

Quality Frameworks for Open Education

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MOOQ: Massive Online Open Education Quality

The **European Alliance** for *Quality of Massive Open Online Courses and Open Education (MOOQ)*

Five founding partners:

- Open University of the Netherlands (*Coordinator, NL*)
- Hellenic Open University (*GR*)
- Hellenic National Quality Infrastructure System (*GR*)
- Universidade Aberta (*PT*)
- Ecole Normale Supérieure de Lyon (*FR*)



<http://mooc-quality.eu/>

COMPASS: Composing Lifelong Learning Opportunity Pathways through Standards-based Services

EU funded project (ends Aug 2018), that builds around:

- (a) the **modeling** of **well-structured representations of Learning Opportunities** with explicit integration of **learning outcome and competence** related information and
- (b) implementation of technology-enhanced, flexible **learning pathways**.



<http://learning-compass.eu/>

Quality: some definitions (*among many...*)

**“ the degree to which a system, component or process meets:
(1) the specified requirements, and
(2) the needs and expectations of customers.**

IEEE 601.12:1990

**“ the totality of features and characteristics of a product,
process or service that bear its ability to satisfy explicit or
implicit needs.**

ISO 8402:1994

**“ the ability of a set of inherent characteristics of a product,
system or process to meet the requirements of customers
and other stakeholders.**

ISO 9000:2000

Quality assurance, quality management, quality control, ...

- **quality assurance ex-post:** measuring of error rates at the end of production
- **in-process quality assurance:** measurement during the production process
- **process-oriented quality management:** process optimization and change management
- **total quality management:** holistic quality management as cross-organizational management philosophy

inspection » quality control » quality assurance »
strategic quality management

| **ISO 9000:2000 (2000)** |
“**Quality management systems.
Fundamentals and vocabulary**”

