Commission des Titres d'Ingénieur

Group 1 : life-long learning *(1/2)*

Moderator : Jacques Schwartzentruber(CTI)

We have found ! *3 key conclusions*

1) Except for a career change towards management, we lack precise information about the professional mobility of engineers, and the subsequent need for continuous professional training

2) Many engineering curricula prepare already fairly to get adequate life-long learning skills (bibliographic search, projects, research work ...)

3) Cost of continuous professional training is an issue (probably also for MOOC's), as well as company readiness to fund the courses

Let's elaborate a bit ... *conclusion n°2*

Some technical fast developing areas are more concerned by continuous professional training (information technology, eg; big data, communications...)

Recognition of prior learning and experience should be developed adequately

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Group 1 : life-long learning *(2/2)*

Moderator : Jacques Schwartzentruber (CTI)

We are still investigating ... *questions remaining open*

An international organization should investigate more carefully the professional mobility of engineers

New fields, such as social responsibility, entrepreneurship, are areas to promote, since they were not taught until recently in most engineering programmes

Divergences *points of disagreement*

Extent of connection between economical and academic world : are academic institutions able to meet the needs of companies in terms of continuous professional education?

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Group 2 : social and societal responsibility *(1/2)*

Moderator : Arnaud Reichart (CTI)

We have found ! *3 key conclusions*

1. Take into account societal issues and human factor impact : engineers must be aware of the direct impact of their decisions on employment, environment … and impacts are very often hard to guess

2. Define good pratices to link business and end-users needs

3. The right question is always "so what ?" : social responsability also means to find useful innovation addressing often non-explicit expectations

Let's elaborate a bit …

1. Organised experience return sharing after internships : very often, students prepare internships in depth, but share their experience only with a very small group and benefits are thus rather poor

2. Courses consistency against target competences : young engineers are socially more and more involved and have to develop new competences, e.g. with practical projects in Africa (EPFL)

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Group 2 : social and societal responsibility *(2/2)*

Moderator : Arnaud Reichart (CTI)

We are still investigating ... *questions remaining open*

1. Change management : a tool to keep up with market trends

2. New usage training : adaptation not only to technology but also to societal evolution

3. Deontology, whistleblowing, personal behavior : a balance between ethics and ruthless competition

Divergences *points of disagreement*

1. On issues : inside institutions, dilution of engineers education in humanities or culture set aside ?

2. Pedagogy consistency factor : company look-alike (i.e. project mode) or traditional academic approach

3. Personal behavior : to be a whistleblower or blindly faithful to your company

4. Coaching and mentoring : generally overlooked as considered a loss of power

5. Company and innovation management : will all engineers become managers ?

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Group 3 : leadership *(1/2)*

Moderator : Michael Milligan (ABET)

We have found !

3 key conclusions

1. A definition: leadership is about inspiration, vision, model behavior examples.
   Some students have a wrong conception of leadership.
   Management is out of our topics. It is not a compulsory talent.
2. Leadership can be captured. Students can be introduced, but not taught
3. Different styles of leadership are possible

Let's elaborate a bit ...

- A leader is not good at all situations. We don't know what is in-born or not.
  We have to explain to the students what is their capability to become a leader.
  Students can adapt to different situations and can succeed.
  A weakness: capacity of creating a vision. It is a target to develop.
- Leadership is not a learning outcome to check, but intellectual curiosity and persistence are.
  Leadership is not taught, but links with industry and the professions more generally (quality of internships, team building, and also identification by students of relevant examples in their fields of interest) give opportunities to detect, identify and develop leadership.
- Creativity and innovation are not the same. We are not the teachers of the university.

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Group 3 : leadership *(2/2)*

Moderator : Michael Milligan (ABET)

We are still investigating ... *questions remaining open*

- How to develop the capacity of creating a vision
- How to find assessors
- In-born leadership or not : synergistic roles of parents, schools, industry , professors

Divergences *points of disagreement*

- Should all engineers be managers? Should they necessarily become CEOs?

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Group 4 : Teamwork *(1/2)*

Moderator : Rochelle Williams (ABET)

We have found ! *3 key conclusions*

1.Teamwork capacities = *ability to effectively integrate and work in multidisciplinary projects*

2. Strategies put in place by institutions

- capstone experiences/projects, specially during the last years of the program (France & USA)
- non-formal/extra-academic activities : involvement in students associations, participation in NGO development projects, participation in inter-institutional contests, etc (France & USA)
- compulsory internship periods (France)

3. Assessment of the actual level of teamwork competencies achieved by the students is a major challenge both for institutions and quality agencies

Let's elaborate a bit ... *conclusion n°3*

- ABET has started to identify the different components of this competence (“attributes” or “rubrics”)
- Then, one must involve alumni and employers in the assessment of the actual level attained by students
- Other possible approaches : competence portfolios, peer assessment
- The nature of the institution must be taken into account to find the right assessment system

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Group 4 : Teamwork(2/2)

Moderator : Rochelle Williams (ABET)

We are still investigating ... *questions remaining open*

- What is the right balance between technical skills and soft skills?
- How to take into account the relationship between teamwork and the other softskills (leadership, etc) in order to design an effective curriculum?

Divergences *points of disagreement*

- None