



# Setting Europe on course for a human digital transition

## Evidence from Cedefop's ESJS2

Konstantinos Pouliakas  
Expert, Cedefop

Cedefop 6<sup>th</sup> VGT 'Tackling the digital divide'  
07 November 2023



# Strengthening skills intelligence for Europe



# 2nd European skills and jobs survey

## Digitalisation and skill mismatch

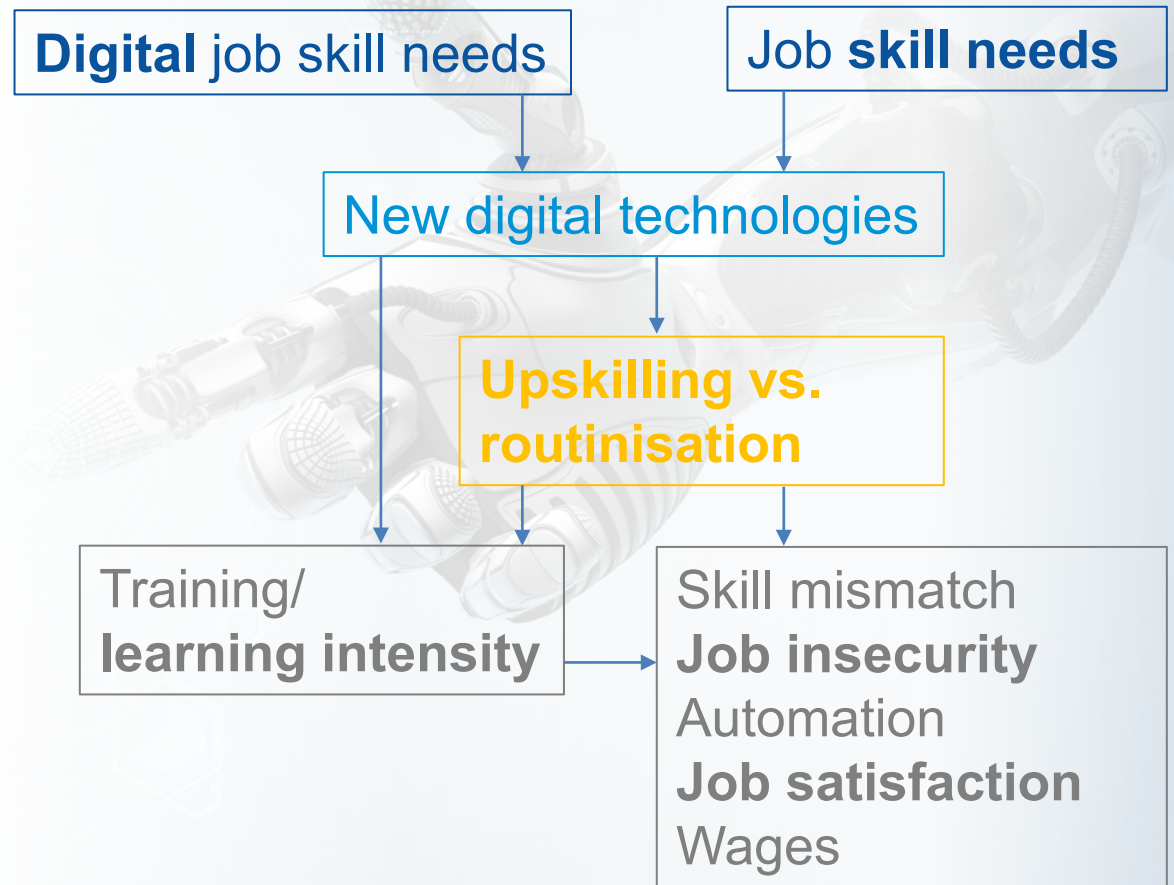
### Main research questions:

- What do EU workers do at work?
- Basic or complex(digital) skills use?
- New digital technologies?
- Skill gaps and remedial learning?

