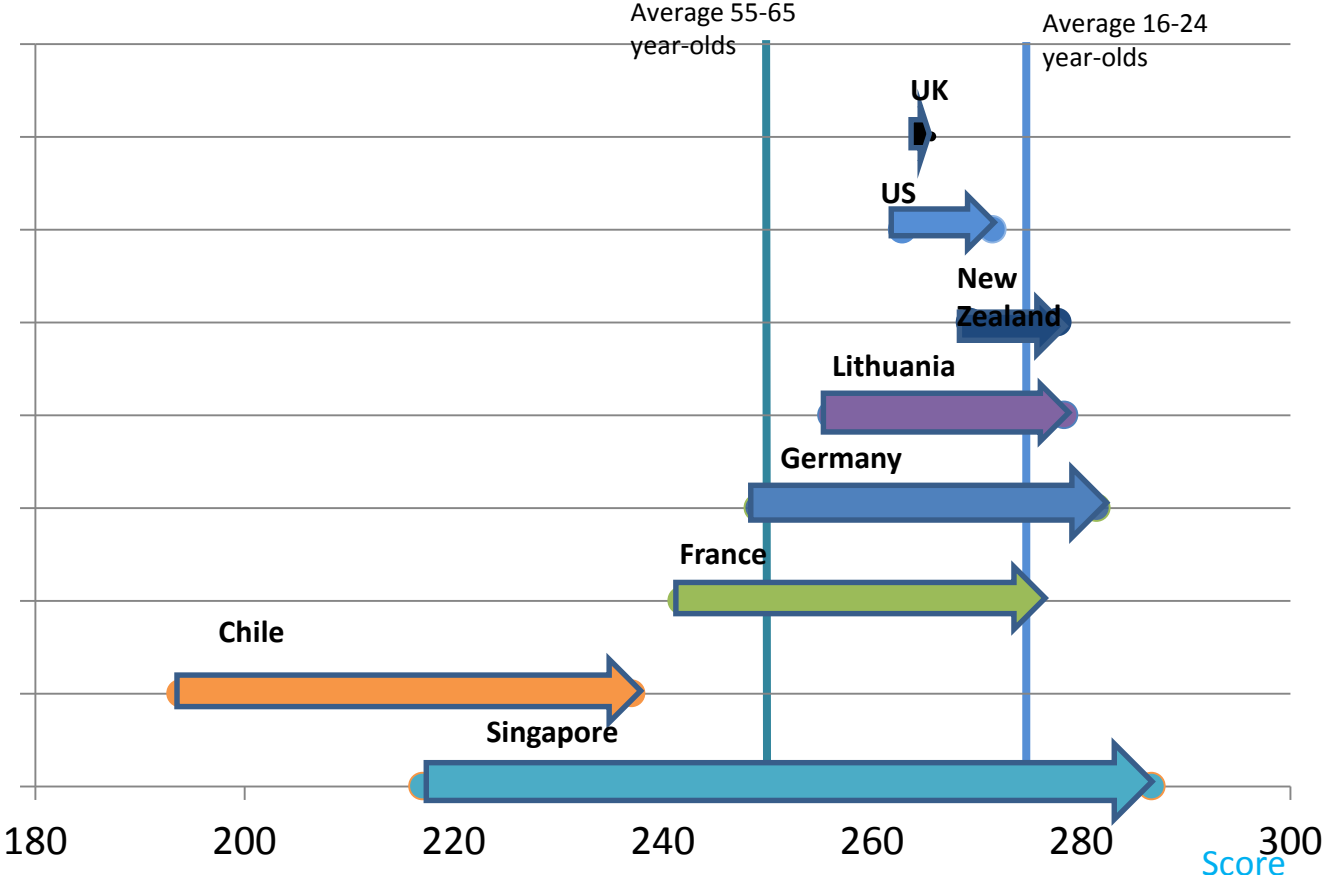
# OLDER INDIVIDUALS SIGNIFICANTLY MORE AT RISK

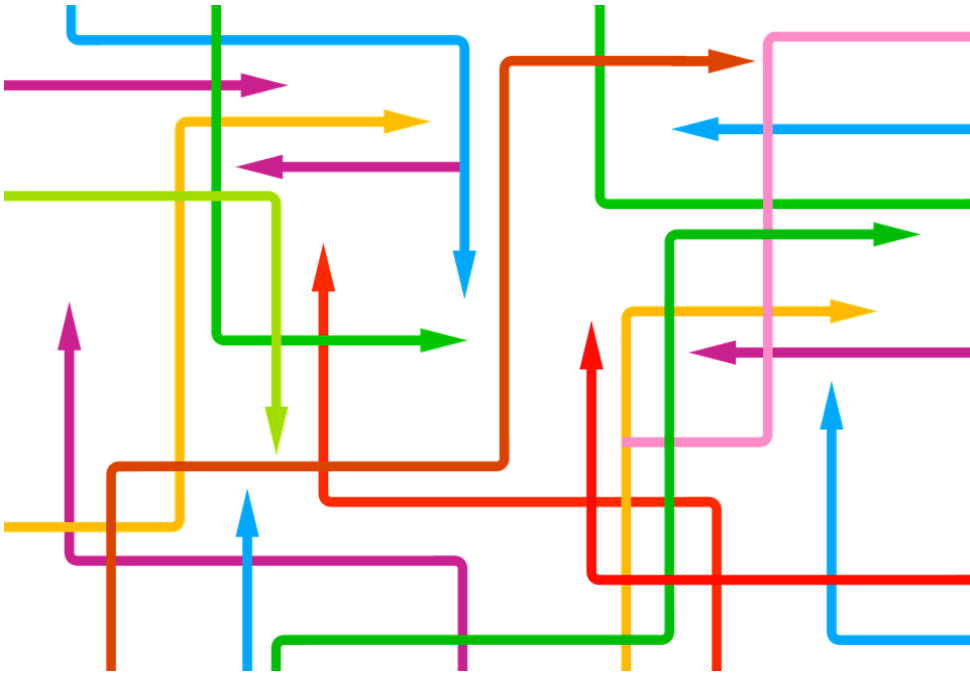
SHARE OF AGE GROUP LACKING BASIC SKILLS (%)



Source: Survey of Adult Skills (2012, 2015)