“Open” Education

Source: <https://www.flickr.com/photos/opensourceway/>



Waves of Open Education

800 BCE - Open Discourse! (*Socrates, Confucius*)

1800 CE - Open Learning! (*Pestalozzi, Piaget, Vygotski*)

1960s - Open Classrooms

1960s - Open Universities

1990s - Open Educational Resources

2000s - Open Online Collaboration

2010s - Open Educational Practices

Now - Open Learning Environments



United Nations
Educational, Scientific and
Cultural Organization



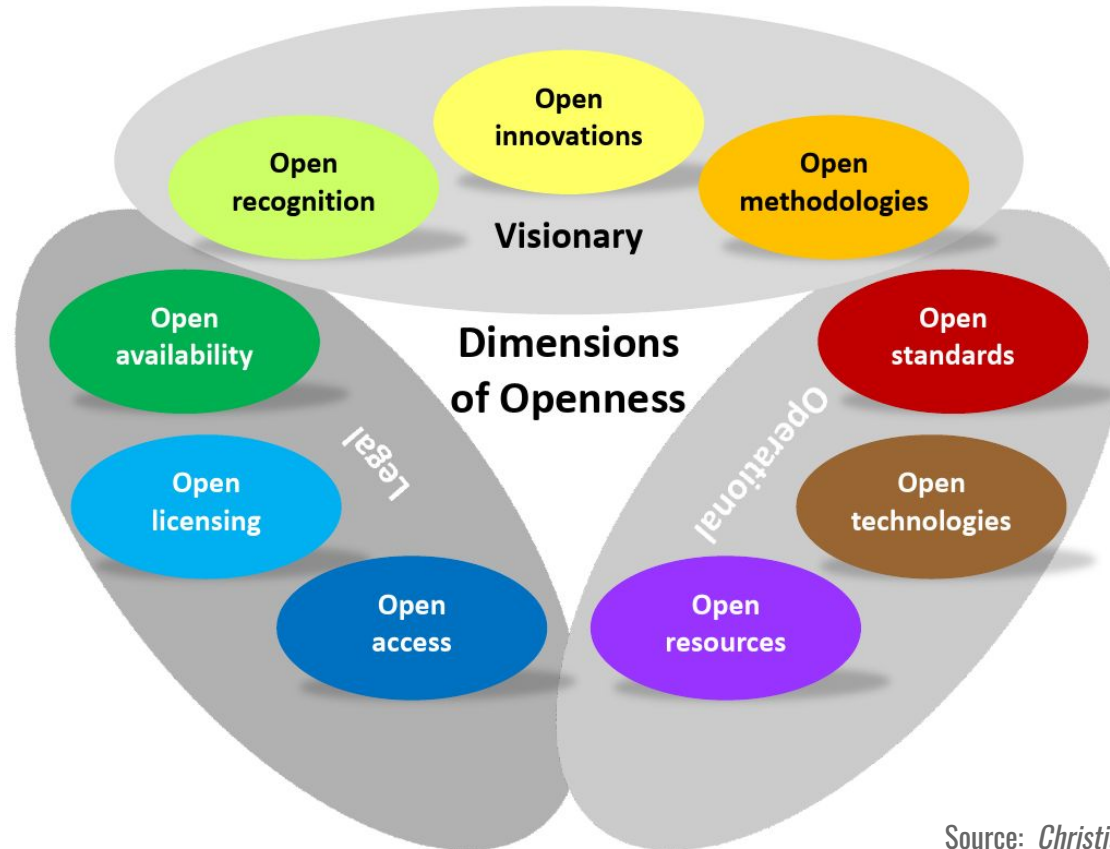
OPEN EDUCATION
CONSORTIUM

The Global Network for Open Education



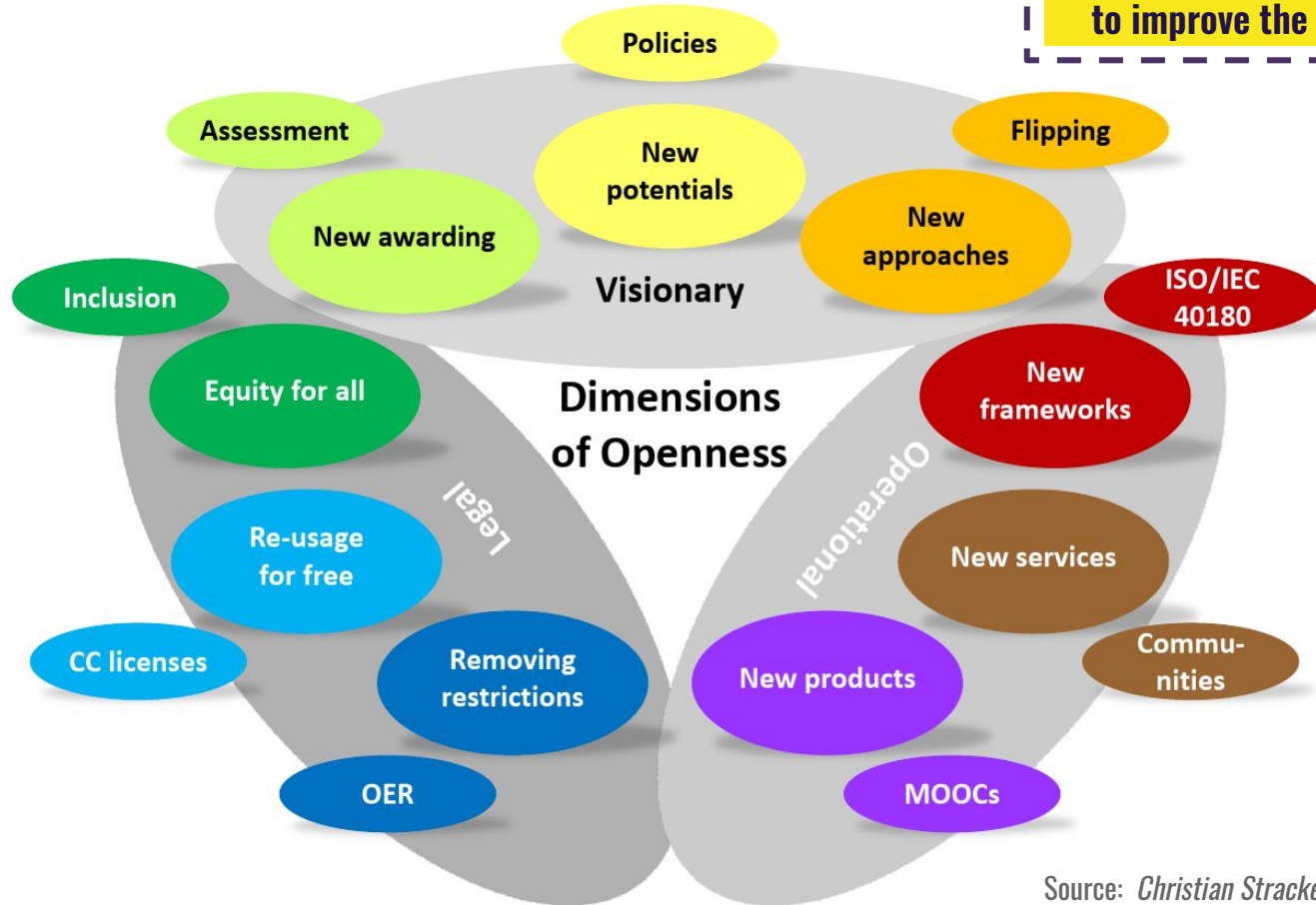
OPEN EDUCATIONAL RESOURCES

Dimensions of Openness in education



Challenges of Openness in education

⇒ Innovations for changing & opening up education to improve the overall quality!

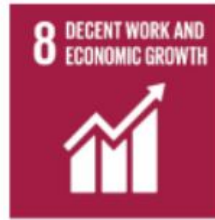


The Core
Challenge:
2030
Agenda
of the
United
Nations



SUSTAINABLE DEVELOPMENT GOALS

Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all



Dimensions of Open Education

Source: *Christian Stracke (2016)*

Macro:

Policies and Curricula

Strategic & organisational

Meso:

Organisation and Design

Micro:

Learner and Course

Quality in Open Education

Source: *Christian Stracke (2016)*

Macro:

Movement & Strategies

Strategic & organisational

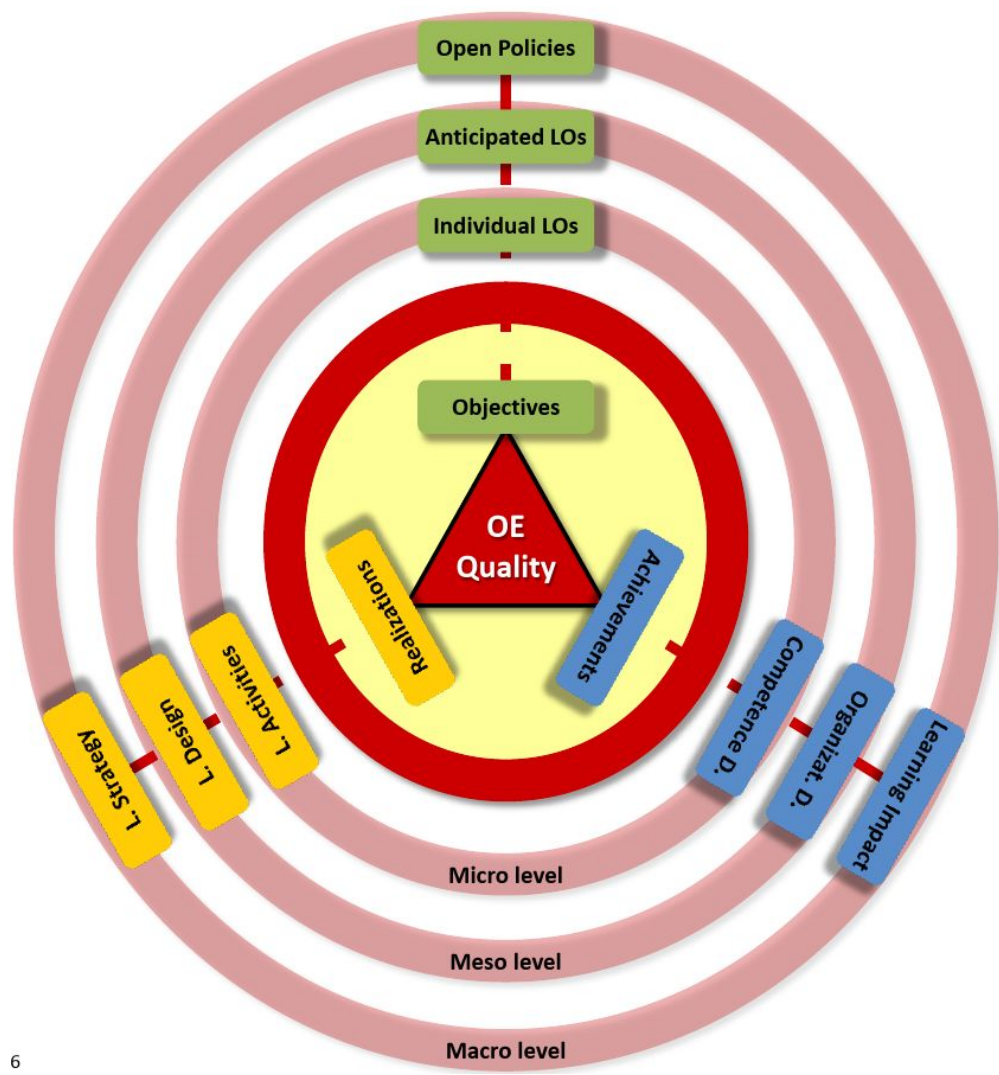
Meso:

