SEFI
European Society for Engineering Education
Europäische Gesellschaft für Ingenieur-Ausbildung
Société Européenne pour la Formation des Ingénieurs

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European Convention for Engineering Deans - Leuven - 26-28 May 2019

Challenges in University Business Cooperation in Engineering Education: Crossing borders

The 2019 Engineering Deans Convention (ECED 2019) will focus on both the strategic and practical modalities of university business cooperation in engineering institutions. From an education point of view, this cooperation has been conceptualized all too often as a hard border between two separate worlds. At the ECED 2019 convention, our aim is to shed light on this hard border analogy. Are we really dealing with two separate entities, each with its own operational mode, or is there a large grey area where both entities meet and exchange ideas, knowledge and human capital?

More specifically, we will explore multiple dimensions of this border concept. For example, from a student perspective, this border is often perceived as a unidirectional temporal border wherein industry employment is the logical capstone of their educational career. However, this border could also be conceptualized as a hybrid constellation wherein (1) faculty staff collaborate with business professionals in terms of research projects or temporary work inside a company to gain business experience (outgoing mobility), and (2) business professionals take an active role in university education of future generation engineers (incoming mobility). Ironically, the incoming-outgoing dichotomy reverses when considered from the other side of the border (e.g., from a business perspective, a visiting academic is labeled as 'incoming'). Finally, from a curriculum perspective, parties on both sides of the border need to agree, at least to a certain extent, on the key and peripheral content of the engineering curriculum. Determining who is predominantly responsible for teaching specific technical and professional skills ideally happens in a meaningful dialogue between both parties. At the 2019 ECED convention, we will explore these multiple perspectives in greater detail.

1. Crossing the border: Towards a meaningful student experience

For many students, industry/business experience is a golden opportunity to get a first-hand experience of what it really means to be an engineer and how to translate academic knowledge into practice. However, the practical and strategical configuration is predominantly in the hands of engineering institutions. In student-focused sessions, a number of issues will be addressed:

- Which learning formats are most suited to serve this purpose (e.g., internships, guest lectures, company visits, in-house project work, etc.)?
- As engineering institutions, do we (1) provide on-campus education with an internship in industry (to gather working experience); (2) do we cross this border by fully shaping our courses based on an active pedagogical approach, such as PBL; or (3) is the context-based CDIO methodology the best answer?
- How do we practically involve business professionals in educating engineering students? How do we define separate responsibilities in the learning process?
- How can we cope with the requirements of academic teaching and didactics and avoid just doing the usual training on the job?
- How do we jointly give rise to a state-of-the-art evaluation of student performance?

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2. Crossing the border: Career mobility of faculty staff and business professionals
As engineering education institutions, are we striving for hybrid faculty staff who are perfectly able to function in both an academic and professional field environment? Conversely, how can professionals blend in to an academic environment? In these sessions, we will tackle the strategic implications in terms of incoming and outgoing career mobility.

A. Outgoing mobility of academic staff: Exploring the outer world of the *Alma Mater*

- Do we impose (minimal) criteria regarding industry experience for young faculty staff? What are the KPI's in this respect for tenure track positions?
- How can we include business experience in the promotional scheme of faculty staff?
- How do we define industry experience (e.g., joint research projects with industry, a full time employment inside industry for a dedicated period, etc.)?
- How do we stimulate more experienced faculty staff to engage in university-business collaboration activities?
- How do we deal with fundamentally different performance criteria within academia and industry?

B. Incoming mobility of business professionals: Climbing the ivory tower

- How do we successfully attract business professionals into engineering education and how should we structurally embed them within the academic structure (e.g., contracts, legal statute, etc.)?
- How to overcome financial obstacles in attracting experienced business professionals?
- How do we match research output requirements of universities with a lack of research experience of business professionals (e.g., publication gap)?

C. The academic PhD: Lost in limbo or a perfect start to a career in industry?

- How do we as universities justify the academic PhD/doctorate as a full career path?
- Is an academic PhD/doctorate merely a runway for an academic career or what is the added value for the labor market?

3. Crossing the border: The engineering curriculum in co-creation
The modern-day labor market is characterized by increasing degrees of complexity wherein different engineering disciplines are more and more intertwined. This calls for more multidisciplinary collaborations (1) between different engineering disciplines and (2) with other disciplines outside of the engineering field.

- Is the division of education programmes in separate engineering disciplines (i.e. similar to classical engineering departments) still valid? Are we ready for the future or are our internal structures unwanted for future education? Within academia, are we evolving too slowly?
- What are the pitfalls in developing interdisciplinary programmes?
- Should professional skills training encompass an integral part of the future engineering curriculum? If so, who is in charge of professional skills training?