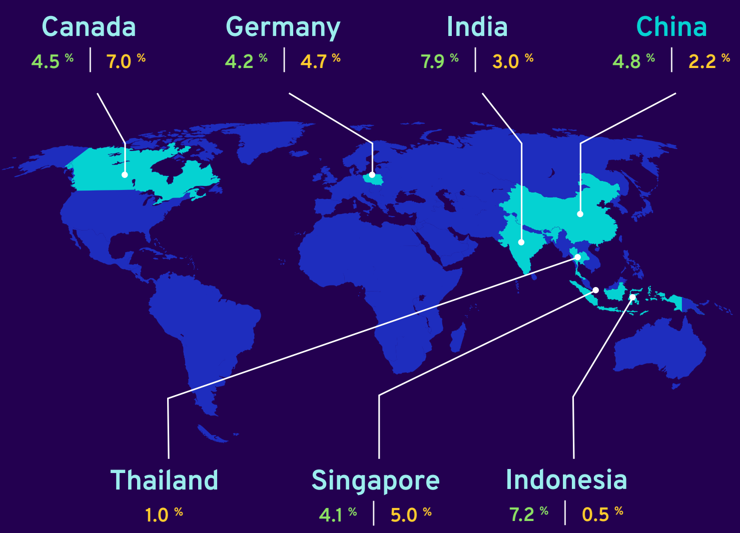
International
Labour
Organization

The Future of Work in Information Communication Technology

Skills shortages and labour migration in the field of information and communication technology in Canada, China, Germany, India, Indonesia, Singapore and Thailand.

Many parts of the world are facing potential shortages of ICT specialists. This may negatively impact a country's economic growth and development effort.

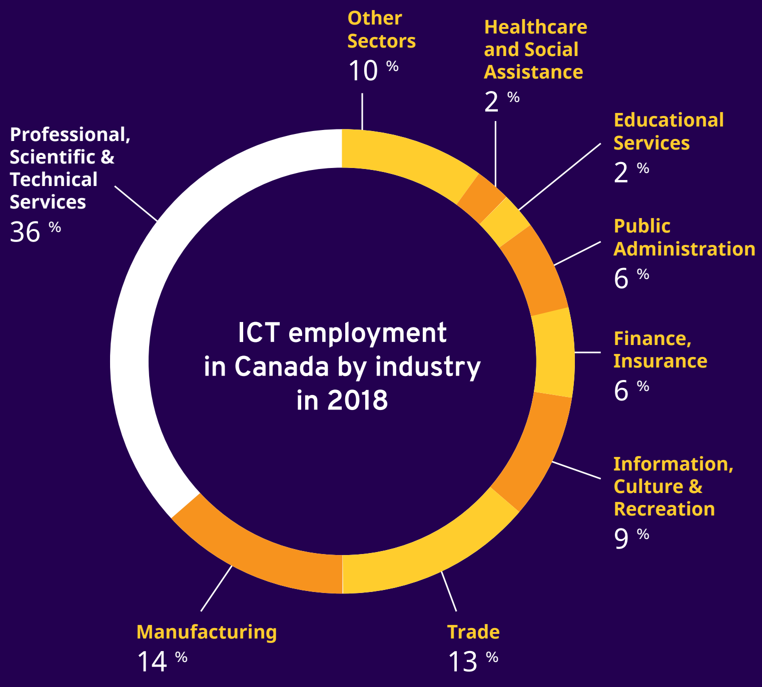


- 🟩 ICT sector as a percentage of national GDP
- 🟨 Share of the national workforce employed as ICT specialists

Between 2017 and 2020, ILO conducted in-depth research on anticipated needs for skilled ICT workers and formulated strategies to address the challenges. This infographic summarizes the project's findings, which were formulated on the basis of research conducted in Canada, China, Germany, India, Indonesia, Singapore and Thailand.

Sources: ICTC, 2019 (Canada); OECD, 2019 (China); Federal Ministry for Economic Affairs and Energy, 2018 (Germany); MEITY, n.d. (India); Agahari, W., 2017 (Indonesia); Ministry of Trade and Industry, 2018 (Singapore).

A large proportion of ICT specialists work in sectors other than the ICT.



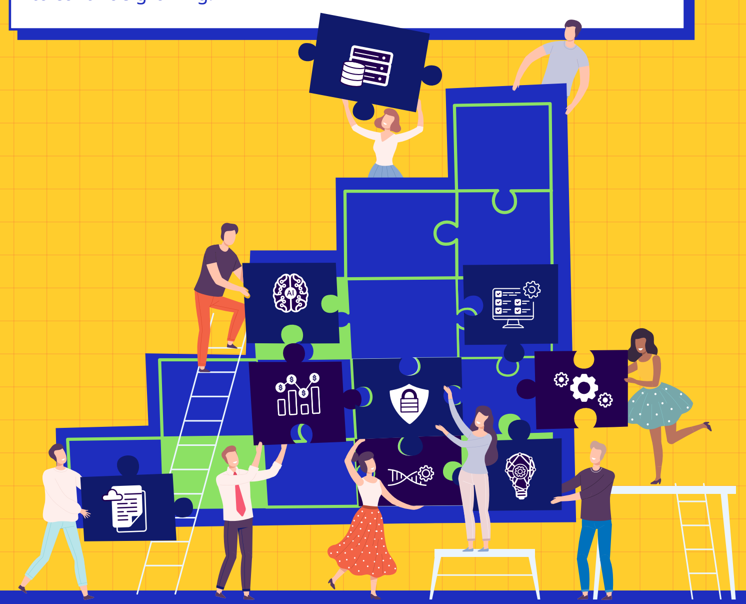
Source: ICTC, 2019

10 POSSIBLE POLICY RESPONSES

#1

Invest in a skill anticipation system to enhance understanding of current and future skills needs.

