



Association for International and Comparative Studies in the Field of Labour Law and Industrial Relations

18 Nov. 2021 | **FINAL CONFERENCE "SKILLS, INNOVATION, TRAINING"** | European social partners

# Skills, innovation and training

## Findings from the research

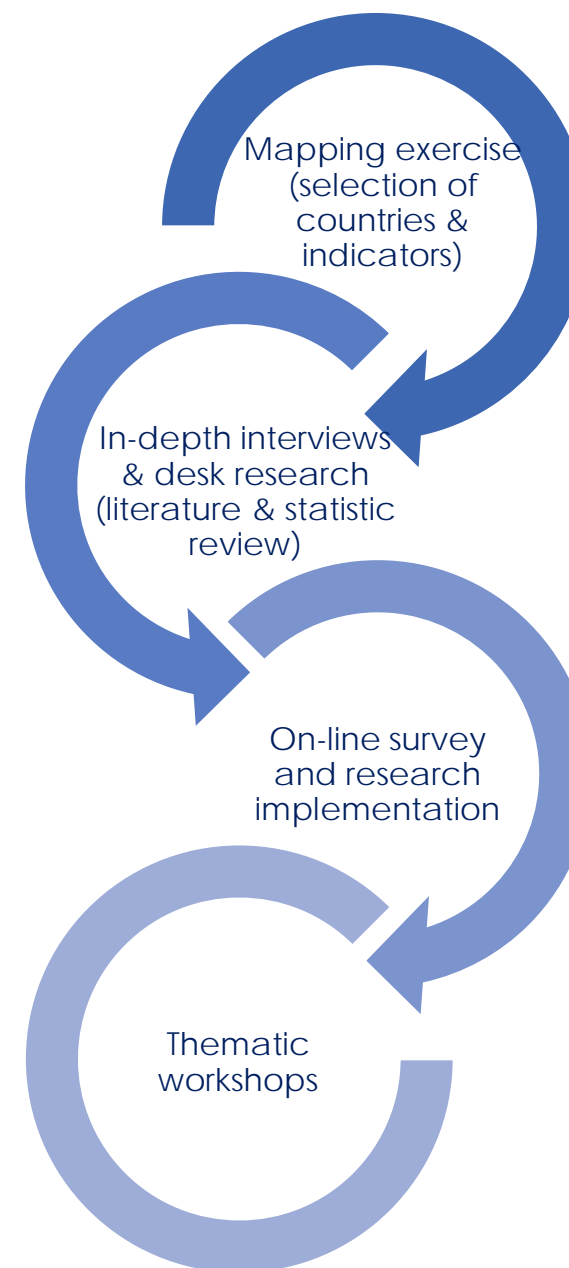
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# Research design



# Benefits of higher skills for innovation

## 1. Accelerating technical change

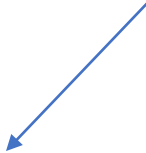
Virtuous circle between increased investment in workforce education, investment in knowledge creation, such as fundamental research, and an increased rate of implemented technical change.

## 2. Adapting to technical change

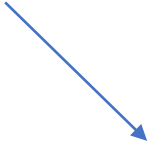
More highly-educated individuals tend to adopt innovations earlier and implement and adapt them sooner than less-educated individuals.

# Complementarity of education, training and innovation

There is an association between the **propensity of firms to innovate** and the probability of them **providing workplace training**.



the characteristics that are positively associated with a high propensity to undertake innovation are also associated with a high propensity to provide employer-funded training



when a firm introduces a new product, service, production process or organisational change, new workforce skills are often required

# Complementarity of education, training and innovation

Complementarity of education, training and innovation suggests a **virtuous circle** whereby a workforce with a higher initial level of education stimulates employers to further develop their productive capacity through training and both of these improve the capacity of the workforce to deal with technical change.

Conversely, persons with low educational attainment are much less likely to participate in either employer-sponsored training or invest in their own training. A vicious circle is evident whereby **low initial educational attainment** constrains further acquisition of knowledge and capacity to engage in innovation.

# Provision of and access to training

Facts & figures/1

Adult participation in learning, 2010 and 2019

	TIME	2010	2019	
GEO				
European Union - 28 countries (2013-2020)		9,3	11,3	
European Union - 15 countries (1995-2004)		10,7	13	
Euro area - 19 countries (from 2015)		8,1	11,6	
Belgium		7,4	8,3	
Bulgaria		1,6	3	
Denmark		32,7	35,3	↓
Germany (until 1990 former territory of the FRG)		7,8	b	8,2
Estonia		11	20,2	
Ireland		7,1	12,6	
Greece		3,3	3,9	
Spain		11,2	10,6	
France		5	19,5	
Croatia		3	3,5	
Italy		6,2	8,1	
Cyprus		8,1	5,9	
Latvia		5,4	7,4	
Lithuania		4,4	7	
Luxembourg		13,5	19,1	
Hungary		3	5,8	
Malta		6,2	11,9	
Netherlands		17	19,5	
Austria		13,8	14,7	
Poland		5,2	b	4,8
Portugal		5,7	10,5	
Romania		1,4	b	1,3
Slovenia		16,4	11,2	
Slovakia		3,1	3,6	
Finland		23	29	
Sweden		24,7	34,3	
United Kingdom		20,1	14,8	↓
Iceland		25,4	22,2	
Norway		18,2	19,3	
Switzerland		29,7	b	32,3

Eurostat (online data code: trng\_lfse\_01)

# Provision of and access to training

## Facts & figures/2

Enterprises that provided training to develop/upgrade ICT skills of their personnel (2019)

COUNTRY	2019			
	All enterprises, without financial sector (10 persons employed or more)	Small enterprises (10-49 persons employed), without financial sector	Medium enterprises (50-249 persons employed), without financial sector	Large enterprises (250 persons employed or more), without financial sector
European Union - 27 countries (from 2020)	23	19	41	70
European Union - 28 countries (2013-2020)	24	19	42	70
Belgium	36	31	37	85
Bulgaria	10	8	16	40
Czechia	25	17	46	78
Denmark	31	25	49	79
Germany (until 1990 former territory of the FRG)	32	25	51	81
Estonia	17	13	33	62
Ireland	31	27	45	77
Greece	15	13	29	61
Spain	22	18	36	63
France	21	18	37	68
Croatia	23	18	41	62
Italy	19	17	38	61
Cyprus	31	27	42	65
Latvia	18	14	30	58
Lithuania	11	8	17	53
Luxembourg	37	22	45	68
Hungary	16	15	29	67
Malta	26	22	43	61
Netherlands	1	1	1	1
Austria	18	14	36	72
Poland	13	9	26	65
Portugal	28	25	1	71
Romania	6	5	10	30
Slovenia	28	23	46	81
Slovakia	18	13	31	63
Finland	37	31	59	88
Sweden	32	27	58	80
United Kingdom	29	24	52	73
Iceland	1	1	1	1
Norway	44	41	60	80

Eurostat (online data code: isoc\_ike\_itn2)



# Provision of and access to training

Facts & figures/3

Reasons for enterprises not providing training - Enterprises not providing CVT, 2015

	Proportion of enterprises not providing CVT	Proportion of enterprises not providing CVT that cited selected reasons for not providing CVT								
		High costs of CVT courses	Focus on IVT rather than on CVT	Major CVT efforts made in recent years	Existing qualifications, skills and competences corresponded to the current needs of the enterprise	Lack of suitable CVT courses in the market	People recruited with the skills needed	Difficult to assess enterprise's training needs	High workload and limited / no time available for staff to participate in CVT	Other reasons
EU-27	29.5	29.8	24.7	13.9	81.2	12.9	53.4	15.0	31.7	17.1
Belgium	16.1	10.7	3.2	2.0	75.5	6.4	28.3	2.5	19.0	
Bulgaria	57.8	42.7	21.7	9.5	81.2	21.5	82.8	15.0	39.5	6.7
Czechia	9.4	5.6	1.0	1.4	69.1	2.3	4.3		5.6	23.3
Denmark	13.4	22.0	44.0	4.5	73.9	19.5	65.3	38.1	41.9	16.4
Germany	22.7	23.3	47.1	13.9	87.7	12.2	53.2	23.3	32.4	21.8
Estonia	13.9	8.8	1.0		43.9	2.3	15.8		10.7	36.7
Ireland (*)	22.6	14.8	7.0	3.5	78.6	9.3	51.3	10.3	27.3	15.1
Greece	78.3	28.8	16.4	2.7	65.7	13.8	55.5	9.2	42.2	12.6
Spain	14.0	38.3	4.2	22.0	84.4	31.2	61.4	20.3	47.7	33.4
France	21.1	48.3	58.3	33.5	88.5	21.0	63.4	38.8	72.6	19.0
Croatia	44.6	14.1	4.2	2.2	79.2	7.0	34.5	6.2	12.1	11.6
Italy	38.8	13.3	8.5	12.1	74.3	6.0	15.4	4.9	14.5	17.1
Cyprus	30.5	19.8	7.4	8.7	78.2	13.8	59.7	3.8	34.2	3.3
Latvia	0.1									100.0
Lithuania	38.4	63.7	15.8	12.2	87.4	26.1	85.2	45.5	40.3	6.6
Luxembourg	22.9	6.0	4.2		70.1	3.5	22.3		16.1	15.3
Hungary	56.2	30.8	14.2	6.9	85.2	13.4	63.6	10.5	22.7	16.9
Malta	38.4	20.7	6.9	3.8	79.9	8.2	60.9	11.5	39.6	15.0
Netherlands	15.0	14.1	5.9	2.2	73.1	4.4	53.5	3.1	9.5	33.3
Austria	11.9	32.0	12.2	1.8	88.2	10.8	50.0	10.9	44.0	19.2
Poland	55.3	33.7	38.3	16.1	85.2	11.4	70.4	12.1	24.9	17.7
Portugal	26.0	46.3	22.3	7.9	78.5	38.3	64.4	30.6	40.5	40.4
Romania	73.3	34.0	5.4	6.6	83.5	8.0	78.3	8.7	25.1	1.5
Slovenia	15.9	31.3	11.9	30.0	92.0	10.1	64.1	5.5	20.8	13.0
Slovakia	30.0	30.6	22.9	15.0	74.2	8.9	48.1	7.9	30.2	12.2
Finland	16.9	39.9	36.1	5.1	89.3	14.4	86.2	17.5	48.7	16.4
Sweden	6.9									
United Kingdom	14.3	19.1	23.3	13.6	88.7	18.4	73.2	30.8	36.7	10.8
Norway	0.9	44.6			100.0		30.0		2.9	
North Macedonia (*)	38.1	26.8	8.6	2.8	47.2	10.2	28.1	7.7	20.4	17.9

