



BRICS
BRICS Business Council

BRICS FUTURE SKILLS CONFERENCE



Brazilian National Service for Industrial Training

THE FUTURE OF WORKFORCE

The industry 4.0 and its impacts on skills development

Paulo Esteves
November 2019

BRICS and Industry 4.0: skills gaps and skills development

The continuous loop connecting the physical and the digital will frame the jobs of the future. Digitalization and automation are the salient dimensions of the process we have been calling the Fourth Industrial Revolution. The phenomenon has no borders and will affect industries all over the globe. Nevertheless, Industry 4.0 impacts each country and each sector in different ways. Highly developed countries are discussing in-depth these changes and their potential impacts. The reality of the emerging economies such as Brazil, Russia, India, China and South Africa, however, is fairly different. Having economies in different positions and diverse political stands, BRICS countries must seek for topics and challenges of common interest aiming at establishing proper and shared platforms, networks and alliances.

The skills that tend to Industry 4.0's needs are quite different from the ones that have always been valued in traditional industries. In order to gain competitiveness in the future business landscape, each country's workforce must adapt. It is therefore of utmost importance that the BRICS countries have an adequate understanding of their current skills gap, so that appropriate policies for skills development can then be developed. This project identifies and analyzes trends and impacts of the industry 4.0 upon the labor market in BRICS countries.

The following Fact Sheets provide and organize data around the skills gaps in the main industries in the BRICS countries, allowing protective analysis about future strategies for BRICS' workforce based on the challenges of the 4th industrial revolution. It was developed in partnership with the Brazilian Section of the Skills Development Working Group (SDWG) of the BRICS Business Council (BBC).

Publications



Russia: Skills Gap and Skills Development

The document summarizes the Industry 4.0 main impacts upon the workforce in Russia, emphasizing future jobs, skills gaps and skills development strategies.



India: Skills Gap and Skills Development

The document summarizes the Industry 4.0 main impacts upon the workforce in India, emphasizing future jobs, skills gaps and skills development strategies.



China: Skills Gap and Skills Development

The document summarizes the Industry 4.0 main impacts upon the workforce in China, emphasizing future jobs, skills gaps and skills development strategies.



South Africa: Skills Gap and Skills Development

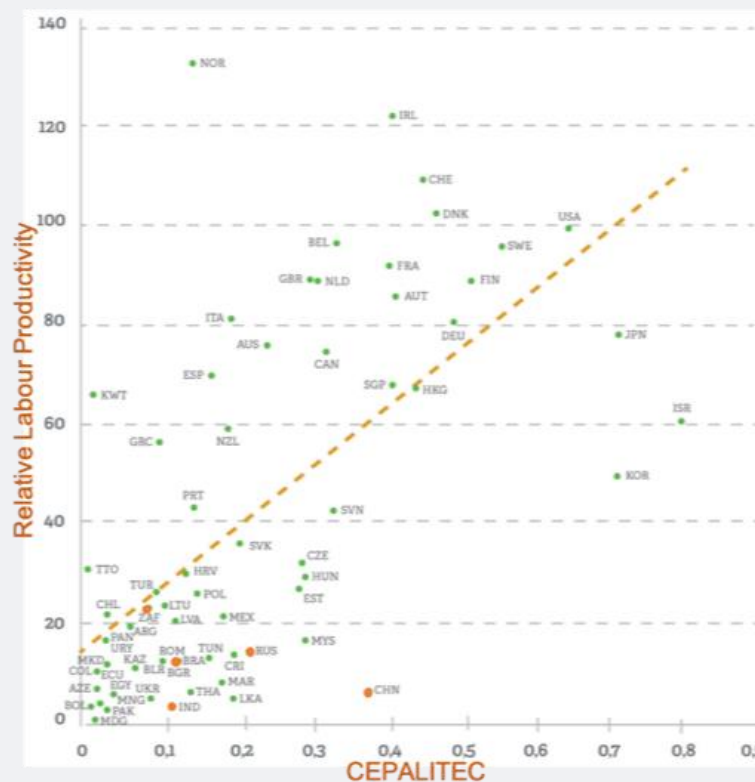
The document summarizes the Industry 4.0 main impacts upon the workforce in South Africa, emphasizing future jobs, skills gaps and skills development strategies.



Brazil: Skills Gap and Skills Development

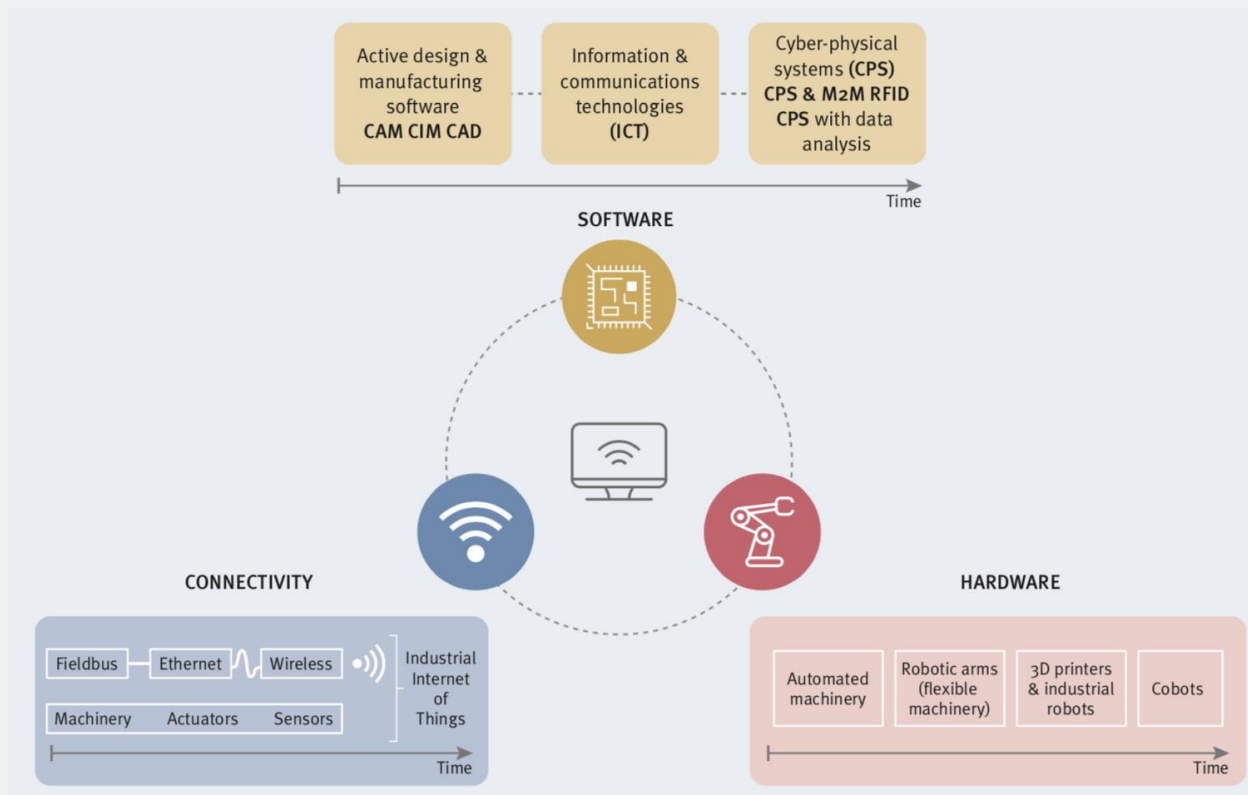
The document summarizes the Industry 4.0 main impacts upon the workforce in Brazil, emphasizing future jobs, skills gaps and skills development strategies.

Productivity and Technological Intensity: a Lasting Divide?



