

SUBJECT-SPECIFIC QUALITY ASSURANCE AND ACCREDITATION OF ENGINEERING EDUCATION IN EUROPE

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Quality Assurance (QA) of Higher Education (HE) is a major objective of the "Bologna Process". However, QA often tends to assess more the "process" than the "contents" of the education: therefore, especially in subjects that lead towards a "profession" ("engineering" first among them), the practice of "accreditation" is also increasing throughout the world. "Accreditation" can follow the "programme" and the "institutional" approach, that are not in contrast, but can usefully complement each other. "Programme accreditation" of an engineering programme can be identified with the process "to ensure the suitability of that programme as the entry route to the engineering profession", and defined as "pre-professional accreditation". Recent European initiatives along these lines will be illustrated: (i) the EUR-ACE® system for the "European accreditation of engineering programmes", (ii) the "European Alliance for Subject-Specific and Professional Accreditation and Quality Assurance" (EASPA), (iii) QUACING, the new Italian Agency for QA and Accreditation of engineering programmes.

1. BACKGROUND: THE "BOLOGNA PROCESS" AND QUALITY ASSURANCE IN HIGHER EDUCATION

The "Bologna Process" started with a "Joint Declaration of the European Ministers of Education", signed by the Ministers of 29 European countries convened in Bologna (Italy) on 19th June 1999. The process has then proceeded through a series of biennial Conferences (the latest one held in Bucharest on 26-27 April 2012) that at present involve the European Commission and 47 countries (from Portugal to Kazakhstan), forming the "European Higher Education Area" (EHEA). The objectives of the Bologna Process have been clarified and expanded by the "communiqués" of the successive Conferences, but the main objectives stated in the 1999 Declaration are still valid, and extracts from that Declaration can summarize them well:

- Adoption of a system of easily readable and comparable degrees ... in order to promote European citizens' employability and the international competitiveness of the European higher education system.
- Adoption of a system essentially based on two main cycles, undergraduate and graduate. Access to the second cycle shall require successful completion of first cycle studies, lasting a minimum of three years. The degree awarded after the first cycle shall also be relevant to the European labour market at an appropriate level of qualification. [The communiqué of the 2007 London Conference referred for the first time to "an EHEA based on a three-cycle degree system", adding the third cycle, the Doctorate.]
- Establishment of the system of credits .....
- Promotion of mobility by overcoming obstacles to the effective exercise of free movement ... for students, ... for teachers, researches and administrative staff ...
- Promotion of European co-operation in quality assurance with a view to develop comparable criteria and methodologies
- Promotion of the necessary European dimensions in higher education, particularly with regards to curricular development, inter-institutional co-operation, mobility schemes and integrated programmes of study, training and research.

Quality assurance (QA) of higher education (HE), already mentioned in the 1999 Bologna Declaration, has gradually become a major concern of the "Bologna Process". The turning point was the 2005 Ministers' Conference in Bergen, that adopted the "European Standards and Guidelines for Quality Assurance in the European Higher Education Area" (better known with the acronym "ESG")[1]. At present, QA Agencies (or analogous bodies) exist in practically every country of the European Union (and in most EHEA countries) and are listed in an ad-hoc official "European Quality Assurance Register of Higher Education" (EQAR). Indeed, this is great progress since a couple of decades ago, because QA greatly contributes to the improvement of HE.

The ESG distinguish between "Internal Quality Assurance", practiced within each Higher Education Institute (HEI), and "External Quality Assurance" by a third-party independent body. However, if not properly intended and applied, these procedures may have great limitations, and even become a hindrance

For instance: within ESG Part 1 on "Internal Quality Assurance", Section 1.3 "Assessment of students" specifies that *"Students should be assessed using published criteria, regulations and procedures which are applied consistently"* and that *"Student assessment procedures are expected to:*
• be designed to measure the achievement of the intended learning outcomes and other programme objectives; …"
but the ESG nowhere define the "intended learning outcomes". Only in later ENQA documents (such as [2]), one can read that:

"Learning outcomes (LOs) are statements of what a student should know, understand and/or be able to demonstrate after completion of a process of learning."

Assessment of students is not mentioned at all in Part 2 of the ESG, that deals with External Quality Assurance": essentially QA of the HE Institutions, of which I do not deny the importance; however, I do believe that too often it tends to assess more the "process" than the "contents" of the education.

