

Diving into EDU4Standards:
Intended learning outcomes
for education on
standardisation

EDU4Standards.eu - Empowering Standardisation through Education in Europe

OBJECTIVES

Obj.1: Increase the number of HEIs offering teaching on standardisation

Obj.2: Increase the number of teachers offering courses about standardisation

Obj.3: Disseminate teaching material about standardisation

Obj.4: Increase the visibility via "Academic Standardisation Days" at HEIs

Obj.5: Set up a Standardisation Student Association

Community

- Standardisation Student Association created
- 100+ HEIs exposed to standard education
- 100+ teachers with standardisation knowledge
- 500 students educated in pilots
- 1,500+ engaged community members
- EURAS
- External Advisory Group (EAG)

Innovative Teaching Concept of Standardisation (ITCoS)

Web Platform

Student Standardisation Association & Academic Standards Days



EU & International Synergies

- > 10 Mutual cooperations with National, European, and Int'l organisations and initiatives
- Continuous engagement and exchanges on all ICT standards topics
- Interaction with Policy makers: (Including: EURAS, MSPs, Sherpa Groups of the High-level Standardisation Forum, STAIR, ISO, IEC, ITU & IEEE etc)
- Collaborations with HE Standards projects:



Pilots

- a. B.Sc course
- b. M.Sc course
- c. In-company Training
- d. Extra-curricular format
- e. Seasonal university school
- f. Pan-EU EARTO
- g. Distance learning

Outreach

- 4 Pilot Workshops
- 10 Webinars
- 5 Academic Standards Days
- 2 CEN Workshop Agreement Meetings
- 1 Final event
- 12 newsletters
- 3 Press Releases
- 10 Professional Videos
- Visibility at >15 3rd party events
- PPC Campaign
- Social media channels

Reports & other value-add output

- Whitepapers & Scientific Publications
- Online Teaching Content
- CEN Workshop Agreement
- Pilot evaluation reports
- Sustainability strategy
- Policy Recommendations
- EU Standardisation Roadmap
- All Results published via zenodo

