

# MARTe – A technological approach to micro-credentials

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# MARTe – A technological approach to micro-credentials

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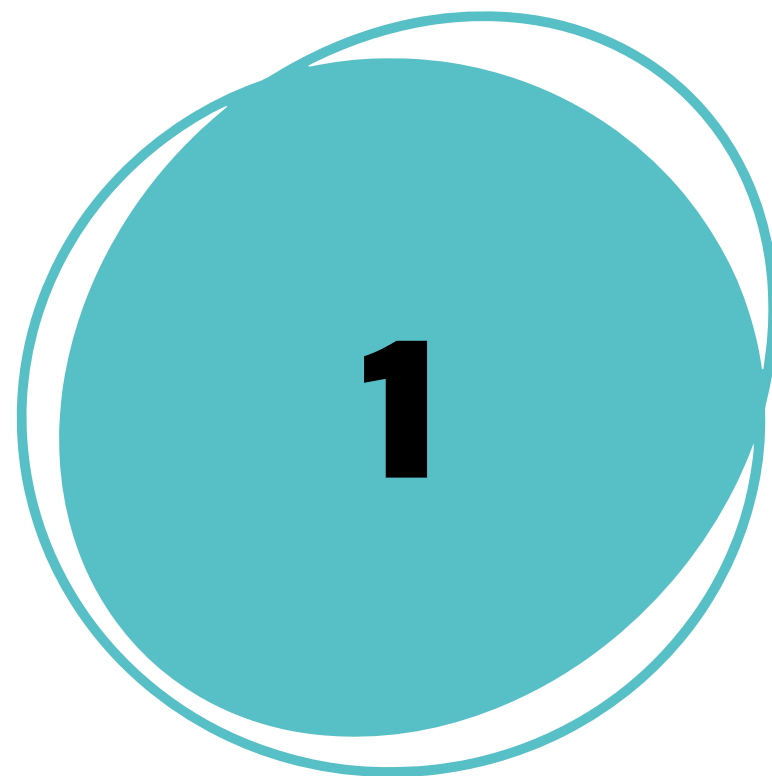
**Background**

**2**

**Project Overview**

**3**

**Validation and Mobility: democracy in action?**



# Background

support achieving the goals of the **European Education Area** - Council Recommendation on promoting automatic recognition of higher education and upper secondary diplomas and the outcomes of learning periods abroad.

## Objectives

Supporting HEIs - recognition-related topics and automatic recognition

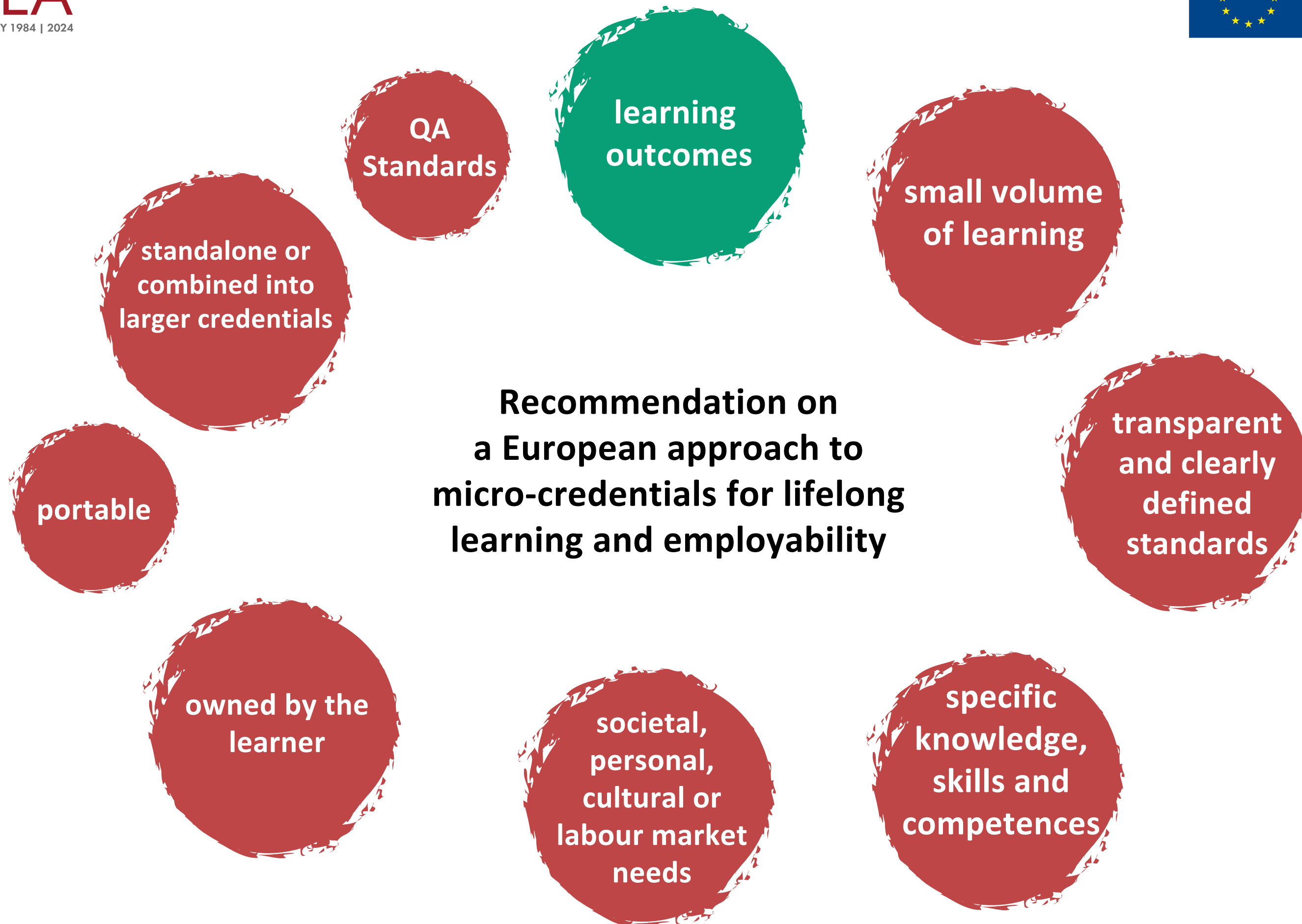
Mapping the possibility of automatic recognition of micro-credentials

