Dear Faculty members,
Dear Collegues,

I have the honour to begin this second part of the CTI workshop on the role and impact of Quality labels in engineering education. My presentation will focus on the following topics :
   a) EPFL experience with EUR-ACE label and corresponding audit accreditation
   b) How the EUR-ACE quality standard and programm outcomes can adress the observed weaknesses of EPFL curricula
   c) How we could profitate of others standards to improve the content of CTI and EUR-ACE guidelines to boost teaching excellence within the European Engineering High Education Area.

EPFL is one of two Swiss Federal Institute of Technology with the reknown ETH Zurich. EPFL is a research technological university ; it is financed directly or indirectly by the Swiss Federal State at a ratio of 90%. The EPFL annual budget is seven hundred thirty millions Swiss Francs, roughly six hundred ten millions Euros. EPFL educates about six thousand two hundred bachelor and master students.

Since 2002, EPFL is structured in five Schools and two Colleges. My institution delivers twenty-two different masters. Among them, thirteen received the EUR-ACE label in 2010, five others engineering degrees had just started and it was too early to get an EUR-ACE accreditation for them.

Since then, we have communicated the EUR-ACE label of our diploma through the institutional communication of our educational programmes, for instance in brochures, on the web, in our Newsletters and in the public media. Our impression is that the impact of our communication is quite limited yet and that the EUR-ACE label is not well known in the public community and among the employers. For the media, it is obviously not a hot topic, compared for instance to the new clothes of Lady Gaga.

EPFL has carried in 2011 out a satisfaction survey adressed to our bachelor and master students. Compared to the results of 2004, we note a very significant improvement of fulfilement of our students. This progress is in particular, but not exclusively, the consequence of the recommendations listed in the 2006 and 2010 CTI and EUR-ACE audit reports, since others major changes happened at EPFL during the same period.

One question of the survey looked for students suggestions regarding educational improvements. About one thousand five hundred students comments were collected. By applying the Pareto diagramm rules, 5 of them were found to include 80% of the proposals ; *decrescendo* :
   • Study plans improvement
   • Teacher pedagogic improvement
   • More/better teaching assistants
   • Teaching Quality improvements
   • More practice, more exercices
At least three of them are in close relation with the EUR-ACE standard requirements.

> Lets come back now to EUR-ACE labels of EPFL diploma for a short moment !

Did we have any expectations when we asked to obtain EUR-ACE labels for our diplomas ? Part of EPFL culture is pragmatic : « *it seems trendy, let's try and we will see* ». On the other hand, we had in mind five distinct goals. As you can see in the slide, three of them seem to be obtained, but two have not reached our expectation. Regarding professional integration of our alumni in Europa and overall visibility of our diploma on the employment market, we assert that the EUR-ACE label would need a stronger branding, may be in collaboration with technological universities of the EHEA to profitate of any kind of synergy.

But, were the others three expectations reached thanks to CTI or to EUR-ACE standard ?

To answer, we should obviously compare the two standards. On the other hand, we have seen that the EUR-ACE standard could cover about 50% of the improvement proposals suggested by our students. Could others standards provide a complementary support ? We will then compare three standards : CTI, ABET, US Accrediting Board of Engineering and Technology, EUR-ACE guidelines and criterion and try to find out.
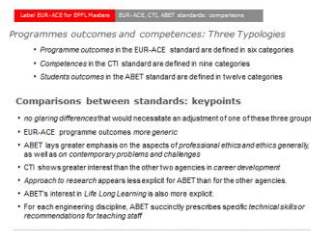

We will divide our analysis in two parts :
- first, comparisons of the typologies of Programmes outcomes and competences and
- second, analysis of criterion and requirements for Programme Assesment and Accreditation.

