

Defining and measuring digital competence in a rapidly changing world

Monitoring the global education goal to
invite policy responses

Digital Citizenship Plus Seminar Series

Seminar 6

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27 January 2022



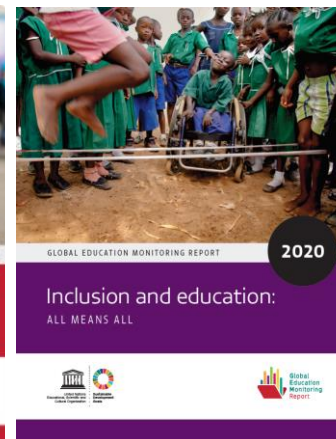
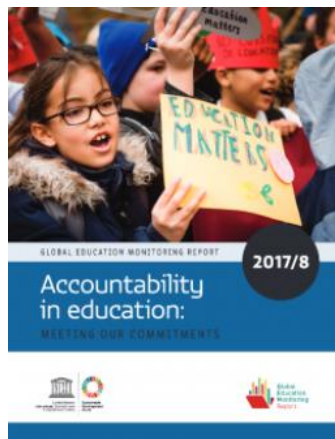
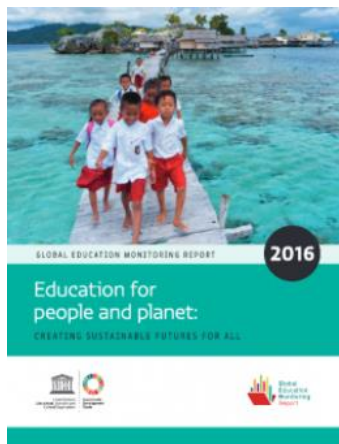
Global Education Monitoring Report

Editorially independent report hosted by UNESCO since 2002

A global mandate since 2015 to monitor:

- ▶ education progress in SDGs ▶ monitoring part
- ▶ strategy implementation ▶ thematic part

... to ‘hold all partners to account’



Launched 10 December 2021 ↑

Monitoring SDG 4

Monitoring framework



4.1 Primary and secondary

4.2 Early childhood

4.3 Technical and tertiary

4.4 Skills for work

4.5 Equity

4.6 Literacy

4.7 Sustainable development

4.a Learning environments

4.b Scholarship

4.c Teachers

A refresher on SDG target 4.4

By 2030, substantially increase the number of **youth and adults** who have relevant **skills**, including technical and vocational skills, **for employment, decent jobs and entrepreneurship**

Global 4.4.1: Percentage of youth and adults with **ICT skills** by type of skill
Not a learning outcome indicator:
indirect (but correlated with skills)

Thematic 4.4.2: Percentage of youth/adults with minimum level of proficiency in **digital literacy skills**
Learning outcome indicator: direct

A refresher on SDG target 4.7

By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, **global citizenship** and appreciation of cultural diversity and of culture's contribution to sustainable development

Global 4.4.1: Extent to which (i) **global citizenship education** and (ii) education for sustainable development are mainstreamed in: (a) national education policies, (b) curricula, (c) teacher education and (d) student assessment

Not a learning outcome indicator: indirect

Thematic 4.7.4: Percentage of students by age group (or education level) showing adequate understanding of issues relating to **global citizenship** and sustainability

Learning outcome indicator: direct

SDG target 4.4.1 indicator

Originates in Eurostat household surveys since early 2000s; endorsed by ITU which is co-custodian agency with UIS; questionnaire collects information on **nine** skills:

- ▶ Copy or move a file or folder
- ▶ Copy and paste to duplicate/move information within a document
- ▶ Send emails with attached files (e.g. a document, picture or video)
- ▶ Use basic arithmetic formulas in a spreadsheet
- ▶ Connect and install new devices (e.g. a modem, camera or printer)
- ▶ Find, download, install and configure software
- ▶ Create electronic presentations with presentation software
- ▶ Transfer files between a computer and other devices
- ▶ Write a computer program using a specialized programming language

