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### Working Party on Regulatory Cooperation and Standardization Policies (WP.6)

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Ad Hoc Team of Specialists on Standardization and Regulatory Techniques

## Education on standards-related issues: update on activities

Submitted by the Acting Chair of the Ad Hoc Team of Specialists

### *Summary*

This document presents the main activities and results of the Working Party on Regulatory Cooperation and Standardization Policies (WP.6) project on education on standardization and an update on the activities under this initiative of the Standardization and Regulatory Techniques Group on Education and Standardization (START-Ed).

#### *Proposed decision:*

“The Working Party takes note of the update on activities and thanks participating delegates and experts for their contributions. The Working Party recommends the continuation of this initiative”.

## I. Introduction

1. Standards are one of the principal cornerstones of trade and economic integration and of all dimensions of sustainable development. They help reduce trade costs; ensure the safety and security of workers and consumers; protect communities from hazards; and facilitate the circular transition to a green economy. Better knowledge of standards and their wider application is beneficial to the society as a whole and is essential for business. An important factor in the marketing strategies of companies in international trade is a good working knowledge of both trade-distorting and trade-facilitating aspects of standards and their appropriate use. There is therefore growing attention to the knowledge needs of university graduates entering the workforce.

2. ECE activities on teaching standards are based on a distinction between education and training. For education, the purpose is to build awareness and understanding of standards in general. For training, the purpose is to provide specific competences and skills to specialists who will or who already work with standards (i.e. vocational educational training). Whereas for education, the focus is on general awareness, for the latter, the emphasis is on how to use existing standards and to elaborate standards as required for a concrete business case. Two main education streams are distinguished as a result: “education about standardization” and “professional training on standards”.

3. National standards-setting bodies and international/regional standardization organizations provide various types of professional training on the use of standards and on the development of standards. At the same time, there are few university programmes on the importance of standards (on a national level and in the global economy). This is where the Working Party on Regulatory Cooperation and Standardization Policies (WP.6) and its START-Ed initiative offer its expertise to interested educational institutions.

4. Standards have always been, and continue to be, on the curricula of engineers in all countries. In addition, international standards-setting bodies such as the International Organization for Standardization (ISO), the International Electrotechnical Commission (IEC) or the International Telecommunication Union (ITU) promote the importance of their own standards. WP.6 experts felt, however, that in addition to this targeted promotion, a horizontal approach across all standards would allow to build general awareness and that similar training/education would be beneficial for students of non-technical specialization and thus demonstrate the multidisciplinary character of standards in the modern world.

## II. Education about standardization

5. ECE and its experts have been advocating the relevance of general education about standardization since at least 1970 when *Recommendation I on Education on Standards-Related Issues* was adopted and called upon Governments to include standardization in the curricula of educational institutions. Intensified discussions in the World Trade Organization and at other fora on technical barriers to trade in the 1990s brought education issues once again to the ECE agenda when defining what knowledge and skills related to standards are required today by the market.

6. As part of its awareness-building and promotional activities, from 2010 to 2012, the ECE secretariat conducted an informal consultation with private-sector businesses in order to ascertain the expected skills and competencies of university graduates. The results stressed that, on the one hand, there was a growing need for standards-related competencies, and, on the other, that very few non-technical universities included standards in their curricula. Thus, the majority of graduates in the areas of economics, business management or law had no understanding of how standards and regulations (technical barriers to trade) could hamper a company’s ability to compete in international markets. Even programmes for engineers primarily presented standards as a technical tool on an individual company level, and not as a global market challenge.

7. ECE research revealed that standards were not taught in many universities and when they were, it was in different ways and formats. Some proposed specialized master programmes (i.e. Geneva University; School of Management and Technology of the Porto

Polytechnic Institute). A number of institutions also provided selected courses on various aspects of standards (i.e. Delf University in Rotterdam; Erasmus University in Rotterdam; Helmut Schmidt University in Hamburg; University of Technology in Berlin; Technical University of Sofia; Chubu University in Kasugai). The *Deutsches Institut für Normung* (DIN, the German standardization body) offered a distance learning course on standards. In the Russian Federation, the Russian Academy of Standardization, Certification and Metrology offered various postgraduate courses (usually as a second diploma) on standardization and technical regulations (ranging from a week for top managers to two years for experts on metrology).

8. Besides quantitative data on the number of students who have had classes about standards in various countries, the ECE secretariat has also collected information on and compared existing educational programmes on standardization. This revealed that programmes differed significantly both from the point of content and duration which make their comparison difficult. In Western Europe, for example, standardization is primarily dealt with from the point of view of companies, whereas in countries of Eastern Europe, Caucasus and Central Asia it is approached from the point of view of regulatory compliance issues. Almost none of the existing programmes dealt with adjacent issues such as metrology and market surveillance.