Frameworks & Standards

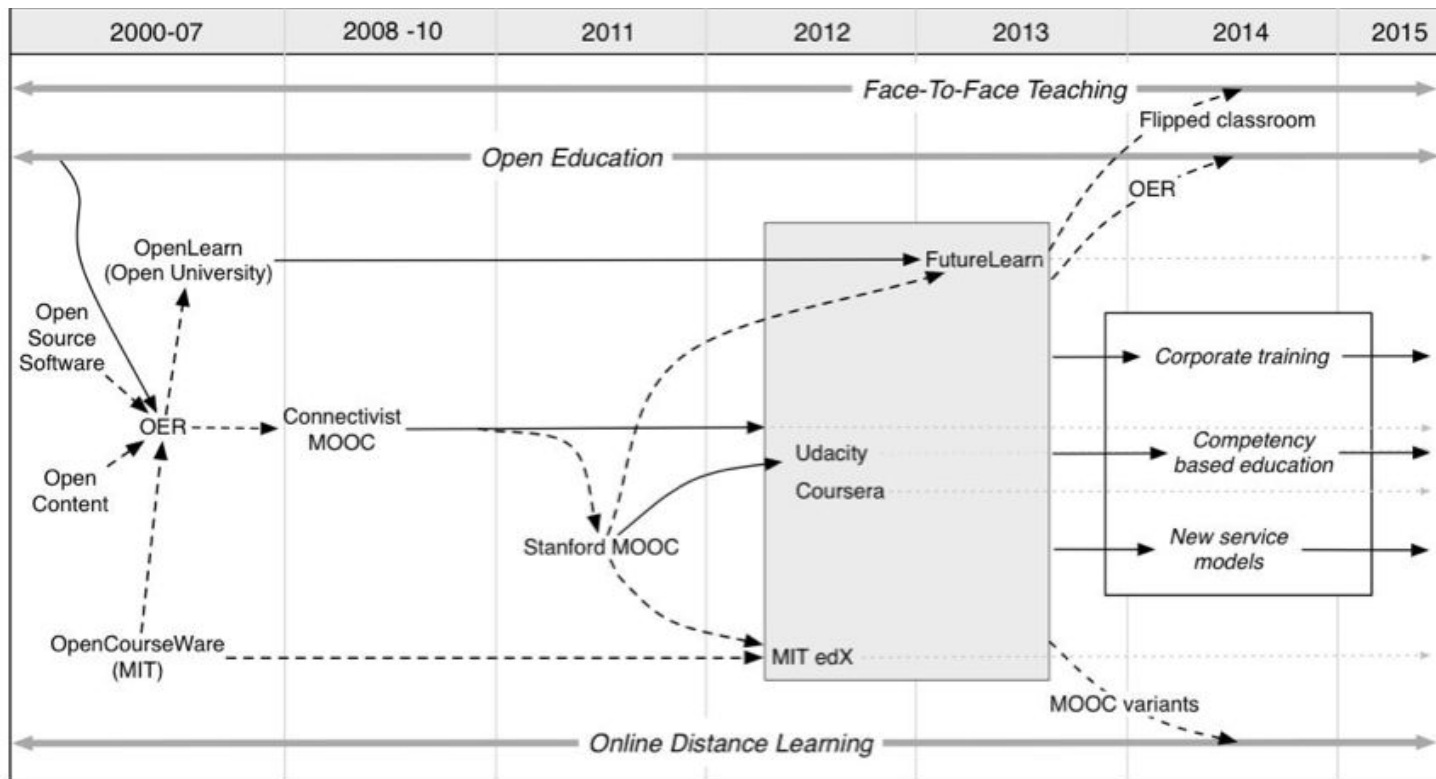
Micro:

Competence & Community

Quality in Open Education



Open Education Timeline



—————> Directly related

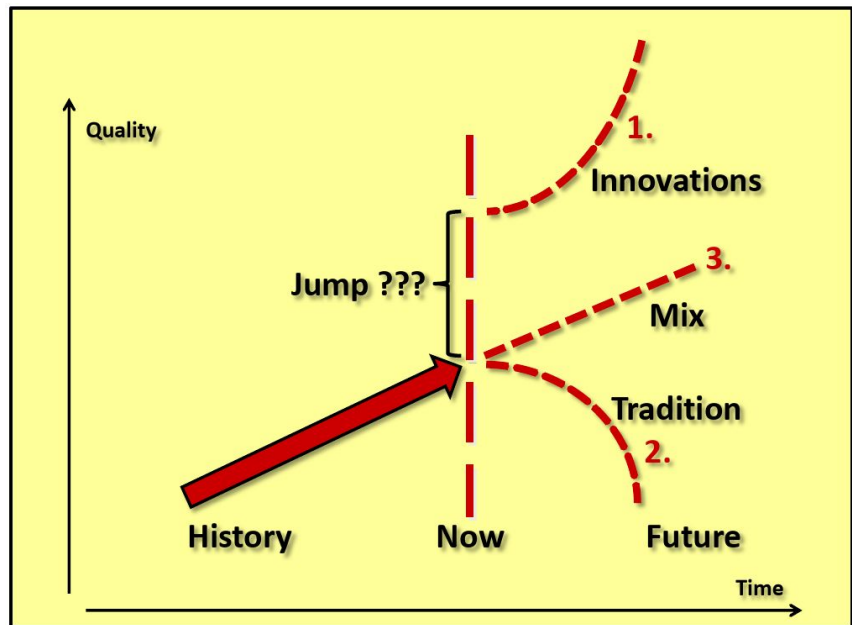
- - - - -> An influence

■ Established MOOC platforms

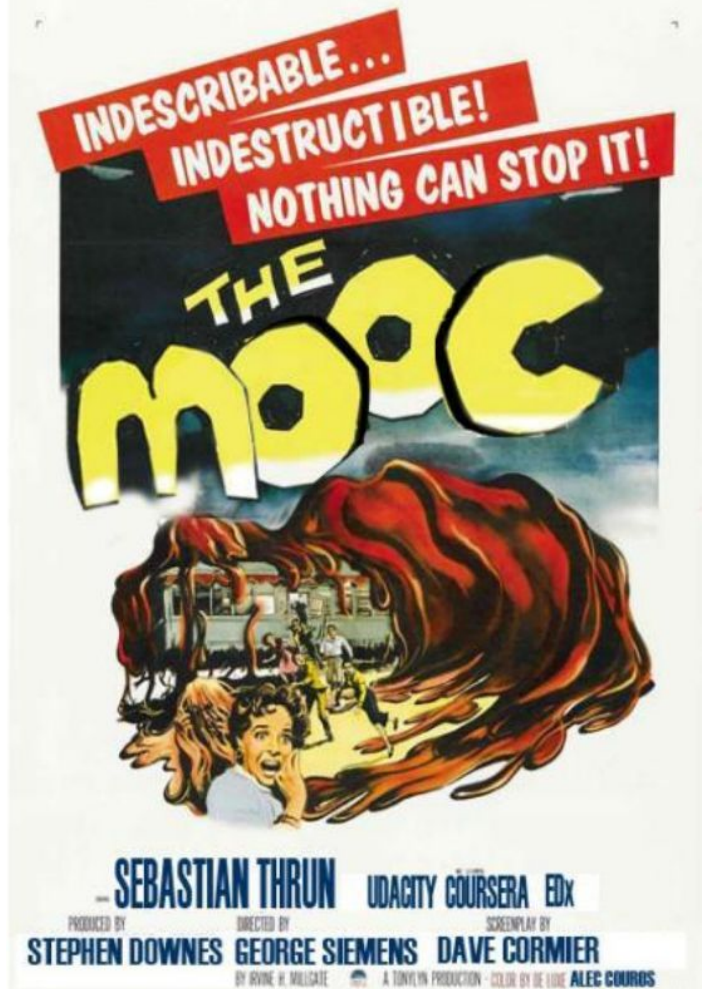
□ Entrepreneurial initiatives

Source: Li Yuan and Stephen Powell CC-BY

The MOOCs are coming... *a long-awaited innovation?*



Source: Stracke, C.M., "Learning Innovations and Learning Quality" (2012)



Source: <https://www.flickr.com/photos/gforsythe>

MOOC: European definition

- MOOCs are “*courses available to masses of online learners for little or no cost*” (Selwyn, Bulfin, & Pangrazio, 2015)
- A MOOC is “*an online course designed for large number of participants that can be accessed by anyone anywhere, as long as they have an internet connection, is open to everyone without entry qualifications and offers a full/complete course experience online for free*”
-

“*A MOOC is an online course aimed at unlimited participation and open access via the web.*”

Source: Wikipedia (updated regularly)

