MOVING ACROSS JOBS: MAPPING SKILLS DISTANCES TO INFORM TRAINING NEEDS

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Digitalisation requires **workers** to be **more mobile**

**Affected workers need to adapt to changing jobs and/or find new jobs.**

**Policy will need to support them** (e.g. matching, re-training).

**Public** resources can be **more efficiently used** if workers can more easily adapt to new jobs or **switch to occupations that are “close” to their previous ones.**

**Evaluate the distances between occupations in terms of multidimensional skill requirements** (cognitive and specific skills) using PIAAC data for 31 OECD and Non-OECD countries.
WHAT **SKILLS** ARE NEEDED TO MOVE TO A **NEW OCCUPATION**?

SHEDDING LIGHT ON THE BALANCE BETWEEN **INITIAL EDUCATION** AND **ADULT LEARNING**
COGNITIVE SKILLS ARE DEVELOPED THROUGH INITIAL EDUCATION

- Literacy
- Numeracy
- Problem solving
- Readiness to learn

SPECIFIC SKILLS ARE DEVELOPED THROUGH ADULT LEARNING AND LEARNING ON THE JOB

- ICT
- Management/Communication
- Accounting/Marketing
- STEM-Quantitative
- Flexibility
QUANTIFYING SKILL DISTANCES BETWEEN OCCUPATIONS

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QUANTIFY THE COGNITIVE SKILLS DISTANCES IN TERMS OF YEARS OF EDUCATION NECESSARY TO CLOSE THE GAP

MEASURE THE DISTANCES IN TERMS OF TASK-BASED SKILLS AND ANALYSE WHICH TYPE OF TASKS DRIVE THE DIFFERENCE
A new measure for skill distances between occupations considering the direction of the distance (Nedelkoska et al., 2015, mimeo)

For a switch from occupation A to B the skill distance measure includes 2 numbers:

**Skill shortage** - Weighted sum of the skill differences for all skills of the skill portfolio that show higher levels in occupation B (compared to A)

**Skill excess** - Weighted sum of the skill differences for all skills of the skill portfolio that show lower levels in occupation B (compared to A)

A switch can require higher levels in some skills (shortage) and lower levels in other skills (excess)
## Measuring Occupation Distances in Terms of Required General Cognitive Skills

<table>
<thead>
<tr>
<th>Occupation of Origin</th>
<th>General Office Clerks</th>
<th>Secretaries (General)</th>
<th>Tellers, Money Collectors and Related Clerks</th>
<th>Client Information Workers</th>
<th>Numerical Clerks</th>
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</thead>
<tbody>
<tr>
<td>General Office Clerks</td>
<td>0.00</td>
<td>0.26</td>
<td>0.08</td>
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<td>0.04</td>
<td>0.00</td>
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</tbody>
</table>

### HOW TO READ THE MATRIX: AN EXAMPLE

**OCCUPATION OF ORIGIN**

<table>
<thead>
<tr>
<th>OCCUPATION OF DESTINATION</th>
<th>General office clerks</th>
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**GENERAL COGNITIVE SKILLS SHORTAGE**

### Measuring Occupation Distances in Terms of Required Specific Skills

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<th>Client information workers</th>
<th>Numerical clerks</th>
</tr>
</thead>
<tbody>
<tr>
<td>General office clerks</td>
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<td>18.1</td>
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<tr>
<td>Secretaries (general)</td>
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<td>Numerical clerks</td>
<td>8.5</td>
<td>5.6</td>
<td>29.3</td>
<td>2.9</td>
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### How to Read the Matrix: Same Example

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<td>0.0</td>
<td>38.3</td>
<td>17.7</td>
<td>17.7</td>
</tr>
<tr>
<td>(general)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Tellers, money</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>3.2</td>
<td>0.4</td>
</tr>
<tr>
<td>collectors and related clerks</td>
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**Specific Skills Shortage**

SPECIFIC SKILLS AND GENERAL COGNITIVE SKILLS: HOW FAR ARE OCCUPATIONS?
MEASURING THE DISTANCE BETWEEN OCCUPATIONS, ON AVERAGE TO ALL OTHER OCCUPATIONS

Shortage in specific skills

Shortage in general cognitive skills

SHORTAGE MAINLY DRIVEN BY SPECIFIC SKILLS

SHORTAGE MAINLY DRIVEN BY GENERAL COGNITIVE SKILLS

MEASURING THE DISTANCE BETWEEN OCCUPATIONS, ON AVERAGE TO ALL OTHER OCCUPATIONS

MEASURING THE DISTANCE BETWEEN OCCUPATIONS, WITHIN GROUPS OF OCCUPATIONS

SIZE of bubbles: average shortage WITHIN groups of occupations in GENERAL COGNITIVE skills

Shortage in specific skills

Shortage in general cognitive skills

Professionnals

Managers

Technicians

Clerks

Service workers

Plant and machine operators

Craft and related trade workers

Elementary occupations

Agricultural and fishery workers

MEASURING THE DISTANCE BETWEEN OCCUPATIONS, WITHIN GROUPS OF OCCUPATIONS

Shortage in specific skills
SIZE of bubbles: average shortage WITHIN groups of occupations in SPECIFIC and COGNITIVE skills

- Managers
- Professionnals
- Technicians
- Clerks
- Craft and related trade workers
- Service workers
- Plant and machine operators
- Agricultural and fishery workers
- Elementary occupations

THE NEEDS FOR GENERAL COGNITIVE SKILLS AND SPECIFIC SKILLS TO SWITCH OCCUPATION

Shortage in general cognitive skills

Shortage in specific skills
DECOMPOSING THE DISTANCE:

WHAT SKILLS ARE NEEDED THE MOST?
CONTRIBUTION OF EACH GENERAL COGNITIVE SKILLS TO THE DISTANCE WITHIN GROUPS OF OCCUPATIONS

SHORTAGE IN GENERAL COGNITIVE SKILLS

Ongoing work - Preliminary results

The importance of lifelong learning: mobility to more skilled occupations involves shortages in BOTH general cognitive skills and specific skills

Low-skilled occupations are far from other occupations but switches WITHIN these groups may involve relatively small reskilling needs

Mobility WITHIN high-skilled occupations may involve relatively big reskilling needs

Next step: merging information on distances with estimates of the risk of automation to identify transitions away from high-risk occupations involving minimum skills shortages and excesses
The Team

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