



European Skills, Competences and Occupations classification

Annual Report

2021

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1. Executive summary

This report covers developments in the European Skills, Competences, Qualifications and Occupations classification (ESCO) during 2021 and the continuous efforts invested in keeping ESCO up to date.

The report briefly analyses the labour market trends such as the twin transition, the EU policy measures in place to respond to them and looks at ESCO's potential in this context. Furthermore, it closely describes the community of ESCO implementers (and their distribution), the status of adoption and/or implementation of ESCO by the Public Employment Services and lists each organisation that uses ESCO in their services, projects or research. This provides an overview of their contribution to the interoperability and better functioning of the labour market.

The report also lists the communication activities that took place in 2021 and the newly designed strategy for conducting a monitoring and evaluation plan for ESCO.

Additionally, the report highlights the process of updating the next version of ESCO (version 1.1) released in January 2022. Subsequently, it describes the activities to maintain the classification, the changes introduced and gives a special focus to Artificial Intelligence (AI) and data science, which is having an increasing role in keeping ESCO up to date with the current labour market trends.

Finally, the report informs about the updates in the IT ecosystem, (including the preparations for the release of a new ESCO portal) and summarises the meetings held with the ESCO governing bodies.

2. Foreword

ESCO made a significant step forward in 2021, by completing the first major update of the classification: ESCO 1.1.

Since the inception of ESCO in 2017, the Commission released only minor versions of the classification addressing changes in translations of existing concepts, without introducing new occupations, skills or competences.

This approach left the time to the National Employment Services to adopt the classification or map their national classifications to ESCO.

Since the deadline for mapping to national classifications or national adoption for EURES purposes expired last summer, it was high time to move forward. ESCO 1.1 introduces 515 new skills and occupations reflecting the new reality on the labour market and also improves the overall quality of the classification. It offers a first list of skills for the green economy, a taxonomy of skills for researchers and a revised terminology for transversal skills and competences.

The new version is not only about adding more and better concepts, but also about new methods of improving ESCO. In addition to the work of experts, the Commission is also using artificial intelligence to improve the classification. The initial set of green skills identified by the experts was completed with suggestions from our neural network. Millions of job vacancies provided by national public employment services are analysed and checked against ESCO to identify missing skills or duplicated occupations.

In a context of widespread digitalization of recruiting and interaction processes, ESCO needs to keep the pace with these dynamic labour market developments. As of now, new versions of ESCO will be issued more frequently, supporting labour market mobility, and upskilling and reskilling of workers.

To check whether we are moving into the right direction, the Commission started at the end of 2021 an evaluation of the relevance, efficiency, cost/benefits, coherence and EU added value of the classification, asking ESCO stakeholders their views on the Commission work. After analysing the data and feedback collected, we'll review our approach for the next years.

I would like to thank all the stakeholders and colleagues who have contributed to update, review and promote ESCO during this fruitful year. Let's wait to see which new features will have ESCO in one more year!

By Jordi Curell, Director for Labour Mobility and International Affairs directorate,
DG Employment, Social Affairs and Inclusion European Commission



3. Introduction

2021 was a key year for the evolution of the ESCO project.

A new version of ESCO was created thanks to the contribution of many stakeholders and with the support of the Member States Working Group on ESCO and the ESCO Maintenance Committee. For the first time, data science techniques were applied to support the continuous improvement of ESCO and map real world data from qualifications, candidates, jobs and employers to the classification. The community of ESCO stakeholders further expanded despite the challenges posed by the COVID-19 pandemic, and a monitoring and evaluation exercise was launched to evaluate the value added of ESCO in the digital labour market.

All these facts are described in more detail in the following sections.

4. ESCO in the EU policy context

Taking a step back to reflect on labour market developments in 2021, it is clear that the transition to a greener and more digital society is significantly shaping the functioning of the EU labour market. Moving towards a resource-efficient and circular economy implies changes in traditional economic sectors and the emergence of new green jobs and competences. Moreover, digital skills are key to be able to face the challenges posed by automation and by technological progress, with CEDEFOP estimating that 85% of jobs are demanding at least basic digital skills¹. In the same context, the rise of digital talent platforms and smart e-recruitment tools requires individuals to develop the right set of skills to navigate the vast amount of available information and make full use of the digital labour market.

Furthermore, the COVID-19 pandemic has increased the digital transition pace and made teleworking and distance learning part of our daily life, but the rapid adoption of technological innovations will continue to accelerate the transformation of jobs and skills in the coming years. However, 35% of the EU population has no or only very low digital skills. In addition, employers in ICT, engineering and the green economy continue experiencing difficulties in finding suitable candidates for vacant jobs and traditional occupations based on a high degree of social interaction lose ground compared to green and digital jobs².

In this increasingly volatile labour market context, where job transitions are becoming the norm, the need to constantly upskill and reskill the workforce is more than obvious. The public and private sector need to pull together resources to ensure a better functioning of the labour market through occupational mobility across countries, improved skills training opportunities and skills-based job-matching.

Moreover, the European Commission recently presented its vision for Europe's digital transformation by 2030, with the aim of training 20 million ICT specialists and ensuring that

¹ CEDEFOP's analysis available at <https://www.cedefop.europa.eu/en/themes/skills-changing-societies>

minimum 80% of the population has basic digital skills². Another policy measure put forward by the Commission is the EU Skills Agenda³ with its 12 actions that help individuals and businesses develop more and better skills, through collective action (the Pact for Skills⁴), enhanced skills intelligence, upskilling scientists, providing tools to support lifelong learning (such as the new Europass platform⁵) and unlocking investments in skills.

A key role is played by the European Public Employment Services, whose services are steadily more supported and driven by digitalization which means jobseekers and employers benefit from personalised and data-driven support when looking for the best fit on the job market⁶. The Public Employment Services (PES) network was established in 2014 by the Council and the European Parliament to maximise efficiency of public employment services (PES)⁷ and its work is already bearing fruits. Currently, the network focuses on integrating the use of technology and data alongside improved skills training for the PES staff, to better fulfil their role as key actors in the employment services ecosystem.

ESCO is an important resource for the Public Employment Services (see section 5.1.2) and for a significant number of those policy actions, like the new Europass platform, the strengthening of skills intelligence or the fostering of transversal skills, and can support further actions like the individual learning accounts⁸ or micro-credentials⁹.

As a digital tool, ESCO is best positioned to support a variety of stakeholders in the employment and education ecosystem through:

- Boosting geographical and occupational mobility through skills-based job-matching;
- Facilitating upskilling and reskilling opportunities as well as tailored guidance and validation services to citizens;
- Providing real time labour market intelligence and forecasting skills demand, building on the potential offered by data science techniques, in particular Artificial Intelligence (AI);
- Enhancing sectoral strategies addressing skill needs in key industrial ecosystems;
- Enabling labour market inclusion in the job searching and matching process by eliminating gender bias and helping to integrate vulnerable groups;
- Documenting and/or (self) assessing skills acquired by individuals through different types of learning experiences.

² European Commission, Europe's digital decade: digital targets by 2023, available at https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en

³ EU Skills agenda actions : <https://ec.europa.eu/social/main.jsp?catId=1223&langId=en>

⁴ The Pact for Skills: <https://ec.europa.eu/social/main.jsp?catId=1517&langId=en>

⁵ The new Europass : <https://europa.eu/europass/en>

⁶ Public Employment Services (PES) network strategy, 2021: <https://op.europa.eu/webpub/empl/pes-network-strategy/en/#:~:text=The%20PES%20Network%20aims%20to, and%20UN%20Sustainable%20Development%20Goals.>

⁷ PES network: <https://ec.europa.eu/social/main.jsp?catId=1100&langId=en>

⁸ OECD report on individual learning accounts: <https://www.oecd.org/employment/individual-learning-schemes-203b21a8-en.htm>

⁹A European approach to micro-credentials: <https://education.ec.europa.eu/levels/higher-education/european-approach-to-micro-credentials#:~:text=Micro%2Dcredentials%20certify%20the%20learning,their%20personal%20and%20professional%20development.>

5. ESCO community of stakeholders

5.1. Take up of ESCO

ESCO continues to register strong interest from a wide range of users, including from stakeholders outside of the EU. While there might be many organisations using ESCO, the Commission is currently aware of **113 implementers worldwide** that are using ESCO. This group includes private companies, employment services, public institutions, non-profit organisation, job portals and other organisations who see the value of ESCO for their services.