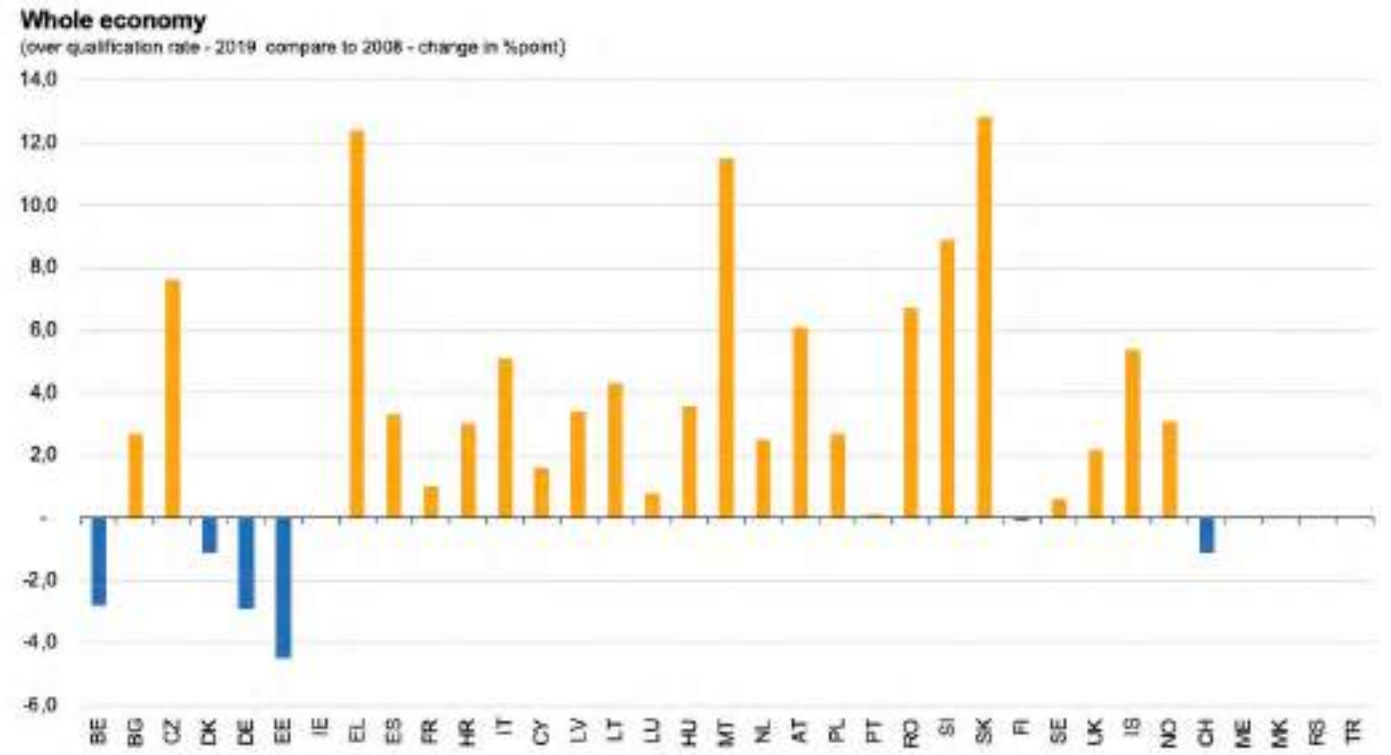
Eurostat (online data code: trng\_cvt\_01n2 and trng\_cvt\_02s)



# Provision of and access to training

Facts & figures/4

Over qualification rate (% of people aged 20-64 with tertiary education and working in ISCO 4-9) in 2019



Eurostat (experimental statistics)

# Provision of and access to training

Facts & figures/5

Skills imbalances (European Union)



# Provision of and access to training

Facts & figures/6

Providers of non-formal education and training activities, 2016  
% share of all non-formal learning activities of adults aged 25–64

	Employer	Non-formal education & training institution (%)	Formal education institution (%)	Commercial institution where education & training is not main activity (%)	Employers' organisation, chamber of commerce (%)	Non-commercial institution (e.g. library) (%)	Non-profit association (%)	Individual (%)	Trade union (%)	Other (%)
EU	33.8	19.3	7.8	9.6	4.5	3.7	7.2	5.8	1.2	5.1
Belgium	33.9	11.3	11.0	12.8	1.7	5.6	9.2	4.4	0.8	-
Bulgaria	63.5	17.5	3.2	3.6	4.2	3.8	-	2.3	1.7	-
Czechia	32.0	35.4	6.7	6.3	1.9	2.8	1.2	12.5	-	0.7
Denmark	32.0	15.5	17.6	8.6	2.0	2.9	3.3	1.3	4.2	11.1
Germany	39.7	14.3	3.3	13.6	8.4	0.9	5.4	10.1	1.7	1.1
Estonia	31.9	24.4	11.7	6.1	-	2.7	10.4	1.3	7.4	2.9
Ireland	33.9	14.2	11.6	12.6	7.4	3.1	2.5	7.6	-	5.1
Greece	17.0	17.9	13.1	4.2	4.9	-	6.9	19.1	-	12.0
Spain	27.2	14.2	16.2	3.7	4.2	7.6	6.2	3.8	2.8	11.3
France	29.2	23.0	2.9	6.7	1.3	3.8	17.1	6.5	0.8	7.1
Croatia	30.8	20.3	12.4	9.6	10.5	5.9	4.5	3.5	-	2.2
Italy	32.8	17.8	12.0	8.2	7.5	5.9	3.2	3.2	0.6	7.8
Cyprus	29.4	14.2	5.2	12.8	-	22.6	4.7	6.2	4.5	-
Latvia	34.7	22.9	6.1	11.8	3.6	3.4	1.5	2.4	-	2.4
Lithuania	12.6	24.3	20.1	8.2	15.2	3.0	1.7	8.6	-	3.7
Luxembourg	28.4	22.0	12.5	6.0	3.7	3.2	5.5	3.1	-	13.5
Hungary	57.9	13.0	4.1	3.8	7.7	1.8	3.3	3.3	-	1.0
Malta	34.6	15.8	16.3	10.2	2.0	3.3	4.5	3.8	-	7.9
Netherlands	35.7	21.5	3.8	14.9	1.1	4.3	6.3	6.7	-	-
Austria	28.5	25.9	10.4	10.2	5.2	3.8	7.9	4.7	1.1	2.4
Poland	23.2	48.7	8.6	8.0	1.4	1.1	2.0	2.4	-	3.6
Portugal	39.6	21.3	7.4	11.0	3.2	3.1	4.1	2.0	0.5	7.2
Romania	45.5	29.6	5.0	8.6	-	-	-	4.3	-	3.9
Slovenia	14.8	36.7	13.7	7.2	4.5	3.9	8.3	0.9	-	8.9
Slovakia	48.8	16.5	8.5	12.4	3.1	2.0	1.2	3.6	-	3.1
Finland	39.2	9.1	23.1	3.1	1.1	1.4	12.3	1.8	3.1	5.4
Sweden	32.9	5.1	9.8	22.1	3.3	1.6	2.0	6.1	-	11.2
United Kingdom	46.9	5.8	6.2	7.8	2.6	1.2	3.4	8.0	-	14.5
Norway	34.7	12.2	7.7	10.3	5.4	-	2.4	2.9	2.6	9.7
Switzerland	30.4	18.7	5.8	7.1	4.8	2.3	5.1	7.7	0.9	15.1
North Macedonia	24.5	30.7	18.4	4.8	9.0	5.9	2.6	-	-	4.4
Albania	37.7	17.3	10.7	-	-	-	-	5.0	-	4.0
Serbia	51.5	14.5	9.6	3.6	5.8	3.3	3.3	3.1	-	4.4
Turkey	45.2	24.8	8.3	6.8	2.1	4.4	3.9	2.8	-	1.4
Bosnia and Herzegovina	27.1	29.2	18.1	5.7	3.8	3.1	3.2	-	-	5.9

Eurostat (online data code:trng\_aes\_170)

# Provision of and access to training

## European social partner involvement in governance of education and training systems

The social partners define and manage the training system	Austria Denmark Germany	Iceland Italy Netherlands
The social partners contribute to the definition of the training system	Belgium Finland France <sup>14</sup> Luxembourg	Norway Poland Slovenia Switzerland
The social partners have a consulting role	Czech Republic Estonia Greece Ireland Latvia	Lithuania Portugal Slovak Republic Spain Sweden <sup>15</sup>
Other	Hungary	United Kingdom

OECD Policy Questionnaire: Towards resilient and inclusive collective bargaining systems (OECD, 2016, 2018), and OECD Policy Questionnaire: Readiness of Adult Learning Systems to Address Changing Skills Needs (2018).

# Provision of and access to training

How much are social partners involved in training programmes in OECD countries?

OECD Employment Outlook, 2019		Country			
1) Trade unions and / or employers finance some ad hoc training initiatives	Australia	Estonia	Latvia	United Kingdom	
	Chile	Finland	Norway	United States	
	Czech Republic				
2) Employers pay a compulsory training levy to a government fund	Canada (QB)	Korea	Spain		
	Ireland	Poland			
3) Social partners are in charge of managing training funds*	Austria	France	Iceland	Netherlands	
	Belgium	Germany	Italy	Sweden	
	Denmark	Greece	Luxembourg	Switzerland	

\* At least in several sectors. Depending on countries, funds can be compulsory or voluntary, and they can be mandated by law or agreed upon through collective bargaining

# Provision of and access to training

Selected best practices at (country/sectoral/enterprise level)

## *Joint priorities and stakeholders' cooperation in adult learning strategies*

Estonia	<p>Some processes for developing adult learning strategies build on earlier cooperation between stakeholders. In 2013/2014, the Estonian Ministry of Education and Research, the Estonian Education Forum and the Estonian Cooperation Assembly (including representatives from trade unions, employer organisations and civil society) developed the Estonian lifelong learning strategy. The involved stakeholders had cooperated previously in the development of the Estonian education strategy 2012-2020.</p> <p><b>All the stakeholders and social partners were actively involved in the development of the new lifelong learning strategies and the work continues on sectoral and horizontal programmes.</b> In addition to the work on strategy, the following specific initiative was launched in 2013 aiming at promoting partnerships with stakeholders, civil society, and social partners in general education.</p>
Netherlands	<p><b>In the Netherlands, employer organisations and trade unions jointly develop sector plans (sectorplannen).</b> Some involve additional stakeholders such as education providers and local authorities. The plans set out measures that aim to improve the functioning of the labour market in the short and medium term.</p> <p>Since 2013, sector plans have been part of a Social Agreement, which aims to make the Dutch labour market resilient to the challenges of the future.</p>
Portugal	<p><b>In order to meet the great challenges of professional training and adult qualification, social partners in cooperation with the central government are working together for updating and renovating the national qualification system, which has been created by the National Social Dialogue Committee.</b> Trade unions and social partners in general terms are subject which are relevant for the update of the professional profiles (i.e. working in close cooperation with the National Agency of Qualification and Vocational Education and Training).</p> <p>The case of ANQEP shows that to establish a sustainable new institution, the process needs to be supported both by political actors and by stakeholders such as training providers, employers' associations and trade unions. It also needs a clear purpose and the means to tackle important societal challenges. The governance of ANQEP therefore involves a broad range of stakeholders, including business associations, trade unions, firms, public and private schools, apprenticeship providers, and representatives from other government bodies.</p>



# Provision of and access to training

Selected best practices at (country/sectoral/enterprise level)

## *Collective agreements and adult learning*

Denmark	In October 2017, the Danish Confederation of Trade Unions, the Confederation of Danish Employers and the Danish government concluded a tripartite agreement on adult and continuing training for the period 2018-2021. It includes a wide variety of initiatives and over 80 commitments, such as the creation of funds for employees to undertake training on their own initiative; awareness raising activities; courses to improve basic literacy and numeracy skills; skill recognition and improved training advice and guidance. The agreement was positively received by social partners and most political parties, leading to optimism about future tripartite agreements.
Italy	In February 2021 the main Italian trade unions (FIOM-CGIL, FIM-CISL, UILM) and their employers' organisations counterparts (Federmeccanica and Assital) signed a new draft agreement for the metalworking sector which maintains the provisions concerning the right to continuous training also broadening the beneficiaries of this right (namely to employees under fixed-term contracts under certain circumstances - i.e. minimum duration of the contract-).
Sweden	Social partners' involvement in the Employment Security Councils - collective agreements on transition). <b>The Swedish Job Security Councils (JSCs) are one of the most notable examples where collective bargaining can complement public policies in enhancing labour market security and adaptability:</b> they provide support and guidance to displaced workers, even before displacement occurs, as well as access to training and reskilling opportunities in the case of plant closures and mass layoffs.