### Better measurement of:

- Job-skill requirements
- Digitalisation/digital work
- (Digital) skills complexity
- Work routinization
- Skill mismatches

### Pillars and conceptual design

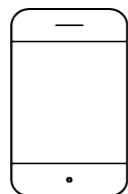


# 2nd ESJS survey ID

## SURVEY METHOD

RDD CATI

ONLINE (CAWI)



Weighting

Representative sample  
of EU+ adult workforce

### COUNTRIES SURVEYED

EU-27  
+ Iceland  
+ Norway  
ETF-7  
+ Western Balkans  
+ Israel

### TARGET NUMBER OF INTERVIEWS

Ranging from 1 000 to 3 000 –  
total of **46 213 observations**.  
500 by RDD CATI  
(except 1000 in MT, CY)

### TARGET POPULATION

All adults (aged 25-64) in  
wage and salary employment  
(i.e. paid employees, excluding  
self-employment and family  
workers), who live in private  
households

### DURATION

About 20-25 min

# Measuring job-skill requirements

## **TASK-BASED APPROACH** (Handel, 2012; Fernandez-Macias & Bisello, 2016, 2020)

As part of your main job, did you do the following activity in the last month?  
...read texts that are least ><5 pages long?

Did you use any computer device to do the following activities for your work in the last month?  
...write or edit text using a word processor?

---

### **COGNITIVE**

Reading  
Writing  
Maths  
Problem-solving  
Creativity

### **MANUAL**

Lifting  
Dexterity  
Repetitiveness/  
standardisation  
Use of computerised  
machines

### **INTERPERSONAL**

Counselling  
Selling  
Serving  
Presenting  
Teaching/training  
Persuading/negotiating  
Caring  
Team-working

### **DIGITAL**

Email/internet/social media  
Word processing  
Spreadsheets  
Data management  
Occupation-specific software  
Programming (AI)

# Measuring digitalisation

## INCIDENCE & COMPLEXITY

[In the last 12 months IF B\_EMPDUR $\geq$ 1 year]

[Since you started your main job IF B\_EMPDUR $<$ 1 year], did you have to learn to use any new [computer programs or software][computerised machinery] to do your main job?

By 'new' we mean those you started using for your main job [in the last 12 months IF B\_EMPDUR $\geq$ 1 year]. Please exclude minor or regular updates.

**[Tech used most]**

About how long did it take you to learn to use it well for your main job?

By well we mean with no or few errors and at the expected speed.

