CESAER
conference of european schools for advanced engineering education and research

Technical University of Munich

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

SEFI & CESAER Convention Paper

The Munich Message

Key statements from a leadership dialogue amongst deans, directors and department heads of engineering institutions following the **Valencia Vision** and the **London Agenda**

September 2017

The Munich Message

The 9th European Convention for Engineering Deans, Department Heads and Directors (ECED³ 2017) was hosted by the Technical University of Munich from the 3rd to the 4th of April 2017. ECED³ is the European networking event of the year for the leaders of engineering education institutions. The convention is organized by CESAER (Conference of European Schools for Advanced Engineering Education and Research) and SEFI (European Society for Engineering Education). It brings together leaders to discuss current issues and trends in engineering education and research.

Framework for European Convention for Engineering Education

The first ECED was held in Florence in 2005, and the convention has now become the annual leading event for the community of leaders of engineering education and research institutions in Europe. It is an assembly of delegates who discuss and take action on matters of common concern. This showed itself very clearly at the 7th European Convention of Engineering Deans (ECED 2015) which was held at the Universitat Politècnica de València (UPV). Here, the organizers developed a forum for the in-depth discussion of "hot topics" raised by participants themselves. The emphasis for the organizers was how the participants would experience the convention: it should be worth their time and be directly relevant for their function at their home institutions. This made the ECED a convention with a purpose – a vision, which is to give tangible benefits and value to the delegates on how to execute their responsibilities as leaders of engineering research and/or education institutions.

The Valencia Vision and the London Agenda

The Valencia Vision is an ambition for leadership dialogue and stipulates a continuous process for the ECED that nourishes the agenda, discussions and outcomes of future meetings. The Valencia Vision follows a cyclic process of four steps: First step, pre-convention; gauging the current situation and directing themes and topics from possible participants for the coming convention. Second step, the convention; applying all sorts of formats to enhance dialogue, e.g. mediator-lead parallel group discussion sessions with rapporteurs, summing sessions and plenty of networking opportunities with feed-back sheets to organizers. No traditional lengthy keynotes are allowed! The time is better allocated for questions and discussions with invited speakers as in the "flipped classroom sessions", where the speaker produces a 5-10 min video in advance (such as a YouTube video) in order to go "fast-forward" to discussion and debate, because all delegates have watched the podcast the night before. Third step, post-convention; the organizers will write, edit and publish a brief communique which is true to the sentiment and general opinion of the meeting. The ECED in Valencia opened a debate around three main issues that lie at the heart of engineering institutions: Teaching & Learning in the digital era, innovative Research & PhD Education, and effective Management in the struggle between operational responsibilities and strategic change. These core issues were further developed in the "London Agenda" set out during ECED 2016 held at University College London (UCL), which created the conditions for the successful discussions at ECED 2017 at the Technical University of Munich (TUM), where this "Munich Message" was developed. Fourth step, between conventions delegates are encouraged to network, take action and collaborate on matters of common concern, where the shared benefits are obvious and clearly exceed the individual effort. One forum for continuing such an on-going dialogue is the European Engineering Deans Council, EEDC, which is an executive-level council under the auspices of SEFI.

Target audience

This convention paper is intended for both internal and external stakeholders. Internal stakeholders are colleagues and leaders of engineering education and research, whom we would like to include in our community of leadership dialogue and use this as a basis for further development. External stakeholders are policy makers, who are responsible for the legislative framework of engineering education and research – and also to a large extent its funding. In addition, ranking civil servants and administrators are considered as external stakeholders with whom we would like to have continuous discussions based on this document.

Three focal points

At its conclusion, ECED 2017 produced a list of three focal points as a first draft of this paper – the Munich Message. The draft was subsequently revised by members of SEFI and CESAER, and it is presented here as a set of statements, that are true to the output of the Convention. The Munich Message is focused on three issues:

I. **Schools of Engineering face major challenges in teaching and research!**
II. **Accreditation of study programs must respect its limits!**
III. **Governance structures at universities present major challenges!**

For each focal point, there are a few bullet points that express the general opinion of delegates. However, this reflects the current status of the ongoing leadership dialogue and should not be seen as the general consensus of delegates in the different engineering schools, where the delegates come from.

Focus I: Schools of Engineering face major challenges in teaching and research!

- **Engineering programs have to teach core competencies for still unknown future challenges and at the same time make new scientific insights available to society.** The development of future professional profiles and what/how to teach require processes for continuous updating and critical self-reflection. The basis of this is robust quality management, and solutions to overcome obstacles when crossing boundaries. These boundaries are made by organizational structures and by traditional subject cultures. This also requires a pro-active discussion with external stakeholders and industry. This discussion has to make clear that the university´s responsibility for its graduates is of long timescale and focused on competencies, that enable them to solve problems in a large variety of contexts. This might be considered in conflict with the immediate needs of industry, as these often are focused on specific and shorter term skills.
- **Engineering professors have to do more than just teaching.** Professors at Schools of Engineering have to prepare their students for their profession, providing them also with the necessary attitudes, by treating them at eye-level as future engineers, giving space for open innovation and reflection and motivating responsibility by trust, rather than preparing them to execute well-defined tasks in bite-sized pieces.

