



Linking learning outcomes of qualifications to ESCO skills

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Introduction: Why linking qualifications to skills?

- to bridge the gap between education and employment → using ESCO to **identify and analyse** which skills are related to a particular qualification (further used to indicate matches and/or mismatches with skills needs of occupations and sectors);
- helps making **qualifications more transparent across Europe** and allows educators, students and employers aligning their needs
- Demonstrates how ESCO classification can be used to **enrich the descriptions of educational curricula**;
- Help the **translation, comparison and/or review** of qualifications
- The use of AI **reduces the costs and resources** needed to perform a similar activity

Why is ESCO relevant for qualifications?

ESCO is a common reference language that supports:

- transparency
- comparison,
- identification and
- analysis of the content of a qualification.



**Describe & understand
Learning outcomes of
qualifications**

Skills & knowledge as common
factor



**Enhance personalised
career guidance services**

Recommend personalised career
paths & learning



**Support validation of
informal/non-formal
learning**

Digital badges/micro-credentials

How to use ESCO for qualifications/training?

- Use the occupational profiles as a starting point
- Get inspiration from the skills and competencies described in ESCO
- Make use of the IT tool (soon to be provided publicly) on referencing learning outcomes of qualifications to ESCO skills
- Use ESCO skills for developing skills intelligence (skills in high demand) & use the results to inform curricula reform

Curricula reform use case

Public administration of Emilia-Romagna region, Italy

AIM:

Use ESCO to assess the skills and occupations relevant for the big data sector in order to adapt the curricula on offer in the region

HOW:

Quantitative & qualitative analysis

Identify occupations & skills from the sector based on ESCO via analysis of job vacancies

Survey to employers, education providers and teachers (universities + VET)

Focus groups on most important skills

RESULTS:

Understand the regional skills landscape

Validate the occupations & skills required by the labour market & supplied by universities

Work towards public-private partnership on skills development

Provide digital badges

In practice:

Competenze chiave

Figura 3.5. Le 17 Abilità/Competenze chiave per lo sviluppo dei Big Data

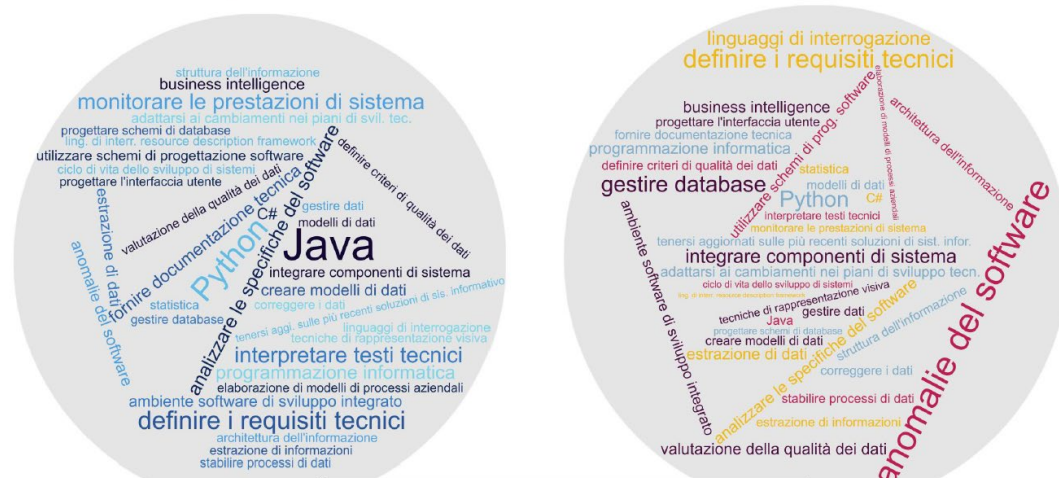
Abilità/Competenze chiave



Le Skills

Imprese

Docenti



- Understand the skills demanded by employers and skills supplied by education providers and where the mismatch is
- Work with education providers to update their curricula accordingly in the big data sector

Curricula reform use case

Politecnico di Milano, Italy
European credit clearinghouse for opening up
education ([ECCOE](#)) project

AIM:

Use ESCO to describe or tag
learning outcomes of Massive
online courses (MOOCs)

Compare content of training
courses to ESCO skills

Make the link explicit

HOW:

**Manual process by
education staff**

Use the ESCO portal to look at
skills, use search & browsing
function

RESULTS:

Annotation & new LO

*Annotate MOOCs with ESCO
skills to facilitate
interoperability*

Facilitate the work of training
providers when creating Learning
outcomes

In practice:

- Tagging courses content with ESCO skills results in references to an EU common standard
- It facilitates interoperability of learning opportunities among stakeholders.
- Supports the recognition of online learning opportunities



Ethics of Artificial Intelligence

INTENDED LEARNING OUTCOMES

By actively participating in this MOOC, you will achieve different intended learning outcomes (ILOs).

