EUROPEAN COMMISSION
DIRECTORATE-GENERAL FOR EMPLOYMENT, SOCIAL AFFAIRS AND INCLUSION

Skills
Skills and Qualifications

Brussels, 1 February 2019

MEMBER STATES WORKING GROUP ON ESCO
9TH MEETING 7 February 2019

MSWG 9-2

A structure for the ESCO skills pillar

1. Introduction

The purpose of the document is to report to the Member States Working Group on the state of play for the work on a structure for the skills pillar of ESCO, including the selection of the new experts and their work.

2. Background

The Commission services will soon start developing a skill and knowledge hierarchy to allow users access the ESCO skill and knowledge concepts more easily and intuitively. To this end, the Commission services will use existing resources as a starting point, i.e. the Canadian Skills and Knowledge glossary[1].

3. Development framework

The development of the hierarchy will involve the following:
1. Compile sufficient background information to guide the developers of the hierarchy and its users towards a correct understanding and use of the hierarchy;
2. Define principles which will form the basis for creating the distinct groups of the hierarchy;
3. Enrich each of the existing groups of the Canadian Skills and Knowledge glossary (and new groups added by the experts and/or the ESCO team) with scope notes in order to define their boundaries and disambiguate them from other groups within the glossary with which they have similarities;
4. Allocate each of the ESCO skill and knowledge concepts to only one skill or knowledge group of the hierarchy.

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[1] https://www.jobbank.gc.ca/skillsandknowledgeglossary#skills-201113

The Commission services have selected four experts to support the implementation of tasks 1-3 and advise the ESCO team on the subsequent implementation of task 4.

The experts will focus on the first two levels of the Canadian Skills and Knowledge hierarchy while exploring the possibilities of adding more levels, if necessary. The ESCO team may develop additional levels (or groups) at a later stage, if needed, while allocating the ESCO skills and knowledge concepts to the newly developed hierarchy. However, the experts will provide the ESCO team with guidance on how to develop the additional levels.

4. Quality assurance

The process will be strengthened by quality assurance steps which will be agreed upon with the experts prior to the start of the allocation and integrated within the allocation process.

To this end, upon completion of the allocation process, the experts will test the usability of the newly developed ESCO skills hierarchy by allocating a sample of ESCO skills. This will allow the experts to test if the hierarchy allows clustering of the ESCO skills, identify gaps, if any, in the draft hierarchy and the scope notes and address them. As an additional quality assurance mechanism, stakeholders coming from IT, employment and education and training will test the new structure's usability.

5. Skill hierarchy use cases

Once all four tasks are completed, the skill and knowledge hierarchy will enable users search and retrieve the ESCO skill and knowledge concepts in order to, *inter alia*:
- Compile CVs and job vacancies;
- Annotate qualifications with ESCO skill and knowledge concepts;
- Map skill and knowledge classifications to ESCO;
- Create skill (self-)assessment tools;
- Provide targeted career guidance.

6. Deliverable

The main deliverable of the experts' team will be a list of skill and knowledge groups, which should include:
- a title referring to the name of each group;
- a description specifying what each group is about;
- a scope note, disambiguating from similar groups;
- examples of skills or knowledge concepts that fall within the scope of the skill or knowledge group.

7. Experts' profile

The selected experts have:

1. professional expertise in the knowledge areas of i) qualifications and curricula design and development, ii) design and development of career guidance services and applications and iii) labour market statistics;
2. a proven track record of working with data modelling, classification systems, taxonomies, ontologies and competency frameworks for education & training and labour market applications, and a proven knowledge of the ESCO functioning structure;
3. a good knowledge of the skill terminology used on the labour market and in educational institutions and extensive knowledge of the information sources available at international and national level on such data (e.g. statistical reports, databases, studies, etc.);
4. knowledge of assessment criteria and performance evaluation of educational outcomes and candidate profiles.

8. ESCO transversal thesaurus

Transversal knowledge, skills and competences are relevant to a broad range of occupations and economic sectors. They are often referred to as core, basic or soft skills and are the cornerstone for the personal development of a person.

Within the ESCO skills pillar, transversal skills and competences are organised in a hierarchical structure with the following five headings:
- application of knowledge
- attitudes and values
- social interaction
- thinking

Both the concepts and hierarchical structure of the transversal knowledge, skills and competences were developed by the cross-sector reference group. The development was based on the analysis of a wide range of existing national and sectoral classifications, the European Dictionary of Skills and Competences (DISCO)[2] and other sources.