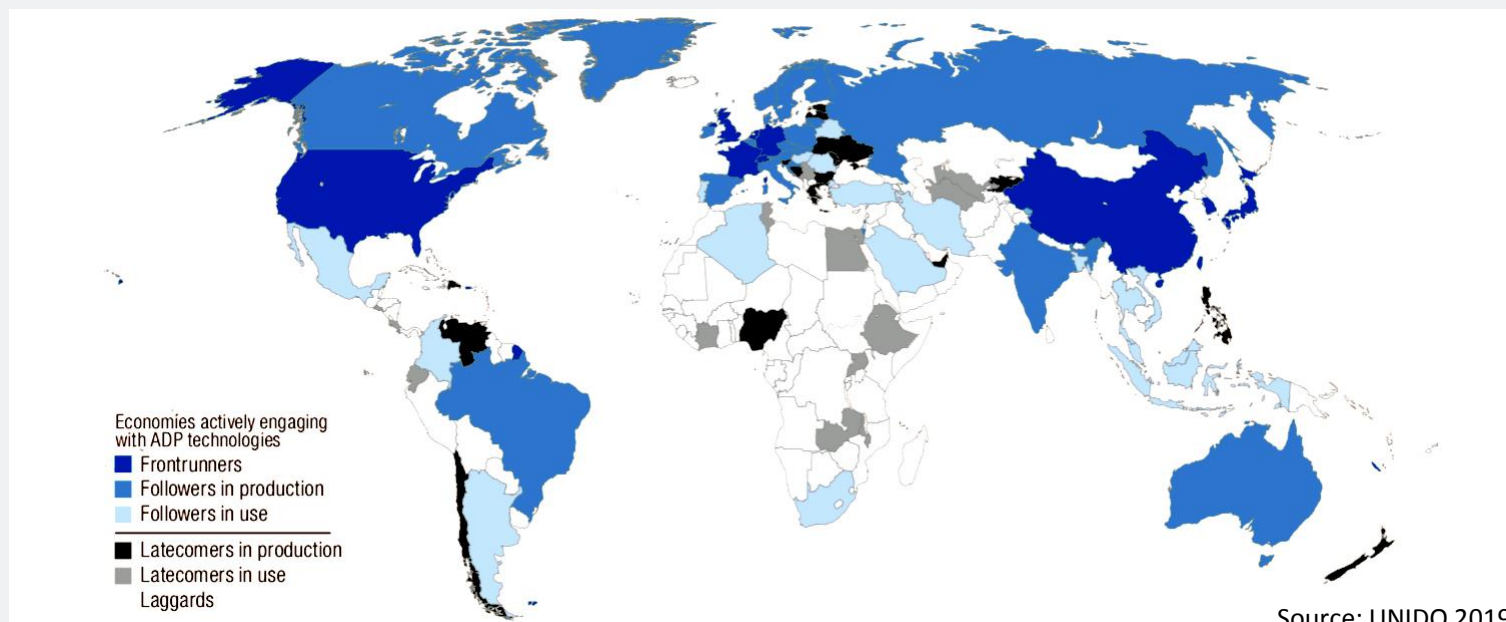
Source: ECLAC 2019

ADP Technologies



Source: UNIDO, 2019

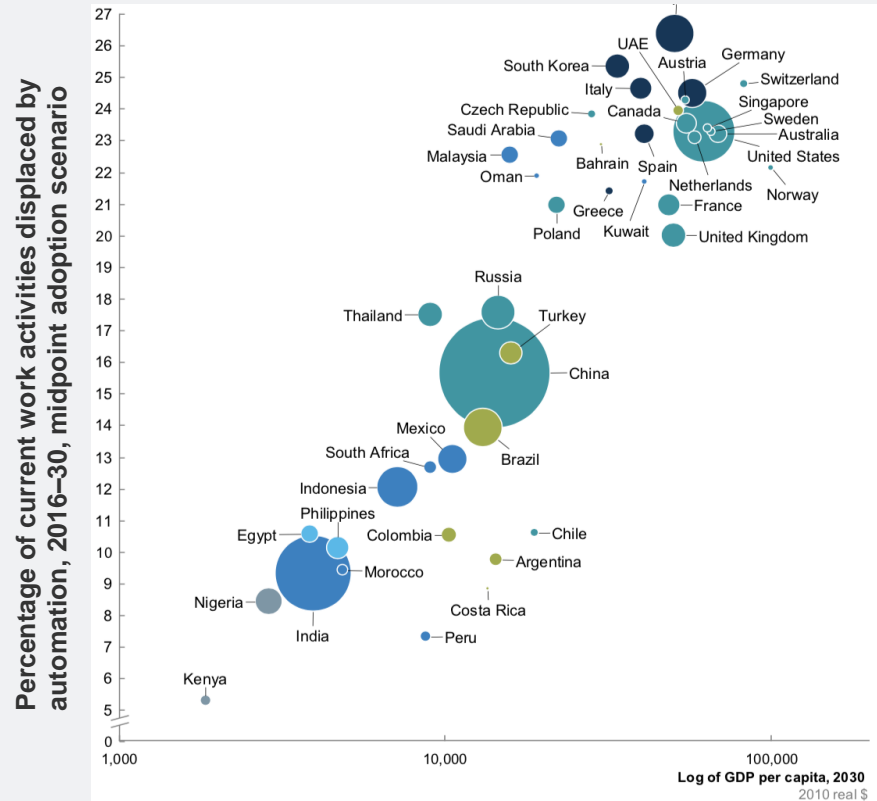
Production and use of ADP technologies



Source: UNIDO 2019

Impacts on Jobs

13–19% of FTEs may be displaced by automation by 2030 in BRICS countries





































Demographics (Average Age):

- **China and Russia: 40-45**
- **Brazil: 35-40**
- **India and South Africa: 30-35**

World Average Impact: 15%

Jobs surplus by 2030

How to manage the transition?

		Overall Index score	 Education Flexibility	 Labour Market Participation	 Labour Market Flexibility	 Talent Mismatch	 Overall Wage Pressure	 Wage Pressure in High-Skill Industries	 Wage Pressure in High-Skill Occupations
Australia		6.0	4.9	5.7	4.3	6.1	5.9	8.6	6.2
Austria		5.9	5.2	5.7	4.0	8.8	7.3	6.6	3.6
Belgium		3.9	5.6	5.6	3.7	1.5	6.2	0.0	4.5
Brazil		5.3	5.8	5.9	9.2	7.9	3.9	3.6	1.0
Canada		5.6	5.9	5.0	4.1	6.0	3.9	9.1	5.4
Chile		5.0	6.4	5.9	6.5	0.0	5.8	4.3	5.8
China		3.7	0.9	1.2	8.1	4.1	1.9	4.4	5.0
Colombia		6.3	5.3	9.1	7.8	6.2	6.1	3.1	N/A
Czech Republic		4.2	7.7	4.6	3.5	4.3	3.6	0.9	5.0
Denmark		6.5	5.2	4.5	3.5	9.5	8.9	8.7	4.9
France		6.0	4.5	5.2	8.4	10.0	3.4	6.4	3.8
Germany		6.5	6.3	5.2	6.9	4.2	5.8	9.5	7.5
Hong Kong SAR		4.4	1.9	5.7	2.6	5.7	8.7	6.1	0.0
Hungary		4.8	8.4	3.7	5.0	6.0	4.8	0.9	4.7
India		5.4	0.7	4.2	8.7	5.2	7.0	6.8	5.0
Ireland		5.5	3.1	7.6	3.0	7.9	3.6	5.7	7.8
Italy		4.8	6.2	3.7	6.6	8.5	3.8	2.4	2.3
Japan		6.1	3.9	6.3	7.0	9.8	7.0	1.1	7.5
Luxembourg		6.8	5.9	5.1	3.6	10.0	10.0	8.3	4.4
Malaysia		4.5	4.1	3.8	5.7	N/A	4.6	5.1	3.9
Mexico		5.8	4.9	5.7	7.1	5.5	4.9	10.0	2.4
Netherlands		5.5	4.7	6.3	5.2	6.4	5.4	5.3	5.5
New Zealand		5.5	4.6	5.6	4.1	5.8	6.1	10.0	2.5
Poland		4.1	5.1	3.6	6.8	5.9	4.1	3.1	0.4
Portugal		5.5	5.2	5.1	6.1	8.6	5.1	8.3	0.0
Romania		4.4	7.4	3.9	7.3	5.0	4.9	0.0	2.6
Russia		6.1	6.4	5.8	7.6	4.3	5.3	5.9	7.2



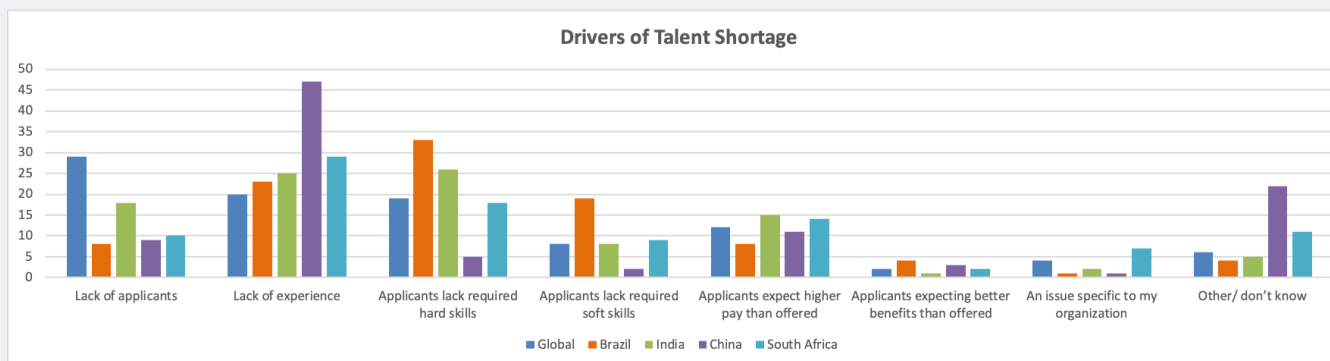
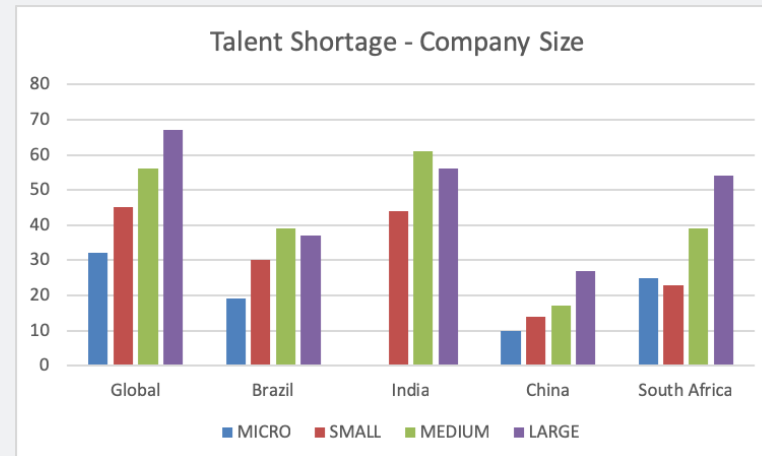
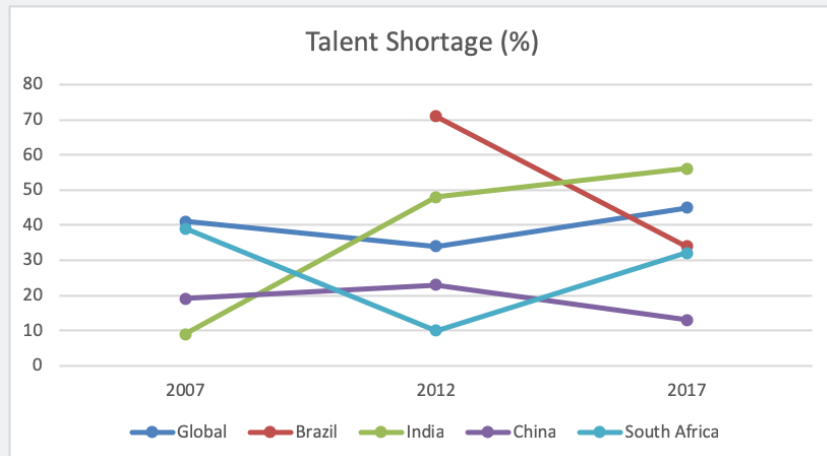
BRICS
BRICS Business Council

