Official Guide 2.2

Edu4Standards.eu guide to implementation of the Innovative Teaching Concept of Standardisation (ITCoS) in practice: getting started to teach about standardisation in line with EU values and interests (Stand-EUVI)

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Executive summary

EDU4Standards.eu project developed the Innovative Teaching Concept of Standardisation (ITCoS) consisting of *educational tools and instruments* and their *implementation guides*. The four-tier Framework Model of ITCoS (ITCoS FM, see Figure 1) developed by Fomin et al. (2025) establishes a *meta-level structural guide* to ITCoS as a set of tools and instruments for education about standardisation.

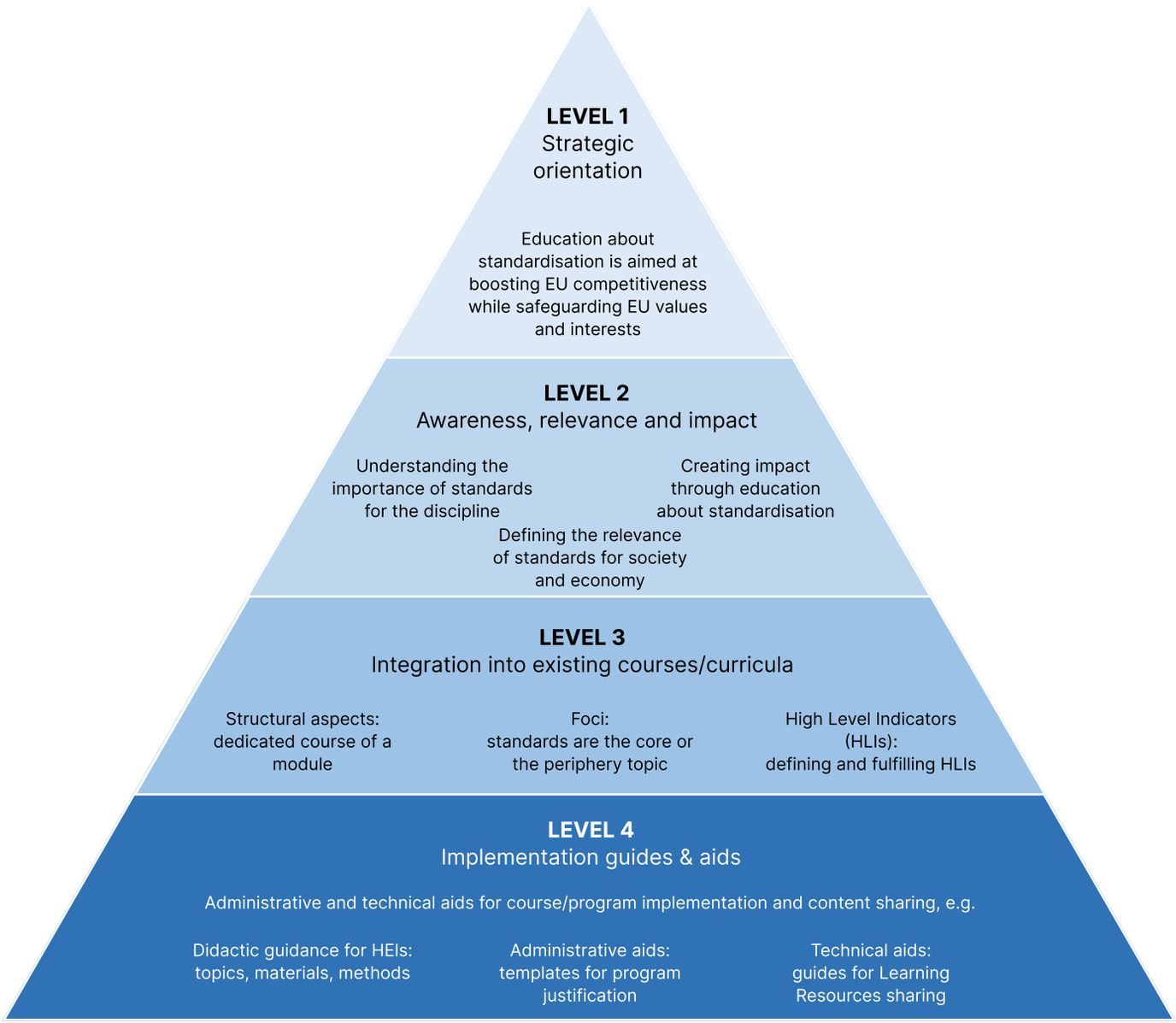

Figure 1. Framework Model of ITCoS: four-level comprehensive framework for the advancement of education about standardisation. Source: (Fomin, Mosakas, et al., 2025)

The original publication of ITCoS Framework Model (ITCoS FM) defined a scope of operational and technical aids required for guiding implementation of education about standardisation, and offered recommendations for the content of (some of) these aids.

