



# LEARNING OUTCOMES IN DIFFERENT SETTINGS

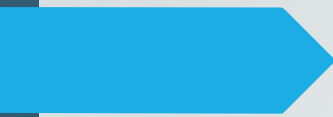
Lucien Bollaert

Independent international QA expert

Seminar: LO: tools & approaches for improving  
qualifications frameworks in (Uzbek) HE

15 November 2017

Tashkent



MACRO

MESO

awards

MICRO

global dimension

EQF (LLL)

QF EHEA

NQF

disc spec LO

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disc spec LO

HEI LO

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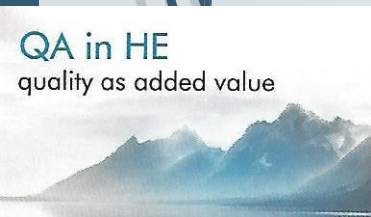
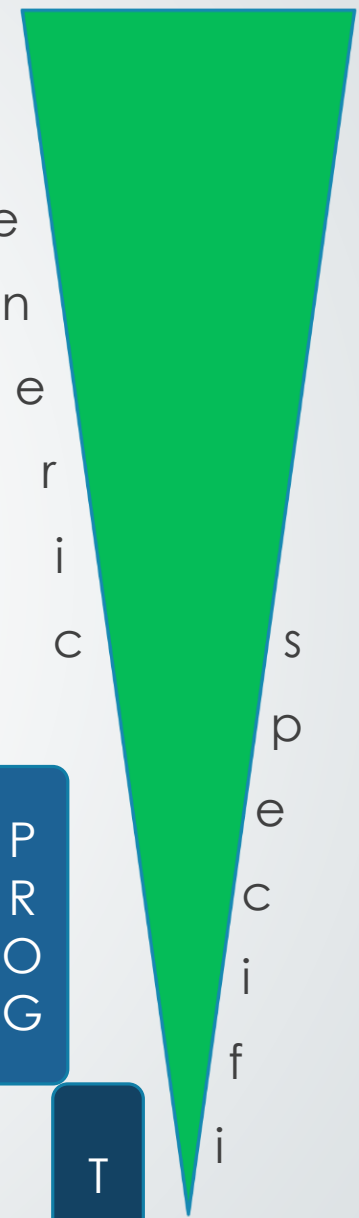
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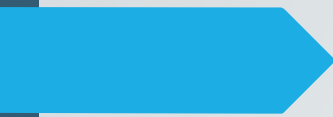
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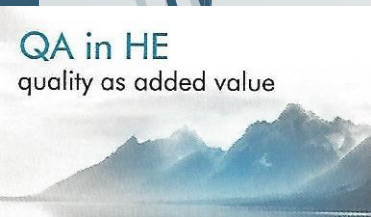
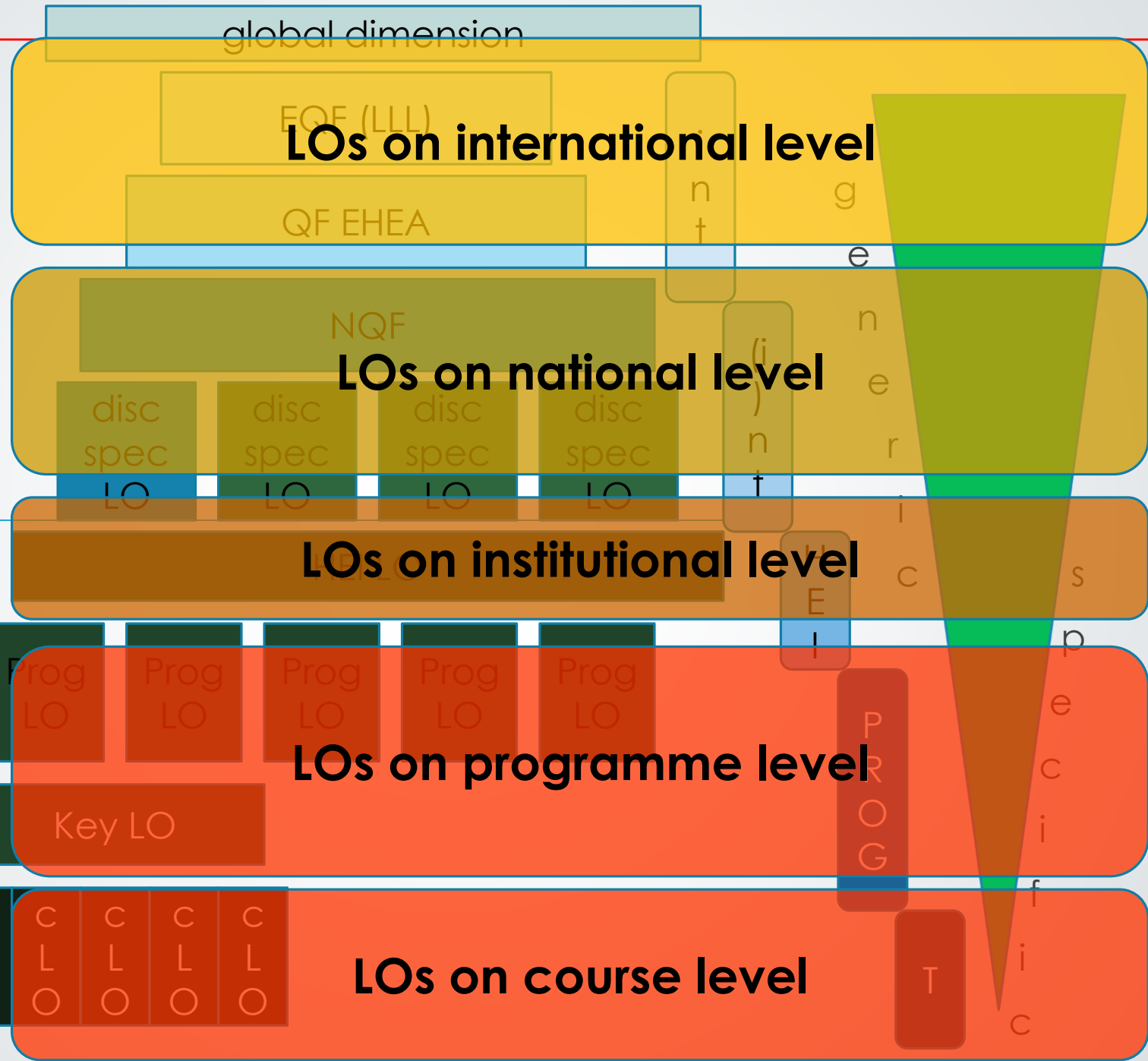


MACRO

MESO

awards

MICRO



- Meeting point
- LOs on international level
- LOs on national level
- LOs on institutional level
- LOs on programme level
- LOs on course level
- Conclusions: recommendations (3)



# LEARNING OUTCOMES in different settings MEETING POINT

Lucien Bollaert

Independent international QA expert

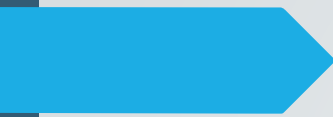
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LOs in ≠ settings

meeting point

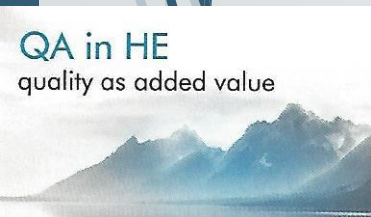
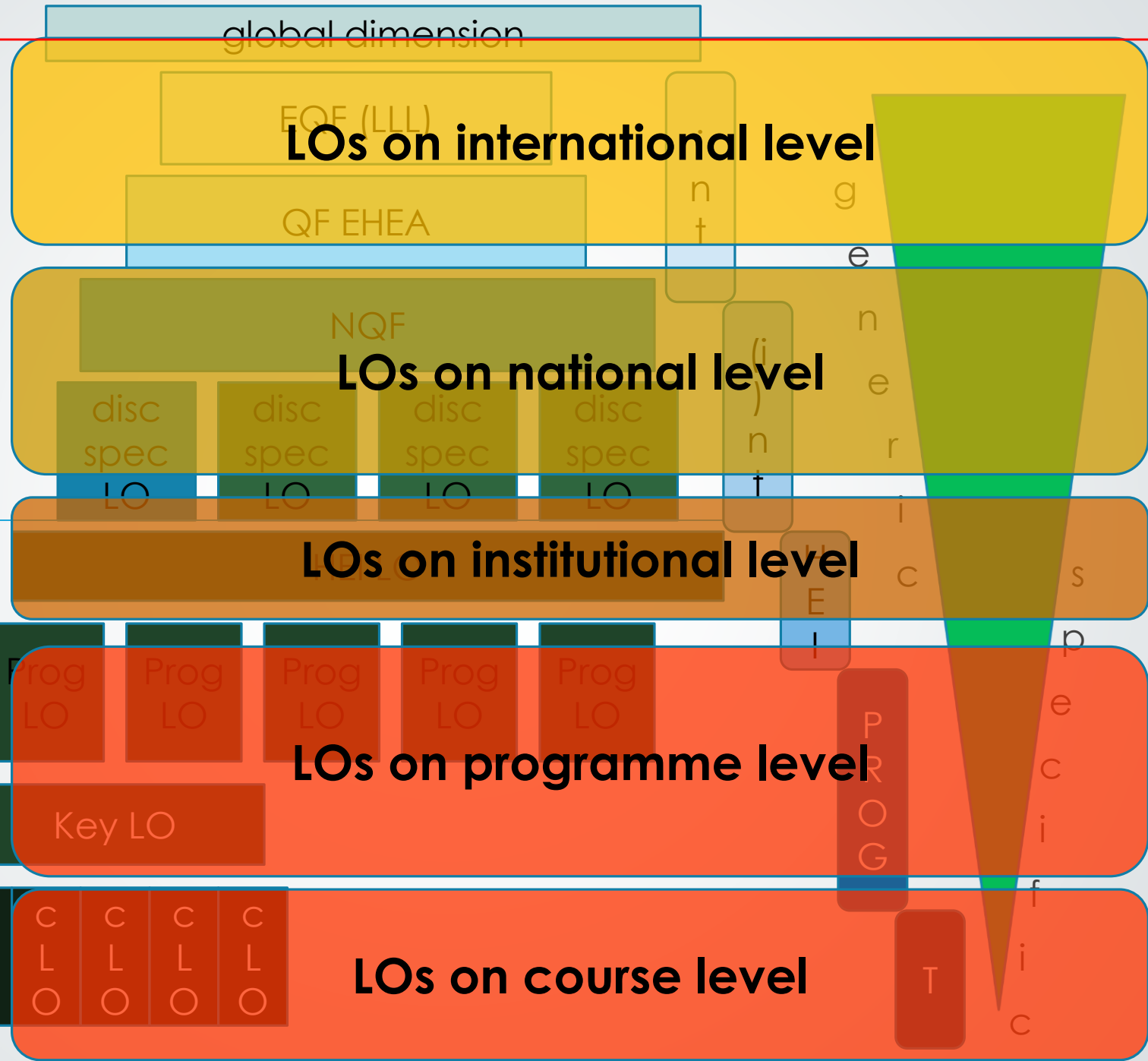


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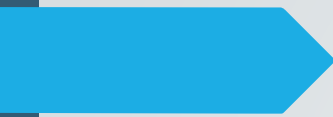
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LOs in ≠ settings

meeting point



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global dimension

EQF (LLL)

QA  
QF EHEA

NQF

disc spec LO  
**LEARNING OUTCOMES**

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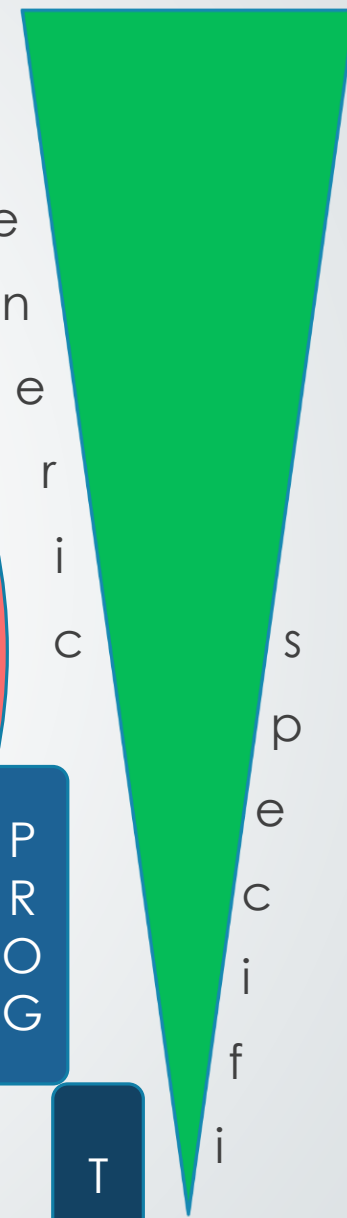
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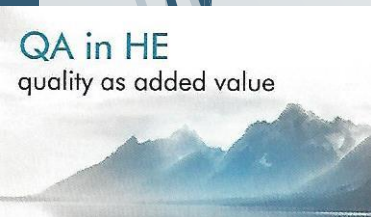
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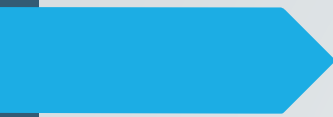


QA



LOs in ≠ settings

meeting point



MACRO

MESO

awards

MICRO

global dimension

EQF (LLL)

QA  
QF EHEA

NQF

disc spec LO  
**LEARNING OUTCOMES**

HELLO =  
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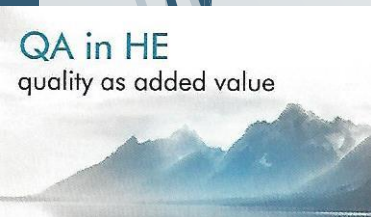
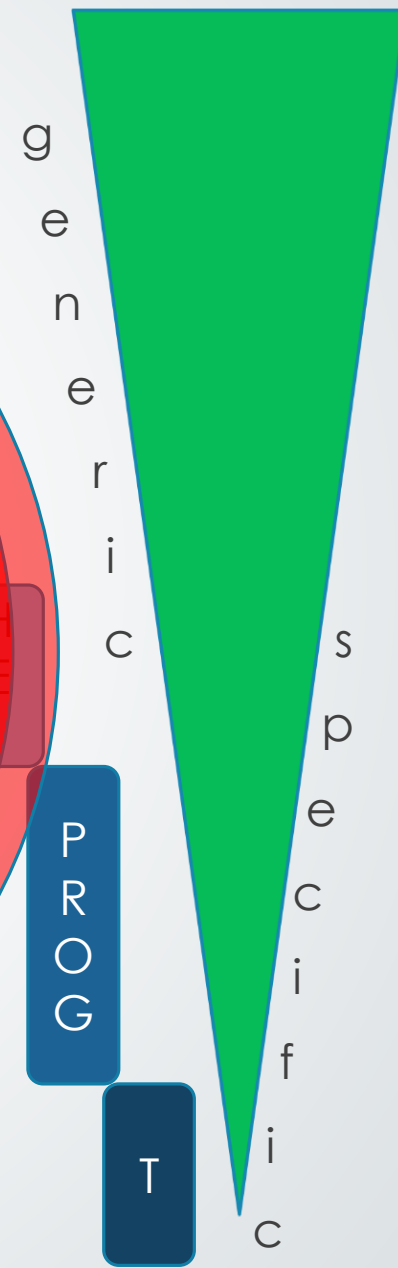
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# LEARNING OUTCOMES in different settings LOs on INTERNATIONAL LEVEL