Hays Global Skills Index Indicators



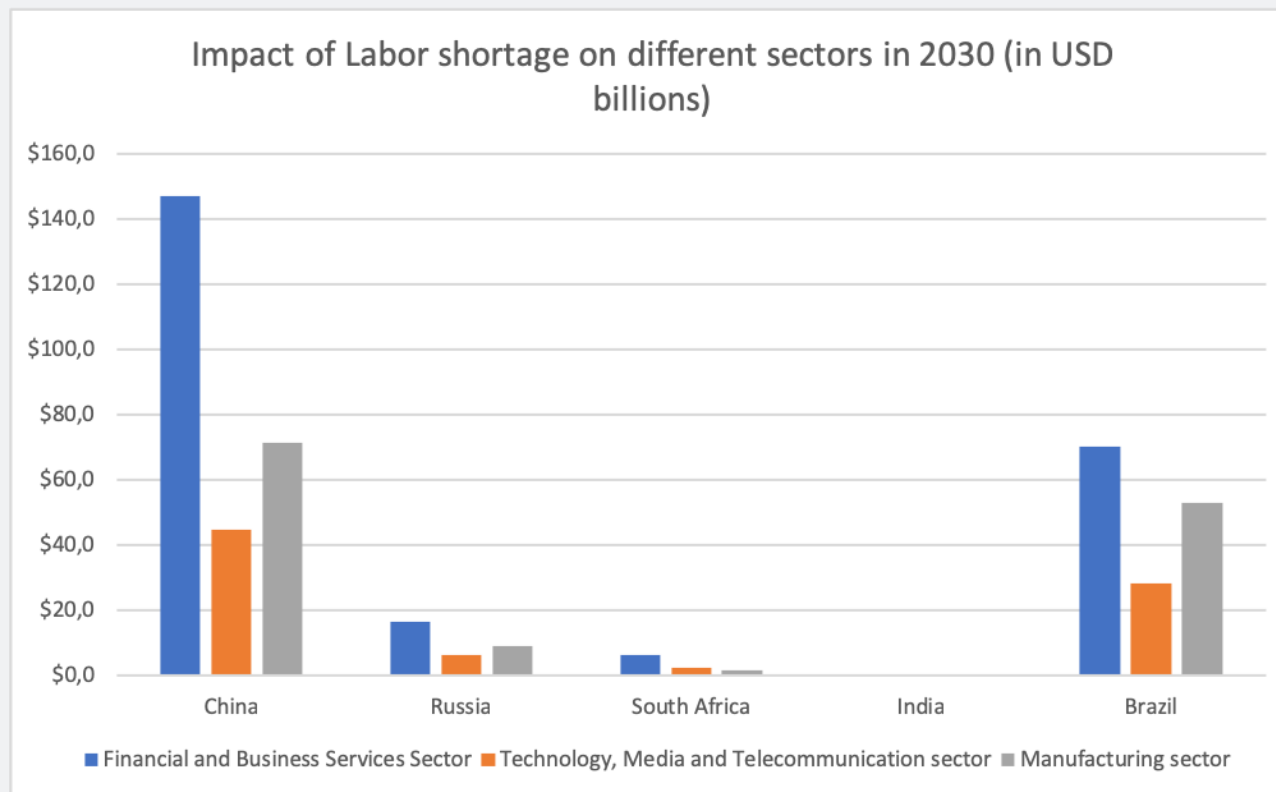
Brazilian National Service for Industrial Training
THE FUTURE OF WORKFORCE

Talent Shortage



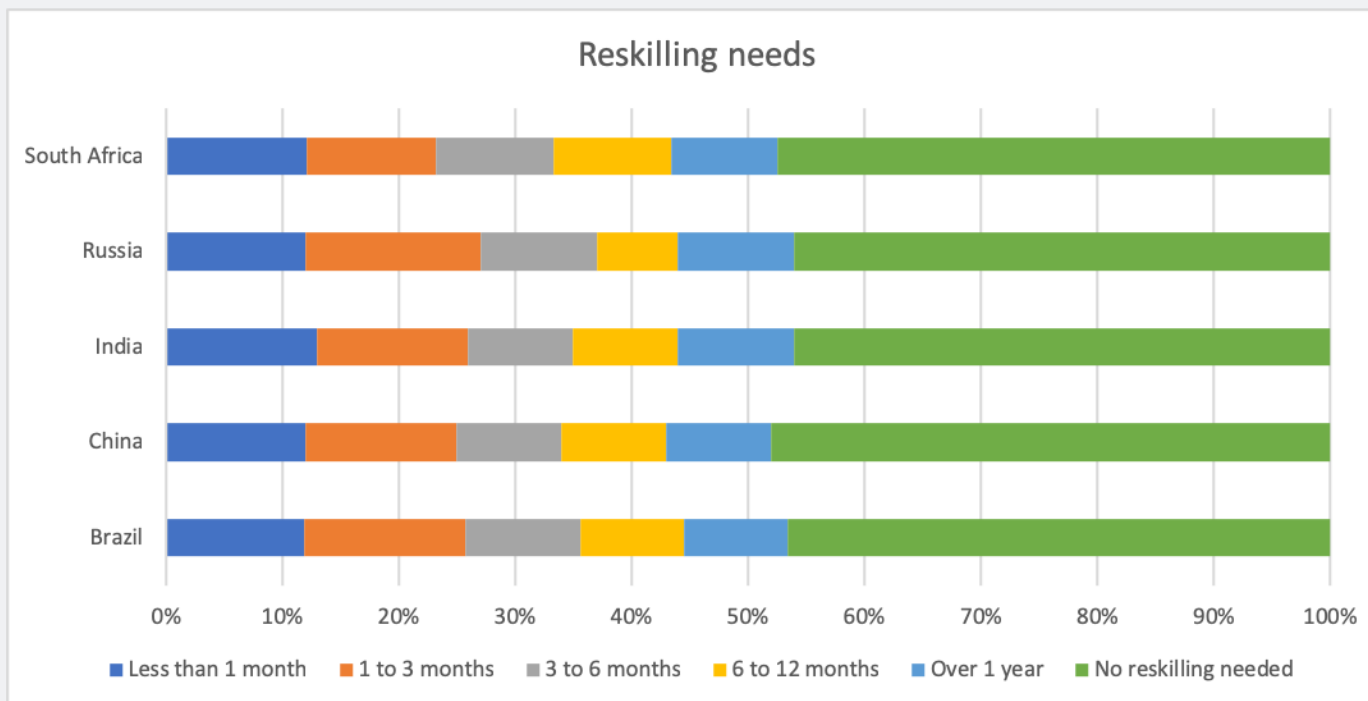
Source: Talent Shortage Survey 2018

Talent Shortage



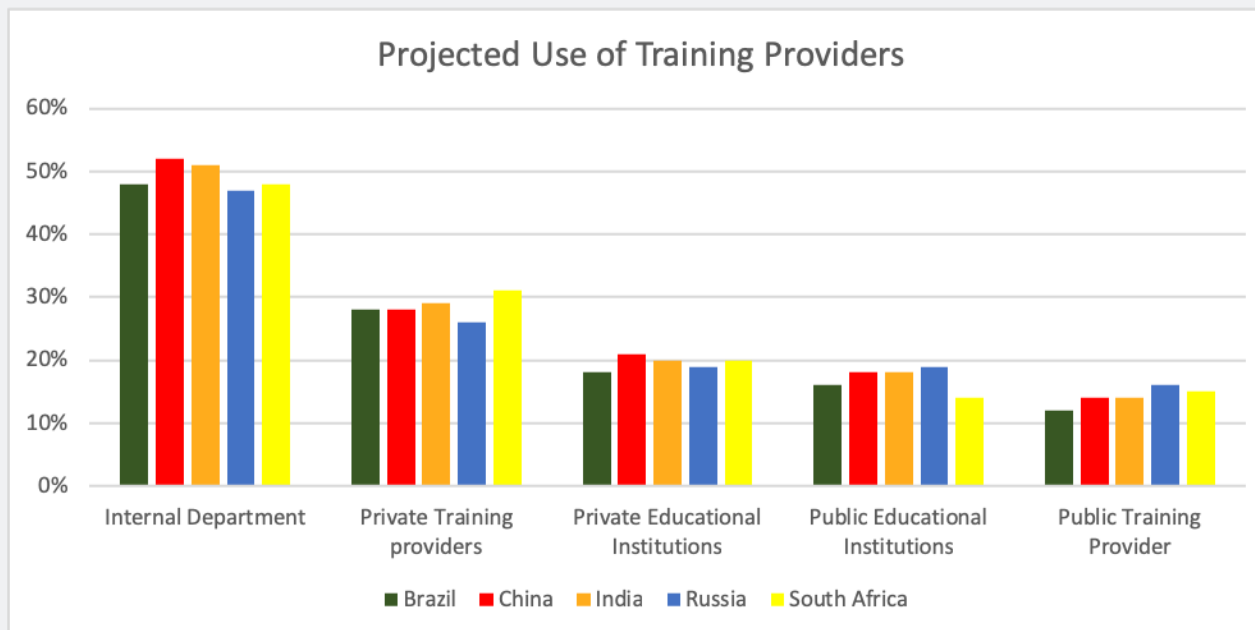
Source: KORN FERRY, "Future of Work: The Global Talent Crunch", 2018

