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OECD CITY NETWORK ON JOBS AND SKILLS

DIGITAL SKILLS AND
DIGITAL INCLUSION

BRIEFING NOTE





Setting the scene

Digital transformations are changing people's lives. Digitalisation is one of the megatrends that drives the global economy and society. The pervasive impact of technology is evident in all aspects of life, including the way we communicate, access services and information, learn and work. Keeping abreast of these changes requires individuals, households and the public and private sectors to access efficient digital infrastructures and people to develop new skills that allow them to make the most of technologies (OECD, 2020^[1]).

Not all people and places have equal access to technology. In 2020, across the OECD on average, 79% of households had a computer and 88% had internet access at home, an increase of 18 and 38 percentage points respectively since 2006 (OECD, 2023^[2]). The internet has democratised information, making knowledge easily accessible to anyone with a connection. Despite the improvements in terms of access to digital infrastructure following the COVID-19 pandemic, internet access and the quality of access (i.e. high-speed broadband) differ across OECD countries and in most countries an urban-rural divide persists (OECD, 2023^[3]).

In addition to digitalisation, other megatrends including automation and the green transition have been reshaping local labour markets across the OECD. These megatrends, as well as the COVID-19 pandemic, resulted in further digitalisation and have changed work practices, highlighting the need to acquire and develop digital skills. Digital skills help people adapt to new work practices, such as remote work, but also move to different jobs when their jobs are subject to change. Overall, 14% of all jobs across the OECD are at a high risk of automation, while another 32% are likely to be affected by significant modifications (Nedelkoska and Quintini, 2018^[4]). When looking at cities and regions, the share of jobs at high risk of automation varies between 4% and 40%. Generally, capital cities and main urban centres have fewer jobs at risk of automation (OECD, 2020^[5]). This is for example the case of Berlin, Paris, London and Stockholm.

This briefing note provides an overview of the digital skills demanded, digital skills among individuals and digital skills gaps. It sets the scene for a discussion of city-level digital inclusion and digital skills strategies. The note has been prepared for the members of the **OECD city-level Network on Jobs and Skills** for the workshop that will be held in Paris on 30 November 2023.



What are digital skills?

Digital skills are defined as the ability to use digital devices and technologies effectively and confidently. These skills include for example basic computer literacy, internet usage, online communication, information retrieval, and digital security. Thanks to these competencies individuals can navigate and use various digital platforms, applications, and services.

Digital literacy refers to the ability to access, understand, communicate, and create information through digital devices and technologies. Generic skills generally refer to simple ICT skills, such as searching information online, word processing software, spreadsheet analysis, use of online communication tools), while advanced ICT skills refer to more specialised skills such as programming and coding.

Source: UNESCO (2018^[6]) A Global Framework to Measure Digital Literacy.

The impact of digital technology diffusion on local labour markets

To deliver a just digital transition, while also achieving climate targets, people need to develop a diverse skillset. While the overall impact of technology adoption is expected to be positive in terms of economic growth and productivity, there are also potential risks related to working conditions, inclusion and well-being. To reduce the potential adverse risks of current and future transitions, people need to develop a diverse set of skills. This includes skills to work alongside people, digital skills and transversal skills such as decision-making and problem-solving (OECD, 2023^[7]).

The demand for digital skills has increased in all sectors and jobs

Jobs requiring digital skills have increased in recent years. Generic ICT skills are sought in a wide range of jobs across sectors and occupations. This relates to tasks such as searching for information online, using word processing software and conducting spreadsheet analysis. The demand for advanced digital skills (e.g. coding and programming) is lower, as these skills relate to specific high-skilled tech jobs. Information collected through web-scraping across online job portals and firms' web pages shows that for example in Cork (Ireland), Madrid (Spain), and Milan (Italy) 60% and more of jobs require generic digital skills. Advanced digital skills are required in more than a quarter of jobs in Paris, Madrid and Dublin.

Across the OECD there is an increasing number of jobs requiring specialist ICT skills but many of these vacancies remain unfilled because of a lack of suitably skilled candidates.