In 2021, the ESCO community continued to expand and the ESCO team met virtually with stakeholders to discuss their use cases and interest and to provide support with the practical usage of the classification.

The infographic below captures some key numbers related to the growing community of ESCO stakeholders and the communication that happened in 2021:

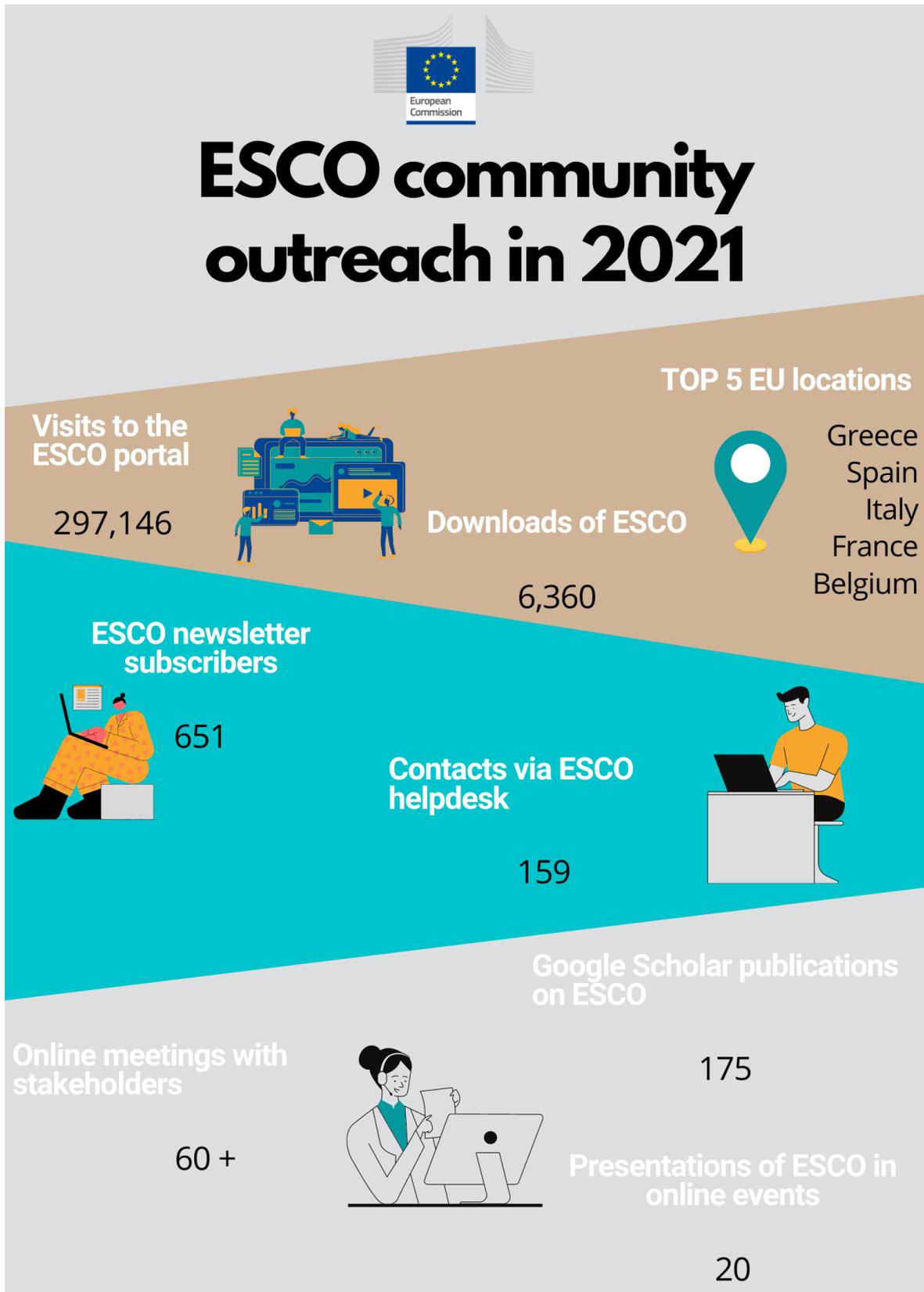


Figure 1. ESCO outreach in 2021

For a more in-depth view of the ESCO implementers, the following charts provide more information about their characteristics.

Figure 2 below shows a snapshot of the distribution of ESCO implementers according to the type of organisation they represent. Accordingly, the **biggest portion of ESCO**

implementers are Human Resource Management System (HRMS) providers (18.58%), followed closely by **educational institutions (13.27%), job portals (7.96%) and European institutions/bodies (7.08%).** A smaller number of implementers are IT/data companies as well as EU funded projects (6.19% respectively), followed by national/regional/local public administrations and representative organisations (5.31%). Learning Management System providers and Public Employment Services represent 4.42% each while credential issuers represent only 1.77% of the total implementers.

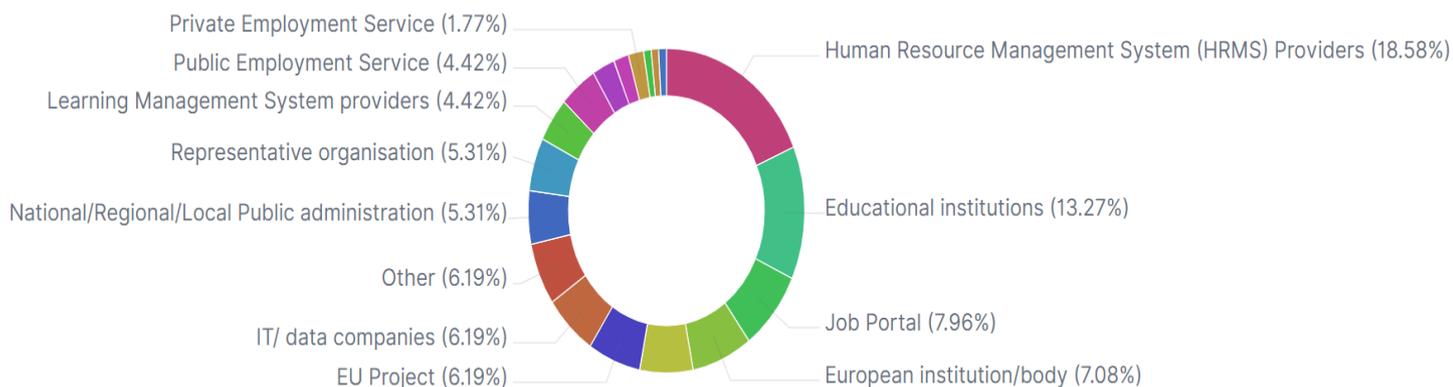


Figure 2. ESCO implementation per organisation type

Additionally, the figure 3 below provides an overview on the distribution of implementers based on the ESCO use case they represent. As such:

- 46 of them **use ESCO for multiple purposes in the same time** (for example job-matching, skills assessment and career learning and development management, or job-matching, ontology management and statistical research, etc);
- 22 organisations use it for **career learning and development management**;
- 16 organisations use it for **job-search and job-matching purposes**;
- 7 organisations use it for **statistical research**;
- 6 organisation use it for **other purposes than mentioned**;
- 4 organisations use it for doing **skills-assessment**;
- 3 organisations use it for **curricula development**;
- 3 organisations use it for **mapping other classifications** (excluding the Member States who map their national classifications to ESCO);
- 3 organisations use it for **ontology management and machine learning** and
- 3 organisations use it for **informal and non-formal learning**.

