Preparing the workforce to meet the challenge of technology

Andreas Schleicher
Director for Education and Skills, OECD
The post-truth world where reality becomes fungible

- Virality seems privileged over quality in the distribution of information
- Truth and fact are losing currency

Scarcity of attention and abundance of information

- Algorithms sort us into groups of like-minded individuals create echo chambers that amplify our views, leave us uninformed of opposing arguments, and polarise our societies
Digitalisation

Democratizing

Particularizing

Empowering

Concentrating

Homogenizing

Disempowering
The new nature of the firm

• Digital “platform” technology drives the (re)organisation of firms

• Small units of employment with global reach require re-think of what “small” means (employment or revenue to market share)

• Peer-to-peer markets are blurring the distinction between a consumer and a business

• Governments work with platforms to implement policies
Likelihood of automation or significant change to jobs

<table>
<thead>
<tr>
<th>Country</th>
<th>High likelihood of automation (&gt;70%)</th>
<th>Significant likelihood of automation (50-70%)</th>
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<td>United States 2017</td>
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<td>Norway</td>
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Percentage of workers

- High likelihood of automation (>70%)
- Significant likelihood of automation (50-70%)
Projected supply and demand for truck drivers

Source: ITF (2017), Managing the Transition to Driverless Road Freight transport, Paris.
Skills and the risk of automation

$R^2 = 0.273$

Skills (PIAAC Numeracy)

Risk of automation
TWO EFFECTS OF DIGITALISATION

Non routine tasks

Routine tasks

Tasks without use of ICT

Tasks with use of ICT
Non routine tasks,
Low use of ICT

Non routine tasks,
High use of ICT

Routine tasks,
Low use of ICT

Routine tasks,
High use of ICT
ADDITIONAL RETURNS TO SKILLS IN DIGITAL-INTENSIVE INDUSTRIES

Source: OECD Science, Technology and Industry Scoreboard 2017, Statlink: http://dx.doi.org/10.1787/888933617472
See: Grundke et al. (2018), Which skills for the digital era? Returns to skills analysis

- Returns to skills in less digital-intensive industries
- Additional returns to skills in digital-intensive industries
EXPECTED EFFECT OF INCREASE FROM 50TH TO 75TH PCTILE OF DIGITAL EXPOSURE ON PROBABILITY OF LEARNING AT LEAST ONCE A WEEK

Skills to manage complex digital information

Young adults (25-34) vs. Older adults (55-65)

- Finland
- Sweden
- Singapore
- Denmark
- Netherlands
- Norway
- New Zealand
- Japan
- Germany
- Flanders (Belgium)
- Czech Republic
- Austria
- Canada
- Korea
- Australia
- England (UK)
- Estonia
- OECD average
- United States 2017
- Northern Ireland (UK)
- Hungary
- Slovenia
- United States 2012/2014
- Israel
- Ireland
- Slovak Republic
- Russian Federation
- Lithuania
- Poland
- Chile
- Greece
- Kazakhstan
- Mexico
- Turkey
- Peru
- Ecuador

55-65 Level 2
55-65 Level 3
Level 2
Level 3

% 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80
The kind of things that are easy to teach are now easy to automate, digitize or outsource.
Education won the race with technology throughout history, but there is no automaticity it will do so in the future.

Inspired by “The race between technology and education” Pr. Goldin & Katz (Harvard)
The multi-faceted world of knowledge
The human world of knowledge
The small world of the curriculum
The small world of the curriculum
The small world of the curriculum
The small world of the curriculum
The small world of the curriculum
The small world of the curriculum
The big world of learning

The True
The realm of human knowledge

The Good
The realm of ethics and judgement

The Just and Well-Ordered
The realm of political and civic life, binding social capital

The Sustainable
The realm of natural and physical health

The Beautiful
The realm of creativity, esthetics and design

The Prosperous
The realm of economic life
Learning Compass: Competencies

- Knowledge
- Skills
- Attitudes and values
Learning compass: Knowledge

- Disciplinary
- Interdisciplinary
- Epistemic
- Procedural
Learning compass: Skills

- Cognitive & meta-cognitive
- Social & emotional
- Physical & practical
Transformative competencies

- Creating new value
- Taking responsibility
- Reconciling tensions & dilemmas
Implications for pedagogy

- Anticipation
- Action
- Reflection
Redefining success
Learning, unlearning and relearning throughout life

Primary and secondary education

Tertiary: specialise

Job: Same sector

Retire and pension

From:

ECEC Primary and secondary education

Tertiary: transversal

Job

Job

Job

Job

Job

Adult upskilling and reskilling

To:

age

age
BUT: 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 (%)

Financial measures do not reach the groups most in need

% of employees receiving **employer financial** support for education or training, by skills level, 25-64 year-olds

Willingness to participate in adult learning is low

Adults not willing to participate, % of 25-64 year-olds, 2012/2015

- Participated, but does not want to participate (more)
- Did not participate, and does not want to participate

Firms as learning environments

• How is the additional funding shared between Governments, employers and beneficiaries?

• What are the incentives?

• Who sets the standards?

• How are the levels of skills recognised?

• Who trains the trainers?
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.

Firms are increasingly testing skills on their own while relying less on diplomas. How to certify skills and who should be in charge of it?

Preferred option: Independent regulated systems for skills certification?
People outside firms

- Unemployed: Government. Funding for unemployment benefits, used for training?
- People at high risk of losing their jobs: firms or Government?
- People who want to change jobs
- Gig economy
Governance challenges

• New forms of work: fewer taxes raised
• Ageing societies: higher expenditure in health and pensions
• Decentralised information: less control
• Link between education and jobs weakened: the role of Governments risks been diminished
• Need to predict rapid changes in skills demands and respond to them
When fast gets really fast, being slow to adapt makes education really slow

<table>
<thead>
<tr>
<th>Industrial systems</th>
<th>World class systems</th>
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<tbody>
<tr>
<td><strong>Some</strong> students learn at high levels (sorting)</td>
<td><strong>All</strong> students need to learn at high levels</td>
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<tr>
<td>Routine cognitive skills</td>
<td>Curriculum, instruction and assessment</td>
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<tr>
<td>Complex ways of thinking, complex ways of doing, collective capacity</td>
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<tr>
<td>Standardisation and compliance</td>
<td><strong>High-level professional knowledge workers</strong></td>
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<td>Teacher education</td>
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<tr>
<td><strong>‘Tayloristic’, hierarchical</strong></td>
<td>Flat, collegial</td>
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<tr>
<td>Primarily to authorities</td>
<td>Primarily to peers and stakeholders</td>
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<tr>
<td>Accountability</td>
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</tbody>
</table>

Accountability
Thank you

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  – All publications
  – The complete micro-level database

Email: Andreas.Schleicher@OECD.org
Twitter: SchleicherOECD
Wechat: AndreasSchleicher