MOOCs... and friends

MOOC: Massive Open Online Course

μOOC: Micro Open Online Course

LOOC: Local Open Online Course

MOOR: Massive Open Online Research

ROOC: Regional Open Online Course

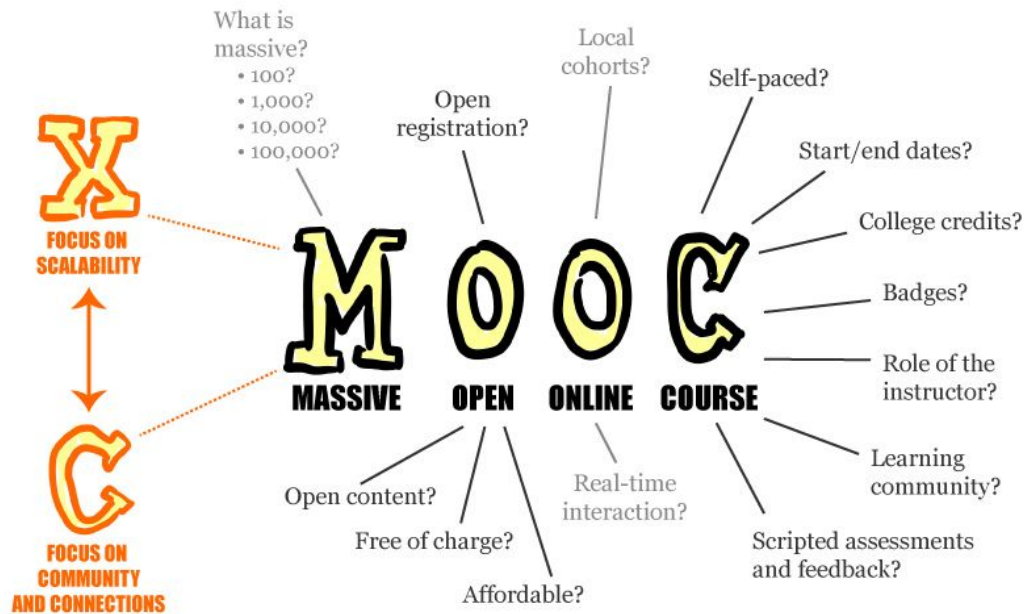
HOOC: Hybrid Open Online Course

COOC: Classically Offered Online Course

SPOC: Small Private Online Course

SOOC: Selective Open Online Course

DOCC: Distributed Open Collaborative Course



Source: *Mathieu Plourde CC-BY*

Every letter is Negotiable!

xMOOC vs cMOOC: *Different approaches for pedagogy*

xMOOC: professor-centric

- focus is on the learner's individual acquisition of knowledge.

cMOOC: built around connectivity

- focus is on the learner's engagement in the network of knowledge production

In the emerging new **combined approaches**, learners are expected to take an active role in and be responsible for their own learning, but also to actively engage in helping build a supporting learning community.

MOOQ - The main goals

Long-term goal:

- improvement of future *online courses* and *associated educational resources*,
- by developing *quality indicators*, *metrics*, and *instruments*.

Main objectives:

1. MOOC *Design Patterns* & *Best Practices* based on a large-scale survey
2. Pre-standard “European Massive Online Open Course Quality Framework” (*Euro-MOOC-QF*)
3. **Q-generation of MOOCs** (*qMOOCS*)
4. **Practical solutions** to Quality Assessment

MOOC Quality Reference Framework (QRF)

- QRF for the design, evaluation, improvement, and comparison of MOOCs
- Drawing upon formal standardization principles issued by ISO and CEN
- Describes internal & external **evaluation mechanisms** for
 - **processes**, and
 - **content**

- Method of **best practice benchmarking**
- Adapts the process model from **EN ISO/IEC 19796-1**
 - **5 phases**: *analysis, design, implementation, learning process, evaluation*
- Defines a **matrix** for the MOOC QRF with
 - **3 pillars** (*pedagogical, technological* and *business model*),
 - **34 dimensions**
 - **123 process descriptors**

Euro-MOOC-QF Pre-Standard

Will address:

- **educational material** (data)
- related **educational design** (process) and requirements for the effective functioning of MOOCs in the educational operation of a HE organization

Shall include a terminology part concerned with terms accompanied by their definitions, for conformity (*use of a common and clearly understood language*).

1. **Technical specifications** (*formative*)
2. **Guidelines, instructions** (*informative*)
3. **Best practice examples** (*informative*)

CEN TC 353 *“ICT for Learning Education and Training”*

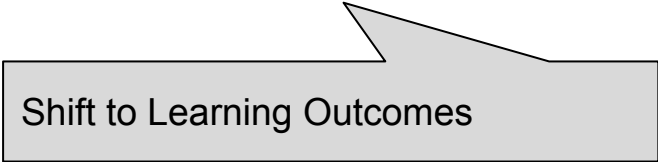
-  [CEN/TC 343 "Solid Recovered Fuels"](#) 
-  [CEN/TC 344 "Steel static storage systems"](#) 
-  [CEN/TC 345 "Characterization of soils"](#) 
-  [CEN/TC 346 "Conservation of Cultural Heritage"](#) 
-  [CEN/TC 347 "Methods for analysis of allergens"](#) 
-  [CEN/TC 348 "Facilities Management"](#) 
-  [CEN/TC 349 "Sealants for joints in building construction"](#) 
-  [CEN/TC 350 "Sustainability of construction works"](#) 
-  [CEN/TC 351 "Construction Products - Assessment of release of dangerous substances"](#) 
-  [CEN/TC 352 "Nanotechnologies"](#) 
-  [CEN/TC 353 "Information and Communication Technologies for Learning Education and Training"](#) 
-  [CEN/TC 354 "Non-type approved light motorized vehicles for the transportation of persons and goods and related facilities"](#) 
-  [CEN/TC 355 "Project Committee - Lighters"](#) 
-  [CEN/TC 356 "Project Committee - Industrial fans - safety requirements"](#) 

UNESCO Paris 2012 OER Declaration

It makes ten recommendations for governments relating to OER: ...

*e. Support capacity building for the sustainable development of **quality learning materials***

*Support institutions, train and motivate teachers and other personnel to produce and share **high-quality**, accessible educational resources, taking into account local needs and the full diversity of learners. Promote **quality assurance** and peer review of OER. Encourage the development of mechanisms for the assessment and certification of **learning outcomes** achieved through OER.*



Shift to Learning Outcomes

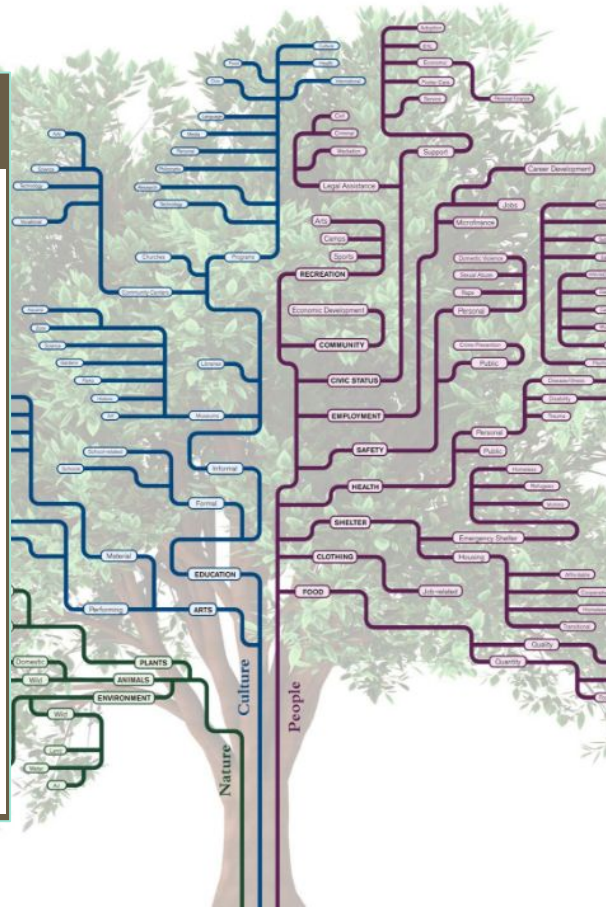
Key ingredient for Quality: “Taxonomy” for Schools

How?