# Provision of and access to training

Selected best practices at (country/sectoral/enterprise level)

Foster awareness and a positive learning culture	
United Kingdom	<b>Unionlearn supports trade unions to help workers acquire skills and qualifications to improve their employability.</b> One of its key activities is the training of Union Learning Representatives (ULRs), who encourage the take-up of learning in the workplace, help workers identify training needs and arrange learning opportunities within their companies. Since its inception in 2006, Unionlearn has trained more than 40 000 ULRs. It provides learning opportunities to about 250 000 workers per year, including disproportionately high numbers of workers with no or low qualifications (Stuart et al., 2016). Unionlearn also manages Union Learning Fund (ULF) projects that are run by individual unions to promote the take-up of learning and skills in the workplace and government provides funding for both the ULF and Unionlearn.
Spain [company level]	<b>Ematsa has established an innovation committee in the company and this community meets on a regular basis (usually every month).</b> The committee discuss all the ideas provided by its members. These ideas come from benchmarking, from technological surveillance, and also from conversations and inputs that other members of the staff which are shared every day. Apart from that, EMATSA <b>launched an initiative which foresees meetings every two, three months in which every single contribution from the workers of the company are brought.</b> EMATSA is committed to well communicate the company innovation vision and strategy and to engage employees in supporting the innovation process. As for the company representative interviewed <i>"it is a concrete example of human capital involvement in a company, workers engagement for the innovation process. We think that we don't want only working people. We want thinking people"</i> .

# Provision of and access to training

Selected best practices at (country/sectoral/enterprise level)

Training provision: evaluation and quality assurance/1	
Sweden	<p>In some countries, social partners have a role in agencies that ensure the quality of (parts of) the adult learning system: <b>the Swedish National Agency for Higher Vocational Education (Myndigheten för yrkeshögskolan) ensures the quality of higher vocational education programmes.</b> Both trade unions and employers are represented on the agency's advisory council for labour market issues. The role of the advisory council includes the inspections of providers and programmes, including work-based training elements. The inspections entail observational visits, interviews with students, tutors, teachers and head coordinators. Based on the inspection, as well as an assessments of labour market needs, the council advises the National Agency about which training programmes should receive state grants and be included in the higher vocational education offer.</p>
Denmark	<p><b>Social partners in Denmark are involved in the 11 continuing training and education committees, which monitor adult vocational training in different sectors of the labour market.</b> One of the key inputs to the monitoring of programmes and providers is information produced through the system Vis Kvalitet. This system collects data from each participant about their satisfaction with the training via a questionnaire, as well as data from a sample of companies whose employees have attended training. Results are used by the committees to identify quality issues and develop remedial action.</p>

# Provision of and access to training

Selected best practices at (country/sectoral/enterprise level)

Training provision: evaluation and quality assurance/2	
Belgium	Social partners can also be involved in the certification of adult learning providers: Flanders (Belgium) <b>have recently introduced changes to their accreditation system to guarantee that training corresponds to labour market needs</b> . From September 2019, there are three accreditation streams for adult learning programmes that benefit from government incentives: i) automatic accreditation for certain (often more general or formal) training programmes, such as the ones provided through adult education centres and higher education institutions; ii) accreditation through social partners (Paritaire Comit��s) for training organised at the sector level; and iii) accreditation by the Flemish accreditation commission (Vlaamse erkenningscommissie) for all other training. The accreditation commission consists of social partners.
Germany	Many countries have complex multi-level quality assurance systems, which are supported by social partners. In Germany, <b>certification of trainings in the context of active labour market policies is conducted by certifying bodies</b> (Zertifizierungsstelle). One of the better-known certifying bodies, CERTQUA, is run by the leading German employer organisations (German Economic Institute, 2018). Certifying bodies, in turn, need to be accredited by the German Federal Public Employment Agency (Bundesagentur f��r Arbeit). An advisory council supports the agency in this work. Trade unions and employer organisations are part of the council. This system does not cover other subsystems of the adult learning system.
Spain [company level]	The company is involved in providing an assessment of the efficacy of the results of the workplace training also engaging workers and asking for their opinions and self-evaluation (" <b>double side evaluation</b> "). All the figures about the training provided are made available in the company social responsibility report.

# Game changing technologies and innovative approaches to the identification of new skills

Facts & figures/1

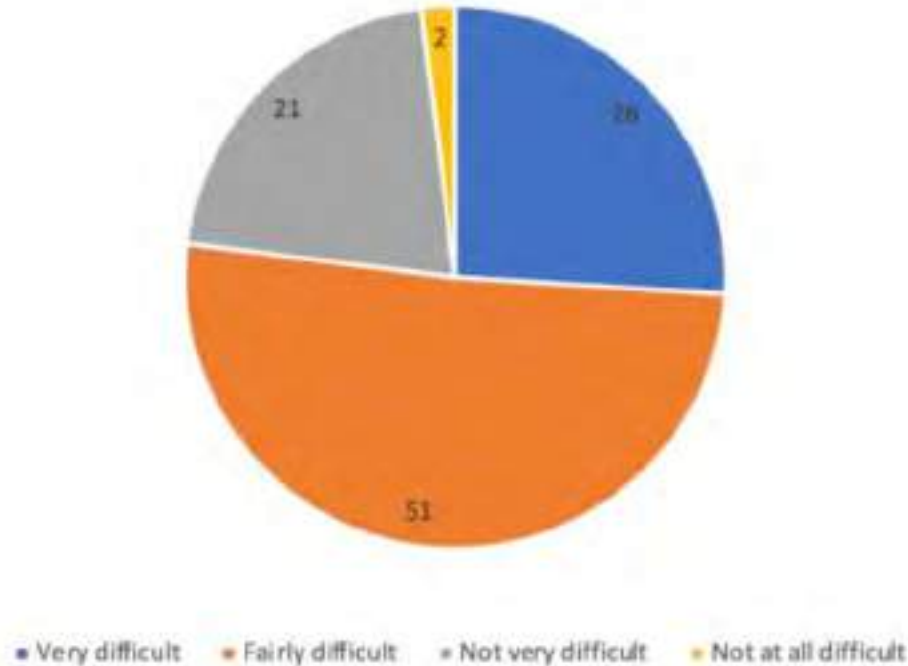
*Skill imbalances represent an impediment to investment for the great majority of European businesses and could hamper their competitiveness in the medium and longterm.*

- Ongoing megatrends (the digital and green transitions, globalisation, ageing societies) are affecting jobs and skills in different ways, from workers' displacement, to growing skills shortages and the demands for a more adaptable workforce. The need for reskilling and upskilling is greater than ever and will continue to intensify.
- Today, regardless of their size, **EU companies are already facing some skills shortages.**

# Game changing technologies and innovative approaches to the identification of new skills

Facts & figures/2

Difficulty in finding employees with the required skills (EU-27;%)

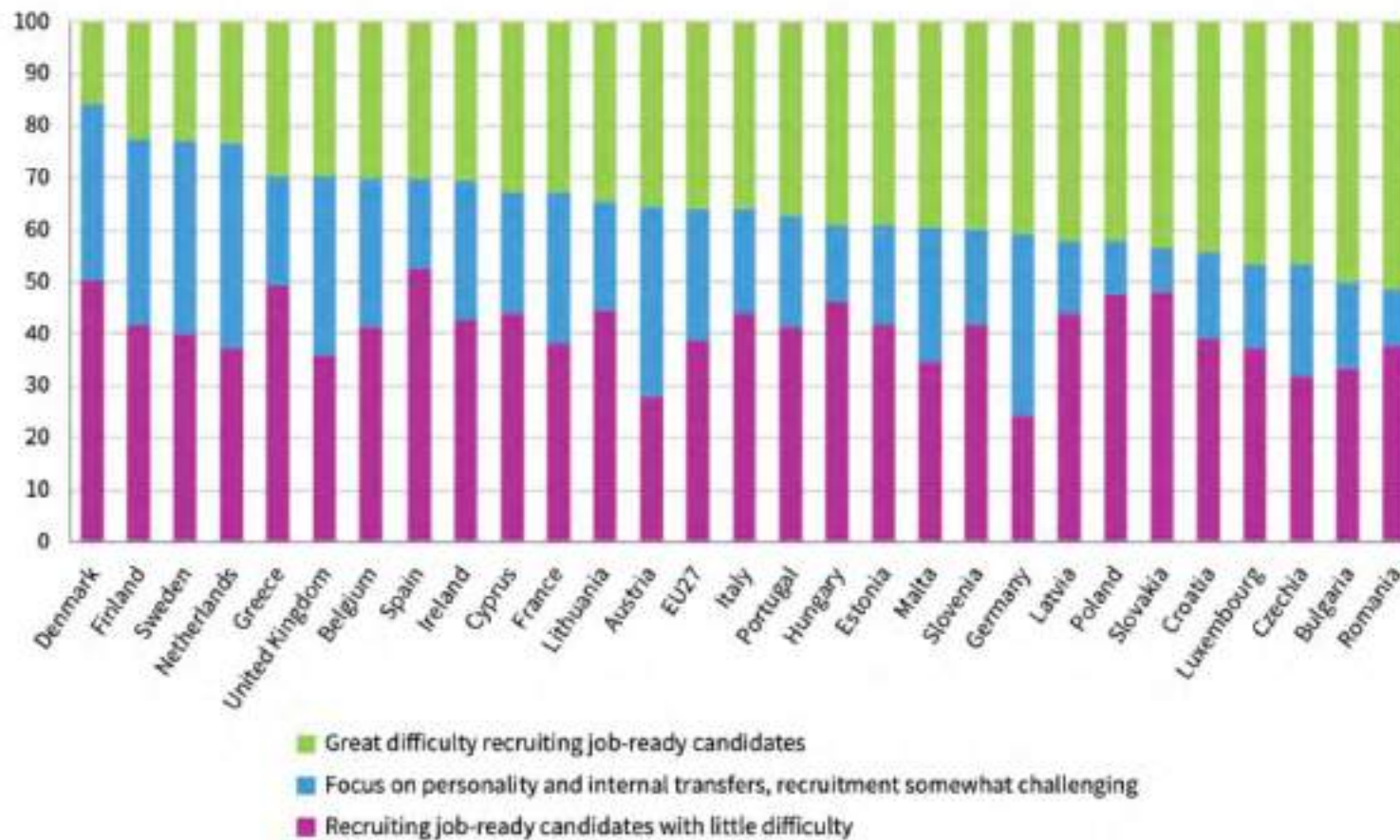


Source: Eurofound and Cedefop (2020), European Company Survey 2019: Workplace practices unlocking employee potential, European Company Survey 2019 series.