The experts will integrate the ESCO transversal thesaurus[3] (a hierarchy of transversal skills) into the new hierarchy, all the while complying with the following requirements for the final hierarchy:
- It should allow structuring the ESCO skill and knowledge concepts through mono-hierarchical relations;
- It should be intuitive for the end users.

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[2] http://disco-tools.eu/disco2_portal/
[3] https://ec.europa.eu/esco/portal/escopedia/Transversal_knowledge_44___skills_and_competences

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Annex

1. ESCO use cases and the structure of the skill pillar

The skill pillar is the central pillar of ESCO, creating a bridge between occupations and qualifications. In this context, its structure should be organised in a way that makes it independent from the other two pillars (occupations and qualifications) and better serves the ESCO use cases, so that users can access the skill pillar directly and obtain skill subsets depending on their needs without navigating the total skill set of 13 500 concepts.[4]

It is noted that certain skill groupings and examples in this document do not currently exist in ESCO and are only used for illustration purposes.

2. Seven use cases for the ESCO skill structure

2.1. Use case 1: validation of non-formal and informal learning

ESCO can be used to validate skills that have been acquired outside formal education, on the workplace or during leisure-time activities. ESCO can help to identify and assess these skills, and link them to careers and learning pathways.

In the example below, ESCO can help service providers to assess the skill "detect malfunctions in engines" by displaying its building blocks.

Skill/competence to be assessed	Skills and knowledge making up the skill to be assessed
Detect malfunctions in engines (skill)	Engine components (knowledge)
	Disassemble engines (skill)
	Principles of combustion engines (knowledge)
	Types of vehicle engines (knowledge)
	Read motor analyser (skill)
	Electrical safety regulations (knowledge)

In the example above, someone might have only some of the "building blocks" skills and knowledge, which could be assessed and validated. A learning opportunity could provide the remaining skills and knowledge and award a formal qualification.

2.2. Use case 2: curricula development

Education and training institutions and awarding bodies could use ESCO to identify relations between skills or how different skills and knowledge can be combined to build other skills. This information would be a helpful tool to develop curricula and training courses. The example below shows the skills and knowledge that a course having as a goal to teach music composition might include.

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[4]

Skill/competence	Skills and knowledge making up the skill/competence
Compose music (skill)	Musical notation (knowledge)
	Musical theory (knowledge)
	Musical instruments (knowledge)
	Think creatively (skill)

2.3. Use case 3: lifelong learning

Jobseekers and learners could use the ESCO skill relations to explore ways for up-skilling and closing their skill gaps. In the previous example, they would have an overview of the skills and knowledge needed to develop the skill "compose music".

2.4. Use case 4: e-portfolios and self-assessment

Jobseekers with little or no work experience may find challenging to compile their CV or e-portfolio using a relevant terminology for the labour market. In particular, they would lack an occupational entry point to describe their skills, thus having to rely on their educational background and on self-assessment. Navigating categories of skills instead of a list of 13 500 skills and competences and being able to retrieve more detail only when needed is a more constructive approach. Depending on their background, their attitudes and preferences, people may want to look at their IT skills, their communication skills, their language skills or their management skills.

Life experience	Skill category	Skills
President of the student union	➢ Management o Coordinating and organizing	• Plan events • Manage schedule of tasks
	➢ Social interaction o Persuade others	• Promote education programmes
Apprenticeship in agriculture	➢ Manufacturing and production o Food production and agriculture	• Market farm products
	➢ Operating and repairing equipment, machinery and vehicles o Operating mobile equipment	• Operate farm equipment

Volunteering experience in an NGO	➢ Digital competences
	
	    o Digital content creation
	
	        ▪ Develop digital content
		• Use word processing software

	➢ Language o Arabic	• Interact verbally in Arabic
	➢ Social interaction o Demonstrate intercultural competence	• Apply intercultural teaching strategies

2.5. Use case 5: skill-based job-matching

When matching people to jobs, employers cannot always find the candidate/s that have the exact same skills described in a job vacancy. Therefore, being able to rank candidates on how close they match the defined set of criteria is of added value.

The example below shows this case by looking at two skills (one in demand and one on offer).

The employer is looking for a candidate that masters the skill "forecast economic trends". However, the best candidates available report that they have the skill "analyse economic trends". These skills are not the same therefore a job-matching algorithm may represent the candidates as a "no match". However, these skills have knowledge in common (namely, the knowledge of macroeconomics and econometric models).