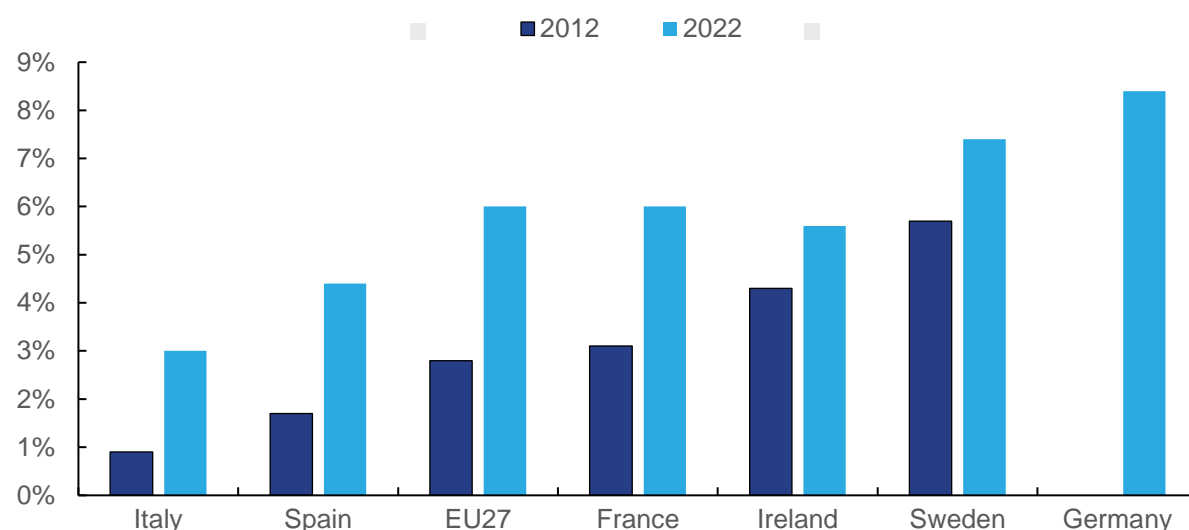


The lack of adequate digital skills represents a challenge for local labour markets across the OECD.

In tight labour markets, employers both in Europe and in the US face labour shortages, with the lack of relevant digital skills representing an obstacle to investment and growth. As the figure below shows, in Europe, the share of firms with hard-to-fill vacancies requiring ICT specialists has doubled in the last decade (Eurostat, 2022^[8]). Difficulties in recruiting ICT specialists are mainly related to the lack of applicants and the lack of skills and qualifications. Challenges are particularly persistent among SMEs that look less attractive than bigger firms in terms of salary, upskilling opportunities and career progression.

In Europe on average the share of hard-to-fill vacancies for jobs requiring ICT specialist skills has doubled in the last decade

Enterprises with hard-to-fill vacancies for jobs requiring ICT specialist skills (% of total enterprises that recruited or tried to recruit ICT specialists)



Source: Eurostat data on ICT usage in enterprises.



Individuals need to develop and update their digital skills to fully benefit from digitalisation

Having digital skills enhances the capacity of people to respond to the evolving requirements of jobs. Among the set of skills sought in fast-changing labour markets, digital skills strengthen people's opportunities to participate in all domains of life, including employment. Recent years have seen profound changes in the skills required to perform jobs and more recently, the diffusion of AI technologies, has posed new challenges and opportunities to workers and local labour markets. To effectively respond to these changes and to the increasing demand from firms, today more than ever people need to constantly update their digital skills (Cedefop, 2022^[9]; OECD, 2023^[10]).

Around 30% of Americans and 42% of Europeans lack basic digital skills. In an increasingly digitalised world, people who lack basic digital skills have limited employment prospects and cannot fully engage in society. In addition, digital transformations can increase the risks of already existing divides between people who have the opportunity to access and use digital technologies, and those who have not (National Skills Coalition, 2023^[11]; European Commission, 2022^[12]).