## NARIC Call 2022

## Themes and priorities

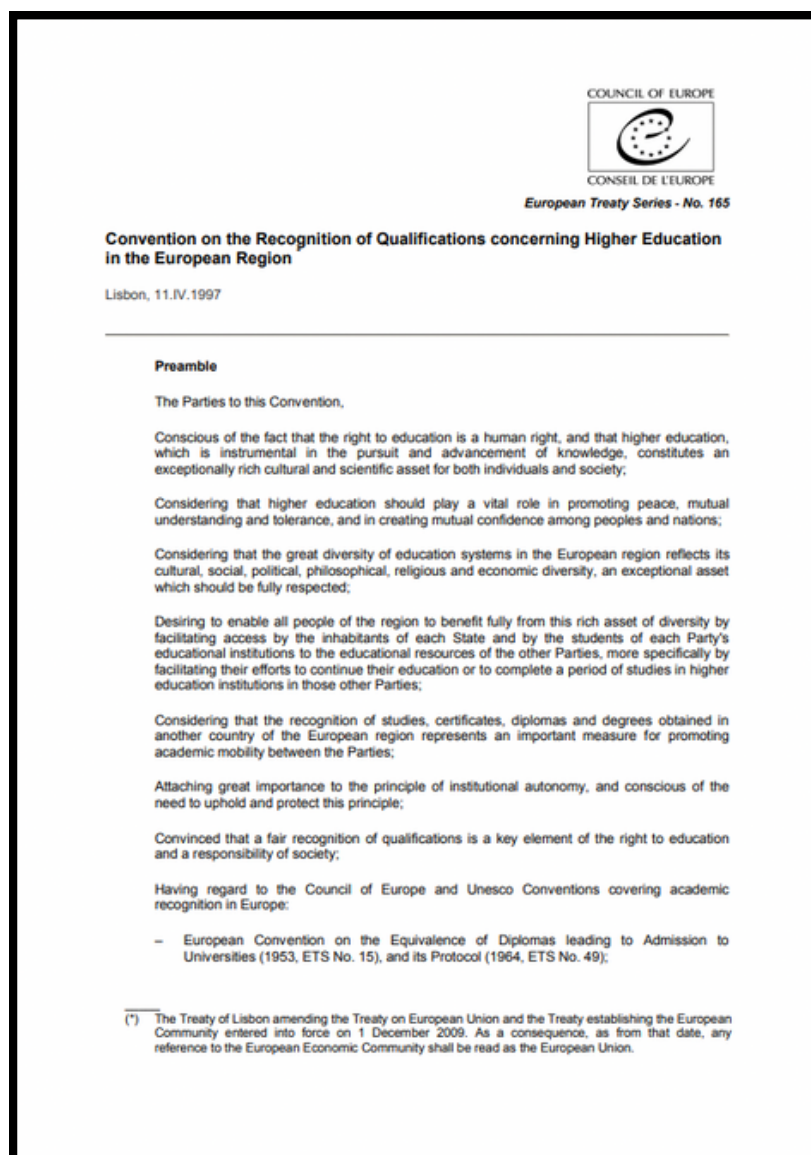
developing the evidence-base in the field of automatic recognition, transparency and availability of information on recognition decisions

support the goals of the **European Strategy for Universities** - map the possible use of automatic recognition for the recognition of micro-credentials and promote the recognition of short learning courses leading to micro-credentials.





