Digital Economy and Society Index (DESI) 2021

Human Capital

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1 Human Capital

In the world of tomorrow, we must rely on digitally empowered and capable citizens, a digitally skilled workforce and digital experts. Clear responses will be needed to successfully manage demographic trends and close existing skills gaps in the context of the digital and green transitions[1]. Basic digital skills for all citizens and the opportunity to acquire new specialised digital skills for the workforce are a prerequisite to participate actively in the Digital Decade[2] and to reinforce our collective resilience as a society. In addition to the target on basic digital skills (80% of people) established in the Digital Education Action Plan[3] and the European Pillar of Social Rights Action Plan[4], a Digital Compass proposes to reach by 2030 a target of 20 million employed ICT specialists in the EU, with convergence between women and men.

Already 84% of people used the internet in 2019 regularly. Nevertheless, only 56% possesses at least basic digital skills and only about one third of Europeans possesses above basic digital skills (31%). Therefore, having an internet connection and using the internet is not sufficient; it must be paired with the appropriate skills to take advantage of the digital society. Digital skills range from basic usage skills that enable individuals to take part in the digital society and consume digital goods and services, to advanced skills that empower to acquire new specialised digital skills, develop new digital goods and services.

Table 1 Human capital indicators in DESI

	EU	
	DESI 2019	**DESI 2021**
1a1 At least basic digital skills % individuals	**55%** 2017	**56%** 2019
1a2 Above basic digital skills % individuals	**29%** 2017	**31%** 2019
1a3 At least basic software skills % individuals	**58%** 2017	**58%** 2019
1b1 ICT specialists % individuals in employment aged 15-74	**3.8%** 2018	**4.3%** 2020
1b2 Female ICT specialists % ICT specialists	**17%** 2018	**19%** 2020
1b3 Enterprises providing ICT training % enterprises	**22%** 2018	**20%** 2020
1b4 ICT graduates % graduates	**NA** 2016	**3.8%** 2018

Source: DESI 2021, European Commission.

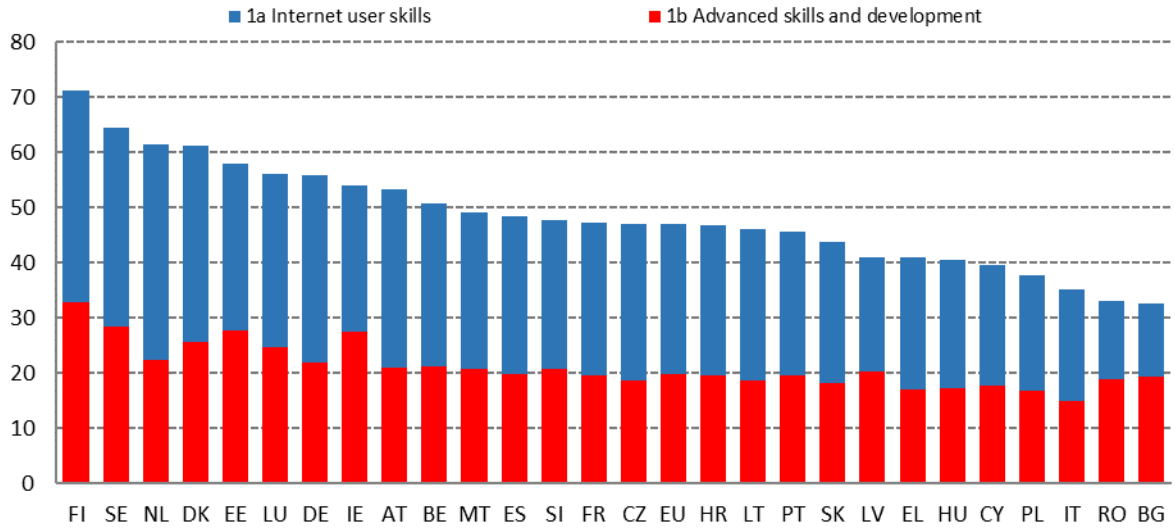
1.1 Human capital in DESI 2021

The human capital dimension of the DESI has two sub-dimensions covering 'internet user skills' and 'advanced skills and development'. The former draws on the European Commission's Digital Skills Indicator, calculated based on the number and complexity of activities involving the use of digital devices and the internet. The latter includes indicators on ICT specialists, ICT graduates and