# Literacy skills in younger and older generations 55-65 to 16-24 years





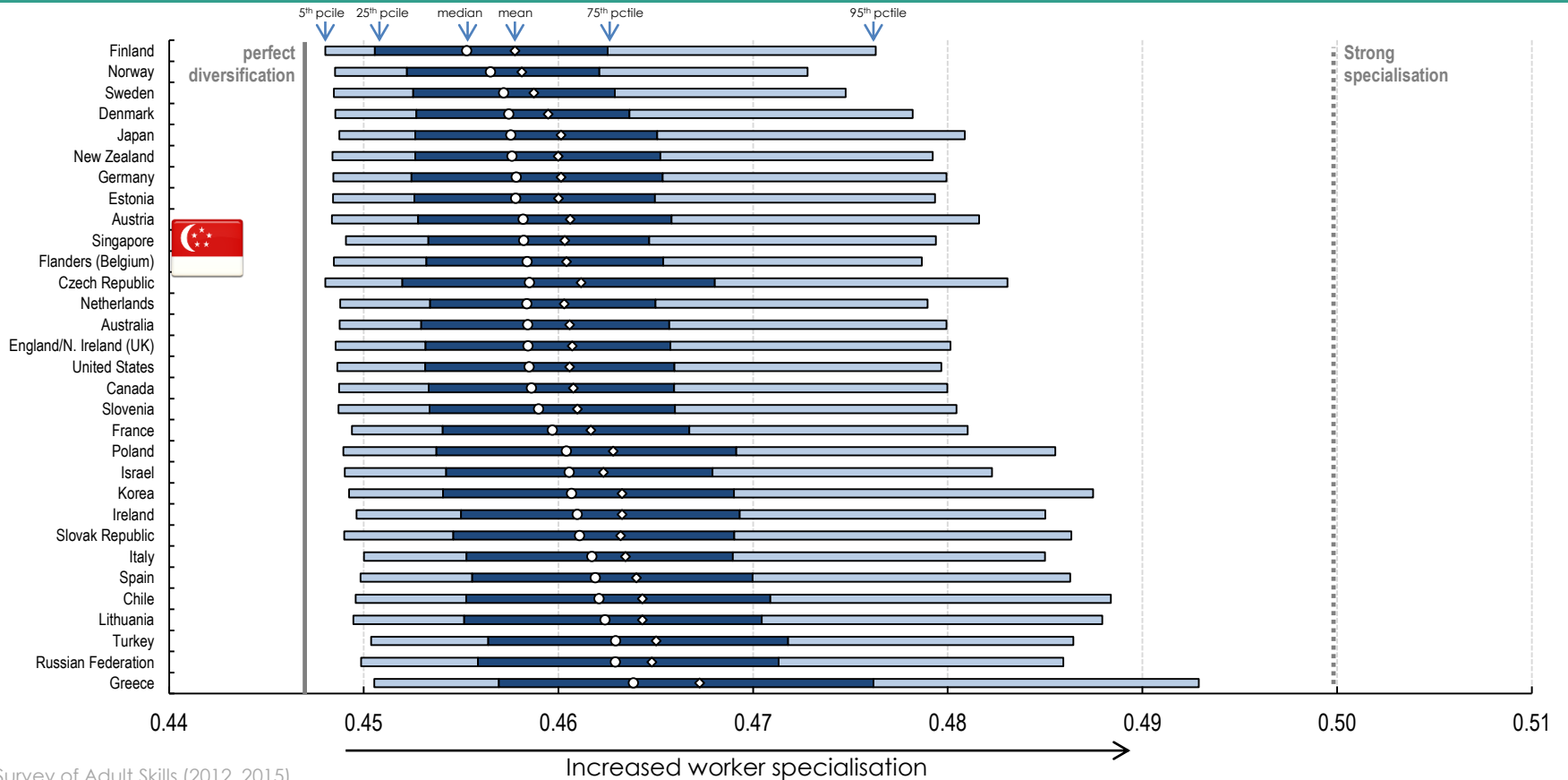
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**COUNTRIES  
WITH  
SPECIALISED  
WORKERS** ARE  
LIKELY TO BE **LESS  
ADAPTABLE** TO  
DIGITALISATION

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# COUNTRIES DIFFER IN THEIR DEGREE OF SPECIALISATION



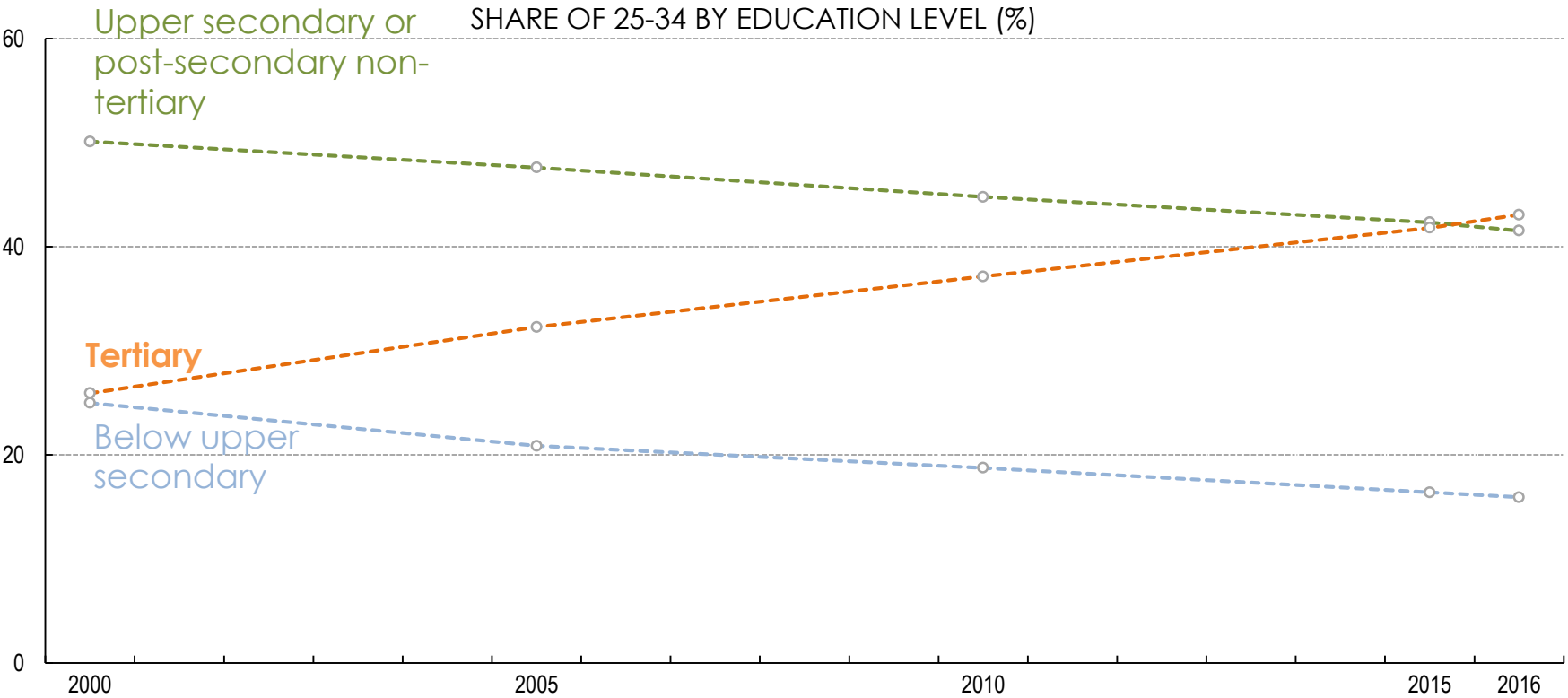
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WHAT ROLE  
CAN  
**EDUCATION**  
PLAY?

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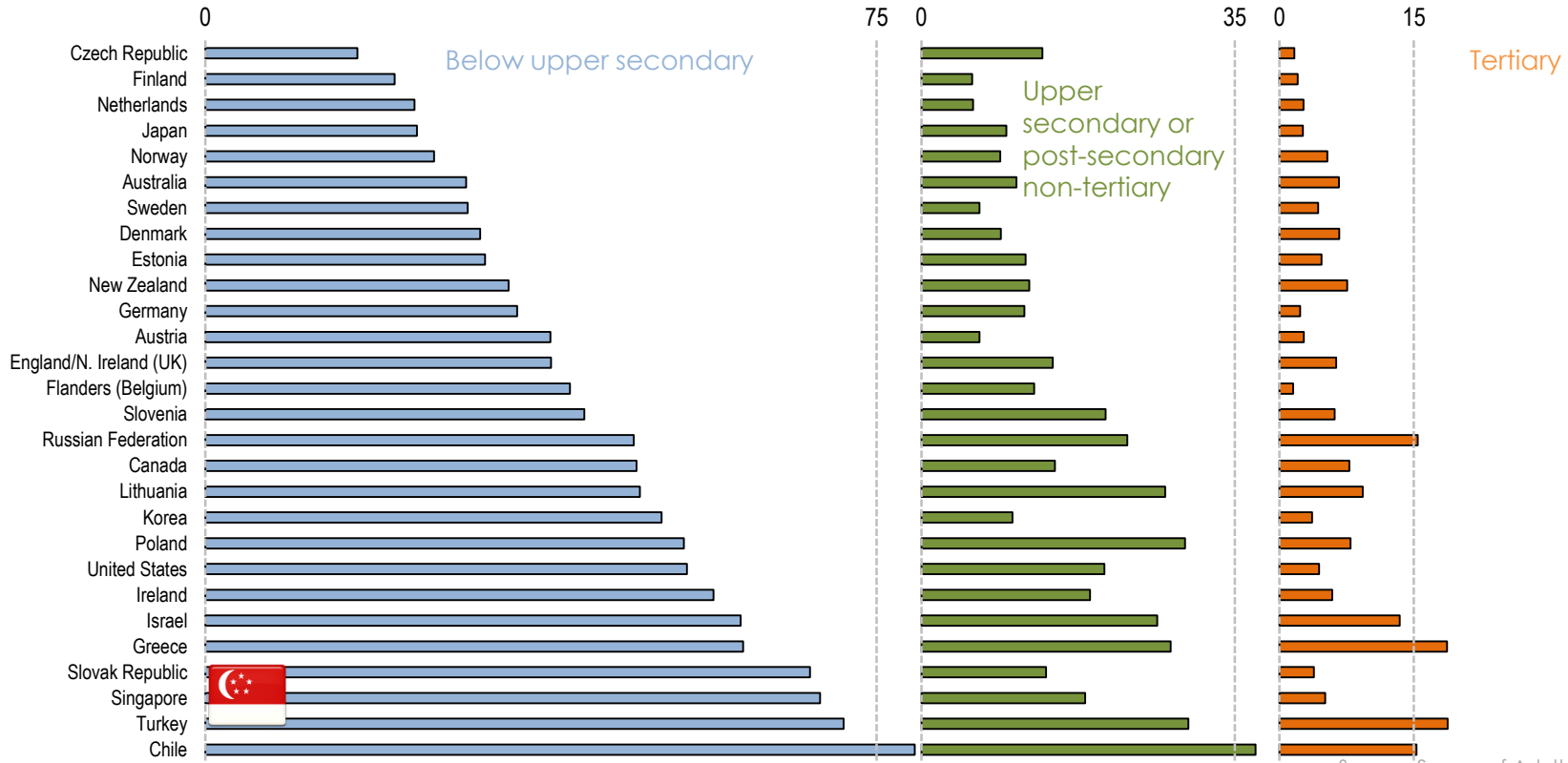
# SIGNIFICANT INCREASE IN TERTIARY EDUCATION