Not all young people have the same opportunities to develop basic digital skills. On average across OECD countries, nearly nine in ten students have both an internet connection at home and a computer. In Europe, seven in ten people aged 16 to 24 have basic digital skills compared to four in ten among people aged 55 to 64. Despite the broader access to technology, and the higher shares of basic digital skills, not all young people are able to develop their potential to embrace and quickly adopt new digital tools. For example, young people from less wealthy backgrounds, living in more remote areas and with less qualified parents are less likely to develop digital skills (OECD, 2021^[13]).

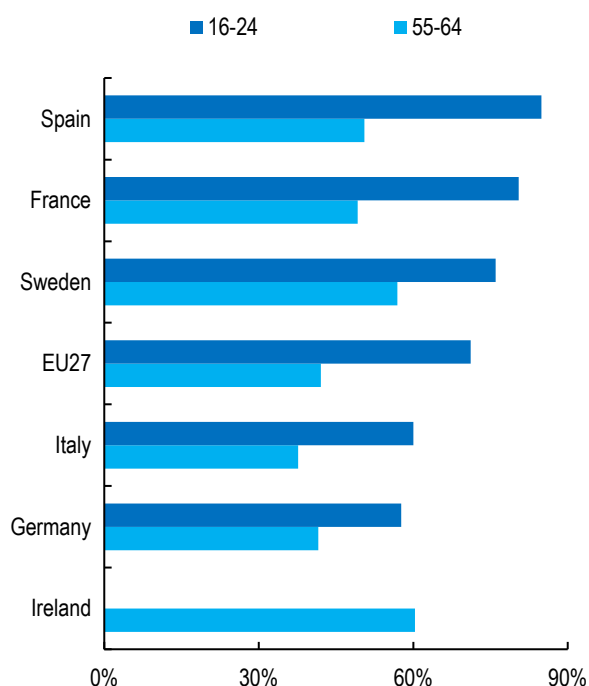
Being longer in education enhances people's opportunities to develop basic digital skills. With the increasing number of years people spend in education, individuals have more chances to get exposed to technology, access learning opportunities and training programmes and develop a culture of lifelong learning, thereby contributing to the development of basic digital skills. On average, across Europe, the share of high-skilled people with basic digital skills is nearly three times as high as that of low-skilled people (81% vs 29%; See the figure below).

Digital skills contribute to improving people's labour market opportunities and well-being, while also increasing the productivity and performance of firms.

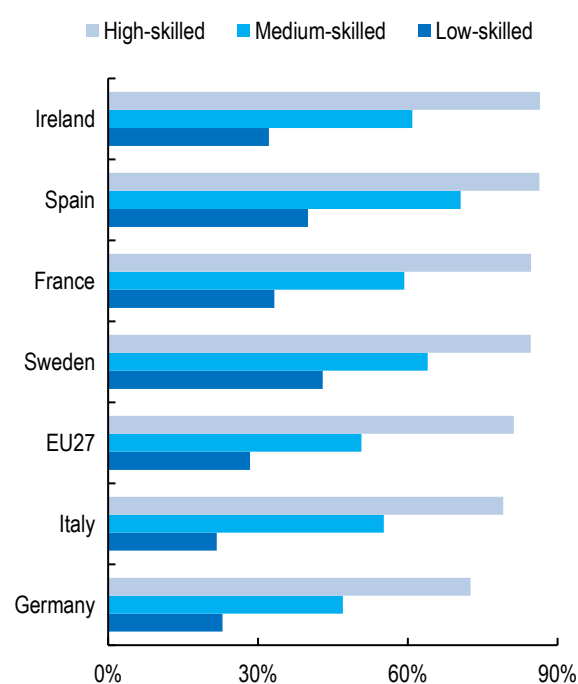
Digital skills are related to personal characteristics

Share of people having at least basic digital skills, 2021

A. By age



B. By education level



Source: Eurostat Survey on the use of ICT in households and by individuals.