# Game changing technologies and innovative approaches to the identification of new skills

Facts & figures/3

Establishment type–recruitment, by country(%) (EU-27;%)



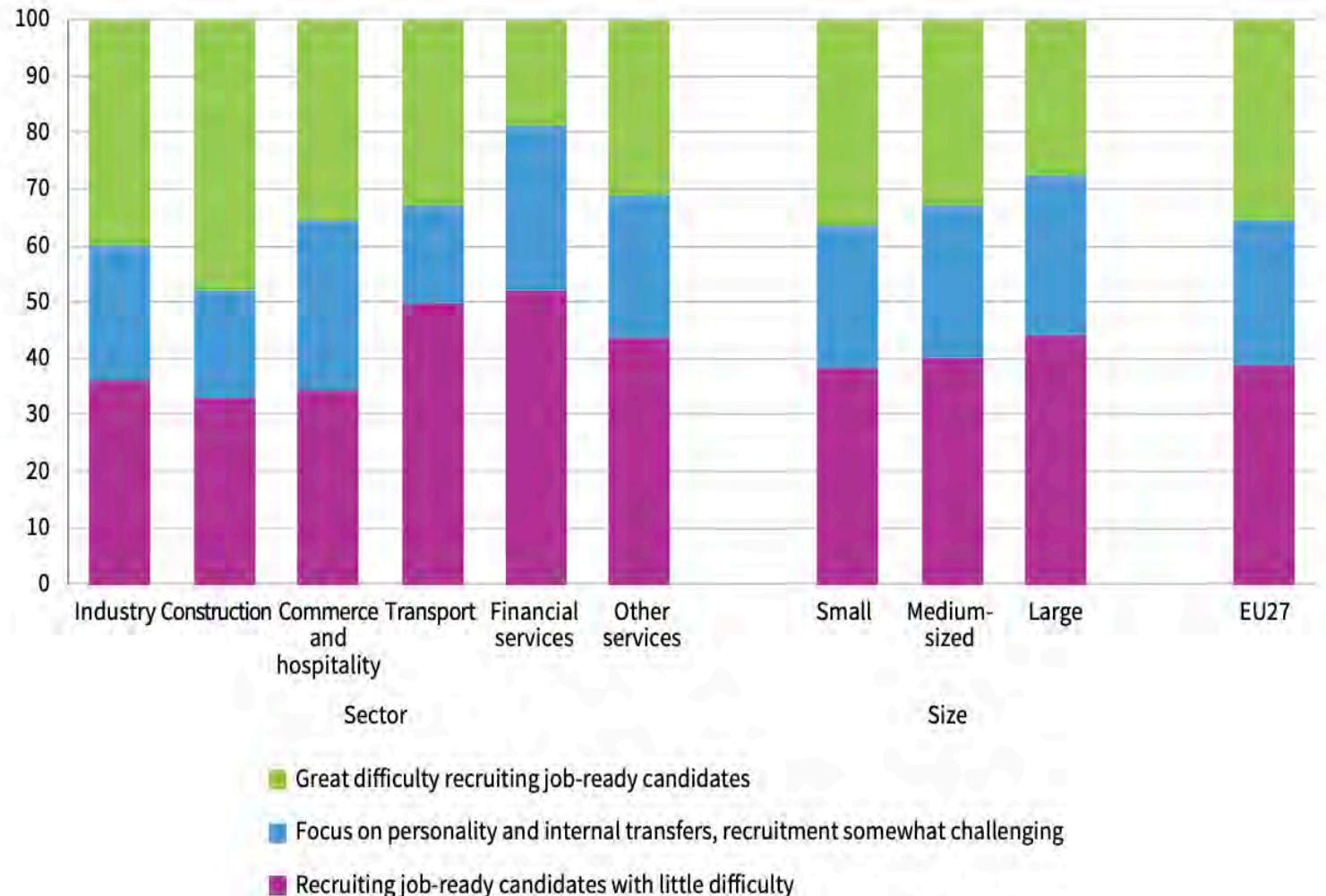
Source: ECS 2019 management questionnaire



# Game changing technologies and innovative approaches to the identification of new skills

## Facts & figures/4

Establishment type – recruitment, by sector and establishment size (%)



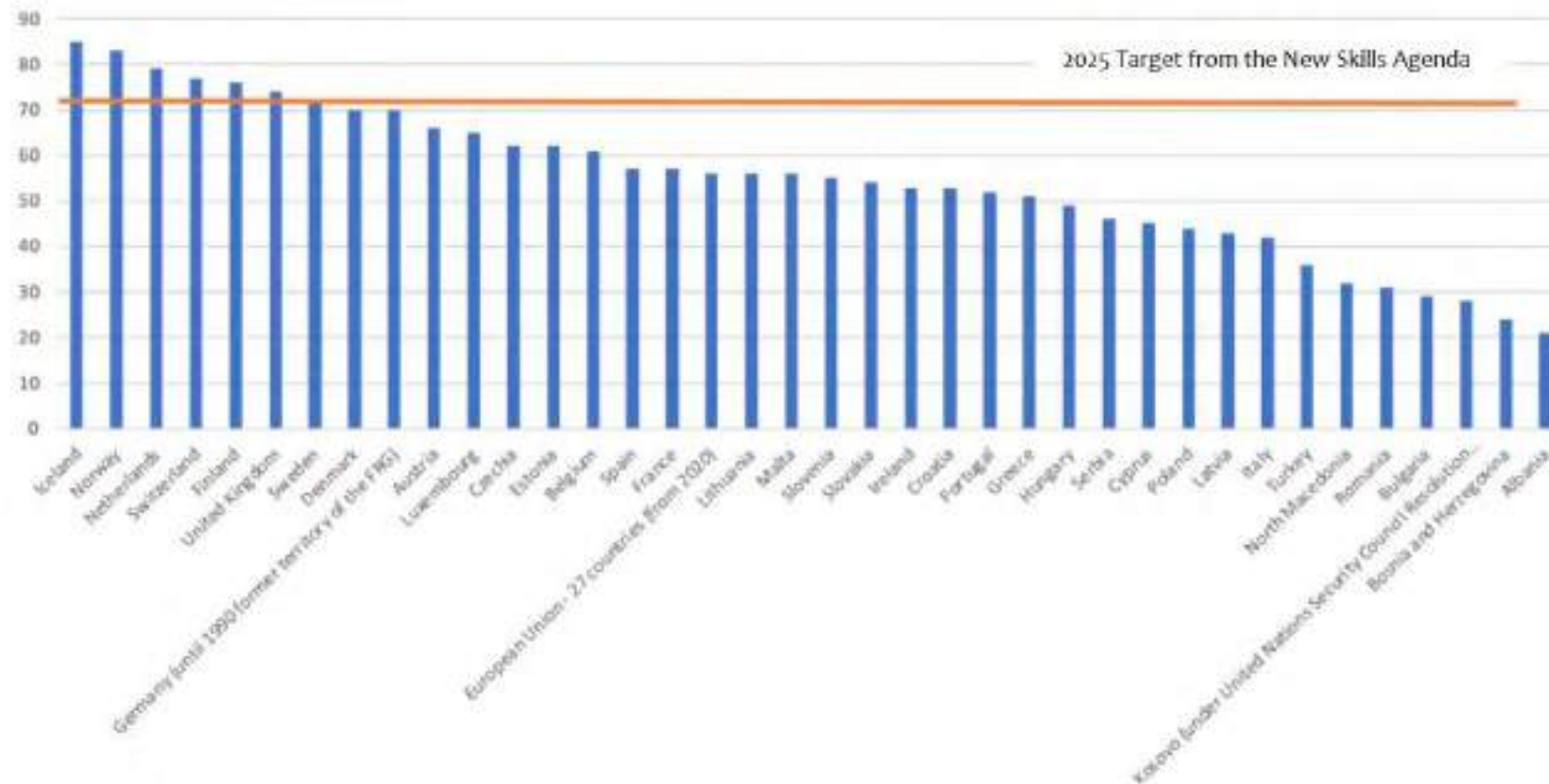


# Game changing technologies and innovative approaches to the identification of new skills

Facts & figures/5

The critical skills to be developed should therefore be related to specific current and future in-demand occupations

Individuals who have basic or above basic overall digital skills (% , EU-27)



Source: Eurostat [isoc\_sk\_dskl\_i]

# Game changing technologies and innovative approaches to the identification of new skills

## Facts & figures/6

More concretely, these **labour-market relevant skills should be identified at several levels:** through the European Skills Panorama and also through more local and industry-specific skills intelligence defined in cooperation between the relevant stakeholders.

At European level, this identification could be facilitated through the **Skills Pact** that notably builds on the Blueprints for Sectoral Cooperation on Skills.

**Companies have a crucial role to play in defining and expressing their current needs,** especially since workers may, and legitimately so, not be aware of these needs or have difficulties identifying them.

However, it would be of strategic importance **promoting the development not only of the skills defined and identified by companies in order to meet their short-term needs, but also of those skills that will be needed tomorrow and in the longer term.**

**The skills anticipation could also be carried out by public employment services as well as local and regional authorities** which will respectively ensure that the training is in line with territorial current and future demand on the labour market, as well as with a more coordinated national strategy.

# Game changing technologies and innovative approaches to the identification of new skills

## Anticipation tools

**Qualitative foresights** require less formalised (data) inputs and are easier to set up initially. They do not require extensive data series or quantitative modelling of labour market relations.

Foresights depend on the inputs from key experts and stakeholders and on the way which they are combined in methodology.

Foresight is a visionary tool which provides incentives for participating stakeholders to come up with the future they want and commit themselves to the implementation of the vision.

**Foresight is a highly interactive tool of social dialogue with representatives of the private sector.**

# Game changing technologies and innovative approaches to the identification of new skills

## Anticipation tools

**Quantitative skills forecasts** offer a consistent and detailed picture of future developments by sector, occupation, qualification or skills. They are more demanding in terms of the availability of adequate labour market data, both in quality and in the data series length.

Building and interpreting quantitative models takes time and expertise, even if they are based on established principles. On the basis of the review international experience, a good way to carry out skills forecast is to **combining (modules generating) supply by qualification, demand by sector, occupation, and possibly skills or qualification** .

# Game changing technologies and innovative approaches to the identification of new skills

Working at sectoral level

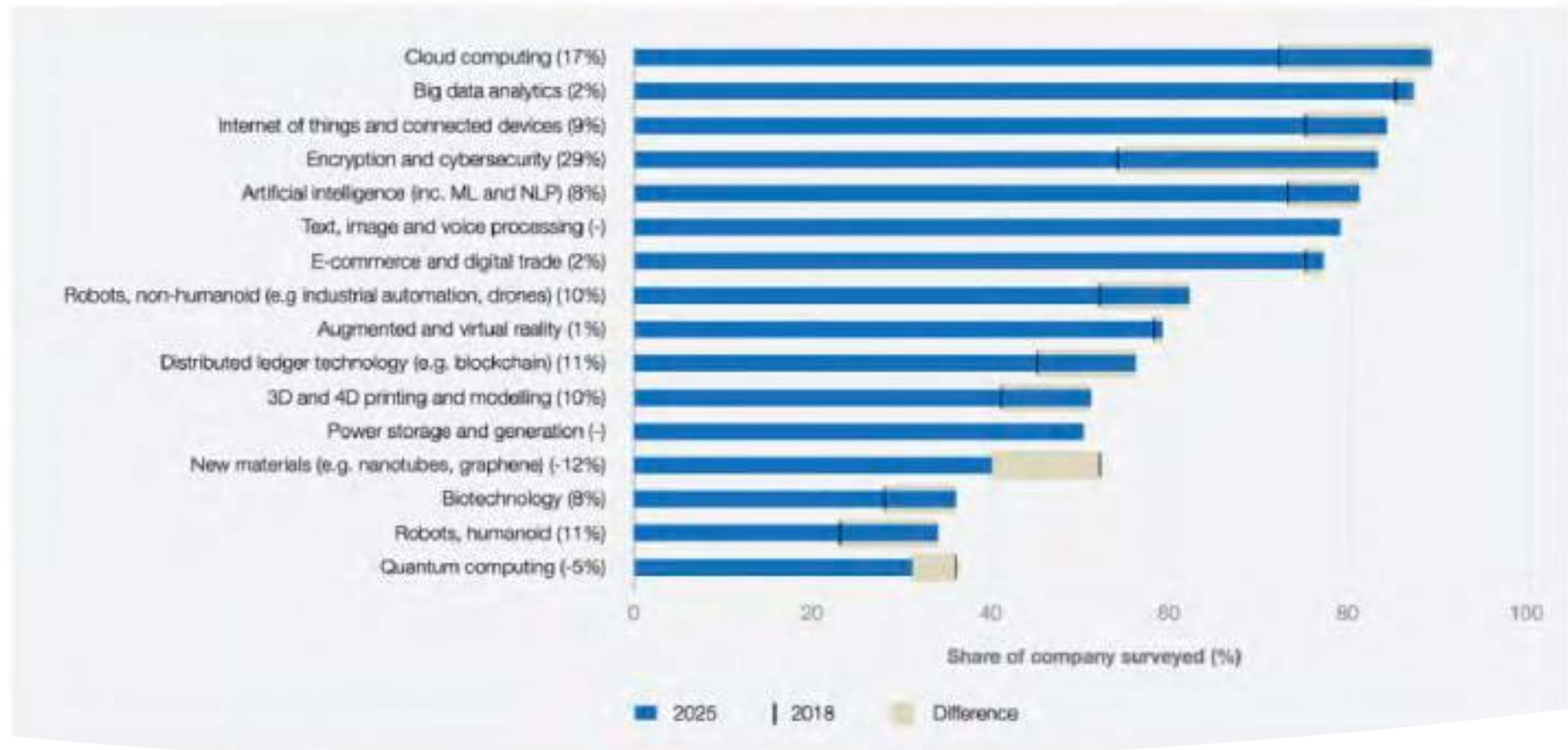
A sectoral approach to such matters is defined as one which looks at changing skills needs from the perspective of a particular sector.