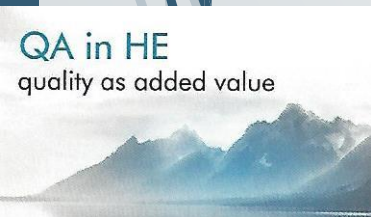
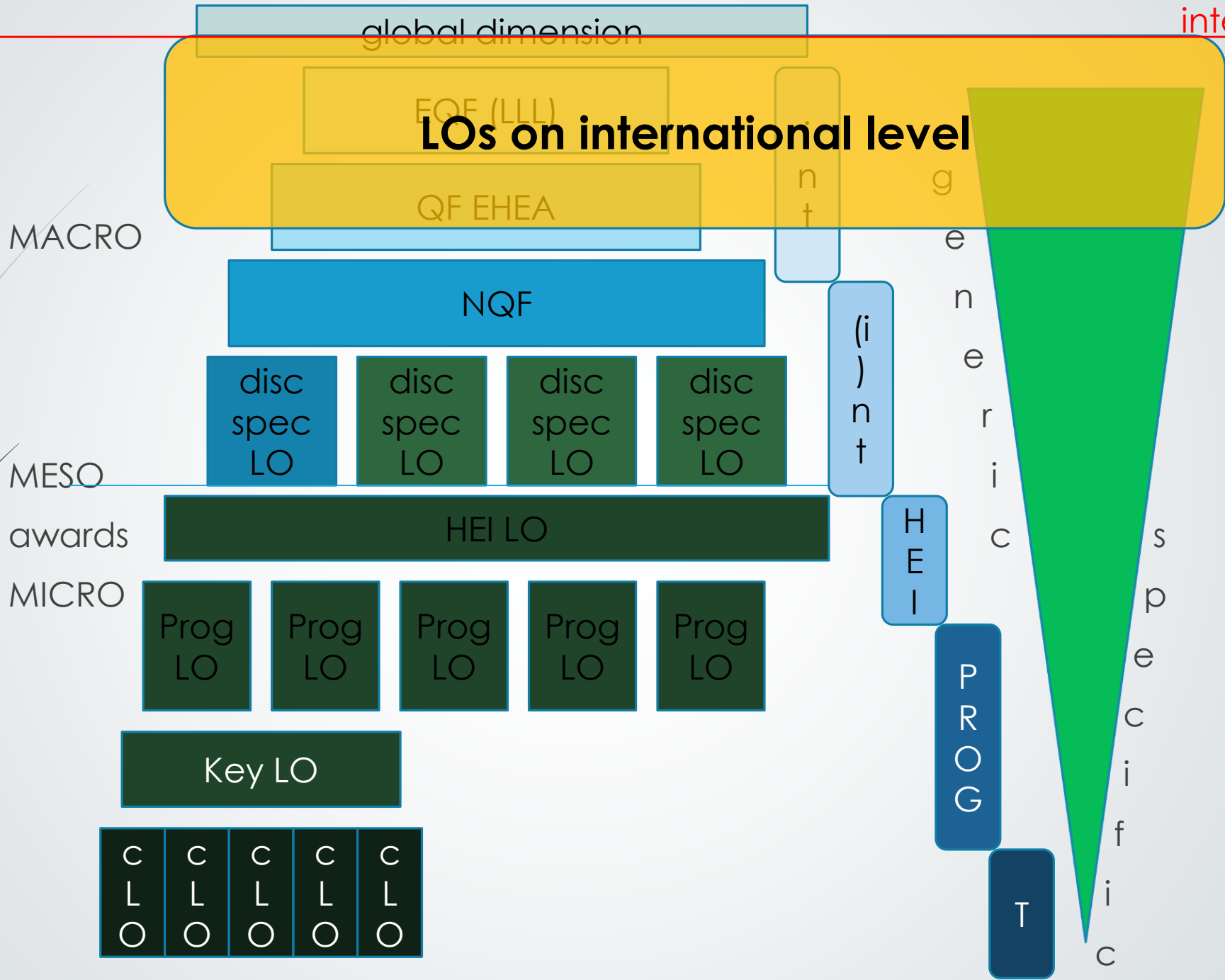
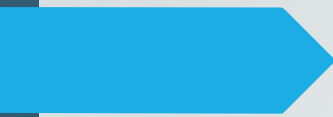
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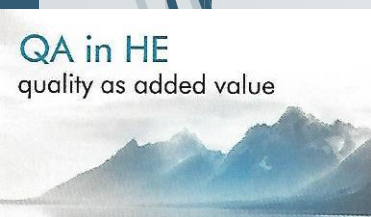
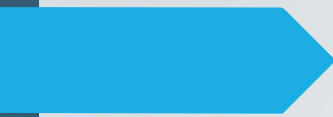
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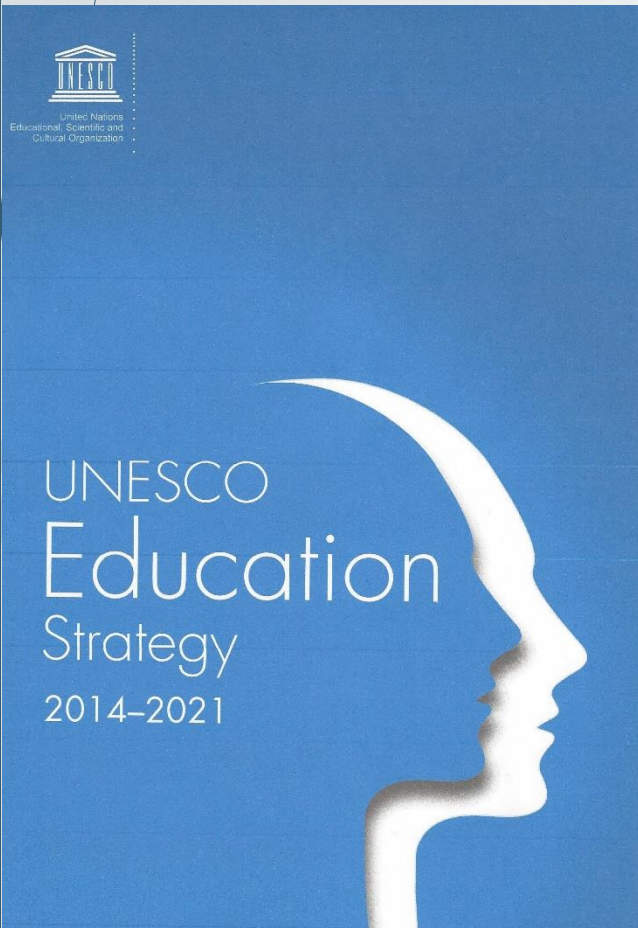


Level	ISCED 2011	Description
0	Early childhood Education (01 Early childhood educational development)	Education designed to support early development in preparation for participation in school and society. Programmes designed for children below the age of 3.
0	Early childhood Education (02 Pre-primary education)	Education designed to support early development in preparation for participation in school and society. Programmes designed for children from age 3 to the start of primary education.
1	Primary education	Programmes typically designed to provide students with fundamental skills in reading, writing and mathematics and to establish a solid foundation for learning.
2	Lower secondary education	First stage of secondary education building on primary education, typically with a more subject-oriented curriculum.
3	Upper secondary education	Second/final stage of secondary education preparing for tertiary education and/or providing skills relevant to employment. Usually with an increased range of subject options and streams.
4	Post-secondary non-tertiary education	Programmes providing learning experiences that build on secondary education and prepare for labour market entry and/or tertiary education. The content is broader than secondary but not as complex as tertiary education.
5	Short-cycle tertiary education	Short first tertiary programmes that are typically practically-based, occupationally-specific and prepare for labour market entry. These programmes may also provide a pathway to other tertiary programmes.
6	Bachelor or equivalent	Programmes designed to provide intermediate academic and/or professional knowledge, skills and competencies leading to a first tertiary degree or equivalent qualification.
7	Master or equivalent	Programmes designed to provide advanced academic and/or professional knowledge, skills and competencies leading to a second tertiary degree or equivalent qualification.
8	Doctoral or equivalent	Programmes designed primarily to lead to an advanced research qualification, usually concluding with the submission and defense of a substantive dissertation of publishable quality based on original research.



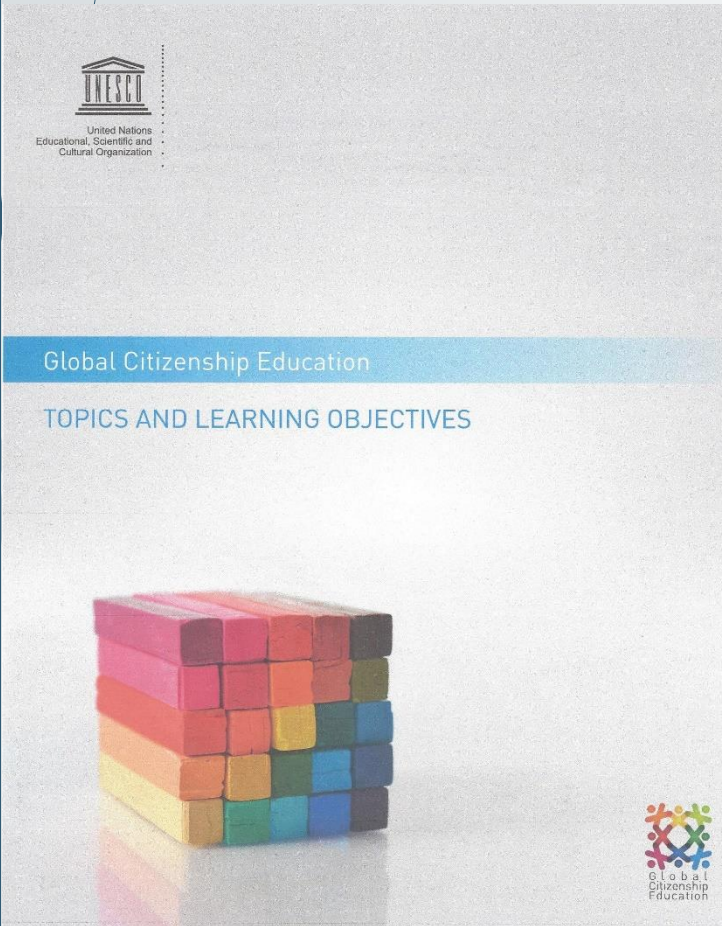
EHEA cycle	EQF level	Level	ISCED 2011	Description
Level 5 non-HE	Level 4	4	Post-secondary non-tertiary education	Programmes providing learning experiences that build on secondary education and prepare for labour market entry and/or tertiary education. The content is broader than secondary but not as complex as tertiary education.
Level 5 HE	Level 5 HE	5	Short-cycle tertiary education	Short first tertiary programmes that are typically practically-based, occupationally-specific and prepare for labour market entry. These programmes may also provide a pathway to other tertiary programmes.
Level 6 HE	Level 6 HE	6	Bachelor or equivalent	Programmes designed to provide intermediate academic and/or professional knowledge, skills and competencies leading to a first tertiary degree or equivalent qualification.
Level 7 HE	Level 7 HE	7	Master or equivalent	Programmes designed to provide advanced academic and/or professional knowledge, skills and competencies leading to a second tertiary degree or equivalent qualification.
Level 8 HE	Level 8 HE	8	Doctoral or equivalent	Programmes designed primarily to lead to an advanced research qualification, usually concluding with the submission and defense of a substantive dissertation of publishable quality based on original research.