To avoid this, I maintain that it is necessary to formulate explicit learning outcomes, specific for each discipline (and sometimes for sub-disciplines or *"branches"*).

[A distinction should also be made between *"intended LOs"* (sometimes called *"programme outcomes"*) and *"achieved LOs"*. How to assess the latter is one of the biggest open problems of QA, still far from a satisfactory solution, that I believe will engage experts and organizations for years to come. But I do not want to deal with this question, that is currently tackled by the very ambitious "AHELO" (Assessment of Higher Education Learning Outcomes) project supported by the OECD Directorate for Education.]

2. "FIELD-SPECIFIC" VS. "GENERAL" QA; "INSTITUTIONAL" VS. "PROGRAMME" EVALUATION; ACCREDITATION

Here there comes the distinction between *"field-specific"* and *"general"* QA approaches, that in turn lead naturally to *"institutional"* and *"programme"* evaluation and accreditation. Institutional and programme approaches share most of their "technical" instruments and procedures: self evaluation reports, peer reviews, benchmarks vs. reference points, etc.; but, as an ENQA Report of a few years ago recognised, while the institutional approach assesses the internal monitoring and QA arrangements, allows for more flexibility in terms of structure, content and implementation of study programmes, and emphasises the autonomy and the primary responsibility of the Institutions for their quality, the contents of programmes are not thoroughly examined.

The latter is a great liability, especially in fields like engineering. In the closing Conference of the EUR-ACE SPREAD project (25 October 2010) the invited speaker from the European University Association (EUA) recognized that in QA procedures there is "no discontinuity between institutional and programmes levels, where both are consistent with ESG", and that programme approaches are "particularly relevant for disciplines relevant to public health and safety", like engineering, and which - I add - in several countries require a "licence" to be practiced.

Therefore, I strongly maintain that the two approaches are not in contrast, but can complement each other: the choice should never be "either - or", but how best to combine the two approaches in order to optimize the results while limiting the burden placed on the HE Institutions and their members.

In short, I would say that *"institutional accreditation"* is essential to guarantee the "quality" of the educational process, since only well-structured HE Institutions can provide reliable education; while *"programme accreditation"*, on the basis of accepted learning outcomes, is essential to assure "relevance for the job" besides "academic quality" of educational programmes.

Indeed, field-specific QA approaches accentuate the need for aligning the goals of educational programmes with the expectations of the stakeholders, and underline that Higher Education Institutions, while in principle autonomous, are nevertheless accountable to their constituents, which includes an obligation to demonstrate the "relevance" of their output. Thus, as underlined in several papers, e.g.[3], field-specific QA systems give credibility and concreteness to the whole "Bologna"/EHEA system. For the EU countries, the link to the relevant social and economical issue of employability is further stressed and strengthened by the "Directive for Recognition of Professional Qualifications" [4], at present (2012) under review.

However, in higher education several definitions of the word *"accreditation"* are possible, that may involve its significance and relevance: indeed, *"accreditation"* means different things for different users. It is therefore appropriate to state that by this term we refer to the definition given in the EUR-ACE Framework Standards [5] (of which I will speak later), that in turn derives from definitions included in several recent national Engineering Standards:

"*Accreditation of an engineering educational programme is the primary result of a process used to ensure the suitability of that programme as the entry route to the engineering profession*", by means of

- *Periodic assessment against accepted standards*
- *Peer review of written and oral information by trained and independent panels including academics and professionals by verifying the achievement of agreed outcomes*

In this definition, written for engineering but extendable to other professions by replacing the word "engineering", *"accreditation"* is strictly related to a field-specific QA approach, in which the aims and contents of the educational programmes are specified, and combines together - as already hinted - assurance of "academic quality" and of "professional relevance". Therefore, it can neither be simply qualified as *"academic accreditation"* nor, on the other hand, as *"professional accreditation"*, because "academic education" may be not sufficient to be "licensed" for a profession (e.g., in several countries to be qualified as "engineer" a graduate of an accredited programme must fulfil further, more or less formalized "professional training" requirements, fixed by professional, not academic, organizations). In order to avoid confusions, "accreditation", defined in this way, can be referred to as *"pre-professional accreditation"*.