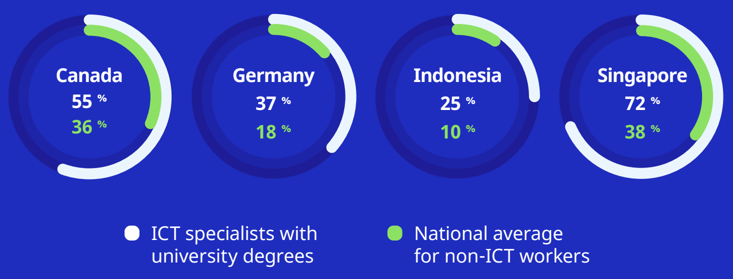
Significant shortages of ICT specialists exist for specific skills. Shortages vary by the level of educational attainment. These shortages are expected to continue growing.



#2

Increase investment in post-secondary education institutions and teaching staff.

While ICT specialists tend to have a higher level of education than non-ICT specialists, further investments in education are required.

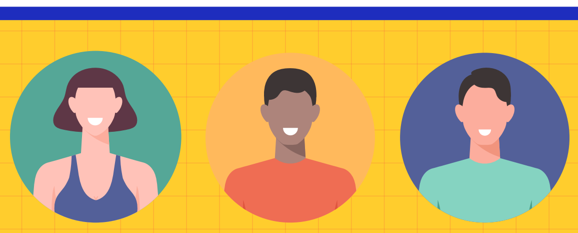


Note: Relevant data is unavailable for China, India and Thailand.

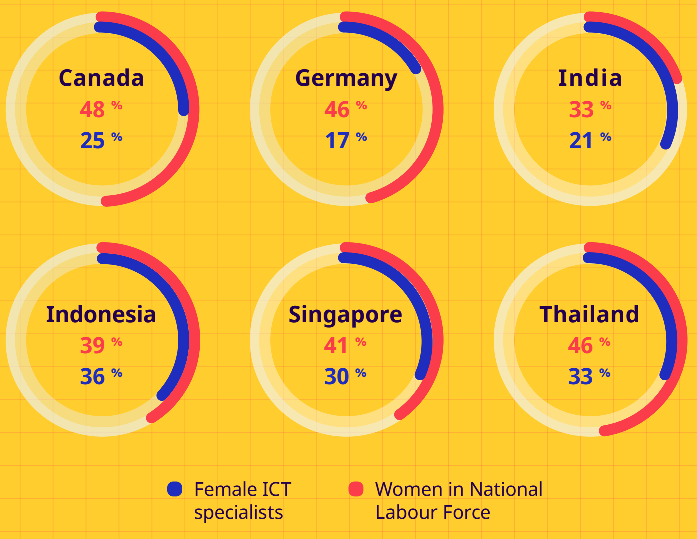
Sources: Government of Canada, 2020 (Canada); Background report, 2019 (Germany); National Labour Force Survey (SAKERNAS), Statistics Indonesia (BPS), 2018 and ILO, 2017 (Indonesia); Infocomm Media Development Authority (IMDA), 2019 (Singapore).

#3

Encourage more women to study science, technology, engineering and mathematics and pursue careers in the field of ICT.



Approximately a third of all ICT specialists are women.



The share of women working in ICT is well below economy-wide averages in all of the countries with the exception of India. The share of women is also much larger at entry level positions compared to managerial positions.

Sources: ICTC, 2019 (Canada); author calculation on the basis of data provided by the Federal Employment Agency (BA)(Germany); India Skills Report, 2014-2018 (India); BPS, 2018 (Indonesia); IMDA, 2019 (Singapore); National Statistical Office Labour Force Survey, 2017 (Thailand).

#4

Tackle the skills gaps between skills acquired at universities or vocational training institutions and skills demanded by industry.

#5

Increase the focus of education and training on soft skills.

#6

Promote interdisciplinary approaches to skills development.

#7

Invest in effective lifelong learning systems and continuous training in the field of ICT.

More work-based learning is required.

In Demand Skills

Technical Skills

- Cloud computing
- Artificial intelligence
- Software development
- Business intelligence
- Advanced analytics

Soft Skills

- Critical thinking, analytical thinking, creative thinking, problem-solving
- Ability to learn, flexibility
- Teamwork, leadership, communication, service orientation, business and management skills

Interdisciplinary Skills

- Ability to work in interdisciplinary fields
- Some knowledge of a range of sectors and fields (including agriculture, medicine and health, education and banking)

Strategies on Lifelong Learning

Comprehensive national policy on lifelong learning

Strengthening capacity of post-secondary education

Continuous training with various formats and duration

#8 Facilitate better recognition of foreign formal qualifications and work experience.

#9 Simplify visa application processes and provide support for migrant ICT specialists to facilitate their integration into their new working and living environments.

Strategies to Tap on Migrant Workforce

Ensuring that international labour standards are upheld

Special visa programmes to facilitate international labour migration of ICT specialists

Mutual agreements on recognition of study programmes

Programmes to assimilate migrant ICT specialists

Attract return migration

Retain international students

#10

Promote coordination among relevant ministries and authorities and strengthen social dialogue.

Engage tripartite constituents ...

Governments

Employers' organizations

Workers' organizations

... in formulating strategies.

Cooperation and coordination among these stakeholders at regional, national and local levels

Strengthening coordination among those stakeholders can play a key role in advancing opportunities for decent work in ICT sector

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