A European Perspective on Engineering Education

Aalborg – 27 May 2014
Françoise Côme, Secretary General SEFI

www.sefi.be
SEFI is the largest network of higher engineering education institutions (HEIs) and educators in Europe
Founded in **1973** in K.U. Leuven by 21 universities and faculties of engineering

**SEFI is an international non-profit organisation under Belgian Law.**

**SEFI is based in Brussels**
Our mission

To support, promote and improve European Higher Engineering Education
+
To contribute to the improvement of the image of engineering education and of engineering in society.
Our objectives

• To formulate **ideas and positions** on engineering education issues
• To pursue a lobbying role to ensure **influence** in engineering education in Europe
• To develop and improve **communication** between all HEE partners:
  - students
  - teachers and academic staff
  - research orientated and practice orientated HEIs
  - related organisations, European and international bodies
  - enterprises
• To act as a **link** between our members and other organisations in Europe and in the world
• To contribute to the recruitment of good **students**
• To promote the development of the **international dimension** in HEE
Respecting the our Values

- **Creativity and professionalism**: in reaching the highest professional quality possible whilst encouraging creativity in our thinking, in our doing, in our learning and in our working.

- **Engagement and responsibility**: in achieving our aims and objectives and fulfilling our mission for the benefit of higher engineering education in Europe.

- **Respect for diversity and different cultures**: in cooperating with different regions all over the world, with specific social and economic settings, with different educational environments, and with different ways of thinking and communicating.

- **Institutional inclusiveness**: in involving all higher engineering education stakeholders, at individual, institutional, organizational and governmental level.

- **Multidisciplinarity and openness**: in being open minded and promoting exchanges across all engineering disciplines.

- **Transparency**: in cooperating in a good and open spirit.

- **Sustainability**: in working efficiently and effectively with technological achievements and with available environmental, economic and human resources, to the benefit of future generations.
SEFI, it is more than 40 years of

• dedication and services to European Engineering Education
• passion for European Engineering Education
• networking: from 21 founding members in 1973, to 415 in 2013, or approx. 158000 academics and 1,000000 students connected

SEFI is nothing but its members and the contributions from its members

415 members
(180 universities and schools of engineering) in 48 countries
Specificity: the diversity of our members

- **Institutions**
  Institutions of a high level (post secondary) that offer a complete curriculum leading to an academic engineering degree.

- **Individuals**
  Typically teachers of science or engineering + People engaged in international relations. Students / Retired engineers....

- **Corporates**
  Any industrial company, public administration or other organisation having an interest in supporting European Engineering Education.

- **Associations and related members**
  Professional societies or other organisations interested in initial or continuing education of engineers. Student organisations.

SEFI receives the support of its corporate partners:
SEFI in 2014 in Europe only

But we have also members in USA, Canada, Australia, Jordania, Korea, Taiwan, Nigeria, Egypt, Lebanon, Kazakhstan, Chile, Israël, Brazil, Mexico, Puerto Rico, Japan, China, South Africa ...

+ National Correspondents
To reach our objectives:

1. Working Groups

1. Curriculum Development
2. Continuing Engineering Education and LLL
3. Engineering Education and Mathematics
4. Engineering Education and Physics
5. Engineering Education Research
6. New educational technologies and ICT
7. Diversity and Gender in Engineering Education
8. Ethics in Engineering Education
9. Attractiveness of Engineering Education
10. Quality Assurance and Accreditation of Engineering Education
11. Sustainability in Engineering Education

With numerous workshops organised on problem solving, effective collaboration, active learning, changing the EE paradigm...
2. Committees and Task Forces

- Global Partnerships Standing Committee
- University-Business Cooperation Standing Committee
- Cooperation with students Standing Committee
- The European Engineering Education Journal Committee
- Web Committee

Just created on 21 May: TF on Engineering Skills
3. Annual Conferences

- 1973 ... 2000 (please refer to our web site)
- New Engineering Competences - **Changing the Paradigm** (Copenhagen 2001)
- The Engineer of the Renaissance (Florence 2002)
- The Global Engineer: Education and Training for Mobility (Porto 2003)
- The Engineering Education at the Cross Roads of Civilizations (Ankara 2005)
- **Engineering Education and Active Students** (Uppsala, 2006)
- Joining Forces in Engineering Education towards Excellence (Miskolc 2007)
- Quality Assurance, Employability and Innovation (Aalborg 2008)
- Attracting Young People in Engineering. Engineering is fun! (Rotterdam 2009)
- Diversity Unifies- Diversity in Engineering Education (Trnava 2010)
- Global Engineering Recognition, Sustainability and Mobility » (Lisbon 2011) in the context of the First World Engineering Education Flash Week
- Engineering Education 2020: Meet the Future (Thessaloniki, 2012)

+ Workshops on PBL during those conferences
2014 SEFI Annual Conference
University of Birmingham (UK), 15-19 September

« Educating Engineers for Global Competitiveness »

sefi2014.com – 300 participants

- Early registration deadline: 30/6/2014
- 156 accepted papers from 29 countries
  - 12 on research methods
  - 27 on curriculum development
  - 19 on active learning
- + workshop on EER
As the economic crisis begins to ease and a number of countries begin to see growth, many will look to engineering to help accelerate this recovery.