[1] Strategic foresight report 2021, COM(2021)750 final
[2] https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en
[3] The Digital Education Action Plan (2021-2027) COM/2020/624 final. Adopted on 30 September 2020.
[4] The European Pillar of Social Rights Action Plan COM (2021) 102. Adopted on 3 March 2021.

enterprises providing dedicated ICT training. According to the latest data, Finland is leading in Human capital, followed by Sweden, the Netherlands and Denmark. Italy, Romania and Bulgaria rank the lowest. In comparison to last year, the largest increases in Human capital were observed in Finland (+2.6 percentage points), Estonia (+1.7 percentage points) and Greece (+1.6 percentage points).

Figure 1 Human capital dimension (Score 0-100), 2021



Source: DESI 2021, European Commission.

1.2 Digital skills

Since 2015, the level of digital skills has continued to grow slowly, reaching 56% of individuals having at least basic digital skills, 31% with above basic digital skills and 58% of individuals having at least basic software skills. The skills indicators are strongly influenced by socio-demographic aspects. For example, 80% of young adults (aged 16-24), 84% of individuals with high formal education[5], and 87% of students have at least basic digital skills. By contrast, only 33% of those aged 55-74 and 28% of the retired and the inactive possess at least basic digital skills. There is still substantial gap between rural and urban areas when looking at the digital skills of the population: only 48% of individuals living in rural areas possess at least basic digital skills, in contrary to the ones living in the cities (62%). For more detailed description of the digital skills, please see the Human Capital Chapter for 2020[6].

It should be noted that youth is not a determinant of digital skills and growing up in a digital world does not automatically make one digitally competent. As demonstrated by the International Computer and Information Literacy Study (ICILS)[7], which assesses digital skills of 8th-graders based on a competence test, rather than self-reporting, young people do not develop sophisticated digital skills just by growing up using digital devices. In 9 out of 14 EU Member States who have participated in ICILS, more than one third of the pupils achieved scores below the threshold for underachievement in digital competence.

[5] ISCED11 levels from 5 to 8 - formal tertiary (or higher) education

[6] The EU averages of the digital skills indicators have been recalculated. The DESI 2020 reports referred to EU28 (including the United Kingdom), while DESI 2021 EU averages refer to EU27 https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=67077

[7] https://www.iea.nl/studies/iea/icils/2018.

1.3 Use of Internet

In 2020, 91% households had access to the internet at home. 86% of individuals were regular internet users (using it at least weekly), while almost 80% were using it either every day or almost every day. Nevertheless, there are still countries where people are not using the internet, for example in Bulgaria and Greece where one in five individuals has never used it. In comparison, only about 1% of the adult population in Sweden, Luxembourg and Denmark have never used the internet.

1.4 Access barriers

Despite many Europeans using internet regularly, we observe some barriers persisting. The top reasons for not having internet access at home in 2019 remained the lack of need or interest (45% of households without internet access in 2019), insufficient skills (45%), equipment costs (25%) and high cost barriers (23%). The deterring effect of each of these factors varies significantly in strength across Member States. For example, only 5% of Estonian households without internet access mentioned costs as a barrier, but as many as 53% did so in Portugal. A lack of relevant skills is an important factor deterring households from having internet access at home. Moreover, given that this factor limits awareness of potential benefits from digitisation, it may also be among the reasons behind the large numbers of EU households that still claim not to have internet access at home, because they do not need it.