Focus II: Accreditation of study programs must respect its limits!

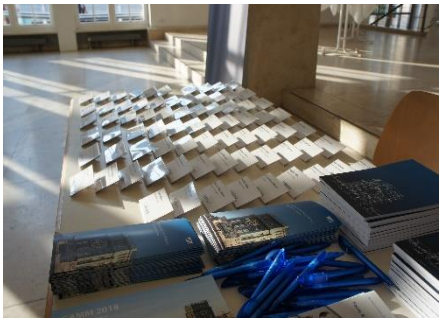
- **Accreditation has to clearly focus on the processes and not on the products.** The subject of accreditation processes is the quality management system at the institutional level and not the specific contents of the programs. Formats, processes and structures of education are under complete and exclusive authority of the universities. This is a prerequisite for innovative engineering education.
- **A forced compliance of study programs with Training Frameworks imposed in a legalist approach would be a severe obstacle for the transfer of modern scientific insights to society and interfere with academic freedom.** As a general principle, the education of student engineers and the licensing of professional engineers are distinct and should not be mixed. It follows that the education of the student engineer should come first, and that licensure processes have to build on the qualifications provided by the university and not vice versa. Licensing of specific types of professional engineers requires a period of professional experience after graduation, considering the professional environment and perhaps be based on criteria described in Sectoral Qualification Frameworks developed in close cooperation between universities and external stakeholders. Acknowledging the difference between academic education and professional experience, there is no need for Common Training Frameworks.

Focus III: Governance structures at universities present major challenges!

- **Universities bring the best brains together, creating an enormous multidimensional space, also making micromanagement impossible.** However, brain is not necessarily linked with leadership skills. Leadership skills have to be fostered and developed at all levels in universities, taking the diversity of talents into account and accepting the depth and breadth respectively of individuals. The university system has to give space to the principle of subsidiarity, so that decisions can be prepared, taken and promoted where the greatest expertise and professional competence lie. Governance has to take a holistic view that crosses the borders of departments and promotes a continuous rethinking of departmental delimiters and professional profiles. Leaders have to assess how far the input of external stakeholders is consolidated and substantial, and should also consider the underlying motivation of such input.

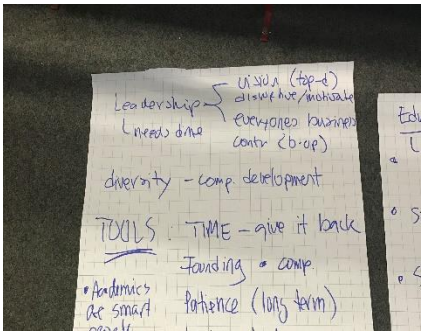
Conclusion & Next Steps

The Valencia Vision was the recognition that engineering deans, department heads and directors are part of a continuous process to explore the three key issues of teaching and learning in the digital era, innovative research and PhD education, and effective leadership and management in the struggle between operational responsibilities and strategic imperatives. These were codified as questions within our London Agenda. The Munich Message sets out key points identified for the future agenda of engineering institution leaders. CESAER and SEFI intend to support this informed discussion and process that will continue when we meet in Trondheim at NTNU in 2018. We urge you to become part of this important process!







ECED^3 2018

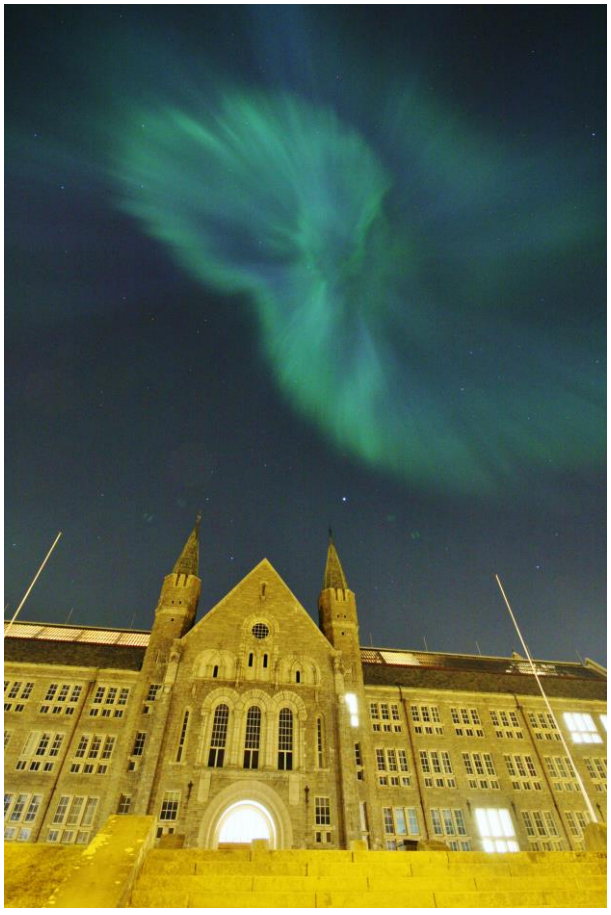
10th European Convention for Engineering Deans, Department Heads and Directors

