

**UNITED NATIONS**  
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**Building digital competencies to benefit from  
existing and emerging technologies with special  
focus on gender and youth dimensions**

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# 4<sup>th</sup> Industrial Revolution: Impact on labour markets and jobs

- ▶ Technological changes are not neutral
  - ▶ Technological innovations are biased towards capital or labour
  - ▶ Current technological innovations have improved the value of capital and skilled workers (e.g. IT skills)
  - ▶ Workers with no digital skills can be replaced by automation and difficult to be re-employed.
  - ▶ Distributional effects: Biased directed technological change increases inequality
  - ▶ Positive and negative influence on sustainable development
  - ▶ Automation will affect men and women differently. Women are less represented in STEMs fields. But also are less represented in jobs with higher risks of automation.
  - ▶ Digital platforms like eBay, Airbnb offer opportunities for entrepreneurship & self-employment.

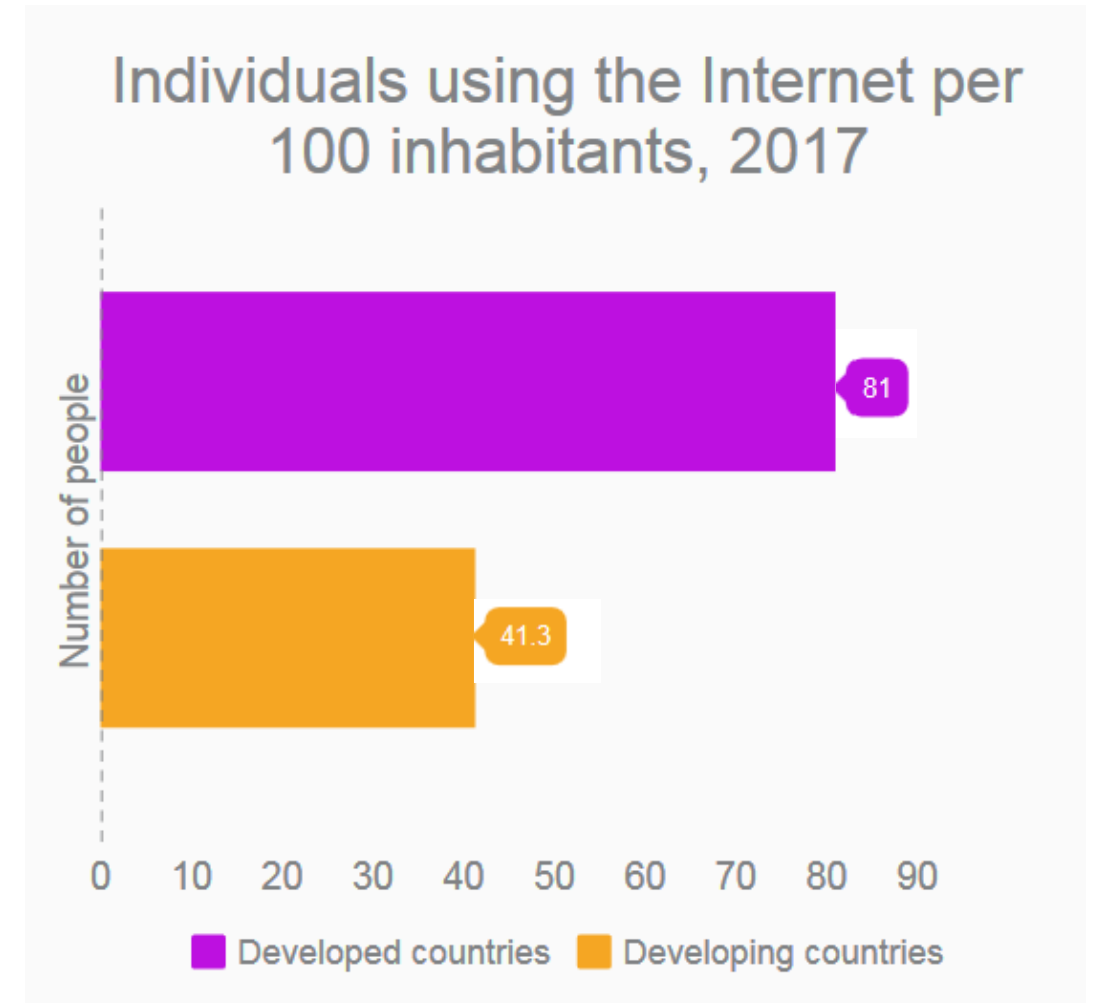
- ▶ Some estimations:
  - ▶ 85-90% of future jobs will require ICT skills
  - ▶ 47% of US employment is at risk of automation
  - ▶ The share of jobs at risk of automation is even higher in developing countries:
    - ▶ 77% of all jobs in China
    - ▶ 69% in India
    - ▶ 85% in Ethiopia
  - ▶ However, the replacement of workers by robots will only occur when is economically profitable (UNCTAD, 2017)