Source: Education at a Glance 2017, Table A1.2 (OECD, 2017)

# ... BUT A TERTIARY DEGREE DOES NOT GUARANTEE SKILLS

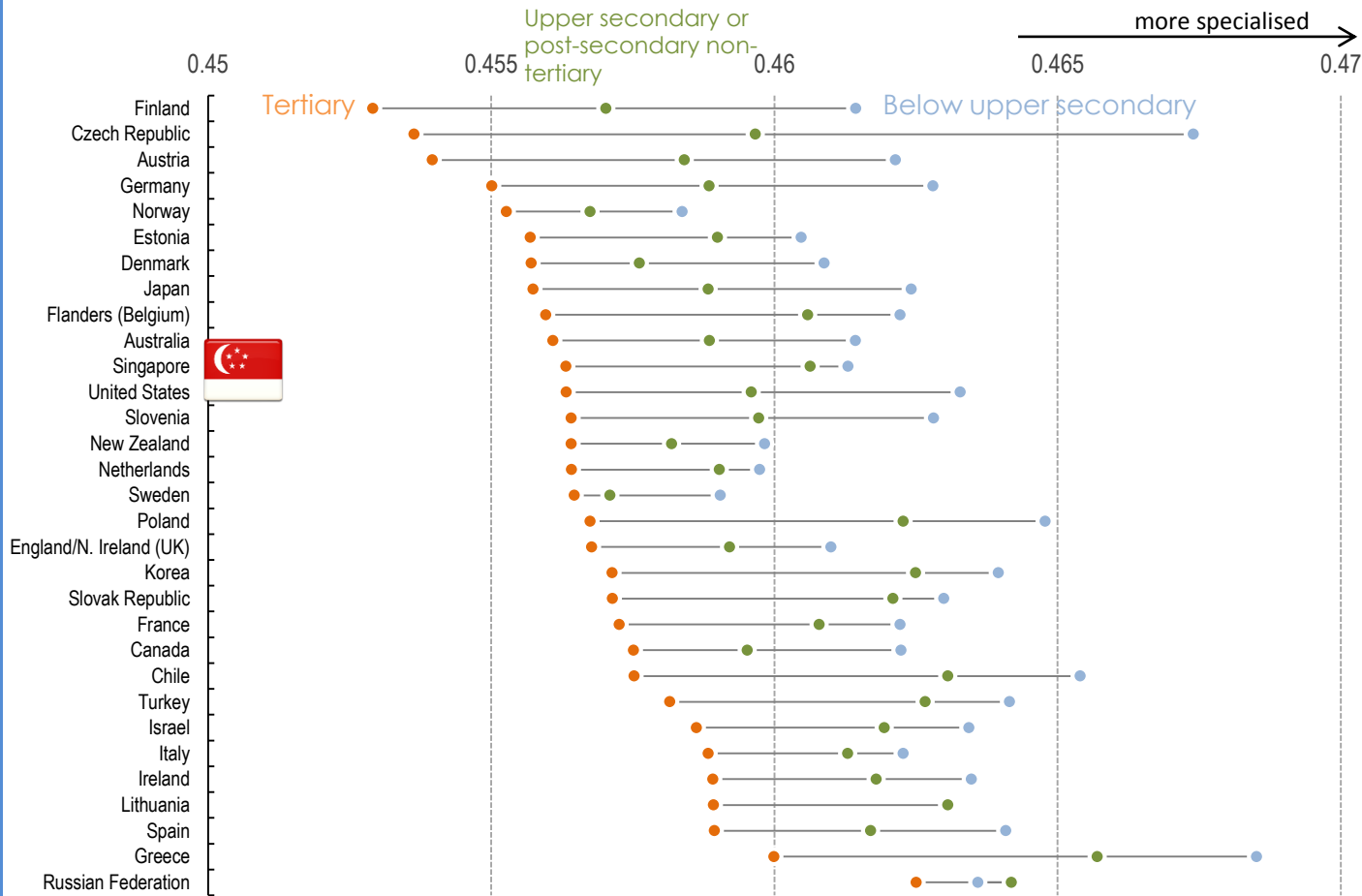
SHARE LACKING BASIC SKILLS BY EDUCATION LEVEL (%)



Source: Survey of Adult Skills (2012, 2015)

# SPECIALISATION OF WORKERS BY EDUCATION LEVEL

**LESS  
EDUCATED  
WORKERS  
TEND BE TO  
MORE  
SPECIALISED**



Source: Survey of Adult Skills (2012, 2015)