## Convention on the Recognition of Qualifications concerning Higher Education in the European Region - Lisbon Recognition Convention



## Global Convention on the Recognition of Qualifications concerning Higher Education

### Art II.9

*Promote, through the recognition of qualifications, inclusive and equitable access to quality higher education and support lifelong learning opportunities for all, including refugees and displaced persons*

### Art VIII.1

*Each State Party shall establish transparent systems for the complete description of the qualifications and learning outcomes obtained in its territory.*



# Project overview

# MARTe Objectives

## General objective

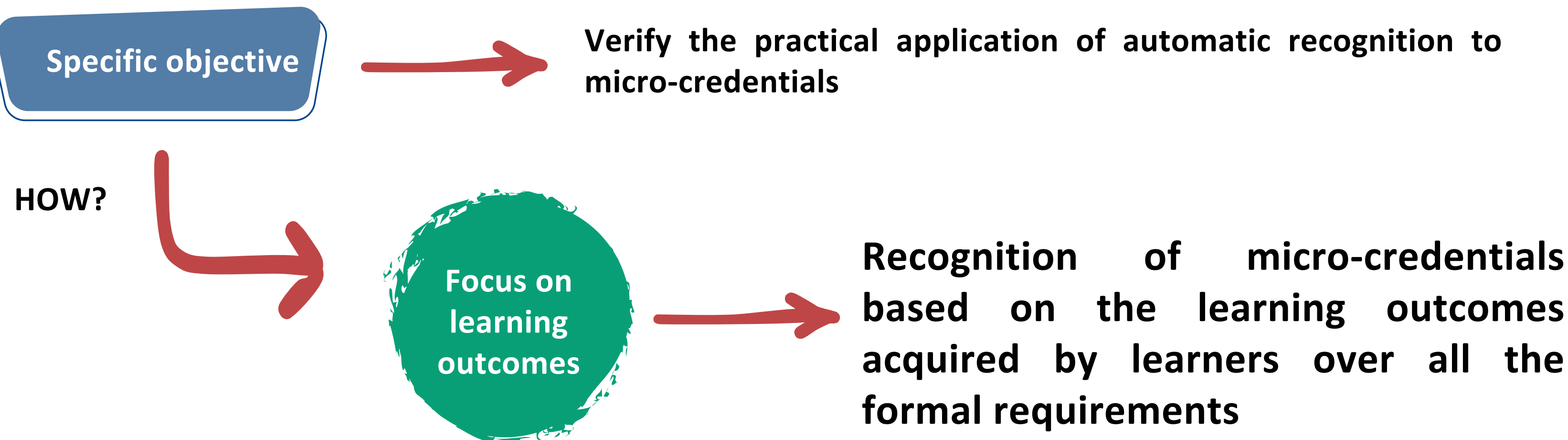
Supporting the implementation of the Council Recommendation on promoting automatic mutual recognition of qualifications and learning periods abroad



## Specific objective

Verify the practical application of automatic recognition to micro-credentials





**Are there common criteria in learning outcomes writing in the NARIC countries?**

# Project partners



**Associazione CIMEA**  
**ENIC-NARIC Italy**  
**Project Coordinator**



**Quality and Qualification Ireland**  
**ENIC-NARIC Ireland**



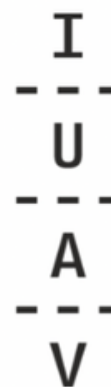
**Stichting Nuffic**  
**ENIC-NARIC Netherlands**

# Third parties



**UNIVERSITÀ DI PISA**

University of Pisa



Iuav University of Venice



Leica

# MARTe Results

1

Mapping the existing repositories of micro-credentials in partner countries and analysing the practises related to the recognition of micro-credentials that are already in place.

2

Verifying the consistency of learning outcomes shared by delivering institutions by applying the text-mining technology to the repositories of micro-credentials.