**COUNTRIES can prepare for future changes brought by digitalisation.**

# Trends in ICTs and gaps\*

- ▶ Individual using the Internet:
  - ▶ **41.3 out of 100 in developing countries;**
  - ▶ **81 out of 100 in developed countries**
- ▶ Gender gap in Internet use (estimated 2016):
  - ▶ **Worldwide: 12%, 31% in LDCs**
- ▶ Digitalisation offer important opportunities for women:
  - ▶ **73.9% e-business owners on Chinese e-shopping website Taobao are women**
- ▶ Women are less represented in ICT workforce:
  - ▶ **Women are 31% of Google's overall workforce yet they comprise only 20% of technical positions (Google, 2017)**
  - ▶ **Women are 17% of Facebook workforce (Williams, 2016)**
- ▶ Percentage of youth using the Internet:
  - ▶ **70% world average; 94% in developed countries; 67% in developing countries; and only 30% in LDCs**
  - ▶ **Out of the 830 million young people who are online, 320 million (39%) are in China and India.**
  - ▶ **Nearly 9 out of 10 young individuals not using the Internet live in Africa or Asia and the Pacific.**



\*Estimated 2017 or latest year available  
Source: ICT access data from ITU

# Importance of developing digital competencies

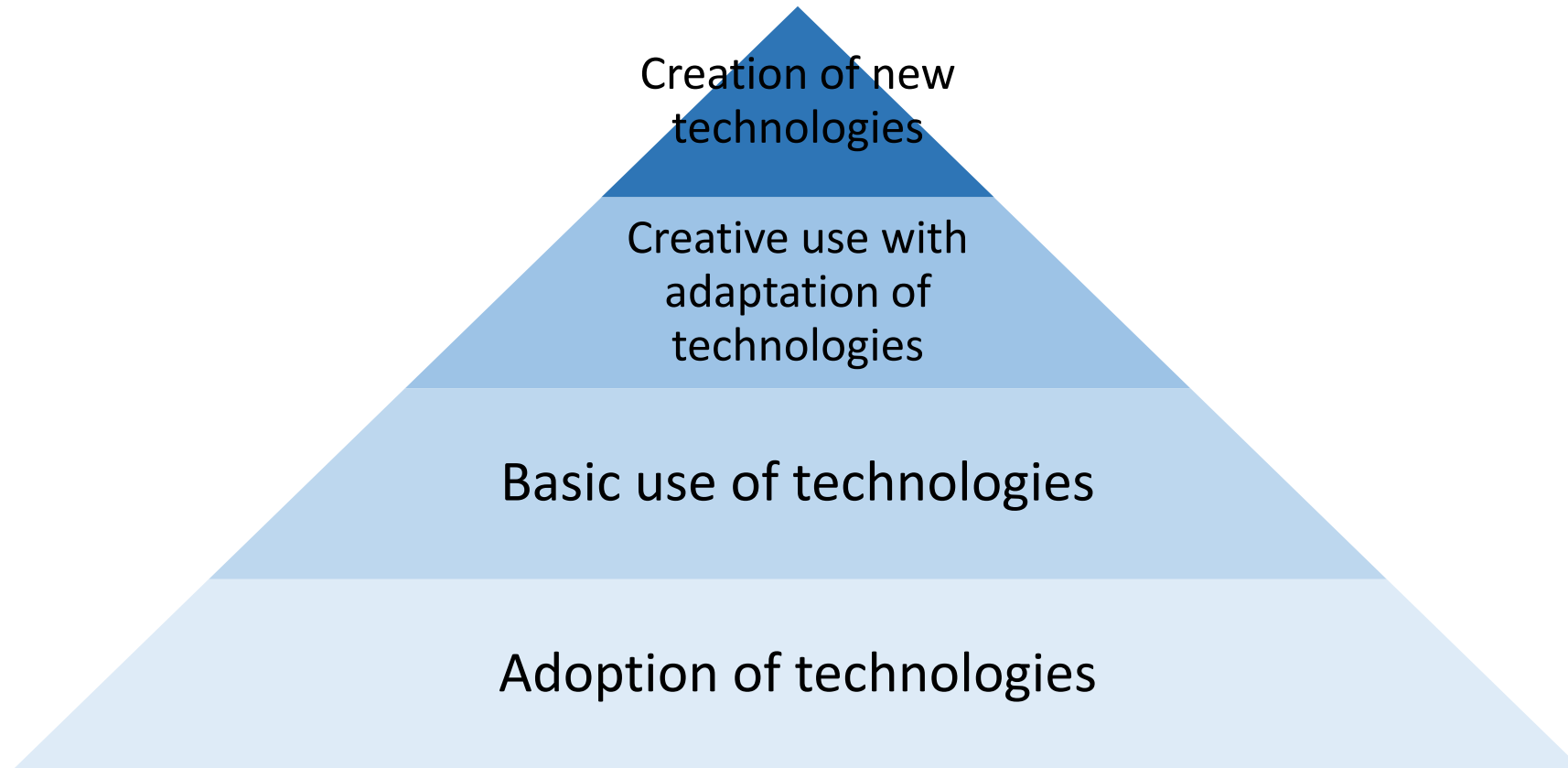
- ▶ We need digital competencies because:
  - ▶ Failing to update skills set to cope with technical changes will reduce employment and the income of workers
  - ▶ Potential increase of tension between workers and employers
  - ▶ Since ICTs are embedded in our lives, we need to have at least basic knowledge of ICTs to solve everyday problems, engage in community activities and protect ourselves from abuse, fraud, and cyber-attacks

# How to building digital competencies to benefit from existing & emerging technologies?

- ▶ Digital Skills and competencies in the digital era
- ▶ New Technologies for Digital Competencies
- ▶ Policy considerations
  - Policies for education and lifelong learning
  - Strategies to use ICTs to help build competencies
  - Other complementary actions and policies.