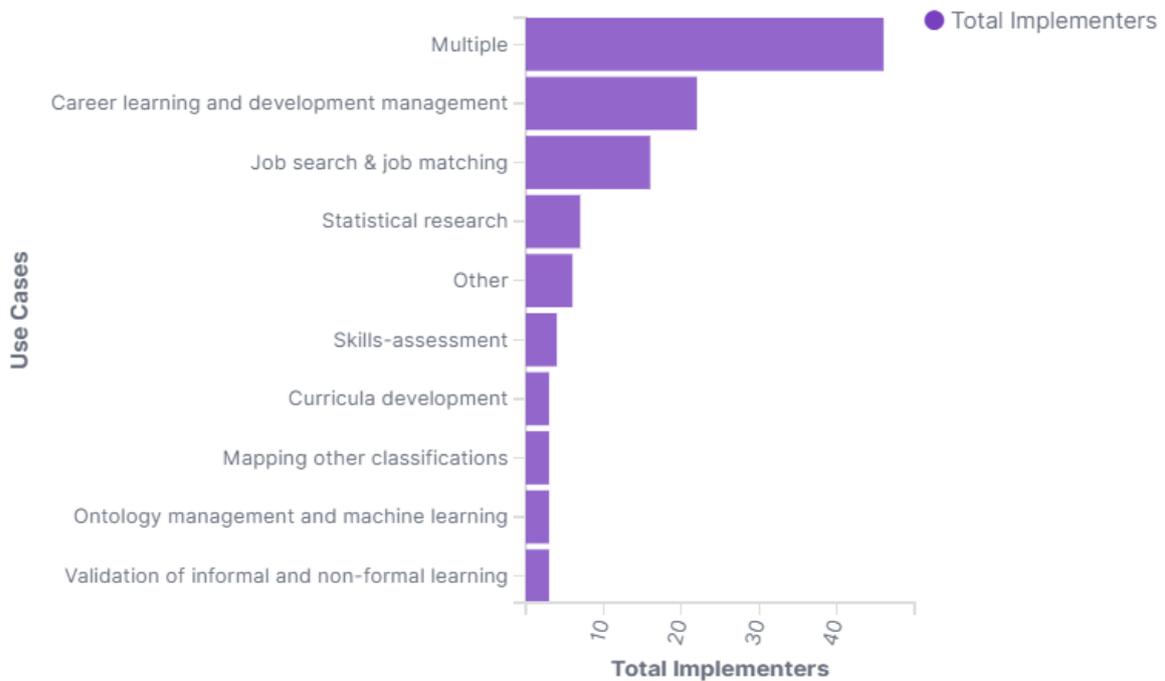


Figure 3. Number of ESCO implementers per use case

Furthermore, figure 4 below shows an overview of the sector and size of these organisations in terms of public sector, private sector, non-profit and small & medium-sized, start-up or large organisation. This reveals that ESCO is used **primarily by large organisations in the public sector** (34.51%), followed closely by **small & medium sized organisations in the private sector** (26.55%). The large organisations and start-ups in the private sector are on a par (13.27%) followed by small & medium sized organisations in the public sector (8.85%) and the non-profit sector (3.54%).

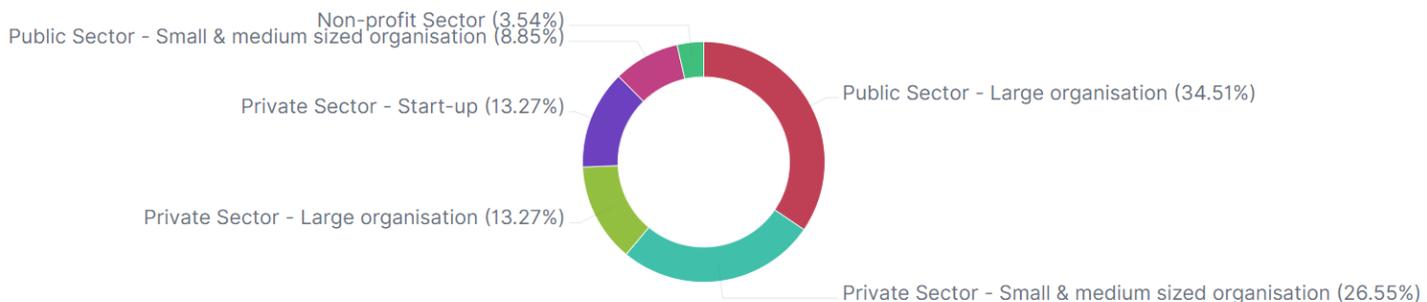


Figure 4. ESCO implementers per sector and size

5.1.1. The use of ESCO for job-matching and job-searching

The following organisations use ESCO to provide job-matching and job-searching services:

- [Actonomy](#), Belgium
- [Adzuna](#), global
- [Almalaurea](#), Italy
- [Ariston](#), Greece
- [Bold](#), global
- [Boost.rs](#), France
- [Consulmarc Sviluppo](#), Italy

- [Dit Werk](#), The Netherlands
- [Foreammati](#), Finland
- [Gigbay](#), Germany
- [House of Skills](#), The Netherlands
- [Inda](#), Italy
- [Janzz technologies](#), Switzerland
- [Joblift](#), Germany
- [Kimbo](#), Italy
- [Matchmanao](#), Germany
- [Milch und Zucker](#), Germany
- [Monster](#), global
- [Nalantis](#), Belgium
- [Randstad](#), The Netherlands
- [Skilla](#), Italy
- [SkillLab](#), The Netherlands
- [Techwolf](#), Belgium
- [Textkernel](#), The Netherlands
- The Adecco Group, [Phyd platform](#), Italy
- The European Commission, [EURES](#) service platform
- The European Commission, [EUROPASS](#)
- The European Commission, [EU Skills profile tool for third country nationals](#)
- The [Public Employment Service of Albania](#)
- The [Public Employment Service of Finland \(Keha Center\)](#)
- The [Public Employment Service of Greece, \(OAED\)](#)
- The [Public Employment Service of Iceland](#)
- The [Public Employment Service of Ireland \(JobsIreland\)](#)
- [The Public Employment Service of Israel](#)
- The [Public Employment Service of Malaysia](#)
- [WCC group](#), The Netherlands
- [Xtramile](#), France
- [Zeit](#), Germany

5.1.2. The use of ESCO for career development and learning management

The following organisations use ESCO to provide career guidance services:

- [Askfood project](#), EU countries
- [Australia's National Science Organisation \(CSIRO\)](#), Australia
- [BlockAdemiC](#) project, Greece
- [Boost.rs](#), France
- [Caisse de Depots](#), France
- [Certif-ID](#), Germany
- [Cities of Learning](#) by [Badgecraft](#), EU countries
- [Continuum](#), Chile
- [Credential engine](#), USA
- [Develop project](#), EU countries
- [eHRgo](#), France
- [eLene4Life project](#), EU countries
- [Estonian Qualification Authority \(OSKA\)](#), Estonia

- EU-learn, the European Commission
- [Europass](#), the European Commission
- Europe [Interoperable Academy](#), EU countries
- [European Broadcasting Union](#) (EBU), Switzerland
- [Fondazione Bruno Kessler](#), Italy
- [Headai](#), Finland
- [House of Skills](#), the Netherlands
- [Inforelea](#), Italy
- [Jose Neves Foundation](#), Portugal
- [Knowledge Innovation Center](#), EU countries
- [Nastspec](#), UK
- [Nxus](#), the Netherlands
- [ODEM](#), Switzerland
- [Open Badge Factory](#), Finland
- [Orange Cat](#), the Netherlands
- [Peers Solutions](#), Germany
- [Relink](#), Chile
- [Riga Stradiņš University](#), Latvia
- [Seven](#), France
- [SkillLab](#), the Netherlands
- [Skills beyond the seas project](#), Spain
- [Skills development Scotland](#), UK
- [Skills Guide by Accenture](#), the Netherlands
- [SkillsBoard](#), France
- [Skillcharge](#) by [EIT – Inno-energy](#), EU countries
- [Skillsmatch project](#), EU countries
- [TESEO project](#), EU countries
- The Adecco Group, [Phyd platform](#), Italy
- [The creative FLIP project](#), EU countries
- [Timber Construction Europe](#), EU countries
- University of Florence, Italy
- University of Tampere, Finland
- VET Voices, EU countries
- [Worldskills](#), global
- [Xtoit](#), France

5.1.3. The use of ESCO for statistics and big data analysis of the labour market

The following organisations use ESCO to conduct statistical research and big data analysis of the labour market:

- [Arbeidsmarktinzicht](#), the Netherlands
- [Australia's National Science Organisation \(CSIRO\)](#), Australia
- [Burning Glass](#) Technologies, global
- [CEDEFOP](#), Greece

- [CRISP](#), Italy
- [ETH](#), Switzerland
- [European Lung Foundation](#), Belgium
- [Intelligence Group](#), the Netherlands
- [Inter-American Development Bank](#), USA
- [National Training and Employment service](#), Chile
- [NESTA](#), UK
- [University of Cambridge](#), UK
- University of Harvard, USA
- [University of Information Technology and Management of Rzeszow](#), Poland
- [West University of Timisoara](#), Romania
- [Wollybi](#), Italy

5.1.4. ESCO in EURES and status in Member States

This section is providing more information about the use of ESCO by the European Public Employment Services, mainly through the EURES platform.

