Hot Issues in Accreditation of Engineering Education

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ENAEE Label Committee
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European Accreditation of Engineering Programmes
EUR-ACE®

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OUTLINE

- Global acceptance of EUR-ACE Label
- Hot issues for transnational accreditation
- Some hot issues related to EUR-ACE programme outcomes
- Issues related to programme aims
- Assessment and continuous improvement
- Some consistency issues

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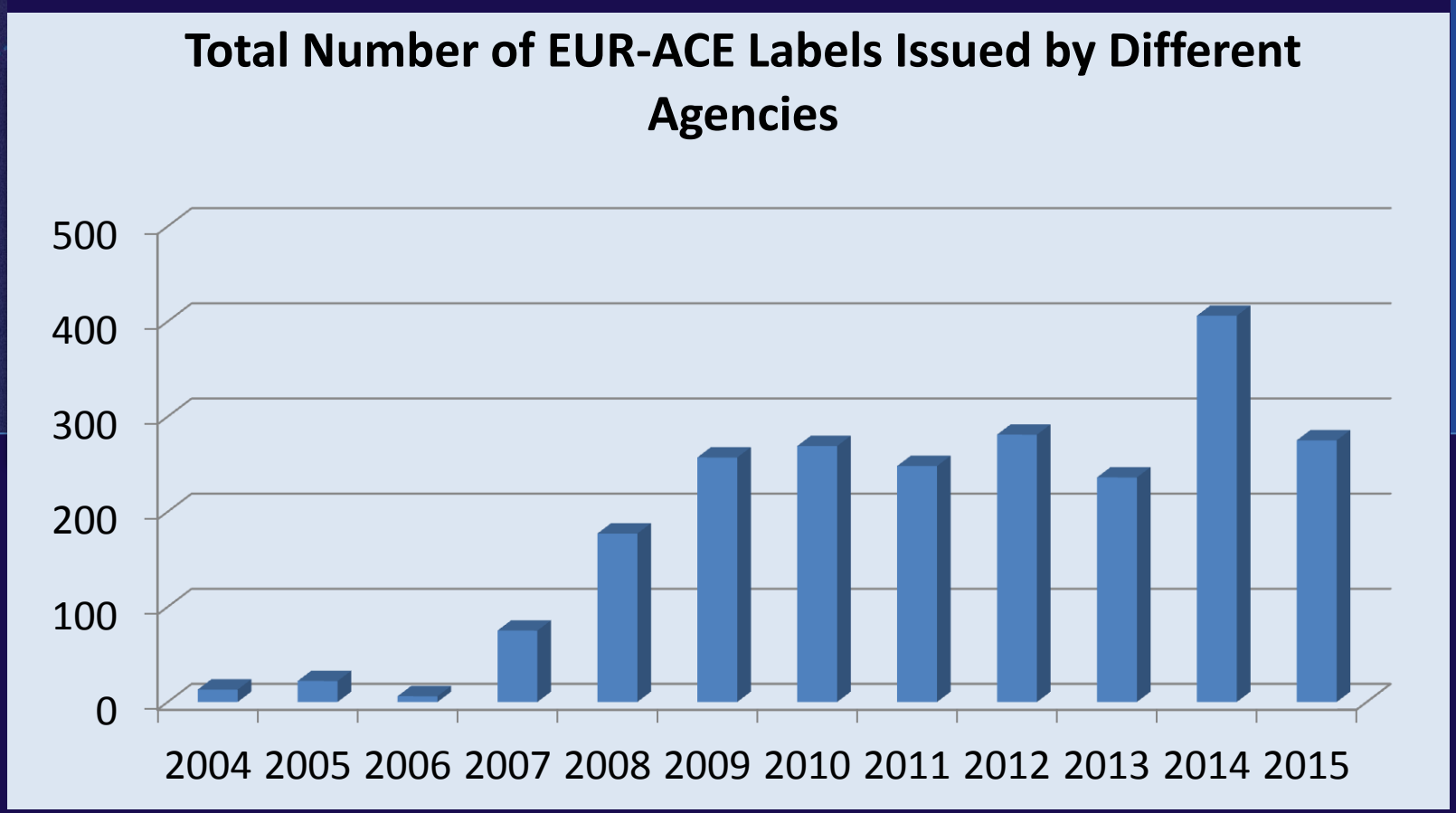
NUMBER OF EUR-ACE LABELS OVER THE YEARS: 2266