1. Week 1:

- Describe the reasons for an ethical analysis applied to AI.
- Recognize how the notion of responsibility is challenged when designing and using AI tools.

2. Week 2:

- Identify the ethical and social impacts and implications of AI.
- Recognize and analyze ethical and social issues inherent in AI by means of examples and case-studies analyzed with the use of the main ethical frameworks.

3. Week 3:

- Learn how to analyze problems through an ethical lens.
ESCO: address problems critically
- Use critical skills in clarifying and ethically analyzing AI in different domains of life.
ESCO: think analytically

4. Week 4:

- Critically analyze the current policies for AI.
- Use ethical and socially responsible principles in your professional life.
ESCO: follow ethical code of conduct ESCO: adhere to organisational code of ethics ESCO: values

Background: LO-linking platform

- **Pilot project for linking learning outcomes of qualifications with ESCO skills** (LO-linking platform) was conducted in 3 phases (started in 2019)

13 Member States and organisations:

- 9 EU MS
- 2 stakeholder organizations: ETUC and EURASHE
- 1 EU agency: The European Training Foundation (ETF)
- 1 international organisation: The Inter-American Development Bank

Second phase of the pilot project:

- Covered **367 qualifications in 9 languages** from different EQF levels (HE+VET)
- **241** qualifications established mappings
- More data was needed

Third phase of the pilot project:

- **1038 qualifications**, out of which **443** qualifications established mappings to ESCO skills
- 12 Languages

20 Member States and organisations:

- 7 EU MS
- 7 Training providers
- 4 private companies
- third country organisation: the Commonwealth Scientific and Industrial Research Organisation (CSIRO)
- 1 EU agency: The European Training Foundation (ETF)

ESCO qualifications pilot

The screenshot displays the 'Learning Outcome - Linking' interface. The top navigation bar includes the European Commission logo, the title 'Learning Outcome - Linking', and progress indicators for 'v1.1.7', 'ECCOEEN EN Qualifications', and 'ESCO skills'. The main content area is titled 'Sustainable Urban Water Systems' and shows a concept identifier 'b687368a-bd9d-41f7-b961-5ecd927a836'. The description states that the MOOC aims to provide knowledge about modern and sustainable solutions for urban water systems in water sensitive cities. A highlighted section indicates the focus is on stormwater management and water supply strategies. Below the description, there are tabs for 'Browse', 'API search', 'ML suggestions', and 'Occupation browsing'. The 'ML suggestions' tab is active, showing a list of related skills such as 'manage water flows and catchments', 'water policies', 'conserve water resource', 'develop flood remediation strategies', and 'water consumption'.

European Commission | Learning Outcome - Linking

v1.1.7 Progress: 0 / 15 Progress: 0 / 13891
ECCOEEN EN Qualifications ESCO skills

en ECCOEEN EN Qualifications → en ESCO skills

Version: v1 Filter... Version: 1.1.0

Active Learning for Soft Skills Development
Artificial Intelligence and legal issues
Artificial Intelligence: An Overview
Designing Learning Innovation
Discovering Nuclear- and Radio-Chemistry
Ethics of Artificial Intelligence
Fostering women's participation to STEM through MOOCs
Integrity and beyond MOOC
New paradigms in wastewater management: from a sanitation problem to a circular sustainable solu...
Platform Thinking: designing a Platform
Platform Thinking: exploiting data through platforms
Platform Thinking: what's beyond Uber?
Sustainable Urban Water Systems
Technologies and platforms for Artificial Intelligence
Water: an essential resource

Sustainable Urban Water Systems

In progress

Concept identifier
b687368a-bd9d-41f7-b961-5ecd927a836

Description
General description:
- The MOOC "Sustainable Urban Water Systems" aims to provide knowledge about modern and sustainable solutions for urban water systems in water sensitive cities. Focus is on stormwater management and water supply strategies for the mitigation of effects on the water cycles due to human settlements. Sustainable strategies integrate Nature-based Solutions (NbS) and Green Infrastructures (GI) to make cities resilient in front of global challenges, adding benefits to both the environment and community.
- The first week gives an overview of water cycle alteration in urban areas due to human activities in combination with climate change.