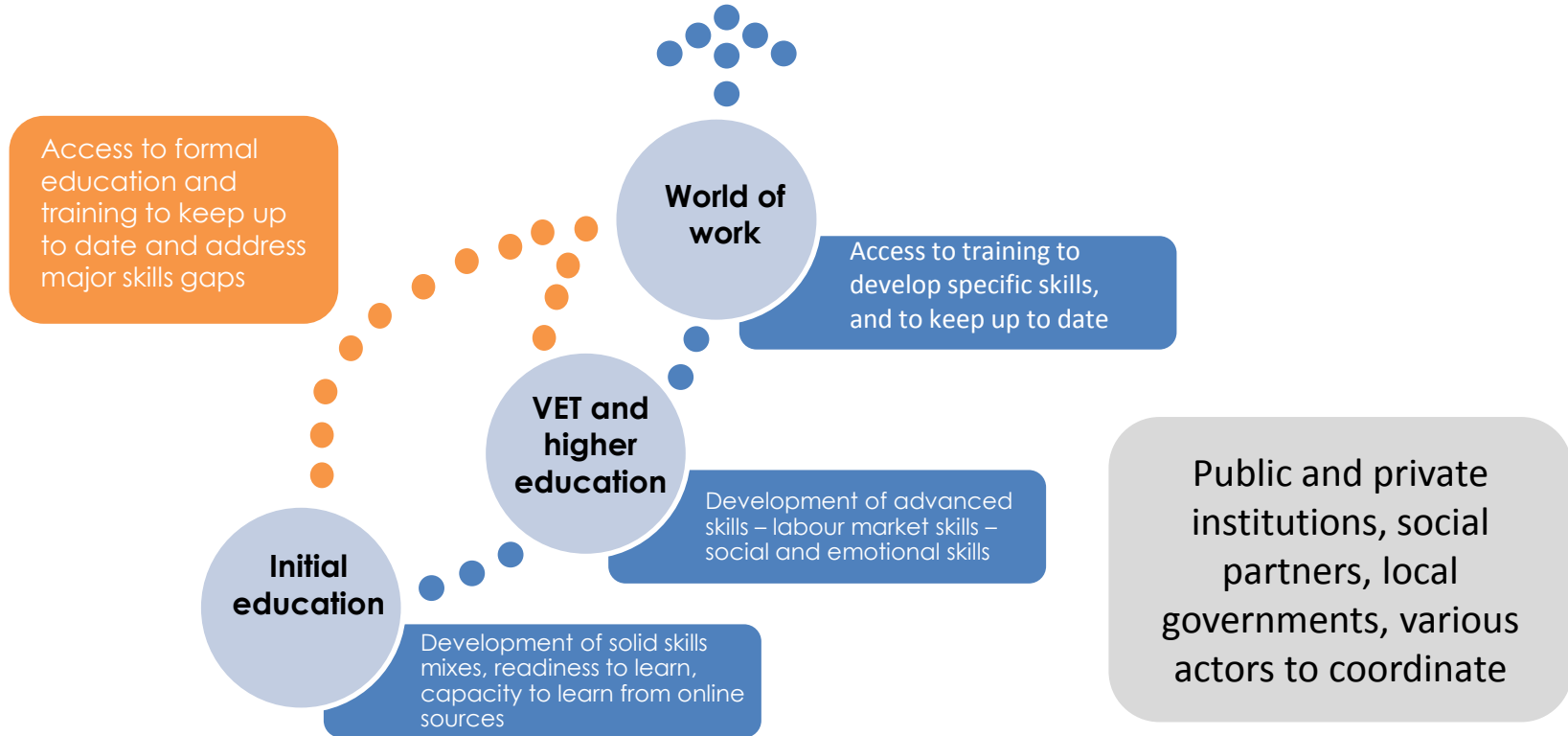



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THE BUILDING  
BLOCKS OF  
**LIFELONG  
LEARNING**

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# LEARNING AT EVERY STAGE OF LIFE



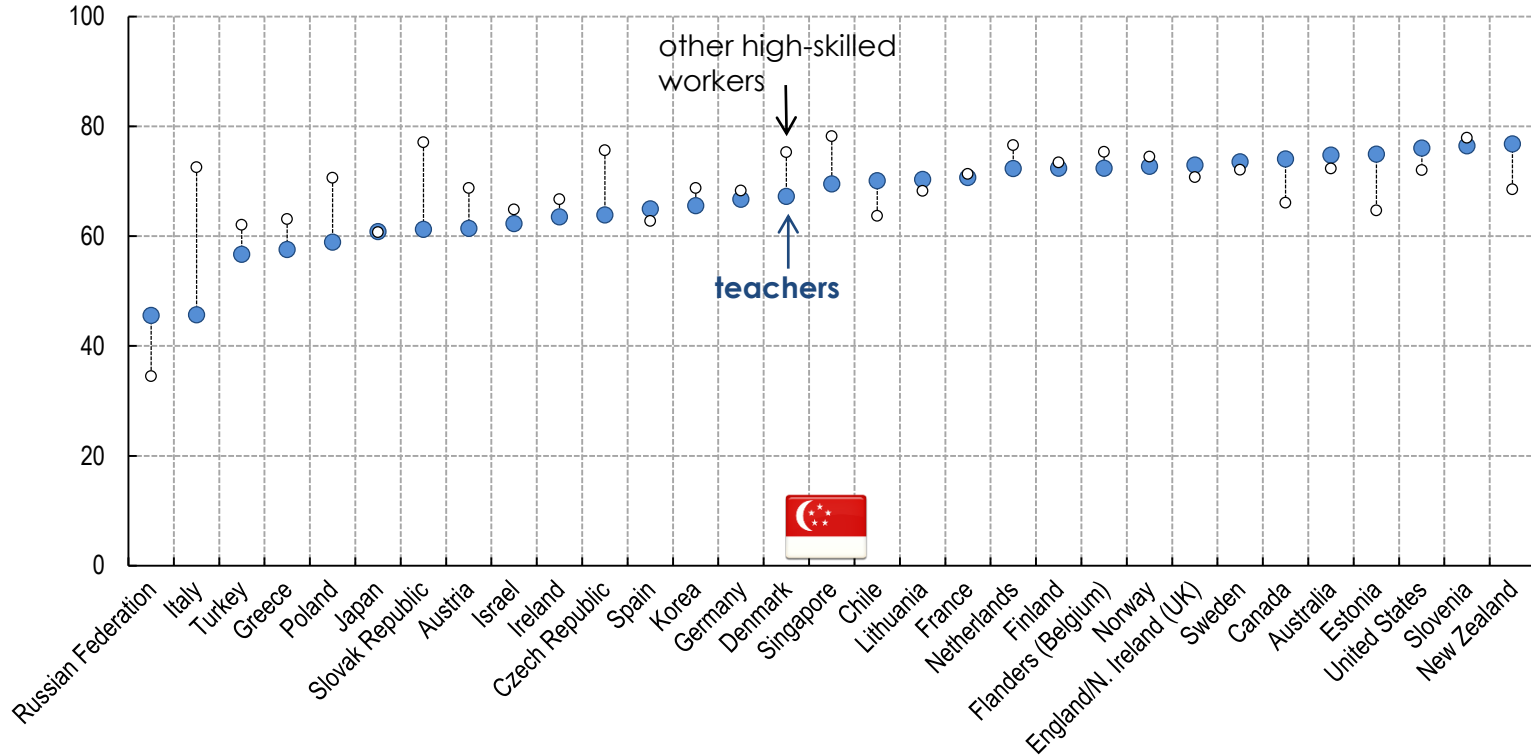
A photograph of a classroom or computer lab. A male teacher with glasses, wearing a purple shirt, is leaning over a desk, looking at a computer monitor. Two female students are seated at the desk; one is wearing a blue shirt and the other a red and black plaid shirt. They appear to be working together on a computer. In the background, other students are visible at their desks. The entire image has a light green tint. Two white horizontal lines are positioned above and below the text.