AGENCIES AWARDING EUR-ACE LABELS

2007	2009	2012	2013	2015	
AEER	AEER	AEER	AEER	AEER	Russ. Fed
ASIIN	ASIIN	ASIIN	ASIIN	ASIIN	Germany
CTI	CTI	CTI	CTI	CTI	France
EI	EI	EI	EI	EI	Ireland
EngC	EngC	EngC	EngC	EngC	UK
	MUDEK	MUDEK	MUDEK	MUDEK	Turkey
	OE	OE	OE	OE	Portugal
		ARACIS	ARACIS	ARACIS	Romania
		QUACING	QUACING	QUACING	Italy
			KAUT	KAUT	Poland
				ANECA	Spain
				OEQ	Switzerland
				FINEC	Finland

EUR-ACE LABEL AWARDING COUNTRIES

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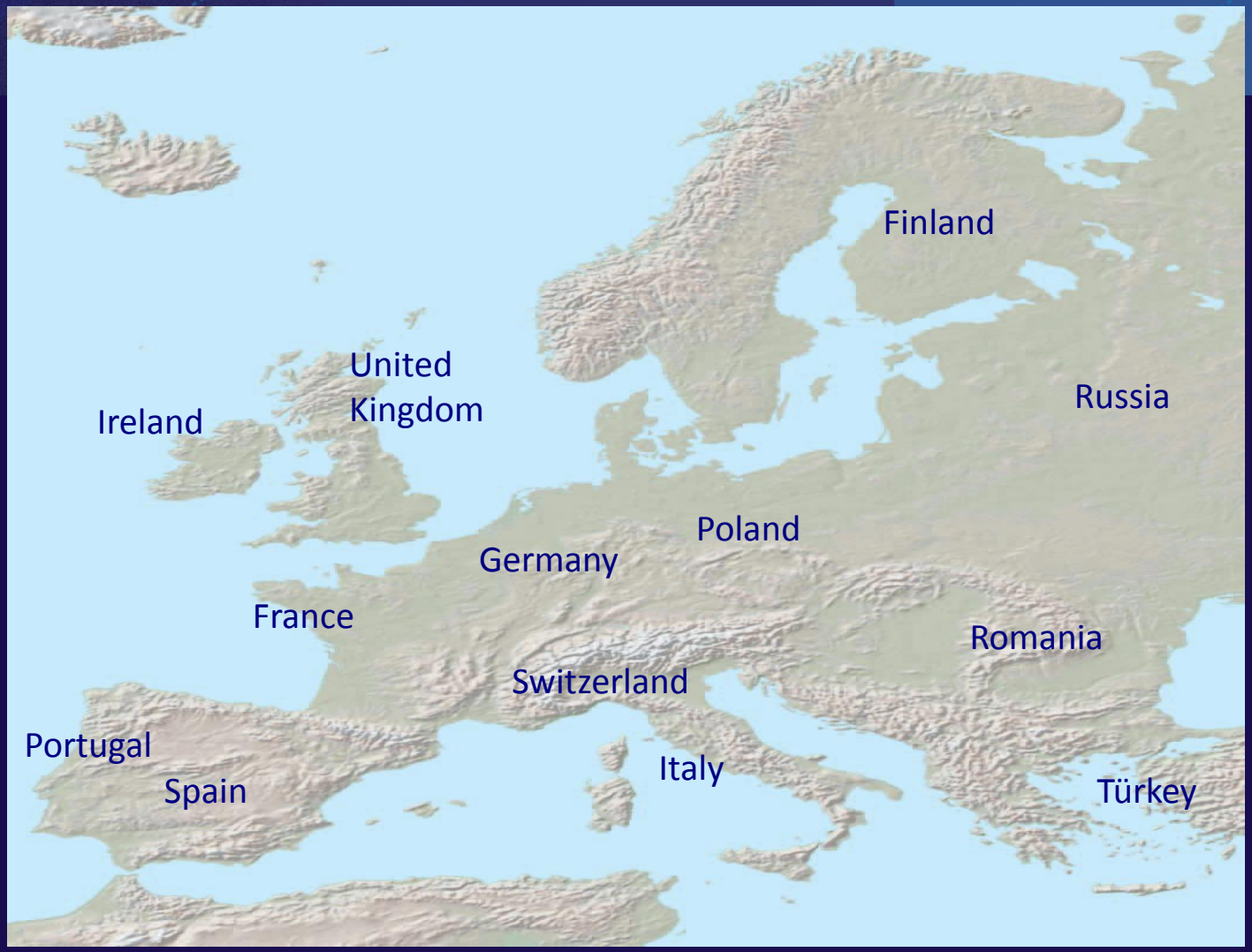
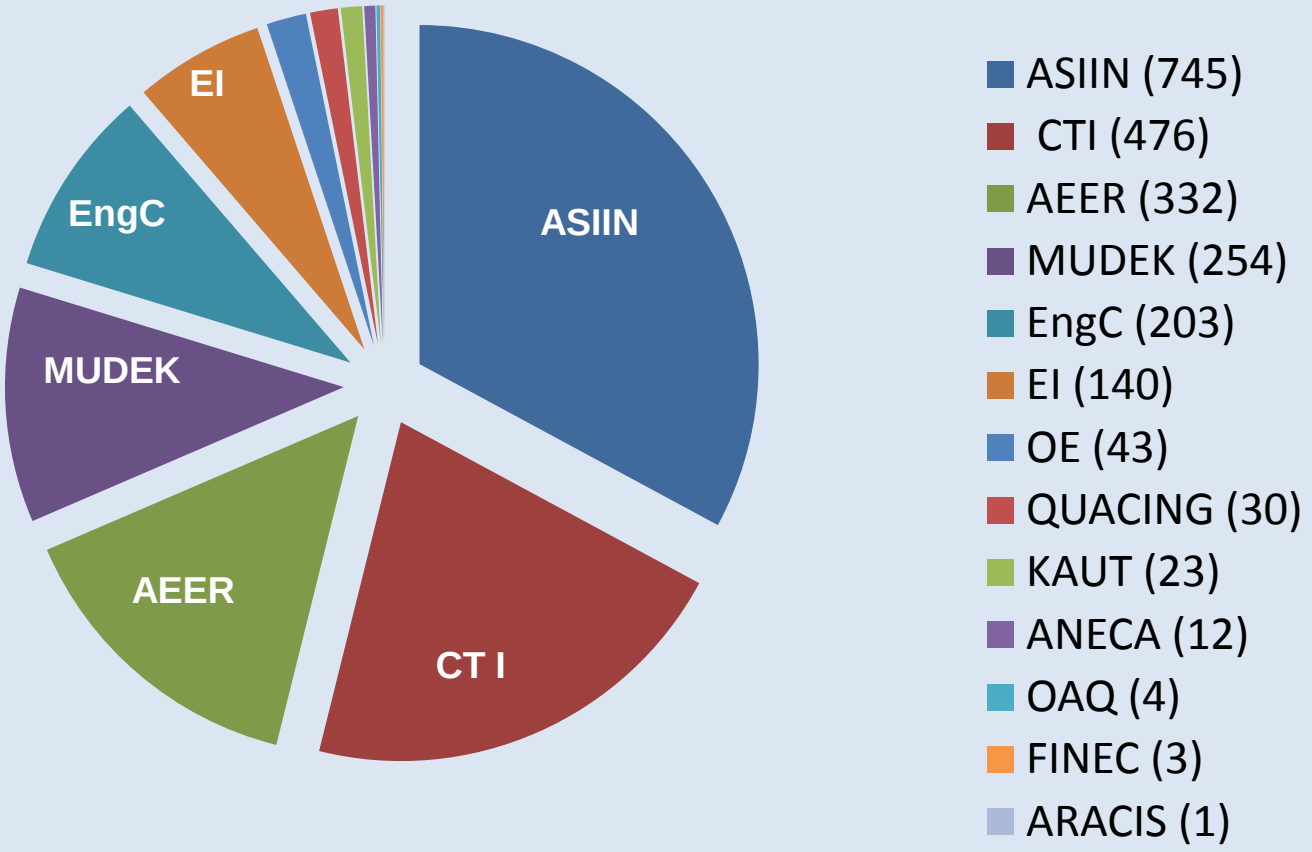