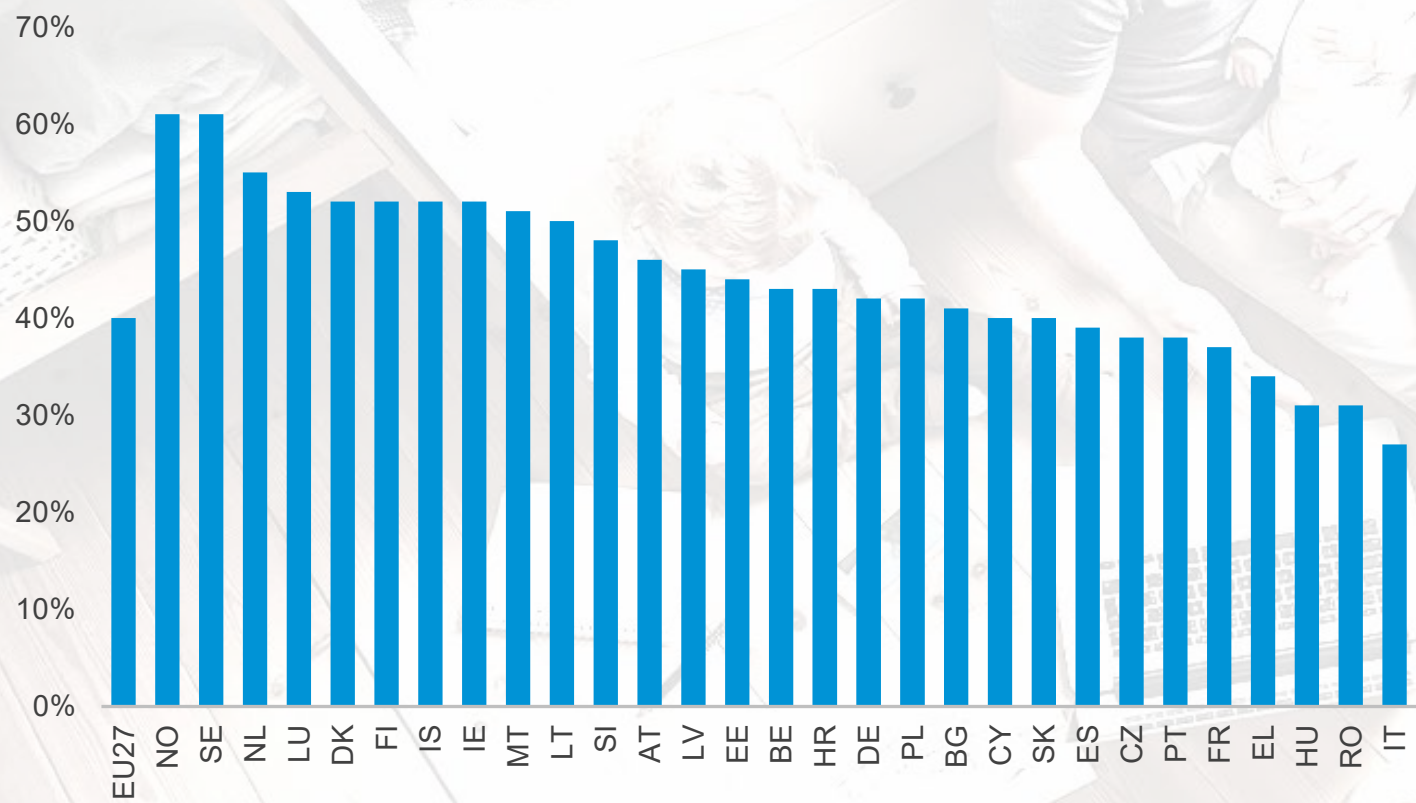
## AUTOMATION IMPACT

As a result of the [new computer programs or software IF D\_CHSFW=1] [or] [new computerised machinery IF D\_CHCM=1] you learnt for your main job [in the last 12 months IF B\_EMPDUR $\geq$ 1 year], did your main job tasks change in any of the following ways?

- No longer do some tasks I did before
- Do some new or different tasks
- Did my job tasks faster than before

# Remote work – new digital divide

**39% of EU+ adult employees worked away from their employer's premises in 2020-21**



## WFH heightened labour market inequalities

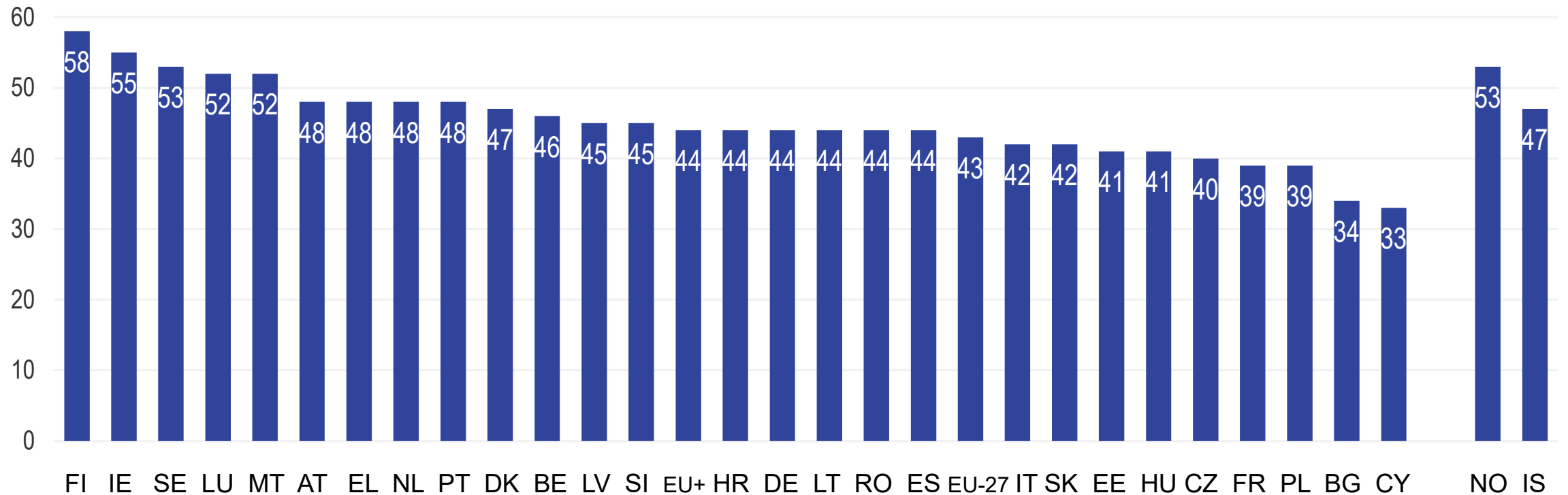
- Low- (18%) vs. high educated (41%)
- High WFH:
  - ICT (63%)
  - financial (54%)
  - professional services (46%)
- Low WFH:
  - accommodation & food services (12%)
  - utilities (19%)
  - health and social work (17%)
- Pre-COVID19 laggards smallest WFH rise