Skills Development



Source: WEF Future of Jobs 2018 Report, 2018

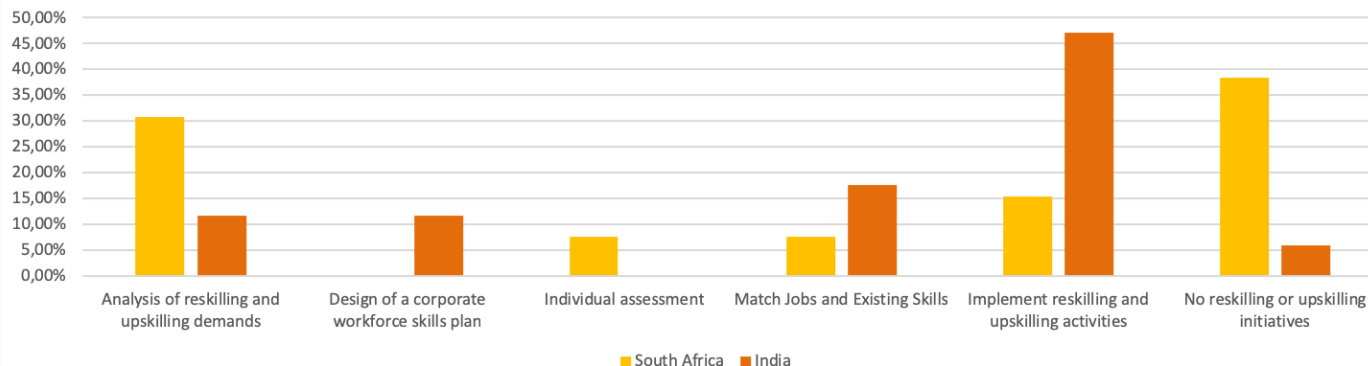
Skills Development



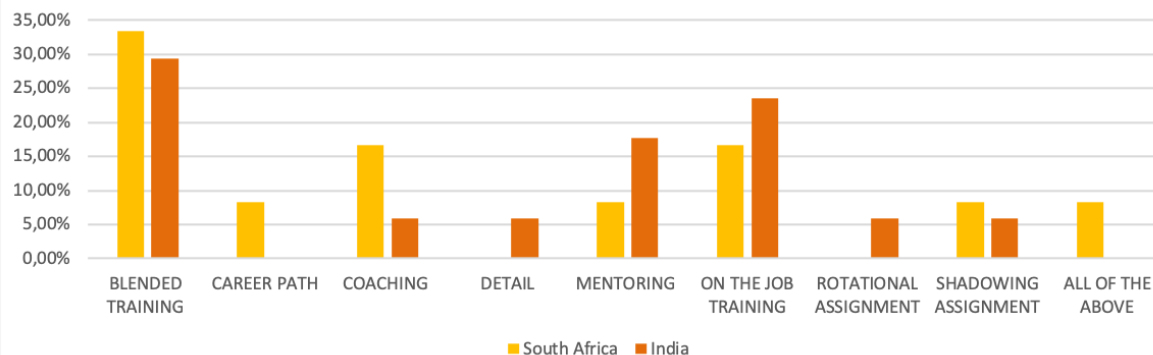
Source: WEF Future of Jobs 2018 Report, 2018

Skills Development

Skilling Initiatives



Skilling Approaches



Source: BBC – SDWG Survey 2019

SG / SD - Brazil

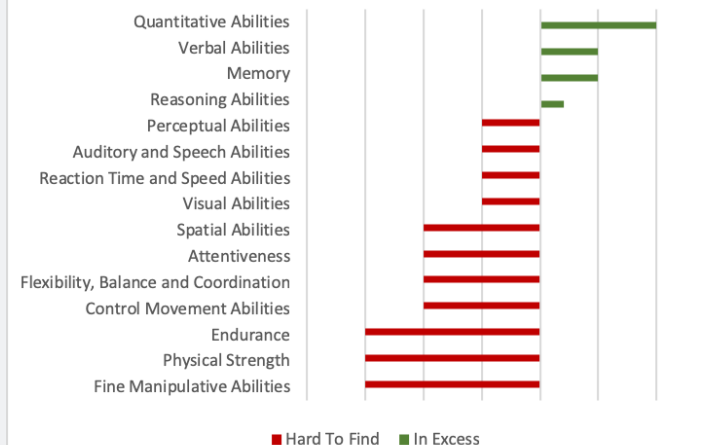
Skills-Sets Availability



Knowledge Areas - Availability

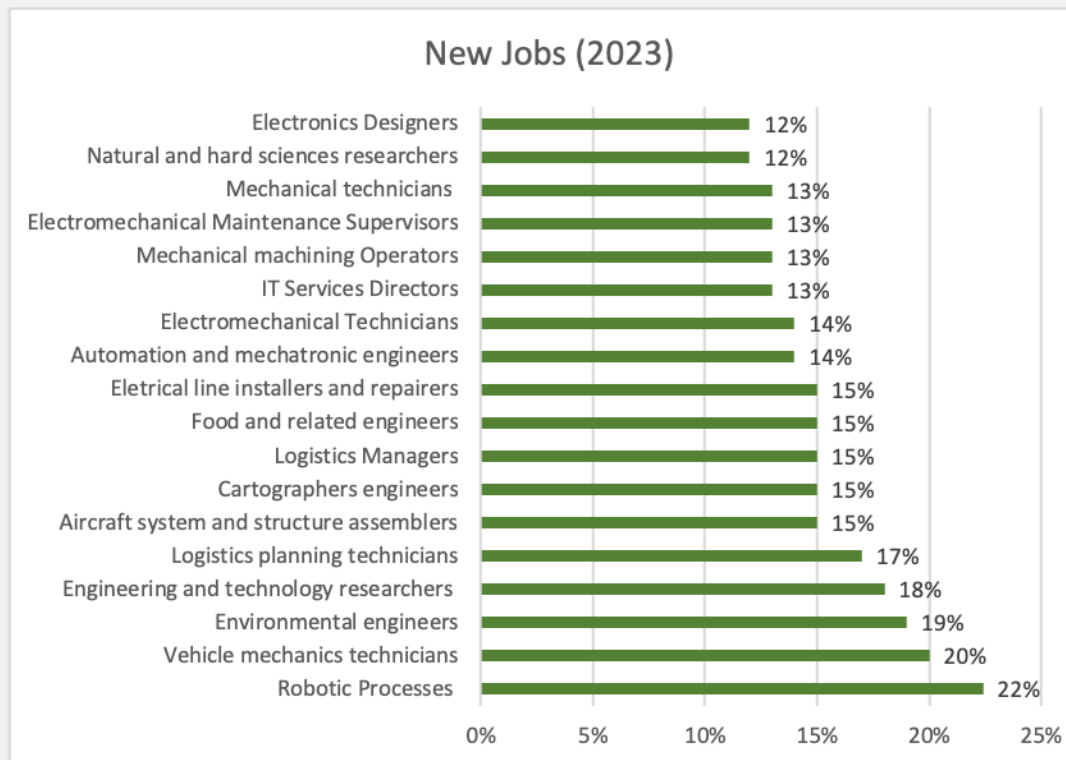


Abilities - Availability



Source: OECD, 2019

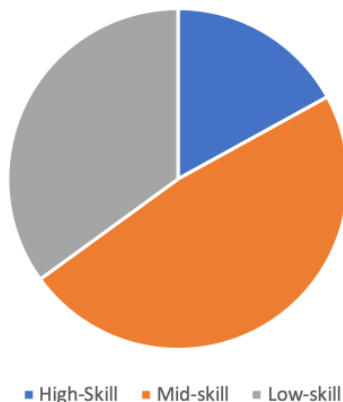
SG / SD - Brazil



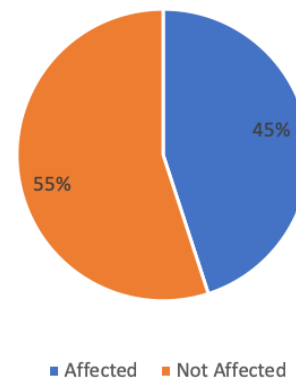
Source: SENAI, Labour Map. 2019

SG / SD - Russia

Workforce



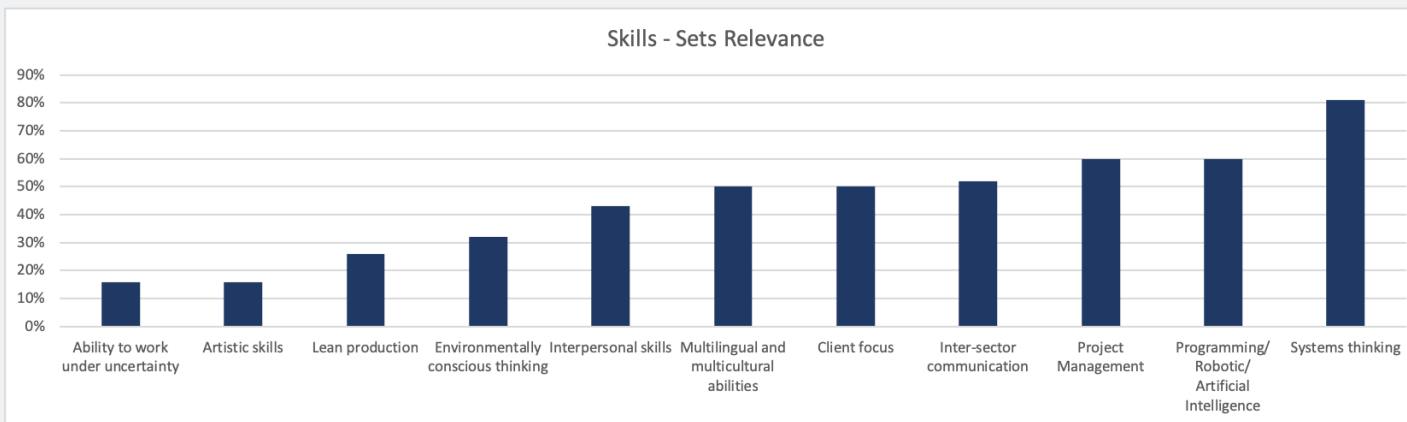
Labor Force affected by Skills Mismatch



Source: "Mission: Talent; Global Challenge - talent future - readiness", Jul. 2019