A university leadership dialogue

27-29 May 2018 at NTNU in Trondheim, Norway

CESAER and SEFI would like to consolidate this meeting as ***the event of the year*** for leaders of engineering institutions, schools, departments and universities. We are looking forward to continuing our leadership dialogue in Trondheim, Norway. Preparations are ongoing. Please do not hesitate to contact CESAER or SEFI if you would like to learn more about the next convention. Info will be displayed on our homepages:

- CESAER: http://cesaer.org/en/home/
- SEFI: http://www.sefi.be/
- NTNU: http://www.ntnu.edu/



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- Left: Maxime Landrot / NTNU Kommunikasjonsavd.
- Top right: Erik Børseth, Synlig design og foto as / NTNU Info
- Bottom right: Kai T. Dragland, NTNU

The Conference of European Schools for Advanced Engineering Education and Research (CESAER) is a not-for-profit international association of fifty-one leading doctorate-granting comprehensive and specialised universities of science & technology from twenty-six countries. We stand for scientific excellence in scientific engineering education and research, and the promotion of innovation through close cooperation with industry in order to ensure the application of cutting-edge knowledge in business, industry, public services and society. CESAER maintains and promotes the highest quality standards. CESAER's mission is to:

- serve as a close network and platform for mutual learning of universities science & technology;
- contribute proactively to European developments by conducting a permanent dialogue with and influencing European institutions and stakeholders;
- inspire reflections and policy decisions of stakeholders at European and national level;
- foster public understanding of the role of science & technology in societal and economic development considering the principles of sustainable development.

NTNU, the Norwegian University of Science and Technology, creates knowledge for a better world and solutions that can change everyday life.

NTNU has the main responsibility for higher education in technology in Norway, and it is the country's premier institution for the education of engineers. The university offers several programmes of professional study and a broad academic curriculum in the natural sciences, social sciences, teacher education, humanities, medicine and health sciences, economics, finance and administration, as well as architecture and the arts.

NTNU has four strategic areas of research in 2014–2023: NTNU Sustainability, NTNU Energy, NTNU Oceans and NTNU Health. Biotechnology, ICT and nanotechnology are NTNU's strategic initiatives in enabling technologies during the period 2011–2020.

NTNU has an extensive international network with NTNU offices in Tokyo and Brussels (together with the University of Bergen and SINTEF).

The European Society for Engineering Education (SEFI) is a non-profit international association of 350 institutions of higher engineering education, rectors, deans, professors and students, corporate partners and partner engineering organisations, of 48 countries. Since its creation in 1973, SEFI stands for scientific excellence in engineering education and the improvement and innovation of engineering education through active cooperation with all the engineering education stakeholders. This diversity of SEFI's membership is the specificity of SEFI in Europe. To reach our mission that is to,

- contribute to the development and improvement of engineering education and encourage the creativity at all levels of engineering education,
- promote and circulate information about engineering education in Europe and in the world,
- improve the communication and exchanges between all the engineering education stakeholders whilst encouraging the multidisciplinary and openness,
- reinforce the university-business and student cooperation,
- reinforce the image of engineering and the importance of engineering education in society,
- represent its members and inspire policy decision makers at European and regional levels,

SEFI organises annual scientific conferences, European debates, workshops and seminars, notably in the context of its working groups and special committees, publishes a bi-monthly scientific journal, a monthly newsletter, position papers, reports, coordinates and participates in EU projects whilst maintaining regular contacts with the European Union bodies, UNESCO, Council of Europe and partner organisations in Europe and in the world. SEFI also organises special activities for engineering deans, notably through its ad hoc Council (EEDC).

This paper was finalised under the lead of:

- Prof. Dr.Ing. Gerhard Müller, Senior Vice-President for Academic and Student Affairs, Technical University of Munich (TUM)
- Prof. Dr.Techn. Mads Nygård, Dean of Engineering Education, Norwegian University of Science and Technology (NTNU) and Earlier Vice-President of CESAER
- Prof. Dr. Martin E. Vigild, Senior Vice-President and Dean, Technical University of Denmark (DTU) and 28th President of SEFI
- Prof. Dr. Mike Murphy, Director of Digital Campus & Learning Transformation, Dublin Institute of Technology (DIT)
- Prof. Dr. Luis Manuel Sánchez Ruiz, Director of Research & Innovation Programs Area, Technical University of Valencia (UPV)

Photo accreditation:

- Pages 1 & 3: TUM
- Page 5: TUM, SEFI, CESAER & NTNU
- Page 6: NTNU

We would like to thank all the conference delegates who made the discussions and plenaries so exiting and worthwhile.

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Technische Universität München, Arcisstraße 21, 80333 München - www.tum.de - ECED2017.bma.bgu@tum.de
CESAER Office, Kasteelpark Arenberg 1, 3001 Leuven (B) - www.cesaer.org - info@cesaer.org
SEFI Head Office, 39 rue des Deux Eglises, 1000 Brussels (B) - www.sefi.be - info@sefi.be