It can be maintained that, although the word was not used, the practice of "accrediting" HEI programmes as the standard entry route for a profession was started in the 1800s by the Professional "Chartered" Institutions in the UK, while in France a law of 1934 introduced the "habilitation" (now translated "accreditation") for engineering schools and degrees, awarded by the "Commission des Titres d' Ingénieur" (CTI) and a prerequisite for the use of the title "Dipl. Ingénieur".

Hence, *"pre-professional accreditation"* is particularly relevant in engineering. However, my feeling is that of its relationship (and strict interdependence) with the QA of engineering education have not been yet studied in detail by QA "specialists", and that not all consequent problems have been solved.

In any case, the situation today is much better than few years ago, when engineering programmes of British Universities had to undergo two separate processes (largely duplicating each other) for quality assessment by the National QA Agency and *"pre-professional accreditation"* by the relevant Professional Institutions. However, very recently in France the CTI had again some difficulties to re-affirm the

peculiarity of engineering education and its traditional *"habilitation"* versus the French newly established QA Agency AÉRES, before CTI and AÉRES reached a substantial agreement.

3. THE EUR-ACE® SYSTEM

A recent achievement along the line of *"pre-professional accreditation"* is the EUR-ACE® system for the *"European accreditation of engineering programmes"* at the Bachelor and Master levels, envisaged by the EU-supported "EUR-ACE" project (2004-2006) and run by the "European Network for the Accreditation of Engineering Education" (ENAEE). "EUR-ACE" is a decentralized Europe-based accreditation system of educational programmes as entry route to the engineering profession (*"pre-professional accreditation"*): a common quality label (EUR-ACE® label) is awarded to programmes that satisfy a common basic set of standards (*"EUR-ACE Framework Standards for the Accreditation of Engineering Programmes"*) [5] and are accredited by an Agency fulfilling appropriate Quality Assurance prescriptions, in particular the already quoted *"European Standards and Guidelines for Quality Assurance in Higher Education"* (ESG). ENAEE, the *"European Network for Accreditation of Engineering Education"*, founded in 2006 at the successful conclusion of the "EUR-ACE" project, has registered the EUR-ACE® trademark and authorizes qualified Agencies to award the EUR-ACE® label.

The EUR-ACE system obviously follows the *"programme approach"* to QA and the ENAEE *"General Policy"* [6] clearly states:

"ENAEE strongly supports a field-specific approach and programme accreditation, considering it essential to fulfil the need of aligning the goals of educational programmes with the expectations of the relevant stakeholders and ensuring their relevance for the labour market."
and also that:
"Programme accreditation does not exclude institutional accreditation: on the contrary, it may become easier if an overall system of QA authorizes only quality HE Institutions to deliver academic degrees."

The *EUR-ACE Framework Standards* identify 21 "programme outcomes" (or "learning outcomes") for First Cycle degrees and 23 for Second Cycle degrees, and provide a common reference framework serving as the basis for the award of the common European EUR-ACE® quality label: a framework flexible enough to accommodate national differences and even different "profiles".

(Do not equivocate: the term *"Standards"* refers to the set of outcomes to be satisfied, and does not imply any "standardization" of the national educational systems, that in the "Bologna" spirit must be *"harmonized"* and made *"transparent"*, not *"uniform"*. Indeed, Europe is a continent of many cultures, whose diversity is valued as a great asset.)

Thus, the EUR-ACE accreditation system is essentially a bottom-up system aiming at a "European Recognition of National Accreditations": national (or possibly regional) agencies accredit the educational programmes, and ENAEE authorizes *("meta-accredits")* them to add the EUR-ACE® label to their accreditation, after checking that their procedures and requirements satisfy the EUR-ACE Framework Standards (hence the ESG). Thus, the authority for accrediting remains with national bodies, but by agreeing a pan-European meta-framework there is the opportunity to build up cross-border recognition. The ultimate objective of the EUR-ACE system should be a multi-lateral mutual recognition agreement of engineering degrees, but a number of operative and legal obstacles must still be overcome before this objective can be reached.