Learning Outcome Entities (15)

General description:
- The MOOC "Sustainable Urban Water Systems" aims to provide knowledge about modern and sustainable solutions for urban water systems in water sensitive cities.
Focus is on stormwater management and water supply strategies for the mitigation of effects on the water cycles due to human settlements.

Sustainable strategies
integrate Nature-based Solutions (NbS) and Green Infrastructures (GI) to make cities resilient in front of global challenges, adding benefits to both the environment and community.

Browse API search ML suggestions Occupation browsing

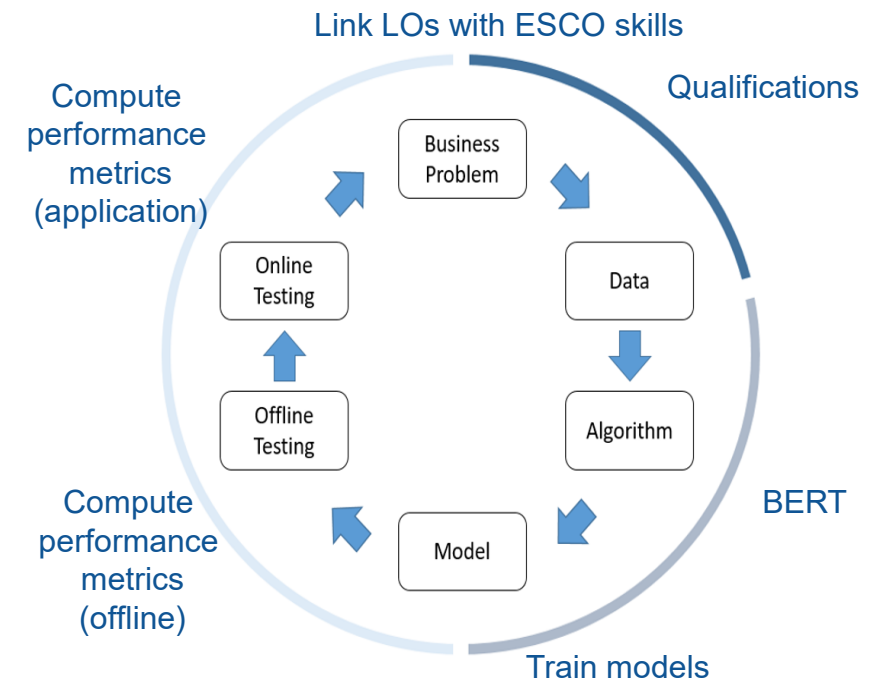
Filter...
 Hidden results are not shown

- + manage water flows and catchments
- + water policies
- + conserve water resource
- + develop flood remediation strategies
- + water consumption