Executive summary

Within the scope of ITCoS FM, the key aim is to help educators embrace the strategic orientation of education about standardisation towards EU core values and interests (Level 1 of the Framework). A hierarchical model of value-based intended learning outcomes (VB-ILOs) was developed to operationalise this orientation (Veljanova, 2024a; Mosakas, Fomin, Veljanova, Staudegger, et al., 2025).

The gap between the generic formulation of intended learning outcomes as presented in the original VB-ILO framework, on the one hand, and the course-specific context established by the intended level of qualification, subject- and topic-specific relevant values and EU interests, presents an obstacle for implementation of ITCoS in practice.

This guide is intended to help teachers in closing the gap between the generic and course-specific knowledge, skills, and attitudes in implementing education about standardisation in line with EU values and interests (Stand-EUVI).

This guide offers didactic guidance to teachers of standardisation, corresponding to Level 1 (strategic orientation), Level 2 (Awareness, relevance and impact), and Level 4 (Didactic guidance) of ITCoS FM model (see Figure 1).

This didactic guide complements EDU4Standards.eu Official Guide "Getting Started with Intended Learning Outcomes (ILOs) for Standardisation Education in Line with European Values and European Interests (Stand-EUVI)" and in this is intended to help teachers bring the Stand-EUVI concepts into practice. By using two proxy concepts: professional competence standards and professional ethics standards, this guide offers the teacher didactic tools to develop, keep track of, revise, and share Stand-EUVI elements, such as course-specific knowledge, skills, and values relevant to or required for standardisation professional and/or for civic engagement with standardisation as a professional of another domain of practice.

Successful implementation of this guide was reported by Fomin et al. (2026).

The Packing List

This section presents the concepts, tools, and knowledge required for implementing ITCoS in practice. Items 1 and 2 are also presented in EDU4Standards.eu Official Guide "Getting Started with Intended Learning Outcomes (ILOs) for Standardisation Education in Line with European Values and European Interests (Stand-EUVI)"

Item 1: Hierarchical framework of intended learning outcomes for Standardisation Education in Line with European Values and European Interests (Stand-EUVI ILO Framework)

The hierarchical framework of value-based intended learning outcomes (VB-ILOs) for education about standardisation was first published as part of Deliverable 2.1 of EDU4Standards.eu project (Veljanova, 2024). It was subsequently recommended as a standard ILO framework for education about standardisation in line with EU values and interests (Mosakas, Fomin, Veljanova, Reiter, et al., 2025) and is offered today to educators as Stand-EUVI ILO Framework.

A teacher is expected to have good knowledge of the concepts of intended learning outcomes (ILOs) and levels of qualification, as, e.g., used in the European Qualifications Framework (EQF) (Council of the European Union, 2017).

For the purpose of this guide, the generic hierarchical framework of intended learning outcomes (ILOs) defines the expected *knowledge* and *skills* on standards and standardisation in line with European values and interests (Stand-EUVI) for different *levels of qualification*.

Level 0 Early childhood

KNOWLEDGE (THE LEARNER IS EXPECTED TO:)

- 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 standardized products and services such as electricity, traffic lights colors, emergency and rescue services (police, ambulance, fire brigade) etc.
- K0.4: form a sense of right and wrong

SKILLS (THE LEARNER IS ABLE TO:)

- 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 standardized products or services from everyday life and why they are important

The Packing List

Level 1 Primary

KNOWLEDGE (THE LEARNER IS EXPECTED TO:)

- K1.1: to have a basic general knowledge of standards and standardisation
- K1.2: to have a basic general knowledge of values in standardisation

SKILLS (THE LEARNER IS ABLE TO:)

- 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 standardized products, services and processes in general
- S1.3: list simple examples of standardized products, services and processes and recognize what values they support (ex. traffic signs & values such as safety, or transparency)
- S1.4: list values and outline examples of standardized products, services and processes that they support

Level 2 Lower secondary

KNOWLEDGE (THE LEARNER IS EXPECTED TO:)

- K2.1: to have a basic factual knowledge of standardisation
- K2.2: to have a basic factual knowledge of values in standardisation
- K2.3: to have basic knowledge of legal, ethical, environmental and gender aspects related to standardisation