- ISCED 1976: an instrument suitable for assembling, compiling and presenting statistics of education both within individual countries and internationally
- ISCED 1997: part of efforts to increase the international comparability of education statistics, adding 25 fields of education
- ISCED 2011: UNESCO's 36th General Conference & UNESCO World Conferences on Education



- ISCED 1976: an instrument suitable for assembling, compiling and presenting statistics of education both within individual countries and internationally
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- ISCED 2011: UNESCO's 36th General Conference & UNESCO World Conferences on (sustainable) Education (development)





### Cognitive

- Learners acquire knowledge and understanding of local, national and global issues and the interconnectedness and interdependency of different countries and populations
- Learners develop skills for critical thinking and analysis

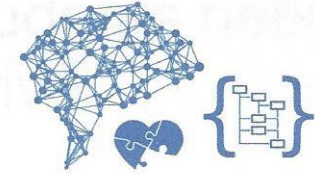
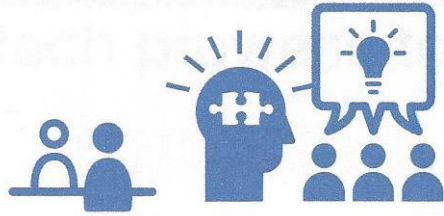
### Socio-Emotional

- Learners experience a sense of belonging to a common humanity, sharing values and responsibilities, based on human rights
- Learners develop attitudes of empathy, solidarity and respect for differences and diversity

### Behavioural

- Learners act effectively and responsibly at local, national and global levels for a more peaceful and sustainable world
- Learners develop motivation and willingness to take necessary actions





# Top 10 skills

## In 2015

1. Complex Problem Solving
2. Coordinating with Others
3. People Management
4. Critical Thinking
5. Negotiation
6. Quality Control
7. Service Orientation
8. Judgment & Decision Making
9. Active Listening
10. Creativity

## In 2020

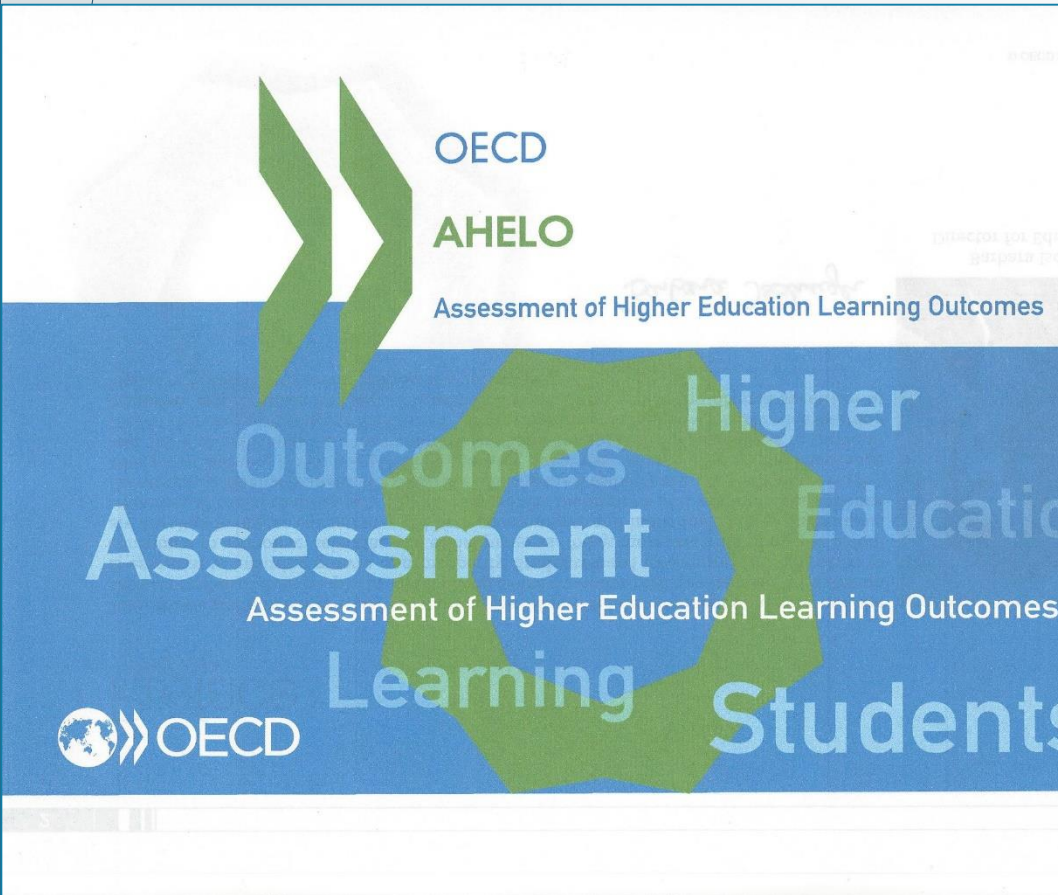
1. Complex Problem Solving
2. Critical Thinking
3. Creativity
4. People Management
5. Coordinating with Others
6. Emotional Intelligence
7. Judgment & Decision Making
8. Service Orientation
9. Negotiation
10. Cognitive Flexibility

Source:  
Future of  
Jobs  
Report  
(2017)



# OECD Assessment of HE LOs (AHELO) 2010-13

## feasibility study

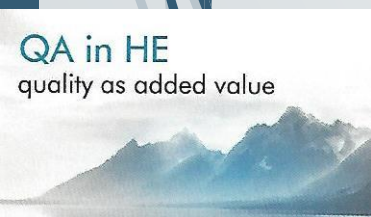


Generic skills	Economics	Engineering
International adaptation	Frameworks and instruments developed with	
Validation: one cognitive lab per country	Validation: focus groups in participating institutions	
120 minutes 1 CRT 25 MCQs	90 minutes 1 CRT 45 MCQs	90 minutes 1 CRT 30 MCQs
Online delivery		
3 contextual questionnaires: Student, Faculty and Institution		

CRT: Constructed Response Task  
MCQ: Multiple Choice Question

17 countries x 10 HEIs = 20,000 students

[www.oecd.org/edu/ahelo](http://www.oecd.org/edu/ahelo)



# OECD Assessment of HE LOs (AHELO) 2010-13 feasibility study

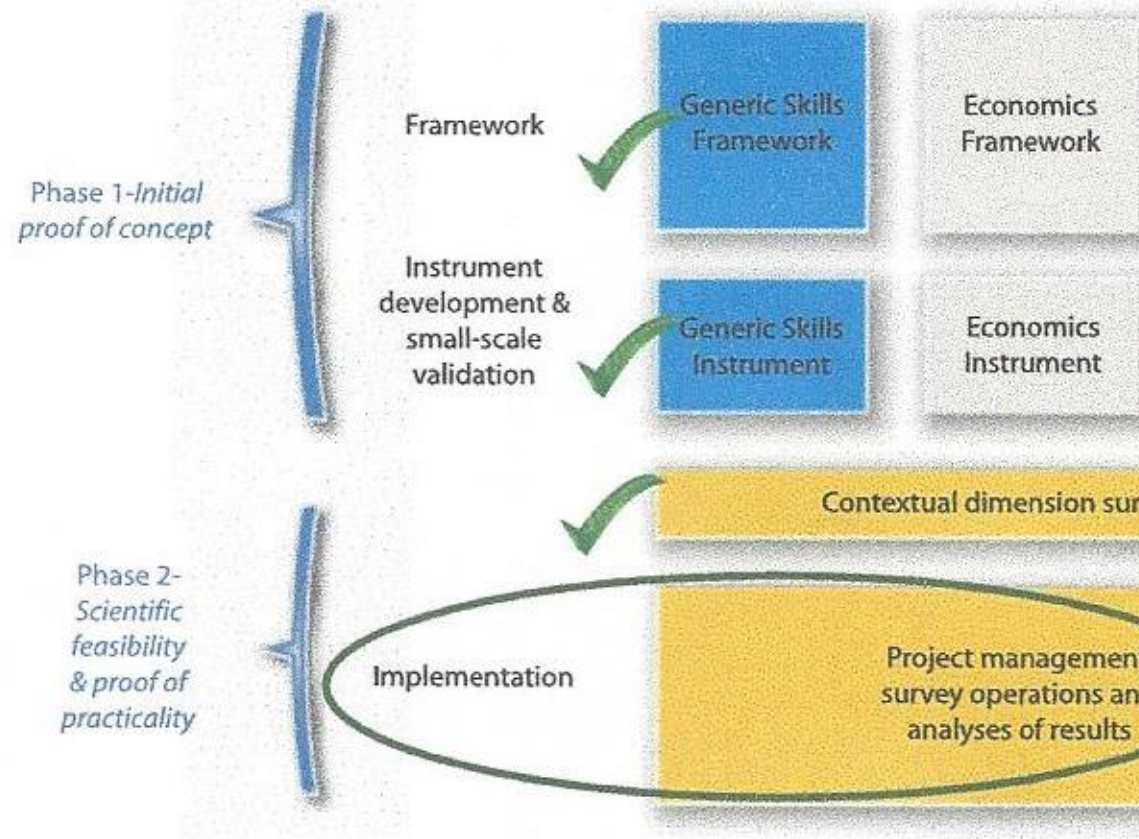
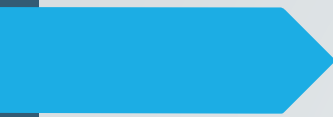
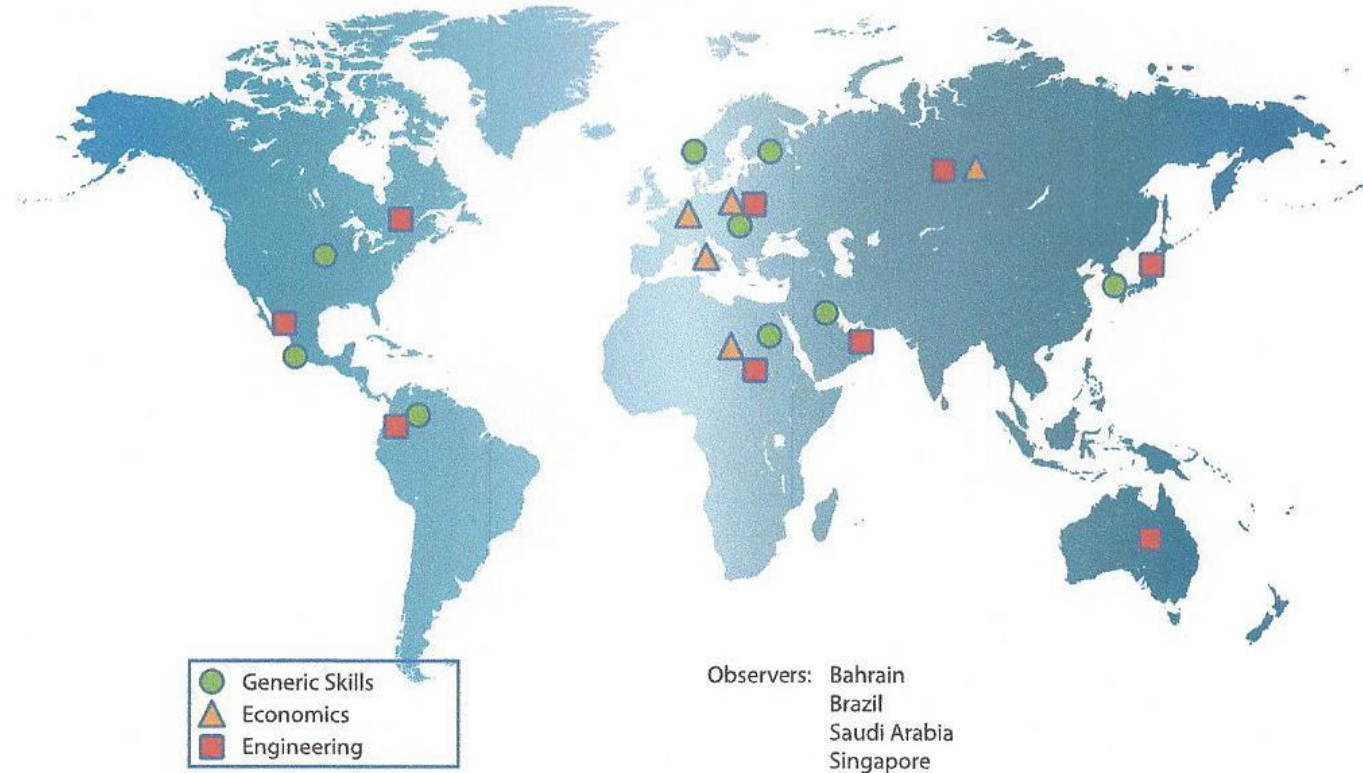


Figure 2. AHELO Country-specific strand of work



17 countries x 10 HEIs = 20,000 students

[www.oecd.org/edu/ahelo](http://www.oecd.org/edu/ahelo)

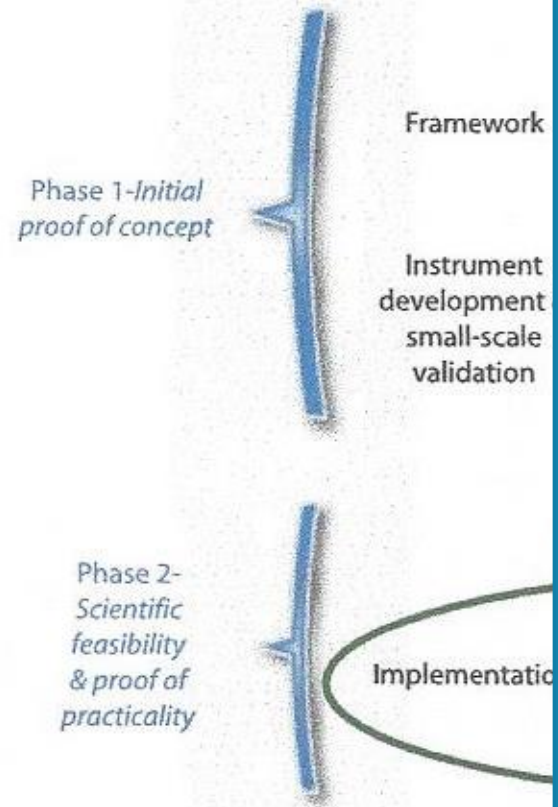


# OECD Assessment of HE LOs (AHELO) 2010-13

## feasibility study

Deeper (methodological) questions:

- Who or what is really being assessed – the students or their HEIs?
- Is the purpose to measure the level of competency achieved or to measure the value added from attending a specific HEIs?
- What can an international assessment provide that national or institutional level instruments cannot – and vice versa?
- Is the main purpose of an assessment instrument for measuring LOs to underpin accountability, provide data for improvement or enhance transparency – or all of these?
- What are the desired LOs of HE – and what can/should be measured?
- How might international measures of LOs be mis-used?



