



JWG Education about Standardization

Model Standardization Curriculum for Educational Establishments

Introduction

The European Standardization Organizations, CEN, CENELEC and ETSI, have prepared an overall policy statement on Education about Standardization, as an informative document for them and their national members. CEN, CENELEC and ETSI have formed a Joint Working Group on Education and Standardization (JWG-EaS), which is preparing material to support this policy.

The first element of the policy consists of “developing elements of a model standardization curriculum for specific educational levels, focusing on the specific characteristics of education, whether academic or vocational, in technical, business, engineering and scientific fields without excluding the social and general education”.

The present document contains such a model curriculum. The document has been taken into account on some earlier academic work by Henk de Vries and Dong Geun Choi about the best practices on this issue across the world and published in as *“Standardization as emerging content in technology education at all levels of education”*.

Comments on the document – especially in terms of “missing elements” that are considered essential - would be very welcome and will be considered by the JWG-EaS, which intends to develop it appropriately, particularly in discussion with circles new to standardization.

Please send observations on this document to the JWG-EaS Secretary, Ms Christine Tack (ctack@cencenelec.eu).

Educational levels

Due to the very different educational systems across Europe, it is necessary to proceed first to a rough identification of the educational levels. The following partition is proposed:

- a) primary education (up to 10/11 years old)
- b) secondary education (up to 16/18 years old)
- c) vocational education
- d) higher education (colleges and universities, incl. engineering and business schools)
- e) post-formal education

Post-formal education, which is considered beyond the scope of this policy element, and vocational education are other kinds of higher education different from colleges and universities, with respect to which they require normally fewer years of learning. They provide career and technical education with the aim of acquiring a profession, especially in jobs based upon manual or practical fields, and often including an on-the-job training component. Jobs are related to specific trades, occupations, and vocations (e.g. nurse, retail, tourism, cosmetology, etc.). The JWG-EaS is working separately on a companion model curriculum concerning vocational training.

Content modules

The proposed teaching contents are gathered into 6 modules:

- **Module 1: Examples in every day** life to raise a general **awareness about the existence and importance of standards** (e.g. paper sizes, country codes, book codes, credit cards, exc.)
- **Module 2: Factual/fundamental contents** to raise a **general understanding of main concepts** (see Table A)
- **Module 3: Academic/theoretical aspects** to learn and develop **academic aspects of standardization**, particularly standardization within disciplines such as business administration, law, engineering (see Table B)
- **Module 4: Case studies** to learn about the **impact of standardisation in business practice** (e.g. ISO 9001 quality management, ISO 14001 environmental management implementation, standards enabling compliance with legal requirements, etc.)
- **Module 5: Skill related contents** to learn how to **carry out a standardization-related task**. They mainly provide communications skills about chairing and moderating a meeting, and managing consensus and negotiation also across different cultures
- **Module 6: Application of specific standards** to learn **how to implement or use specific standards** (see Table C)

Modules 1 and 2 provide basic contents and are considered part of any level of education.

Modules 3 and 4 are normally provided by higher education even if some simplified contents are present in secondary education.

Modules 5 and 6 provide advanced contents and can be generally associated to the post-formal education, even though, especially for module 6, some references can be included also in higher education curricula.

Table D seeks to match different academic level requirements to the modules and gives some suggestion as to the types of course (or other instructional activity) that might be applied to each.

List of topics for selected Modules

The following tables show possible topics of teaching materials for Modules 2, 3 (limited to business administration, law and engineering) and 6.

Some examples for Module 1 “standards in every day life” and 4 “case studies” are listed above and of course they are open to unlimited permutations.

Module 5 is deemed to be linked to post-formal education and it is beyond the scope of this element of the policy.

Table A – Module 2: Factual/Fundamental contents

Major classification	Sub-classification
General	General introduction, orientation
Definitions	Concepts and definitions
Functions	Needs or objectives, functions and effectiveness
History	General history, evolution
Types/ classifications of standards	General, by who, by how, by what
National standardization	History, policy, strategy, role in the marketplaces, procedures, legal system, relevant organizations, impact and challenges, issues, finding standards in catalogues
Regional standardization	
International standardization	
Conformity assessment	General, types, and strategy, procedures, legal system, national system-accreditation, other nations, international, regional, multi/bi-lateral, mutual recognition agreements
Consumers	Users and consumers
Government	Government and standardization, technical rules and standards, harmonised standards

Table B – Module 3: Academic/Theoretical aspects

Type of course	Topics
Business administration	Standardization as a strategic decision-making tool Key factor for competitiveness Low price best practices Technology transfer Marketing tool Global business and foreign market access CE Marking Conformity assessment Accreditation (series ISO 17000) Consumers and environmental protection Service management Innovation

Type of course	Topics
Law	Laws and standards European Directives and harmonised standards IPRs, patents and standardisation CE Marking Conformity assessment Accreditation (series ISO 17000) Consumers and environmental protection
Engineering	Technology management Technology transfer Safety requirements CE Marking Conformity assessment Accreditation (series ISO 17000) Consumers and environmental protection Energy saving solutions Interoperability schemes Standardisation in the respective engineering disciplines: <ul style="list-style-type: none"> - Mechanical, - Construction, - ICT - etc.

Table C – Module 6: Application of specific standards

List of examples
Electronic engineering related standards and application
Chemical engineering related standards and application
Mechanical engineering related standards and application
Management systems standards- quality management and application
Management systems standards- environmental management and application
Service standards and application
CSR and application
NOTE A simplified overview of the examples could be used in other Modules.

Framework for education about standardization

Table D – Proposed framework

Educational Level	Why – Learning objectives	Operators	What – Contents		How - Methods
			Main content	Subsidiary content	
Primary education	Awareness	Government NSBs	Module 1 simplified -Examples	Module 2 simplified -Fundamental	Quiz Game Draws Leaflet Brochures
Secondary education	Awareness/ Understanding/ Technical knowledge for specific well defined domains	Government NSBs	Module 1 -Examples Module 2 -Fundamental Module 3 simplified -Academic	Module 6 simplified -Standards	Quiz Game Leaflet Contest Handbook Video Internet sites
Vocational education	Awareness/ Understanding/ Technical knowledge for specific well defined domains/ Theory/	Government NSBs Various	Module 1 -Examples Module 2 -Fundamental Module 4 -Case study	Module 6 -Standards	Contest Handbook Video Internet sites Team Project Presentation Case study Workshop
Higher education	Understanding/ Specialized knowledge/ Theory/ Interaction between innovation and standardization	Universities Government NSBs	Module 2 -Fundamental Module 3 -Academic Module 4 -Case study	Module 6 -Standards Module 1 -Examples Module 5 -Skill set	Contest Handbook Video Internet sites Team Project Presentation Case study Workshop

Notes on operators: Primary and secondary schools depend on the education policies determined by the Ministry of Education, identified by the term "Government". Universities have more independence on the curricula definition and so they are differently identified. "Various" is for all the kinds of vocational training schools.