SG / SD - Russia

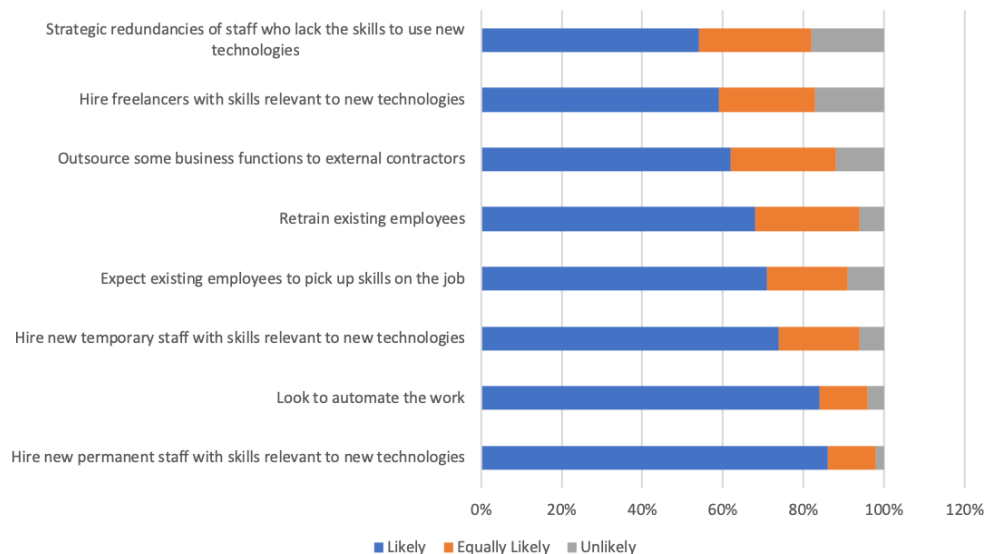
Source: Высшая школа экономики, Москва, 2016



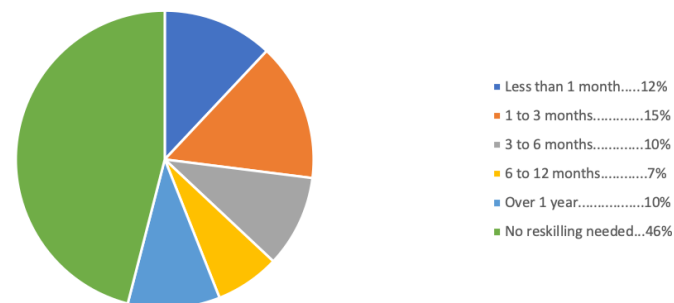
Source: Atlas of Emerging Jobs, Agency for Strategic Initiatives and SKOLKOVO, 2015

SG / SD - Russia

Facing reskilling needs (share of companies surveyed)



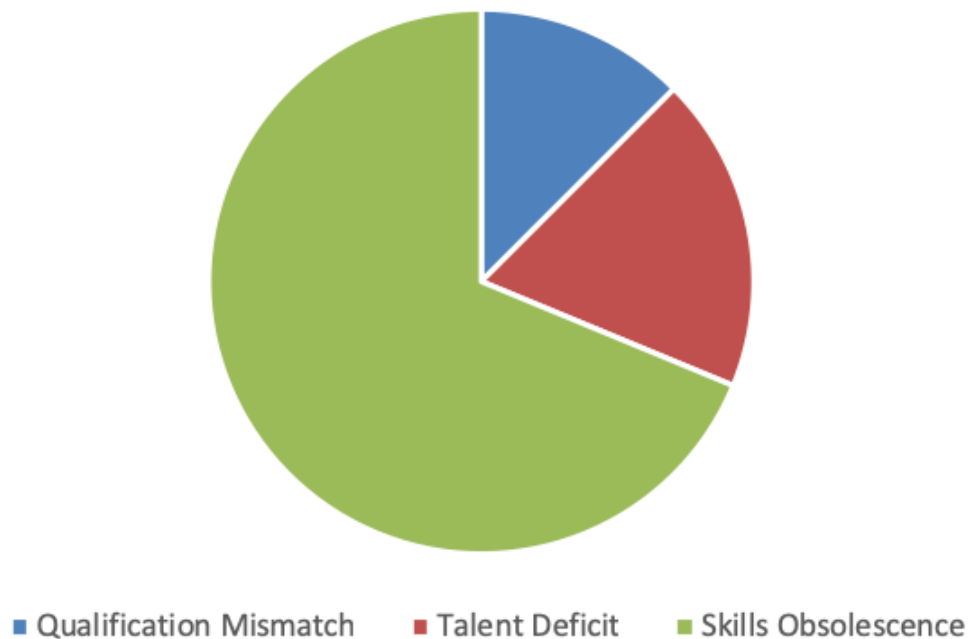
Average reskilling needs



Source: World Economic Forum, 2018

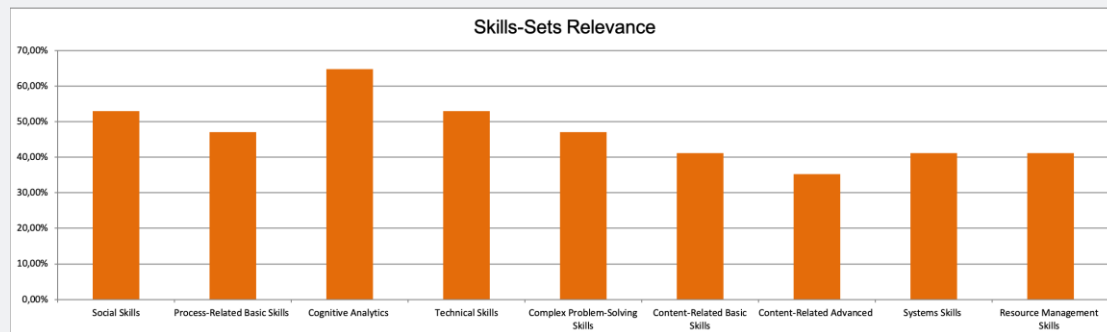
SG / SD - India

Workforce Inadequacy



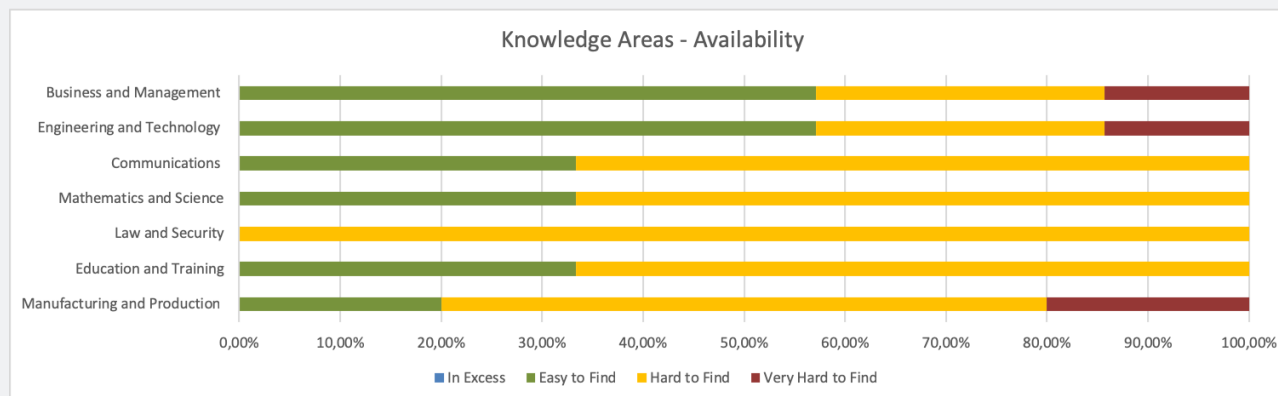
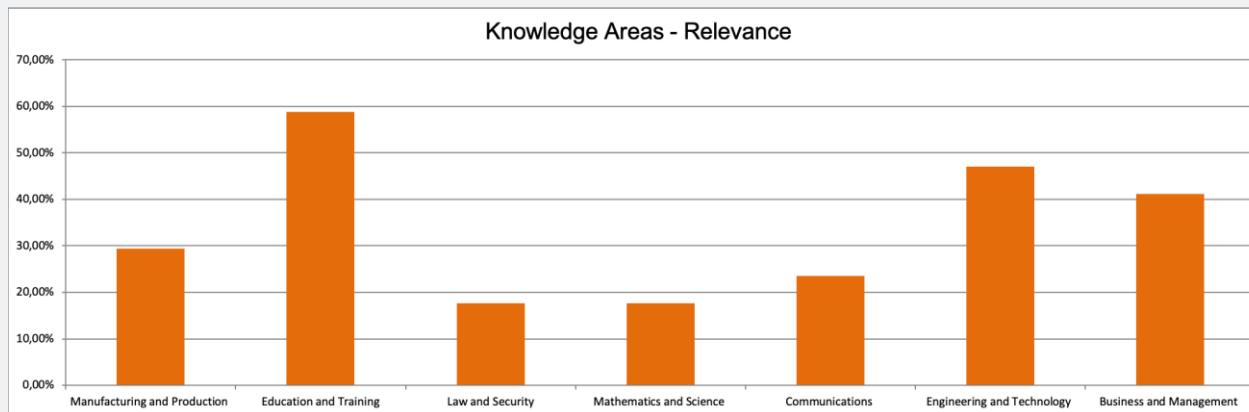
Source: BBC – SDWG Survey 2019