Distribution of EUR-ACE Labels Awarded by Different Agencies



GLOBAL ACCEPTANCE OF EUR-ACE LABEL

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Country	# EUR-ACE
Australia	20
Azerbaijan	4
Belgium	32
Bulgaria	5
China	3
Cyprus	3
France	404
Finland	13
Germany	639
Ireland	140
Italy	30
Kazakhstan	63
Kyrgyzstan	2
Lebanon	1
Mongolia	2
Peru	8

Country	# EUR-ACE
Poland	23
Portugal	43
Romania	1
Russ. Fed.	294
Serbia	2
Slovenia	13
Spain	19
Switzerland	25
Tajikistan	2
Tunisia	3
Turkey	254
Ukraine	1
UK	202
Uzbekistan	1
Vietnam	9

European Label
Global Quality

2266 Labels in
31 countries
By 13 agencies

HOT ISSUES FOR TRANSNATIONAL ACCREDITATION

- What should be the rules for a EUR-ACE Agency, to award EUR-ACE Label outside its own country?
  - If a EUR-ACE Agency exists in that country
  - If there is no EUR-ACE Agency in that country

- What should be the rules for an agency in a country outside EHEA to award EUR-ACE Label.

- What should be the rules for authorization of an agency in a country to award EUR-ACE Label if an authorized agency already exists from that country.

Why EUR-ACE Label

- To increase quality
- To enhance mobility
- To facilitate continuous improvement
- To design engineering curricula
  for the challenges of 21. century

EUR-ACE Framework Standards and Guidelines (EAFSG)

Some Hot Issues Related to the Understanding Clarification Assessment Achievement

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RESOURCES

Teaching staff

Facilities

Support staff

Financial resources

Student support services

INTERNAL QUALITY ASSURANCE

Continuous improvement

STUDENTS

Admission
Transfer
Progression
Graduation

PROGRAMME

PROGRAMME OUTCOMES

PROGRAMME AIMS

Educational needs of the labour market and other stakeholders

TEACHING & LEARNING PROCESS

Curriculum

EUR-ACE Programme Outcomes

Hot Issues in Achieving Programme Outcomes

Significant variability in relation to
certain programme characteristics
such as duration
&
more applied versus more theoretical programmes
has the potential to cause problems for achievement of programme outcomes

COMPLEXITY

- Engineering Analysis: (Bachelor; Master)

  - ability to analyse *complex* engineering products, processes and systems…
  - ability to identify, formulate and solve *complex problems* in new and emerging areas of their specialization…
  - ability to identify, formulate and solve unfamiliar *complex engineering problems* that are incompletely defined, have competing specifications…

COMPLEXITY

- Engineering Design: (Bachelor; Master)

  -ability to develop and design *complex* products (devices, artefacts, etc.), processes and systems to meet established requirements …

  - ability to develop and design *complex* products (devices, artefacts, etc.), processes and systems with specifications incompletely defined …

- Investigations

  -… investigations and research of *complex* technical issues.

COMPLEXITY

- Engineering Practice: (Bachelor & Master)

  - practical skills for solving *complex* problems, realizing *complex* engineering designs and conducting investigations in their field of study…
  - practical skills including the use of computer tools for solving *complex* problems, realizing *complex* engineering designs and conducting *complex* investigations in their field of study…

- Making Judgements:

  - ability to gather and interpret relevant data and handle *complexity* within their field of study…
  - ability to manage *complex* technical or professional activities
  - ability to integrate knowledge and handle *complexity*…

What should be the definition of complexity

Complexity: (ENAEE)

"The property of being complex; that is having a number of interconnected parts. Use engineering judgement to work with complexity means that the issue under consideration is not straightforward or amenable to analysis or calculation using standard methods, but requires judgement to balance possibly conflicting requirements."

ENAEE Glossary of Terminology

FOREFRONT

- Knowledge and Understanding: (Bachelor; Master)
  - knowledge and understanding of engineering disciplines .....including some awareness at their *forefront*.
  - *critical* awareness of the *forefront* of their specialization.
- Engineering Design:
  - ability to design using some awareness of the *forefront* of their engineering specialization.
  - ability to design using knowledge and understanding at the *forefront* of their engineering specialization.
- Investigations:
  - ability to investigate the application of new and emerging technologies at the *forefront* of their engineering specialization.

Definition of "forefront":

"Forefront of a branch of engineering or a specialization is the knowledge of recent developments in practice and research. In a field of study that combines knowledge from different branches, the forefront is interpreted as that of the combination and not of the individual branches."