17 countries x 10 HEIs = 20,000 students

[www.oecd.org/edu/ahelo](http://www.oecd.org/edu/ahelo)

ASSESSMENT OF HIGHER EDUCATION  
LEARNING OUTCOMES

# AHELO

FEASIBILITY STUDY REPORT

## VOLUME 1

DESIGN AND IMPLEMENTATION

Karine Tremblay  
Diane Lalancette  
Deborah Roseveare



ASSESSMENT OF HIGHER EDUCATION  
LEARNING OUTCOMES

# AHELO

FEASIBILITY STUDY REPORT

## VOLUME 2

DATA ANALYSIS AND NATIONAL  
EXPERIENCES



ASSESSMENT OF HIGHER EDUCATION  
LEARNING OUTCOMES

# AHELO

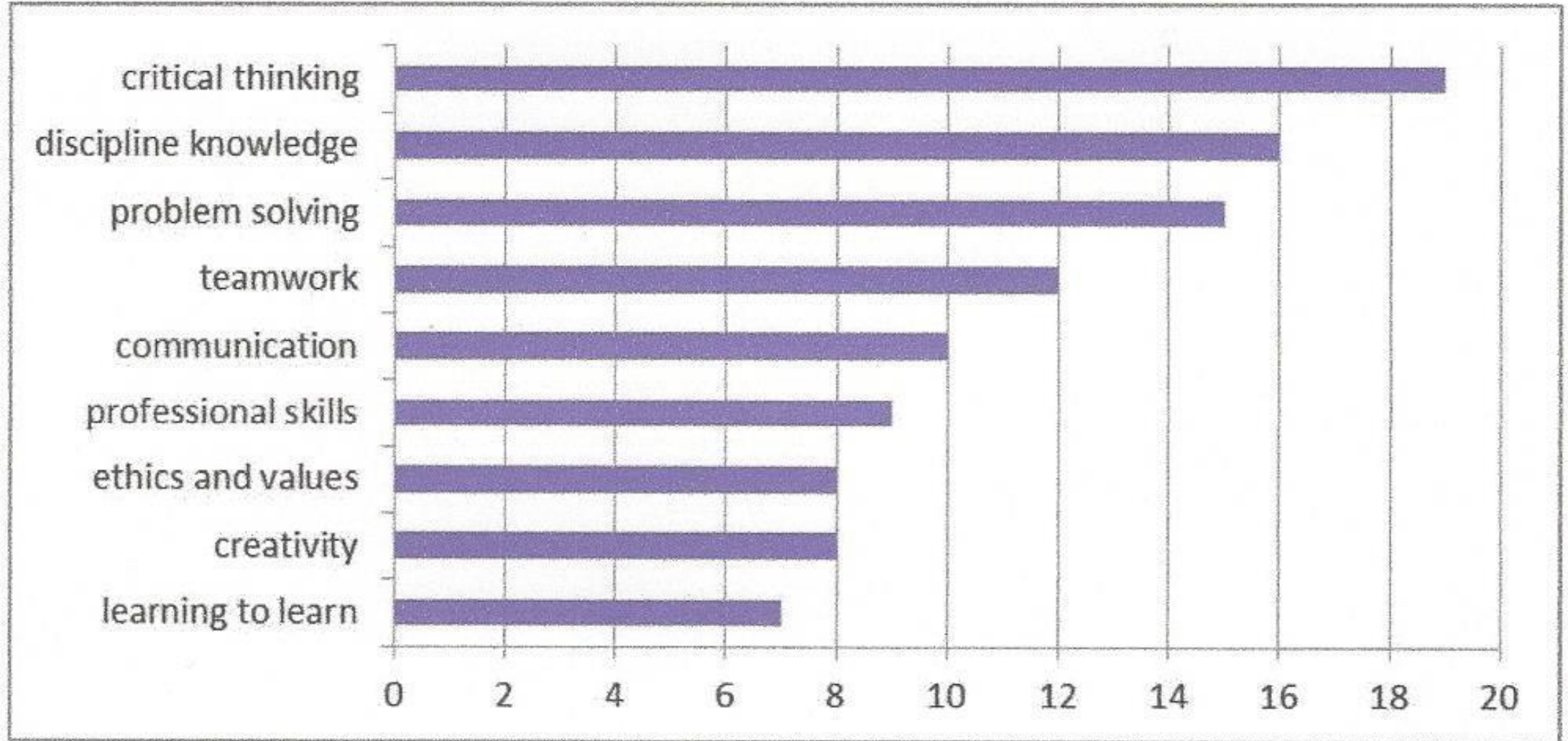
FEASIBILITY STUDY REPORT

## VOLUME 3

FURTHER INSIGHTS



## Types of learning outcomes – Top 10 answers:



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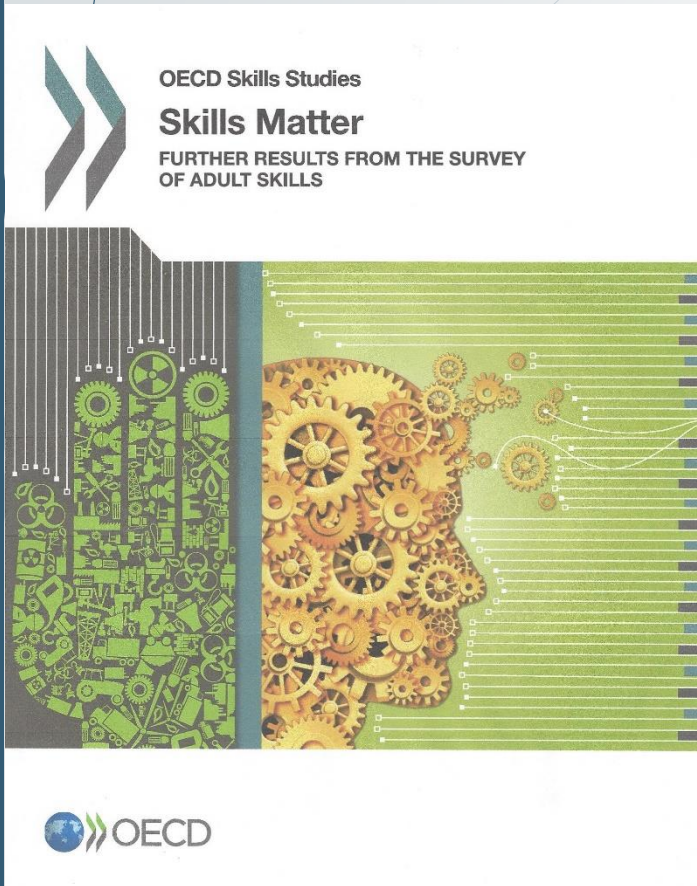
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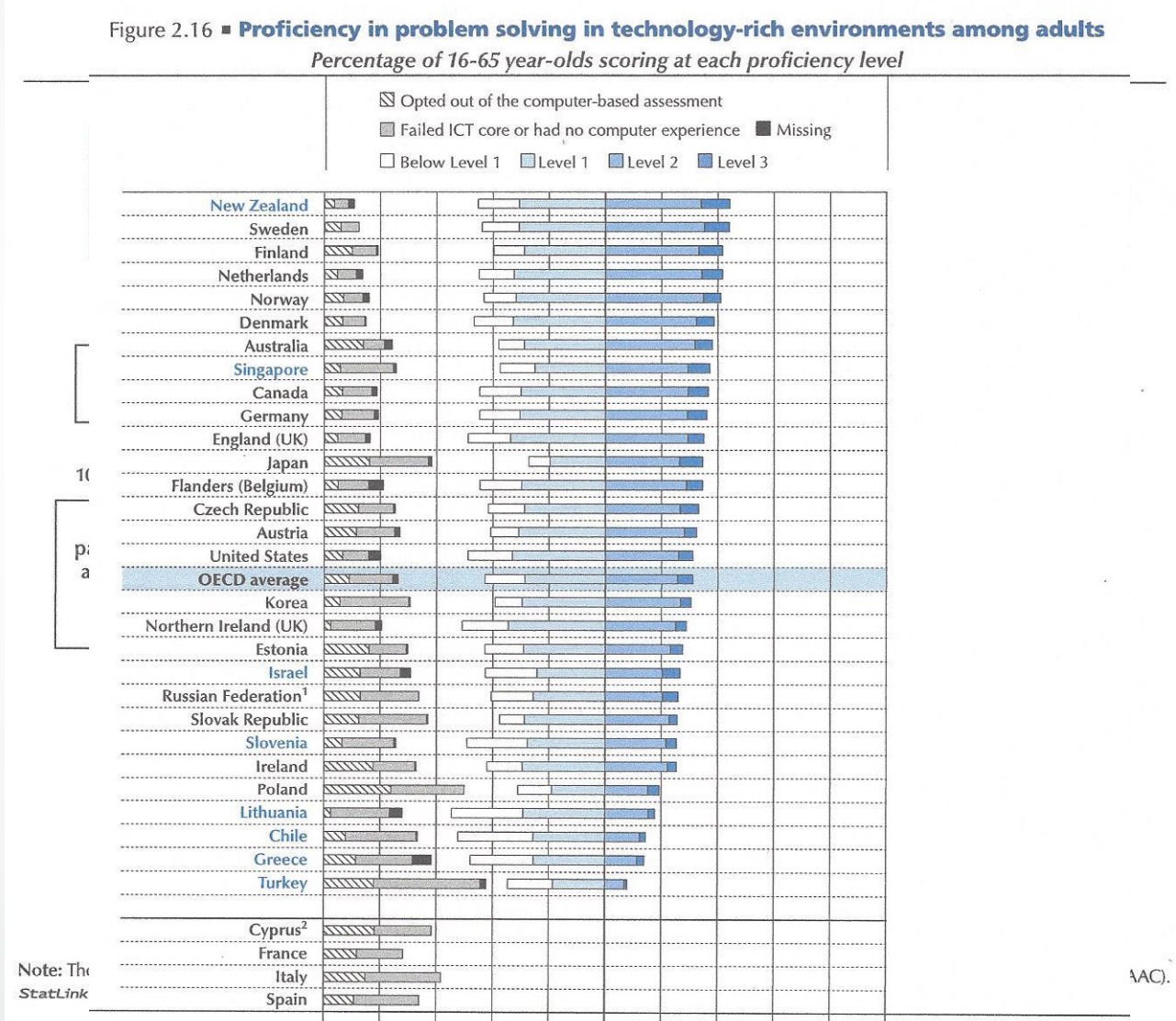
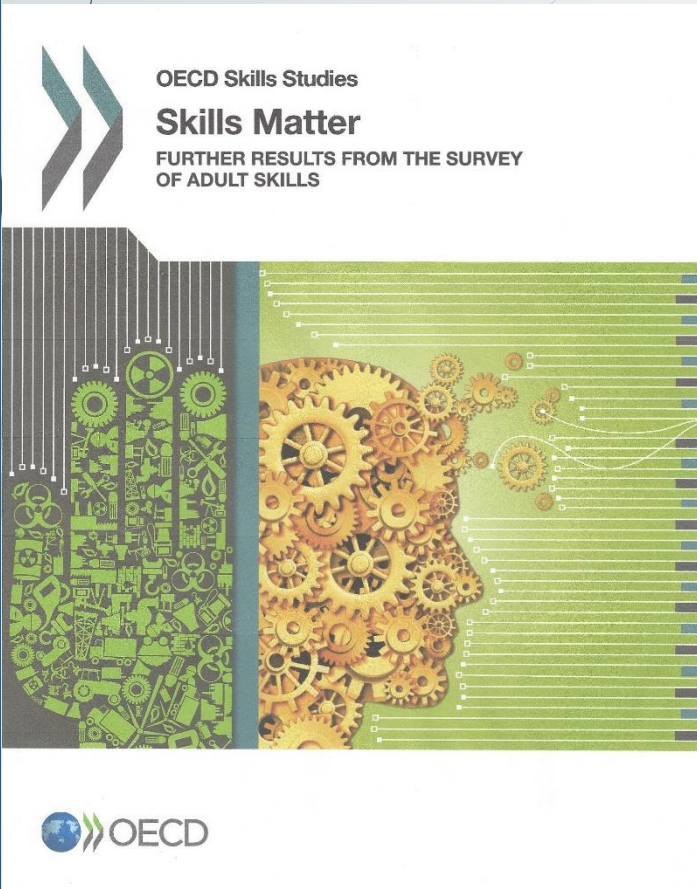


# OECD Programme for the International Assessment of Adult Competences (PIAAC):

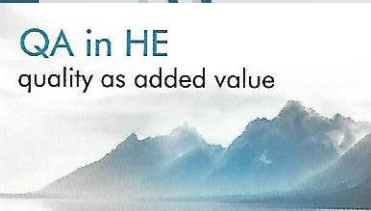


- PISA (15-year olds) for Adults
- Survey of Adults Skills measuring adults' proficiency in key information-processing skills being literacy, numeracy and problem solving in technology-rich environments
- Gathers information and data on how adults use their skills at home, at work and in the wider community
- Take a personal test online and enter country profiles
- Round 1 (2011-12): 166,000 adults in 24 countries
- Round 2 (2014-15): 50,250 adults in 9 countries

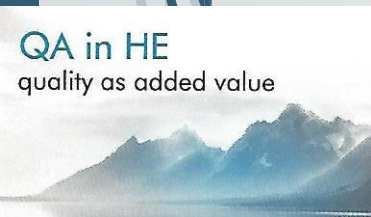
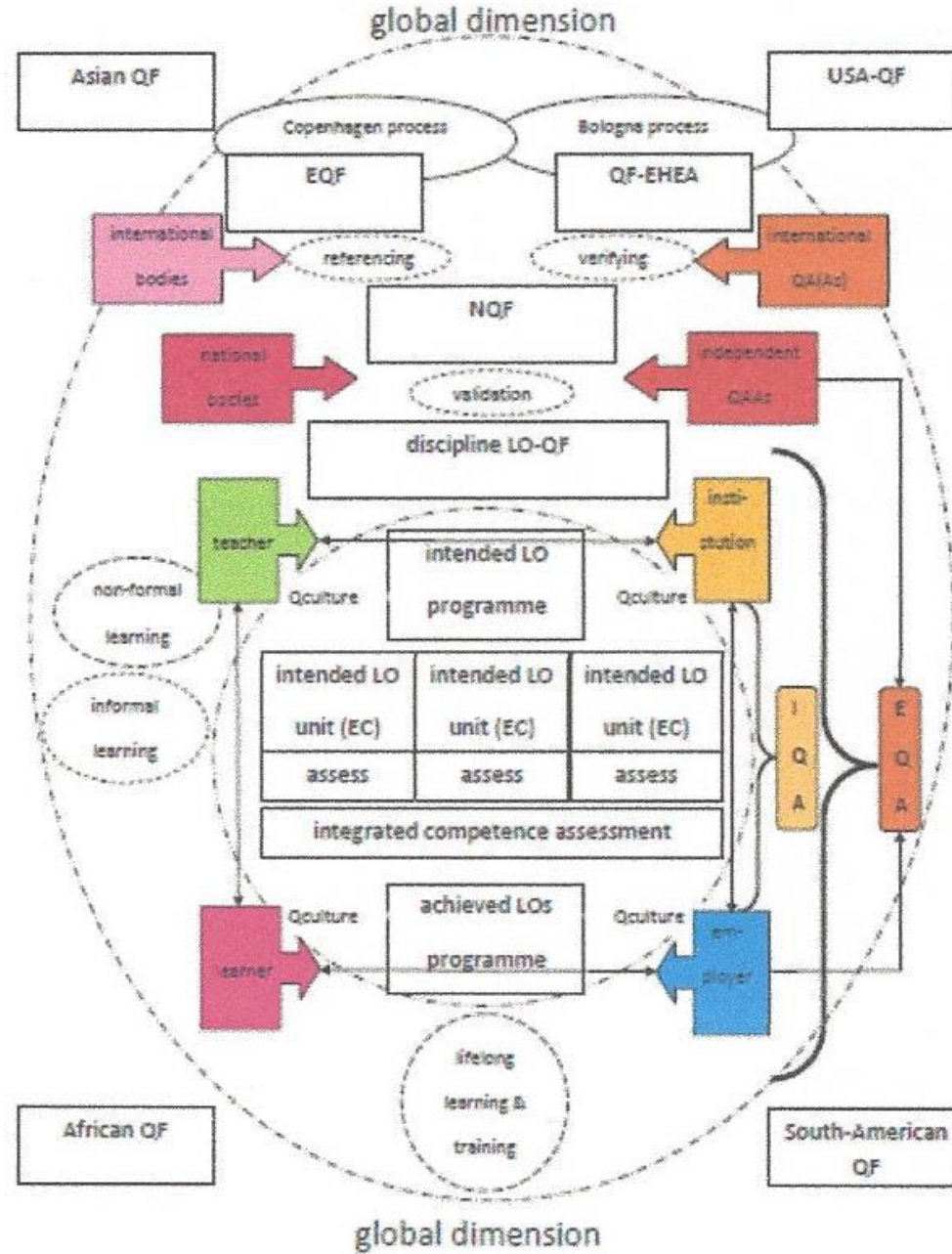
# OECD Programme for the International Assessment of Adult Competences (PIAAC):