# Digital upskilling – EU unequal

## 35% of EU+ adult employees had to learn to use new digital technologies to do their main job in 2020-21

**ESJS2:** In the last 12 months, did any of the following changes take place in your workplace?

New digital technologies i.e. new computer systems/computer devices/computer programmes (Total, %)



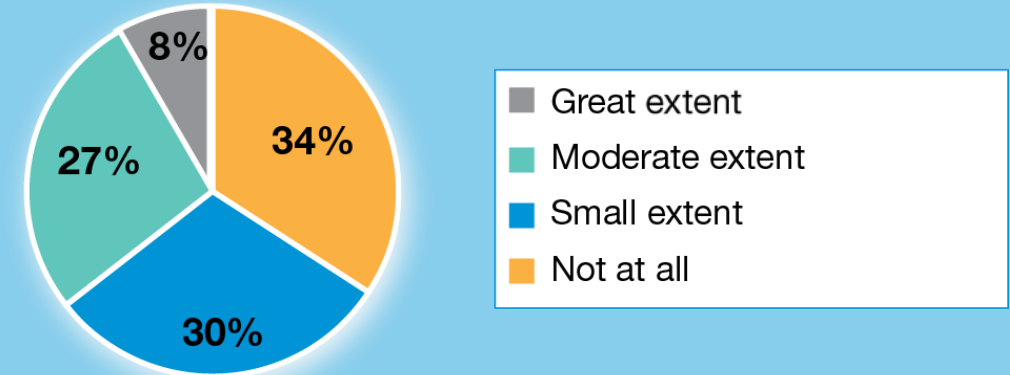
# Task automation – fear vs. reality

**45% of the EU+ workforce** believe that they **need or will need new knowledge and skills** because of the **new digital technologies in their workplace**

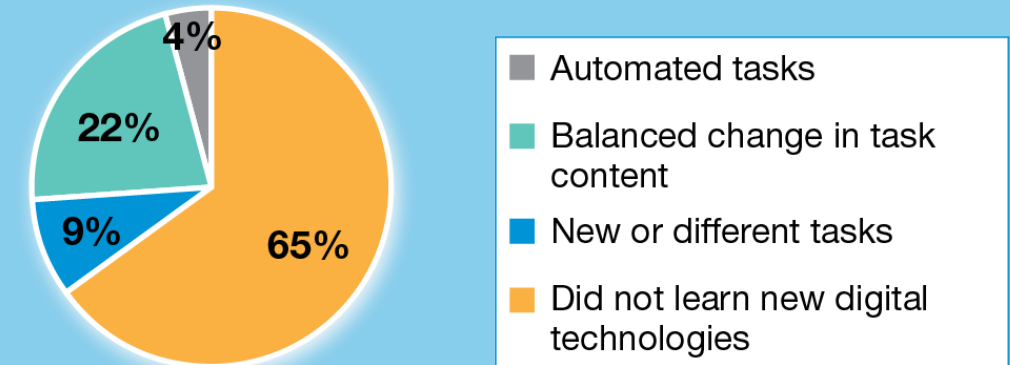
## Mostly affected by task automation

- Males
- Lower-educated
- Manual and low-skilled, elementary, jobs
- Routine jobs
- Larger-sized firms
- Agriculture, finance, utilities sectors