SKILLS (THE LEARNER IS ABLE TO:)

- S2.1: explain the basic concepts in the field of standardisation
- S2.2: name and describe few existing standards
- S2.3: clarify why concrete standards are important
- S2.4: give examples of important milestones in the history of standardisation
- S2.5: understand the concept of value
- S2.6: compare simple standards to one another and the values they promote
- S2.7: explain ideas and concepts of values relevant for a concrete standardisation case

The Packing List

Level 3 Upper secondary

KNOWLEDGE (THE LEARNER IS EXPECTED TO:)

- K3.1: to have knowledge of facts, principles, processes, general concepts and players regarding standardisation
- K3.2: to have knowledge of facts, principles, processes, general concepts and players related to values in standardisation
- K3.3: to have knowledge of the legal, ethical, environmental and gender aspects related to standardisation

SKILLS (THE LEARNER IS ABLE TO:)

- S3.1: explain more complex concepts used in standards and standardisation
- S3.2: sketch the standardisation process (standards-development) at a glance
- S3.3: analyze the standards ecosystem
- S3.4: compare the SDOs in terms of scope, geographical focus, decision-making processes, standards development processes, structure, types of standards etc.
- S3.5: explore the difference between various types of standards
- S3.6: develop a deeper understanding of the history of standardisation
- S3.7: explore the benefits and risks of standardisation
- S3.8: integrate green/digital/gender considerations to existing standards use cases
- S3.9: apply value-based concepts, terms and content to different industry-relevant or sector-specific contexts, scenarios

Level 4 Post-secondary non-tertiary

KNOWLEDGE (THE LEARNER IS EXPECTED TO:)

- K4.1: to have a factual and theoretical knowledge in broad contexts regarding standardisation
- K4.2: to have a factual and theoretical knowledge in broad contexts of values in standardisation
- K4.3: to have factual and theoretical knowledge of the legal, ethical, environmental and gender aspects related to standardisation

SKILLS (THE LEARNER IS ABLE TO:)

- S4.1: explain the functions of standardisation institutions and their processes
- S4.2: select appropriate standardisation organizations
- S4.3: search for and select appropriate standards for different scenarios and contexts
- S4.4: determine which form of standardisation (formal vs. informal) is appropriate
- S4.5: explain the impact of implementing standards
- S4.6: analyze, interpret and evaluate values in different standardisation scenarios and (industry) sectors
- S4.7: identify strategies to ensure more value-based approach in standardisation processes

The Packing List

Level 5 Short-cycle tertiary

KNOWLEDGE (THE LEARNER IS EXPECTED TO:)

- K5.1: to have comprehensive, specialized, factual and theoretical knowledge of standardisation within one's field and an awareness of the boundaries of that knowledge
- K5.2: to have comprehensive, specialized, factual and theoretical knowledge of values in standardisation within one's field and an awareness of the boundaries of that knowledge
- K5.3: to have comprehensive, specialized, factual and theoretical knowledge of the legal, ethical, environmental and gender aspects related to standardisation within one's field

SKILLS (THE LEARNER IS ABLE TO:)

- S5.1: assess the need for standards
- S5.2: assess the need for getting involved in standardisation
- S5.3: propose new work items in standardisation
- S5.4: explain the steps needed to identify and use standards relevant to a specific topic of interest
- S5.5: analyze the interactions between standards and the regulatory framework
- S5.6: outline the professional activities of a standardisation expert during committee meetings, between organization meetings, inside his/her own organization, further activities as a national delegate
- S5.7: be passively involved in standardisation processes (observer)
- S5.8: implement standards in product or process development
- S5.9: reflect on possible (positive and negative) relations between the values relevant to a standardisation case
- S5.10: carry out analysis of the value relations

Level 6 Bachelor's level

KNOWLEDGE (THE LEARNER IS EXPECTED TO:)

- K6.1: to have advanced knowledge of standards and standardisation within one's field, involving a critical understanding of theories and principles
- K6.2: to have advanced knowledge of values in standards and standardisation within one's field, involving a critical understanding of theories and principles
- K6.3: to have advanced knowledge of the legal, ethical, environmental and gender aspects related to standardisation within one's field

SKILLS (THE LEARNER IS ABLE TO:)

- S6.1: be actively involved in standardisation processes (participant)
- S6.2: illustrate the interactions between standards and the regulatory framework
- S6.3: carry out deeper analysis of the value relations
- S6.4: determine and analyze value conflicts in a standardisation use case
- S6.5: propose solutions on simple value conflicts
- S6.6: promote green/digital/gender aspects in standardisation through active participation in various initiatives