THE **TEACHING**  
PROFESSION IS AT THE  
CORE OF THE **QUALITY**  
OF EDUCATION AND  
TRAINING



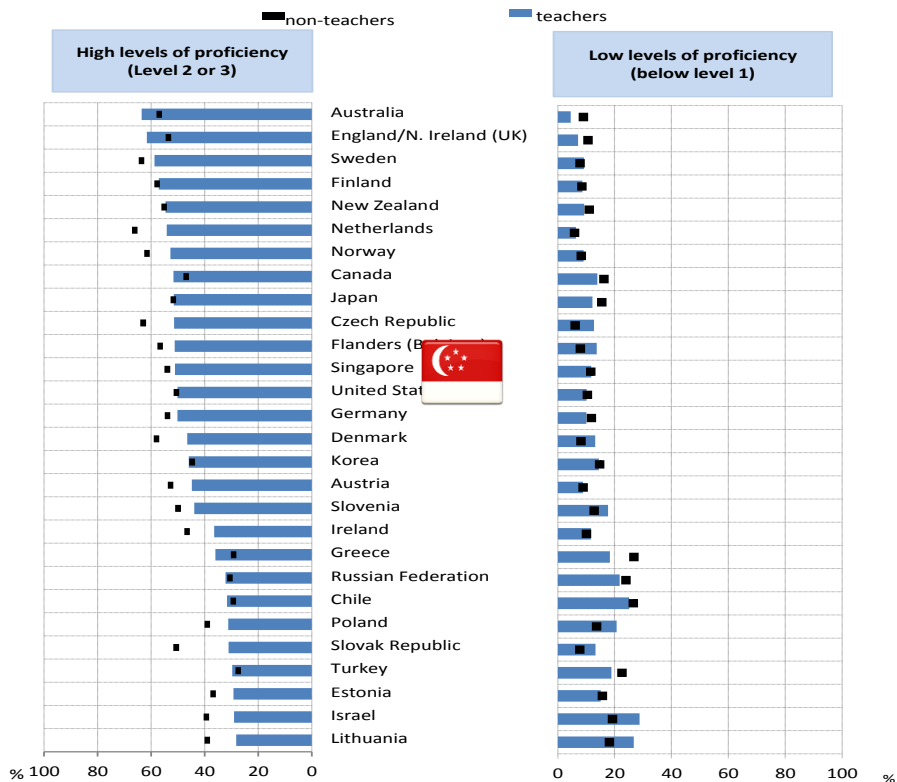
# TEACHERS USE ICT AS MUCH AS OTHER HIGH-SKILLED WORKERS

INTENSITY OF ICT USE AT WORK FOR **TEACHERS** AND **EMPLOYED TERTIARY EDUCATED WORKERS**



# BUT LESS LIKELY TO HAVE HIGH PROBLEM-SOLVING SKILLS

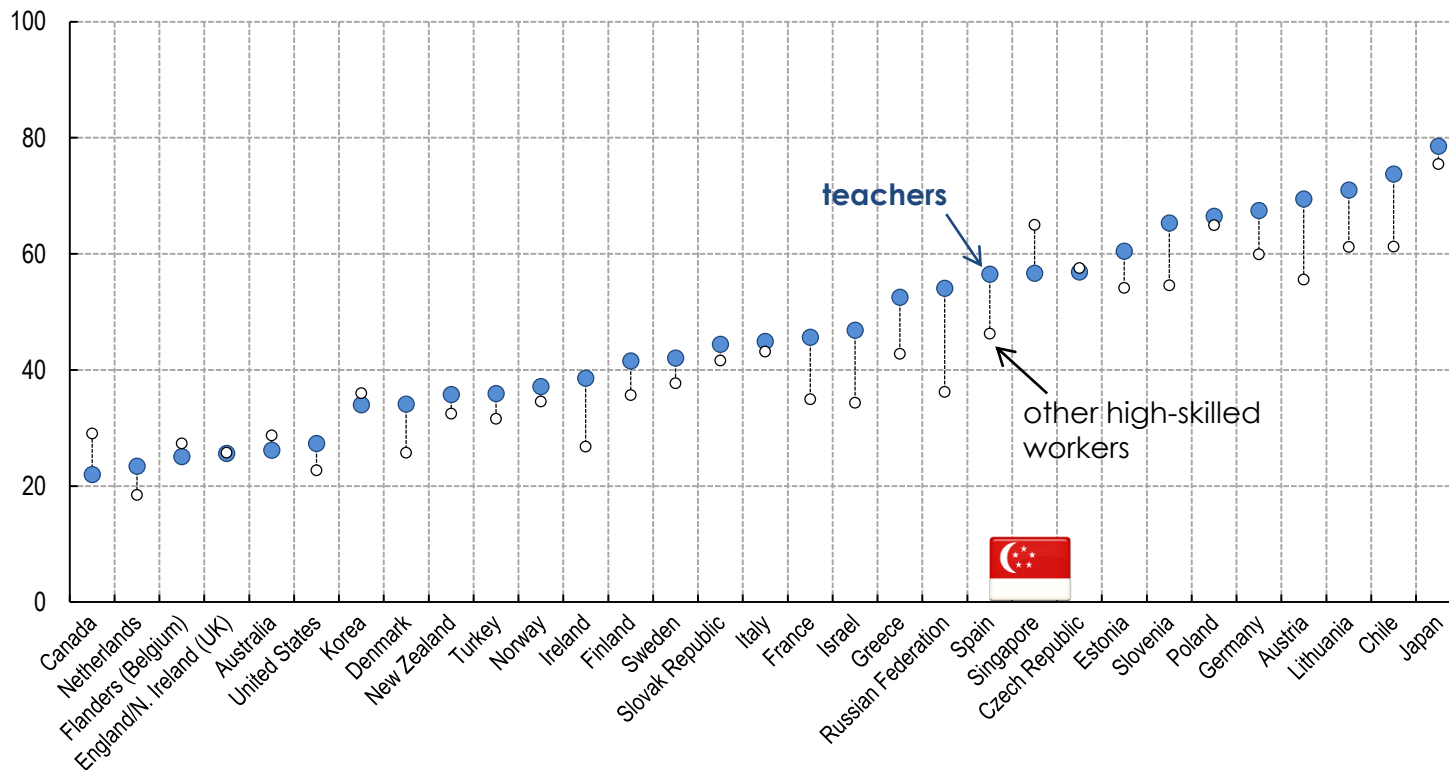
TEACHERS' AND EMPLOYED TERTIARY EDUCATED WORKERS' PROBLEM SOLVING IN TECHNOLOGY-RICH ENVIRONMENT PROFICIENCY

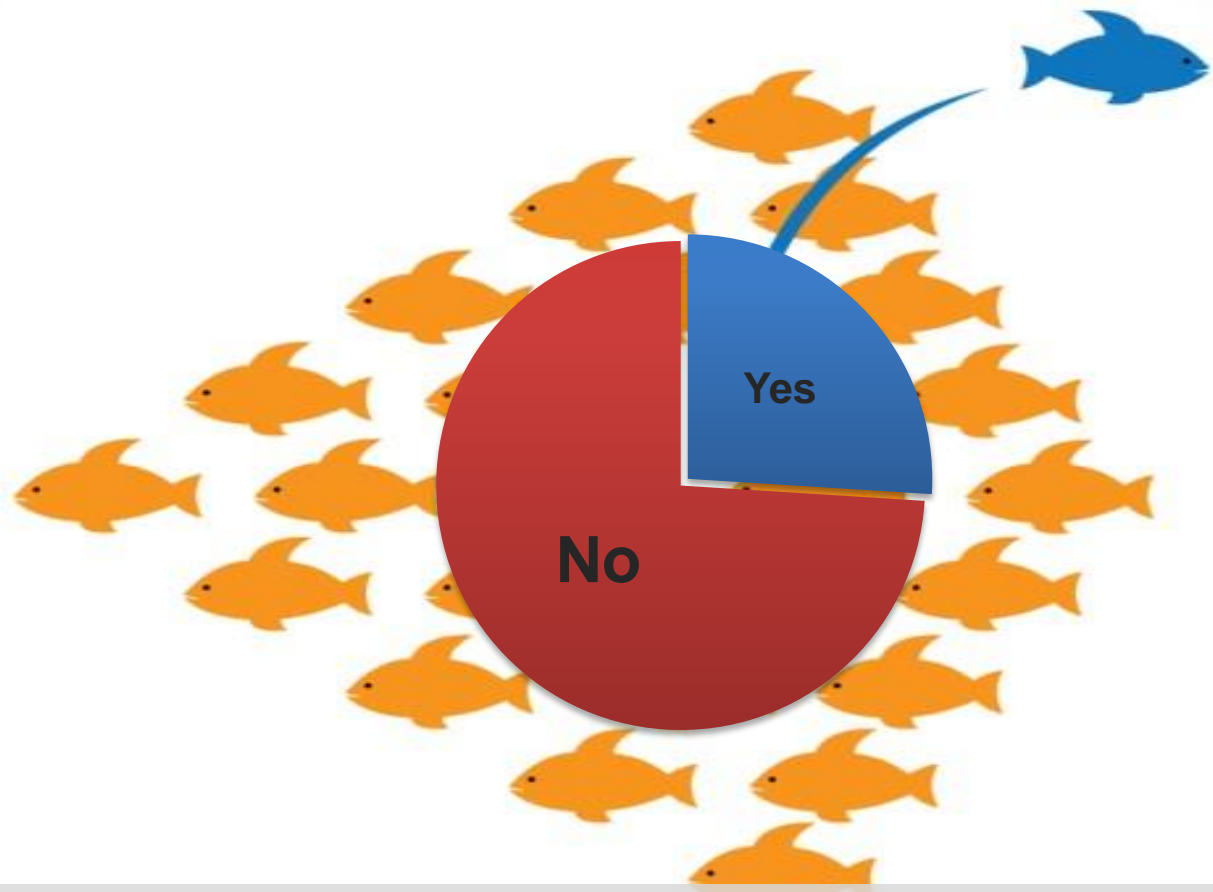


Source: Survey of Adult Skills (2012, 2015)

# AND MORE LIKELY TO NEED TRAINING

SHARE REPORTING NEEDING FURTHER TRAINING FOR THEIR JOB (%)