As of August 2021, ESCO supports the automated skills-based matching of the EURES service platform¹⁰. In 2016 the EURES Regulation¹¹ aiming to put in place better job search and recruitment services across Europe was adopted. It reinforces the cooperation between EURES countries and the Commission regarding interoperability, in particular the exchange of CVs and job vacancies via a single coordinated channel and automated matching between job vacancies and CVs.

Article 19 of the EURES Regulation and its Implementing Decisions¹² provide for the use of a European classification of skills, competences and occupations (ESCO) with a view to developing an automated skills-based matching tool through the EURES portal. To enable successful implementation, EURES countries need to supply the job vacancies and CVs using ESCO codes. EURES countries had until August 2021 to map their national occupational classifications/national skills classifications to ESCO. Alternatively, they could decide to directly adopt ESCO. By 11 February of 2022¹³:

- 17 EURES countries had completed the mapping of occupations;
- 2 EURES countries had completed the mapping of skills;
- 4 EURES countries had completed the adoption of occupations;
- 4 EURES countries had completed the adopting of skills.

In total 21 out of 31 EURES countries had completed the implementation of ESCO.

¹⁰ EURES is the network of European employment services which aims to provide information, advice and recruitment and placement services for workers and employers.

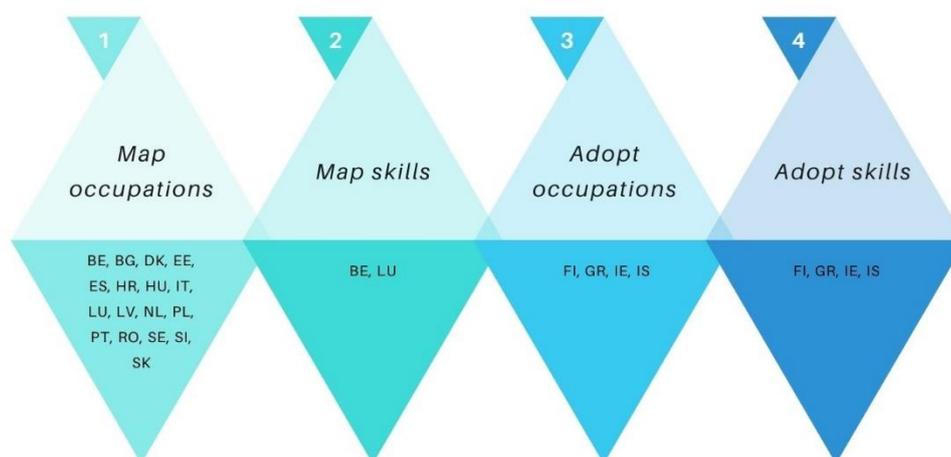
¹¹ Regulation (EU) 2016/589 of the European Parliament and of the Council of 13 April 2016 on a European network of employment services (EURES), workers' access to mobility services and the further integration of labour markets, and amending Regulations (EU) No 492/2011 and (EU) No 1296/2013 (Text with EEA relevance)

¹² Commission Implementing Decision (EU) 2018/1020 of 18 July 2018 on the adoption and updating of the list of skills, competences and occupations of the European classification for the purpose of automated matching through the EURES common IT platform (Text with EEA relevance) and Commission Implementing Decision (EU) 2018/1021 of 18 July 2018 on the adoption of technical standards and formats necessary for the operation of the automated matching through the common IT platform using the European classification and the interoperability between national systems and the European classification (Text with EEA relevance).

¹³ This list is not exhaustive and there could be EURES countries who map/adopt without having communicated it to the Commission and thus they are not included in this list

Status of ESCO implementation across the EURES countries

Completion of mapping/adoption



The approaches used by the EURES countries to carry out the mapping vary. These could be:

- artificial intelligence tools;
- “human” approach, i.e. experts in the EURES countries carry out the mapping exercise manually;
- hybrid approach combining approaches one and two.

Support by the Commission to the EURES countries

The Commission supports the EURES countries in the implementation process in the following ways:

ESCO mapping platform: an IT application designed to help EURES countries map their national classifications to ESCO.

Mapping manual: a step-by-step guide for mapping NOCs and NSCs to ESCO or replacing them with ESCO.

Trainings in the form of webinars and workshops.

Visits - upon request - to the EURES countries.¹⁴

ESCO Helpdesk: a central European contact point set up to clarify difficult/ambiguous cases composed of a team of experts who reply to enquiries received by the mappers. The ESCO helpdesk is accessible via EMPL-ESCO-SECRETARIAT@ec.europa.eu

The Commission launched the **call for proposals VP/2019/010 "EURES: support to national classification inventories and innovative national online services for mobile workers"**. The aim of the call was to financially and technically support EURES countries to comply with the obligations under Article 19 of Regulation (EU) 2016/568. Eight countries **applied** to the call.¹⁵

¹⁴ No country visit was realized in 2020 and 2021 due to Covid.

¹⁵ The list of the awarded grants is available at: <https://ec.europa.eu/social/main.jsp?catId=632&langId=en>

6. Communication and dissemination activities

One of the main channels for promoting ESCO to a broad range of stakeholders and potential implementers is the participation in events and conferences.

6.1. ESCO presentations in online events

Throughout 2021, the Commission presented ESCO in a number of online conferences and events. The online events are briefly summarised in the table below:

Table 1 – Events where ESCO was presented

Name of the event	Date	Organiser	Type
OECD PISA-VET internal meeting	31/07/2021	OECD	online
AI follow-up meeting with Malaysia	07/09/2021	International Labour Organisation Malaysia	online
Education and skills for the green transition online workshop	22-23/09/2021	Joint Research Centre	online
SSA EQVEGAN project conference	23/09/2021	Sector Skills Alliance EQVEGAN	online
Skills beyond the sea project conference	14/10/2021	Sea Teach	online
Introductory call with the Australian government	9/9/2021	ESCO-Australian government	online
PES network working group on taxonomies	29/09/2021	PES network	online
PISA-VET working group	30/09/2021	OECD	online
T3 network working group	18/10/2021	T3 network	online
EVCP workshop	28/10/2021	European Commission	online
EURES Interoperability Contacts Groups meeting	10/11/2021	EURES Coordination Office	online
Validts project conference	14/11/2021	Sea Teach	online
THAMM project webinar	15/11/2021	International Organisation of Migration Egypt	online
EU Mobility Network Meeting	23/11/2021	Norwegian PES	online
ETF Training Big Data for LMI	24/11/2021	European Training Foundation	online

Recognition of competences acquired in the non-formal sector	08/12/2021	SNJ - MENJE Luxembourg	physical
PM ² meeting	09/12/2021	European Commission-DG DIGIT	online
Peer learning webinar with Armenia	08/12/2021	ESCO Secretariat	online
Greek PES launch event	16/12/2021	Greek PES	online

6.2. A new ESCO portal

Throughout 2021, the Commission has been working on the revamp of the ESCO portal, in order to make it more user-friendly, accessible, and aligned with the Europass and EURES websites. After a first round of development and testing, the Commission decided to adjust the designs that were realised in 2020, in order to further improve the look and feel of the website and add more functionalities, including a filter for the classification and a simplified way to download ESCO files.