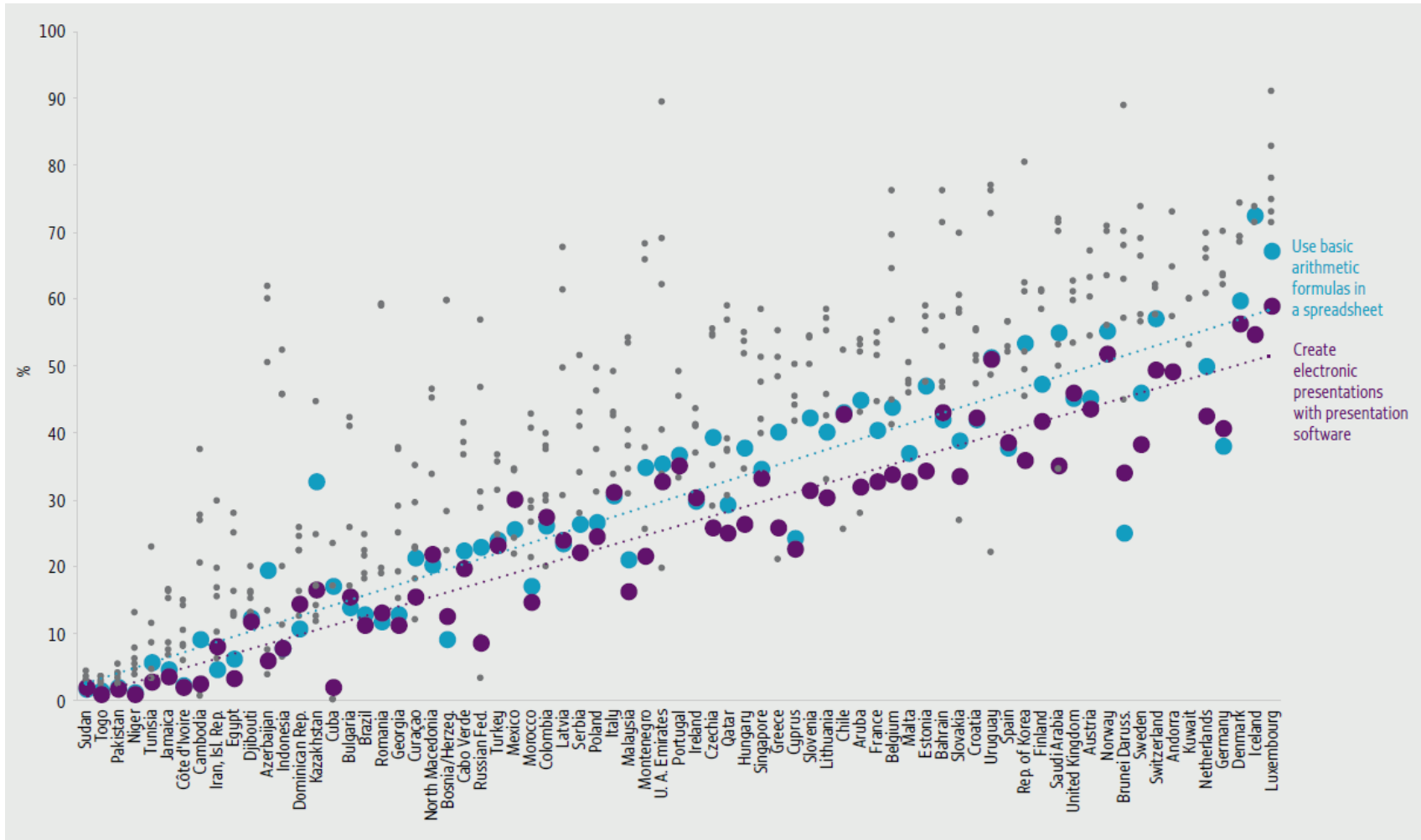
SDG target 4.4.1 indicator (revised)