(a) Extent to which adults think digital technology can or will do their main job partly or fully



(b) Actual change in job tasks resulting from new digital technology



# Digital learning potential is vast, but diverse **skill gaps**

## Cedefop Digital Skills Intensity (DTI) index, EU+ countries



## Learning potential (% EU+ workers who could be trained)



Internet browsing, email, social media	20%
Write or edit text	28%
Use spreadsheets	38%

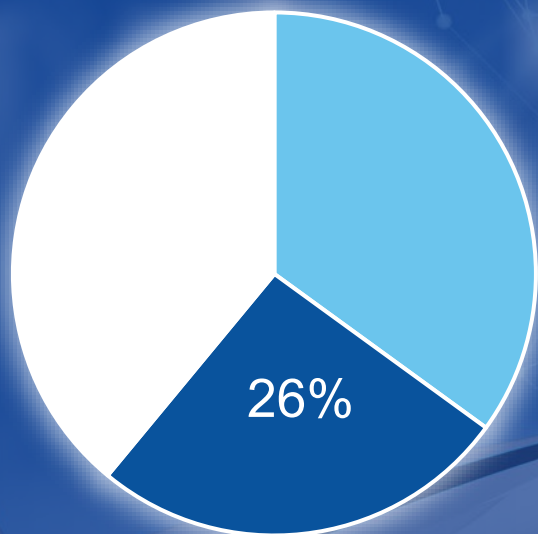


Use specialised software	50%
Prepare presentations	60%
Advanced spreadsheets	74%



Manage or merge databases	81%
IT systems, hard/software	87%
Programme or code	92%

# Those who need **digital skills training** the most don't get it

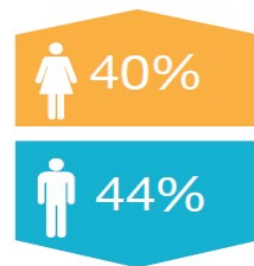


## % EU+ workers who did digital skills training

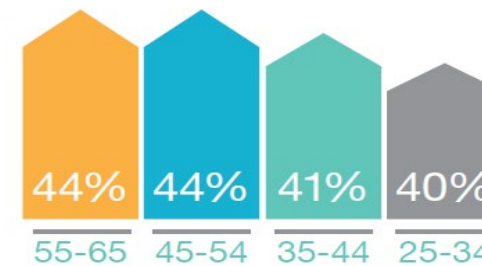
- ✓ New digital tech at work
- ✓ Digital skill gap
- ✓ Task automation
- ✓ Fear of skills (job) loss
- ✓ Positive attitudes to technology

EU+ adult workers taking part in digital skills training (*% of all who trained in past year*)