9. The debate on teaching standards in the ECE region continued in November 2012, when WP.6 in the framework of its twenty-second annual session, held an international workshop on “Introducing standards-related issues in educational curricula”, with close to a hundred delegates from more than 20 countries from governmental authorities, standards bodies, international organizations, the academic community, as well as business. Participants noted the growing demand for specialists on the subject and at the same time regretted that very few programmes on standardization existed in the ECE region.

10. As the result of these discussions, WP.6 adopted a revised *Recommendation I on Education on Standards-Related Issues* stressing the importance of promoting and teaching standardization through the elaboration of coordinated approaches and building on existing national best practices. In particular, the Recommendation calls on Governments to encourage

- (a) “the introduction by educational establishments of the subject of standardization into the curricula of educational establishments and particularly of universities for students majoring in technical and scientific subjects, as well as in legal, economic and management studies;
- (b) the vocational education and training of specialists in standardization;
- (c) the enhancement of awareness-raising activities targeted to the business community and regulatory authorities (in particular, trade and customs officials);
- (d) the further study of standardization issues in order to identify best practices in ensuring that standardization and regulatory regimes contribute to meeting the legitimate concerns of society (e.g. human safety, environment) without creating unnecessary technical barriers to trade.”<sup>1</sup>

11. WP.6 experts developed a *Concept note for the Workshop on “Introducing standards-related issues in educational curricula”*, including a proposed model programme on standardization (ECE/TRADE/C/WP.6/2012/6)<sup>2</sup> in order to facilitate the introduction of standardization into curricula. This concept note develops a model programme which is based on elements that existed at the time of writing as well as suggestions from experts and delegates on new areas (i.e. market surveillance). The programme is intended to accommodate both the business and governmental points of view, establishing the basics that a graduate should master to have a general understanding; it includes the major standardization, regulatory and related issues relevant to the activities of business and of

<sup>1</sup> ECE *Recommendation I on Education on Standards-Related Issues*:

[https://unece.org/DAM/trade/wp6/Recommendations/Recommendation\\_I\\_en.pdf](https://unece.org/DAM/trade/wp6/Recommendations/Recommendation_I_en.pdf).

<sup>2</sup> See: [https://unece.org/DAM/trade/wp6/documents/2012/wp6\\_2012\\_06E.pdf](https://unece.org/DAM/trade/wp6/documents/2012/wp6_2012_06E.pdf).

regulatory authorities). The programme is intended for general university level academic programmes rather than to provide specialized in-depth training on standardization.

12. These essential issues are grouped into 15 modules that can either be used together as a complete course or individually for training on a specific topic, each with a suggested timing which could be adapted depending on the purpose of training and the level of knowledge of students. These modules are as follows:

- (1) Standardization basics
- (2) Benefits of standardization for society
- (3) Standardization and companies
- (4) National legal and institutional framework for standardization
- (5) Regulatory policies and related institutional mechanisms
- (6) Managing risks through standards, regulations and regulatory impact assessments
- (7) Metrology
- (8) Conformity assessment and its place in business processes and regulatory infrastructure
- (9) Market surveillance
- (10) Management system standards
- (11) International standardization
- (12) International trade, standards and regulations
- (13) Standardization of information requirements and supply chains
- (14) A practical exercise: Standardization within a company
- (15) Policy issues and challenges in standardization

13. Splitting the programme into distinct modules provides flexibility to professors and also brings forward the minimum knowledge that a graduate should obtain on the subject. This programme can provide educational institutions with a check list of essential standards-related issues, but it also marks a major step towards the harmonization of educational programmes (by agreeing on their content) and eventually to the mutual recognition of diplomas.

14. To monitor developments in the education area within the existing WP.6 Ad Hoc Team of Specialists on Standardization and Regulatory Techniques (START), the START-Ed initiative was launched. This initiative has enabled the organization of exchange of experiences and of materials between universities on teaching standards (examples of programmes from countries, of teaching materials and other related information to be used by professors) which is available on the WP.6 education web page at: [www.unece.org/trade/wp6/thematic-areas/education](http://www.unece.org/trade/wp6/thematic-areas/education).

### **III. Ongoing activities**

#### **A. Education on standardization**

15. One of the practical results of ECE awareness and capacity-building efforts within the region has been the introduction of new courses on standards and wider attention to related issues in existing curricula. For example, the Moscow State Regional University introduced in a new course entitled “Fundamentals of standardization” broken down to 15 thematic areas which mirror those suggested by the ECE model programme. The course is taught at the management faculty to students with various specializations and received positive feedback.

16. The Matej Bel University in Banska Bystrica, Slovakia provides another positive example. There, a course entitled “Standardization and international standards” is offered at the Master’s degree programme in the finance, banking and investment specialization. The content of the course is close to the ECE model programme. It consists of 13 areas; two of these are different (“Standardization in the EU” and “Political implications of standardization”). Certain elements of the ECE model programme were also used in courses in other universities.