Originates in Eurostat household surveys since early 2000s; endorsed by ITU which is co-custodian agency with UIS; questionnaire collects information on **nine** skills:

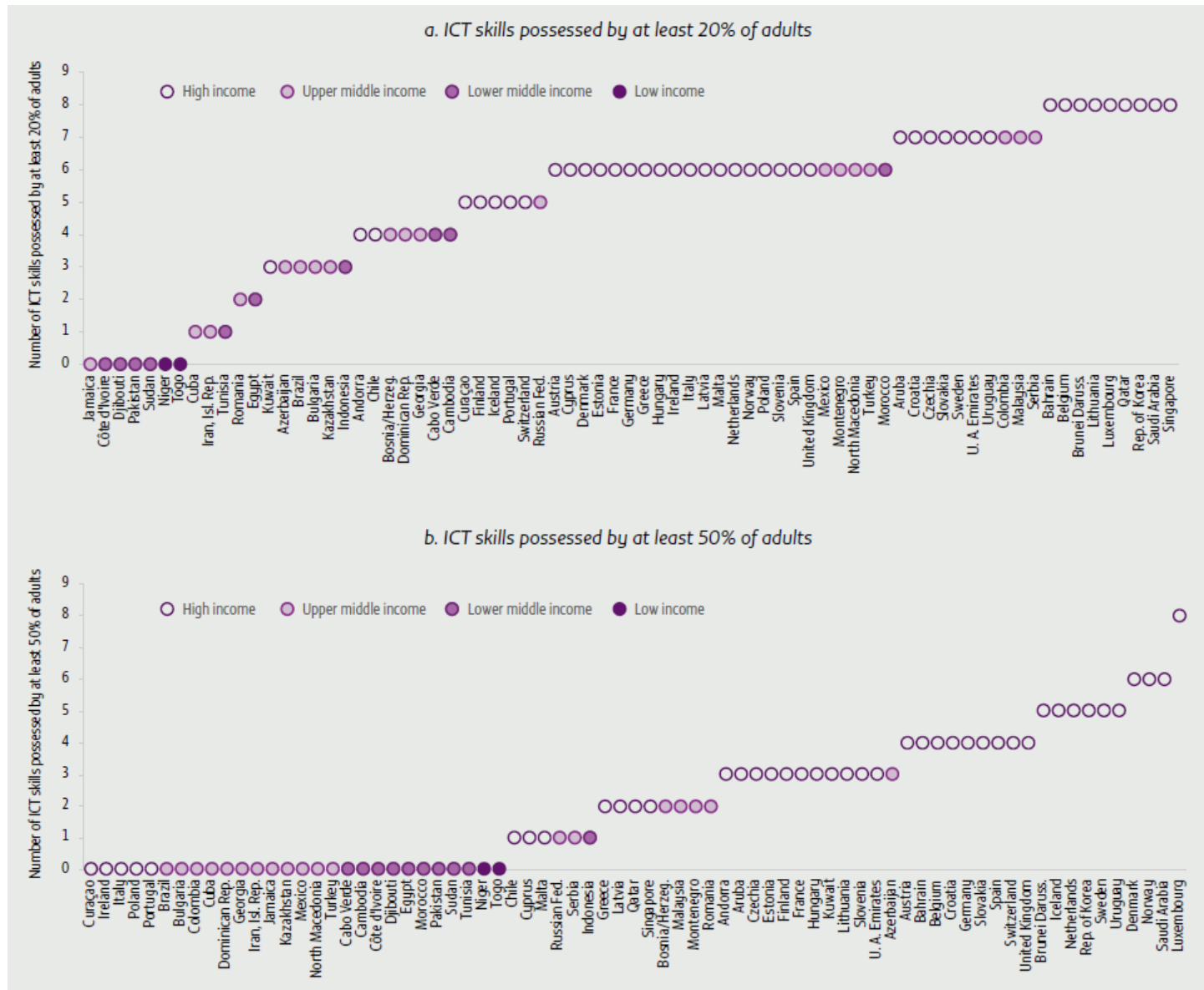
- ▶ ~~Copy or move a file or folder~~
- ▶ Copy and paste to duplicate/move information **in digital environments**
- ▶ Send **messages** with attached files (e.g. a document, picture or video)
- ▶ Use basic arithmetic formulas in a spreadsheet
- ▶ Connect and install new devices (e.g. a modem, camera or printer)
- ▶ Find, download, install and configure software
- ▶ Create electronic presentations with presentation software
- ▶ Transfer files **or applications** between a computer and other devices
- ▶ **Programming or coding in digital environments**
- ▶ **Setting up effective security measures to protect devices/accounts**
- ▶ **Change privacy settings to limit sharing of personal data/information**