## 2. Digital Skills and competencies in the digital era

### Different levels of digital skills



# Categories and levels of digital skills

Category	Levels	Skills
Digital Skills for All	Adoption	Basic education and literacy; Familiarity with technology devices and services;
	Basic use	Basic understanding of technologies, software and applications; Knowledge of digital privacy and security
Digital Skills for ICT professionals	Creative use of adaptations	Basic computing skills; Familiarity with basic algorithms
	Creation of new technologies	Sophisticated programming skills; Knowledge of complex algorithms

# Types and examples of digital competencies

<b>Types</b>	<b>Examples</b>
Technical and professional skills	Installation and operation of robots;
Generic ICT skills	Understanding, use and adoption of technologies; Life-learning ability to adapt to technology changes
ICT complementary “soft skills”	Creativity; communication skills; critical and logical thinking; teamwork; digital entrepreneurship

Source: (OECD, 2016)



# 3. New Technologies for Digital Competencies

Trends	Examples
Technology-mediated teaching and learning	Laptops, internet resources and adaptive assessment system for teachers; ICT facilities in classrooms ICT for remote learning and life-learning Platform for teacher-student interactions Assistive technologies for individuals with disabilities
Massive Open Online Courses (MOOCs)	MOOCs for higher education (Coursera, edX, and Khan Academy) MOOCs for vocational training (Alison)
Open Access to Scientific Literature	Open access journals and databases (PLOS) Traditional publishers open to developing countries (PNAS) Self-archiving websites (arXiv)
Scale Education Using the Internet	Media centre and remote learning

# 4. Policy considerations

- Building digital competencies through education
  - Incorporating digital skills' training at school
  - Providing digital skills' training for the labour force and life
  - Embedding digital skills in lifelong learning
- Creation of an enabling environment through investment in infrastructure, institutional development and entrepreneurship
  - Investment and development of digital infrastructure
  - Development of institutions and environment to nurture digital competencies
- Establishment of initiatives that promote entrepreneurship in the digital economy
- International collaboration to facilitate technology adoption and knowledge exchange
- Public-private partnerships in delivering digital skills and building digital infrastructures

# Building digital competencies through education

- Identify key skills needed to build up digital competencies through int'l cooperation.
- Incorporate them as a part of the *compulsory* formal curriculum in primary or secondary education according to conditions in each country
- Support firms, community schools and NGOs to provide training of broad skills to existing workforce and the population, including basic ICT skills to work and to live, life-long learning capabilities and entrepreneurship skills.
- Develop online platforms and MOOC to deliver these training

# Creation of an enabling environment through investment in infrastructure, institutional development and entrepreneurship

- Investment in data resource capabilities, including facilities for data collection, storage, and transmission, and capabilities for big data analysis, for example, building national big data centres, rolling out full broadband coverage in developing countries, and regional high-speed computing and processing facilities.
- Policy and financial support to encourage entrepreneurship in digital economy sectors.
- Set up institutions such as incubators to support digital start-up companies.
- Build digital infrastructure eg., online platforms, for international knowledge sharing and capabilities building.
- Encourage public-private-partnership (PPP) in support of training provision, infrastructure development, and data facility building.

# Establishment of initiatives that promote entrepreneurship in the digital economy

- Reform tax, finance, industry and labour market policies to develop an incentive structure that encourages and facilitates investment and labour participation in the digital economy, for example, tax breaks, low interest rate bank loans, digital SME support funds, and preferential human resource or migration policies for digital talents.

## Special policies and partnerships to support youth & women

- 1) Targeted programs for women and youth in terms of financial support, tax incentives, and training courses to companies who prioritize youth and women employment and digital skill training;
- 2) Targeted funding, tax and policy support and market information provision to youth and women digital entrepreneurship promotion;
- 3) Special programs or support to encourage female student in digital skills training;
- 4) Policies that support community and NGOs programs that aim to bridge the digital divide in the society, and with special focus on youth and women.

# International collaboration to facilitate technology adoption and knowledge exchange

- Strengthen international cooperation to improve the infrastructure, accelerate the development of digital skills, building data collection, storage and analysis capabilities.
- Special international cooperation targeted at helping enhancing women's digital skills or help youth digital entrepreneurs.
- International cooperation can also play an important role in developing regulations and ethics in data collection, usage and open access, and in providing a forum for the exchange of good practices and lessons learned.