3

**Designing a Pilot micro-credential issued by a non-academic actor in cooperation with a higher education institution**

1st January 2023

31st December 2024

Beginning of the project

Mapping phase

Text-mining applied

In-progress

End of the project

# Work Packages

1

Project management, quality assurance  
monitoring and evaluation

2

Identification and further development  
of learning outcomes acquired through  
micro-credentials

3

Portability and recognition of a micro-  
credential

4

Publication on methodology and key-  
findings of the research and piloting  
activity

5

Dissemination and promotion activity

# WP2: Identification and further development of learning outcomes acquired through micro-credentials - methodology

## Step 1

Data collection - existing repositories of micro-credentials in partner countries

## Step 2

Data pre-processing - Data cleaning and Metadata analysis

## Step 3

Text Mining analysis

**Step 1**

## Data collection - existing repositories of micro-credentials in partner countries



### Mapping of single micro-credentials

1. Partner country
2. Providing country
3. Course description language
4. Industry 4.0? (YES/NO question)
5. Thematic Area
6. Workload (ECTS)
7. Duration of the Micro-credential (in hours)
8. Is the Micro-credential from an online university?
9. Name of the Micro-credential provider
10. Name of the micro-credential
11. Is the course still running?
12. Is the course already described as Micro-credential?
13. URL

What course did we  
considered as micro-  
credential?



- Courses provided by HEIs
- 1-59 ECTS credits\*

\*MICROBOL project: see references



### Collection of repositories of micro-credentials in partner countries

**1048 micro-credentials  
collected**



## Step 2

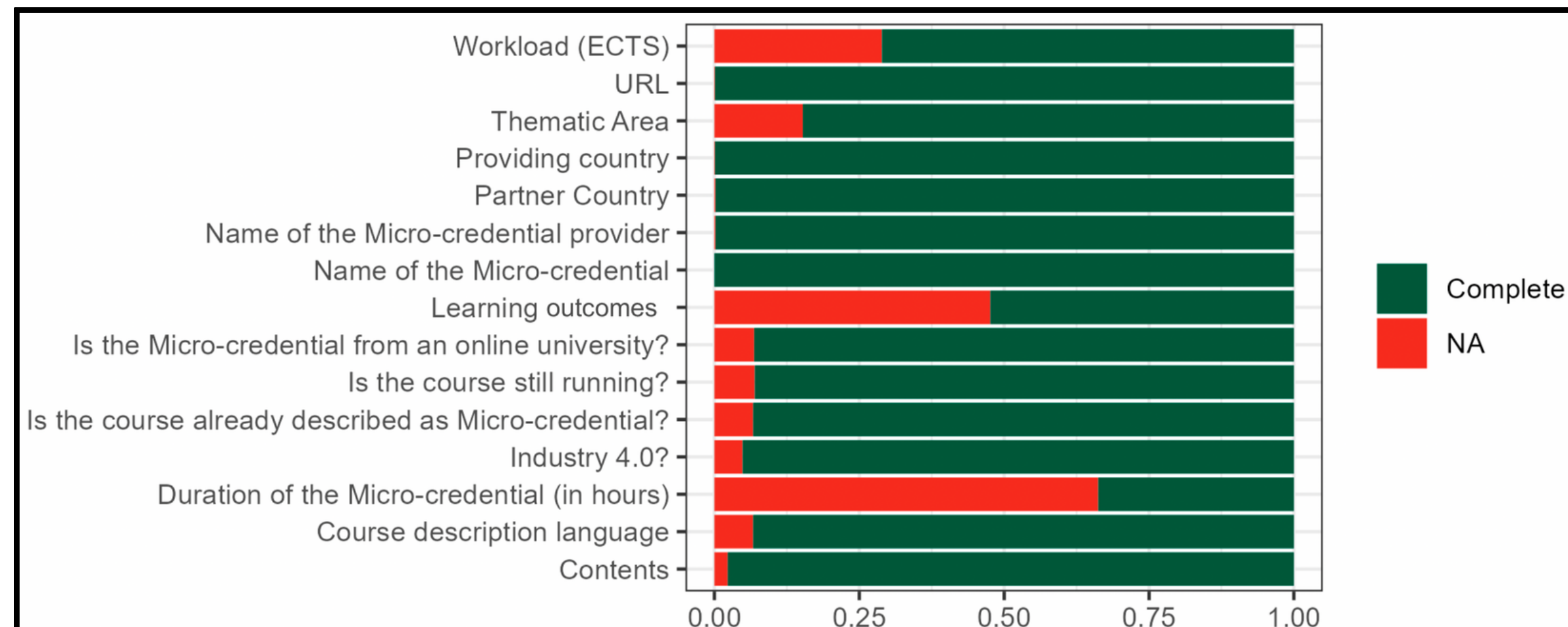
## Data pre-processing - Data cleaning and Metadata analysis