Note that, in accord with the *EUR-ACE Framework Standards* and the *European Qualification Framework* [7], the EUR-ACE® label distinguishes between First-Cycle (FC) and Second-Cycle (SC) degrees (sometimes referred to as "Bachelor" and "Master" degrees in engineering). The SC label is awarded also to degrees obtained via "Integrated Programmes" (i.e. "long-cycle" programmes leading directly to a Second-Cycle degree). Consequently, the EUR-ACE-authorization *("meta-accreditation")* specifies if the Agency is authorized to deliver FC and/or SC labels. Each EUR-ACE label is awarded to a specific programme by means of a certificate signed by the ENAEE President and by an official of the Accrediting Agency. The graduates of an EUR-ACE-accredited programme can define themselves as either *"EUR-ACE® Bachelor"* or *"EUR-ACE® Master"*, respectively if they have obtained a First-Cycle or Second-Cycle degree.

As of October 2012, nine Agencies based in nine countries throughout the European Higher Education Area are authorized to deliver EUR-ACE® labels. They are:

- CTI (Commission des Titres d' Ingénieur), France;
- ASIIN (Accreditation Agency for Study Programs in Engineering, Informatics, Natural Sciences and Mathematics), Germany;
- Engineers Ireland;
- Ordem dos Engenheiros, Portugal;
- AEER (Association for Engineering Education in Russia);
- Engineering Council, United Kingdom;
- MÜDEK (Association for Evaluation and Accreditation of Engineering Programs), Turkey;
- ARACIS (Agency for Quality Assurance in Higher Education), Romania
- QUACING (Agency for Quality Certification and EUR-ACE accreditation of Engineering Programmes), Italy.

(ARACIS and QUACING have been authorized on 13 September 2012).

The award of EUR-ACE® labels started in 2007: at present, approximately 1000 labels have been awarded: they are listed on the ENAEE web site (www.enaee.eu or www.eur-ace.eu). And since some of the eight authorized Agencies can accredit outside their home country, a few EUR-ACE® labels have already been awarded also outside the nine countries (e.g. in Belgium and Switzerland).

Note that, at least for the time being, the EUR-ACE® labels are limited to First-Cycle and Second-Cycle engineering degrees, but ENAEE is monitoring the possibility and opportunity of accrediting other engineering programmes, including Third-Cycle (Doctoral) and Continuing Education programmes.

Up to now, ENAEE has received applications to be authorized to award EUR-ACE® labels by several more bodies, including:

- SKVC, Centre for Quality Assessment in Higher Education, Lithuania;

- OAQ, QA Agency, Switzerland;
- KAUT, Accreditation Committee for Technical HE Institutions, Poland;
- NVAO (Accreditation Organisation of Netherlands and Flanders);

These applications are now undergoing the process of evaluation by ENAEE, that involves consideration of submitted documentation and site visits to verify compliance and actual application of the Standards: it is hoped that within a few months most of, if not all, these Agencies will be able to join the EUR-ACE system.

Moreover:

- CTI has signed an agreement with AEQES (the evaluation agency for the HEIs of the French Community of Belgium) that will allow CTI to accredit and award EUR-ACE® labels to French-language Belgian HEIs (as already done for programmes of the bi-lingual Belgian Military Academy, Brussels),
- FINHEEC, the "Finnish Higher Education Evaluation Council", is studying, with the collaboration of "mentors" nominated by ENAEE, an internal structure aimed at the EUR-ACE accreditation of engineering programmes.

EUR-ACE is arising great interest in other countries too (e.g. Austria, Spain, Denmark, Hungary, ...): thus, the perspectives to make it a truly pan-European system look good.

4. "EUROPEAN QUALITY LABELS" AND OTHER INITIATIVES IN "FIELD-SPECIFIC" APPROACHES; EASPA

EUR-ACE has been quoted by the European Commission as an example of good practice in its 2009 *"Report on progress in quality assurance in higher education"* [8] and in the publication *"The EU contribution to the European Higher Education Area"* [9], issued in the occasion of the 2010 "Bologna Anniversary Conference".

Besides EUR-ACE, other "European Quality labels" (also denoted as "quality seals") have been recognized by the European Commission. Five were presented at the ENQA Seminar "European Quality labels and Quality Assurance" held in Brussels on 2/12/2011 [10]:

- ECTN Eurobachelor (Chemistry)
- EUROInf (Informatics)
- Polifonia (Conservatoires; Music)
- EFG, euro-ages (Geology)
- EUR-ACE (Engineering)

The interest of the European Commission towards the "quality labels" appear to be highly variable. Also some influential members of ENQA are strongly in support of unspecified QA and against "sectoral" approaches.