SG / SD - India



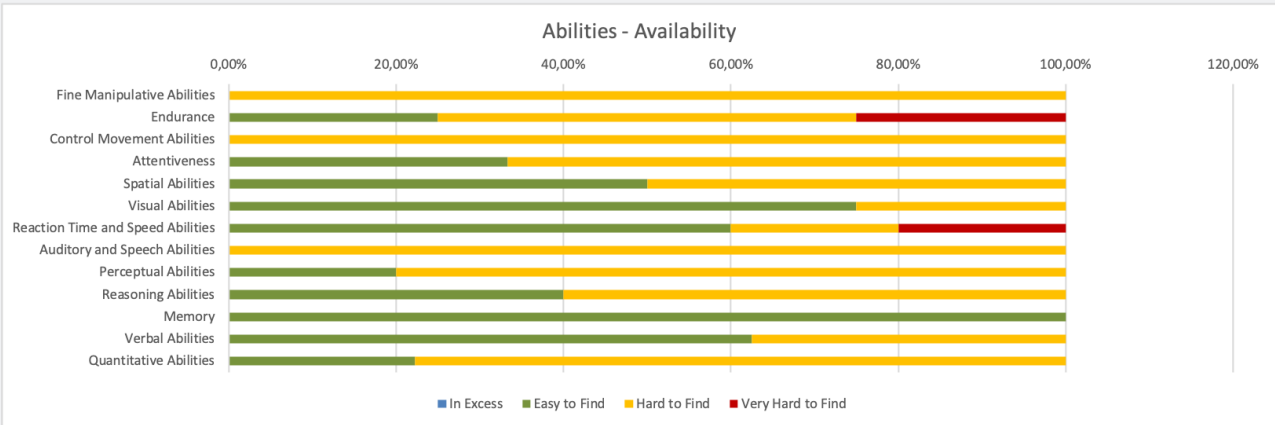
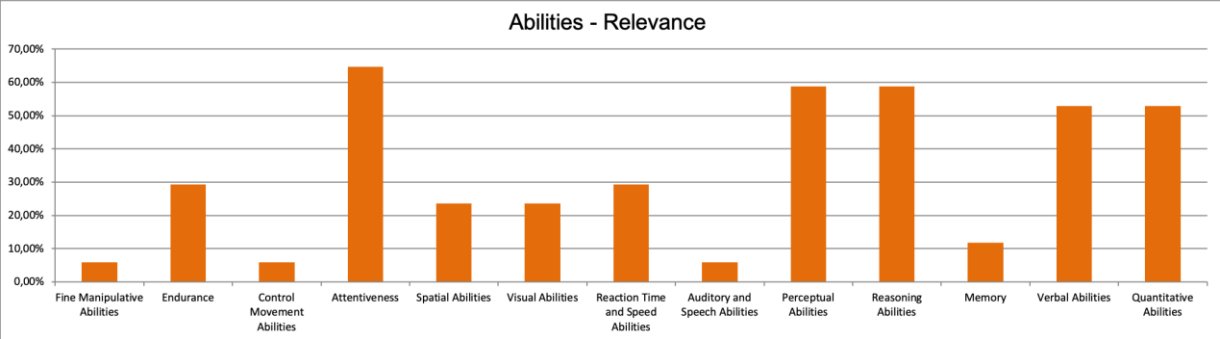
Source: BBC – SDWG Survey 2019