**WHY** Preparing the data collected for text mining analysis

**HOW** Data cleaning and Metadata analysis



- Extraction of learning outcomes (LOs) from course descriptions
- Selection of usable cases from the sample (e.g. exclusion of cases without learning outcomes)



**Step 3**

**Text Mining analysis**



**Text data analyzed focusing on the semantic and morphosyntactic structure of learning outcomes of the collected micro-credentials**

## 2 main research questions:

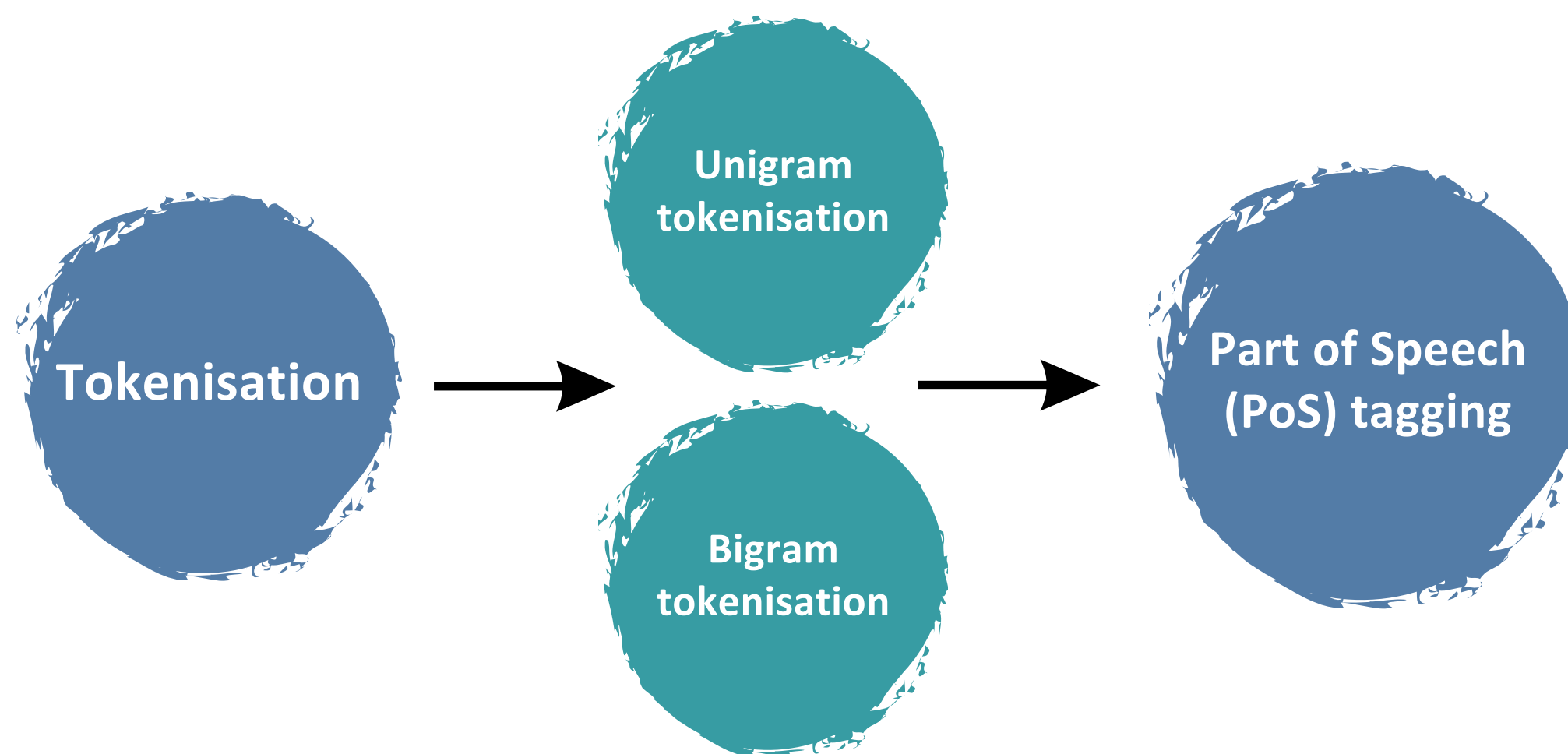
**1**

**Are there common patterns in learning outcomes writing?**

**2**

**Is there a real connection among learning outcomes of micro-credentials and skills required in the labour market?**

1



1. **Distribution of different PoS categories in the collected LOs**
2. **Identification of the most frequent words for each PoS category**
3. **Identification of linguistic patterns in the structure of learning outcomes**