However, several initiatives testify the growing interest of HE circles and stakeholders towards "field-specific" approaches to QA and accreditation. To quote just a few:

- "TechnoTN", the "Archipelago of Thematic Networks in the fields of Sciences and Technology", is an example of positive collaborations and exchanges of experience within and between subject- and branch-specific networks and associations. Between 2004 and 2007, four "TechnoTN Fora" had been organized; the fifth Forum has taken place in Antwerp in May 2012.
- A "Joint Statement of the European Networks for the Accreditation of Chemistry-, Engineering-, Informatics- and Medical Study Programmes" was submitted to the 2007 HE Ministers' Conference, held in London.
- A Conference "Defining Quality - The Relevance of Field-specific Approaches to Quality Assurance in Higher Education" was held in November 2009 in Bonn, organized by ASIIN and sponsored by ENAEE and a number of other networks.
- The "International Network of Quality Assurance Agencies in Higher Education" (INQAAHE) has promoted a series of meetings of leaders of European disciplinary networks and of professional and specialized accreditors.

The INQAAHE-promoted meetings have lead to the foundation in November 2011 of the "European Alliance for Subject-Specific and Professional Accreditation and Quality Assurance" (EASPA), the European analogous of the older American "Association of Specialized and Professional Accreditors" (ASPA).

The EASPA founding document ("Düsseldorf declaration") [11] reads: "The European Alliance for Subject-Specific and Professional Accreditation and Quality Assurance constitutes a pan-European platform of quality assurance in Higher Education that comprises the European Association for Public Administration Accreditation, the European Association of Conservatoires, the European Chemistry Thematic Network Association, the European Countries Biology Association, the European Federation of Geologists, the European Network for Accreditation of Engineering Education, the European Physical Society, the European Quality Assurance Network for Informatics Education as well as the International Food Association"; underlines the EASPA's members "common goal to maintain and develop European-wide disciplinary learning outcomes, competence profiles and qualification frameworks as well as corresponding quality assurance tools thereby making an important contribution towards the development and implementation of academic and professional mobility within the European Higher Education Area"; state that they "have undertaken the development of subject-specific criteria and procedural guidelines, European learning outcomes as well as competence profiles and qualifications based on which academic and professional mobility in the respective discipline may be facilitated", resulting in quality criteria "complementary to the outcomes defined in the Framework for Qualifications in the EHEA, adopted in Bergen 2005, and the European Qualifications Framework for Lifelong Learning, adopted by European Parliament and Council in 2008. In line with the approach established by the EU-funded Tuning project for the design, implementation, and evaluation of degree programmes, they reflect the state of the art in their respective disciplines and the competences graduates must have acquired in order to be able to take up their chosen profession. The development and improvement of these quality criteria involves intensive consultation with experts from academia, scientific societies industry as well as other relevant stakeholders. Thus it is assured that these criteria do not only reflect the state of the art from an expert's point of view but

also meet with the widest possible acceptance without compromising the quality requirements." Consequently, EASPA members' "work not only provides criteria for the accreditation or quality evaluation of transnational programmes and highly international disciplines for which appropriate criteria did previously not exist, but contributes to the harmonisation of the European Higher Education Area by providing a sound basis for the mutual recognition of qualifications awarded by institutions of higher education throughout the EHEA."

The "Düsseldorf declaration" has been presented to the Bucharest HE Ministers' Conference (26-27 April 2012).

5. A PECULIAR BUT EXEMPLARY SITUATION: ITALY

In Italy, a QA system for Higher Education is not yet in force, notwithstanding that Italy participates since the very beginning to the Bologna Process and has signed all Ministers' Communiqués. A Law of 2006 defined A.N.V.U.R. (National Agency for the Evaluation of Universities and Research Institutes) but change of political background in 2008 delayed its implementation, and the Board of A.N.V.U.R. took formally office only on 2 May 2011.