17. Despite a rise in interest in standardization, there are still only a few dozen courses of this kind within the Pan-European region. At the same time, there is a continuous boom of programmes on standards in Asia. In China alone there are more than 200 university programmes on standardization. Similar developments took place in other leading exporting countries such as Japan (more than 50 courses introduced in 32 educational establishments) and Korea (more than 80 programmes at 41 universities). In Indonesia, the national standards body (BSN) signed a memorandum of understanding with thirty higher educational establishments; standardization is currently taught as a permanent subject in 10 universities.

18. START-Ed initiative continually provides methodological support and advice to interested professors on initiating new courses or on finding relevant material for students. Among the deliverables in this area are three ready-to-use lectures that professors can use as a basis or part of their programmes on international trade, benefits of standardization and management of standards. Another key deliverable in this area is the publication *Bringing Standardization in University Curricula: Making the Case* (ECE/TRADE/440) which outlines why this topic is important and offers an analysis of how this is organized within the ECE region and beyond.

19. These efforts culminated in a high-level panel discussion during the twenty-ninth session of WP.6 on 21 November 2019 where experts shared their experience on teaching standards.<sup>3</sup> The debate confirmed again that even basic knowledge of standards can be beneficial to various stakeholders (from high school graduates, to technical specialists and policymakers).

20. These efforts on consultation with education specialists and providing support for relevant curricula continued over this reporting period. Furthermore, discussions have been initiated on how to better identify education needs for those entering the workforce.

## **B. International cooperation on educational needs for standardization**

21. In view of the global character of educational needs, the START-Ed initiative sees the importance for further enhanced international cooperation. This cooperation is well underway with ISO and the Asia-Pacific Economic Cooperation (APEC) whose teaching materials are referenced on the website of WP.6. WP.6 and the START-Ed initiative have also regularly contributed to ISO events such as the “World Standard Day.” Similar cooperation is under way with IEC and ITU as well as with the European Commission, companies and educational institutions.

22. ECE has a category A liaison with ISO Technical Committee 232 (TC 232) on Education and learning services. This group recently delivered two new standards: ISO 29994:2021, *Learning services – additional requirements for distance learning* and ISO 29995:2021, *Education and learning services – vocabulary*. A joint working group was established with the ISO Committee on Conformity Assessment in January 2021 which is working on a new standard on audit and certification to evaluate compliance of ISO 21001:2018, *Educational organizations – Management systems for educational organizations – Requirements with guidance for use*; the expected standard is to be the ISO technical standard 21030, *Educational organizations – Requirements for bodies providing audit and certification of educational organizations management systems*).

<sup>3</sup> See: <https://unece.org/info/Trade/WP.6-Meetings/events/17967>. Speakers included representatives of educational institutions from Belarus, China, Germany, the Netherlands, Portugal, the Russian Federation and Slovakia as well as representatives from the European Commission and ISO.

23. WP.6 has provided input to the current work of the ISO Research and Innovation Unit on developing a new education strategy for ISO.

24. On the regional level, the WP.6 START-Ed initiative has been working with the African Organization for Standardization (ARSO). The latest WP.6 developments were presented on an ARSO webinar entitled “Insights on the strategic value of standards education: developing standards professionals and standards education in Africa and internationally, – perspectives, challenges and opportunities”, held in November 2020.

25. The START-Ed initiative established contacts with the Commonwealth of Independent States (CIS) Bureau on Standards based in Minsk, Belarus. This body provides the secretariat for the CIS Intergovernmental Council on Standardization, Metrology and Certification, a regional standardization organization of the CIS countries. The work of the START-Ed initiative as well as the Gender-Responsive Standards Initiative were presented to the CIS Council on Standardization in a virtual meeting in May 2021. The Commission took note of these initiatives and invited national standards bodies of its region to cooperate with ECE on these topics. It is expected that contacts with the CIS regional organization will contribute to a wider awareness of and participation in the activities of WP.6 from the region.

#### **IV. Future challenges**

26. The START-Ed initiative recommends the following actions:

(a) Regularly update teaching material. There reason for this is that one of the more common complaints of companies is the gap between actual market constraints and the curricula that university students discuss. This reveals that, on the one hand, it is important to have a regular revision of educational programmes to reflect the needs as perceived by standards users. And on the other hand, it underlines the challenge to keep professors aware of the latest developments (teaching standards). A solution for this could be to regularly update teaching materials.

(b) Develop teacher training material. Professors at non-technical institutions often have only a general background in standardization. It is therefore necessary to put in place a mechanism of regular teacher training with, for example, the involvement of major stakeholders such as national standards bodies.

(c) Enhance collaboration with the subgroups and other thematic areas under WP.6 to elaborate relevant training material related to their areas of competencies.

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