The redesign implies that the new portal will be deployed in more than one release, the first of which is foreseen for March 2022 and the second towards the end of the year.

7. ESCO Monitoring and evaluation strategy

Because of its ontological structure and semantic richness, ESCO has been designed to fit in the digital landscape of employment and learning in order to support better job-matching, personalized career guidance and better intelligence on skills supply and demand. While these policy goals have been defined from the inception in the ESCO strategic framework¹⁶, the ESCO Secretariat saw the need to start collecting evidence about these statements and clarify the impact and suitability of ESCO in the digital labour market. As such, a Monitoring and Evaluation plan was developed in July 2021 to set out the premises for the evaluation: the evaluation questions and criteria, the data collection methods and the foreseen timeline.

The M&E approach is grounded on results-based management (RBM)¹⁷ approaches and guidelines on evaluation and impact assessment described by OECD¹⁸ and the EU Better Regulation¹⁹. These guidelines are beneficial for ESCO because they promote organisational learning by developing a knowledge base about what works, what does not,

¹⁶ ESCO strategic framework: <https://ec.europa.eu/esco/portal/document/en/89a2ca9a-bc79-4b95-a33b-cf36ae1ac6db>

¹⁷ Used largely in the international development sector, RBM is defined as a management strategy by which all actors, contributing directly or indirectly to achieving a set of results, ensure that their processes, products and services contribute to the achievement of desired results (outputs, outcomes and higher level goals or impact). More information: <https://unsdg.un.org/sites/default/files/UNDG-RBM-Handbook-2012.pdf>

¹⁸ Principles and guidance on Evaluation for development by the OECD: <https://www.oecd.org/dac/evaluation/daccriteriaforevaluatingdevelopmentassistance.htm>

¹⁹ Better Regulation guidelines for Monitoring and Evaluation: https://ec.europa.eu/info/law/law-making-process/planning-and-proposing-law/better-regulation-why-and-how/better-regulation-guidelines-and-toolbox_en

and why, while also promoting better transparency and accountability towards ESCO stakeholders.

It is important to note that this evaluation is using the EU Better Regulation guidelines as an inspiration only and does not constitute an official evaluation as defined by the Commission in its law- and policy-making procedures.

7.1. Methodological approach to the evaluation of ESCO

The M&E plan involves the collection and analysis of data from an ample spectrum of sources:

1. The Customer Relationship Management (CRM) platform of the ESCO Secretariat;
2. The Learning Outcomes Linking (LOL) tool's dataset;
3. The EURES and Europass datasets;
4. The ESCO mapping platform;
5. Google Scholar;
6. The ESCO Evaluation Survey;
7. The ESCO Evaluation Case Studies (including interviews).

The last two constitute the core of the evaluation and are being carried out for the first time in the lifecycle of ESCO.

The analysis consists of a mixture between a quantitative and qualitative approach, such combination allows for a complete, objective, and informative study.

The Evaluation proposes to assess the impact of ESCO, to do so the first thing is to understand the big picture of the intended change that ESCO is seeking to achieve. For this, on the basis of ESCO's vision and mission (as described in the ESCO strategic framework²⁰), the Commission constructed ESCO results framework²¹ which defines the general objectives or long-term goal of ESCO, its specific policy objectives, its inputs, activities and main outputs as well as the results and long-term impact. Furthermore, based on this framework, the Commission specified the objectives of the project along with its indicators for success and the types of measurements used to evaluate the results. This framework is being used in the evaluation plan to gather data and analyse evidence against the described indicators.

The following diagram shows the main components of ESCO's results framework.

²⁰ ESCO strategic framework: <https://ec.europa.eu/esco/portal/document/en/89a2ca9a-bc79-4b95-a33b-cf36ae1a6db>

²¹ https://www.betterevaluation.org/en/managers_guide/step_2/describe_theory_of_change



Figure 5. ESCO's results framework

For the purpose of this evaluation, the Commission defined key indicators such as the number of organisations using ESCO for different use cases, the share of job vacancies annotated with ESCO in EURES, stakeholders' opinion on EU-added value of ESCO etc. This exercise has never been done previously but it is extremely beneficial for analysing the effectiveness of the project.

7.2. Monitoring of ESCO implementers

During the last two years, the Commission has been developing a Customer Relationships Management (CRM) tool, which collects information related to the ESCO stakeholders. The

Commission uses it to record the information of those who contact and have at least a meeting with the ESCO team to explain about their projects and/or receive support on the implementation of the classification.

In 2021, the Commission decided to use this information to learn more about the ESCO implementers, their characteristics, and needs, therefore it was decided to set up a monitoring strategy at the same time as the evaluation.

Monitoring is a tool for project management that is used to understand whether the project is on track or something needs to be changed in it. It helps to identify what changes have occurred since the launch of the project and to collect data that will be useful in the evaluation to then assess whether the intervention has achieved its objectives and why.

For the purpose of monitoring the usage of ESCO, the following questions are guiding our analysis:

1. Who are the implementers of ESCO? What type of organisations do they represent? What geographical area and customer base do they cover through their services?
2. What are their use cases and how do they implement ESCO in their products/services?
3. Why do they use ESCO? And what is missing in ESCO that would bring further improvement to their use cases?

The data from the CRM is being constantly updated, plus it has been combined with other sources, such as the Evaluation survey, the ESCO and EURES data.

The monitoring activities will generate a constant stream of data, which will acquire a high value if combined and compared. The information retrieved from the aforementioned sources will be gathered in a single dashboard (such as Power BI) to connect the different data and present it in a clear and structured way.

7.3. Launch of ESCO evaluation survey

During the last months of 2021, the Commission has focused on the production of the Evaluation Survey. The starting point for the survey is the M&E plan, thus the first draft has been based on that, however, thanks to multiple rounds of feedback, the survey evolved to the following structure:

- ESCO visibility
- The use of ESCO in your services
- Evaluations of ESCO in your services
- Perception of ESCO's impact and relevance
- Coherence with other EU initiatives and EU added value
- Use of ESCO in EURES
- Demographics

The survey questions have been created following the criteria and evaluation questions defined initially in the M&E plan. They were fine-tuned via regular feedback loops and they were tested by at least 2 external users. More information about the survey questions can be found in the annex.

The survey has been published on EU Survey on the 22nd of November and remained available until the 7th of January 2022. It has been advertised through the ESCO newsletter and the LinkedIn accounts of the ESCO Secretariat members. Additionally, it was included in other EU newsletters and further shared by close colleagues of the ESCO network.

Participants from 101 organisations answered to the survey. 60% of them are ESCO implementers. Participants are well widespread among the various ESCO use cases and are also balanced between the private and public sector, with a slight majority of the latter, most of them are based and operate in Europe, although a small proportion is based and operates in extra-EU countries.

From the survey it emerges that **implementers are overall satisfied with ESCO** and state that **most of the times it brought positive changes to their operations**, in particular in terms of **starting new projects or research, interoperability, and quality of the services**. According to **EURES members, ESCO contributed to improve the quality of data exchange and their job-matching services**.

The results are currently being analysed in depth and will become available in the final ESCO evaluation report.

8. Improvements to the ESCO classification

In 2021 the Commission published a new minor version of the classification, ESCO v1.0.9. It also completed the work for the release of ESCO v1.1, which was released in January 2022.