ANVUR started to organize the evaluation of research with the programme denoted "VQR 2004-2010", but did not take any action for evaluation of Higher Education, waiting for the definition of its tasks and competencies in relation to evaluation and accreditation of Universities and study programmes. The relevant "Decreto Legislativo" has been published on 8 March 2012 [11], but the connected rules and procedures are not yet clear.

The main points of this decree can be summarized as follows:

Art.2: ...this decree regulates:

a) the introduction of a system for initial and periodic accreditation of the institutions and of the study programmes;

b) the introduction of a system of evaluation and of assurance of the quality, efficiency and efficacy of didactics and research;

c) the strengthening of the system of self-evaluation of the quality and the efficacy of the teaching and research activities of the Universities. ....

Art.4: The national system ... articulates into:

a) a system of internal evaluation in each University,

b) a system of external evaluation of the Universities,

c) a system of accreditation of the institutions and of the study programmes.

Art.5:

1. The system for initial and periodic accreditation quoted in Art.2 has for object:
a) the institutions;
b) the University study programmes.

2. "Initial accreditation" is defined as the authorization to the University by the Ministry to activate institutions and study programmes... It implies verification of the "ex ante" indicators defined by ANVUR ...

3. "Periodic accreditation" is defined as the verification of the requirements of quality, efficiency and effectiveness of the developed activities. ... it is carried out at least every five years for the institutions and every three years for the study programmes ... and is based on the verification of the requirements of item 2 above, on further "ex ante" indicators defined by ANVUR and on the results of the evaluation in Art. 9 and 10.

Art.9: Monitoring of indicators and periodic accreditation:

1. The activity for monitoring the application of the indicators mentioned in Art.5 ... , aimed at verifying the continuing respect of the indicators ... is developed by ANVUR according to criteria to be determined ....

Art.10: Definition of criteria and indicators:

1. ANVUR, within 120 days ... defines criteria and indicators for the periodic evaluation of the efficiency, of the economic-financial sustainability of the activities and of the results attained by each University in didactic and research, and for quality assurance ...

2. Criteria and indicators, elaborated in coherence with the standards and the guidelines defined by ENQA (Standards and Guidelines for Quality Assurance in the European Association for Quality Assurance in Higher Education)[sic], take into account the qualitative objectives defined by the Presidential Decree 1/2/2010, n. 76 and the general guidelines for the triennial planning of universities.....

Note the difference between the above definitions of "accreditation" and the definition adopted by ENAEE/EUR-ACE: in particular, "initial accreditation" is just the authorization, given by the Ministry following a report by ANVUR, to start or continue a HEI or a study programme, while it is not yet clear what "periodic accreditation" will be. Moreover, nowhere in the Decree there is a mention of the "content" nor of learning objectives of the programmes.

Quite different was (and is) the idea of "accreditation" within Italian Academic circles.....

The "Conference of (Italian) Engineering Deans" (**CoPI**) has been for many years very active and proactive towards "accreditation":

- Already in 1999 CoPI presented In a public Conference a proposed "National System for Accreditation of Engineering Education" (SINAI).
- In the following year CoPI conducted a pilot project on accreditation of "Diplomi Universitari" in Engineering (the 3-year programmes that for a few years run in parallel with the traditional 5-year "Laurea").
- In 2003, the CoPI proposal was elaborated into the document "Progetto per la definizione e la sperimentazione dei criteri e delle modalità di accreditamento dei Corsi di Studio in Ingegneria" that contained the following definition of the Standards for accreditation: "the Standards, besides fulfilling Ministerial prescriptions, must be able to make valid and credible the learning outcomes of the study programmes and guarantee an appropriate level of competences of the graduates."

Unfortunately, the 2003 project had no concrete development, but CoPI has been active (and supported these ideas) throughout the EUR-ACE exercise since its very beginning in

2004.

In the meantime, with the active collaboration of CoPI, the Italian "Conference of University Rectors" (CRUI) developed its "Modello CRUI per l'Assicurazione e la Valutazione della Qualità dei Corsi di Studio" that, after having been tested between 1998 and 2003 in the pilots projects "Campus" and "CampusOne", is currently used in a continuous activity of "certificazione della qualità" of Italian HE programmes.

Also the Italian Industrialists' Association CONFINDUSTRIA prompted for the establishment of a QA/accreditation system aimed at guaranteeing the quality and competences of Italian graduates, in particular in the technical fields.