2



alignment with



**1**

**The analysis confirmed that there are common patterns in learning outcomes writing among partner countries**

**2**

**Low alignment with ESCO (42% ESCO skills in LOs in English)**

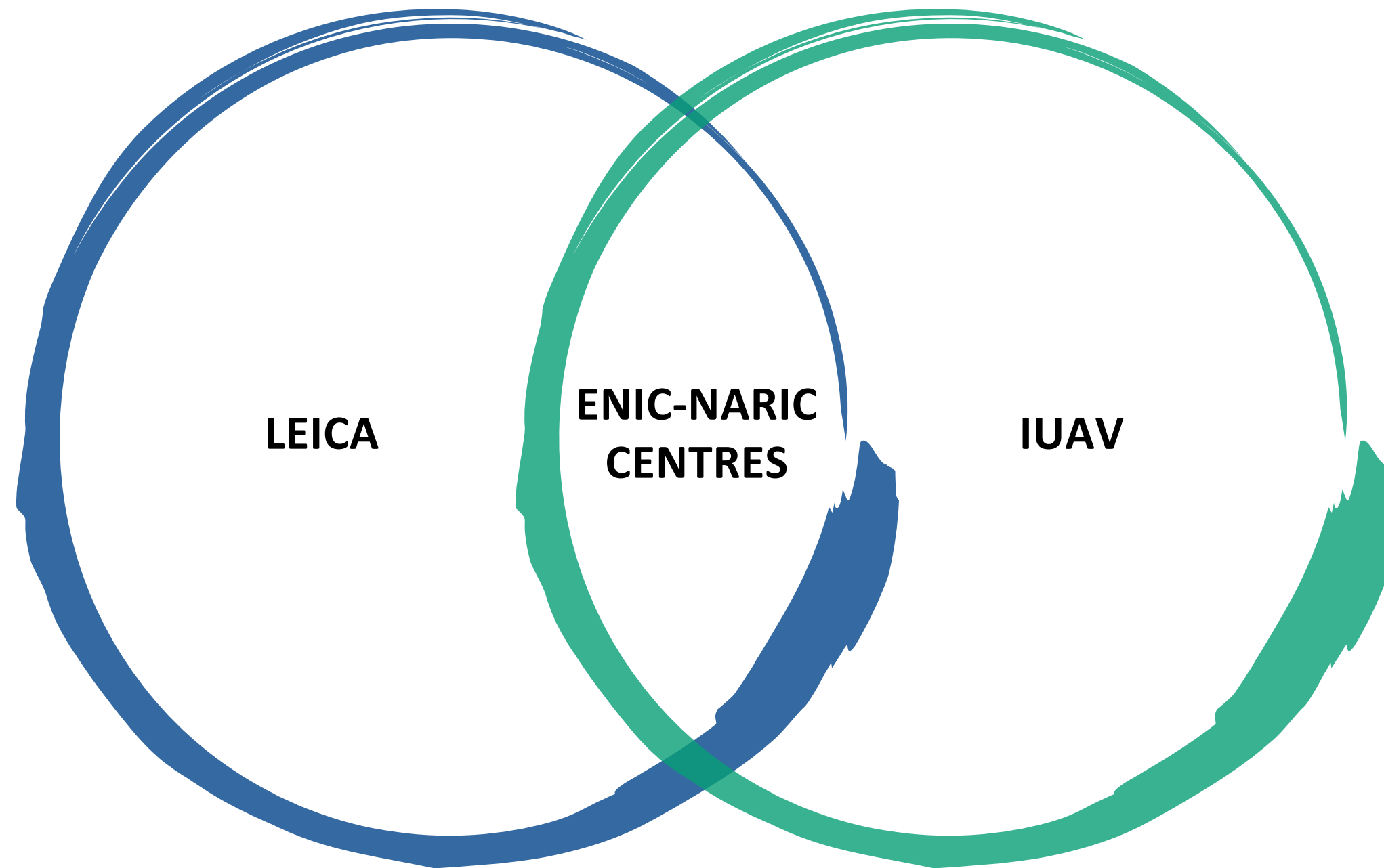
\*More detailed data will be available in the project final publication