SG / SD - India



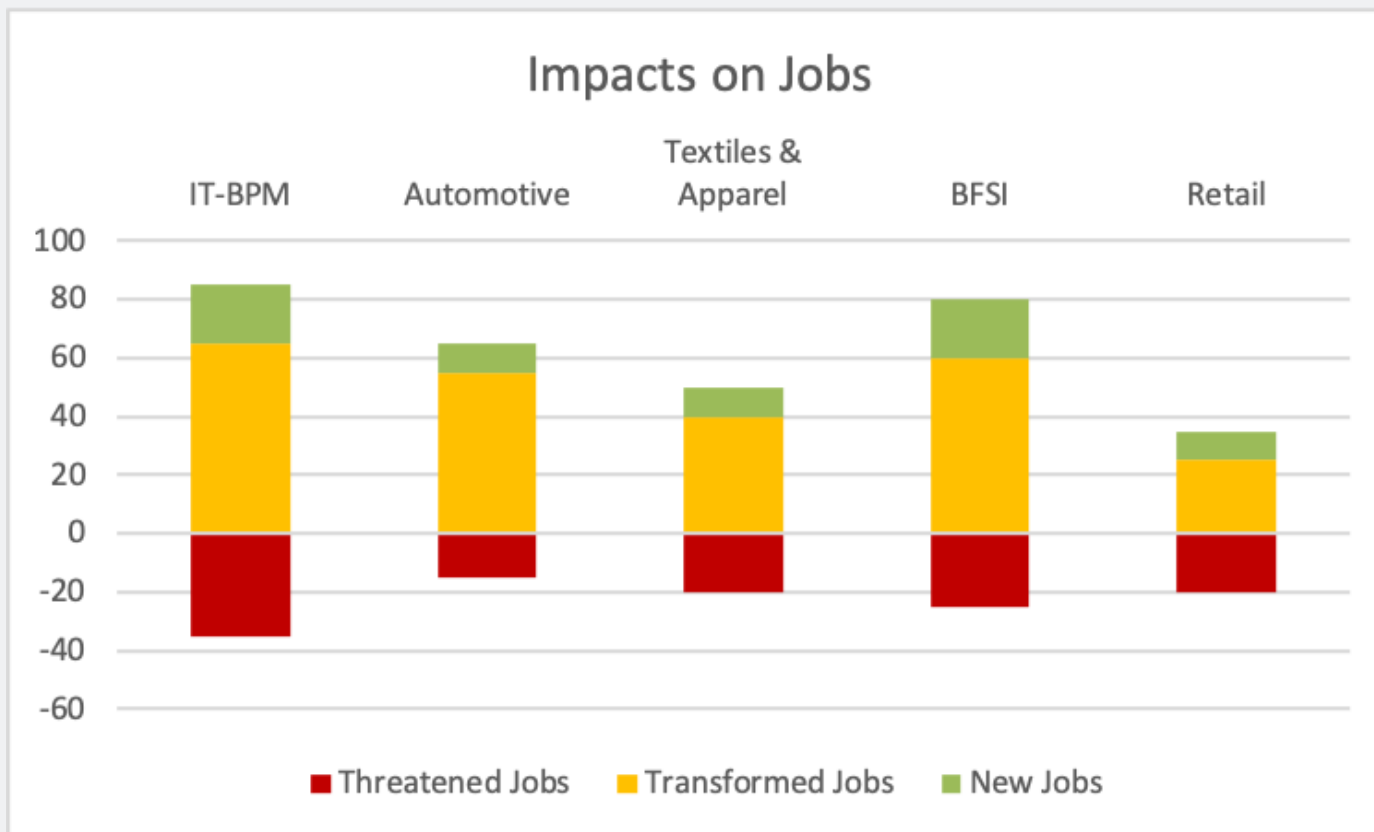
Source: BBC – SDWG Survey 2019

SG / SD - India



Source: BBC – SDWG Survey 2019

SG / SD - India



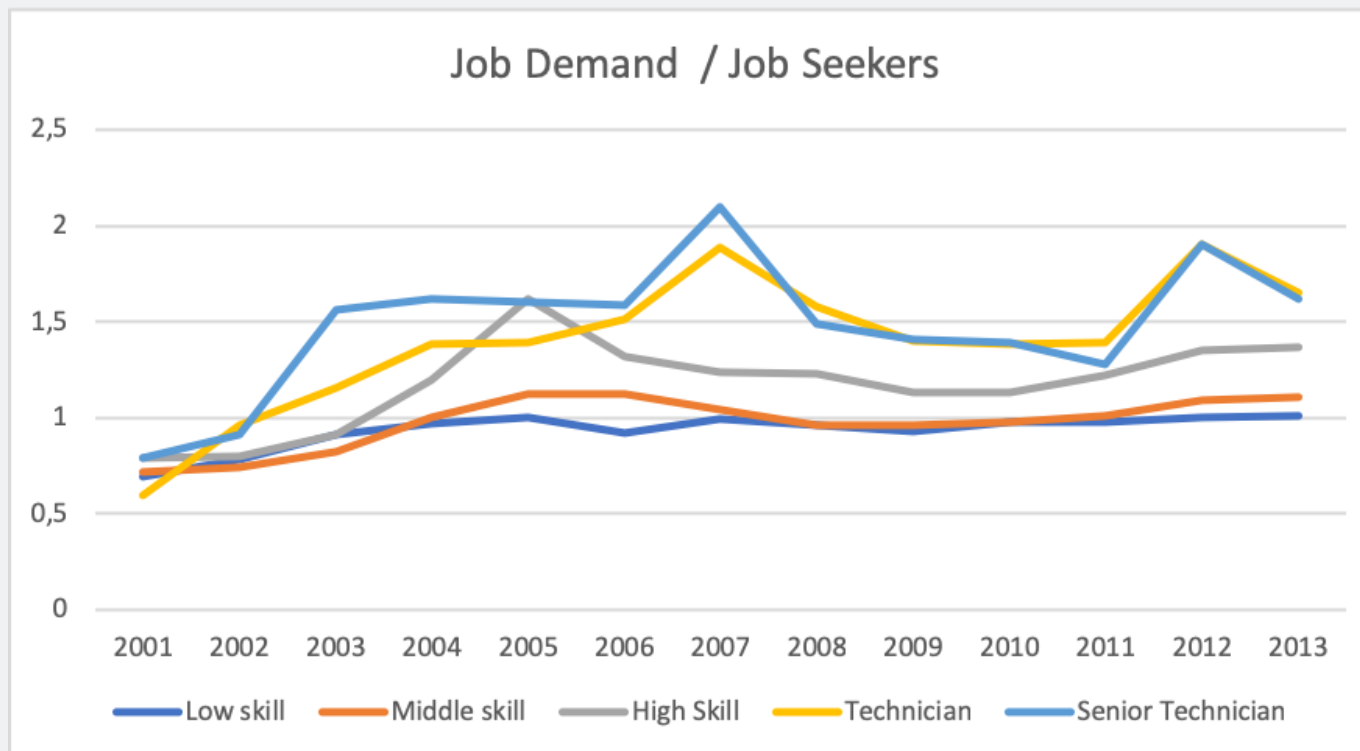
Source: FICCI

SG / SD - India



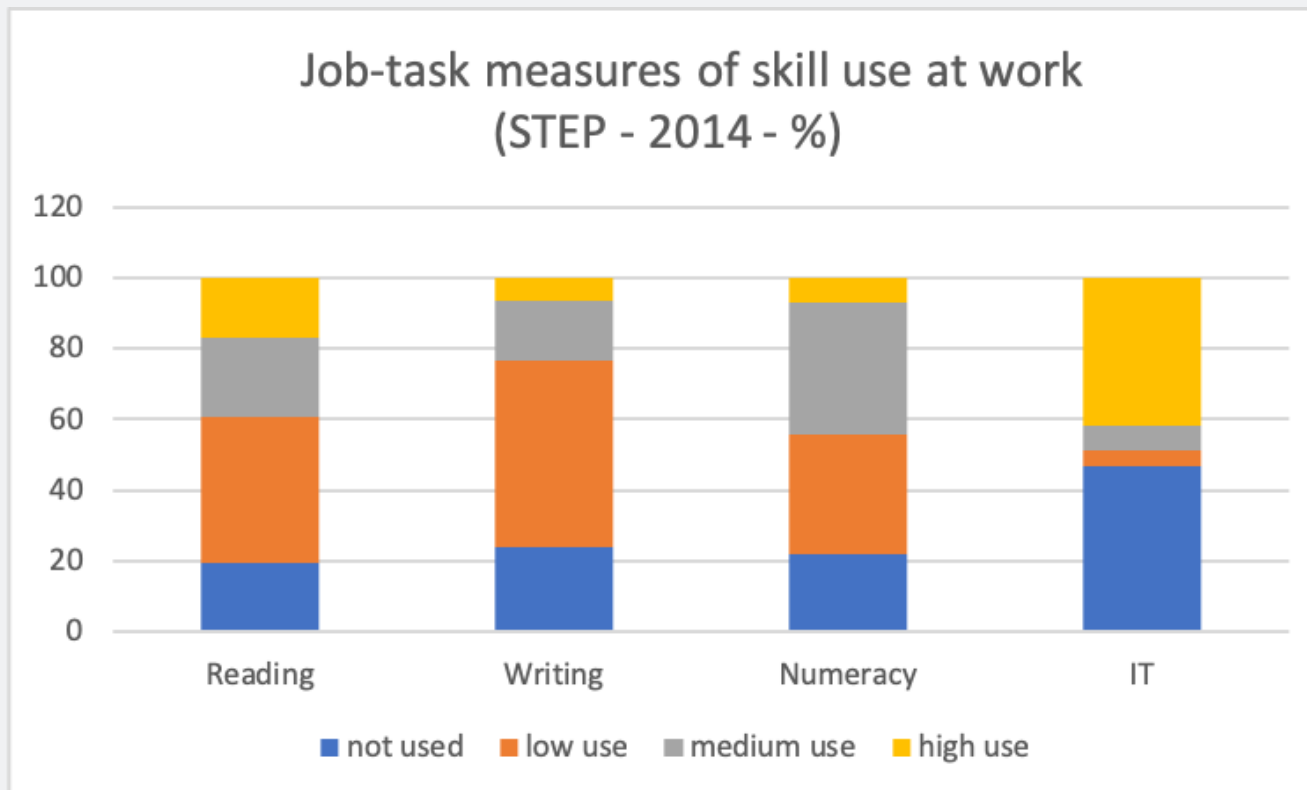
Source: BBC – SDWG Survey 2019

SG / SD - China



Source: JP MORGAN CHASE, Skills Shortages in the Chinese Labor Market, October 2016

SG / SD - China



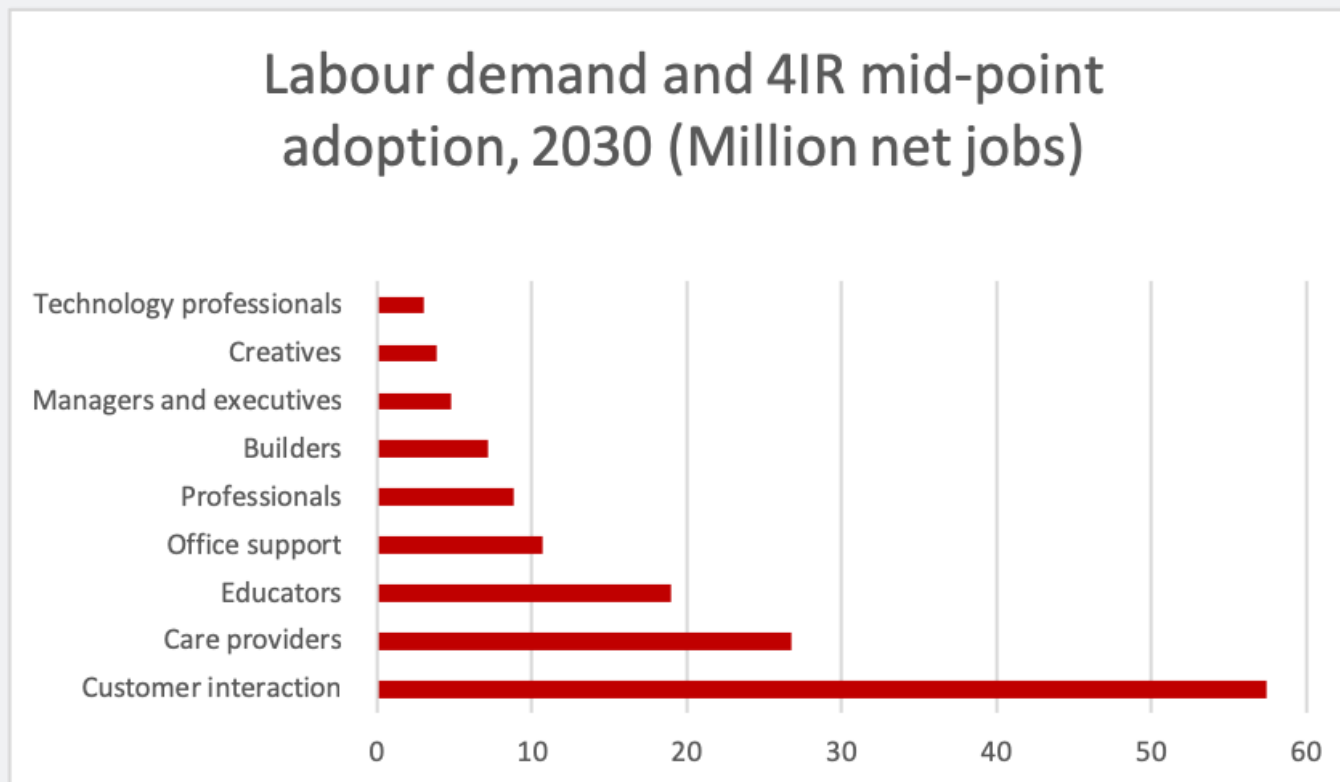
[Source: World Indicators of Skills for Employment](#)

SG / SD - China



Source: JP MORGAN CHASE, Skills Shortages in the Chinese Labor Market, October 2016

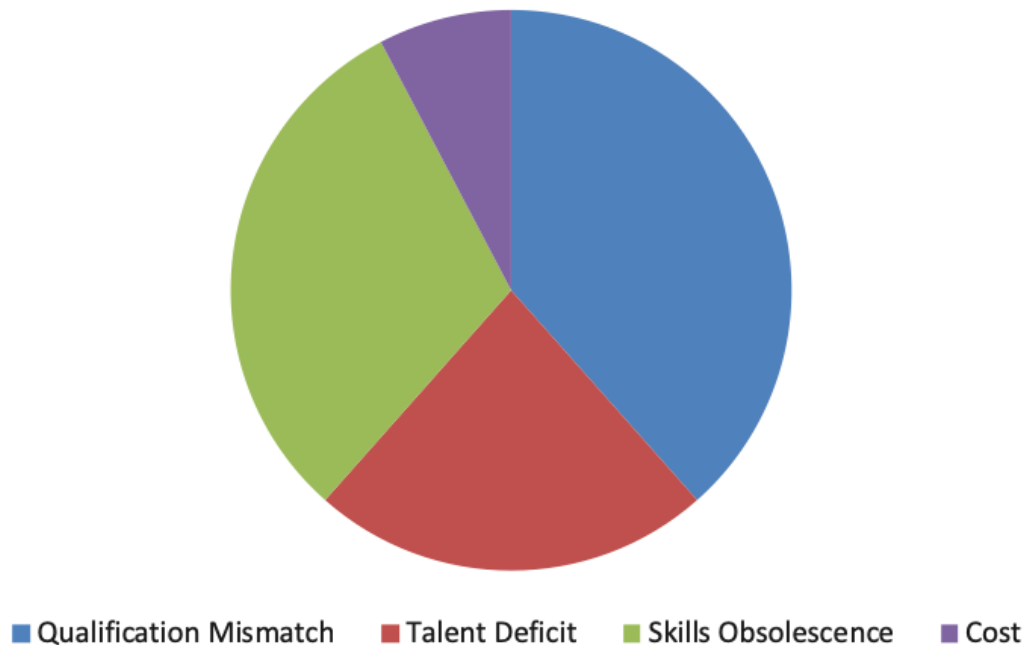
SG / SD - China



Source: McKinsey Global Institute, 2017

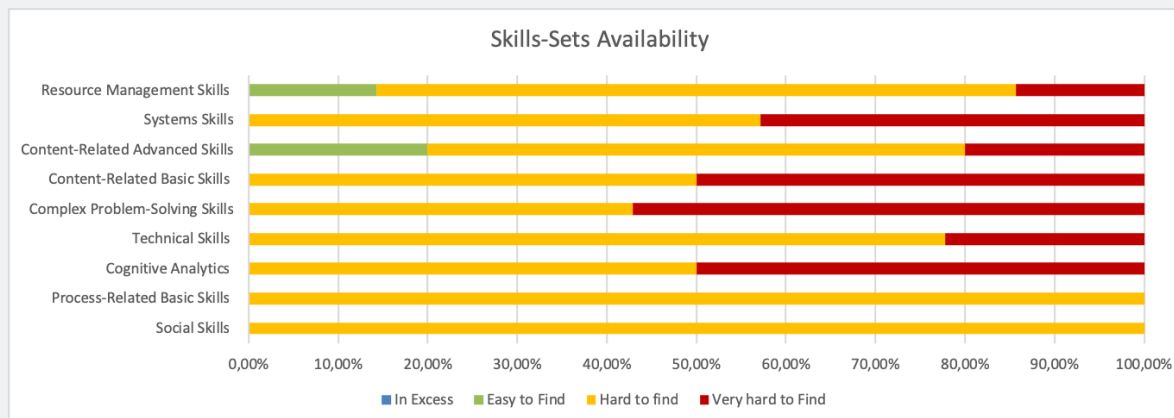
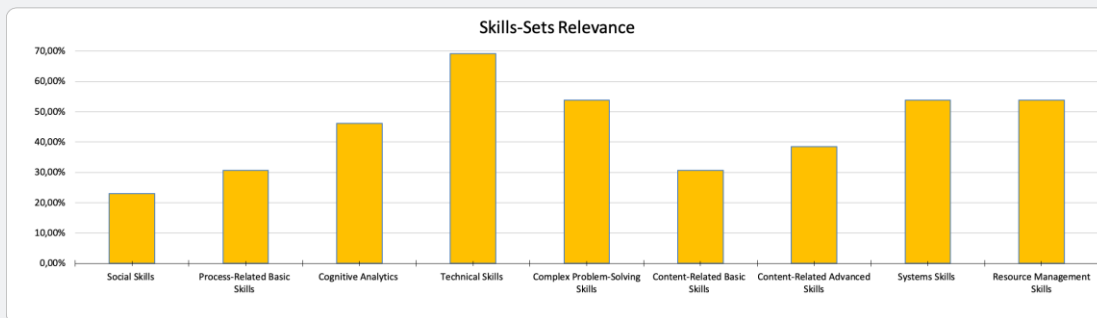
SG / SD – South Africa