Let's start by an analysis of the outcomes. Programme outcomes in the EUR-ACE standard are defined in six categories ; competences in the CTI guidelines are classified in nine categories ; students outcomes in the ABET standard are described in twelve categories

If we compare the three families, we observe no glaring differences that would necessitate an adjustment of one of these three groups. On the other hand :
- EUR-ACE programme outcomes are more generic
- ABET lays greater emphasis on the aspects of professional ethics and ethics generally, as well as on contemporary problems and challenges
- CTI shows greater interest than the other two agencies in career development
- Approach to research appears less explicit for ABET than for the other agencies.
- ABET's interest in Life Long Learning is also more underlined.
- For each engineering discipline, ABET prescribes specific technical skills or recommendations for teaching staff qualifications.

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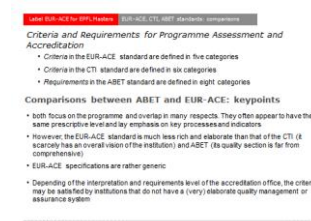
Let's analyse now the requirements for programme assesment and accreditation. For EUR-ACE, they are defined in five categories, in six for the CTI standard and in eight for the ABET guidelines.
If we compare EUR-ACE and ABET :

- both guidelines focus on the educational programme and overlap in many respects. They often appear to have the same prescriptive level and lay emphasis on key processes and indicators
- However, the EUR-ACE standard is much less rich and elaborate than that of ABET (its quality section is far from comprehensive) as well as of the CTI (it scarcely has an overall comprehensive vision of the institution).
- EUR-ACE specifications are rather generic
- Depending of the interpretation and requirements level of the accreditation office, we get the impression that EUR-ACE criterion may be reached by institutions that do not have a (very) elaborate quality management or assurance system.
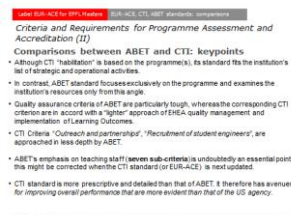
Lets end our analysis by the comparisons of CTI and ABET criterion :

- Although CTI "habilitation" is based on the programme(s), its standard fits the institution's list of strategic and operational activities.
- In contrast, ABET standard focuses exclusively on the programme and examines the institution's resources only from this angle.
- Quality assurance criterion of ABET are particularly tough, whereas the corresponding CTI criterion are in accord with a presently "lighter" approach of EHEA quality management and implementation of Learning Outcomes.
- CTI Criteria "Outreach and partnerships", "Recruitment of student engineers", are approached in less depth by ABET.
- ABET's emphasis on teaching staff (with seven sub-criteria) is undoubtedly a clear-cut added value; these criterion could be included when the CTI standard (or even EUR-ACE) is next updated.
- CTI standard is more prescriptive and detailed than that of ABET. It therefore has avenues for improving overall performance that are more evident than that of the US agency.

Now, if we look at again EPFL students improvement suggestions, we observe that ABET guidelines would adress four of the main listed improvements. There seems also some complementarity between ABET and EUR-ACE standards.

In conclusion, let me first summarize my impressions of the added value of EUR-ACE for EPFL and second propose several possibilities of improvements for CTI and EUR-ACE standards.

First of all, EPFL improvement of teaching and institutional performances came in priority from the application of CTI standard. According to our feeling, EUR-ACE standard as such didn't have a direct strong impact yet ; this is not a surprise : EUR-ACE content is presently included in the CTI guidelines !

We believe that EUR-ACE guidelines are presently most useful for Institutions of EHEA nations which do or didn't have an accreditation agency focused on engineering curricula. Now, EUR-ACE is indeed an outstanding basis to build up a comprehensive standard for the education of European Engineers. To develop its present generic content might be a future and welcome development.

CTI criterion will gain in added value if they include, in the future, guidelines of learning outcomes implementation and evaluation. Last, but not least, both CTI and EUR-ACE would benefit to underline teaching staff criterion such as:

- Faculty work load
- Faculty Qualification for teaching
- Faculty size
- Faculty Development
- Authority and responsibility of the Faculty
- Faculty Hiring and Retention
- Support for Faculty Professional Development

Thank you for your attention.