## WP3: Portability and recognition of a micro-credential





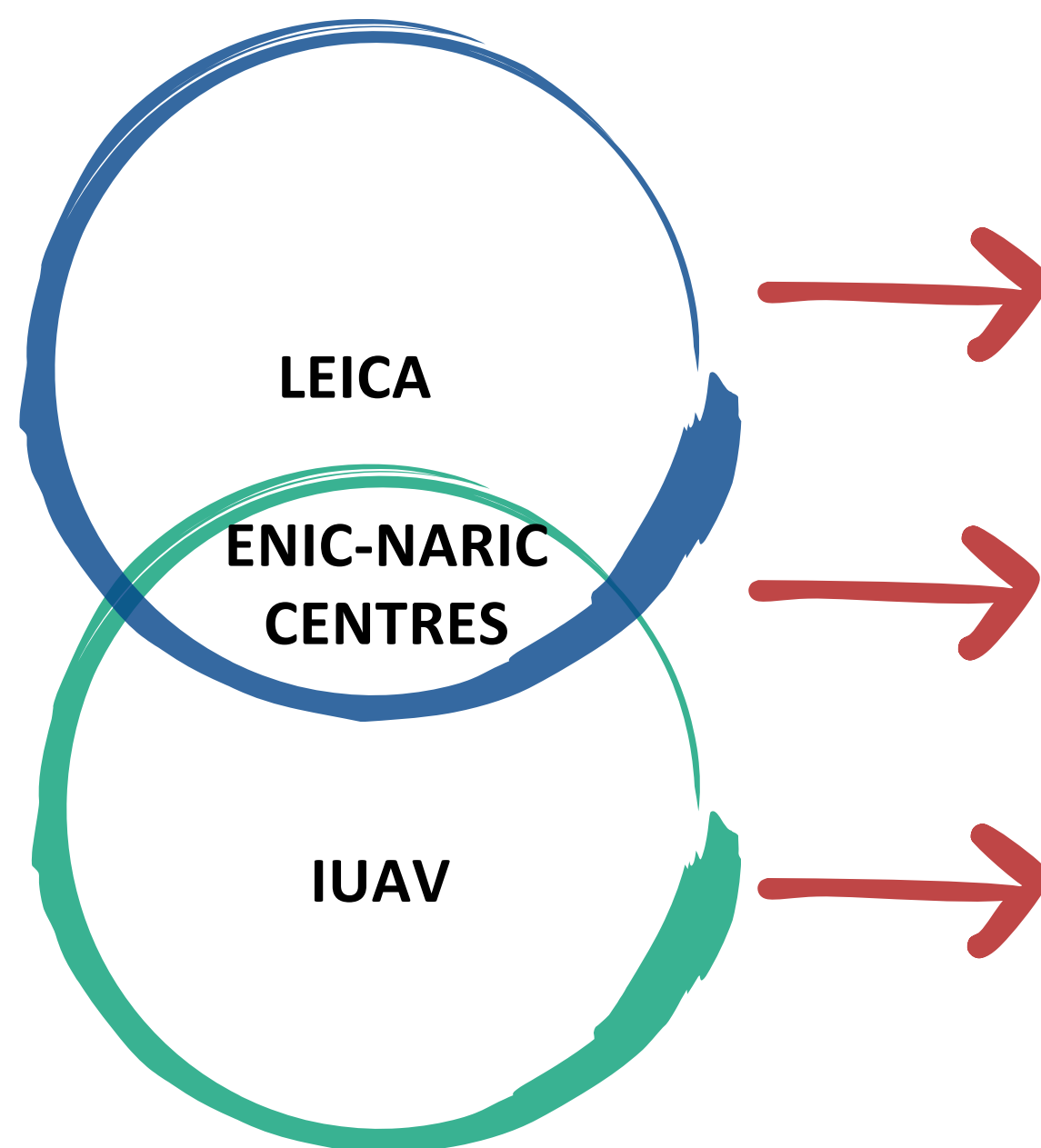
## Stakeholders involved



**PRIVATE SECTOR**

**ACADEMIC SECTOR**

## PILOTING ACTIVITY



- Definition of contents (field of photography)
- Connection with the labour market needs
- Learning outcomes writing on the base of the results of the research carried out in WP2
- Definition of quality requirements
- Possibility of recognition of the MARTe micro-credential