**Sector matters: to understand the key drivers of change in skills demand, it is critical to have a sectoral focus and perspective.** Sector lies at the heart of most approaches to skills anticipation and matching. Understanding technologies and markets at the detailed sectoral level, and involving representatives of employers and workers at that level, are crucial. **Different sectors have very different skills needs because of the different economic activities they pursue and the technologies associated with them. It is essential to have a sectoral focus and perspective as defined above.**

# Game changing technologies and innovative approaches to the identification of new skills

## Game changing technologies

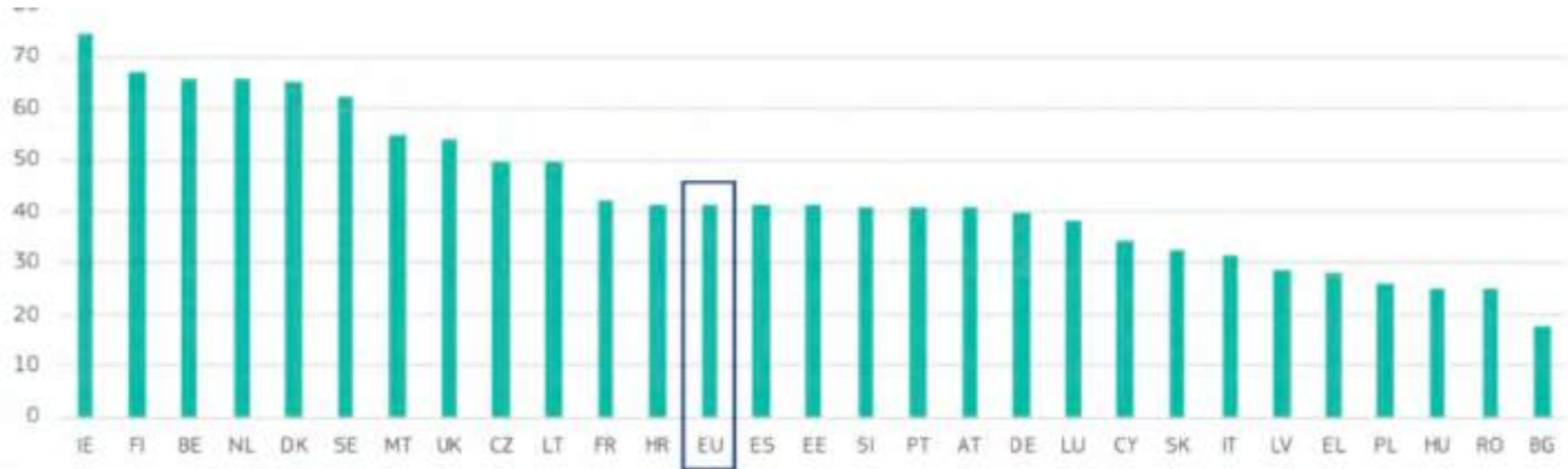
Technologies likely to be adopted by 2025 (by share of companies surveyed) (WEF, 2020)



# Game changing technologies and innovative approaches to the identification of new skills

## Game changing technologies

Digital Economy and Society Index (DESI) 2020, integration of digital technologies

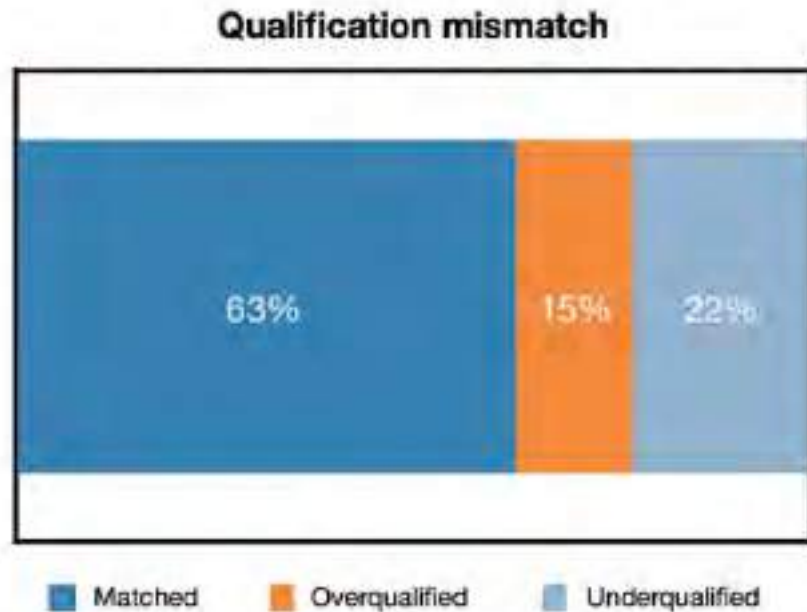


Source: European Commission, DESI 2020



# Game changing technologies and innovative approaches to the identification of new skills

National cases (a selection of): Sweden



OECD (2018), *Skills for Jobs*

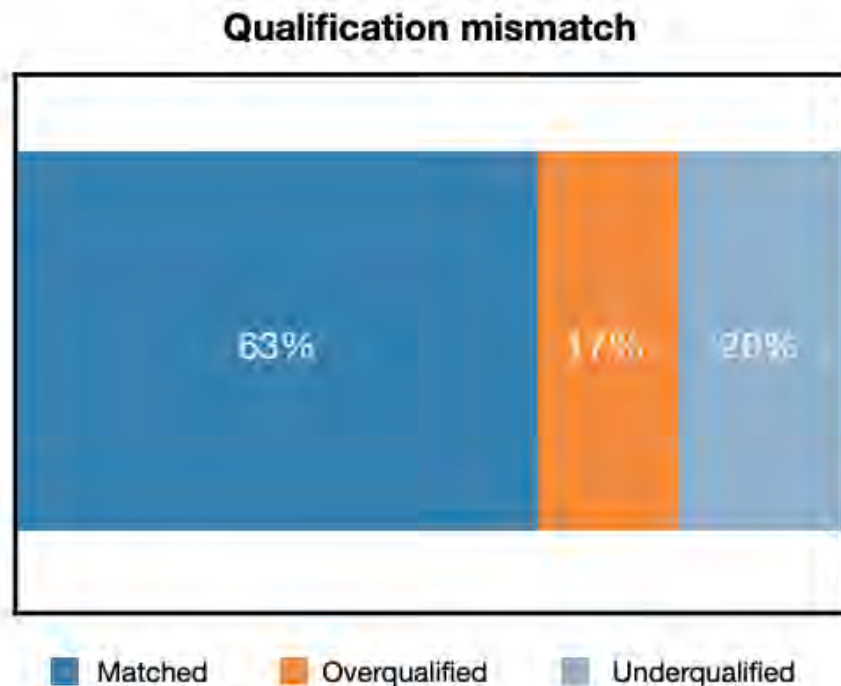
Fully operational since 2017, the “**Matching Map**” (Matchningskartan) is a tool explicitly designed to address skill mismatch and consists of around 17500 combinations of 123 educational and 143 occupational groups, with detailed codes for the level of match for each combination.

The codes show the match both in regard to level of education, field of education and future labour market demand.

The extensive work that lies behind the Matching map is made in an attempt to develop the method for measuring skills match, taking it beyond direct comparisons between the classification of educations and the classification of occupations.. **The objective with the Matching map is therefore to provide policy makers, employers, labour market analysts etc. with better statistics on skills match, in relation to a wide range of policy areas.**

# Game changing technologies and innovative approaches to the identification of new skills

National cases (a selection of): Germany



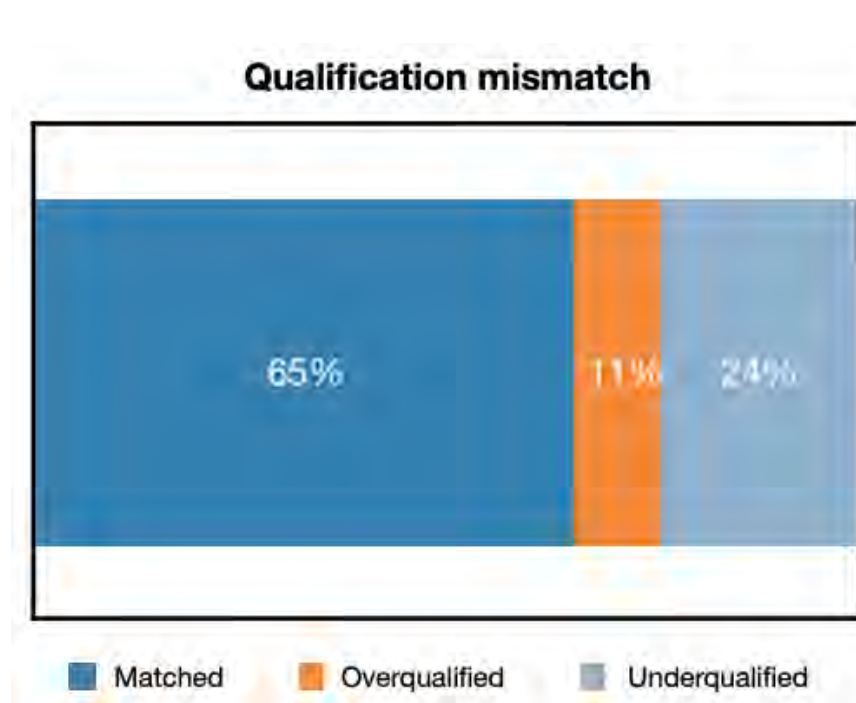
With specific reference to a tool explicitly designed to address skill mismatch, the *"Skilled workforce bottleneck monitor"* (Fachkräfteradar) should be mentioned. It is fully operational since 2012 and its goal is to enable different stakeholders (employers, employees, public stakeholders) to react to future skill mismatch.

The instrument provides information on which occupational groups are already affected by skill shortages and where bottlenecks are likely to occur. The results are broken down by province.

Together with the Arbeitsmarktmonitor (Labour Market Monitor), it features various functions, e.g. regionalised data on industries and occupations, visualisations of regional structural data, an overview of labour market relevant networks throughout Germany, success stories and contacts with experts in various labour market issues. Skilled worker shortage indicators by occupation, age, or gender presented on the website are calculated twice per year.

# Game changing technologies and innovative approaches to the identification of new skills

National cases (a selection of): France



Recently France launched the *"Transitions collectives"* tool. Since January 15, 2021, the so-called Transco system makes it possible to anticipate economic changes of companies by supporting volunteer employees towards a *"serene, prepared and assumed retraining"*.

This new system aims to protect low-skilled employees whose jobs are threatened, by offering them certifying training for up to 24 months or validation of prior learning preparing them for promising jobs or jobs in sectors that are struggling to find their way.