Prevalence of ICT skills is highly correlated

Adults possessing eight basic ICT skills, 2015–17



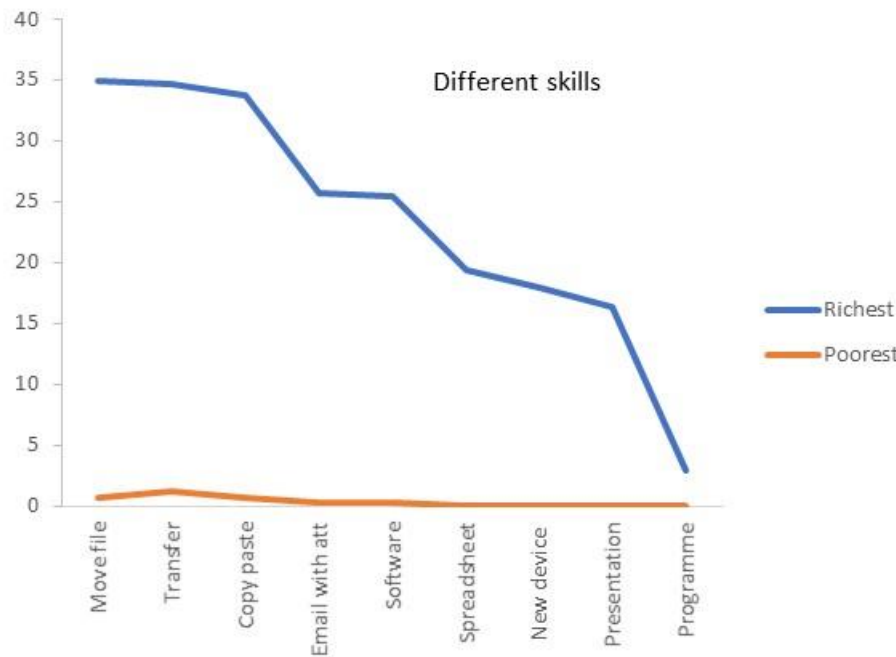
Most adults lack most ICT skills in most places



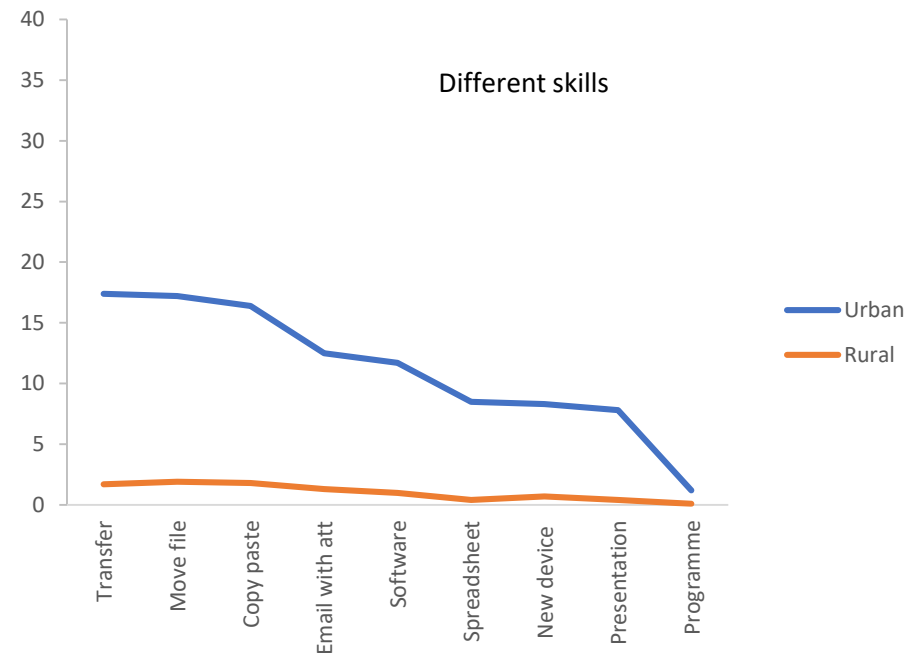
Household surveys including 4.4.1 questions