**If I am more innovative in my teaching  
I will be rewarded (country average)**

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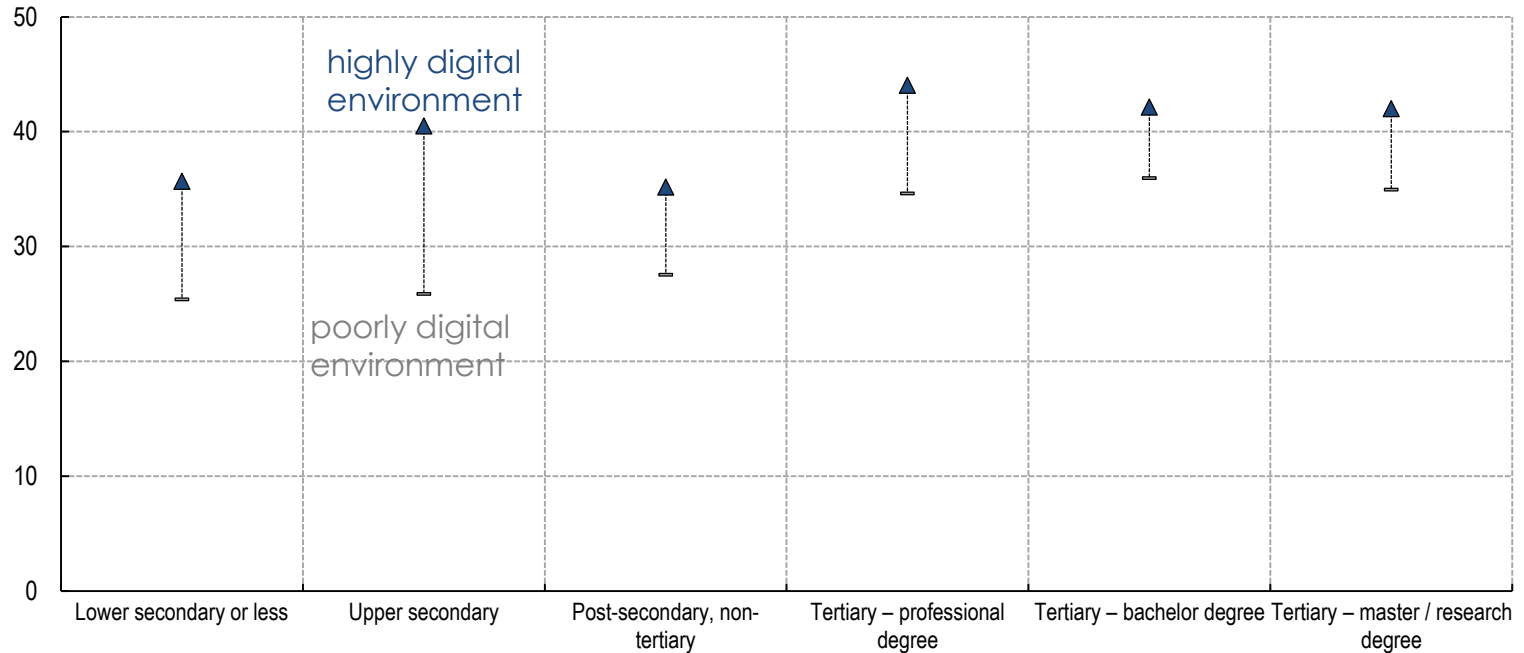
WORKERS **NEED TO**  
**KEEP ON LEARNING**  
AT VARIOUS STAGES OF  
LIFE **TO FACE THE**  
**CHANGES BROUGHT**  
**BY DIGITALISATION**

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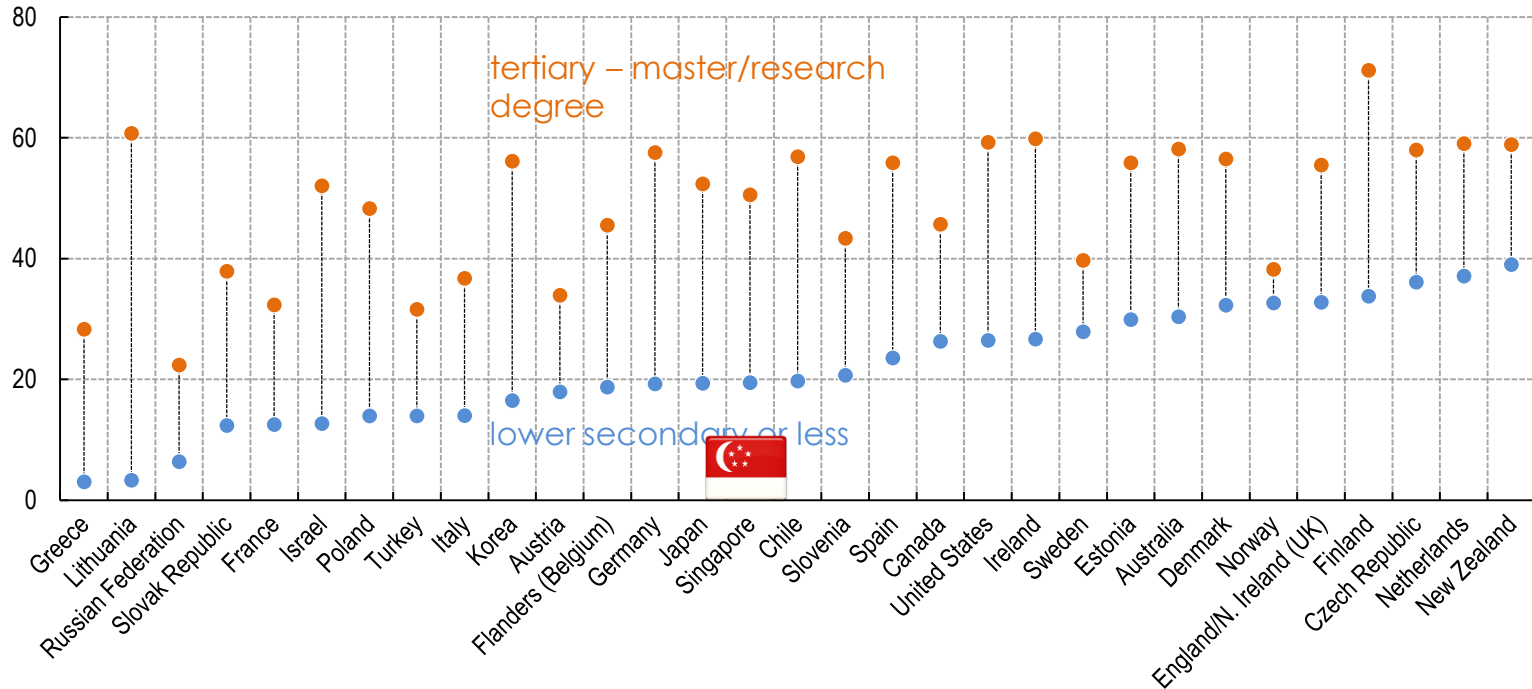
# DIGITALISATION RAISES NEEDS FOR TRAINING

SHARE OF WORKERS REPORTING NEEDING FURTHER TRAINING FOR THEIR JOB BY EDUCATION LEVEL (%)



# LOW-SKILLED ARE LESS LIKELY TO PARTICIPATE IN TRAINING

SHARE OF WORKERS WHO PARTICIPATED IN ON-THE-JOB TRAINING IN THE PREVIOUS YEAR  
BY EDUCATION LEVEL (%)