While retaining their remuneration and their employment contract, employees benefit from training funded by the State, with the aim of accessing a promising profession in the same territory (employment pool). This new tool foresees the active involvement of social partners: employers must engage in social dialogue to identify weakened jobs in the company and include them in a **GEPP-type agreement** (management of jobs and career paths).

# Game changing technologies and innovative approaches to the identification of new skills

What interviewees said - Insights from interviews and online survey

*To what extent do workers/people entering the labour market for the first time have these skills in your Country/Sector/Company? (i.e. Mismatches between the skills offered and those required on the National/Sectoral/Company level job market)*

These skills are difficult to find.: 32/63

These skills are available, on average: 24/63

I don't know: 4/63

These skills are fully available: 3/63

*To what extent is workplace training important to develop such skills? 4,57/5*

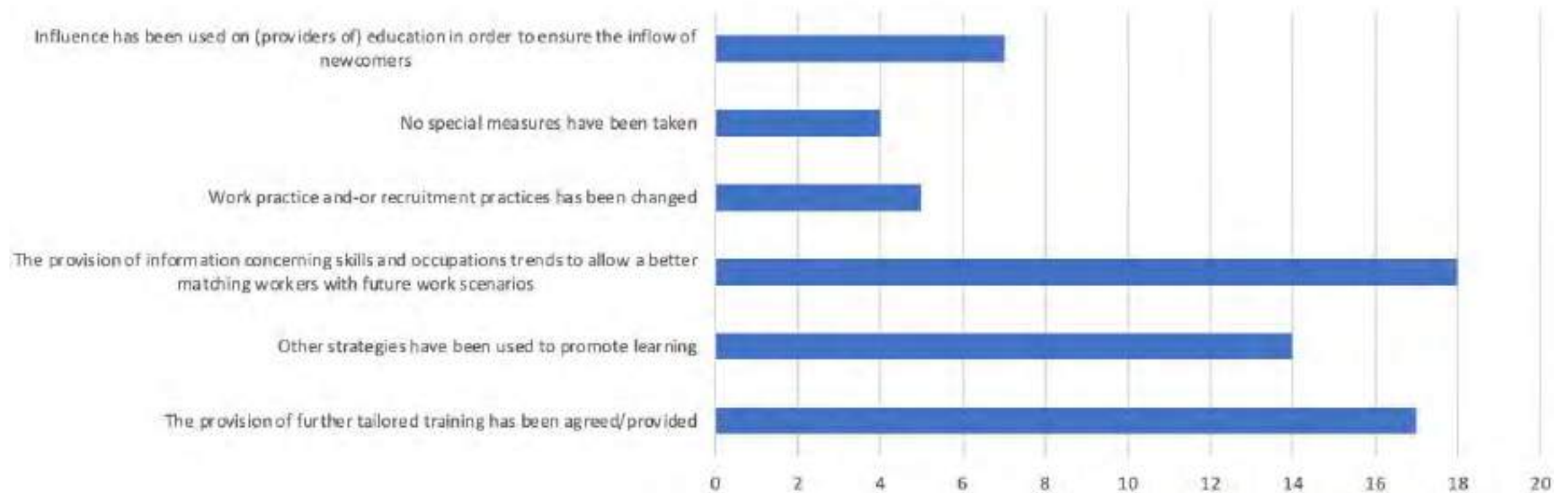
*With reference to workplace training (as for respondents' knowledge)*

- there is a validation process (internal):30/64
- there isn't a validation process: 21/64
- there is a validation process (external validation solutions): 13/64

# Game changing technologies and innovative approaches to the identification of new skills

What interviewees said - Insights from interviews and online survey

## Measures undertaken to overcome skills imbalances



# Game changing technologies and innovative approaches to the identification of new skills

Expected technological developments [5-10 years]

*Changes to the technologies used by workers  
(e.g. machinery, ICT systems)*



*Changes to working methods/practices*



*Changes to the products/services  
produced/provided*



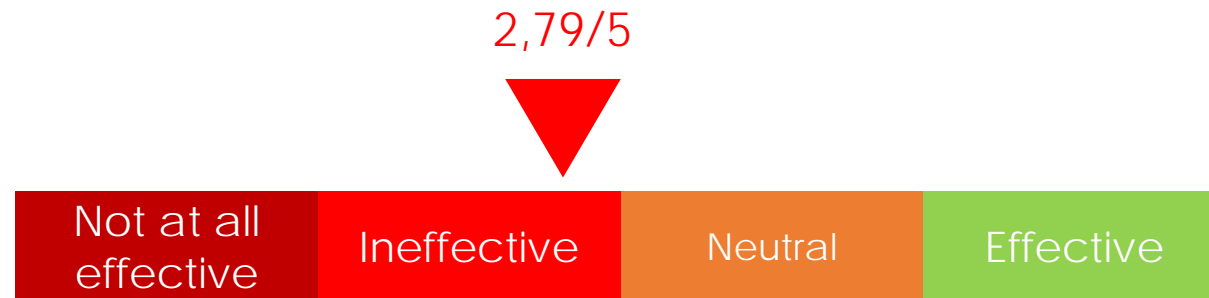
*Changes to the amount of contact workers have  
with clients or customers*





# Game changing technologies and innovative approaches to the identification of new skills

Effectiveness of employment services (public and private) in fostering training opportunities to adapt to new and emerging skills needs, including skills for innovation



*" Currently we are waiting for a huge reform of the national system of public employment agencies. **We hope for a better engagement and involvement of private entities in the field in the coming years** " [EMPL - SE]*

*" **Employment agencies are the meeting points of education[system] and labour ministries.** They should communicate with both the channels, and unfortunately, in most of the countries it doesn't happen. In this field, the **social partners play an interconnecting role**, because they have a concrete look at the labour force, and they know what the employers expect about skills. **Without the social partners and some NGOs, it is difficult for the labour agencies to fulfil their tasks** " [TU - BG]*

# Game changing technologies and innovative approaches to the identification of new skills

Organizations' involvement in skills assessment and/or skills forecast/foresight exercise/s

	Nr. of feedback received	An Enterprise/ workers' representative	An Enterprise/ empl	An Employers' Organisation	A Trade Union
Yes	33	1	4	15	12
Don't know	18		3	5	8
No	13	1	1	5	6

*" We regularly carry out skills foresight exercises (i.e. the last one supported by McKinsey), however technological changes are so fast that long term predictions could be inaccurate and already obsolete. In some industry branches, we run these exercises together with sectoral education providers, academies and relevant research institutions (i.e. building industry). "* [EMPL rep - AU]

*" In Germany, a research institute at national level is in charge of carrying out analysis about future labour market prospects and skills forecast/foresight exercises. Social partners cooperate with the institute within a specific permanent committee and are involved in defining future occupations skills needs "* [TU rep - DE]

*" In the Netherlands, with reference to skill foresight and forecast exercises **Social Economic Councils should be mentioned** (organizations where employers' organizations, trade unions and experts are involved) since it gives advises and recommendations to the government also on these topics "* [EMPL rep - NL]

# Game changing technologies and innovative approaches to the identification of new skills

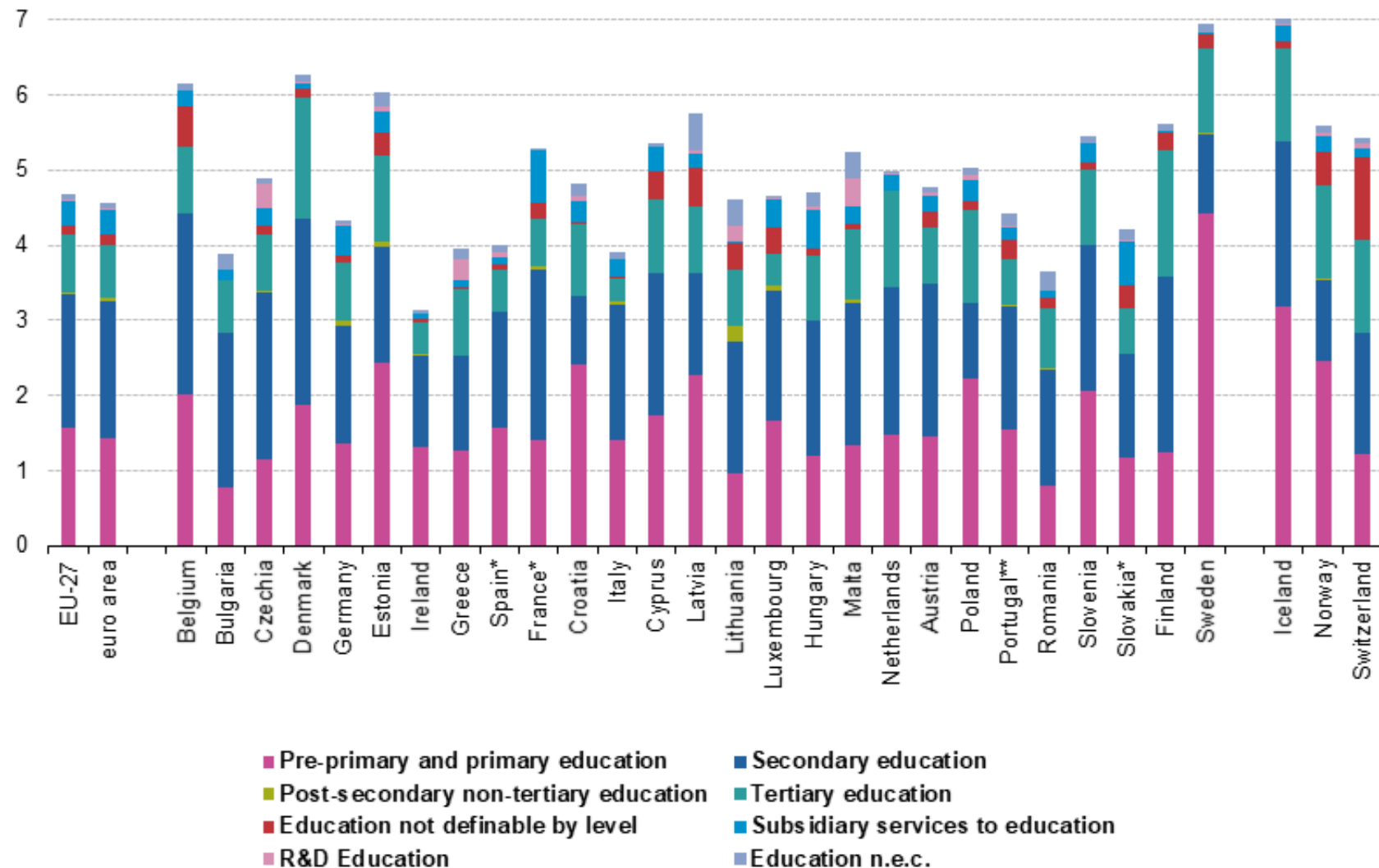
*"Social partners are involved in the working groups to support the activity of the special department about labour market of the Ministry of Labour and Social Policy, **but they are not responsible to organize the research about skills, analysis and forecast** " [TU rep - BG]*

*"The most important tool for skills anticipation/forecasting is the GPEC (**gestion prévisionnelle des emplois et des compétences**) which is mandatory for big companies but can also be developed for small and medium size companies on a regional basis: **social partners should promote the shift towards a territorial dimensions and they can cooperate with observatories and bilateral/tripartite/quadripartite bodies at a local level to support these measures**" . [TU rep - FR]*