MICS 6 has included these questions enabling disaggregation
e.g. Gambia, 15–49 year olds

By wealth

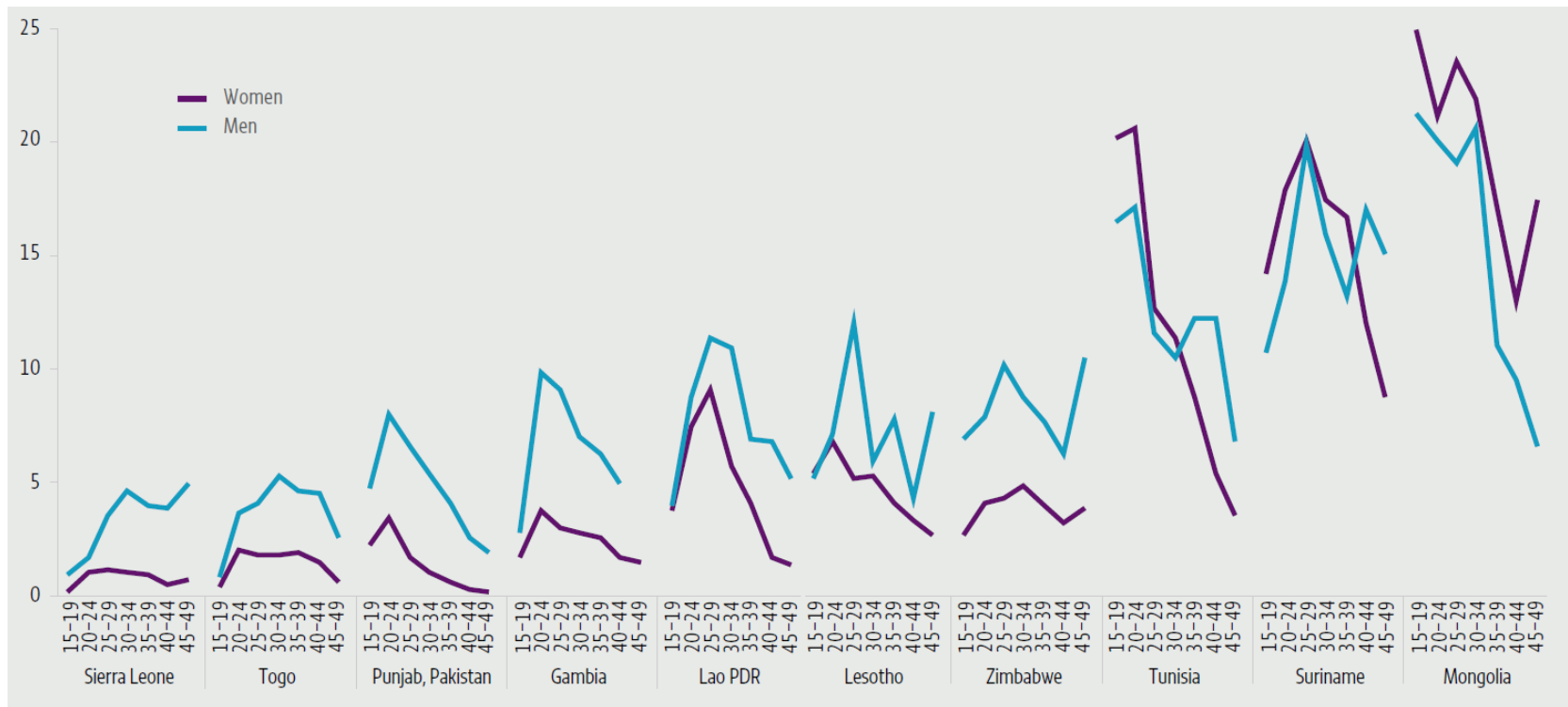


By location



Household surveys including 4.4.1 questions

By age and sex, selected countries, 2017–19



Digital Literacy Global Framework

Technical Cooperation Group on SDG 4 indicators process

Review of 43 digital literacy frameworks with focus on 7 national and 3 popular enterprise frameworks

Key recommendation = adopt DigComp and add **two areas**

0. Hardware and software operations

1. Information and data literacy
2. Communication and collaboration
3. Digital content creation
4. Safety
5. Problem solving

6. Career-related competences

= use examples of digital literacy in major economic sectors
e.g. agriculture; energy; finance; and transportation



Digital Literacy Global Framework

e.g. pathways mapping for agriculture