SG 1 HEIs/universities

SG 2 Teachers & standards educators

SG 3 Students & Student Associations

SG 4 Standard Development Organisations

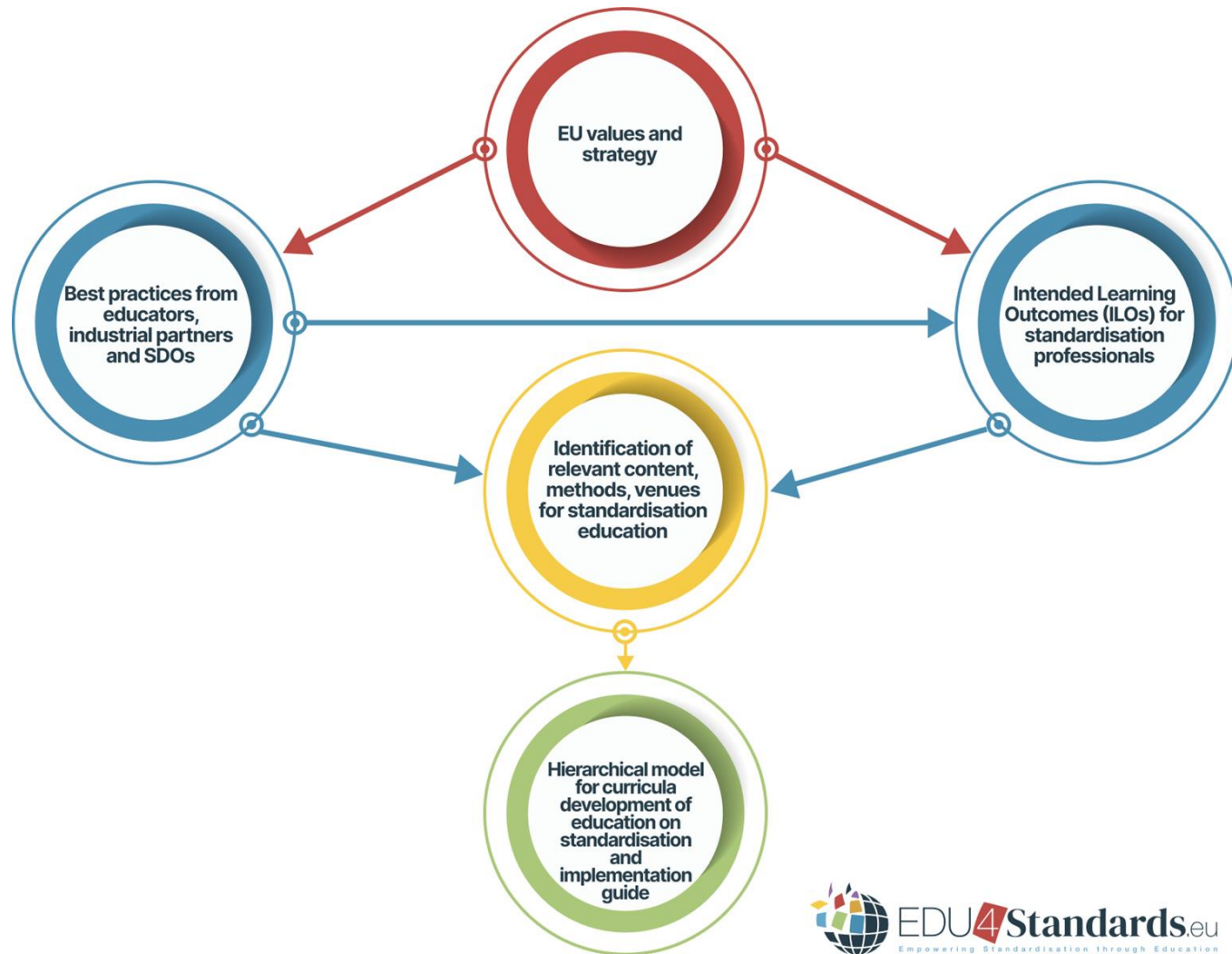
SG 5 Policy Makers

SG 6 Environmental and consumer organisations

SG 7 Research organisations & EU projects

SG 8 Industry & SMEs

SG 9 Citizens and citizen groups



Best Practices and Expertise Integration:

- Collect best practices from educators, industrial partners, and (SDOs).

Curriculum Development and Learning Outcomes:

- Identify content, methods, and educational venues
- Formulate Intended Learning Outcomes (ILOs)

Educational Framework and Guidance:

- Design a hierarchical curricula development model dedicated to the education on standardisation after testing in **5 different pilots**.
- Create a comprehensive implementation guide to apply the model which will be promoted via dedicated **Academic Standardisation Days**



The graphic features a central image of a hand holding a glowing lightbulb, surrounded by colorful geometric shapes. To the left, five circular portraits of speakers are arranged in two rows. The top row includes Dr. phil Barbara Reiter (Ethics), Hristina Veljanova (MA, Ethics), and Prof. Heike Wendt (Educational Sciences). The bottom row includes Prof. Elisabeth Staudegger (Law) and Maria Giuffrida (Senior Researcher). The text 'Diving into EDU4Standards: Intended learning outcomes for education on standardisation' is written in yellow and white. At the bottom, it says '20 November 2024 Online Webinar 15:00 - 16:15 CET'. The EDU4Standards.eu logo is in the top right corner, and the European Union funding logo is in the bottom left corner.

Dr. phil **Barbara Reiter**
Ethics

Hristina Veljanova
MA, Ethics

Prof. **Heike Wendt**
Educational Sciences

Prof. **Elisabeth Staudegger**
Law

Maria Giuffrida
Senior Researcher

Diving into EDU4Standards:
**Intended learning outcomes for
education on standardisation**

20 November 2024
Online Webinar 15:00 - 16:15 CET

Funded by the European Union

- 15:00 - Welcome and introduction, Maria Giuffrida, PhD, Trust-IT Services
- 15:10 - Values in standardisation education (Dr. phil Barbara Reiter, Ethics, Uni Graz)
- 15:20 - The EDU4Standards.eu value-based ILOs framework (Hristina Veljanova, MA, Ethics, Uni Graz)
- 15:30 - From competences to attitude (Prof. Heike Wendt, Educational Sciences, Uni Graz)
- 15:40 - Example applications and how to use the framework (Prof. Elisabeth Staudegger, Law, Uni Graz)
- 15:50 - Q&A and interaction with audience
- 16:10 - Final remarks
- 16:15 - End of the webinar

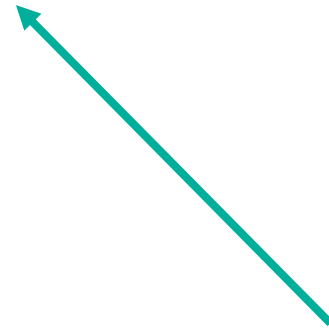
**Questions will be mostly addressed in the final part of the event
BUT...**