Gender differences exist also for jobs requiring more advanced digital skills. Across Europe on average, the gender gap in basic digital skills among the working-age population is around 3 percentage points. Despite this narrow gap, women working as ICT specialists are still underrepresented across Europe (6.5% of jobs for men vs. 1.4% for women on average). This can be partially explained by the significant gender gap in STEM (i.e. science, technology, engineering, and mathematics) graduates. At the EU level, the Gender Equality Strategy and the Digital Education Action Plan put great emphasis on closing the digital gender gap by promoting digital skills among girls and encouraging enrolment in STEM (i.e. science, technology, engineering, and mathematics) through dedicated online platforms and festivals (European Commission, 2022^[14]). Similarly, the US Department of Education's Office of Educational Technology has engaged in promoting digital access and use for all and developed targeted programmes for girls and women (US Department of Education, 2022^[15]).

Some communities experience more challenges in developing basic digital skills. In Europe, cities with a higher share of native-born people with basic digital skills are also those where more foreign-born people have basic digital skills. In the United States, Black and Hispanic workers are more likely to lack basic digital skills (at 50% and 57% respectively) compared to around 30% of the overall population. Drivers of these outcomes include their lower access to good quality education, poorer digital access and longstanding inequalities in society. In the long term, their limited digital skills can have an impact on their labour market prospects, including their wages and stability (National Skills Coalition, 2023^[11]).

Digital inclusion for everyone – policy priorities in cities

Achieving “inclusion for all” is an important aspect of successful digital strategies. To ensure people of all ages and from different communities fully benefit from the digital transition, policies and programmes should target those with limited/no digital access and address gaps in basic digital skills. An important aspect thereby is the collaboration among different stakeholders. Recent digital strategies in both Europe and the US have identified digital inclusion as a key priority and several actions have been taken to reduce digital gaps. Cities play an important role in implementing and complementing national strategies by providing effective support to their residents in relation to the following dimensions: 1) Digital access, 2) Basic digital skills training, 3) Making ICT occupations and the tech industry more inclusive, and 4) Preparing youth for the labour market.

1. Digital access

Access to digital devices and internet connection is the first step towards digital inclusion. In the digital era, providing equitable access to digital infrastructure has become a prerequisite for inclusion and participation in society. Despite having better and faster internet connections cities still face challenges in ensuring all people have access to technology. One of the reasons is that people in certain communities do not have a computer at home or in another easily accessible location (Cedefop, 2023^[16]). Research for the UK shows that groups particularly at risk of digital exclusion are older citizens, the most financially vulnerable, those not working, and people living alone (Ofcom, 2022^[17]). In the US, many cities, regions and states have developed partnerships to improve broadband and digital inclusion, with positive effects on people’s well-being and business prosperity (National Telecommunications and Information Administration, 2023^[18]). In Paris (France), the [Centre Picoulet](#) provides access to computers for people who need to search for jobs or conduct online administrative tasks, and organises free training to develop basic digital skills for more disadvantaged adults.

Questions to cities:

- What is the role of cities in making technology adoption more inclusive?
- Does your city have a policy or strategy to foster digital access for residents with no/limited digital connections?
- Does your city have targeted programmes or partnerships to improve digital access?

2. Basic digital skills training

A lack of basic digital skills and access can have a huge negative impact on individuals’ lives, leading to poorer health outcomes and a lower life expectancy, increased loneliness and social isolation, and less access to jobs and education. As digital exclusion can lead to a vicious circle of further exclusion from society, governments and stakeholders at various levels aim to address this challenge (GoodThingsFoundation, 2023^[19]). In the United States, the Digital Equity Act aims to help people from more disadvantaged communities develop digital skills as well as obtain access to broadband and devices. The EU included basic digital skills for all citizens in its Europe 2020 strategy. The European Court of Auditors, however, notes that across the EU there has been little progress in increasing digital access in recent years and only 2% of European Social Fund spending in the period 2014-2020 specifically addressed digital skills training (European Court of Auditors, 2021^[20]). The European Commission now has set a target to increase the percentage of citizens with basic digital skills to 70 % by 2025. To counter digital exclusion, England (United Kingdom) has introduced the right to free digital education for adults with no or low digital skills (Department for Digital, Culture, Media & Sport, 2017^[21]).