The Packing List

Level 7 Master's level

KNOWLEDGE (THE LEARNER IS EXPECTED TO:)

- K7.1: to have highly specialized knowledge, some of which is at the forefront of knowledge in standards and standardisation within one's field and at the interface between different fields, as the basis for original thinking and/or research
- K7.2: to have highly specialized knowledge, some of which is at the forefront of knowledge of values in standards and standardisation within one's field and at the interface between different fields
- K7.3: to have highly specialized knowledge of the legal, ethical, environmental and gender aspects related to standardisation within one's field and at the interface between different fields

SKILLS (THE LEARNER IS ABLE TO:)

- S7.1: evaluate existing policy documents on standardisation within one's field and at the interface between fields
- S7.2: strategically influence the agenda in standardisation processes
- S7.3: understand the key determinants of successful standardisation
- S7.4: support the development of new more value-sensitive standards within their field
- S7.5: influence the development of standardisation policies at national and international level
- S7.6: lead standardisation committees
- S7.7: depict the interdependencies between standardisation and innovation
- S7.8: depict the relation between standardisation and IPR (relevance of patents, tension between patents and standards)
- S7.9: propose solutions on more complex value conflicts in a standardisation use case
- S7.10: understand standardisation in the context of the national quality infrastructure and the macroeconomic environment
- S7.11: actively contribute to making standardisation processes and the standardisation working environment more respectful, inclusive, open and accessible

Level 8 Doctoral level

KNOWLEDGE (THE LEARNER IS EXPECTED TO:)

- K8.1: to have knowledge on standards and standardisation at the most advanced theoretical level within one's field and at the interface between fields
- K8.2: to have knowledge about values in standardisation at the most advanced theoretical level
- K8.3: to have knowledge of the legal, ethical, environmental and gender aspects related to standardisation within one's field at the most advanced theoretical level

SKILLS (THE LEARNER IS ABLE TO:)

- 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 policy documents on values in standardisation within one's field and at the interface between fields
- S8.4: propose solutions, new ideas, new work items and processes of standardisation within one's field and at the interface between fields
- S8.5: write policy documents on standardisation
- S8.6: reflect on European values and interests in standardisation on a meta-level
- S8.7: conduct policy negotiations on values in standardisation in international settings
- S8.8: lead complex projects on standardisation within one's field and at the interface between fields

Item 2: Stand-EUVI ILO template matrix for mapping course-specific ILOs

The template matrix was originally proposed by Mosakas et al. (Mosakas, Fomin, Veljanova, Reiter, et al., 2025). Recognising diversity of disciplines, topics, and context in which education about standardisation can be carried out, this template matrix of Stand-EUVI ILOs allows the teacher to develop, report, and share course-specific elements of Stand-EUVI ILO, such as *knowledge*, *skills*, and *values*.
Maintaining (filling out, revising) the matrix will support the teacher in such situations as the need to change the level of qualification of learners, introduction of new topics, introduction of new skills, etc.

Level of qualification	Knowledge	Values					Skills		
		Human Dignity	Freedom	Democracy	Equality	Rule of Law	Green skills	Digital skills	Gender equality
Level 0 Early childhood education (Basic general knowledge)	K0.1 ... K0.4	VHD0.1	VFR0.1	VDM0.1	VEQ0.1	VRL0.1	SGS0.1	SDS0.1	SGE0.1
Level 1 Primary education	K1.1 K1.2								
Level 2 Lower secondary education	K2.1 ... K2.3								
Level 3 Upper secondary education (Knowledge of relevant facts, processes, and general concepts)	K3.1 ... K3.3	VHD3.1	VFR3.1	VDM3.1	VEQ3.1	VRL3.1	SGS3.1	SDS3.1	SGE3.1
Level 4 Post-secondary non-tertiary education	K4.1 ... K4.3								
Level 5 Short-cycle tertiary education	K5.1 ... K5.3								
Level 6 Bachelor's level	K6.1 ... K6.3								
Level 7 Master's level	K7.1 ... K7.3								
Level 8 Doctoral level (Advanced knowledge of a field of work or study, involving a critical understanding of theories and principles)	K8.1 ... K8.3	VHD8.1	VFR8.1	VDM8.1	VEQ8.1	VRL8.1	SGS8.1	SDS8.1	SGE8.1

Item 3 — "Knowing to Action" Evolutionary Categories of Awareness

This table introduces three generic “evolutionary” categories of awareness (knowledge) about standards and standardisation. The evolutionary perspective is expected to help promote interest in the topic of standards and standardisation. It helps the teacher promote the idea of civic engagement as a way to promote and protect European values and interests through standards and standardisation. This Item also helps the teacher and students identify gaps in actionable knowledge (how to choose the right standard, how to directly or indirectly influence standards selection and/or development). Application of these evolutionary categories in practical teaching exercise was reported by Fomin et al. (2026).