Thus, CoPI decided to go forward, together with the interested parties, towards an Agency for the "EUR-ACE Accreditation" of Engineering Education, leaving the "legal" aspects and the relations with ANVUR and Ministry to later steps: this action led on 13 December 2010 to the foundation of the "*Agenzia per la certificazione della qualità e l'accreditamento EUR-ACE dei corsi di studio in ingegneria* - Agenzia QUACING". Founding members of QUACING were CoPI, Fondazione CRUI (the Rectors' Conference Foundation), CNI (National Engineers' Council: the official Engineers' representative body) and, as industrial representatives suggested by CONFINDUSTRIA, Finmeccanica (a major national holding) , C.R.F. (the FIAT Research Center) and ANCE (National Association of Building Enterprises). A 10-member Board and a Steering Committee, fully responsible for technical matters, including accreditations, have been nominated.

An "Appendix" to the "Regolamento" (By-Laws) of QUACING contains the Learning Outcomes that must be satisfied by accredited programmes: they are the translation, with minor variations, of the "EUR-ACE Framework Standards".

QUACING has run its first evaluations of 15 programmes (7 "Lauree". i.e. FCD; 8 "Lauree Magistrali", i.e. SCD) of Milan & Turin Technical Universities ("Politecnici"), that have been completed in June 2012. All 15 programmes were awarded the "quality certification"; 14 programmes have also been awarded the FC or SC EUR-ACE® label, while one FC programme has not been awarded the label, because its curriculum was not designed as an "entry route to the engineering profession" but only as a pivot point in the academic career towards a higher degree.

In fact, in the meantime QUACING had applied to be authorized to award the EUR-ACE FC and SC labels. The EUR-ACE Label Committee - in accord with ENAEE rules - nominated a Review Team of three experts, who monitored the 15 evaluations to verify whether QUACING structure, rules and procedures met all requirements: they were deemed satisfactory, and on 13 September 2012 the ENAEE Administrative Council authorized QUACING to deliver FC and AC EUR-ACE® labels.

6. CONCLUDING REMARKS

Since the 2005 Ministers' Conference in Bergen, that adopted the "European Standards and Guidelines for Quality Assurance in the European Higher Education Area", Quality Assurance (QA) of Higher Education (HE) has become a very major objective of the "Bologna Process", the process that aims at harmonizing HE throughout Europe. At present, QA Agencies (or analogous bodies) exist in practically every country of the European Union (and in most of the 47 countries of the European HE Area - EHEA), and the "European Quality Assurance Register of Higher Education" (EQAR) has been established. This is indeed a great positive progress, because of the contribution that QA can give to the general improvement of Higher Education.

However, traditional, undifferentiated QA tends to assess more the "process" than the "contents" of the education: therefore, especially in subjects that lead towards a "profession" ("engineering" first among them), the practice of "accreditation" is also increasing throughout the world. Accreditation approaches can be distinguished into "programme" and the "institutional" approaches can be followed, that however are not in contrast, but on the contrary can usefully complement each other. More specifically, "programme accreditation" of an engineering programme can be identified with the "primary result of a process used to ensure the suitability of that programme as the entry route to the engineering profession", and defined as "pre-professional accreditation": this approach is aimed at evaluating at the same time "academic quality" and "relevance for the job market" of educational programmes.

Recent European initiatives along these lines have been illustrated in this lecture: (i) the EUR-ACE® system for the "European accreditation of engineering programmes" at the Bachelor and Master levels, run by the "European Network for the Accreditation of Engineering Education" (ENAEE) since 2006; (ii) the "European Alliance for Subject-Specific and Professional Accreditation and Quality Assurance" (EASPA), the European analogous of the older American "Association of Specialized and Professional Accreditors" (ASPA), founded in 2011; (iii) the specific Italian Agency for "Quality Certification" and Accreditation of engineering programmes QUACING, established in 2010. It is thus evident that "programme accreditation" is gaining an increasingly major role for Higher Education besides the more traditional procedures of Quality Assurance.

ACKNOWLEDGEMENT

This is a revised and expanded version of a lecture presented at the International Symposium "Innovation and Quality in Engineering Education", Valladolid, Spain, April 2012.

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