Please ask your questions in the chat or Q&A box as soon as you have them

This will help us moderate efficiently

The recordings and slides will be available at edu4standards.eu

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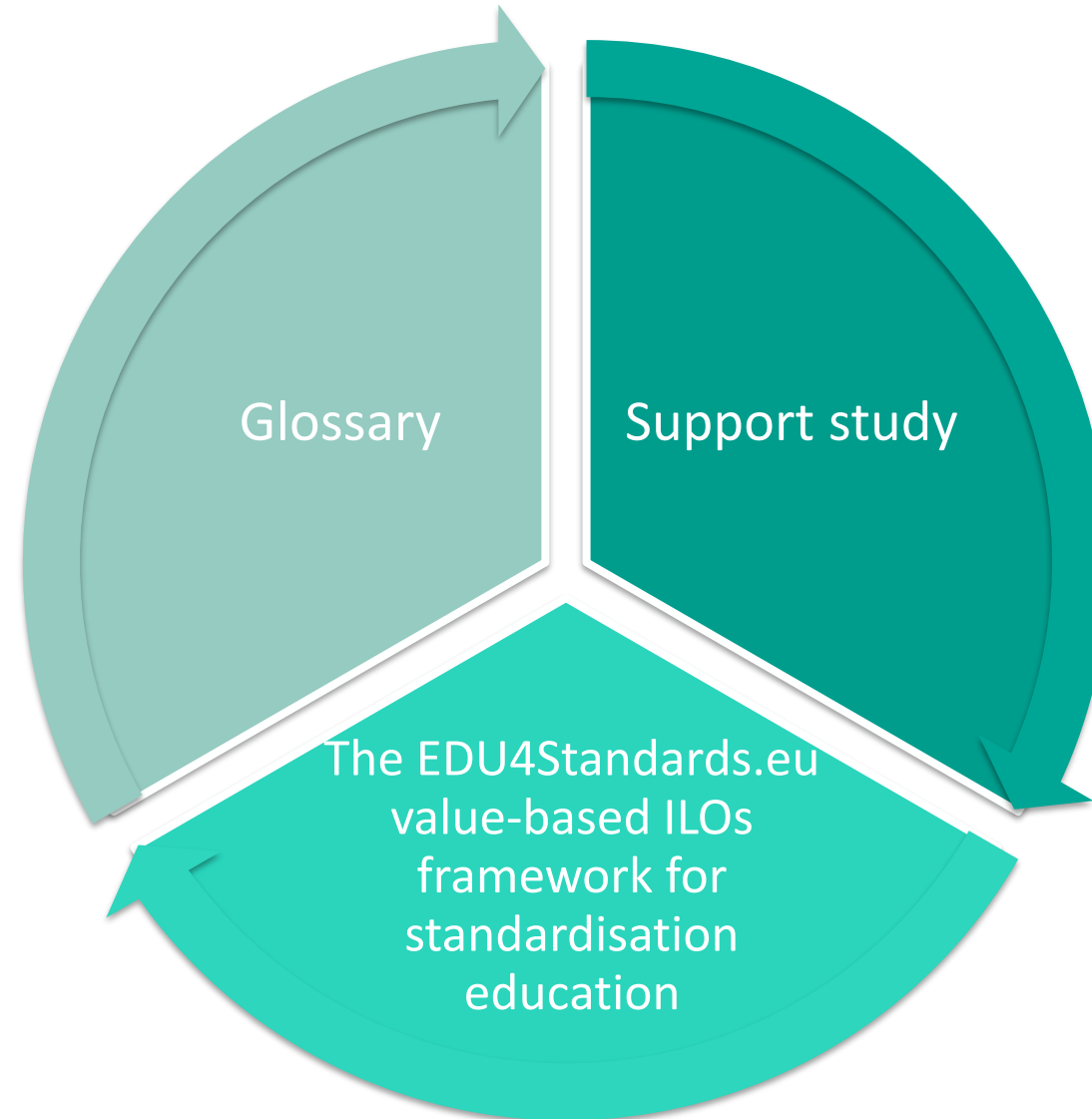


Intended learning outcomes for standardisation education (ILOs): in line with EU values and interests