Two broad domains of standardisation-related activities

Use of standards
(with regard to both *de jure* and *de facto* standards)

Development of standards

Categories representing degrees of knowledge required

(1) Passive user (aka “consumer” → **(2) Active / knowledgeable user of standards (aka “informed consumer”** → **(3) Engaged contributor (aka “prosumer”)**

A person without any specific knowledge of standards/ standardisation.

This person lives in a socio-cultural environment where many different standards are functioning. However, they are introduced by other actors without the conscious person’s participation. The person is the passive user of the existing standards by default, i.e. the person applies standards (consumer)

A person who understands that there are different standards to choose from or to adhere to in daily personal or professional activities, and who makes conscious choices with regard to the use of the standards, i.e. called “informed consumer” of standards

A person who realizes there are gaps or imperfections in the available standards and decides to engage to contribute to “betterment of the world” by contributing to revision of existing or development of new standards, i.e. called “prosumer” which is an informed consumer “producing” standards by feeding back his/her experiences and/or needs to the standardization process

Item 4 — Questionnaire to Determine Student Knowledge on Standards and Standardisation

Determining the level of awareness / knowledge of learners on standards and standardisation helps lecturer to select the appropriate level of qualification (Items 1 and 2 above) to be aimed in teaching. Identification of learners' knowledge and experience is also important for understanding what are the gaps in knowledge/ experience of the learners. The identified gaps can be targeted by using Items 1, 2, and 3 as aids.

By focusing on both professional and ethical standards associated with the (prospective) domain of practice of the learners, this questionnaire allows the teacher to introduce the concept of values to the learners as the composite of skills (professional standards, competences, as formally defined as part of the teaching program or enlisted in job advertisements) and attitudes (ethical standards, often not being formally defined, but implicitly or explicitly required from the professionals). The use of this questionnaire in teaching was reported by Fomin et al. (2026).

I. Section. Questions on professional competences and ethics

I.1. Are you aware of required or desired, written or unwritten requirements for professional skills and competences in the professional area for which you prepare/ study?

I.2. Are you aware of written or unwritten, official or unofficial code of ethical conduct in the professional area for which you prepare / study?

I.3. Are you aware of any standards which have to be followed or certified against in the professional domain for which you prepare/ study?

II. Section. Questions on professional domain standards

II.1. If you answered "yes" to I.1., I.2., or I.3. above, do you understand that these requirements/codes are either de jure or de facto standards?

II.2. Can you tell the difference between de facto and de jure standards?

II.3. Are you familiar with standardisation in general, its added values, its implementation processes, and the activities of standardisation bodies in your country, Europe, and worldwide?

II.4. Are you familiar with the specific international standards that regulate the activities in the field you are studying in/for?

II.5. If you answered "yes" to II.1. or II.4. above, do you have experience of applying these standards?

III. Section. Questions on values and sustainability

III.1. Are you aware of United Nation's SDGs (Sustainable Development Goals)? If yes, do you see any of the SDGs as pertaining to your future job / speciality?

III.2. Do you know what are the EU Core values? If yes, do you see any of the core values as pertaining to your future job / specialty?

IV. Section. Questions on contribution to standards

VI.1. Do you have experience in collaborating with organisations that apply standards? What is your experience?

VI.2. Do you have experience of contributing to standards creation? Do you have experience in collaborating with standardisation bodies in your country, Europe, or worldwide? What is your experience?

Prerequisites

The teacher must have a basic knowledge on professional and ethical standards in the field of professional practice associated with the field of studies of the students. The teacher is expected to have good knowledge of the concepts of intended learning outcomes (ILOs) and levels of qualification, as, e.g., used in the European Qualifications Framework (EQF).

The "How To" Guide

3.1 Step 1

Teacher initiates 5-10 minute discussion with students on professional standards (skills and knowledge required for fulfilling a job, for being qualified for a job, for being considered a (highly) skilled professional, etc) and on norms / standards of professional ethics (what values are inherent in a job, what qualities are expected from a professional, what helps to be valued by peers and/or management, etc).