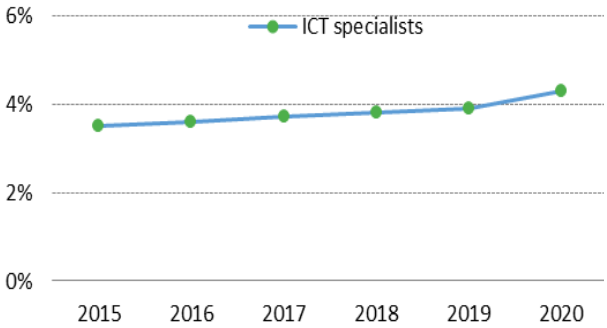
1.5 ICT specialists

The *advanced skills and development* sub-dimension looks at the workforce and its potential to work in and develop the digital economy. This takes into account the percentage of people in the workforce with ICT specialist skills, with a breakdown for female ICT specialists. At the same time, it looks at the share of ICT graduates. Following the Digital Decade communication, the key target for Europe is to reach 20 million employed ICT specialists in the EU by 2030, with convergence between women and men.

In 2020, 8.4 million persons worked as ICT specialists across the European Union. The highest number was reported in Germany (1.9 million ICT specialists) followed by France (1.2 million) and their combined share accounted for less than 40% of the EU's ICT workforce.

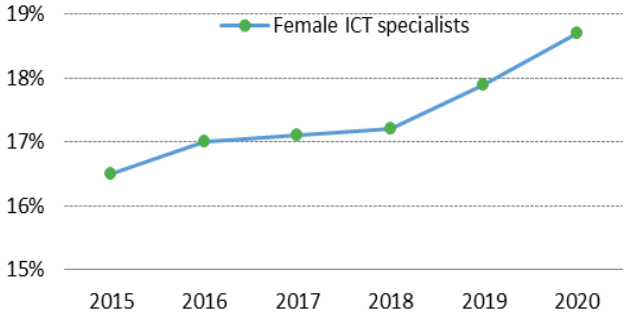
The share of ICT specialists is slowly progressing and reached 4.3% of total employment in 2020. The vast majority of ICT specialists in the EU are men (81.5% of ICT specialists were male in 2020). In Czechia, Hungary and Malta, almost every 9 out of 10 ICT specialists were men, while in Bulgaria almost every third ICT specialist was a woman.

Figure 2 ICT specialists (% of total employment), 2015 -2020



Source: Eurostat, European Union Labour Force Survey.

Figure 3 Female ICT specialists (% of ICT Specialists), 2015 - 2020



Source: Eurostat, European Union Labour Force Survey.

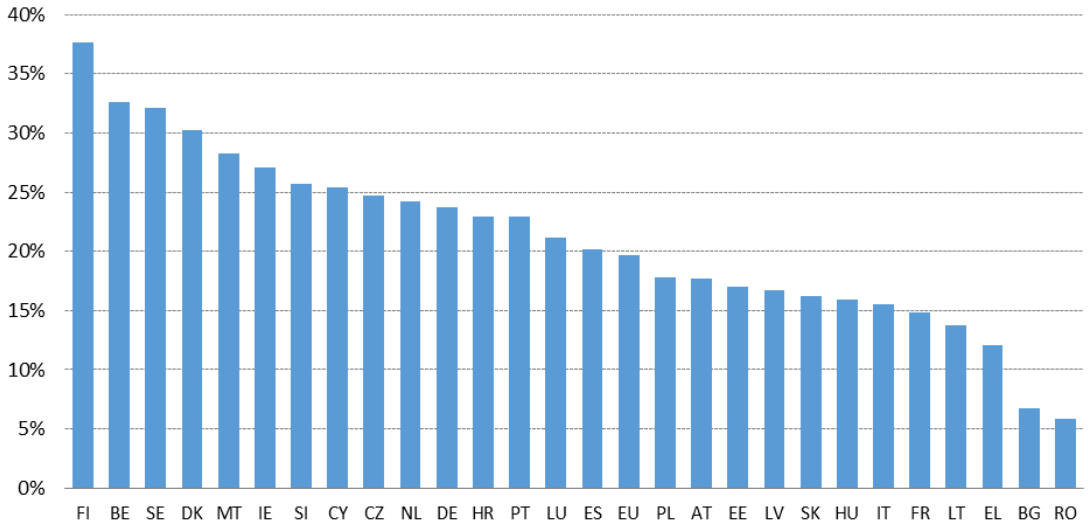
1.6 Enterprises recruiting ICT specialists and providing ICT training

In 2020, 19% of EU enterprises employed ICT specialists. Among the EU Member States, Ireland and Belgium presented the highest proportion of enterprises employing ICT specialists, with 30% each. Italy, with 13%, presented the lowest ratio of enterprises employing ICT specialists in 2020.