Trading using
mobile phone



Using smartphone
to cut out middlemen



Data-driven irrigation
system using
Internet-of-Things



Prospects for 4.4.2 measurement? (1)

Map digital literacy assessment to DLGF and evaluate assessments that cover part of DLGF: psychometrics and external vs internal validity, cost (e.g. duration)

Review of prior mapping exercises

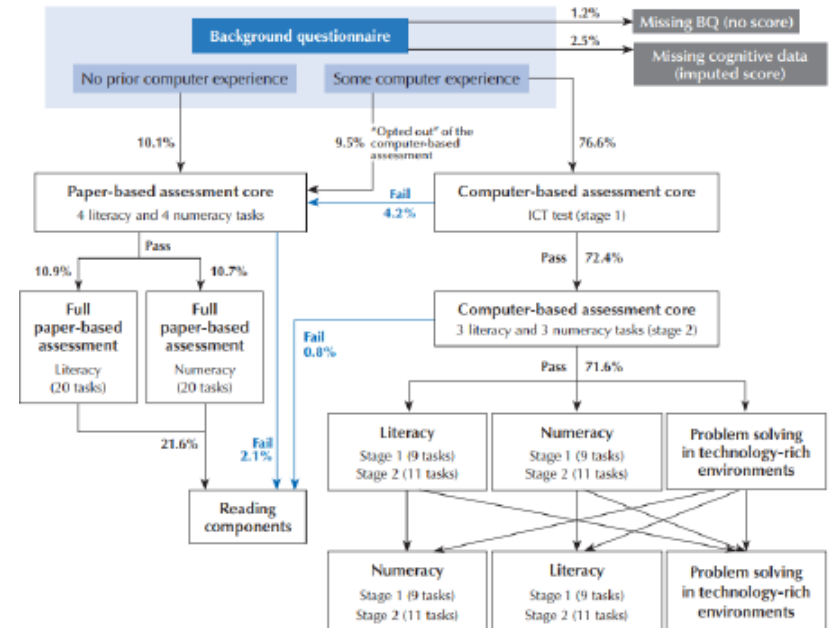
- ▶ Carretero et al (2017) (22 assessments)
- ▶ Siddiq et al. (2016) (30 school-based assessments)

Different classifications of assessments

- ▶ By purpose: research, credentials, statistics
- ▶ By focus: technical skills (e.g. ICDL), information literacy (e.g. ICILS), digital competence (e.g. PIAAC)
- ▶ Delivery: self-report, self-assess on scale, test;
if so by item: multiple choice, interactive, authentic

Prospects for 4.4.2 measurement? (2)