Webinar
November 20, 2024

University of Graz

Barbara Reiter, Hristina Veljanova, Heike Wendt, Elisabeth Staudegger



Human dignity

Care

Respect

Core values

Protection

Equality

Sustainability

Trust



Freedom

Autonomy

Responsibility

Democracy

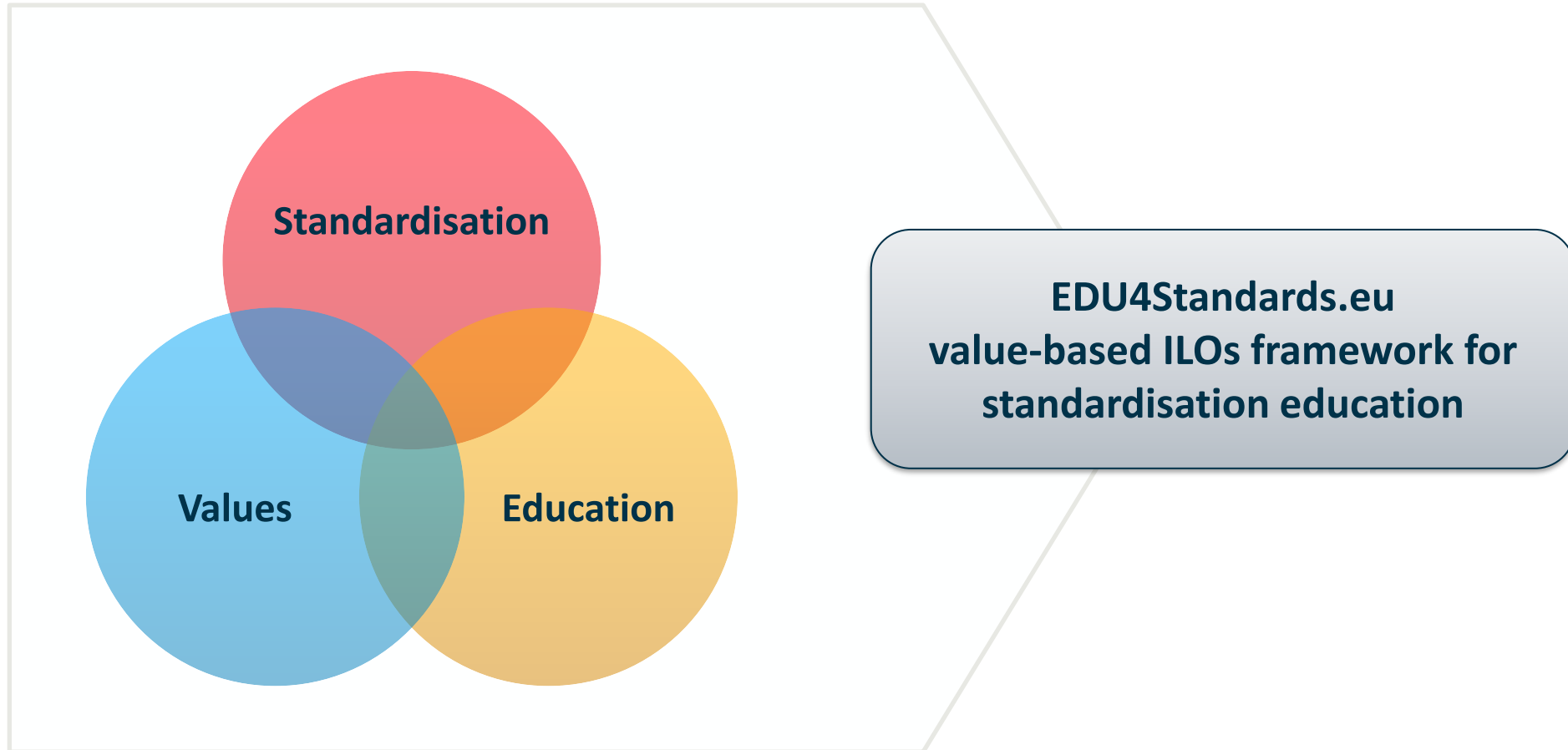
- *Who do we want to be?*

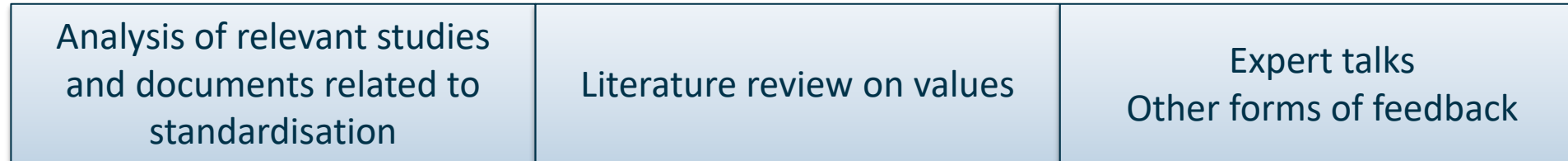
- *Which world do we want to live in?*

- *Abstract ideas need context*

Rule of law

Participation





- Similarities in content, i.e. **what** is taught in standardisation education
- Diversity as to **when** the content is taught, i.e. at what level
- Modest representation of (a wider range of) values in standardisation education