**Pilot micro-credential certified on the CIMEA DiploME Blockchain platform**

# WP4 - Publication on methodology and key-findings of the research and piloting activity

1

**Focus on learning outcomes:  
text-mining application**

3

**EU policies and practices on  
micro-credentials**

2

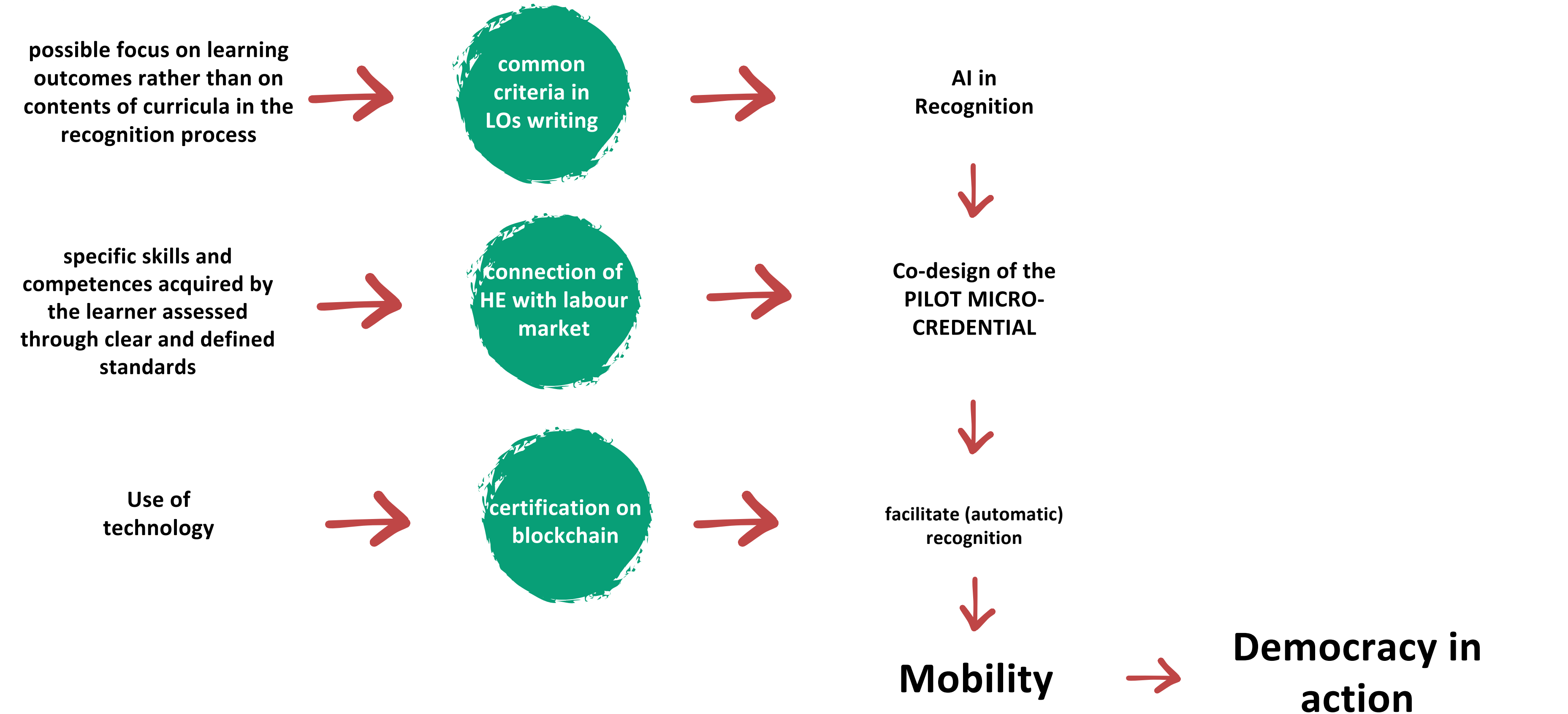
**Pilot micro-credential:  
methodology and development**

4

**National policies on micro-  
credentials in partner countries**

**3**

# **Validation and Mobility: democracy in action?**



**THANK YOU!**



## References

- Council of Europe (1997). Convention on the Recognition of Qualifications concerning Higher Education in the European Region. <https://rm.coe.int/168007f2c7>
- Council of the European Union (2018). Council Recommendation of 26 November 2018 on promoting automatic mutual recognition of higher education and upper secondary education and training qualifications and the outcomes of learning periods abroad. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32018H1210%2801%29>
- Council of the European Union (2022). Council Recommendation on a European approach to micro-credentials for lifelong learning and employability, <https://data.consilium.europa.eu/doc/document/ST-9237-2022-INIT/en/pdf>
- European Commission (2022). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on a European strategy for universities, <https://education.ec.europa.eu/sites/default/files/2022-01/communication-european-strategy-for-universities-graphic-version.pdf>
- MICROBOL project (2022). Micro-credentials linked to the Bologna Key Commitments: Common Framework for Micro-credentials in the EHEA. [https://microcredentials.eu/wp-content/uploads/sites/20/2021/02/Microbol\\_State-of-play-of-MCs-in-the-EHEA.pdf](https://microcredentials.eu/wp-content/uploads/sites/20/2021/02/Microbol_State-of-play-of-MCs-in-the-EHEA.pdf)
- UNESCO (2019). Global Convention on the Recognition of Qualifications Concerning Higher Education. <https://unesdoc.unesco.org/ark:/48223/pf0000373602/PDF/373602eng.pdf.multi.page=3>