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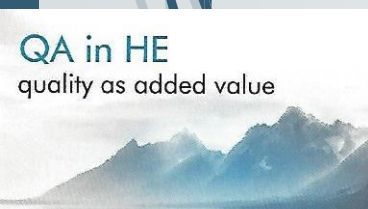
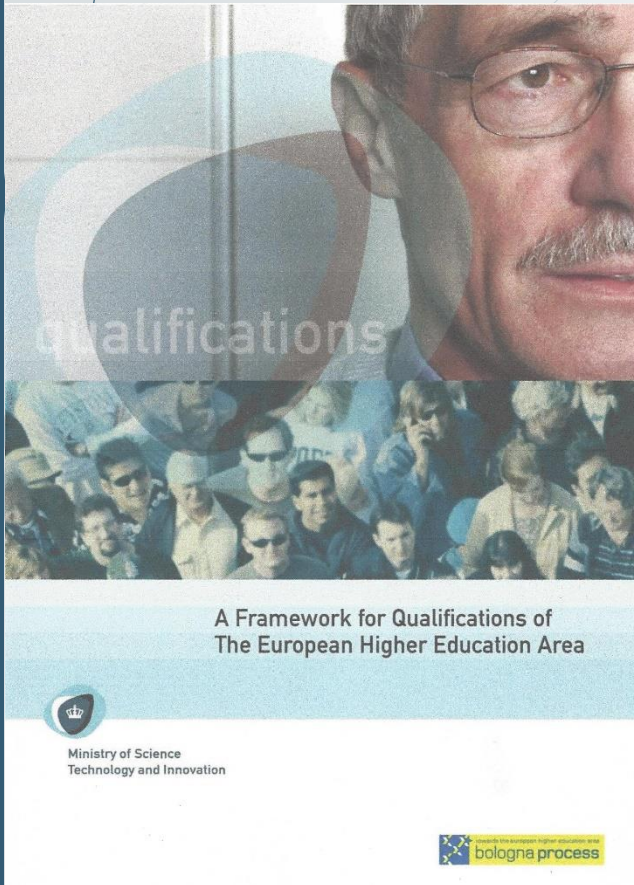
picture 1 : integrated global LO & QA scheme



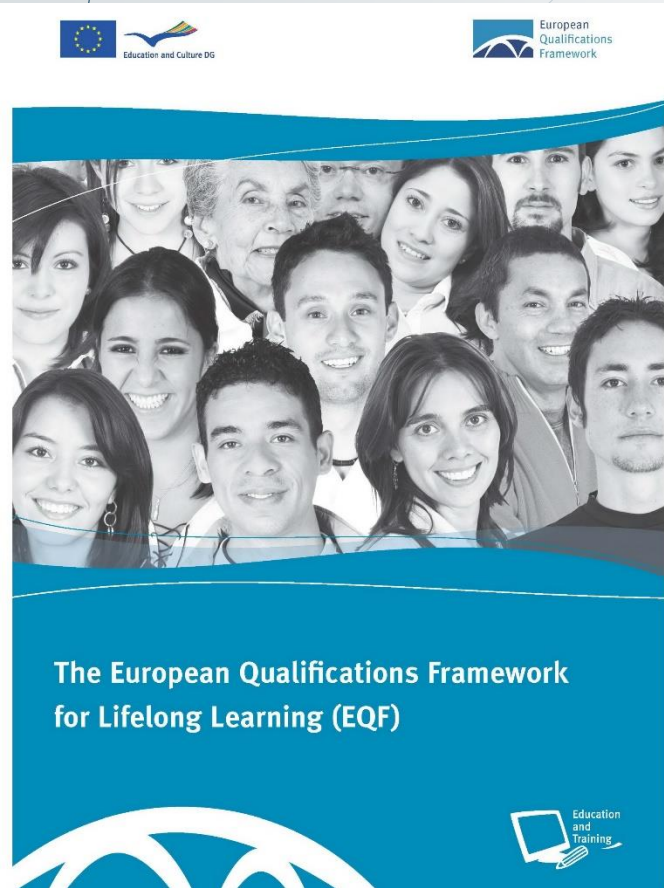


# Purposes & nature of QF-EHEA:

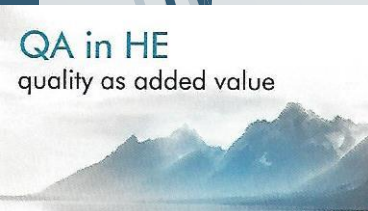
- ✓ **International transparency**: to ensure qualifications can be easily read and compared across borders;
- ✓ **International recognition** for various reasons (continuing education, employment, etc) based on a common understanding of the learning outcomes, including competences, of qualifications rather than a mere comparability (ERIC-NARIC);
- ✓ **International mobility** of learners and graduates;
- ✓ Improves **curriculum design and innovation** through flexible pathways and new LOs;
- ✓ Helps widening participation and LLL;
- ✓ Provides indicators for **international QA framework** (degree of achievement of LOs).

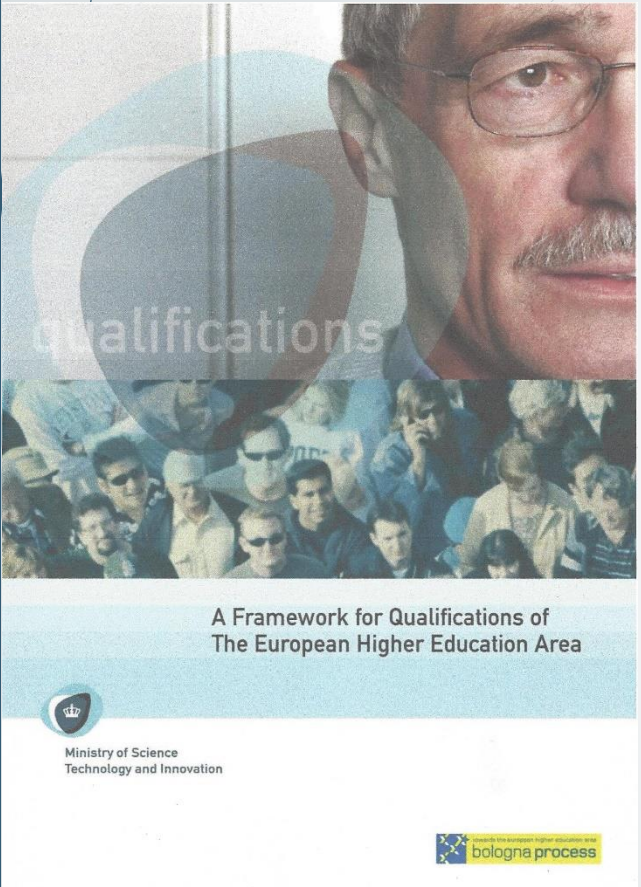


# EQF-LLL (2008/2017)



- Transparency tool
- Comparative or “translation” device
- Reference levels and descriptors for international and national referencing in...
- Recognition
- Mobility
- Quality Assurance
- Credit systems





Second cycle qualification (1)

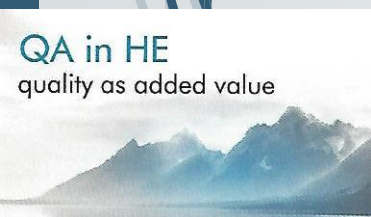
outcomes

ECTS credits

*Qualifications are awarded to students who*

normally carry 90-120 credits - minimum 60 ECTS at 2nd cycle

- have demonstrated knowledge and understanding that is founded upon and extends and/or enhances that typically associated with the first cycle, and that provides a basis or opportunity for originality in developing and/or applying ideas, often within a research context;
- **can apply their knowledge and understanding, and problem solving abilities in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their field of study;**
- have the ability to integrate knowledge and handle complexity, and formulate judgements with incomplete or limited information, but that include reflecting on social and ethical responsibilities linked to the application of their knowledge and judgements;



## Level 7

## learning outcomes

knowledge (theoretical and/or practical)

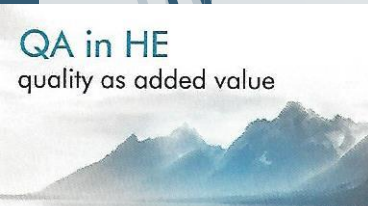
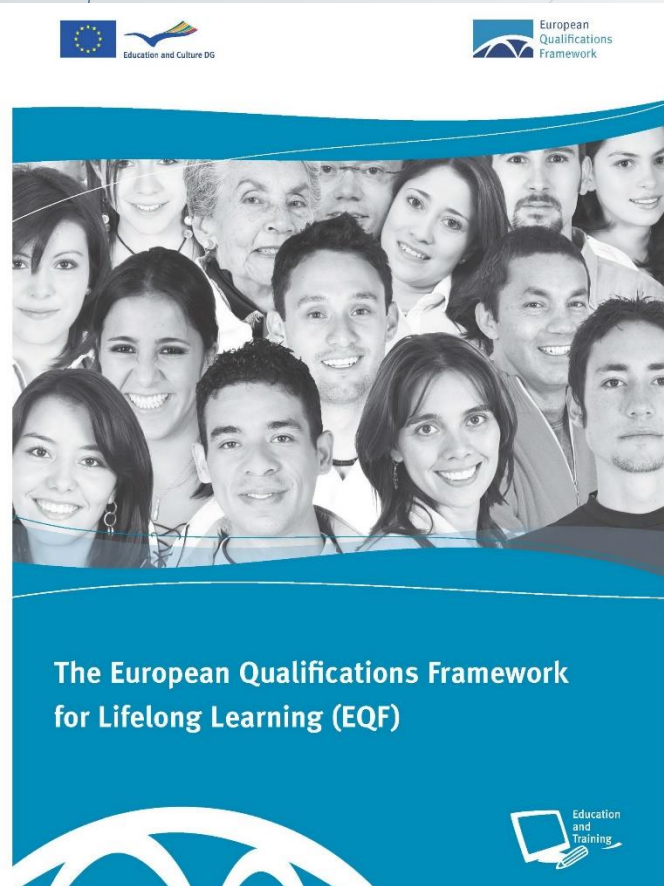
- highly specialised knowledge, some of which is at the forefront of knowledge in a field of work or study, as the basis for original thinking and/or research
- critical awareness of knowledge issues in a field and at the interface between different fields

skills (cognitive or practical)

- 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

competence (responsibility and autonomy)

- 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



global dimension

# LOs on international level

Ma graduates are able to perform specialised problem-solving to develop new knowledge and innovation from integrating different fields

MACRO

NQF

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MESO

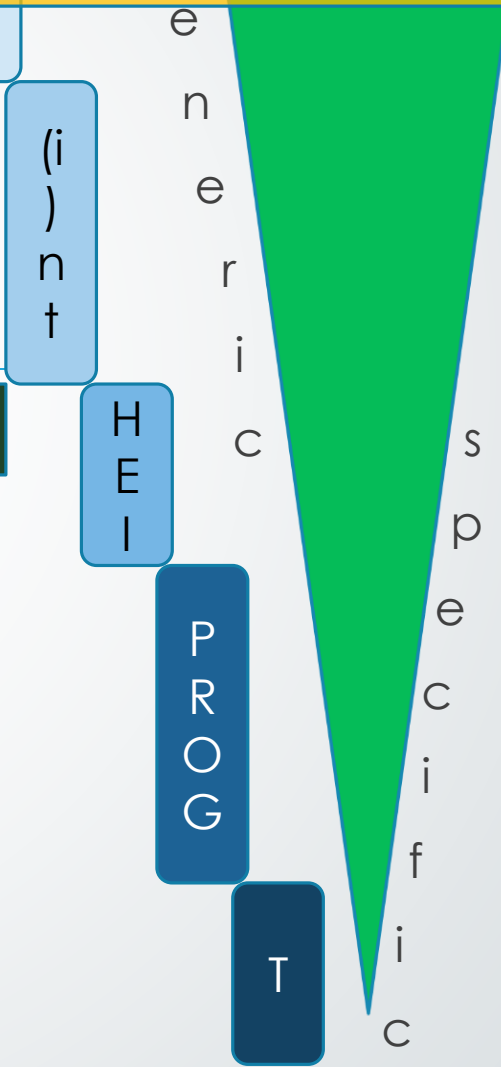
awards HEI LO

MICRO

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Key LO

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**LEARNING OUTCOMES**  
**in different settings**  
**LOs on NATIONAL LEVEL**