**EDU4Standards.eu value-based ILOs
framework for standardisation education**

Standardisation work

**EQF, ISCED and
Bloom's Taxonomy**

**Article 2 TEU
(European values)**

Cedefop materials



**Lecturers of standardisation,
experienced and new ones**



**Learners (as future standards
professionals and learners in a
broader sense)**



Standardisation bodies



Industry



Research organisations



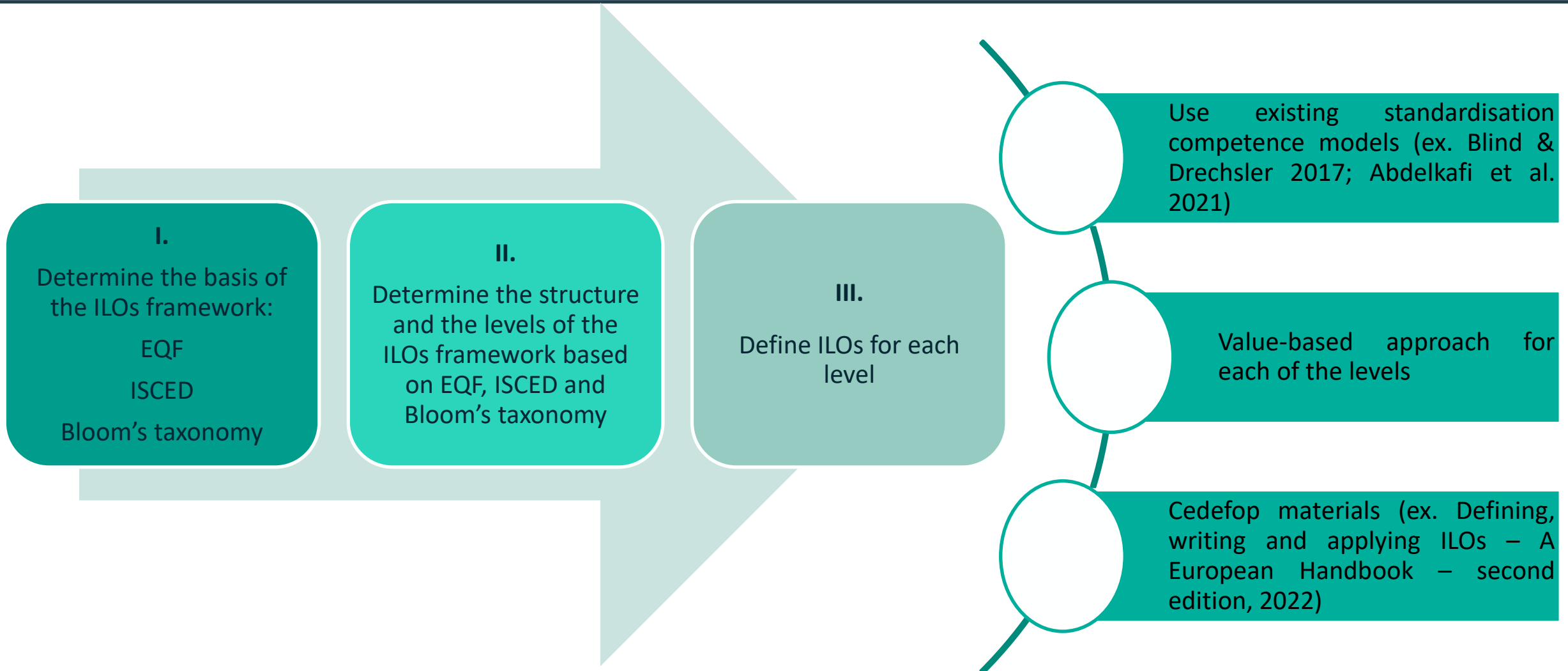
NGOs



Public sector



Citizens



European Qualifications Framework

Level 1 - learning outcomes		
Knowledge	Skills	Responsibility and autonomy
Basic general knowledge	Basic skills required to carry out simple tasks	Work or study under direct supervision in a structured context
Level 2 - learning outcomes		
Knowledge	Skills	Responsibility and autonomy
Basic factual knowledge of a field of work or study	Basic cognitive and practical skills required to use relevant information in order to carry out tasks and to solve routine problems using simple rules and tools	Work or study under supervision with some autonomy
Level 3 - learning outcome		
Knowledge	Skills	Responsibility and autonomy
Knowledge of facts, principles, processes and general concepts, in a field of work or study	A range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information	Take responsibility for completion of tasks in work or study; adapt own behaviour to circumstances in solving problems
Level 4 - learning outcomes		
Knowledge	Skills	Responsibility and autonomy
Factual and theoretical knowledge in broad contexts within a field of work or study	A range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study	Exercise self-management within the guidelines of work or study contexts that are usually predictable, but are subject to change; supervise the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities
Level 5 - learning outcomes		
Knowledge	Skills	Responsibility and autonomy
Comprehensive, specialised, factual and theoretical knowledge within a field of work or study and an awareness of the boundaries of that knowledge	A comprehensive range of cognitive and practical skills required to develop creative solutions to abstract problems	Exercise management and supervision in contexts of work or study activities where there is unpredictable change; review and develop performance of self and others
Level 6 - learning outcomes		
Knowledge	Skills	Responsibility and autonomy
Advanced knowledge of a field of work or study, involving a critical understanding of theories and principles	Advanced skills, demonstrating mastery and innovation, required to solve complex and unpredictable problems in a specialised field of work or study	Manage complex technical or professional activities or projects, taking responsibility for decision-making in unpredictable work or study contexts; take responsibility for managing professional development of individuals and groups
Level 7 - learning outcomes		