- ▶ **PIAAC** most comprehensive household survey; but expensive and excessive given skill levels in LICs
- ▶ Other measures based on school surveys, e.g. **ICILS** but also national surveys using **DigComp** framework, likewise likely inappropriate



Prospects for 4.4.2 measurement? (3)

Self-reporting and knowledge

- ▶ **Estonia** DigComp school test grades 9/12, less reliable in competence areas 3-5
- ▶ **France** Pix: advanced platform and item design (incl. adaptive testing), does not cover competence 5

Selected recommendations

- ▶ Self-report, 3-5 point scale, 15-20 min
- ▶ Pilot 1000+ in 3 languages, validate, steering group
- ▶ Knowledge-based test extension for selected competency areas to enhance validity
- ▶ Software architecture similar to Pix, e.g. built-in data upload in anonymized form; software and test items in Github; responsive user interface; smartphones/tablets
- ▶ Extensions for e-portfolios, microcredentials

Relationship between 4.4.1 and 4.4.2?

Can **indirect** methods approximate the underlying distribution of technology skills in the population?

OECD PIAAC defined three levels of **problem-solving skills in technology rich environments**:

Level 1: able to use widely available applications, such as email or a web browser, to access the information or commands necessary to solve a problem.

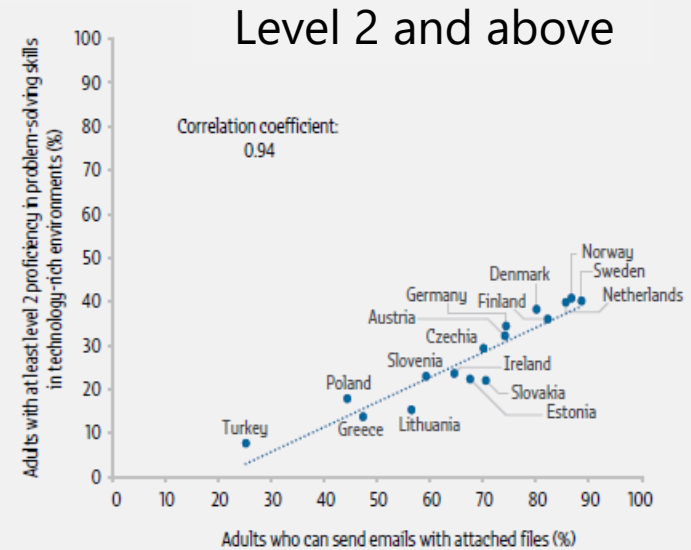
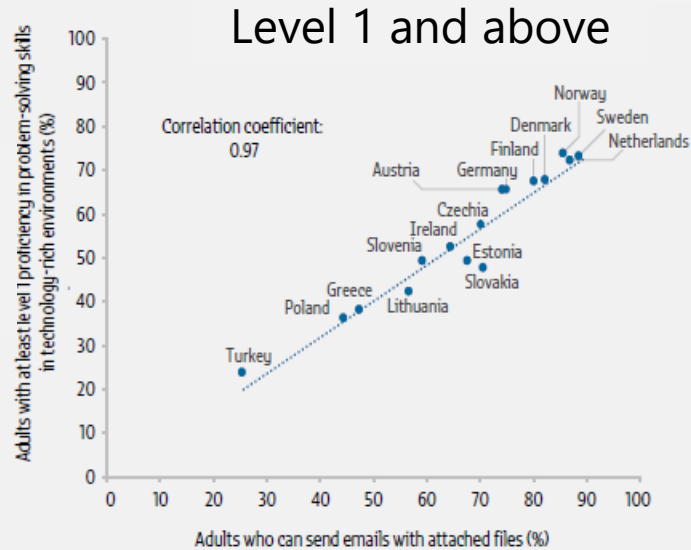
Level 2: able to use specific applications and tools with multiple steps and operators to resolve problems