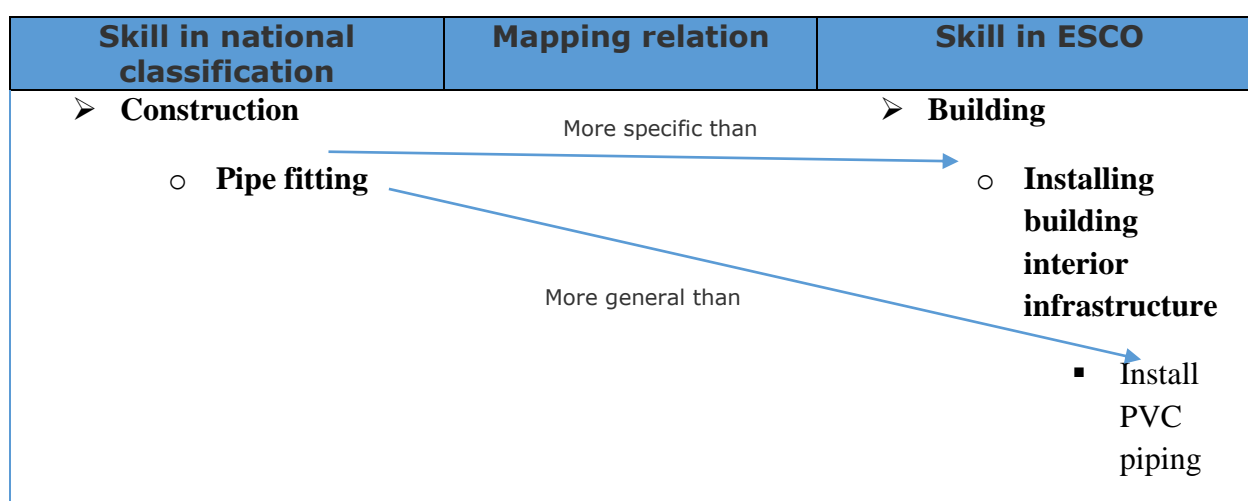| Skill/competence in demand	Skill/competence on offer	Knowledge common to both skills
Forecast economic trends	Analyse economic trends	• Macroeconomics • Econometric models

If this "common" basis is captured in the knowledge structure, the job-matching algorithm may use this information to return a measure of how "close" the candidates are to the requirements described in the job description, leaving the final decision to the employer.

2.6. Use case 6: mapping skill classifications to ESCO

Art.19 (2) and (6) of the EURES regulation requires Member States that use a skill classification for their employment services to either replace it with ESCO or map to it.

The mapping of skill classifications can be facilitated when the skills in both classifications are grouped into a hierarchical structure. This helps mappers to:

- use the structure to find the skills they are searching for; and

- cope with different levels of detail (see below).

Skill in national classification	Mapping relation	Skill in ESCO
➤ **Construction**		➤ **Building**
○ **Pipe fitting**	More specific than → More general than →	○ **Installing building interior infrastructure** ▪ Install PVC piping

In the example above, the skill groups making up the hierarchy for the skill pillar in ESCO help the mapping of a national classification that features a different level of detail.

2.7. Use case 7: improve data visualisation on the ESCO Service Portal

Each occupation in ESCO is linked to a set of skills/competences and knowledge concepts that can be displayed on the ESCO Service Portal. Clicking on an ESCO occupation opens a list of 35 to 50 skills/competences and knowledge concepts. While this wealth of information makes ESCO extremely valuable, the absence of a hierarchy can also make navigation difficult.

Adding a more consistent and comprehensive structure to the skill pillar would allow the ESCO Service Portal to display the skills in clusters, improving their visualisation and highlighting the skills/competences and knowledge areas that are relevant for each occupation.

The table below displays a possible partial structuring of the skills of the ESCO occupation "plumber" (on the basis of the Canadian skill classification). The skill groups highlighted in yellow will offer easier access to the occupation "plumber".

Occupation	Skill category/ies	Skill category/ group (lowest level)	Skills
Plumber	➤ Building	o Installing building interior infrastructure	• Install PVC piping • Install metal gas piping • Install plumbing systems
		o Constructing	• Set up temporary construction site infrastructure
		o Finishing building interior/exterior	• Use sander • Apply proofing membranes
	➤ Working with Technological Equipment and Machinery	o Using specialised instrumentation and equipment	• Check water pressure • Use measurement instruments
	➤ Attitudes and values o Attitudes	o Attend to hygiene	• Maintain work area cleanliness
	➤ Application of knowledge o Health and safety	o Follow safety precautions in work practices	• Work ergonomically