Definiton of "critical":

"Used to describe a factor, component, process, issue or decision in an engineering activity requiring analysis and judgement from which other consequences follow; an entity or operation that must be successfully implemented or completed to ensure that a more complex operation or system can function: failure of the critical entity or operation compromises the whole."

MULTIDISCIPLINARY CONTEXT

- Knowledge & Understanding: (Bachelor; Master)

- critical awareness of the wider *multidisciplinary context* of engineering and knowledge issues at the interface between fields.

- Engineering Design:

- ability to develop and design ….that require integration of knowledge from *different fields* and non-technical…

- Communication & Team Working:

- ability to function effectively in a national and international context, as an individual and as a member or leader of a team that may be composed of *different disciplines* and levels…

LEADERSHIP & TEAM WORK

- Communication and Team Working
  - ability to function effectively in a national and international context, as an individual and as a *member of a team*…
  - ability to function effectively in a national and international context, as an individual and as a *member or leader of a team*…

LIFE-LONG LEARNING

- ability to recognize the need for and to engage in independent *life-long learning*;

- ability to engage in independent *life-long learning*; ability to undertake further study autonomously.

IT MAY NOT BE STRAIGHTFORWARD
TO ACHIVE & PERIODICALLY ASSESS

REALISTIC CONSTRAINTS

- Engineering Analysis:

  - ability to identify, formulate and solve engineering problems ….to recognize the importance of non-technical *societal, health and safety, environmental, economic and industrial* constraints…

- Engineering Design:

  - ability to develop and design ….that can include an awareness of non-technical – *societal, health and safety, environmental, economic* and *industrial* – considerations…

- Engineering Practice:

  - awareness (knowledge and understanding) of non-technical– *societal, health and safety*, *environmental*, *economic* and *industrial* implications of engineering practice…

PROGRAMME AIMS

- Confusion between “programme outcomes” and “programme aims”
- Are programme aims decided as a result of consultation with internal and external stakeholders? (relevant industry, labor market organisations, etc.)
- Is the methodology used by the program adequate for determining the aims?

ASSESSMENT & CONTINUOUS IMPROVEMENT

- Is there an appropriate ongoing assessment and evaluation process for programme outcomes, as well as teaching and learning processes?

- Is there any evidence for the use of the results of the systematic assessment process for continuous improvement?

CONSISTENCY ISSUES

Considering the increasing number of EUR-ACE labels awarded by different agencies,

the increase of number of agencies which are authorized to award EUR-ACE label

&

mutual recognition agreement of EUR-ACE labelled engineering degree programmes

consistency became an important issue

Mutual Recognition of EUR-ACE Labelled Engineering Degree Programmes

Mutual recognition of EUR-ACE labelled programmes among authorized agencies means that an agency (the host agency) in one country recognizes that EUR-ACE labelled degree programmes from ENAEE authorized agencies in other countries meets the EUR-ACE Framework Standards requirements at the relevant bachelor or master level.

CONSISTENCY ISSUES

- Are there consistency checks/consistency editors, in every agency?
- Are procedures/conclusions/recommendations of different agencies consistent?

SOME CONSISTENCY ISSUES FOR THE REVIEW PROCESS

- Duration of site visits
- Time devoted to checking the evidence for EAFSG
- Meeting with alumni and employers
- Meeting with students
- Involvement of student reviewer (student reviewers are involved only by some agencies)

Involvement of Student Reviewer

BEST PRACTICE IN ACCREDITATION (ENAEE-IEA)

Where the practice is to have a student member(s) of the visiting team, the following apply:

The student or students contribute to evaluation of programmes in areas where they are competent, including :

I. Meeting with a cross-section of students in the programmes being assessed and student leadership;

II. Participating in the evaluation of student services, assessment, teaching and learning facilities, library support, safety as instructed and practiced and the student body's understanding of the programme educational objectives.

III. Participating in the evaluation of the learning conditions as perceived by the students: scheduling, pedagogical methods, workload, etc.

Publication of Reports

Institutional Evaluation and/or Programme Evaluation

Publication is expected from QA agencies recognized by EQAR. It is less common practice for accreditation agencies oriented towards professional recognition.

Transparency versus Confidentiality

Inspection or Evaluation

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Thank you

http://enaee.eu/