Efficient strategy is vital for success and quality and includes a **Taxonomy* for Schools**.

The taxonomy needs to be designed, agreed with all stakeholders and deployed for all schools’ activities.

** a classification system that is ordered in some way.*



Key benefits

A **shared language** for describing **learning outcomes**, stages and **performance**.

Essential for **Instructional Design, Learning Materials** and **Assessments**.

Enables an Intl **Marketplace of Learning Resources**.

Educational taxonomies and curriculums

Educational taxonomy sets the **learning goals** for **what** students should know and be able to do at **each grade level**.

Educational taxonomies (or *educational standards*), are not a curriculum.

- Standards is *what* students need to learn.
- **Curriculum** is *how* students will learn it.

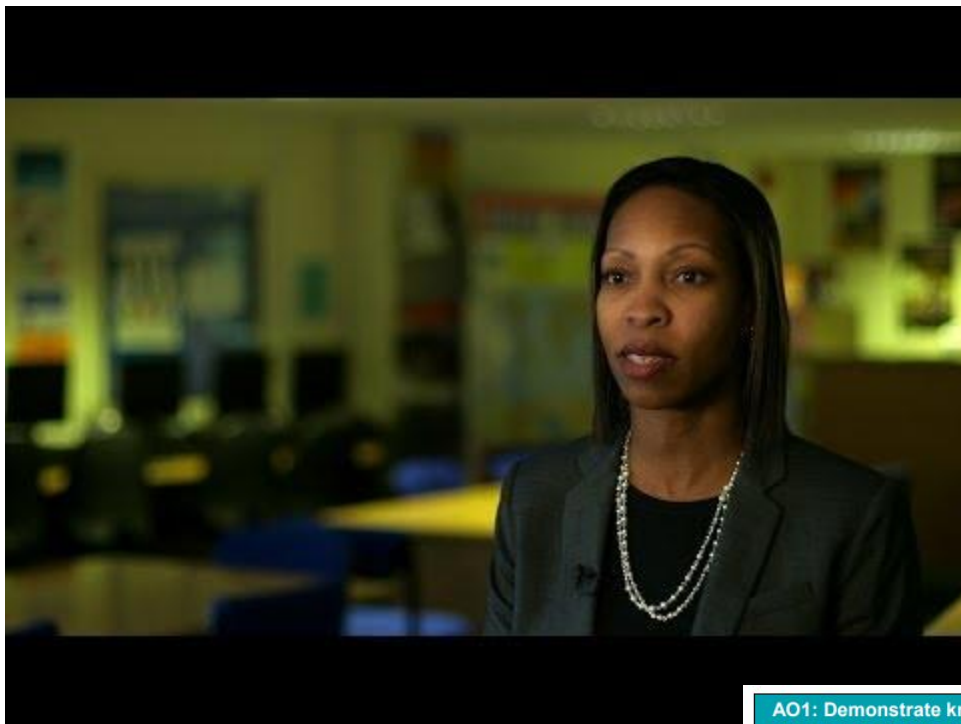


Example: UK Computing standards

Computing was re-introduced in UK in 2013 - designed **not by bureaucrats** but **by teachers** and other sector experts, with input from **industry leaders** like Microsoft, Google and the computer games industry.

Aligned to the sort of skills which the **jobs of the future** - and, for that matter, the jobs of the present - demand. From now on, all UK reforms ensure that every child gets a solid grounding in these essential skills - giving them the best possible start to their future.





“ There’s a huge move away from ICT and towards computational thinking

	Objective	Weighting
AO1	Demonstrate knowledge and understanding of the key concepts and principles of computer science.	30%
AO2	Apply knowledge and understanding of key concepts and principles of computer science.	40%
AO3	Analyse problems in computational terms: <ul style="list-style-type: none"> to make reasoned judgements to design, program, evaluate and refine solutions. 	30%

AO1: Demonstrate knowledge and understanding of the key concepts and principles of computer science.			30%
Strands	Elements	Coverage	Interpretations and definitions
n/a	1a – Demonstrate knowledge of the key concepts and principles of computer science. 1b – Demonstrate understanding of the key concepts and principles of computer science.	<ul style="list-style-type: none"> Full coverage in each set of assessments² (but not in every assessment). No more than 15% of the total marks for the qualification should reward demonstrating knowledge in isolation.³ 	<ul style="list-style-type: none"> In the context of this assessment objective, demonstrate means showing knowledge and understanding – for example, by stating or explaining a fact, concept or principle. Key concepts and principles of computer science are aspects of subject content. Awarding organisations should explain their approach to targeting them in their assessment strategy.

EU e-Competence Framework

Dimension 1 5 e-CF areas (A – E)	Dimension 2 40 e-Competences identified	Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3–8				
		e-1	e-2	e-3	e-4	e-5
A. PLAN	A.1. IS and Business Strategy Alignment					
	A.2. Service Level Management					
	A.3. Business Plan Development					
	A.4. Product/Service Planning					
	A.5. Architecture Design					
	A.6. Application Design					
	A.7. Technology Trend Monitoring					
	A.8. Sustainable Development					
	A.9. Innovating					

Dimension 1 e-Comp. area	B. BUILD				
Dimension 2 e-Competence: Title + generic description	B.3. Testing Constructs and executes systematic test procedures for ICT systems or customer usability requirements to establish compliance with design specifications. Ensures that new or revised components or systems perform to expectation. Ensures meeting of internal, external, national and international standards; including health and safety, usability, performance, reliability or compatibility. Produces documents and reports to evidence certification requirements.				
Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3 to 8 e-1 to e-5, related to EQF levels 3–8	Level 1	Level 2	Level 3	Level 4	Level 5
	Performs simple tests in strict compliance with detailed instructions.	Organises test programmes and builds scripts to stress test potential vulnerabilities. Records and reports outcomes providing analysis of results.	Exploits specialist knowledge to supervise complex testing programmes. Ensures tests and results are documented to provide input to subsequent process owners such as designers, users or maintainers. Accountable for compliance with testing procedures including a documented audit trail.	Exploits wide ranging specialist knowledge to create a process for the entire testing activity, including the establishment of internal standard of practices. Provides expert guidance and advice to the testing team.	–
Dimension 4 Knowledge examples <i>Knows/aware of/familiar with</i> Skills examples <i>Is able to</i>	K1 techniques, infrastructure and tools to be used in the testing process K2 the lifecycle of a testing process K3 the different sorts of tests (functional, integration, performance, usability, stress etc.) K4 national and international standards defining quality criteria for testing K5 web, cloud and mobile technologies and environmental requirements				
	S1 create and manage a test plan S2 manage and evaluate the test process S3 design tests of ICT systems S4 prepare and conduct tests of ICT systems S5 report and document tests and results				