3.2 Step 2

Teacher is asking students to fill out the questionnaire-based survey.

3.3 Step 3

Results of the assignment are used for the following:

1) Identifying the degree of awareness of stud ents about standards and standardisation (Item 3).

Lecturer uses this knowledge for adjusting the teaching plan (including the assignments) depending on the scope and depth of students' knowledge about standards.

For example, the teacher can share with students the list of standards students named in the survey and ask the students to refine the list:

- eliminating ambiguities/duplicated,
- finding and introducing hyperlinks to the enlisted standards' online repositories/shops,
- determining whether the standard is national or international,
- finding out further information on the standard, such as the working group (WG) under which it was produced, the country which hosts the secretariat of that WG, what other WGs are hosted by the same secretariat / the same country, etc.

2) Organizing a discussion with students on EU values and interests.

Students are asked to map the produced list of professional ethics values onto EU core values. Students are asked to accomplish the task manually (using their own critical judgement), and after that – with help of a Large language Model AI (LLM AI).

Example of a prompt for LLM:

> "This is a list of professional ethics and professional values as developed by students of the program X at the faculty Y. Please map these standards according to EU core values as defined in Article 2 of EU Treaty: human dignity, freedom, rule of law, quality, democracy"

The results of the manual mapping and the LLM-assisted mapping are discussed in class.

3) Use the results of 2) above to fill out the Stand-EUVI ILO Matrix (Item 2).

The teacher should fill out the Stand-EUVI ILO Matrix. This exercise will allow the teacher to understand whether and which values and interests can / should / must be introduced to students in subsequent lectures of this course or subsequent teachings of the same course.

If needed, think about and introduce in the subsequent teaching new examples/topics / assignments to have better coverage of values and interests.

3.4 Step 4

Use available teaching aids (Level 4 of ITCoS FM Model, see Figure 1) to share the filled-out Stand-EUVI ILO matrix (Item 2) with the community of educators. Suitable aids include, but are not limited to, built-in export tools in learning management system (LMS, such as e.g., Moodle), chosen Open Educational Resources (OER) repository, or EDU4Standards.eu Teachers Support Tool (TST).

Consult EDU4Standards.eu web page for recommendations on how to maximise the impact from sharing teaching materials, experiences, and results.

Your educational materials - lecture slides, assignments, examples, reading materials – can help other teachers engage in and promote education about standardisation in line with European values and European interests (Stand-EUVI).

Bibliography

Council of the European Union. (2017). Council Recommendation of 22 May 2017 on the European Qualifications Framework for lifelong learning and repealing the recommendation of the European Parliament and of the Council of 23 April 2008 on the establishment of the European Qualifications Framework for lifelong learning (2017/C 189/03). *Official Journal of the European Union,* C 189, 15–28.

Fomin, V. V., Abdelkafi, N., Blind, K., & Laužikas, R. (2025). The Framework Model for the Promotion of Education about Standardisation in Line with EU Values and Interests. In K. Jakobs (Ed.), T*he 29th EURAS Conference*. Aachener Beiträge zur Informatik.

Fomin, V. V., Laužikas, R., & Kiczko, A. (2026). Initial Validation of Edu4Standards.Eu Project Results: Identifying the Degree of Students' Knowledge about Professional and Ethical Standards. In K. Jakobs (Ed.), *The 30th EURAS Conference*. Aachener Beiträge zur Informatik.

Fomin, V. V., Mosakas, K., & Kuzmuk, O. (2025). D2.2. T*opical and methodological map of standardisation education*. https://doi.org/https://doi.org/10.5281/zenodo.14645903

Mosakas, K., Fomin, V., Veljanova, H., Reiter, B., Staudegger, E., Bierbauer, D., & Kuzmuk, O. (2025). Bringing values to standardisation: From policy concepts to a value-based framework for education about standardisation. *Ethics and Information Technology*, 27(3), 38. https://doi.org/10.1007/s10676-025-09833-6

Mosakas, K., Fomin, V., Veljanova, H., Staudegger, E., Kuzmuk, O., Bierbauer, D., Laužikas, R., & Reiter, B. (2025). Bringing values to standardisation: From policy concepts to a value-based framework for education about standardisation. *Ethics and Information Technology*, 27(38), 1–16. https://doi.org/10.1007/s10676-025-09833-6

Veljanova, H. (2024). D2.1 – I*ntended Learning Outcomes (ILOs) for Standardisation Education*. https://doi.org/10.5281/ZENODO.14229235

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