In 2019 55% of the EU enterprises that recruited or tried to recruit ICT specialists reported difficulties in filling vacancies. In Czechia, more than 3 out to 4 enterprises that recruited ICT specialists reported difficulties in filling those vacancies. In Austria and the Netherlands respectively 74% and 70% of enterprises which recruited or tried to recruit ICT specialists reported difficulties in filling ICT vacancies.

Enterprises are providing more and more training to their personnel to develop or upgrade their ICT skills. Overall 20% of the EU enterprises provided ICT training for their personnel. The leaders in this domain are Finland (38%) and Belgium (33%). In countries like Lithuania (14%), Greece (12%), Bulgaria (7%) and Romania (6%), the provision of such a training was considerably lower. When looking at company size, 68% of large enterprises actively provided the training, while only 18% of SMEs did so.

Figure 4 Enterprises providing ICT training (% enterprises), 2020

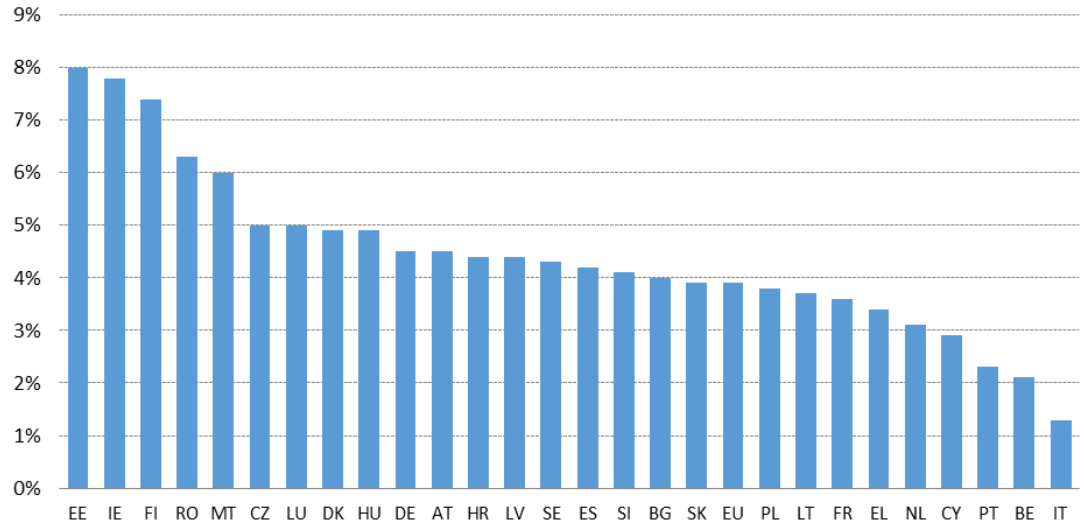


Source: Eurostat, European Union survey on ICT usage and e-commerce in enterprises.

1.7 ICT Graduates

With growing demand for ICT specialists and jobs becoming even more driven by digital technology, the EU employers are looking for staff with the necessary skills to satisfy the growing demand for ICT specialists and workers able to properly use the digital technologies. We observe a slow but overall increase of students pursuing and graduating in ICT domains. In 2019, 3.9% of Europeans graduated with an ICT diploma. The countries with the highest share are Estonia (8%), Ireland (7.8%) and Finland (7.4%). Estonia has also recorded the highest increase (+1.3 percentage point) in comparison to 2018. While, Italy, Belgium, Portugal and Cyprus are among the countries with the lowest share of ICT graduates (below 3%) in European Union.