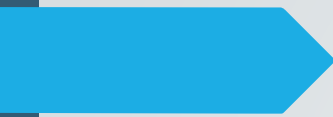
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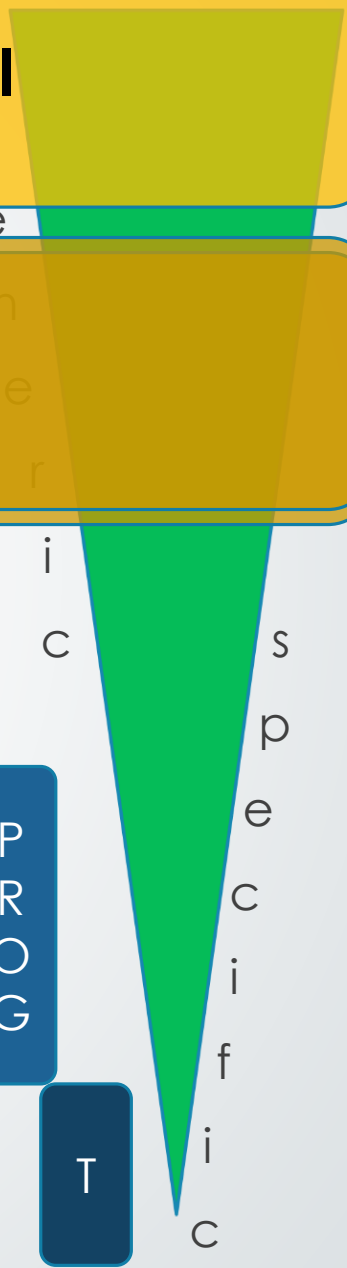
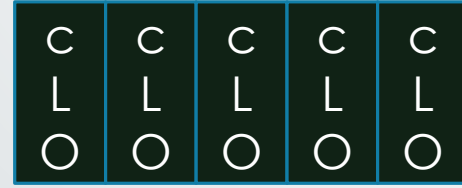
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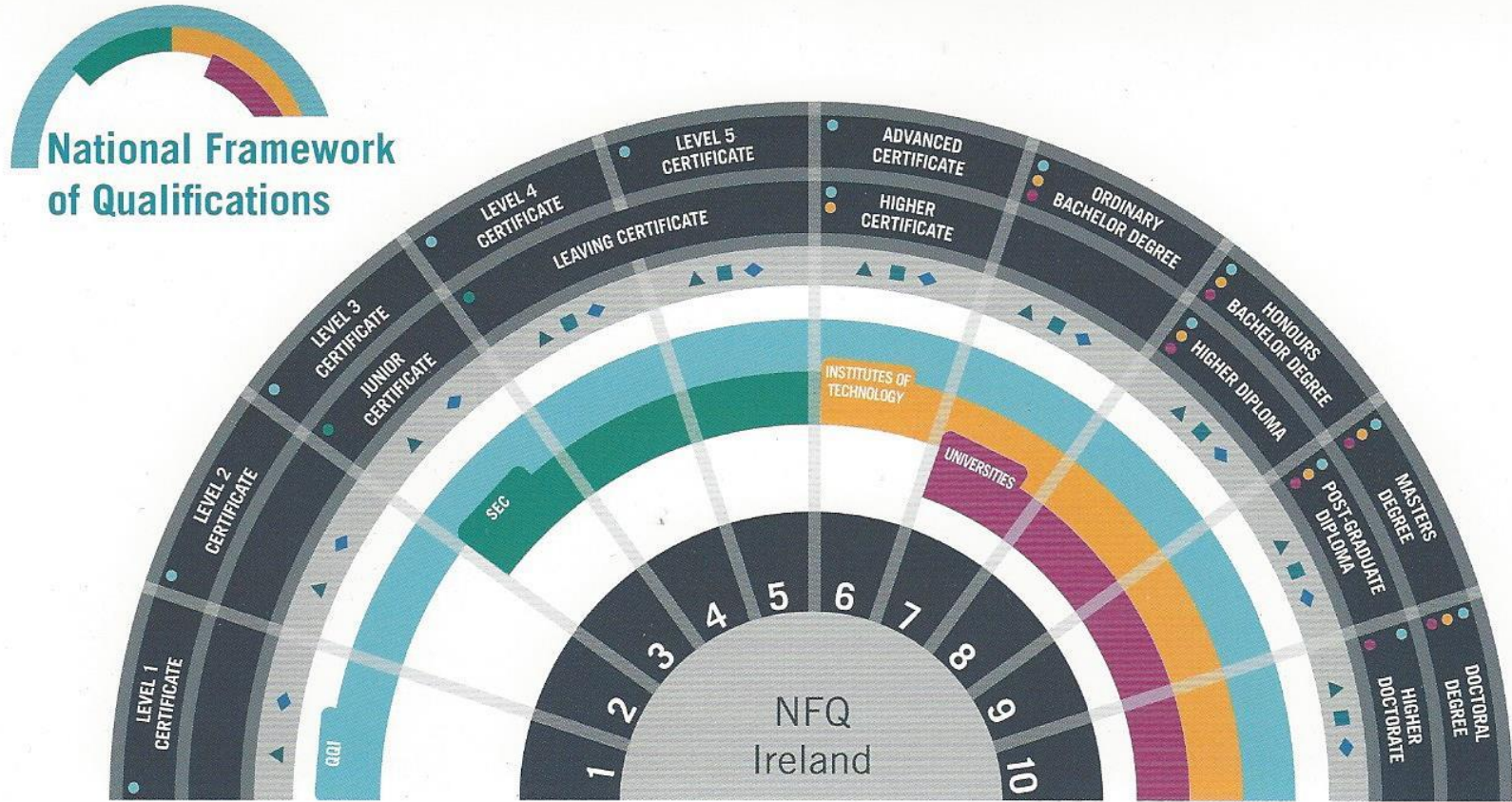
awards



MICRO



QA in HE  
quality as added value



**AWARDING BODIES**

- Quality and Qualifications Ireland (QQI) makes awards in further and higher education and training
- SEC - State Examinations Commission (Department of Education and Skills)
- Institutes of Technology
- Universities

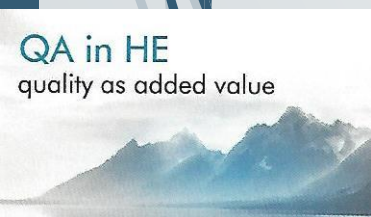
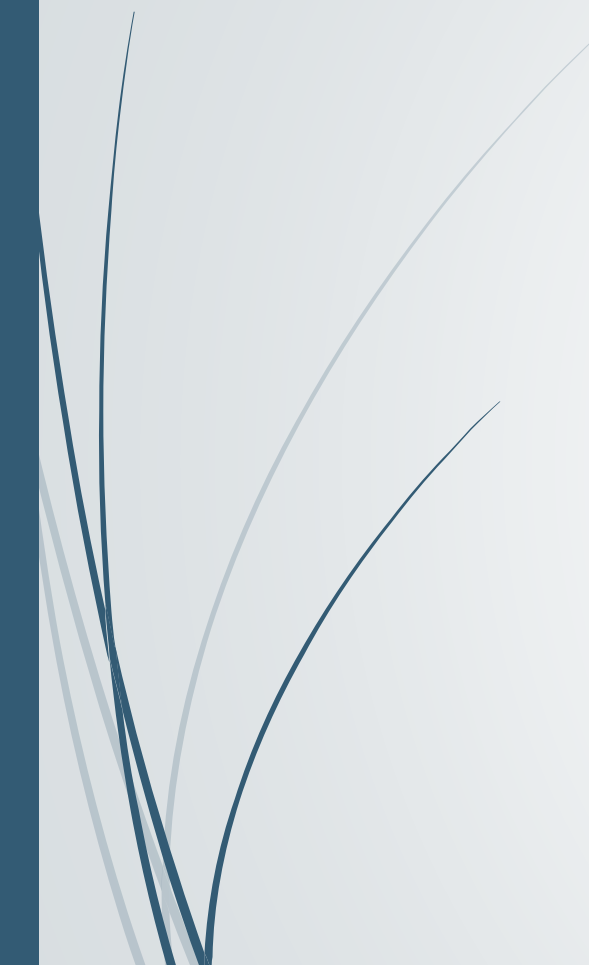
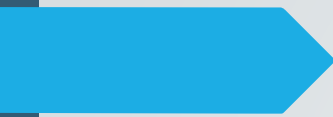
**AWARDS IN THE FRAMEWORK**

There are four classes of award in the National Framework of Qualifications:

- ◌ Major Awards: named in the outer rings, are the principal class of awards made at a level
- ◌ Minor Awards: are for partial completion of the outcomes for a Major Award
- ◌ Supplemental Awards: are for learning that is additional to a Major Award
- ◌ Special Purpose Awards: are for relatively narrow or purpose-specific achievement







**K**  
Qualifications:  
...al class of awards made at a level  
...es for a Major Award  
...al to a Major Award  
...rpose-specific achievement



## NQFs as drivers of change and enhancement:

- ✓ Promote the attainment of qualifications by indicating their role and **benefits for society, citizens and employers;**
- ✓ Facilitate and support learners and **clarify all of the educational opportunities** available;
- ✓ **Improve access and social inclusion** by creating alternative routes;
- ✓ Raise the awareness and **opportunities nationally and internationally** through recognition and mobility;
- ✓ Facilitate curricular change;
- ✓ **Provide indicators for QA** both for enhancement and for accountability.



- ✓ Use the steps and criteria to develop a National Qualifications Framework linked to the international ones (AHELO, PIAAC, QF-EHEA, EQF-LLL)
- ✓ Involve all the stakeholders in the development of a NQF (HEIs, teachers/professors, students, employers, representatives of the wider community)
- ✓ Make sure your national descriptors or learning outcomes are generic enough to cover all programmes, yet clear, easy to understand and to translate to programme level
- ✓ Link your NQF to the cycles or levels of (higher) education
- ✓ Link your NQF to a credit system (ECTS)
- ✓ Link your NQF to a national EQA system and framework
- ✓ Invite representatives of similar or comparable programmes to draft a minimum of national programme threshold LOs

global dimension

**LOs on international level**

Ma graduates are able to perform specialised problem-solving to develop new knowledge and innovation from integrating different fields

**LOs on national level**

Ma graduates are able to perform solve new problems in complex, unpredictable contexts using different disciplines

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awards

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LO LO LO LO

HEI LO

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Key LO

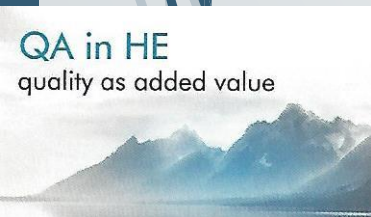
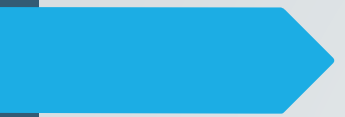
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# **LEARNING OUTCOMES** **in different settings** **LOs on INSTITUTIONAL LEVEL**

Lucien Bollaert

Independent international QA expert

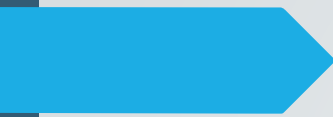
seminar: LO: tools & approaches for improving  
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15 November 2017

Tashkent

LOs in ≠ settings

institutional LOs

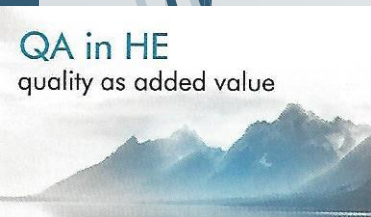
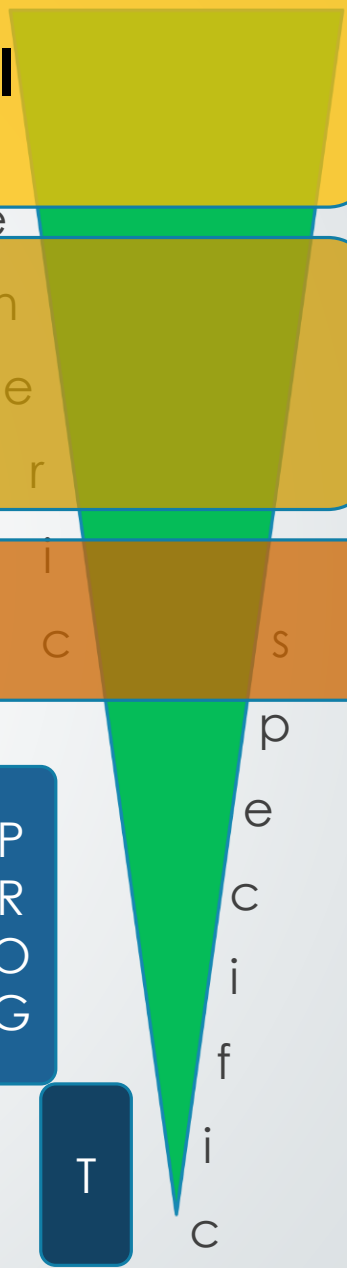
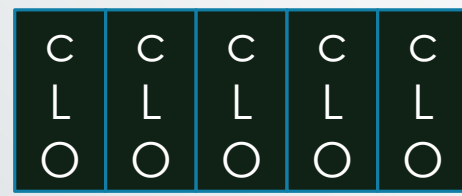
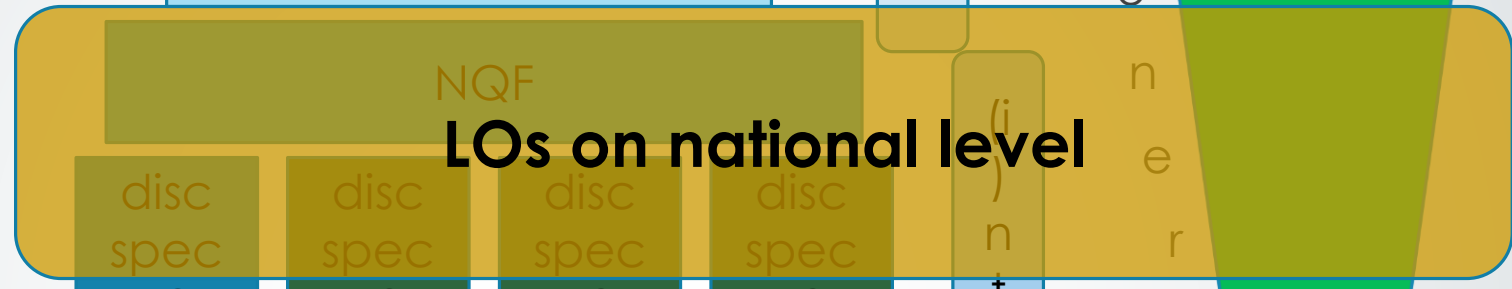


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Standard I.2 : Design and Approval of Programmes

## Guidelines:

“Study programmes are at the core of the higher education institutions’ teaching mission. They provide students with both **academic knowledge** and **skills** including those that are **transferable**, which may influence their **personal development** and may be applied in their **future careers**.”

## Programmes

- are designed with overall programme objectives that are in line with the **institutional strategy** and have explicit **intended learning outcomes**;
- are designed by **involving students and other stakeholders** in the work;
- benefit from **external expertise and reference points**;
- reflect the four purposes of higher education of the Council of Europe;
- define the **expected student workload**, e.g. in **ECTS**; (...).”

[preparation for sustainable employment;

preparation for life as active citizens in democratic societies;

Personal development;

The development and maintenance, through teaching, learning and research, of a broad, advanced knowledge base.