Level 3: able to resort extensively to inferential reasoning

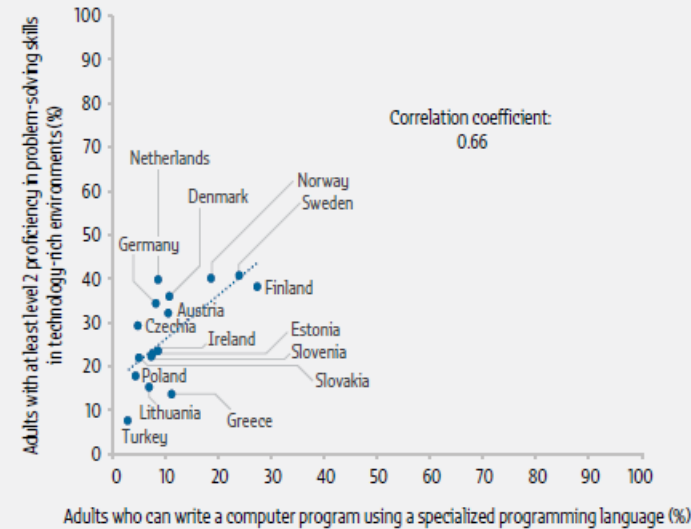
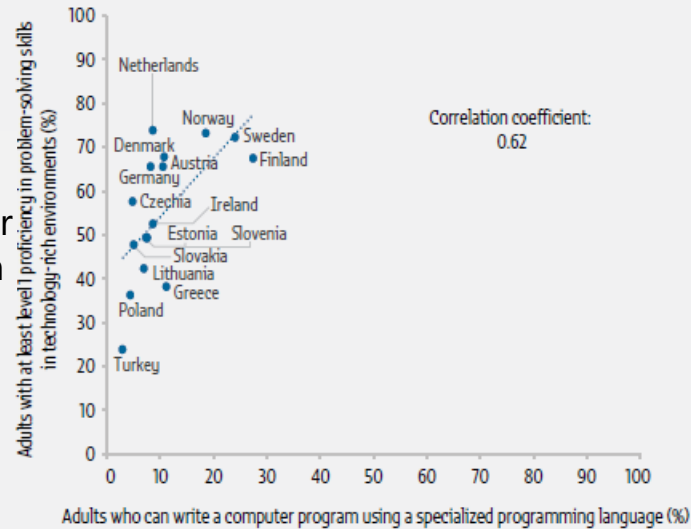
Relationship between 4.4.1 and 4.4.2?

PIAAC

ITU
Send email
with attachment



Write
computer
program



SDG target 4.7.4 indicator

Framework proposed based on the 2016 International Civic and Citizenship Education Study (ICCS)
(=23 upper-middle- and high-income countries)

One **cognitive** component (consisting of four civic knowledge content domains: society and systems, principles, participation, and identities)

Seven **non-cognitive** components (global-local, multiculturalism, gender equality, peace, freedom, social justice, sustainable development)

2023 GEM Report on technology (1)

Concept note for the
2023 Global Education
Monitoring Report
on technology and
education



What is the education we want? Can technology help?

1. Access, equity and inclusion

Access for disadvantaged groups: Hard-to-reach learners

Access to content: As much in as attractive/cheap formats

2. Quality

Basic skills: transform pedagogy, engage students,
improve learning

Digital skills: Provide new skills that technology demands

3. Technology development

How can education support technological development?

4. System management

How to make assessment and other education
management data more relevant and widely used?

2023 GEM Report on technology (2)

What conditions to be met for technology to support education? How can education systems:

1. Access to technology

...ensure that all learners have access to technology resources?

2. Governance and regulation

...protect learners from the risks of technology?

3. Teacher preparation

...support all teachers to teach, use and deal with technology?

2023 GEM Report on technology (3)

Online consultation

Send your comments and recommendations!

<https://en.unesco.org/gem-report/2023/technology>

Call for expressions of interest out this week

Respond to topics / Propose your own by 27 January

<https://en.unesco.org/gem-report/2023eoi>

New chapter of **PEER country profiles**

www.education-profiles.org



Regional editions of the 2023 GEM Report

South-eastern Asia and Pacific