8.1. ESCO v1.0.9

ESCO v1.0.9 was published in November 2021. It addressed feedback on the translation of ESCO concepts provided by members of the ESCO Member States Working Group (MSWG), EURES mappers and ESCO implementers. In particular, the following language updates were performed:

- Updated alternative labels in the German language package
- Correct translations of occupation descriptions in the German language package
- Correction translations of preferred labels of skills in the Spanish language package
- Correction of labels and descriptions of occupations and skills in the Dutch language package
- Correction of labels and descriptions of occupations and skills in the Italian language package
- Correction of labels and descriptions of occupations in the French language package
- Correction of description of skills in the Lithuanian language package
- Correction of labels and descriptions of occupations and skills in the Romanian language package
- Add alternative labels and improve preferred terms of occupations in the Norwegian package
- Improve translations of ISCO groups in the Bulgarian language package

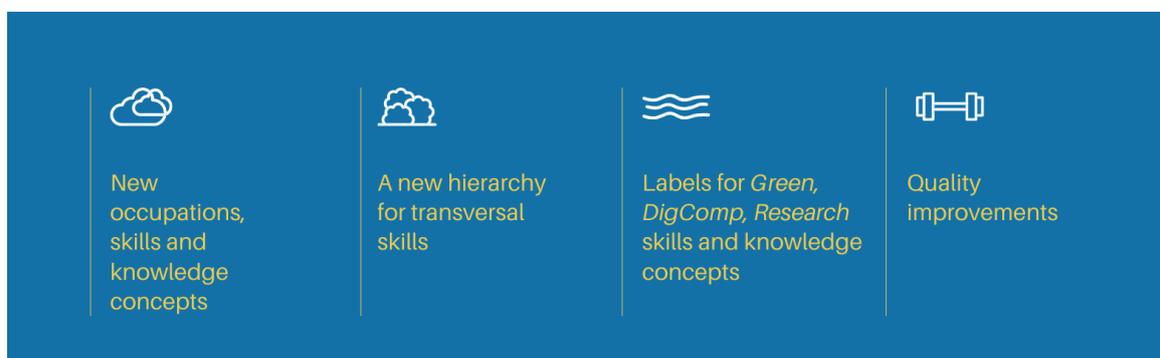
- Correction of portal labels in Greek, Spanish, Norwegian and French
- Missing labels from the ESCO skills hierarchy (all ESCO languages)

8.2. Towards ESCO v1.1

ESCO v1.1 is the first major update of the ESCO classification since the launch of ESCO v1.0 in July 2017. It addresses a substantial number of changes in the European labour market, focusing in particular on the digital and green transitions and on the impact of COVID 19 in terms of new occupations and skill requirements.

The key changes following the release of ESCO v1.1 are summarised in the infographic below. These include:

- **New content.** 68 new occupations, 354 new skills and 158 new knowledge concepts have been created and translated in all the ESCO languages. We name all the contributors below in this news item.
- **A new transversal skills hierarchy.** ESCO v1.1 includes a revised structure and terminology on transversal skills and competences.
- **Labels for Green, DigComp, and Research skills.** ESCO v1.1 offers the possibility to access to new sub-sets of skill and knowledge concepts. It includes in particular a taxonomy of skills for the green transition and for researchers, as well as digital skills and skills corresponding to the competences and competence areas of the European Digital Competence Framework for Citizens (DigComp).
- **Quality improvements.** Over 500 terms have been updated. Improvements range from removing duplicate concepts to addressing relations between concepts.



The sub-sections below describe the main activities carried out in 2021 in view of the publication of ESCO v1.1.

8.2.1. Organising feedback sessions and implementing changes

ESCO major changes – such as the introduction of new occupations, skills and knowledge concepts – require review and approval by European Member States. The review must be conducted both on the nature of the content (e.g. is the new occupation relevant for the local labour market?) and the quality of the translation (e.g. is the translation in the local language correct and representative?).

The process to collect feedback was divided into two parts.

First, a [new temporary portal](#) was created to host the drafted ESCO v1.1 classification. In this platform, users could navigate the classification using the pillar sections (as they would have done in the original ESCO portal) and download a ODS document with a list of the changes proposed. Such document included a designated area to provide feedback. This platform was also shared with other stakeholders to gather feedback on the content from different sources.

Second, once the content was finalised (based on feedback) and translated, Member States received files with translation of new and reviewed concepts. This round of validation aimed not only at ensuring a correct translation from a syntax perspective, but also as a correct representation of the national labour market jargon.

8.2.2. Labelling ESCO skills and knowledge concepts

Labelling skills and knowledge concepts offers the opportunity to expand the use of ESCO and better respond to labour market changes. In the ESCO context, the labelling activity results in providing supplementary information on existing concepts, at the level of *Concept Scheme*, which is the field where this type of metadata is stored.

Following the priorities set by the European Commission, during 2021 the labelling activity focused on *green*, *DigComp* and *research* labels.

The process to label green skills and knowledge concepts is described in Section 9.1.2. DigComp labels did not require intensive work, as the work conducted Digital Competence Framework for Citizens was adopted.

Skills for researchers were labelled thanks to a collaboration between ESCO and the Commission's Directorate-General for Research and Innovation (DG RTD). The methodology started from a selection and review of ESCO occupations related to the field of research. Then, essential and optional skills have been reviewed, and a final dataset of skills relevant for researchers has been drafted. In such collaboration, the RTD team focused on the analysis of the concepts, while the ESCO team supported from a technical perspective (e.g. preparing the data files to be processed) and ensuring compliance with ESCO standards. As an additional result of this effort, skills relevant for researchers but not yet included in the ESCO classification have been drafted and included in v1.1.

8.2.3. Delta files and support material

To ease the shift from ESCO v1.0.9 to ESCO v1.1 for implementers, a number of actions have been undertaken.

The delta file, a document which stores the delta between ESCO v1.1 and the previous minor version (ESCOv1.09), named *Delta_ESCO_v1.1.0* is available in the ESCO Portal ([Documents Section](#)). This document is developed in two tabs: one provides general information for the wider public concerning new, updated, and obsolete concepts, while the other provides detailed information for ESCO implementers concerning every change between version v1.0.9 and version v1.1.0.

Additional support material includes the report *Green Skills and Knowledge Concepts: Labelling the ESCO classification*, also available in the ESCO portal.

9. Data science for ESCO

9.1. ESCO updates and changes

Data science played a key role in a wide range of activities that were undertaken for the creation of ESCO v1.1. The following sections provide a number of examples on how the Commission applied these techniques.

9.1.1. Quality improvements

A set of ESCO skills was linked to ESCO occupations by combining the results from a machine learning model technique with EURES data and expert validation. Firstly, this approach was followed to link new skills to support sustainability in the building sector to occupations by using ESCO Preferred Terms and Descriptions as input for the model. These suggestions were filtered by the Commission and finally validated by sectoral experts. A second use case focused on skills with modified reusability level (from transversal to cross-sectoral) and a set of orphan skills (i.e. skills without occupation links). For this task, a similar procedure as above was followed, but additional validation was performed using summary statistics (skill-occupation pair frequencies) extracted from online job vacancies from the EURES portal.

As some of the new occupations drafted for ESCO v1.1 were missing Non-Preferred Terms, the Commission opted to include alternative labels that appear as job titles in online job vacancies. A machine learning model was developed to suggest job titles from vacancies that were semantically most similar with respect to a newly created ESCO occupation. These suggestions were enriched with statistics from the labour market and ultimately manually validated by the Commission and sectoral experts.

9.1.2. Green skills

To better support the European workers and employers responding to labour market changes due to the Green Transition, the ESCO skill pillar now includes a green label for skills and knowledge concepts. Skills have been labelled as green based on a 3-step process. First, skills have been manually labelled by the Commission based on the definition of green skills suggested by Cedefop. Then, the Commission developed a machine learning model to classify skills as white, brown, and green. The classifier was built using data from European vacancies, reports and regulations, as well as classifications developed by Member States and non-EU members. Finally, the two result sets were compared and discrepancies manually verified.

9.2. ESCO interoperability with O*NET

Creating crosswalks between ESCO and other classifications was one of the goals set for 2021. Crosswalks are extremely relevant to better connect the European labour market to non-EU countries for economic growth, statistical analysis, and other use cases through interoperability. In 2021 the Commission, in collaboration with US Department of Labour (US DOL), worked on realising a crosswalk between the occupations of the ESCO classification and O*NET.