Knowledge	Skills	Responsibility and autonomy
Highly specialised knowledge, some of which is at the forefront of knowledge in a field of work or study, as the basis for original thinking and/or research Critical awareness of knowledge issues in a field and at the interface between different fields	Specialised problem-solving skills required in research and/or innovation in order to develop new knowledge and procedures and to integrate knowledge from different fields	Manage and transform work or study contexts that are complex, unpredictable and require new strategic approaches; take responsibility for contributing to professional knowledge and practice and/or for reviewing the strategic performance of teams
Level 8 - learning outcomes		
Knowledge	Skills	Responsibility and autonomy
Knowledge at the most advanced frontier of a field of work or study and at the interface between fields	The most advanced and specialised skills and techniques, including synthesis and evaluation, required to solve critical problems in research and/or innovation and to extend and redefine existing knowledge or professional practice	Demonstrate substantial authority, innovation, autonomy, scholarly and professional integrity and sustained commitment to the development of new ideas or processes at the forefront of work or study contexts including research

ISCED Levels of education, age of entry and duration	
ISCED 0	Early childhood education age 0/3 to 3/6
ISCED 1	Primary education age 5/7 to 10/12
ISCED 2	Lower secondary education age 10/13 to 14/16
ISCED 3	Upper secondary education age 14/16 to 17/18
ISCED 4	Post-secondary non-tertiary education
ISCED 5	Short-cycle tertiary education
ISCED 6	Bachelor's or equivalent level
ISCED 7	Master's or equivalent level
ISCED 8	Doctoral or equivalent level

ISCED Levels (UNESCO-UIS 2012)

Image: Europass, EU

Bloom's Taxonomy

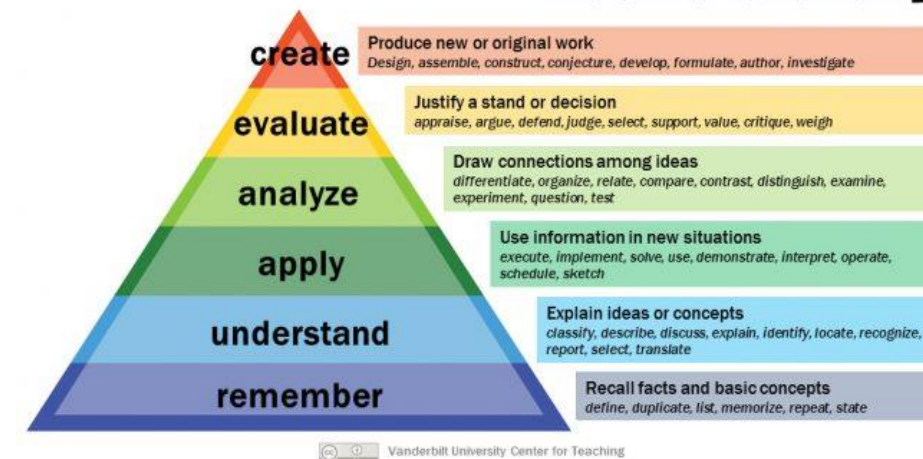


Image: Vanderbilt University Center for Teaching

II. Determine the structure and levels of the framework

The EDU4Standards.eu value-based ILOs framework		
Levels of qualification	Levels of formal education	Non-formal education (ex. in-company training)
Level 0	Early childhood education (ex. 0 – 6 years)	Not age-bound, qualifications matter
Level 1	Primary education (ex. 5 – 12 years)	
Level 2	Lower secondary education (ex. 10 – 16 years)	
Level 3	Upper secondary education (ex. 14 – 18 years)	
Level 4	Post-secondary non-tertiary education (ca. age 18-20)	
Level 5	Short-cycle tertiary education	
Level 6	Bachelor's level	
Level 7	Master's level	
Level 8	Doctoral level	

Three-part framework

1. The general value-based ILOs framework for standardisation education

- addresses the issue of fragmented standardisation education by providing a framework with a clear structure and guidance on ILOs and levels of qualification
- shows how values in general can be integrated into standardisation education