[https://www.coe.int/t/dg4/highereducation/PublicResponsibility/Explanatory%20Memorandum%20public%20responsibility\\_EN.asp](https://www.coe.int/t/dg4/highereducation/PublicResponsibility/Explanatory%20Memorandum%20public%20responsibility_EN.asp) ]



ESG  
2015



Standards and Guidelines for Quality Assurance  
in the European Higher Education Area

www.enqa.eu



QA in HE  
quality as added value

# INSTITUTIONAL STRATEGIC CHOICES on LOs

- Decide on your institutional strategic LOs departing from your vision, mission and strategic policy, e.g. link between teaching, learning and research, multi-cultural diversity, relation with the world of work, learning outcomes as competences?, ...
- Develop and decide formally on a procedure how to write LOs on programme level that is congruent with the national procedure
- Link your strategic institutional LOs and procedure with the development of study programme, their learning and assessment methods
- Link your strategic institutional LOs with your institutional QA to measure the achievement





global dimension

**LOs on international level**

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**LOs on national level**

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**LOs on institutional level**

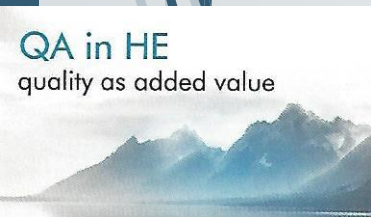
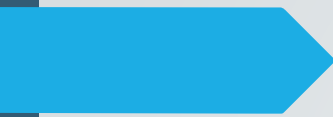
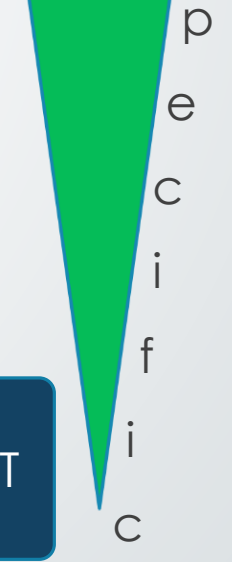
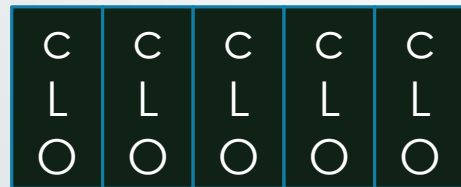
Ma graduates should be able to work in diverse teams

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**LEARNING OUTCOMES**  
**in different settings**  
**LOs on PROGRAMME LEVEL**

Lucien Bollaert

Independent international QA expert

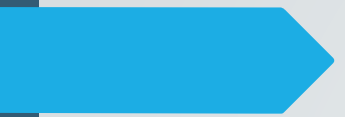
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LOs in ≠ settings

programme LOs

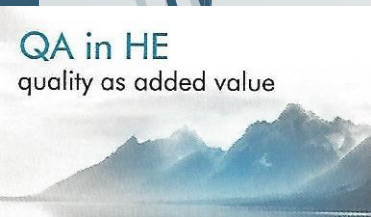
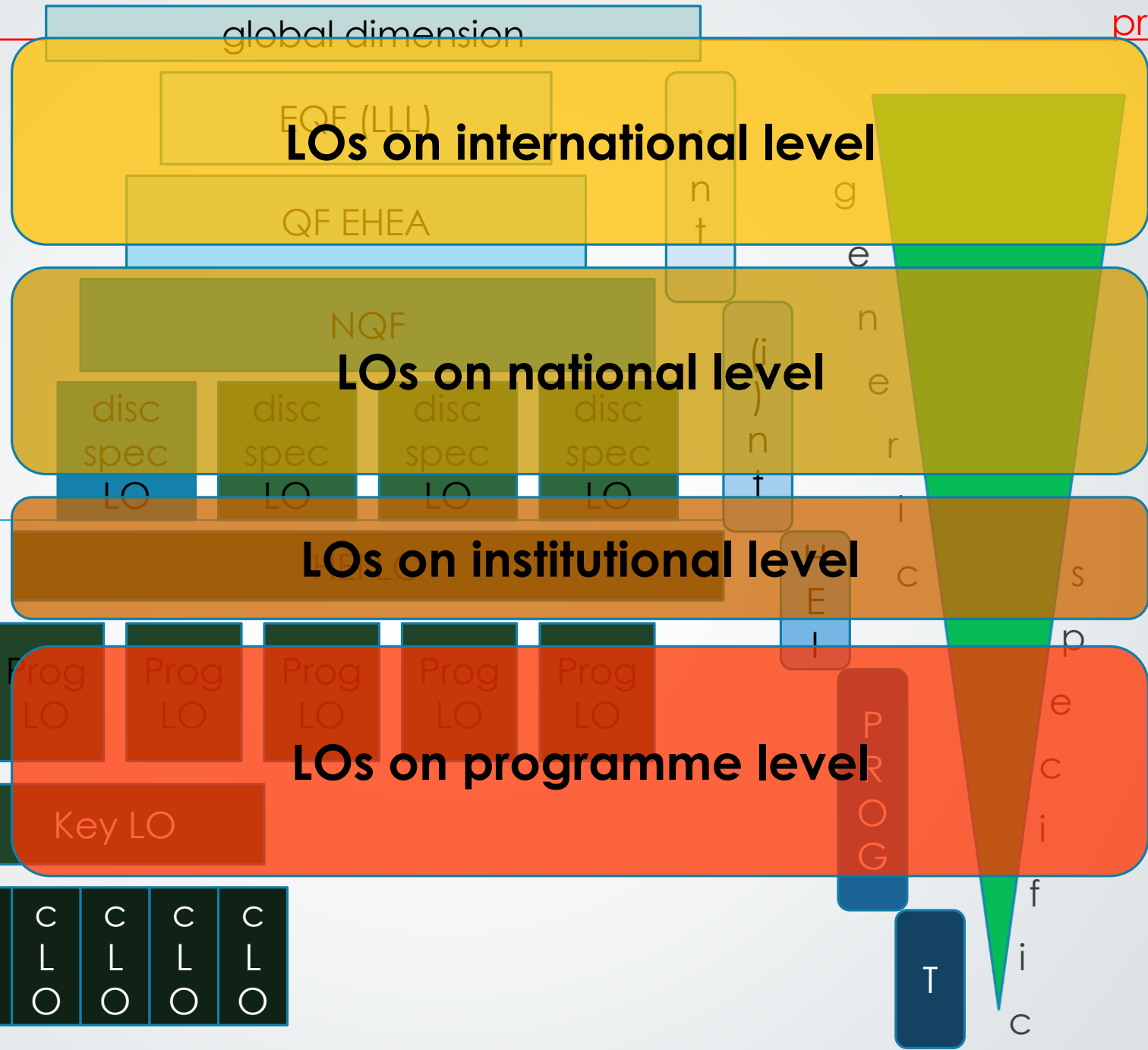


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## Standard I.2 : Design and Approval of Programmes

“(...) The programmes should be designed so that they meet the objectives set for them, including the **intended learning outcomes**. The **qualification** resulting from a programme should be clearly specified and communicated, and **refer to the correct level of the national qualifications framework** for higher education and, consequently to the **Framework for Qualifications of the European Higher Education Area.**”

The image shows the cover of the 'ESG 2015' document. It features a colorful, abstract graphic of overlapping lines in blue, green, yellow, and red, resembling a stylized 'E' or a network. The text 'ESG 2015' is prominently displayed in the upper right corner. At the bottom, there are logos for ENQA and the European Higher Education Area, along with the text 'Standards and Guidelines for Quality Assurance in the European Higher Education Area' and the website 'www.enqa.eu'.

ESG  
2015

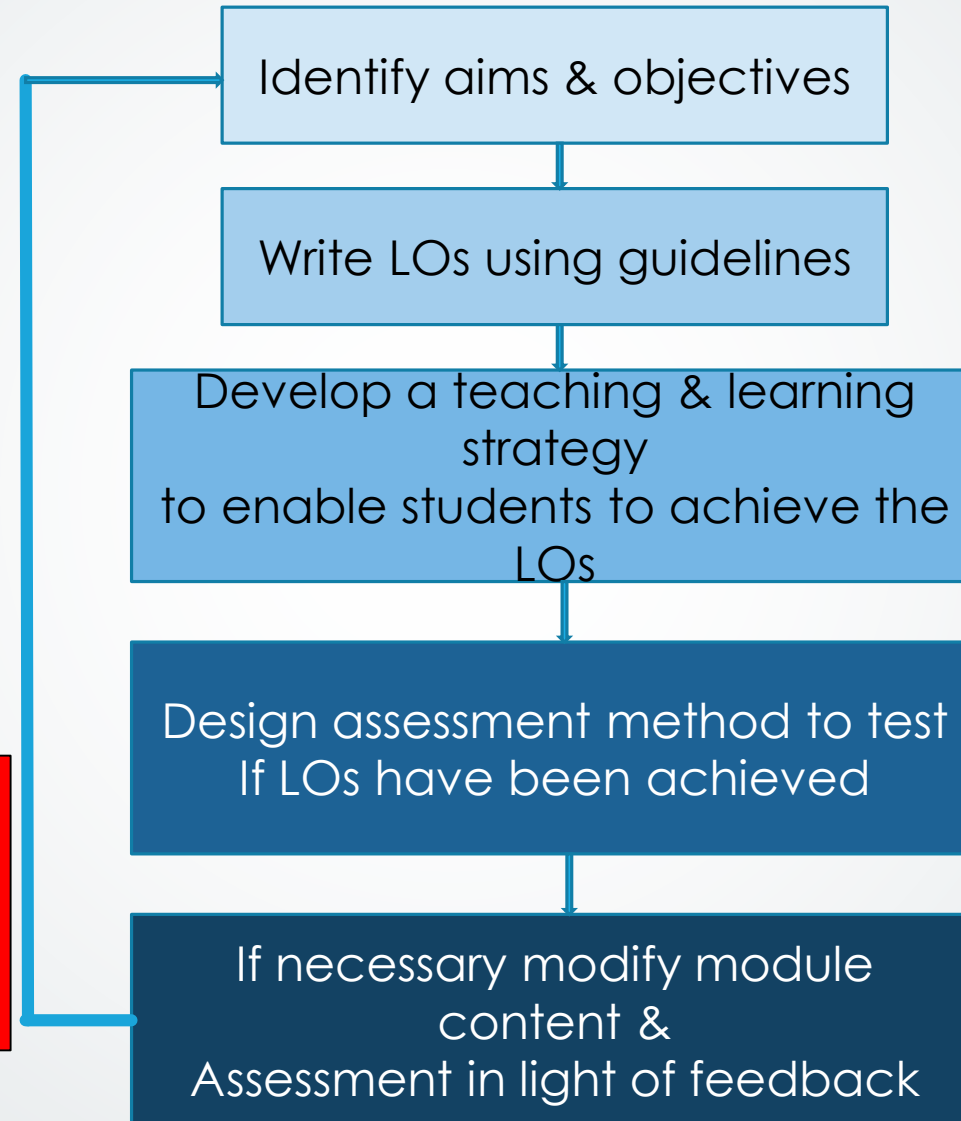
Standards and Guidelines for Quality Assurance  
in the European Higher Education Area

[www.enqa.eu](http://www.enqa.eu)

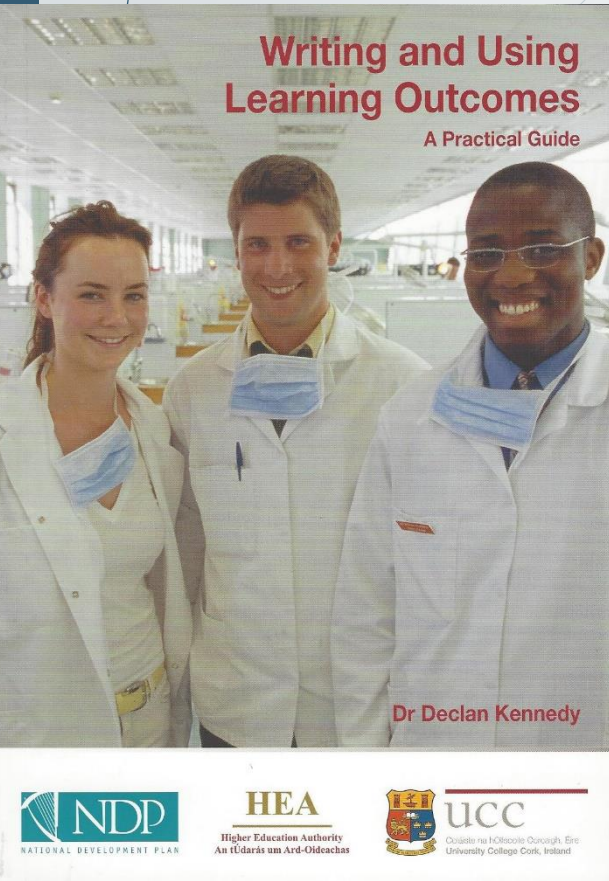
The logo for 'QA in HE' features a landscape with mountains and a blue sky. The text 'QA in HE' is in a bold, sans-serif font, with 'quality as added value' in a smaller font below it.

QA in HE  
quality as added value

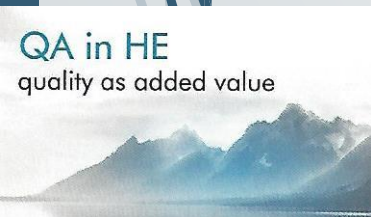
# course design



Make of the LO living things that are formulated by the stakeholders, shared by the whole team and shape the teaching, learning and assessment forms !



- ✓ Begin each outcome with an active verb after a phrase like *On successful completion of this programme/module/ course... students should be able to...*
- ✓ Avoid ambiguous or unclear verbs like *to know, to understand, to learn, to be familiar with, to be exposed to, to appreciate, etc.*
- ✓ The learning outcome should be observable and measurable
- ✓ Be sure all the LOs fit within the aims and content of the programme/HEI's strategic LO/National and International Qualifications Frameworks
- ✓ Make use of the range of levels of Bloom's Taxonomy



# Bloom's Taxonomy

## AFFECTIVE DOMAIN:

Value issues (attitudes)

5. Characterisation

4. Organisation

3. Valuing

2. Responding

1. Receiving

## PSYCHOMOTOR DOMAIN:

Co-ordination of brain & muscular activity

**create**

**Produce new or original work**

*Design, assemble, construct, conjecture, develop, formulate, author, investigate*

**evaluate**

**Justify a stand or decision**

*appraise, argue, defend, judge, select, support, value, critique, weigh*

**analyze**

**Draw connections among ideas**

*differentiate, organize, relate, compare, contrast, distinguish, examine, experiment, question, test*

**apply**

**Use information in new situations**

*execute, implement, solve, use, demonstrate, interpret, operate, schedule, sketch*

**understand**

**Explain ideas or concepts**

*classify, describe, discuss, explain, identify, locate, recognize, report, select, translate*

**remember**

**Recall facts and basic concepts**

*define, duplicate, list, memorize, repeat, state*

# ECTS Users' Guide

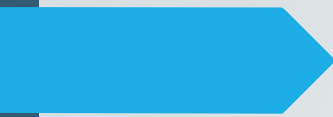


- LO = statements of what the individual knows, understands and is able to do on completion of a learning process.
- LOs are attributed to individual educational components and to programmes at a whole.