An official mapping, co-created and approved by the owners of both classifications, guarantees a high level of quality and reliability and therefore would encourage its use by a wide range of organisations, including those that do not have the resources to establish such a crosswalk or ensure the reliability and quality of the data.

The process started in the second quarter of 2021 with a pilot of 200 O*NET occupations that were mapped to ESCO, after which both partners met to verify the quality of the work and to improve the alignment. Subsequently, the Commission continued with the two remaining batches of data. Currently the validation of the third batch is ongoing and the work will be published on the ESCO portal and on other channels agreed with US DOL.

In order to support this process, the Commission developed a machine learning model that, based on semantic similarities, matched O*NET occupations to similar ESCO occupations. This model was trained using labour market expert feedback, national taxonomies, Qualification Data Register qualifications and job vacancies. Next, the machine learning suggestions were used as input for the human validation phase: the suggestions for the first batch of 200 occupations (corresponding to 2.000 mappings) were manually verified and the type of relation for each suggested O*NET-ESCO pair was established. The human feedback originating from this first batch was then used to obtain an improved machine learning model for processing the second batch, after which it was repeated for the third batch. This iterative process represented an efficient approach to quickly optimise the results over time. The complete process was subjected to various stages of quality control by both partners to ensure the highest possible level of quality.

9.3. Revising transversal skills in ESCO

The skills pillar of ESCO v1.1 includes a new transversal skills hierarchy, which clusters some of the former ESCO transversal skills, as well as new skills that were added to ESCO v1.1. A consequence of this process was that a subset of former transversal skills, included in the classification until ESCO v1.0.9, got disconnected from the new transversal skills hierarchy. To handle this group of skills, two main activities were performed.

Firstly, the Commission employed a machine learning model to verify whether new transversal skills were duplicates of old transversal skills or non-transversal skills (e.g. cross-sectoral skills). This process of duplicate detection resulted in removing the old concepts and revising all the links between these skills and other concepts in the classification.

Secondly, while adding new transversal skills, it was important to ensure consistency with the existing transversal skills. Therefore, the Commission developed methodology to suggest possible parent-child relations between the new transversal skills and non-transversal skills. For this task, a machine learning model was developed on all parent-child relations that were already present in the ESCO classification. In addition to such a model, pre-training and post-training rules were applied. An example of a pre-training rule is that skill groups could not be considered as children. Post-training rules were more elaborate, for example the ability to filter by the: amount of word overlap, best possible parent suggestion for the same child skill, reusability level of the suggested child, etc.

9.4. Linking ESCO skills to qualifications

Between September 2020 and January 2021, the Commission organised the second phase of the Learning Outcome Linking pilot. This phase resulted in a set of 3.724 learning

outcomes linked to ESCO skills in nine different languages. These data are crucial to iteratively improve the ESCO skill suggestions as it enables the Commission to compute and compare the performance of different algorithms. A thorough statistical analysis of these mappings was performed, resulting in a benchmark dataset for algorithm development purposes.

The third phase of the pilot is planned to start in March 2022, and for this phase two additional algorithms were included besides the word2vec algorithm that was already integrated in the platform. In total over 30 different models were built based on the multilingual BERT algorithm and the semantic embedding mapping algorithm. The multilingual BERT model is a methodology that allows direct semantic comparisons in the native language. The semantic embedding mapping model is including a BERT model that only accepts English input text, requiring a translation step. For each of these algorithms the model with best performance on the benchmark dataset was selected. In conclusion, for the next phase of the pilot three algorithms were implemented: word2vec, multilingual BERT and semantic embedding mapping.

A major complication in benchmarking the results was that the results for word2vec are over-optimistic as this method was also used to collect the data in phase 2 of the project. This results in biased performance metrics for this method. In order to have an unbiased comparison between the three models a balanced interleaving approach is used to compare the models in the third phase of the pilot. This approach will result in an unbiased measurement of the different performances and provides crucial evidence for further improvements.

Finally, a multilingual sentence splitter model was implemented to produce higher quality initial splits. In phase 2 of the pilot the algorithm was splitting only for newlines, resulting in inaccurate results and leading to significant manual corrections. The new sentence splitter that will be implemented for phase 3 is a machine learning model that learns to split multilingual qualifications based on a set of already split qualifications.

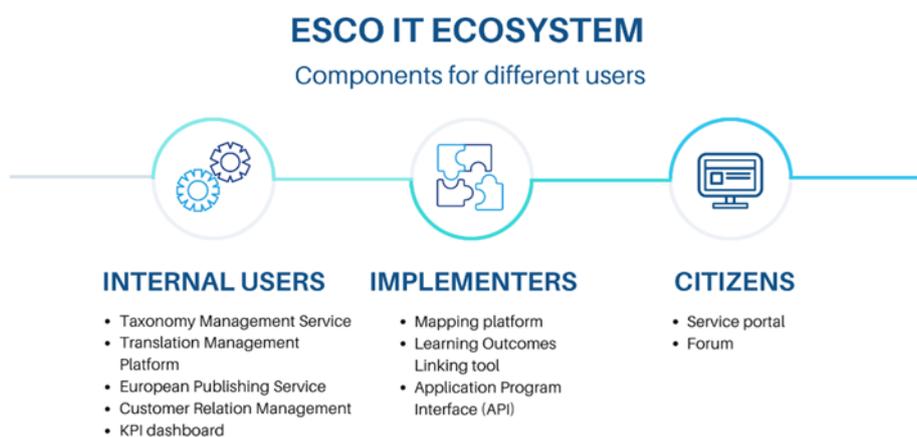
10. The ESCO IT ecosystem

ESCO needs to be supported by several IT components for the maintenance of the classification, the management of its versions (past and future ones), the creation of links with external classifications and qualifications and the communication with stakeholders. These tools allow, for instance, to update the classification, translate the terms in different languages, publish ESCO and create and maintain correspondence tables resulting from mapping processes.

Each year the Commission invests in the improvement and maintenance of the existing ESCO IT components and – whenever necessary - in the development of new ones. Users' needs are at the forefront of such investment decisions. These needs come from i) those users responsible for maintaining the classification (internal users) as well as from ii) implementers who integrate ESCO in their businesses (both private and public ones) and iii) citizens. The ESCO applications which are available today are the following:

1. **Taxonomy Management Service:** is used to manage the continuous improvement of the ESCO classification in its reference language, i.e. English. The platform allows creating new skills and occupational profiles and various other features necessary for the content improvement of ESCO.
2. **Translation Management Platform:** facilitates the translation of ESCO from English to other languages.

3. **ESCO Publishing Service:** aims at facilitating the ESCO versioning generation and publication workflow.
4. **Customer Relation Management (CRM) platform:** supports the ESCO stakeholders' follow-up.
5. **KPI dashboard:** displays KPIs (business and quality ones) measuring the success and quality of ESCO.
6. **Mapping platform:** allows EURES countries to create, update and manage correspondence tables of concepts between their national classifications and ESCO.
7. **Learning-Outcomes Linking (LO-L) tool:** supports EURES countries in enriching the learning outcomes data of their qualifications with links to the ESCO skills.
8. ESCO offers access to the classification through **APIs**²² (web and local).
9. **ESCO Portal:** provides general and technical information about ESCO and allows users to browse and download the classification.
10. **ESCO fora:** is a discussion space which allows ESCO stakeholders to interact and exchange both with the Commission and among themselves on ESCO content-related topics as well as technical ones.



In 2021 the Commission delivered:

- an improved version of CRM in order to facilitate the Commission keep record of stakeholders and
- an improved version of LO-L in order to facilitate Member States pilot the link of learning outcomes of qualifications with ESCO skills.

The Commission, also, created a new, revamped ESCO portal foreseen to be launched in February 2022 – an investment that started in 2020 - offering a more straight-forward access to the ESCO services and a more user-friendly lay out. The redesign has the goal to improve the usability and the information structure for the visitors of the portal.

The new ESCO portal will include an improved homepage, providing an overview of the main sections while allowing the users to access directly the classification, the web API and the download section with fewer clicks than in the older portal. The portal will, also, feature

²² API is a software component facilitating the interaction with other software components.

the mapping tables of the EURES countries between their national classifications and ESCO as well as the mapping table between O*NET²³ and ESCO.