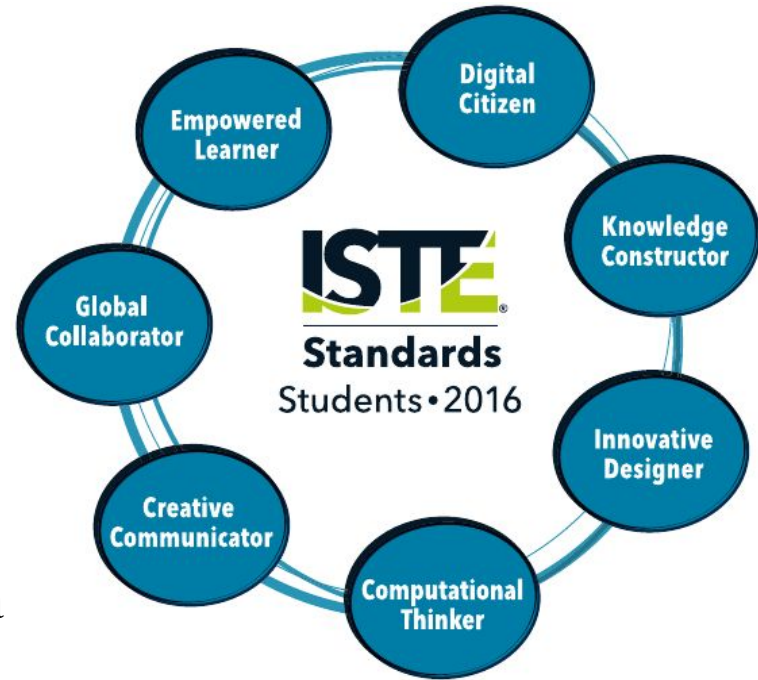
ISTE Standards (2016)

Consist of **five sets** of standards and provide a **framework** for amplifying **digital age *learning, teaching*** and *leading*.

Emphasize the *skills* and *qualities* we want for students, enabling them to engage and thrive in a *connected, digital world*.

Are designed to serve the field for *5-10 years* as a *blueprint* for tech adoption and implementation.

“ *Education technology standards to transform learning and teaching* ”



US: The “Common Core” standards



Learn why the Common Core is important for your child

Explore the Common Core

Understand how the Common Core was created

<http://www.corestandards.org/>

“ *We can't predict the future but we can better prepare our children for it!*

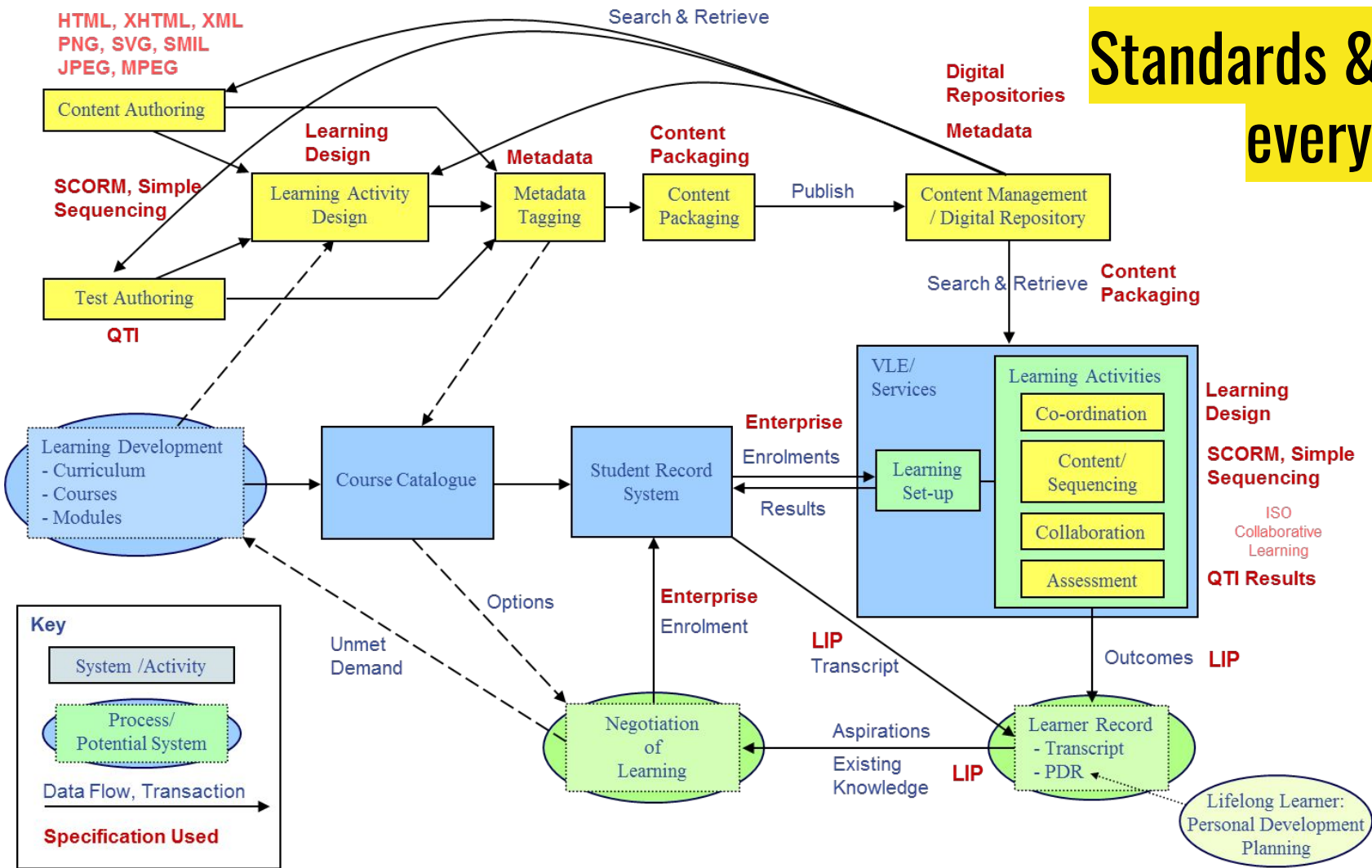
Learning Technology Standardisation

Challenges addressed:

- **Interoperability**
 - technical
 - organisational
- **Quality**
 - process
 - outcome
- **Sustainability**



Standards & specs everywhere!



European and International Standards

- **EN 15981 (EuroLMAI):** European Learner Mobility - Achievement Information
- **EN 15982 (MLO-AD):** Metadata on learning opportunities (MLO) - Advertising
- **EN 15983 (CEF):** Curriculum Exchange Format (CEF)
- **ISO/IEC 19796-1 (RFDQ):** unique Quality Standard for Education worldwide, other parts: Methods & metrics (2009), Quality Model (soon)
- **ISO/IEC 19788 (MLR):** - Metadata for Learning Resources, also Multi-part standard, compliant with DC
- **ISO/IEC 20006:** Information Model for Competency
- **ISO/IEC 29163 (SCORM):** Combination of several specifications for Learning Management Systems & Objects
- **ISO/IEC 12785 (CP):** Content Packaging - Aggregation of Learning Objects

Quality-specific standardisation initiatives for Education

- **EFQM Excellence Model framework**
(QM framework by the European Foundation for Quality Management)
- **French Code of Practice in e-Learning**
(best practices, guides and benchmarking by AFNOR)
- **Quality Guides by NADE**
(by the Norwegian Association for Distance and Flexible Education)
- **Systems of Certification and Accreditation**
 - Distance Education and Training Council of the USA
 - British Quality Assurance Agency for Higher Education (QAA)
 - Hellenic Quality Assurance & Accreditation Agency (HQA / ΑΔΙΠ)