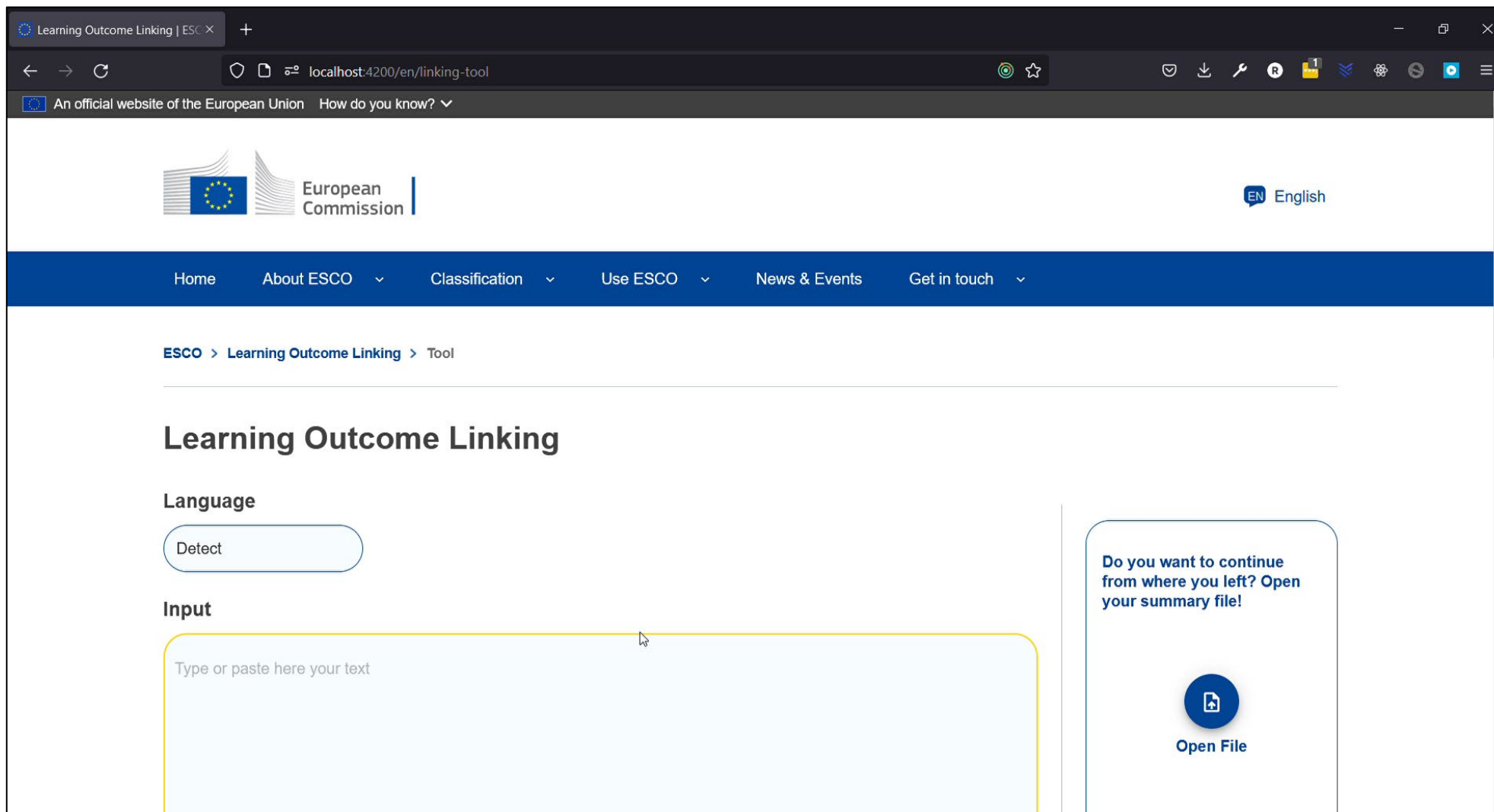
Background: LO-linking platform

Features of the IT tool supporting automated linking of Learning Outcomes of Qualification to ESCO skills :

- **Second phase: basic search algorithm + first standard NLP algorithm** based on word2vec
 - More data → **Two additional models** built based on **the Sentence-BERT algorithm** and the **semantic embedding mapping algorithm**
- From the third phase: **multilingual sentence splitter model** (a machine learning model that learned to split multilingual qualifications based on a set of already split qualifications)



Next steps – Open Access Mapping Tool



The screenshot shows a web browser window displaying the 'Learning Outcome Linking' tool. The browser's address bar shows 'localhost:4200/en/linking-tool'. The page header includes the European Commission logo and the text 'European Commission'. A navigation menu contains links for 'Home', 'About ESCO', 'Classification', 'Use ESCO', 'News & Events', and 'Get in touch'. Below the menu, a breadcrumb trail reads 'ESCO > Learning Outcome Linking > Tool'. The main heading is 'Learning Outcome Linking'. Under the heading, there is a 'Language' section with a 'Detect' button. Below that is an 'Input' section with a large text area containing the placeholder text 'Type or paste here your text'. To the right of the input area is a callout box with the text 'Do you want to continue from where you left? Open your summary file!' and a blue circular button with a file icon labeled 'Open File'. The footer of the page features the European Commission logo and the text 'European Commission'.

Thank you