Workforce Inadequacy



Source: BBC – SDWG Survey 2019

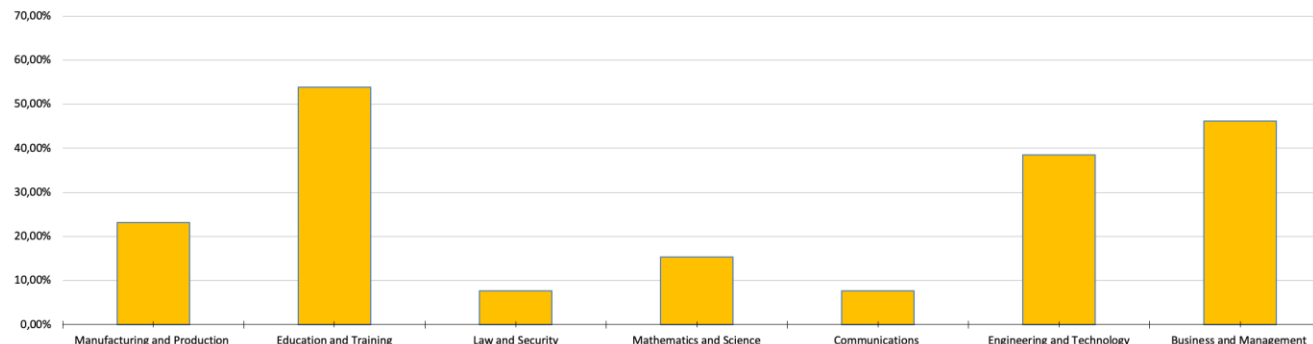
SG / SD – South Africa



Source: BBC – SDWG Survey 2019

SG / SD – South Africa

Knowledge Areas - Relevance



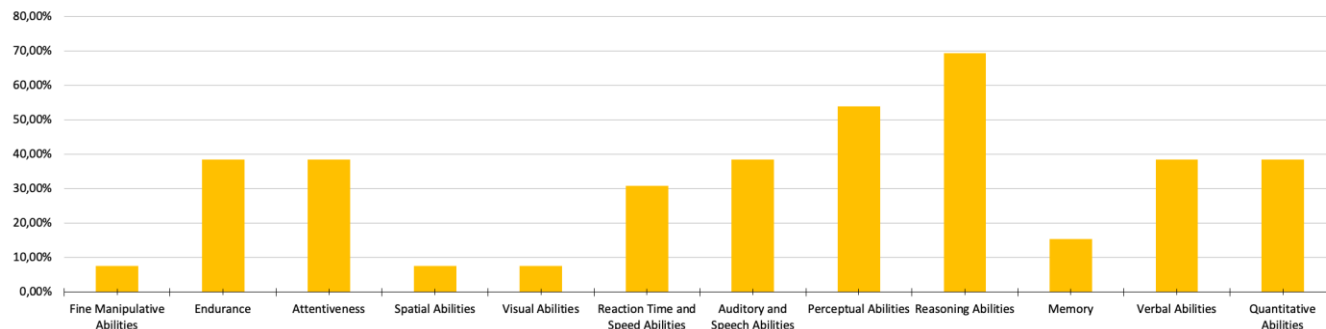
Knowledge Areas - Availability



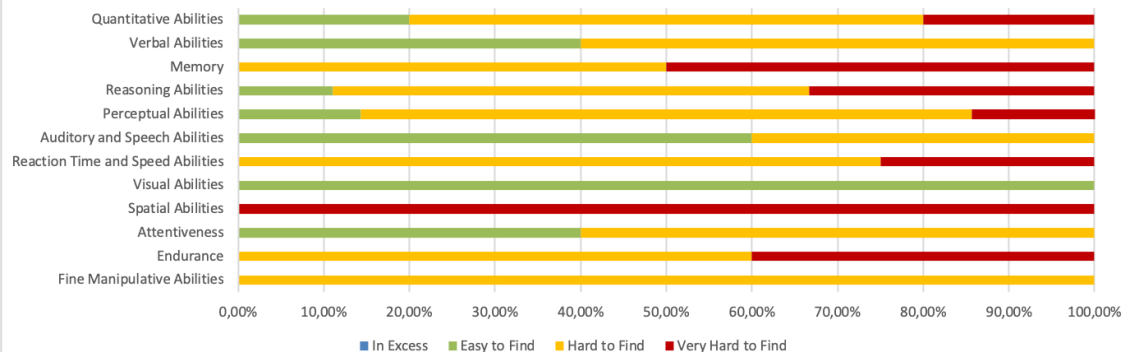
Source: BBC – SDWG Survey 2019

SG / SD – South Africa

Abilities Relevance

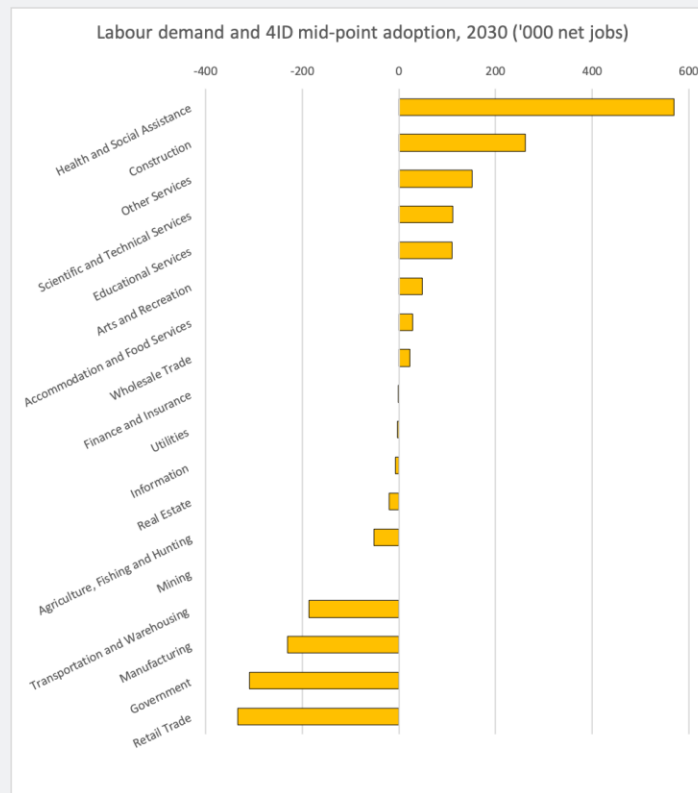


Abilities - Availability



Source: BBC – SDWG Survey 2019

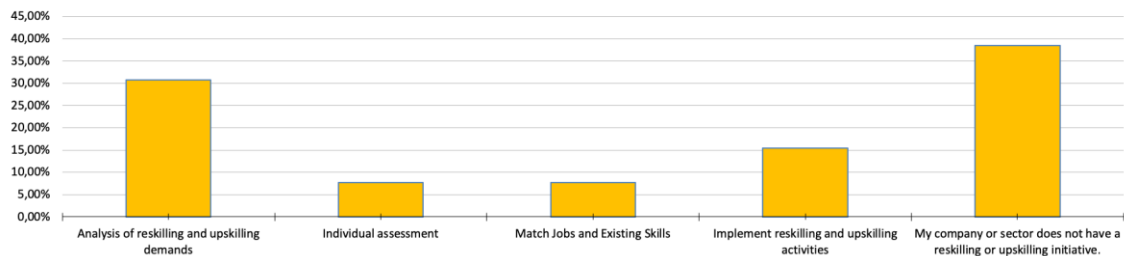
SG / SD – South Africa



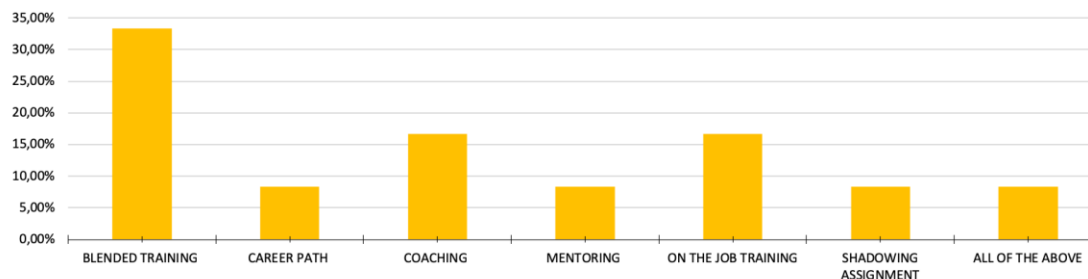
McKinsey Global Institute, 2017

SG / SD – South Africa

Skilling Initiatives



Skilling Approaches



Source: BBC – SDWG Survey 2019

THANK YOU!

esteves.pauloluiz@gmail.com

esteves_paulo@puc-rio.br

<http://www.bricspolicycenter.org/en/projetos/brics-and-industry-4-0-skills-gaps-and-skills-development>