A long timeline of initiatives: *need to pick up 10 yrs after!*

Guidelines on the Quality Assurance of Distance Learning	QAA - Quality Assurance Agency for Higher Education	1999
Standards in Open and Distance Learning	British ODLQC Open and Distance Learning Quality Council	2000
IHEP's Quality on the line	Institute for Higher Education Policy (EUA)	2000
NADE'S Quality Standards for Distance Education	Norwegian Association for Distance Education	2001
Sloan consortium's five pillars of quality	The Sloan Consortium	2002
EADL Quality Guide	European Association for Distance	2003
French Code of practice - e-learning guidelines	AFNOR - Association Française de Normalisation	2004
ISO/IEC 19796-1 Standard on Quality for e-learning	ISO - International Organization for Standardization	2005
MEC/SEED Benchmarks for Quality of Distance Higher Education	Brazilian Ministry of Education and Culture, Dpt of Distance Education	2007

Source: R. Rossi, P. N. Mustaro *"Comparing eQETIC Model and ISO/IEC 19796-1: Focus on Their Defined Processes"* (2014)

ISO/IEC 19796:2005 (RFQD)

Structured on a Reference Model of processes covering the development lifecycle of educational solutions, suitable for developing different types of digital educational solutions, with **7 categories of processes** and **38 subprocesses**.

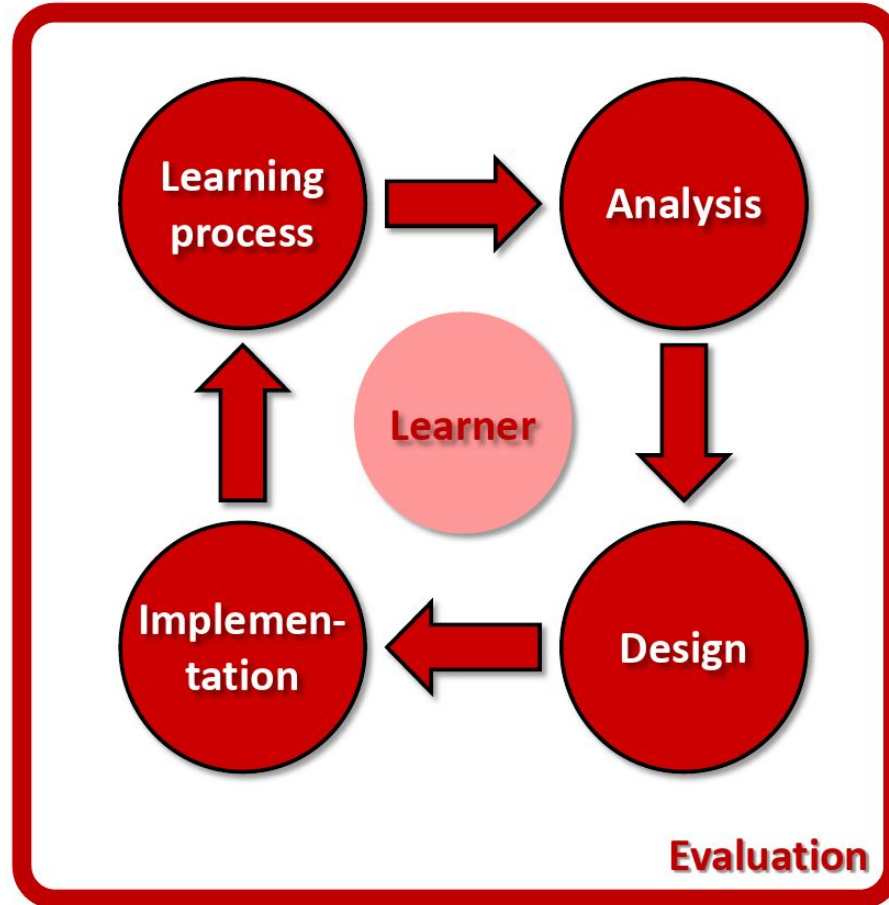
- **ISO/IEC 19796-1:** *“How to Use the New Quality Standard for Learning, Education and Training”*
- **ISO/IEC 19796-2:** *“Quality Model”*
- **ISO/IEC 19796-3:** *“Reference Methods and Metrics”*
- **ISO/IEC 19796-4:** *“Best practice and implementation guide”*