# Financial incentives for research and development and skills investments

Facts & figures/1

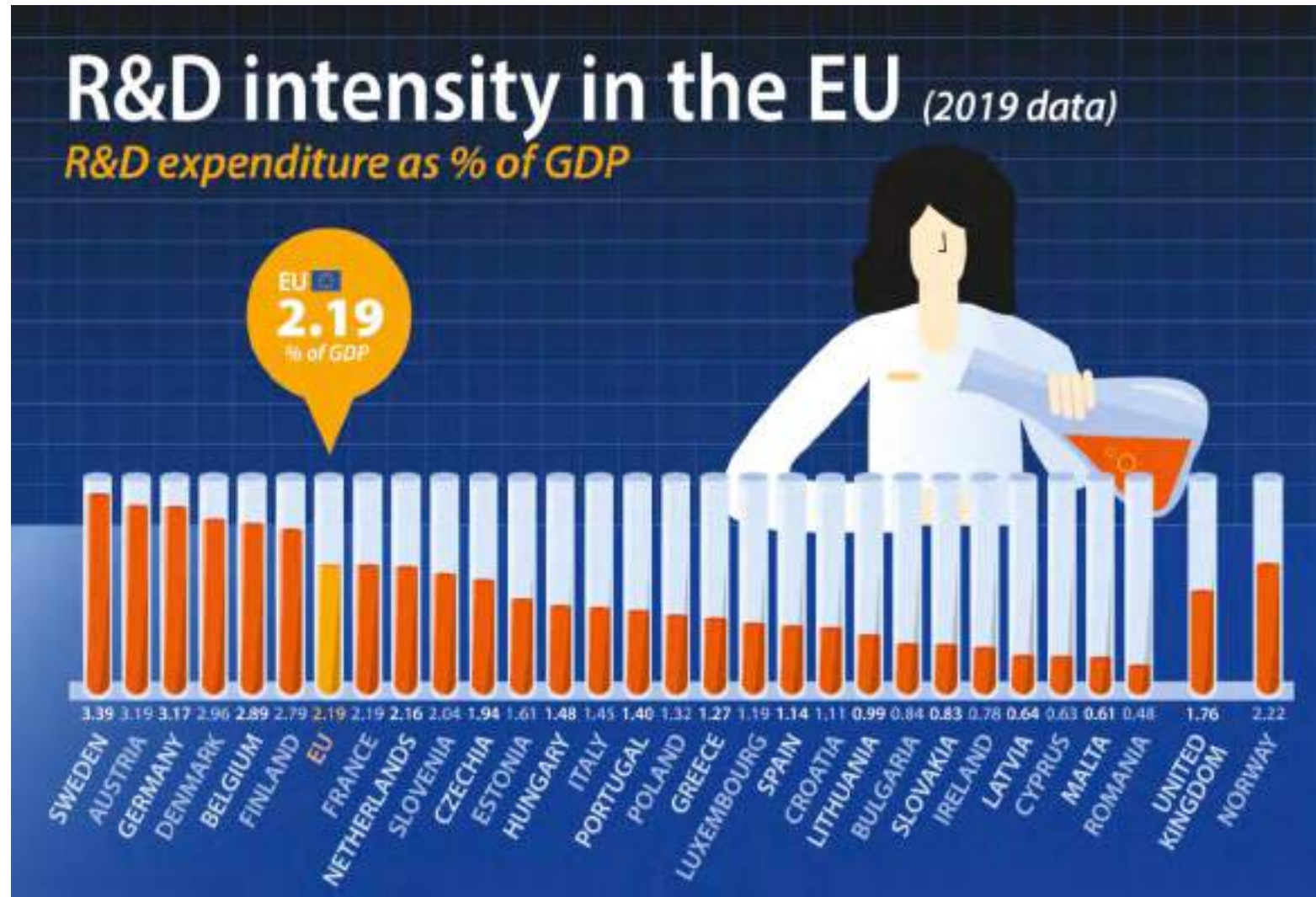
General government expenditure in education (2019) % GDP



# Financial incentives for research and development and skills investments

Facts & figures/2

R&D intensity in EU (2019)



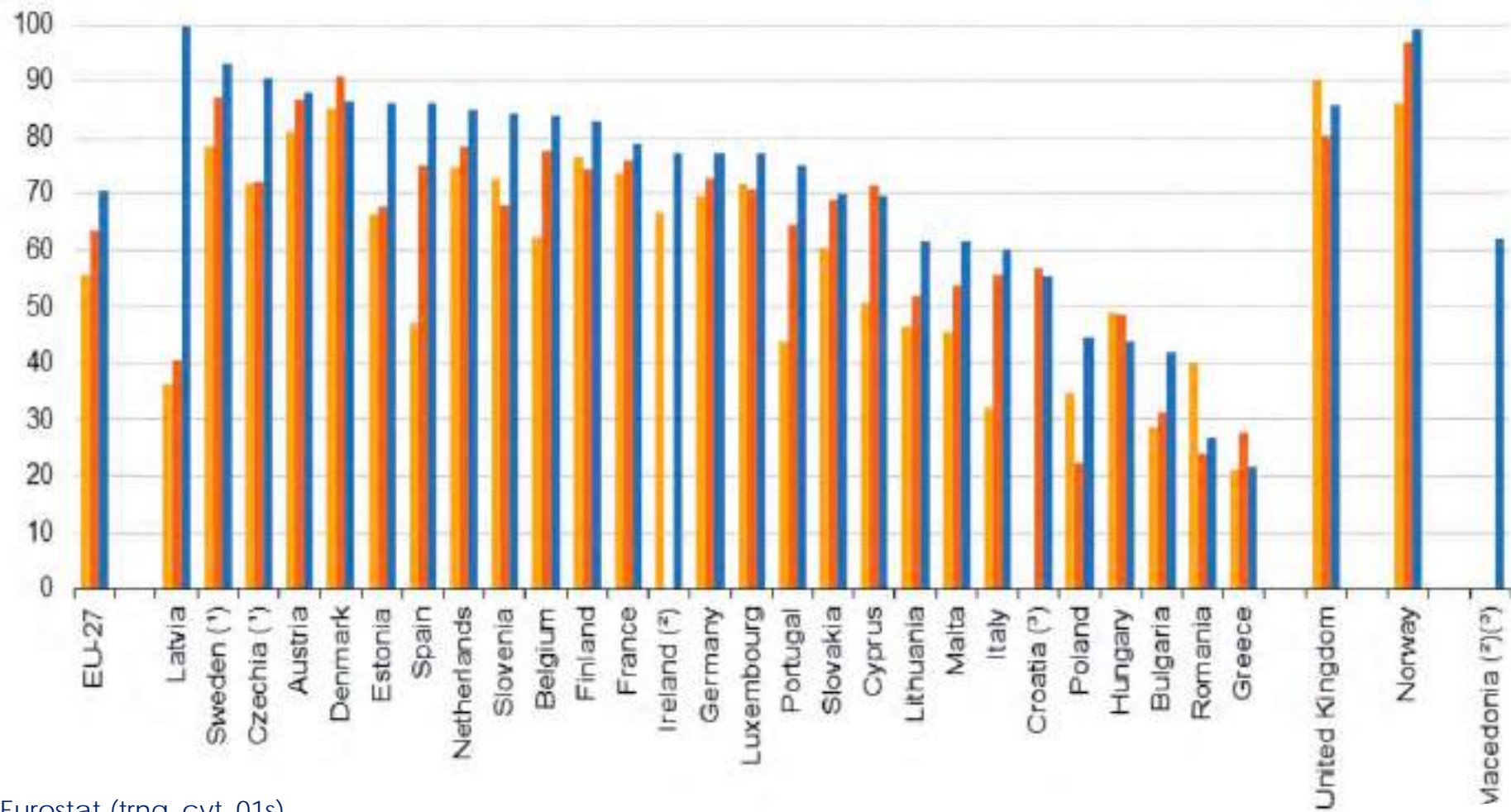
Eurostat  
(rd\_e\_gerdtot)



# Financial incentives for research and development and skills investments

Facts & figures/3

Enterprises providing CVT, 2005, 2010 and 2015 (% of all enterprises)



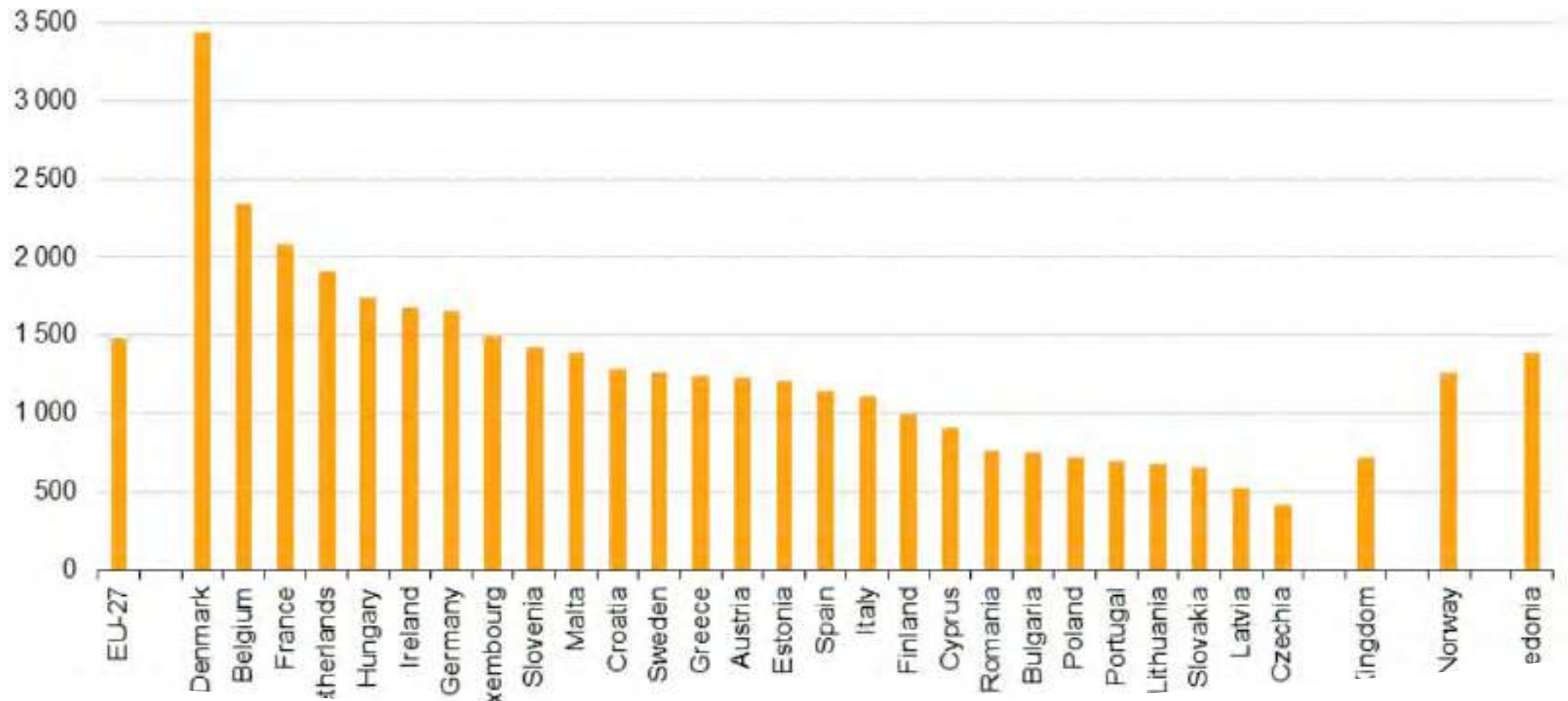
Eurostat (trng\_cvt\_01s)



