Digitalisation of jobs and age segregation in digital tasks[1]

Evidence from the Cedefop's 2nd European Skills and Jobs Survey 2021

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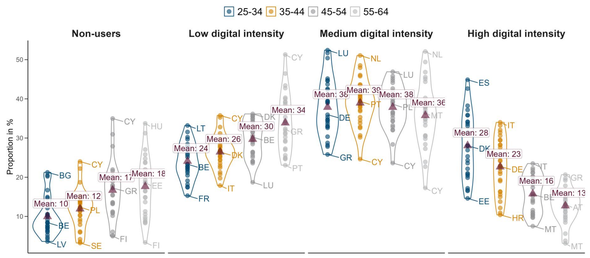
Introduction

The digital transition has a profound impact on how people work. With the continuous introduction of new digital technology into the workplace, it is becoming essential for workers to acquire the skills and competencies needed to use it effectively. However, not all workers are equipped with the skills required to adjust to the spread of digitalisation and the concomitant shift in job tasks; especially older workers tend to be disadvantaged in terms of digital skills (Falck et al., 2022). These skill disparities are also reflected in labour market outcomes, with older workers facing greater barriers to performing more complex digital job tasks, risking the widening of wage and skill gaps - especially without appropriate training measures. Our study therefore investigates age disparities in digital skill intensities, participation in IT training, and wage returns within digital skill intensity categories.

Figure 1. Employment distribution by age group across different categories of digital skills intensity



- Employment tends to be concentrated in medium digital intensity category.
- Cross-country variation most pronounced among older generations in non-user and medium digital intensity categories and among younger generations in high digital intensity category

Empirical Analysis Overview

Data and Sample Selection

The ESJS2 survey, conducted in 2021, includes 45,000 employees aged 25–64 from 27 EU countries, Iceland, and Norway. It collects detailed data on socio-demographics, job characteristics, and work tasks, with a focus on digital tool use. The Digital Skills Intensity (DSI) index, our main metric of interest, measures both the breadth (number) and depth (complexity) of digital activities. It classifies employees into four categories—no, low, medium, and high DSI—based on tasks ranging from basic web browsing to complex programming.

Method

We use weighted (ordered) logistic regressions and weighted OLS regressions to estimate the following specifications:

Digital Skills Intensity Index as Dependent Variable

$$P\{DSI_i = \{0,1,2,3\} | A_{ij}, G_{ij}, Job_{ij}, X_{ij}^n\} = \alpha + \beta A_{ij} + \mu G_{ij} + \sigma A_{ij} \times G_{ij} + \rho Job_{ij} + \gamma_n X_{ij}^n + \varepsilon_{ij}$$

Upskilling as Dependent Variable

$$P\{NewTech_i = \{0,1\} | A_{ij}, G_{ij}, Job_{ij}, X_{ij}^n\} = \alpha + \beta A_{ij} + \mu G_{ij} + \sigma A_{ij} \times G_{ij} + \rho Job_{ij} + \gamma_n X_{ij}^n + \varepsilon_{ij}$$

Gender-stratified OLS wage regression

$$lnW_{ij} = \alpha + \beta A_{ij} + \omega DSI_{ij} + \rho Job_{ij} + \gamma_n X_{ij}^n + \tau_m S_{ij}^m + \varepsilon_{ij}$$

where A_{ij} is a categorical variable with ten-year age categories, G_{ij} stands for gender, Job_{ij} refers to industry–occupation pairs, the vector X_{ij}^n includes demographic (education, urbanisation) and employment controls (tenure, firm size, type of contract, work hours).

Results – Digital Skills Intensity

Figure 2. Ordered Logit Results: Digital skills intensity

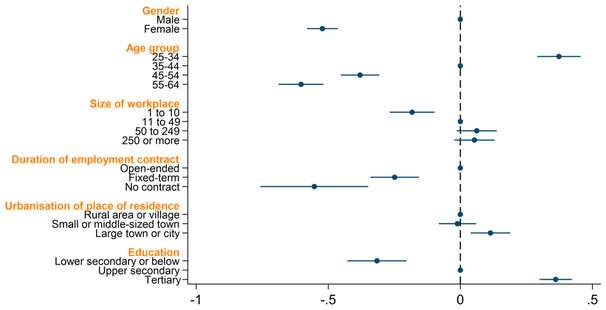
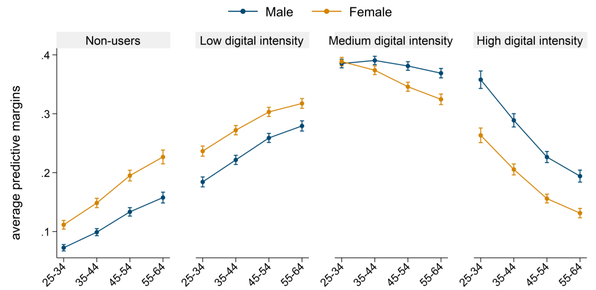


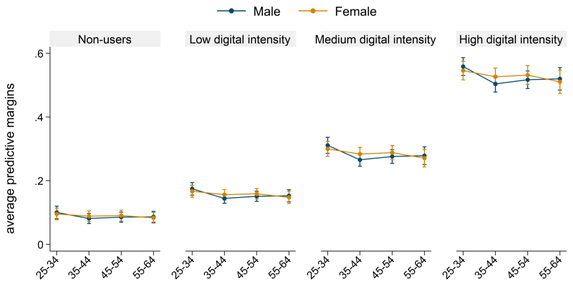
Figure 3. Digital skills intensity: average predicted probabilities by age group and gender



- Younger workers are more likely to work in positions requiring frequent and complex use of digital technology, while older workers tend to occupy roles needing lower or no digital skills.
- Women are less likely to perform medium to high digital intensity roles.
- The gender gap increases with age for medium digital intensity tasks.

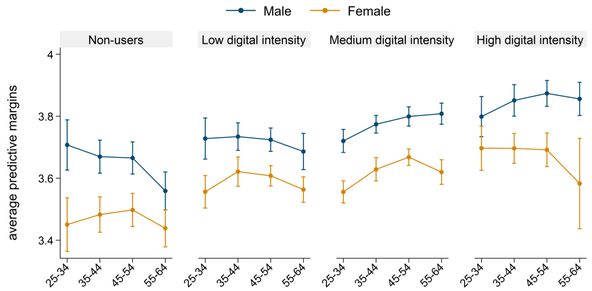
Results – Training and Wages

Figure 4. Training participation by digital skills intensity: average predicted probabilities by age group and gender



- The probability of training participation increases with digital skills intensity, but there are neither significant gender nor age gaps

Figure 5. Average predicted wages by digital skills intensity, age group and gender



- Higher DSI is associated with higher hourly wages, but age-related wage patterns differ: wages increase with age for medium and high DSI (especially for men) and decrease for low DSI and non-users.
- The GPG narrows with age for low DSI and non-users but widens for medium and high DSI

[1]This research was conducted as part of a project supported by the OeNB Jubilee Fund (Project No. 18934).