## Programme LOs

- ✓ should adequately reflect the context, level, scope and content of the programme
- ✓ have to be mutually consistent
- ✓ have to be succinct and not too detailed
- ✓ have to be linked with appropriate learning activities, assessment methods and assessment criteria
- ✓ have to be achievable within the specified workload
- ✓ The achievement of LOs has to be assessed through procedures based on clear and transparent criteria.





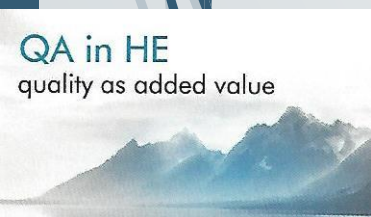
**COURSE  
CATALOGUE**



**University**

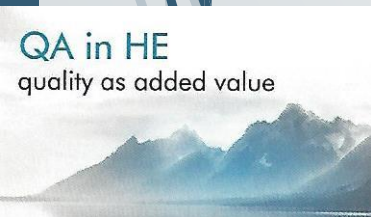
**2017-18**

study programma:	qualification/degree:	QF-EHEA:	EQF:
Faculty/School:	Study field:	ECTS:	
Admission requirements:		Academic year:	
Title course/module 1:		Semester:	
Title course/module 2:		Exam periods:	
Title course/module 3:		Optional courses:	
Programme LO 1:			
Programme LO 2:		Internationalisation:	
Programme LO 3:		Practical information:	
Career perspectives:			



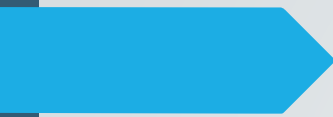


- ✓ Develop a national procedure to invite all representatives of similar or related programmes to formulate the national programme LOs
- ✓ Develop and decide on a national procedure how to link programme LOs with the more generic outcome descriptors of the cycles or levels in the NQF (validation)
- ✓ Be sure they cover all the categories of descriptors of the NQF (knowledge, understanding, abilities or skills, competences, contexts, etc.)
- ✓ Use the same buswords used in the NQF (verbs, adjectives for levels, nouns for areas e.g. creativity, LLL, international mindset, etc.)
- ✓ Link the national programme LOs with one or more NQF descriptors





- ✓ Limit the number of programme LOs to 10 or 12
- ✓ Let the draft be commented by the relevant stakeholders i.e. employers/alumni and students
- ✓ Insert and/or translate the institutional LOs into your programme ones
- ✓ Edit a course catalogue with ECTS (1 credit = 25-30 hrs)
- ✓ Leave room for individual LOs to individual programmes, to ownership of unique profiles, to experimentation and creativity



MACRO

global dimension

### LOs on international level

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### LOs on national level

Ma graduates are able to perform solve new problems in complex, unpredictable contexts using different disciplines

MESO

### LOs on institutional level

Ma graduates should be able to work in diverse teams

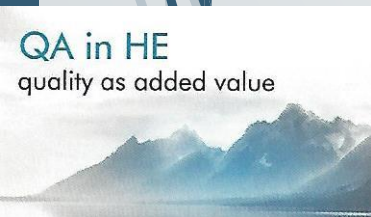
awards

MICRO

### LOs on programme level

Ma graduates should be able to use, manipulate and create large computational systems to solve new problems in industrial environments

C	C	C	C	C
L	L	L	L	L
O	O	O	O	O





# LEARNING OUTCOMES in different settings LOs on COURSE LEVEL

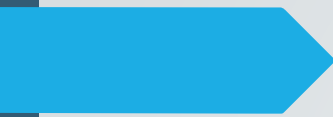
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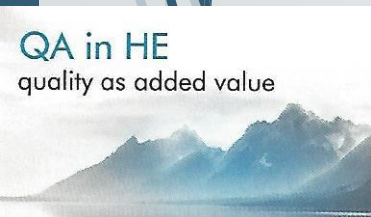
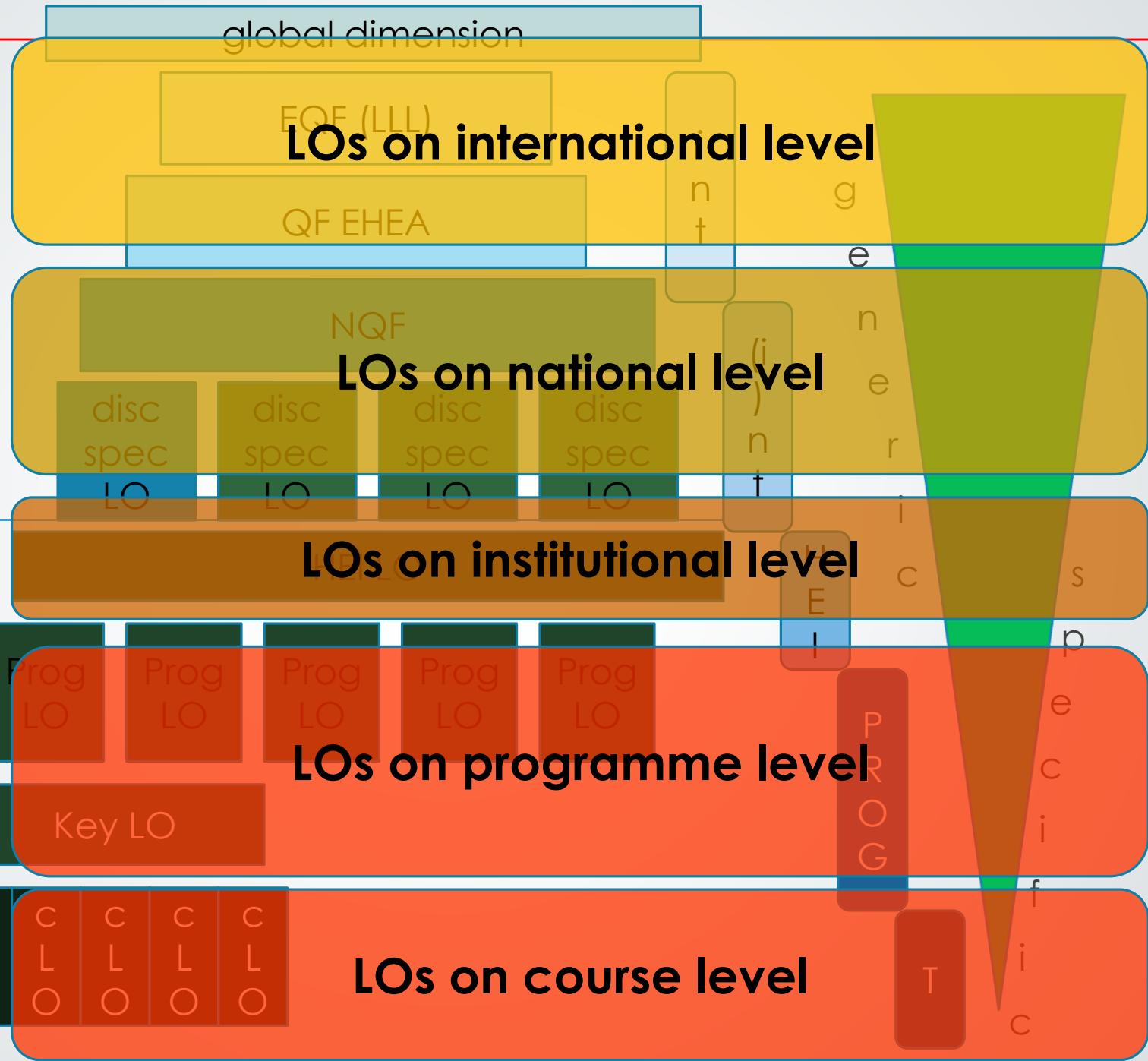


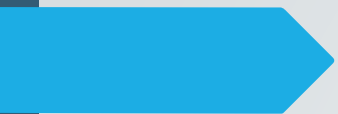
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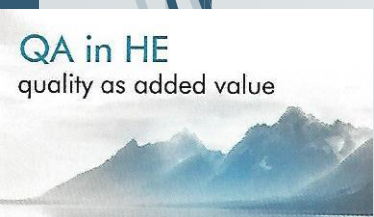
**COURSE CATALOGUE**



**University**

**2017-18**

study programma:	qualification/degree:	QF-EHEA:	EQF:
Prof/lecturer/team:	Title course:	ECTS:	
Admission requirements:		Contact hours/lectures:	
Course structure/chapters: 1., 2., 3, ...		Participative seminars:	
Course content:		Group work:	
Course LOs: LO 1, LO 2, LO 3, ...		Individual work/study:	
Assessment methods:		Assessment hours:	
Assessment criteria:		Max:	
Didactic materials:		Practical information:	
Further compulsory/elective reading:			



## necessary congruence between LO, learning & assessment

LO	T & L forms	assessment
cognitive <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: 80%;">             Demonstrate              Knowledge              Comprehension              Application              Analysis              Synthesis              Evaluation           </div>	lecture tutorials discussions laboratory	end of course exam multiple choice essays/papers practical assessment fieldwork
affective <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: 80%;">             Integration of              beliefs, ideas &amp;              attitudes           </div>	clinical work seminar peer group presentation	clinical practice presentation project work co- or peer- &
psychomotor <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: 80%;">             Acquisition of              physical skills           </div>		<i>overall assessment</i>

Kennedy (2007)



**COURSE  
CATALOGUE****University****2017-18**

- ✓ Be sure all the LOs fit within the aims and content of the programme/HEI's strategic LO/National and International Qualifications Frameworks
- ✓ Begin each outcome with an active verb after a phrase like *On successful completion of this programme/module/course... students should be able to...*
- ✓ Avoid ambiguous or unclear verbs like *to know, to understand, to learn, to be familiar with, to be exposed to, to appreciate, etc.*
- ✓ The learning outcome should be observable and measurable
- ✓ Make use of the range of levels of Bloom's Taxonomy
- ✓ Make sure the assessment and teaching/learning method(s) are congruent with the LOs
- ✓ Leave place for experimentation and ownership



MACRO

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MESO

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awards

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### LOs on programme level

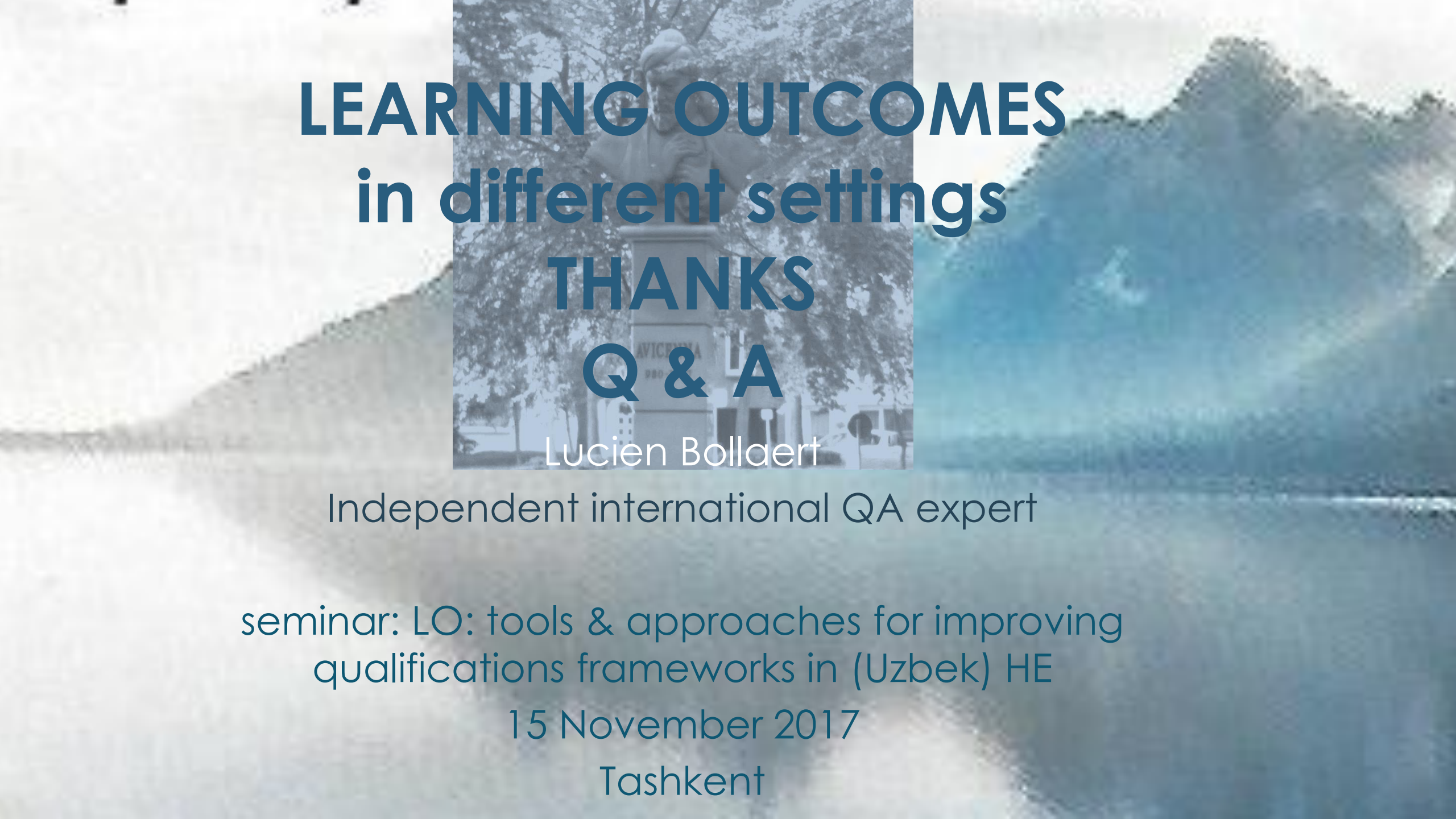
Ma graduates should be able to use, manipulate and create large computational systems to solve new problems in industrial environments

### LOs on course level

After this course students should be able to build a new computational system using the latest version of JavaScript and integrating hardware

C  
L  
O





**LEARNING OUTCOMES**  
**in different settings**  
**THANKS**  
**Q & A**

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