



A Skilled Workforce – Ready to Contribute to Tomorrow’s World of Work

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Abstract. The digital transformation is rapidly changing the demand for workers’ skills, and this poses several challenges. One such challenge is how do we define ‘skills’ in the digital economy. Another challenge is who invest in workers’ digital skills? This chapter discusses policies to better measure digital skills, personal learning accounts; 2) policies focussed on training of workers; and 3) the role of intermediaries to help reduce the skills gap.

1 Introduction

The digital transformation is contributing to skill mismatch and shortages that require investments in education and employee training. Considering these challenges, several actors, including the European Centre for the Development of Vocational Training, the European Commission, the Organisation for Economic Cooperation and Development (OECD) and European Union Member States, have focussed on the question of how to achieve a better alignment of skill supply and demand.

One important question is how to define ‘skills’ in the digital economy. Although the various existing measures of worker skills are informative about shortages, these measures usually do not account for workers’ task experiences and soft skills as well as their relevance for individual employers, each with their specific workplaces and related skill needs. Another important question is whether workers, employers, some third parties or a combination of these should invest in workers’ digital skills?

Given these questions, this chapter discusses policies to better measure digital skills, personal learning accounts; 2) policies focussed on training of workers; and 3) the role of intermediaries to help reduce the skills gap.

The digital transformation is rapidly changing the demand for workers’ skills and task competencies. This way, the digital transformation is contributing to skill mismatch and shortages that require investments in employee training. In light of these challenges, several actors, including the European Centre for the Development of Vocational Training, the European Commission, the Organisation for Economic Cooperation and Development (OECD) and European Union Member States, have focussed on the question of how to achieve a better alignment of skill supply and demand, with a focus on: i) understanding how countries collect and use information on skill needs; ii) investigating cost-effective training and labour market policies to tackle skill mismatch and

shortages; iii) studying the incentives of training providers and participants to respond to changing skill needs; iv) setting up a database of skill needs¹.

Despite the extensive focus on collecting survey data to measure different versions of skill gaps, evaluating existing training policies and collecting survey data, several important challenges remain. One such challenge is how do we define ‘skills’ in the digital economy.

One definition of a worker’s skills is the formal education that a worker received during full-time education before entering the labour market. Given this definition of skill, one can then think of how technological progress has changed the demand for workers with more relative to less full-time education².

However, a more precise view would be that digitalisation is changing the demand for tasks that workers do on-the-job because some tasks can be automated, but others cannot. Consequently, digitalisation will change the demand for workers with different levels of formal education only indirectly through changes in on-the-job task requirements for workers³.

This decoupling between workers’ formal education levels and their task competencies poses the question of how to define skills when thinking about the impact of the digital transformation on labour markets⁴. In part due to this decoupling, many different classifications of skills (e.g. years of schooling, occupational or sector experience, tasks done in an occupation and soft skills such as personality traits) have been developed and are used to measure skill gaps⁵.

Although the various existing measures of skill gaps are informative about skill shortages and abundancies for the labour market, they are less accurate regarding individual workers, each with their specific formal education, task experiences and soft skills as well as for individual employers, each with their specific workplaces and related skill needs.

One solution to this problem would be to use big data and machine learning techniques to better inform individual workers about their specific skill set and help them find jobs that better match their skill set. Similarly, such a tool could be used to help employers find workers that better fit their skill requirements, thereby reducing skill gaps.

¹ OECD, *Getting Skills Right: Assessing and Anticipating Changing Skill Needs*, Chapter 4, 2016.

² This was the consensus thinking in the academic literature until recently. See, for example, Goldin and Katz, *The Race Between Education and Technology*, Harvard University Press, 2009.

³ Acemoglu, D. and Autor, D., *Skills, Tasks and Technologies: Implications for Employment and Earnings*, *Handbook of Labor Economics*, 2011, Volume 4b, <https://economics.mit.edu/files/5571>.

⁴ Goos, M., Manning, A. and Salomons, A., *Explaining Job Polarization: Routine-Biased Technological Change and Offshoring*, *American Economic Review*, 2014, 104(8), pp.2509–2526.

⁵ For an example of such a tool, see <https://www.media.mit.edu/posts/how-skills-affect-your-job-trajectory-and-their-implications-for-automation-by-ai/>, although this algorithm is not (yet) programmed to reduce skill gaps.

Additional policy recommendations are 1) digital skills personal learning accounts; policies focused on the delivery of training, career guidance services and quality assurance; and 3) policies to support intermediaries to help reduce skill gaps:

1. Enabling **digital skills personal learning accounts**, allowing workers to acquire relevant skills throughout their careers in order to stay relevant in rapidly transforming, digital labour markets. The accounts would belong to the worker and would be portable from job to job. Details such as contributions, number of hours per year, top ups, eligible expenses, withdrawal processes and taxing schemes will be determined later.
2. Scaling up **career counselling** and creating **innovative learning environments** to enable better career choices and active pursuit of relevant training for all Europeans. Career counselling could be supported through establishing quality training standards and “digital literacy” for career counsellors at the European level. Communities of practice could foster informal group learning at workplace.
3. Supporting **labour market intermediaries to reduce structural skill gaps especially for women in Science, Technology, Engineering and Mathematics (STEM), workers at risk of automation and the low-skilled**. Intermediaries (such as public employment services, outplacement offices or temporary agencies) would invest in on- the-job training provided they can recoup the training cost from employers who on their turn will benefit from trained workers.