Detailed programme
Sun, Sep 17, 2017

10:00am

Transnational Meeting readySTEMgo project (by invitation only)
⏰ 10:00am - 4:45pm, Sep 17
📍 Meeting Room

1:00pm

WA11 - Workshop "Publishing in an engineering education research journal"
⏰ 1:00pm - 3:00pm, Sep 17
📍 Room C

Workshop "Publishing in an engineering education research journal" organized by the SEFI WG-EER and facilitated by Bill Williams and Jonte Bernhard. Participants should bring their own laptop if they have one!

WG1 - SEFI Open and Online Engineering Education WG meeting
⏰ 1:00pm - 2:00pm, Sep 17
📍 Small Auditorium

WG2 - SEFI Engineering Skills WG meeting
⏰ 1:00pm - 2:00pm, Sep 17
📍 Room A

WG3 - SEFI Continuing Engineering Education and Lifelong Learning WG meeting
⏰ 1:00pm - 2:00pm, Sep 17
📍 Room B

2:00pm

WG4 - SEFI Ethics in Engineering Education WG meeting
⏰ 2:00pm - 3:00pm, Sep 17
📍 Room A

WG5 - SEFI Attractiveness of Engineering Education WG meeting
⏰ 2:00pm - 3:00pm, Sep 17
📍 Room B
WA1 - Workshop "Increasing interactivity in lectures"

Predrag Pale ABSTRACT Perhaps the only thing that e-learning has problems to replace from traditional education are lectures. Some people believe that lectures are the epitome of education, while others believe they are a relic. Still, the average student, throughout the human history, probably experienced much more boring and useless lectures than the exciting ones. The most important property of live lectures, in comparison with all other educational tools and methods as well as in comparison with lecture’s stepbrother – recorded lecture, is interactivity: the ability to ask and answer questions. The true interactivity is bidirectional: both the lecturer as well as the audience can, and should, ask and answer questions. The workshop will deal with questions like: why is there so little interactivity in live lectures? How to overcome students’ problems which prevent them from asking and answering questions? How to overcome teacher’s problems? Which other methods improve interactivity beside Q&A? How can information technology be used to improve interactivity of live lectures? Is there a way to make e-learning interactive? How to substitute or simulate interactivity in recorded lectures? The aim of the workshop is that each participant carries away at least one useful idea, method or tool which she or he can use immediately in their practice. The workshop itself will be conducted in a highly interactive manner leveraging most of the techniques and methods that will be discussed. It will use an equilibrium of traditional methods to foster interactivity as well as technical tools.

WA3 - Workshop "Attractiveness of engineering profession in Europe"

Klara Kövesi and Katriina Schrey-Niemenmaa ABSTRACT There is no doubt that the public perception of the work and profession of the engineer has an important influence on the attractiveness of engineering education and young peoples’ professional choices. However, the image of engineers differs widely among European countries and varies from very positive (e.g.: in Finland) to respectful (e.g.: in Deutschland) and prestigious (e.g.: in France) to a less glamorous (e.g.: in the UK). This large diversity in the social perception of engineers is not surprising as it is derived from the very different historical, cultural, economic and social contexts in which engineering education developed in each country. In this workshop, we would like to discuss and share knowledge in order to better understand the social perception of engineering work and profession (e.g.: its usefulness, its social status, the associated stereotypes…) in the different European countries. To what extent do these images contribute to the attractiveness of engineering? How is the work and profession of the engineer perceived by young people? What things attract and repel them? The main objective of this workshop is to explore these questions in an international and multicultural setting and to confront the different points of views of the participants, aiming, through contrasts and comparisons, to attain an across-the-board overview of the image of the profession. The workshop will allow the participants to exchange their views and ideas about the perception of engineering work and profession in their country and compare them with those views dominant in other countries. We hope to develop a prolific discussion to improve our understanding and knowledge about this subject, which as of present has received very little attention in the literature. In order to achieve our objectives, we have planned a five-stage workshop organization process based on the participants’ teamwork. The results of this workshop will give us a broad panorama which will take into consideration the country-specific contexts of
engineering work as seen from varying economic, social, cultural and educational perspectives. Also, it will hopefully give us an indication of ongoing tendencies and generate emergent ideas for improving the attractiveness of engineering profession for the younger generation. As work of the SEFI WG of Attractiveness in Engineering Education, this workshop aims to build foundation for future projects concerning motivation and needed talent/competence profile of students.