Access to basic digital skills training needs to be “low-threshold” to ensure that those most in need take up training offers. People with lower skills tend to be less likely to participate in any type of training as the opportunity costs often appear too high and they do not see the immediate benefits. This is true also for digital training. Recent OECD work highlights the importance of promoting interest (e.g. by raising awareness of the benefits of training, offering flexible solutions and creating innovative learning opportunities such as gamification) in adult learning as a key tool for low-skilled workers to benefit from the gains stemming from digitalisation (OECD, 2021^[22]). For example, in Paris (France), [Konexio](#) provides free digital training to more disadvantaged people, such as migrants, refugees, job seekers and early school leavers. Their training covers different types of courses, including basic digital skills.

Questions for discussion:

- Does your city have a policy or strategy to increase basic digital skills for all residents?
- Does your city have specific programmes for basic digital skills training? Who are the partners in the delivery and how are these programmes financed?
- Has your city developed ways to incentivise low-skilled people to participate in digital training?

3. Making ICT occupations and the tech industry more inclusive

Major cities around the globe strive to attract the tech industry, which requires the ability of cities to both produce and attract talent. Against the backdrop of labour shortages in ICT occupations and the tech industry, an important element is to foster diversity and inclusion in these occupations. In the last decade, the city of Paris has developed several initiatives to make the tech industry more inclusive through collaboration with employers and training institutions. The *Diversi’Tech* event in Paris on 29 November will celebrate the success of the city in making ICT occupations more accessible to people from disadvantaged communities.

People from disadvantaged communities as well as women are often underrepresented in high-skilled ICT occupations and the tech sector. The increasing awareness of the benefits of inclusion in the workplace is not sufficient to make companies operating in the tech sector more diverse. Efforts to support greater diversity need to consider both hiring practices and ways to help those less represented stay and progress in their careers. Several initiatives at the local level can support people from underrepresented groups to find their way to employment in ICT positions and the tech sector.

Questions for discussion:

- What is the role of cities in attracting the tech industry and ensuring that the tech industry and other employers seeking tech talent have access to the talent they seek?
- Does your city have programmes that support the development of advanced digital skills for example for underrepresented groups or as an alternative career? Who are the partners in the delivery and how are these programmes financed?
- Who does your city partner with to ensure ICT occupations and the tech industry are more inclusive?

4. Preparing youth for the labour market

Education institutions play a key role in preparing young people for the world of work. To reap the benefits of digital innovations, students need to leave education with the skills needed to thrive in increasingly digital economies and societies (van der Vlies, 2020^[23]). Despite increasing access to internet connections and digital devices, young people from more disadvantaged groups leave education without having adequate digital skills. Through collaboration with local schools and colleges, and partnerships with tech companies willing to provide mentorship to students in selected neighbourhoods, cities can create an environment that not only equips young people with the necessary digital skills but also fosters innovation, collaboration, and a culture of life-long learning (OECD, 2021^[24]).

Career guidance throughout education can foster the development of digital skills. Effective career guidance facilitates a smooth transition from school to employment for young people and promotes equal opportunities and equitable access to rewarding careers for all individuals (Cedefop, European Commission, ETF, ILO, OECD, UNESCO, 2021^[25]). The development of career guidance requires the involvement of a wide range of stakeholders, including employers, trade unions and education and training institutions. Providing students with the knowledge of the types of skills required in local labour markets and the range of career opportunities available can help strengthen their willingness to develop digital skills (Mann, Denis and Percy, 2020^[26]).

Questions for discussion:

- Does your city have any policies or programmes to ensure digital access and digital skills training in schools?
- Does your city collaborate with schools to ensure current students will enter the labour force with adequate digital skills?
- What career advice services are available for youth and are there any special programmes that encourage girls/women and other under-represented groups to choose STEM education?



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How to learn more?

If you have questions, please contact:

Michela Meghnagi, Policy Analyst (Michela.Meghnagi@oecd.org) or

Kristine Langenbucher, Head of Unit Employment and Skills, (Kristine.langenbucher@oecd.org)

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