Engineering educators need to both share ideas of effective practice in preparing future engineers but also to anticipate future challenges. The annual SEFI conference, provides an excellent opportunity for educators, students, policy makers and industry to meet, debate and consider future directions.

As a major research and education university, the University of Birmingham is delighted to be hosting the SEFI 2014 conference in collaboration with SEFI member institutions in the UK.

Join us to learn, share and influence in September 2014.

Professor Kamel Hawwash, President of SEFI

15th - 19th September 2014
University of Birmingham, UK
4. Publications
- Exists for 29 years
- Major scientific publication the field
- 39 members in EB (9 non-European)
- Bi-monthly since 2006
- E. de Graaff as Chief Editor
5. Cooperation

I. European cooperation

- Official relations Council of Europe
- Regular relations with the European Commission
- Founding member in Europe of
  ENAEE - European Network for the Accreditation of Engineering Education
  EEDC - European Engineering Deans Council
- Permanent contacts in Europe with FEANI, CLAIU, EFMD, EUA, CDEFI, RAEE, CESAEER, SEII, ...

EU Projects

- QUEECA
  Submitted in April:
  ERASMUS +
  1 Knowledge Alliance
  2 Strategic partnerships
II. International cooperation

SEFI is founding member IFEES, the International Federation of Engineering Education Societies (2006)

And together with IFEES of

International Institute for Developing Engineering Academics (2011)

Official relations with UNESCO
Regular contacts with OECD

And with many other organisations such as

- ASEE: American Society for Engineering Education (plenary session at ASEE IF, June 2014)
- GEDC: Global Engineering Deans Council (joint workshop in WEEF 2015, Florence)
- IGIP: International Society for Engineering Pedagogy
- RAEE: Russian Association for Engineering Education
- RCI: Réseau Carthagène d’ingénierie
- JSEE: Japanese Society for Engineering Education
- KSEE: Korean Society for Engineering Education
- CAEE: Chinese Association for Engineering Education
- LACCEI: Latin America and Caribbean Engineering Organisation …
6. Specific activities

• ECED: European Conventions for Deans in Engineering
  “Educating engineers for a connected world” 2-3 April 2014, Lund
  To come on 28-30 March 2015, Universidad Politecnica de Valencia

• SEFI Debates
  7 April 2014:
  “EE Facing the Challenges of the Crisis in Europe”

To come next November, Debate on Entrepreneurship, Brussels
7. Awards

• **SEFI Leonardo da Vinci Medal**

  *The Leonardo da Vinci Medal is the highest distinction SEFI can bestow. The Medal is awarded by the Administrative Council to living persons who have made an outstanding contribution of international significance to engineering education.*

  **2013 Medal to Frank de Winne**

• **SEFI Fellowships**

  *The SEFI Fellowship Award recognises meritorious service to engineering education in Europe. The nominees are in principle SEFI individual members who have worked in the field or in the promotion of engineering education for at least the previous five years.*

• **Best (student) papers at SEFI Conference**

• **SEFI Prize for the best PHD Thesis in Engineering Education**

• **F. Maffioli – SEFI Award for Students active in EE**
Towards the future

Themes for the next five years

• **Attractiveness**, in making a major contribution to the attractiveness of engineering to potential students at all levels

• **Education and Skills / Employability**, in ensuring the best preparation of graduates for the European and worldwide employers whilst supporting the improvement of a more coherent EE processes.

• **Capacity building** to reshape EE and contribute to the development of guidelines facilitating the **mobility** of graduates and students (accreditation/quality) in Europe and in the world.

• The **new technological context** and its consequences for engineering education (e-learning, open and on-line, cyber security and data protection; MOOCs,...).

• **Engineering education research** to underpin the development of new educational practices and technologies to support the continued development of engineering education.
Conclusions

- **Community of practice** of engineering educators and EE partners
- Specific **European dimension** in our work: issues tackled by our members, while possibly global, originate from challenges faced by European engineering educators and institutions
- **Influence engineering** education Europe
- **Diversity** of stakeholders
- **Voluntary** work
- European and international **cooperation** and **joint events/projects**
- Conference 2014: 15-19 September, Birmingham UK
- Conference 2015, 28 June-1 July, Orléans, F – Conference 2016, Mid-September, Tampere, FIN
- **PBL on the agenda for years and remains a priority for the future**
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