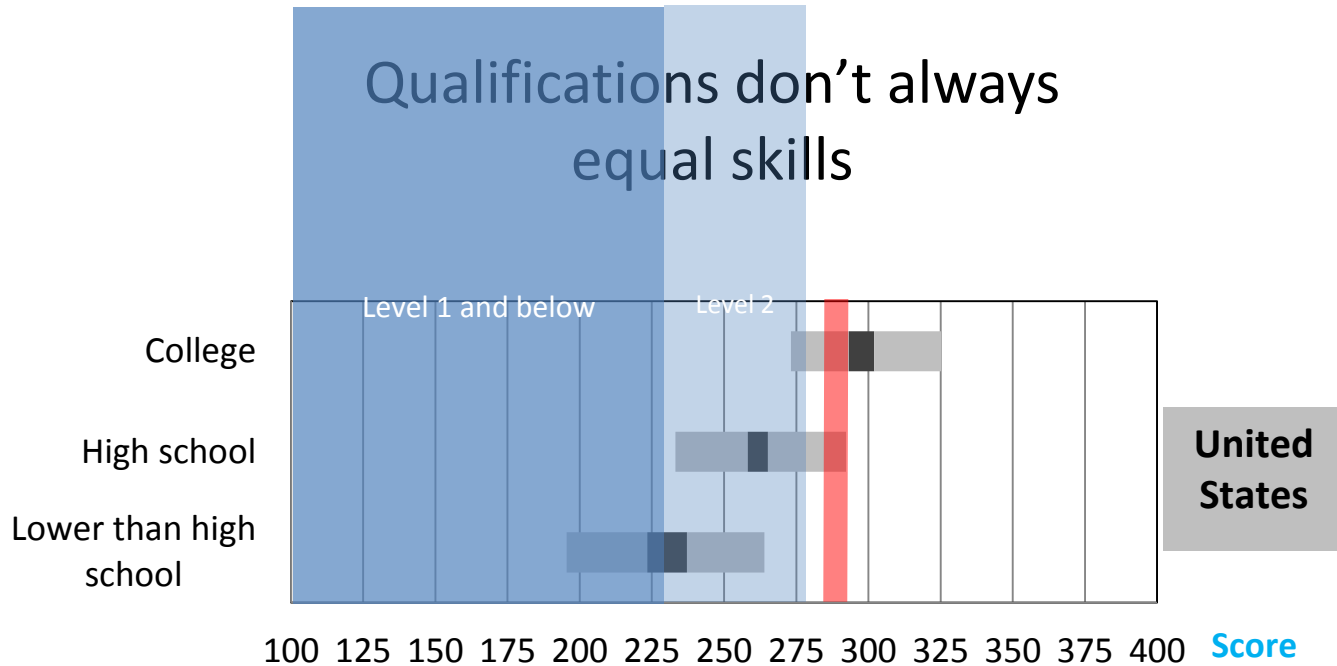


# CERTIFYING SKILLS DEVELOPMENT IN A DIGITAL WORLD

- The digital transformation **expands and diversifies education, training and learning opportunities.**
- The **certification of skills becomes increasingly important:** employers need clear signals on workers' skills.

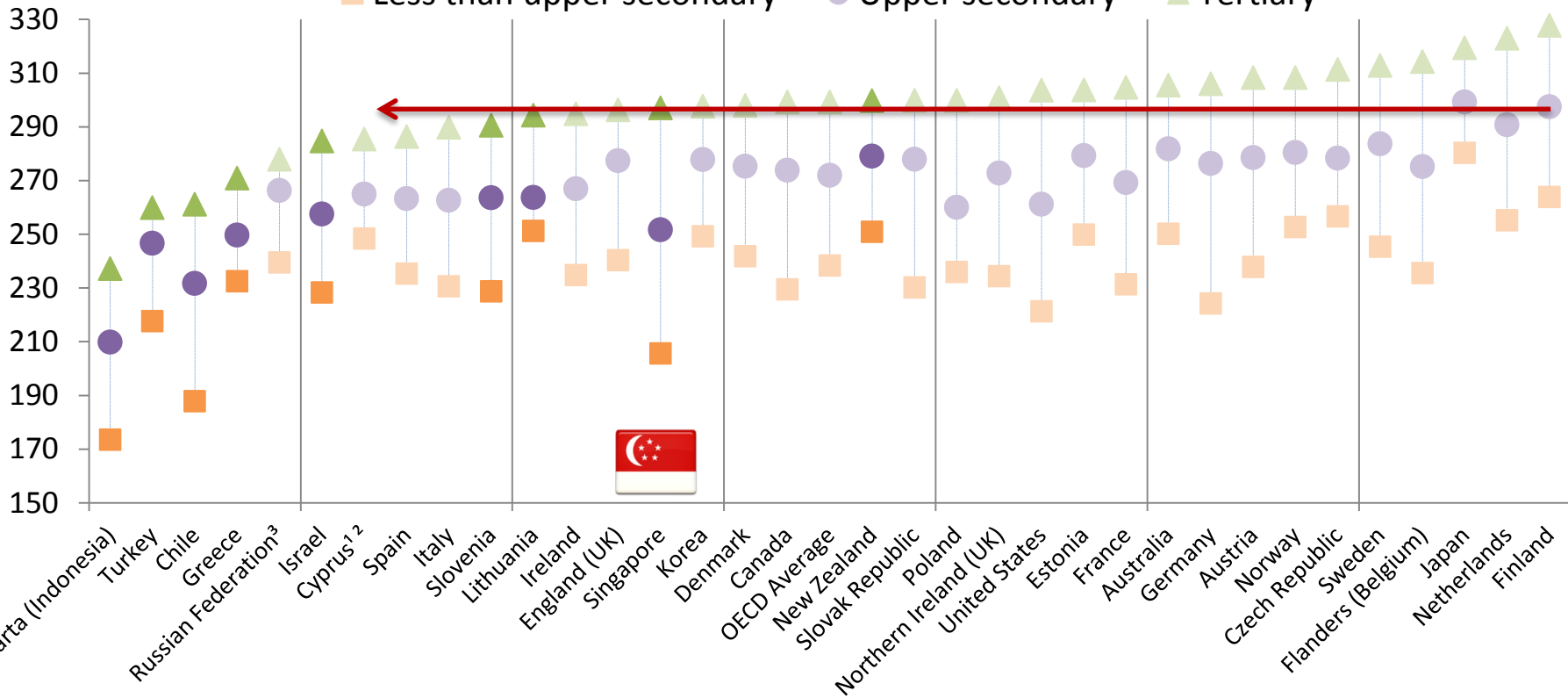


# Mean literacy proficiency and distribution of literacy scores, by educational attainment



# Literacy proficiency by level of educational attainment (25-34 year olds):

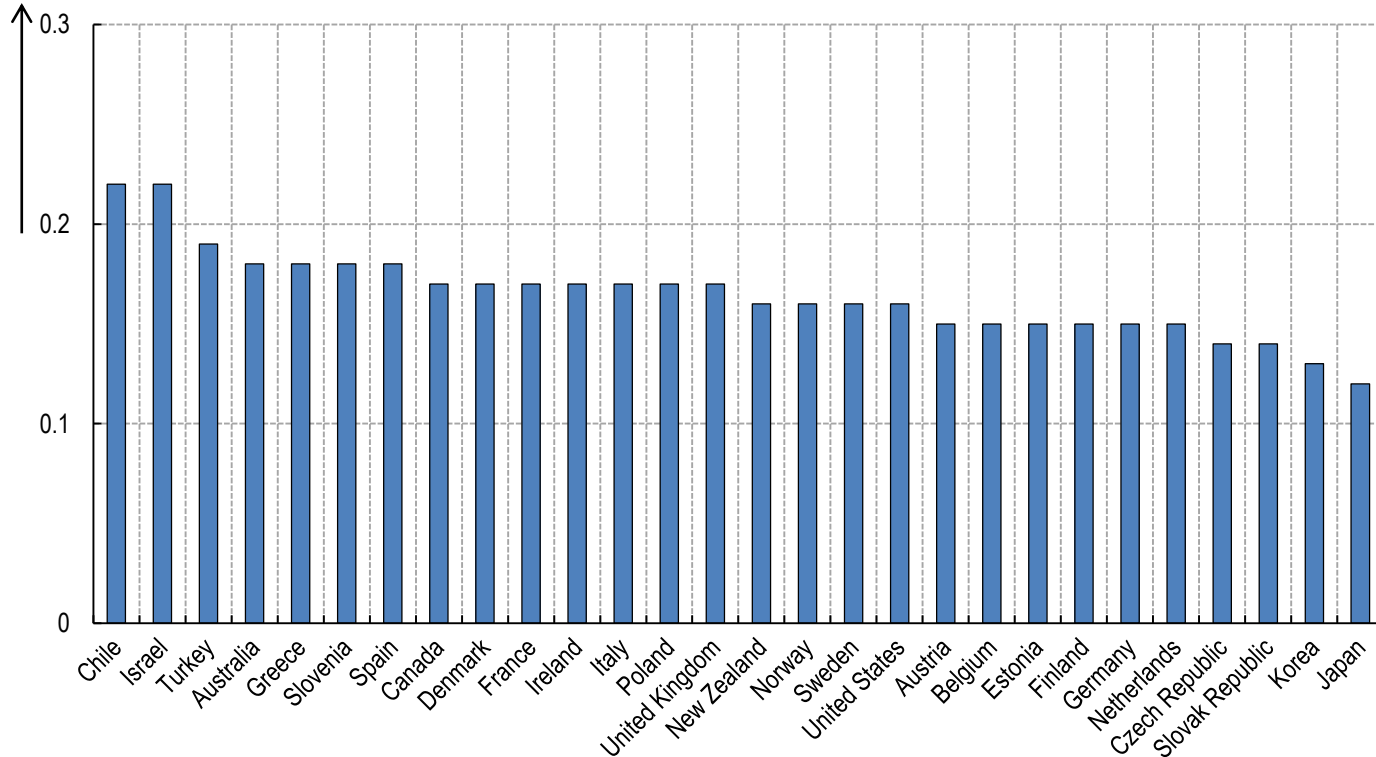
■ Less than upper secondary
 ● Upper secondary
 ▲ Tertiary