International Organization for Standardization

Great things happen when the world agrees

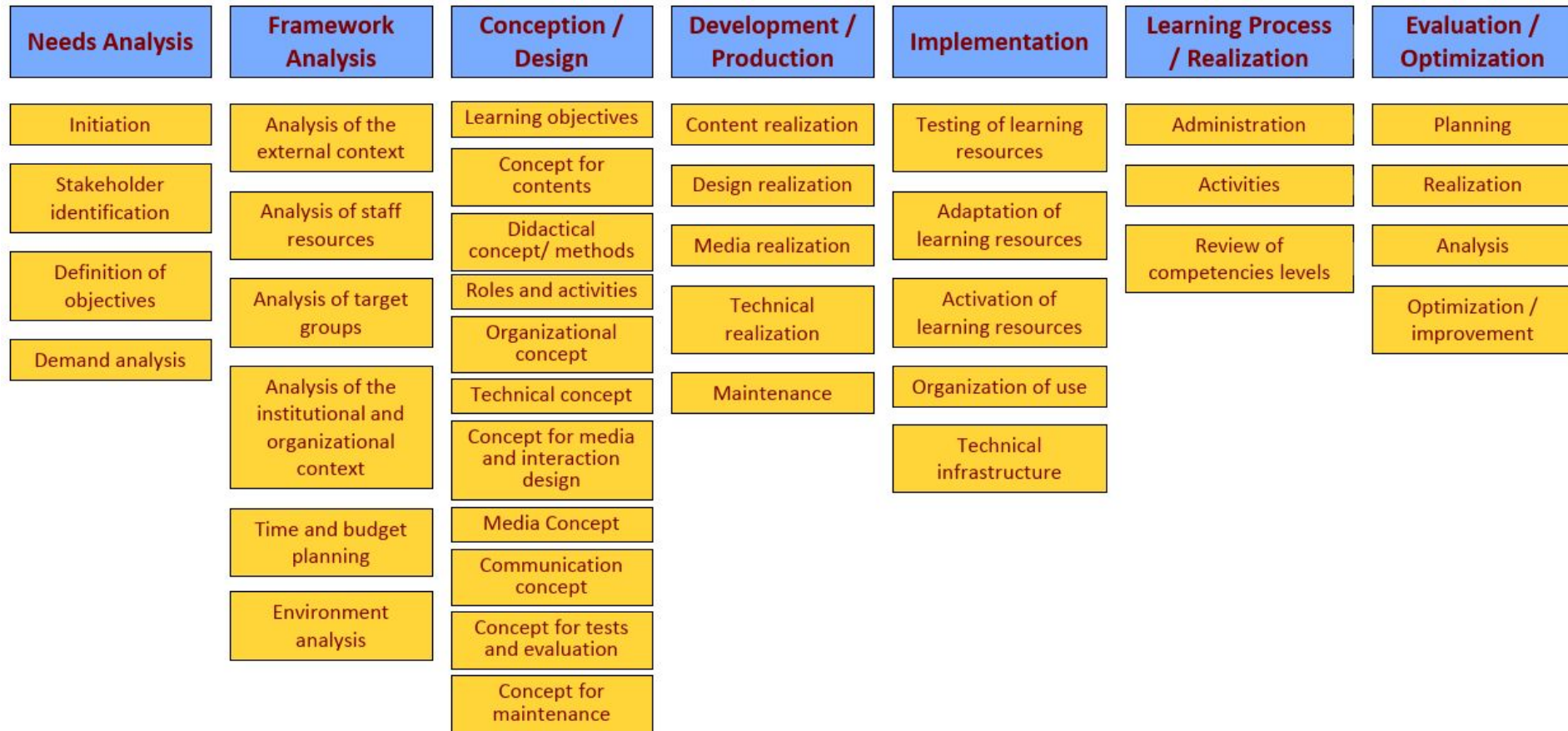
Dimensions in Quality of Open Education



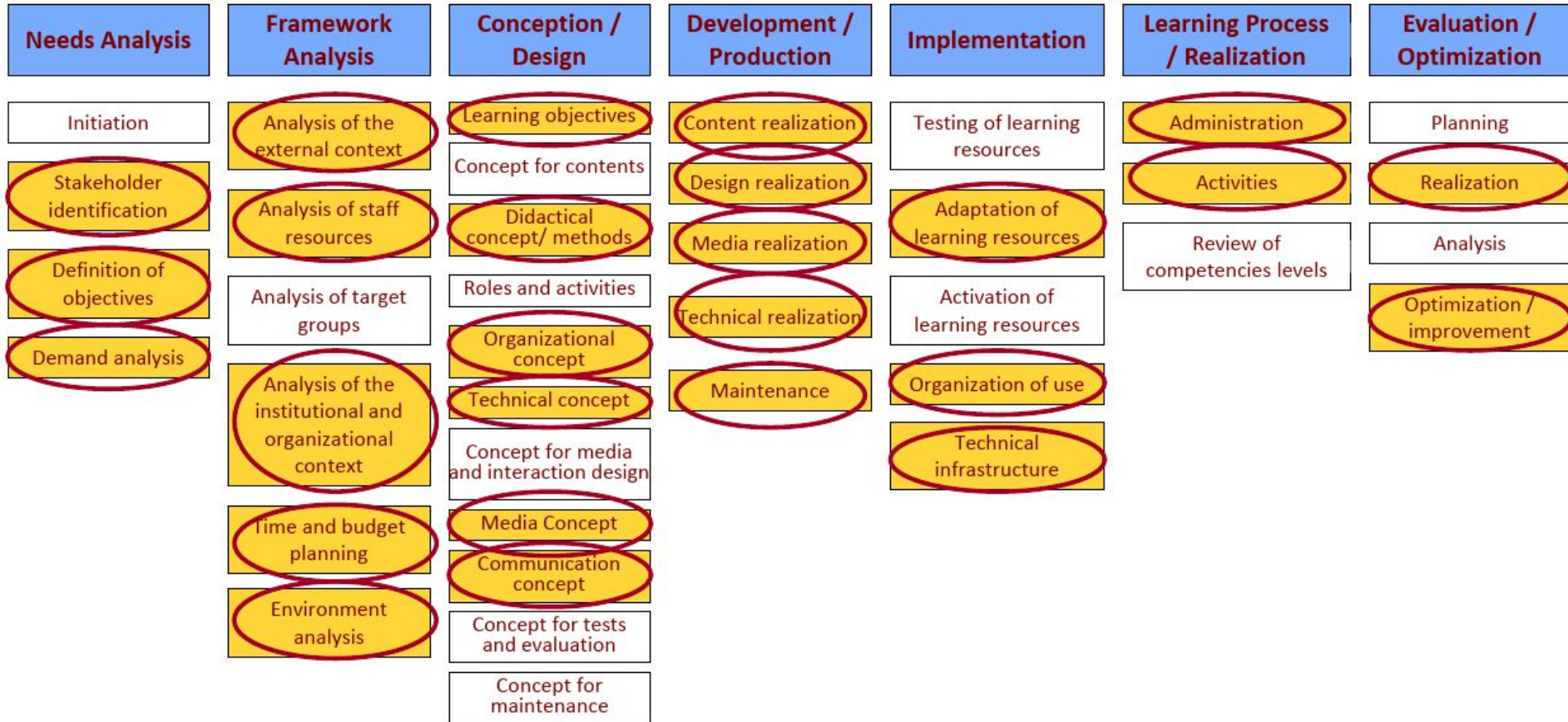
Quality Dimensions in the (adapted) ISO/IEC 19796-1

ID	ISO/IEC 19796-1	New ID	Proposed Modification
NA	Needs Analysis	AN	Analysis
FA	Framework Analysis		
CD	Conception / Design	DE	Design
DP	Development / Production	PR	Production
IM	Implementation		
LP	Learning Process	LE	Learning
EO	Evaluation/ Optimization	EV	Evaluation
		OP	Optimization

ISO/IEC 19796-1: The Reference Model



ISO/IEC 19796-1: Adaptation by MOOQ



Discussion, ideas' sharing & beyond!



LEARNING
COMPASS

<http://learning-compass.eu/>

mooq

<http://mooq-quality.eu/>

<http://survey.mooq-quality.eu>



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Draft

notes and draft slides

Pillars	Dimensions
Pedagogical	Learning opportunities and course planning
	Pedagogical design
	Learning pace and progress
	Equity / Inclusion
	Openness of content data and software, flexibility and personalization
	Learning resources and support
	Learning assessment and certification
	Evaluation planning
	Evaluation realization
	Evaluation analysis
	Involvement of all stakeholders
	Learning design optimization
	Evaluation optimization

Pillars	Dimensions
Technological	Learning environment approach
	Requirements
	Learning environment design
	Infrastructure and resources, data and metadata management
	Evaluation planning
	Evaluation realization
	Evaluation analysis
	Involvement of all stakeholders
	Learning environment optimization
	Evaluation optimization

Pillars	Dimensions
Business Model	Social demand / Market analysis
	Return On Investment (ROI)
	Scalability
	Budget
	Human and technological resources
	Evaluation planning
	Evaluation analysis
	Involvement of all stakeholders
	Vision and mission optimization
	Analysis optimization

Needs and Framework Analysis

Pillars	Dimensions	Descriptors
Pedagogical	Learning opportunities and context	<ul style="list-style-type: none"> The defined target participant groups are justified clearly. Diverse socio-cultural contexts are identified and taken into consideration when planning the MOOC.
Technological	Learning environment definition	<ul style="list-style-type: none"> Provider assesses the interest to use an external distribution platform or internal solution.
Business Model	Social demand / Market analysis	<ul style="list-style-type: none"> The MOOC reflects social or market demands for the MOOC type(s) specified. All stakeholders to be involved are selected and are active in the market described. The MOOC has a clear plan to reach new target groups. The MOOC provides flexible learning opportunities that widens participation in Higher Education.
	Return On Investment (ROI)	<ul style="list-style-type: none"> A cost estimation is produced for setting up and running the MOOC A target ROI is determined The economic context is conducive to the development of the MOOC. The political context is conducive to the development of the MOOC (optional). The organizational / institutional context is conducive to the development of the MOOC. The educational context is conducive to the development of the MOOC. Business/institutional goals are clearly identified. There is a detailed financial plan. A cost-benefit analysis is performed. Contractual constraints (ex: with staff) are planned.
	Scalability	<ul style="list-style-type: none"> The provider is able to estimate the potential of the MOOC to scale up to a large number of participants. The provider is able to estimate the type and cost of resources needed to support a large number of participants, i.e., the human and technical resources.