Last but not least, the ESCO fora will be revamped, in accordance with the look and feel of the new ESCO portal.

11. ESCO governance

Until the end of 2021, ESCO governance was ensured by the Member States Working Group on ESCO (MSWG) and of the ESCO Maintenance Committee (MAI). These expert groups provided feedback concerning the release of ESCO v1.1. The term of these group ended with the release of this ESCO version.

11.1. Closure of existing ESCO governance bodies

In total, three meetings for the two governance bodies were held in 2021. Due to the COVID-19 pandemic, all meetings took place online.

The **35th meeting** of the ESCO Maintenance Committee took place on 27 April 2021. The Commission informed the Maintenance Committee on the following topics:

- The state of play regarding the uptake of ESCO by public and private implementers
- The results from the second phase of the pilot project for linking learning outcomes of qualifications with ESCO skills
- The state of play of the implementation of ESCO in EURES
- The results of the consultations of the ESCO Member States working group on the draft English version 1.1
- The feedback received on the ESCO skills hierarchy and future improvements
- The work on transversal skills.

Moreover, the Commission organised 2 workshops dedicated to the future evolution of ESCO (ESCO v1.2).

The **14th meeting** of the ESCO Member States Working Group took place on 10 June 2021. During the meeting, the Commission informed the working group on the use of ESCO in Europass, on the state of play of the mapping exercise and on the approved communication plan for ESCO.

It also discussed the results from the second phase of the pilot project for linking learning outcomes of qualifications with ESCO skills and presented the updated report of the expert group on a new terminology for transversal skills. Moreover, it informed members on the state of play of ESCO 1.1 and on the timeline of the consultation on language versions.

A **joint meeting** of the two governance bodies took place on 29 November 2021. The Commission presented the final EN version of ESCO 1.1 which was formally approved by the two groups. The Commission offered a state of play of the mapping exercise and

²³ O*NET is the US classification of occupations. Available at: <https://www.onetonline.org/>

informed the two groups on the partial results related to the exchange of vacancy and CVs tagged with ESCO codes. Other topics included the third phase of the pilot project for linking learning outcomes of qualifications with ESCO skills, and the presentation of the monitoring and evaluation survey.

The go live of ESCO v1.1 will coincide with the end of the mandate for both ESCO governance groups. In 2022, the Commission will begin the process for creating a new expert group to support the development of the classification. The group will be of technical nature, composed by experts in classification and taxonomies applied in the labour market, education or training.

12. Annex: ESCO evaluation survey

Background

The European multilingual classification of Skills, Competences and Occupations (ESCO) is a European Commission initiative, run by the Directorate General for Employment, Social Affairs and Inclusion (DG EMPL). ESCO is available free of charge, as linked open data since July 2017.

Purpose of the survey

Through this survey, the European Commission seeks to collect feedback from ESCO implementers about the specific use of the classification and the contribution it makes in the delivery of digital services, projects or research.

The survey is part of ESCO's monitoring and evaluation strategy started in 2021 that aims to draw evidence-based conclusions about ESCO's role and impact on the EU labour market and education and training. The results will feed into the continuous development of ESCO and its management.

Target audience

The target audience of this survey is any public, private or non-profit organisation using ESCO in their systems, projects or research for any of the ESCO use cases: connecting people to jobs, connecting education with the labour market and performing labour market analysis on skills and occupational trends.

Time estimation

To complete the survey, it will take around 15 minutes.

Data privacy

The data collected is solely intended for the purpose of the evaluation of ESCO. More information about the privacy statement can be found in the document attached below.

[ESCO evaluation survey privacy statement.pdf](#)

ESCO's visibility

* How did you learn about ESCO?

- Search engine
- Social media
- Word of mouth (employer, colleagues, friends, etc.)
- Blog or publication
- European Commission website
- ESCO is a formal part of the activities of my organization
- Other

* How familiar are you with ESCO?

- Not at all familiar
- Slightly familiar
- Moderately familiar
- Very familiar

* How well known is ESCO in your sector/organisation?

- Not at all
- Slightly known
- Moderately known
- Very well known

The use of ESCO in your services

* Is your organisation implementing ESCO?

- Yes
- No

Perception of ESCO's impact and relevance

Please rate the following:

	To a great extent	To a good extent	To a certain extent	To a minor extent	Not at all	I don't know
*To what extent does ESCO contribute to increased opportunities for labour mobility?	<input type="radio"/>					
*To what extent does ESCO facilitate re/up skilling for workers/job-seekers?	<input type="radio"/>					
*To what extent is ESCO connecting the world of education with the labour market (e.g updating or creating training/curricula to bridge skills gaps)?	<input type="radio"/>					
*To what extent does ESCO contribute to the analysis of labour market data (e.g skills trends in a specific sector/industry)?	<input type="radio"/>					
*To what extent is ESCO contributing to	<input type="radio"/>					

	To a great extent	To a good extent	To a certain extent	To a minor extent	Not at all	I don't know
improved interoperability in the digital labour market?						
*To what extent do you value ESCO's interoperability with national and other international classifications (O*NET, NACE, ISCO)?	<input type="radio"/>					
*To what extent is ESCO a widespread standard?	<input type="radio"/>					
*To what extent is ESCO fit for the needs of your organisation?	<input type="radio"/>					
*To what extent does ESCO benefit your type of organisation?	<input type="radio"/>					
*To what extent is ESCO aligned with labour market occupational and skills trends?	<input type="radio"/>					

Please rate the following:

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
*ESCO complements other EU initiatives on job-matching and big data analysis (such as Europass or OVATE, for example), without duplicating them.	<input type="radio"/>				
*ESCO complements national taxonomies, without duplicating them.	<input type="radio"/>				
*A classification like ESCO can only exist if provided by the European Commission or another EU body.	<input type="radio"/>				

Users demographics

* Organisation name

Name

* In which country(ies) is your organisation located?

- In a European country
- In a non European country
- In several European countries
- In several non European countries

* In which country(ies) does your organisation operate in?

- In a European country
- In a non European country
- In several European countries
- In several non European countries

* In which sector is your organisation operating in?

- Public sector
- Private sector
- Private sector - startup
- Non profit sector

* What is the size of your organisation in terms of employees?

- 1 to 9 (micro)
- 10 to 49 (small)
- 50 to 249 (medium)
- 250 or more (large)

* When did your organisation start operations?

- Less than a year ago
- 2-5 years ago
- 5-10 years ago
- 10-20 years ago

More than 20 years ago

* How many users/customers do you have?

- 1 to 100
- 100 to 1000
- 1,000 to 10,000
- 10,000 to 100,000
- 100,000 to 1,000,000
- More than 1,000,000
- No users/customers yet
- Not applicable

* You are representing:

- | | |
|---|---|
| <input type="radio"/> Career advisors | <input type="radio"/> National/Regional/Local public administration |
| <input type="radio"/> Consultancy companies | <input type="radio"/> Ontology management companies |
| <input type="radio"/> Credential issuers | <input type="radio"/> Public employment services |
| <input type="radio"/> Educational institutions | <input type="radio"/> Private employment services |
| <input type="radio"/> EU projects | <input type="radio"/> Representative organisations |
| <input type="radio"/> EU institutions/bodies | <input type="radio"/> Research institutes/universities |
| <input type="radio"/> Human resources management system providers | <input type="radio"/> Social media/e-portofolio platforms |
| <input type="radio"/> International organisations | <input type="radio"/> Social partners |
| <input type="radio"/> IT/data companies | <input type="radio"/> Student information system providers |
| <input type="radio"/> Job portals | <input type="radio"/> Other |
| <input type="radio"/> Learning management system providers | |

We would like to hear more about your feedback on ESCO. Do you agree to be contacted for a follow-up interview?

- Yes
- No

We would like to keep in touch and provide you with the opportunity to be part of a community of ESCO implementers. Do you agree to be added to our database of ESCO stakeholders and receive our newsletters (every quarter)?

- Yes
- No

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