2. ILOs framework focusing on the European values in standardisation education (Art. 2 TEU)

- shows how concrete values can be translated into ILOs for each of the levels

3. ILOs framework integrating green, digital and gender skills in standardisation education

- shows green, digital and gender skills at all levels

1. The general value-based ILOs framework for standardisation education

Levels		Knowledge as defined in the EQF	Examples of skills	Responsibility and autonomy as defined in the EQF adapted to the educational context
Level 0	Early childhood education (ex. 0 - 6)	<p>The learner is expected to:</p> <ul style="list-style-type: none"> • K0.1: know that standards are similar to guidelines and rules and that they make sure that things work safely and consistently • K0.2: understand the importance of having and following standards, rule, guidelines to make sure that things are understandable for all • K0.3: understand simple examples of standardised products and services such as electricity, traffic lights colours, emergency and rescue services (police, ambulance, fire brigade) etc. • K0.4: form a sense of right and wrong 	<p>The learner is able to:</p> <ul style="list-style-type: none"> • S0.1: follow simple rules and routines • S0.2: role-play situations of rule-following and point at the rules that are followed • S0.3: in an interactive game or activity discuss with the group examples of simple standardised products or services from everyday life and why they are important 	<p>The learner can engage in simple play and creative activities with guidance and under direct supervision in a structured context.</p>
Level 1	Primary education (ex. 5 - 12)	<p>The learner is expected to:</p> <ul style="list-style-type: none"> • K1.1: to have a basic general knowledge of standards and standardisation • K1.2: to have a basic general knowledge of values in standardisation 	<p>The learner is able to:</p> <ul style="list-style-type: none"> • S1.1: define the concept of standards and standardisation by using examples • S1.2: outline the purpose of standards and standardisation (to ensure consistency, safety, understandability) and the benefits of having standardised products, services and processes in general • S1.3: list simple examples of standardised products, services and processes and recognise what values they support (ex. traffic signs & values such as safety, or transparency) • S1.4: list values and outline examples of standardised products, services and processes that they support 	<p>The learner can perform basic tasks under direct supervision in a structured context. They can participate in and contribute to group activities.</p>

Levels	Knowledge	Examples of skills					Responsibility and autonomy
		Human dignity	Freedom	Democracy	Equality	The rule of law	
Level 3 Upper secondary education (ex. 14-18)	The learner is expected: <ul style="list-style-type: none"> • K3.1: to have knowledge of facts, principles, processes, general concepts and players related to values in standardisation • K3.2: to have knowledge of the legal, ethical, environmental and gender aspects related to standardisation 	The learner is able to: <ul style="list-style-type: none"> • S3.1: evaluate one's own value and the value of others • S3.2: apply the value "human dignity" to sector-specific contexts • S3.3: explore the relationship between "human dignity" and standardisation 	The learner is able to: <ul style="list-style-type: none"> • S3.1: explore and use the range of one's own freedom (ex. voting) • S3.2: apply the value "freedom" to sector-specific contexts • S3.3: explore the relationship between "freedom" and standardisation 	The learner is able to: <ul style="list-style-type: none"> • S3.1: explore the importance of decision making and participation • S3.2: apply the value "democracy" to sector-specific contexts • S3.3: explore the relationship between "democracy" and standardisation 	The learner is able to: <ul style="list-style-type: none"> • S3.1: explore the importance of equal treatment of all group members • S3.2: apply the value "equality" to sector-specific contexts • S3.2: explore the relationship between "equality" and standardisation 	The learner is able to: <ul style="list-style-type: none"> • S3.1: understand the importance of adhering to the law when being part of a community • S3.2: apply the value "the rule of law" to sector-specific contexts • S3.3: explore the relationship between "the rule of law" and standardisation 	The learner can take responsibility for completion of tasks and for their learning process. They can participate in group projects meaningfully.
Level 4 Post-secondary non-tertiary education (ex. 18 - 20)	The learner is expected: <ul style="list-style-type: none"> • K4.1: to have a factual and theoretical knowledge in broad contexts of values in standardisation • K4.2: to have factual and theoretical knowledge of the legal, ethical, environmental and gender aspects related to standardisation 	The learner is able to: <ul style="list-style-type: none"> • S4.1: analyse, interpret and evaluate the value "human dignity" in different standardisation scenarios and (industry) sectors • S4.2: identify strategies to ensure more respectful cooperation in standardisation processes 	The learner is able to: <ul style="list-style-type: none"> • S4.1: analyse, interpret and evaluate the value "freedom" in different standardisation scenarios and (industry) sectors • S4.2: identify strategies how to ensure more respectful cooperation in standardisation processes 	The learner is able to: <ul style="list-style-type: none"> • S4.1: analyse, interpret and evaluate the value "democracy" in different standardisation scenarios and (industry) sectors • S4.2: identify strategies how to ensure more democratic standardisation and participatory decision-making processes 	The learner is able to: <ul style="list-style-type: none"> • S4.1: analyse, interpret and evaluate the value "equality" in different standardisation scenarios and (industry) sectors • S4.3: identify strategies how to ensure more inclusive participation in standardisation • S4.4: identify cases of inequality and discrimination in existing standards 	The learner is able to: <ul style="list-style-type: none"> • S4.1: analyse, interpret and evaluate the value "the rule of law" in different standardisation scenarios and (industry) sectors • S4.2: identify strategies how to ensure more transparency and accountability in standardisation processes 	The learner can take responsibility for planning and managing their learning process. At the same time, they can participate actively in collaborative projects by providing meaningful contribution.