### GENDER



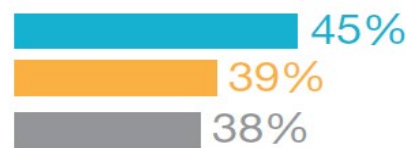
### AGE



### FIRM SIZE

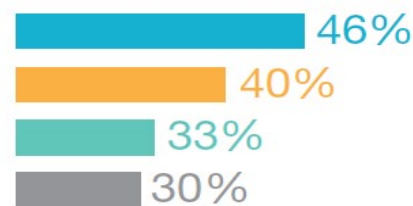


### EDUCATION



HIGH  
MEDIUM  
LOW

### OCCUPATION



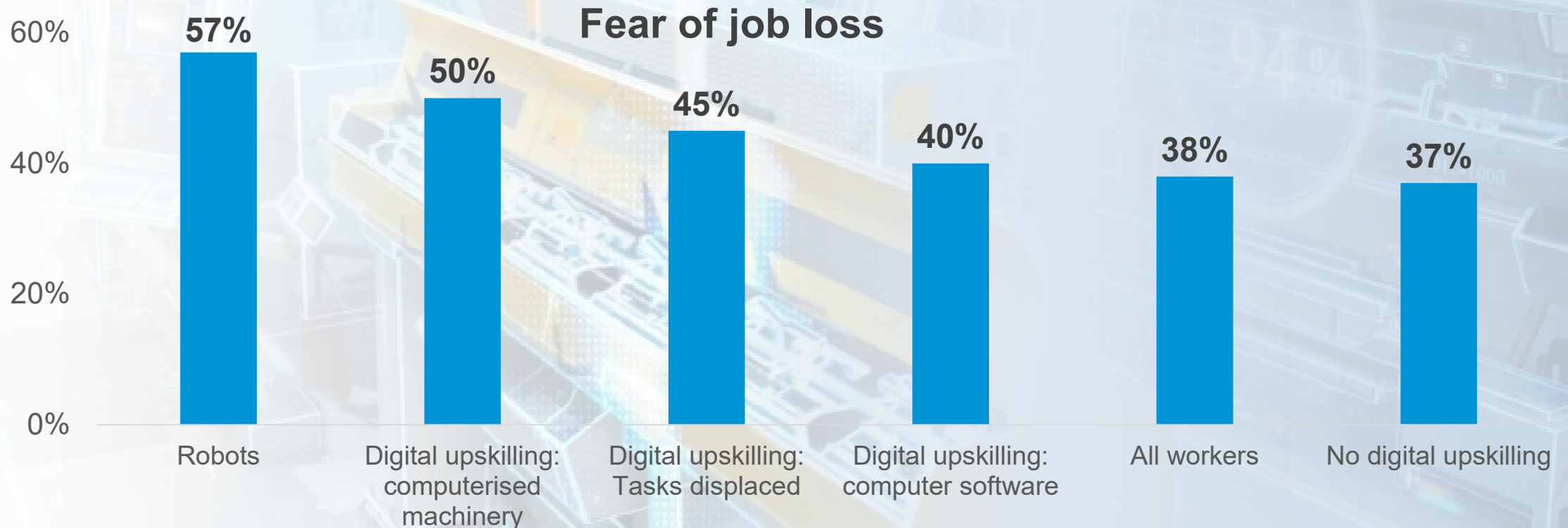
SKILLED  
SEMI-SKILLED  
MANUAL  
ELEMENTARY

### GEOGRAPHY



# Policy challenges of the digital transition

- (Some forms of) digital technology increase work routinisation & job insecurity
- Non- or low digital users unaware of potential automation risks & low technology acceptance
- Low digital jobs make less use of people's skills – who in turn don't develop their digital skills



# ESJS2 online tool



**29**  
countries  
EU-27 plus  
Norway and  
Iceland

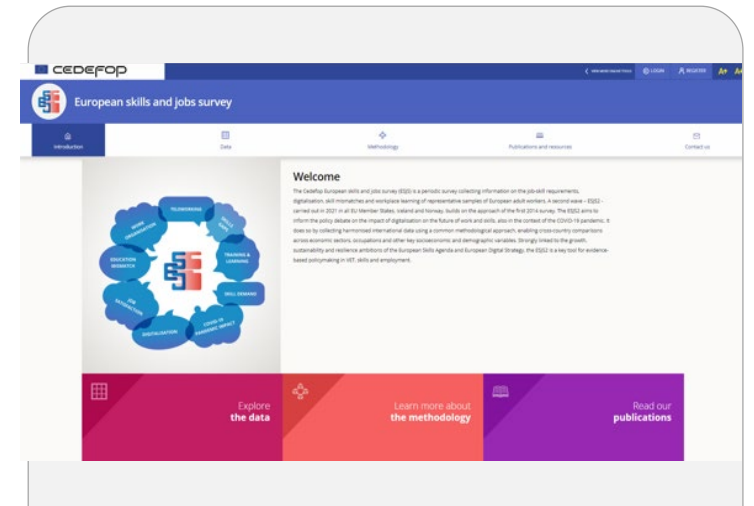
**46 213**  
EU+  
adult workers

**Representative  
data**  
of EU+  
labour markets

**More  
than  
80**  
indicators

## COMPARATIVE EU+ INFORMATION ON

- Skill demands
- Work organisation
- Remote work
- Digitalisation and automation
- Skill gaps and mismatch
- Training and learning for work
- Covid-19 pandemic impact