WG6 - SEFI Engineering Education Research WG open meeting

- 3:00pm - 4:45pm, Sep 17
  - Room C

4:00pm

Coffee Break

- 4:45pm - 5:15pm, Sep 17
  - Foyer

5:00pm

SEFI Board of Directors Meeting and WG Chairs Meeting (by invitation only)

- 5:00pm - 7:00pm, Sep 17
  - Room A

7:00pm

SEFI meets the new Comers

- 7:00pm - 8:00pm, Sep 17
  - Room A

8:00pm

Get together dinner BOD (by invitation only)

- 8:00pm - 10:00pm, Sep 17

Mon, Sep 18, 2017

9:00am

Opening session

- 9:00am - 10:00am, Sep 18
  - Auditorium
Plenary session I - Educating for a changing world: New challenges for Engineering Schools

10:00am - 11:00am, Sep 18
Auditorium

Educating for a changing world: New challenges for Engineering Schools

Over the last few years, many societal changes affected the context where Engineers and Engineering Schools live. A growing need for Environmental sustainability in processes and products, Digitalization of Economy and Society, Globalization, just to consider the most important emerging issues, are affecting the way engineers operate and the way they must be educated and trained. The lecture will outline the consequences of these changes on the expected output of engineering Schools (i.e. competence and skills required) and their actual input (i.e. the competence and skills of new freshmen), deriving some consequences for the contents and process of engineering education.

Speaker:

Giovanni Azzone
Full Professor, Politecnico di Milano

Coffee Break

11:00am - 11:30am, Sep 18
Foyer

WA5 - Workshop "Demonstration of the Engineering Education Research to Practice Cycle Using a Cyberlearning System for Environmental Education and Research"

11:30am - 1:00pm, Sep 18
Room A

Vinod Lohani and Debarati Basu Abstract

In this presentation, the authors will share their experiences of developing and implementing a cyberlearning system called the Learning Enhanced Watershed Assessment System (LEWAS) at Virginia Tech (VT), USA. The LEWAS is an environmental monitoring system that monitors water (quality and quantity) and weather data using sensors from an urban watershed that includes VT campus. The development and enhancement of the LEWAS follows the innovation cycle of educational research and practice. This system enables users to visualize and access the high frequency (1-3 min.) historic and real-time LEWAS data using a system called the Online Watershed Learning System (OWLS: http://www.lewas.centers.vt.edu/dataviewer/) for research and education. As of this writing, the OWLS/LEWAS has been implemented in 26 courses, across 8 academic institutions in 3 countries. Three PhD and six Masters level research projects have been completed using the LEWAS data. Recently, a user-tracking system with log-in functionalities is built on the OWLS to analyze the learner-specific pathways for solving an environmental problem using the OWLS, thus allowing the evaluation of the individual learning and engagement within this cyberlearning.
system. This work is targeted at advancing personalized learning in the context of environmental monitoring and is related to one of the 14 Grand Challenges advocated by the U.S. National Academy of Engineering. In spring 2017, the OWLS with the user-tracking system was implemented in two sections of a junior level course on “Monitoring and Analysis of the Environment” at VT. A total of 26 students participated in the study, and completed an in-class OWLS-based environmental monitoring task along with a post-survey. The task was graded with a rubric to understand their actual learning, while the post-survey was used to collect data on their perceived learning, and their perception towards the various components of the OWLS. The user tracking system used a database to collect individual student’s actions with timestamp that provided information for approximating the level of engagement within the OWLS. Analysis of the data showed that students found the OWLS to be an effective leaning tool for environmental monitoring education with an average perceived learning value of 5.27 out of 6. The user tracking data described differences and similarities in learning behavior among students (males vs. females and various ethnic minorities) when using the OWLS for an environmental monitoring task. Additional results will be shared in the presentation. Lastly, the attendees will be invited to participate in a "live" demonstration of the LEWAS/OWLS to explore their interests.