Levels		Knowledge (as defined in Table 5)	Examples of skills			Responsibility and autonomy
			Green skills	Digital skills	Gender skills	
Level 8	Doctoral level	<p>The learner is expected:</p> <ul style="list-style-type: none"> • K8.1: to have knowledge about values in standardisation at the most advanced theoretical level • K8.2: to have knowledge of the legal, ethical, environmental and gender aspects related to standardisation within one's field at the most advanced theoretical level 	<p>The learner is able to:</p> <ul style="list-style-type: none"> • S8.1: reflect on European values and interests in standardisation on a meta-level and in a global setting • S8.2: critically evaluate existing policy documents regarding the value "sustainability" in standardisation within one's field and at the interface between fields • S8.3: conduct policy negotiations on enhancing the value "sustainability" in standardisation in international settings • S8.4: write policy documents on standardisation while including green considerations 	<p>The learner is able to:</p> <ul style="list-style-type: none"> • S8.1: participate in discourse on standards and standardisation at the most advanced level • S8.2: critically evaluate existing policy documents on standardisation within one's field and at the interface between fields • S8.3: critically evaluate existing ICT policy documents on values in standardisation within one's field and at the interface between fields • S8.4: write policy documents on ICT standardisation 	<p>The learner is able to:</p> <ul style="list-style-type: none"> • S8.1: reflect on European values and interests in standardisation on a meta-level and in a global setting • S8.2: critically evaluate existing policy documents regarding the value "gender equality" in standardisation within one's field and at the interface between fields • S8.3: conduct policy negotiations on enhancing the value "gender equality" in standardisation in international settings • S8.4: write policy documents on standardisation while including gender considerations 	<p>The learner can carry out tasks independently. They can mentor and guide others, contribute to the development of new ideas or processes with minimal guidance.</p>



Validate the value-based framework for standardisation education

Value-based framework for standardisation education as a standard in education in the European Education area

- **Design** &
- **Research**

- **Promote** &
- **Implement**

Validate the value-based framework for standardisation education

- **Design** learning disciplinary and interdisciplinary situations for various educational stages
 - Program and Curriculum development and alignment (Design: Program goals, learning objectives, methods, materials, assessments, recognition (certification and credits))
 - **knowledge and skills**
 - **attitude and practice** **indicators** **importance/value**
 - in accordance's with standards for programs, curricula and assessments for different sectors in different contexts
 - in a participatory design-based research process

Validate the value-based framework for standardisation education

- **Systematic research** such as:
 1. Theoretical and empirical studies on the relationship to constructs of related competency frameworks (e.g. 21-skills, civic competencies);
 2. Validation of competency models underlying the framework;
 3. Systematic context-specific curriculum analyses for alignment;
 4. Empirical representative baseline studies in different sectors;
 5. Design-based research on rich delivery formats;
 6. Studies on the effectiveness of different teaching-learning approaches;
 7. Research on assessment

Promote the value-based framework for standardisation education as a standard in education in the European Education area

- **Best-practice examples**
- Implementation into curricula
- Implementation into national qualifications frameworks

1. Pilot at university B.Sc. level (UB)
 2. Pilot at university M.Sc. level (TUD, TU Berlin)
 3. Summer school (UGZ) / extra-curricular pilot (POLIMI)
 4. Pilot of in-company training (TU/e)
 5. Pilot of lifelong learning: the Pan-European EARTO pilot (FhG)
- “C4P” – call for further pilots

0. Invite a guest lecturer from philosophy / ethics
1. short video clips that stop at certain points with questions about EU values/interests (TUD)
2. the 'norm person': male/175cm/75kg; what about other men/women/children? (TU Berlin)
3. have the students write a standard (ETSI manual) and ask if something is missing (POLIMI)
4. shock with very clear case studies / "red lines" e.g. total surveillance (UB)
5. standardisation in line with EU values and interests as a fact of life / strategic issue (TU/e)
6. don't forget to define HLI (freesia)

“Boosting competitiveness of the EU
through standardisation
in line with European values and interests!”

(POLIMI / N.A.)

Thank you!

Questions?



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