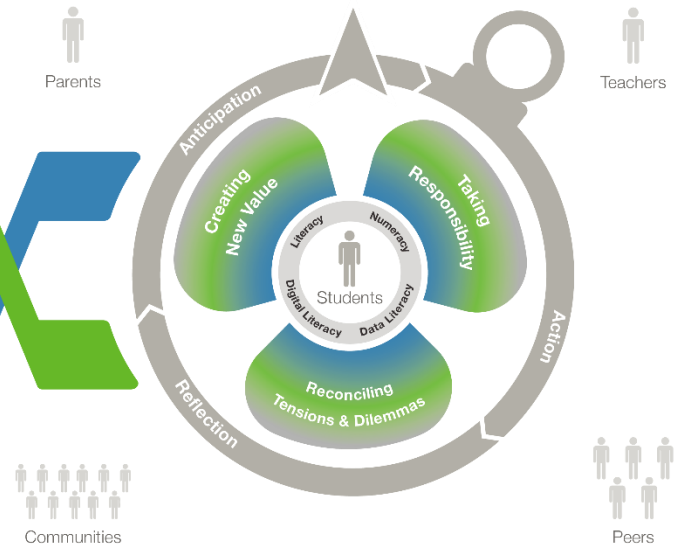
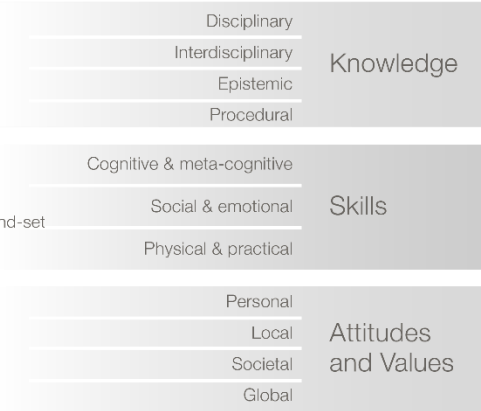
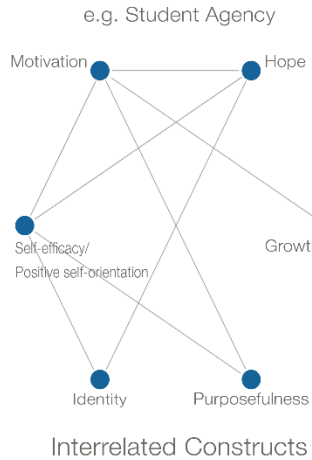
# EDUCATION IS ONLY A PROXY FOR SKILLS

DISPERSION IN UNOBSERVABLE COMPONENT IN LITERACY SKILLS

Diploma and observable characteristics **poorly** reflect individuals' literacy skills



# The **OECD** Learning Framework 2030

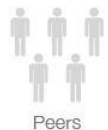
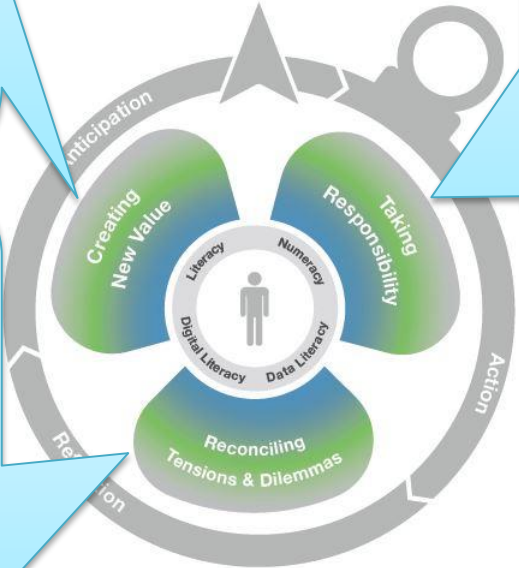




Creating new value connotes processes of creating, making, bringing into being and formulating; and outcomes that are innovative, fresh and original, contributing something of intrinsic positive worth. The constructs that underpin the competence are imagination, inquisitiveness, persistence, collaboration and self-discipline.

In a structurally imbalanced world, the imperative of reconciling diverse perspectives and interests, in local settings with sometimes global implications, will require young people to become adept in handling tensions, dilemmas and trade-offs. Underlying constructs are empathy, adaptability, trust.

Dealing with novelty, change, diversity and ambiguity assumes that individuals can 'think for themselves'. This suggests a sense of responsibility, and moral and intellectual maturity, with which a person can reflect upon and evaluate their actions in the light of their experiences and personal and societal goals; what they have been taught and told; and what is right or wrong





## High quality initial education and lifelong learning

- Investing in high quality early childhood education and initial schooling, particularly for children from disadvantaged backgrounds
- Financial support targeted at disadvantage
- Opportunities and incentives to continued development of proficiency, both outside work and at the workplace.



## Make learning everybody's business

- Governments, employers, workers and parents need effective and equitable arrangements as to who does and pays for what, when and how
- Recognise that individuals with poor skills are unlikely to engage in education on their own and tend to receive less employer-sponsored training .



## Effective links between learning and work

- Emphasis on workbased learning allows people to develop hard skills on modern equipment and soft skills through real-world experience
- Employer engagement in education and training with assistance to SMEs
- Strengthen relevance of learning, both for workplace and workers broader employability .





## Allow workers to adapt learning to their lives

- Flexibility in content and delivery (part-time, flexible hours, convenient location)
- Distance learning and open education resources .



## Identify those who can benefit from learning most

- Disadvantaged adults need to be offered and encouraged to improve their learning
- Foreign-language migrants
- Older adults
- Show how adults can benefit from improved skills, both economically and socially .



## Improve transparency

- Easy-to-find information about adult education activities
- Combination of easily searchable, up-to-date online information and personal guidance and counselling services
- Less educated workers tend to be less aware of the opportunities
- Recognise and certify skills proficiency .



## Guidance

- Timely data about demand for and supply of skills
- Competent personnel who have the latest labour-market information at their fingertips to steer learners
- Qualifications that are coherent and easy to interpret



## Flexible labour-markets

- Labour-market arrangements that facilitate effective skill use and address skill mismatches
- Encourage mobility to optimise skill match .



## Help employers make better use of workers skills

- Flexible work arrangements that accommodate workers with care obligations and disabilities
- Encourage older workers to remain in the labour market
- Encourage employers to hire those who temporarily withdrew from the labour market .



## Help economies move up the value chain

- Governments can influence both employer competitiveness strategies and product-market strategies, which determine in what markets the company competes
- Strengthen 21<sup>st</sup> century skills
- Foster entrepreneurship.

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and remember:

**Without data, you are just another person with an opinion**