# Financial incentives for research and development and skills investments

Facts & figures/4

Cost of CVT courses per participant, PPS \*- 2015 \*Purchasing power standards

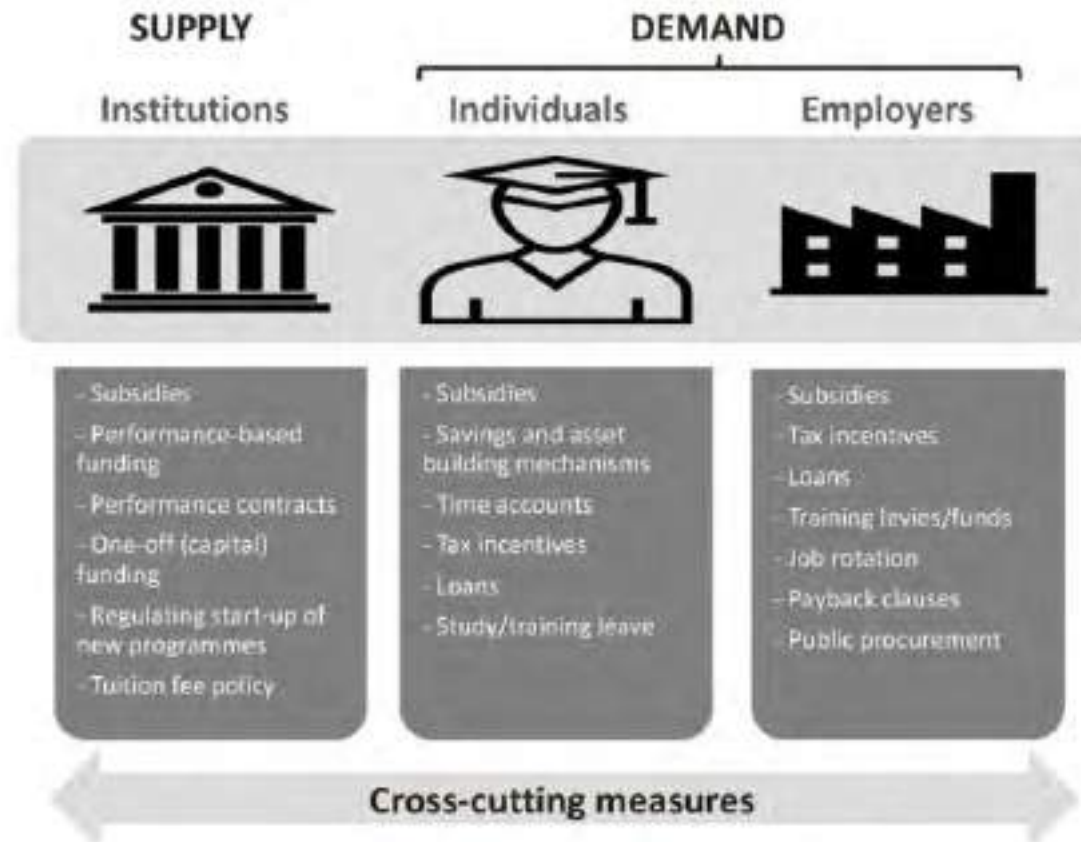


Eurostat (trng\_cvt\_19s)

# Financial incentives for research and development and skills investments

Facts & figures/5

## Taxonomy of financial incentives for steering education and training acquisition



Source: OECD, Financial Incentives for Steering Education and Training (2017) p. 36

# Financial incentives for research and development and skills investments

Facts & figures/5

*Broadly speaking, “funding approaches are more effective when social partners are actively involved in the designing and implementation process; high-quality and widely accessible guidance and information services are provided to beneficiaries; the legal environment is favourable, stable and flexible; and the administrative burden is kept as light as possible”*  
(CEDEFOP 2015)

# Financial incentives for research and development and skills investments

What interviewees said - Insights from interviews and online survey

*"As far as it concerns the funding for training, we think that **a public-private co-funding involvement in terms of contribution to the continuous vocational training could be the most effective**. More funds should be allocated for the continuous vocational training, with specific reference to the area of digitalisation and securisation of career paths "*

*[TU rep - L]*

*"Concerning training funding, we have to consider the money that is put in also by **European funding**." [Company level respondent empl - FR]*

*"Given that funding is one of the main barriers to accessing both initial and periodic training in countries where training is not (sufficiently) state-funded, representative trade associations and their national trade union social partners should jointly reflect on and identify the most appropriate ways within their respective countries of establishing collective funding schemes to fund, in whole or in part, all types of training (initial, periodic, apprenticeships, niche, excellence etc.). Two best practice are identified in **training and development bilateral funds in Belgium and in the Netherlands**."*

*[TU rep - Eu level]*

# Financial incentives for research and development and skills investments

What interviewees said - Insights from interviews and online survey

*“ We have a problem of insufficient resources and investments on training. It is necessary to invest in education and training and there are some attempts in this direction from governments: tax credit, National innovation plan Industry ”*

[TU reps - IT]

*“ One concern about the funding for training is the **unpredictability of the public payments schedule which discourage employers and training providers from applying for funding**. Thus, is not a matter of availability of funding (enough money allocated) but of stability of transfers. This concern also applies to employment promotion measures that we have in terms of active labour market policies and, in general, in receiving replies in due time from the public administration ”*

[EMPL - PT]

# Financial incentives for research and development and skills investments

What interviewees said - Insights from interviews and online survey

Perceived role of Social Partners in helping to design and/or encourage incentives for research and development and skills investments by employers in their workforce

	Number of replies received	An Enterprise/workers' representative	An Enterprise/employer's side	An Employers' Organisation	A Trade Union
They have a consultation role	17	1	1	7	8
They have a marginal role	15		2	2	11
They play a significant role	14		2	6	6
They have a quite relevant role	14	1	3	8	2



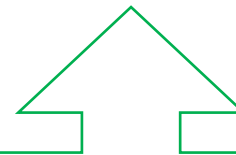
# Financial incentives for research and development and skills investments

*Has your Organization/Union/Company ever been involved in measuring the effectiveness of the incentives in terms of skills development and strengthening of innovation?*

No: 39

Maybe: 14

Yes: 11



- Responding to interviews linked to studies about training [TU rep. - Spain]
- By participating in training funds [TU rep – the Netherlands]
- By participating in Monitoring Committees supervising the operational programmes [EMPL rep. - Italy]
- An evaluation of the last reform concerning training is planned for 2021 and French Social Partners initiated a work programme in order to reflect on the measurement of the impact on companies of the « Bill for the freedom to choose one's professional future » promulgated on Septembre 5th, 2018 [EMPL rep. - France]
- We monitor innovation impact on customer product rating and market expansion [Company level respondent - EMPL]
- Law regulating collective access for employees to continuing training, individual training leave, existing competence centers (eg. construction sector) [TU rep. - France]
- Interprofessional training funds [TU rep. - Italy]
- Training financed to a large extent with the professional training fee paid monthly by companies and workers [TU rep. - Spain]

# Financial incentives for research and development and skills investments

*Are you aware of any cost-sharing approaches (public-private, and/or between Social Partners) to training provision within your country/sector?*

YES: 32/64

NO: 32/64

*If there is not currently a cost-sharing approach, do you think that introducing one could help to increase investment in training (including In the form of incentives encouraging employers to invest)?*

Maybe: 21

YES: 38

NO: 3

# Financial incentives for research and development and skills investments

Which kind of resources, besides the financial ones, could encourage employers to invest in research, innovation and up-skilling their workforce and supporting employees to acquire the skills and qualifications adequate to meet the innovation challenge both now and in the future?

- *Collaborations with startups, universities, research centers, participation in clusters, etc.*
- *Facilitation/Counselling/guidance through networks and alliances*
- *General business environment, legal certainty, business-friendly policies*
- *Recognizing the value of innovation to retain and build the customer base. we run a lot of research on this*
- *Appropriate policies for professional and personal development in the medium and long term*
- *Support structures for SMEs, greater co-responsibility in the sharing of the functions associated with the training process (prioritization, offer coordination, evaluation ...), and recognition of the training role of the company*
- *Employers themselves need training to become aware of the importance of training for the productivity of the company, to guarantee its future*
- *Increased competitiveness, differentiation from the competitors*
- *Penalties for employers in the event of non-compliance with their obligations*
- *Non-compulsory question. Brief paragraph reply option (autonomous entry by respondents). "Recurrent" refers to similar replies entered by at least 2 respondents.*
- *Addressing also SMEs peculiarities.*

# How do target countries compare over the themes prior to the project? A selection of indicators/1

Country	Innovation performances (EIS - 2021)	Digital performances (DESI 2020 - Human Capital weighted score 0 to 100) <sup>175</sup>	Individuals who have basic or above basic overall digital skills % of population 16-74 (European Social Scoreboard 2019 -data)	Adult participation in learning % of population 25-64 (European Social Scoreboard – 2020 data)	Enterprises that provided training to develop/upgrade ICT skills of their personnel (percentage of enterprises - Eurostat 2020 and change compared to 2019)		Cost of continuing vocational training courses (Eurostat, PPS – 2015)	Skills Foresight/Forecast systems (Cedefop Matching Skills Portal - examples of policy areas supported by skills anticipation)	Presence of financial support measures targeting or privileging the education and training of low-qualified adults (Eurydice 2021)	Involvement of social partners in the adult learning system (OECD 2019)
AT	Strong Innovator	14,2	66	11,7	18	0	1365	VET curricula and course design		The social partners define and manage the training system
BG	Innovation Leader	8,48	29	1,6	7	-3	363	Labour market training policies		The social partners contribute to the definition of the training system
DK	Innovation Leader	15,3	70	20	30	-1	4685	VET curricula and course design		The social partners define and manage the training system
EE	Strong Innovator	16,7	62	17,1	17	0	908	VET curricula and course design		The social partners have a consulting role
ES	Moderate Innovator	11,9	57	11	20	-2	1063	Labour market training policies		The social partners have a consulting role
FR	Strong Innovator	11,9	57	13	15	-6	2341	Career guidance		The social partners contribute to the definition of the training system
DE	Strong Innovator	14,1	70	7,7 <sup>176</sup>	24	-8	1800	Labour market training policies		The social partners define and manage the training system



# How do target countries compare over the themes prior to the project? A selection of indicators/2

Country	Innovation performances (EIS - 2021)	Digital performances (DESI 2020 - Human Capital weighted score 0 to 100) <sup>175</sup>	Individuals who have basic or above basic skills % of population 16-74 (European Social Scoreboard 2019 -data)	Adult participation in learning % of population 25-64 (European Social Scoreboard – 2020 data)	Enterprises that provided training to develop/upgrade ICT skills of their personnel (percentage of enterprises - Eurostat 2020 and change compared to 2019)		Cost of continuing vocational training courses (Eurostat, PPS – 2015)	Skills Foresight/Forecast systems (Cedefop Matching Skills Portal - examples of policy areas supported by skills anticipation)	Presence of financial support measures targeting or privileging the education and training of low-qualified adults (Eurydice 2021)	Involvement of social partners in the adult learning system (OECD 2019)
IT	Moderate Innovator	8,11	42	7,2	15	-4	1149	Career guidance		The social partners define and manage the training system
LU	Strong Innovator	14,6	65	16,3	21	-6	1838	Career guidance		The social partners contribute to the definition of the training system
NL	Strong Innovator	16	79	18,8	24	:	2154	Career guidance		The social partners define and manage the training system
PL	Emerging Innovator	9,32	44	3,7	18	+5	425	VET curricula and course design		The social partners contribute to the definition of the training system
PT	Moderate Innovator	9,44	52	10	23	-5	566	Funding and allocation of student places		The social partners have a consulting role
RO	Emerging Innovator	8,29	31	1	6	0	396	Funding and allocation of student places		:
SW	Innovation Leader	17,9	72	28,6	32	0	1668 <sup>177</sup>	Funding and allocation of student places		The social partners have a consulting role
UK	:		:		24	-5	961	Career guidance		Other



Th**A**nks.

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