<https://www.cedefop.europa.eu/en/tools/european-skills-jobs-survey>

# Call for research papers: Human-centred digital transitions and skill mismatches in European workplaces

Cedefop workshop - 12 December 2024

 CEDEFOP | European Centre for the Development  
of Vocational Training

Call for Papers  
Cedefop workshop

## Human-centred digital transitions and skill mismatches in European workplaces

### Motivation

Recent improvements in autonomous digital technologies, such as the radical developments in generative artificial intelligence, in particular large language models (LLMs), and advanced robotics, can markedly affect skills demand in workplaces and foster skill mismatches (Felten et al., 2023; Eloundou et al., 2023). Most literature has focused on investigating the impact of new digital technologies on job loss and worker replacement (Acemoglu and Autor, 2011; Bessen et al., 2020; Acemoglu and Restrepo, 2020; Acemoglu et al., 2022) or the risk of automation (Frey and Osborne, 2017; Arntz et al., 2017). Technological change can substitute human capital, such as when automating technologies substitute for labour input in typically routine-intensive / low-skill jobs (Autor et al., 2003; Goos et al., 2009). It could however also

**Recent improvements in autonomous digital technologies, such as radical developments in generative artificial intelligence and advanced robotics, can markedly affect skills demand in workplaces and foster skill mismatches. In this research workshop, Cedefop invites the submission of research papers -some of which may apply to use the [second European skills and jobs survey microdata](#)- to investigate factors underlying the different forms of conjoined agency between humans and technology and how these may differ across workplace environments and human resource management practices. Understanding the conditions under which digital technologies may have positive or negative implications for workers' upskilling and skills matching outcomes is a key aim of the workshop.**

[News details](#)

[Downloads](#)

# Thank you

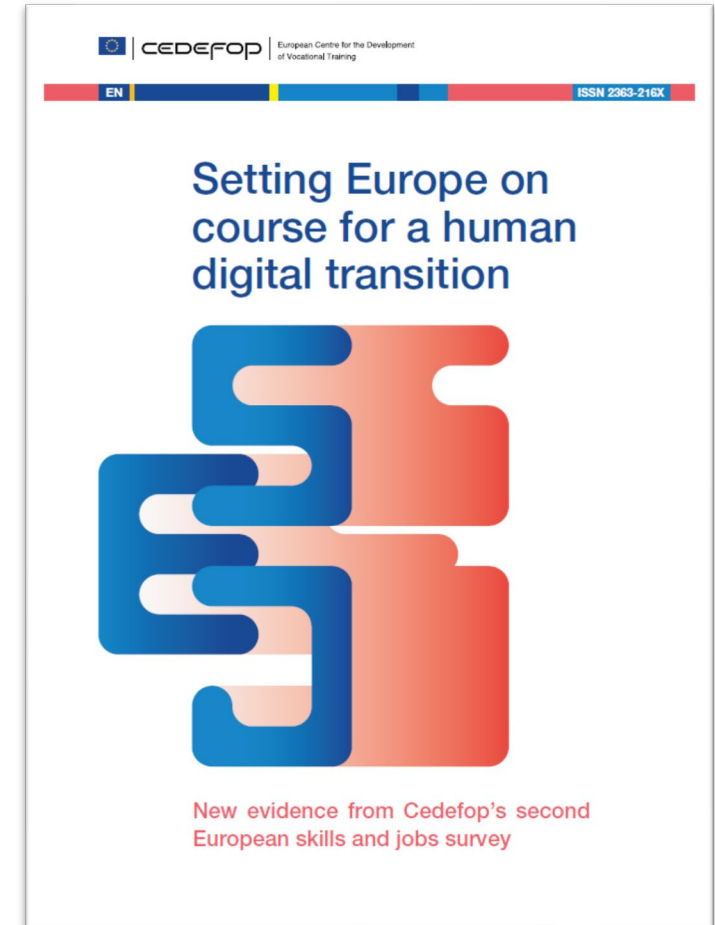


For more information

[Konstantinos.Pouliakas@cedefop.europa.eu](mailto:Konstantinos.Pouliakas@cedefop.europa.eu)

[www.cedefop.europa.eu](http://www.cedefop.europa.eu)

Follow us on social media



**CEDEFOP**

European Centre for the Development  
of Vocational Training