Figure 5 ICT Graduates (% of graduates), 2019



Source: Eurostat, Education and training statistics (table educ_uoegrad03, using selection ISCED11=ED5-8 and ISCEDF_13).

1.8 EU Code Week 2020

EU Code Week[8] is a grassroots movement run by volunteer ambassadors, teachers and coding enthusiasts around the world. The initiative is backed by the European Commission and education ministries in the EU and Western Balkans.

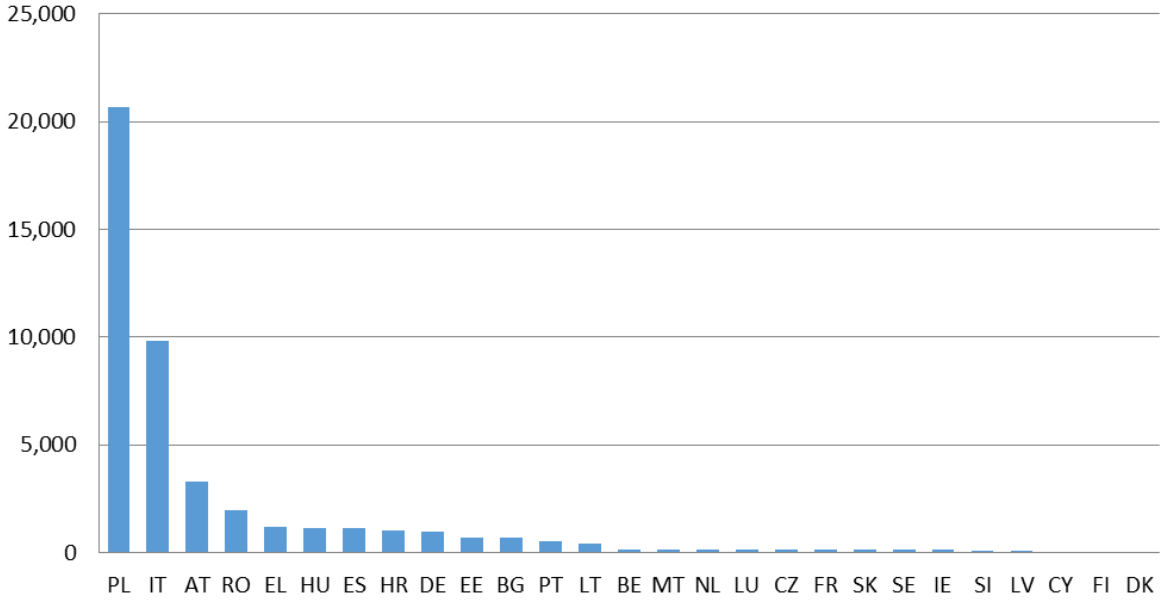
The Commission's aim is to contribute to the reduction of the number of 13-14 year olds who do not have sufficient computing and digital literacy skills by half by 2030, as outlined in the Digital Education Action Plan 2021-2027. Moreover, the initiative contributes to the targets of the Digital Decade: increasing the number of European with basic digital skills and the number of digital experts.

EU Code Week provides teachers with free resources, ready-made lesson plans, free online introductory courses and other materials to help them bring coding and technology to all subjects and classrooms.

In 2020, more than 3.4 million – mostly young people – participated in EU Code Week in schools all around Europe and the world, despite the pandemic. 84% of the activities took place in schools even with lockdowns and 44% of participants were girls. Poland (20,653) and Italy (9,833) were the top EU countries with the highest number of activities organised in 2020. There were also attracting the highest number of participants in the EU, Poland attracted 632,305 coding enthusiasts and Italy 330,021.

[8] https://codeweek.eu/

Figure 6 EU Code Week 2020 – number of EU Code Week activities in Europe



Source: European Commission

The next edition of the Code Week took place between 9 and 24 October 2021 with organisers actively registering their activities on the EU Code Week map.