WA2 - Addressing Attrition: Changing Students’ Futures: A Problem-Based Workshop

安く 11:30am - 1:00pm, Sep 18
 Auditorium

Jane Andrews; Rebecca Broadbent; Robin Clark  Workshop Aim To provide colleagues with a framework for tackling student attrition at institutional level. Rationale Starting with the research question “How can we reverse the negative impact of failure on engineering students’ futures?”, this workshop focuses on student attrition. It builds on the emergent findings of a five year Action-Research Project which aims to directly tackle student attrition by identifying and addressing the socio-pedagogy of failure and by putting in place and testing a series of solutions. Workshop Outputs Participation in the workshop will provide colleagues with the means by which they will be able to develop a bespoke approach to attrition which may be applied at an institutional level. Workshop Format Building on previous research to critically examine the issues underpinning failure and attrition, the workshop will involve small group activities and interactive discussion. It will a ‘problem-based’ approach and will comprise four distinctive stages: Stage 1: Introduction – What is the problem? Working in small groups colleagues will consider the issues around attrition and failure at an institutional level. By working in international groups from different institutions colleagues will be able to gain an international perspective of the various issues. Three distinctive factors underpinning attrition will be considered: Student failure: Individual engagement & attitudes: Socio-economic barriers. Stage 2: Study Support – What are the academic issues? Taking a cross-disciplinary perspective, colleagues will be encouraged to identify the main ‘study’ based problems in their institutions. Using examples from Maths and Study Skills, the workshop will look at different mechanisms for addressing such problems; whereupon colleagues will be have the opportunity to consider how to begin to develop similar resources for use in their own institutions. Stage 3: Non-Study Related Support – What non-academic difficulties do students face? The workshop will then turn to individual / socio-economic causes of attrition. It is anticipated that the participants’ different organisational and cultural perspectives will result in a rich discussion that will form the basis of future interventions. Stage 4: Plenary The plenary will bring together all of the discussions and outputs from the first three stages, identifying the main problems and considering what the solutions should be. Colleagues will leave with a ‘plan of action’ for addressing attrition at an institutional level.

WA4 - The Online Learning HUB: a tool for teachers to develop and run online courses
Jan-Paul van Stealduinen and Pieter De Vries

ABSTRACT

The Online Learning HUB ([https://onlinelearninghub.tudelft.nl](https://onlinelearninghub.tudelft.nl)) is a platform and community to support the development of open and online education. The HUB is created by the Delft University of Technology (TU Delft) with the purpose of supporting staff members in developing good quality open and online education. The HUB helps to structure the course development process, makes the support more consistent, open and accessible, and is embedded in TU Delft's Education Quality Cycle. The aim of the workshop is to explore, test and reflect on the online HUB service for staff development in higher education institutions that produce (or plan to) and execute online and open education, keeping their staff aligned with the latest developments in the field. The model will be accessible for all after the workshop and can be implemented by each individual higher education institution, and connected into a network of institutional models that might speed up the development of open and online education in Europe and worldwide.

INTRODUCTION

This workshop will present and open up the Online Learning HUB and aims to let all participants explore, test and reflect on an online HUB service for staff development, for higher education institutions that produce (or plan to) and execute online and open education, keeping their staff aligned with the latest developments in the field. The model can be implemented by each individual higher education institution, and connected into a network of institutional models that might speed up the development of open and online education in Europe and worldwide.

1.1 Objectives of the workshop

- Explore, test and reflect on the Online Learning HUB as a tool to support the development of online courses;
- Conceptualize a HUB for their own context / institution;
- Compare to their current way of working and discuss the added-value of a HUB.

1.2 Justification of the importance/currency/need for the proposed workshop

Online education is considered critical to the long-term strategy of Higher Education (HE) with consequences for the current professional development policy. While online learning has continued to increase, professional development opportunities for online educators have not been able to keep pace. At the same time most lecturers at brick-and-mortar universities don't have any experience in online teaching and online learning. Improved professional development strategies are needed to facilitate and support faculty to cope with these demands. Therefor TU Delft Extension School developed the Online Learning HUB ([https://onlinelearninghub.tudelft.nl](https://onlinelearninghub.tudelft.nl)), a platform and community for staff development that supplies operational support for the production of open and online education that complies with quality standards. The purpose is to promote learner-centered professional development which involves teachers (developers, course teams, i.e.) as active and reflective participants.

1.3 Format of the session (provisional agenda)

1. Introducing presenters and participants
   - Why a HUB and how is it used?
   - General HUB setup - challenges
2. Create your own HUB
   - Discussion
   - Wrap-up, feedback and follow-up
3. Presentation format
   - Participants will be introduced to the Online Learning HUB and be able to explore its structure and content using their own device, engaging in tasks provided by the presenters. In the second part of the workshop, active participation will be required to conceptualize a new or adapted HUB to their own context/institution, discuss in small groups and in the end present their ideas to all participants and receive feedback. It is possible to have virtual participants. We can send the presentation and activities (challenges and design template) to virtual participants interested in our workshop. They will be invited to share their products on social media during the workshop. Results/activity will be shared live on social media.
4. Outcome measures
   - The outcome of this workshop will be: To understand the HUB concept as a new way to support staff development;
   - To understand the HUB as a tool for the development of open and online courses;
   - Develop a first concept for a personalized Online Learning HUB, adapted to the participant's own context / institution and sketched in a canvas template.

We also expect to gather feedback and ideas to further develop the existing HUB and start collaborating with partners interested in the concept.
Kseniya Zaitseva and José Carlos Quadrado AIM Develop in an international and multidisciplinary environment, personal characteristics essential in the field of Interdisciplinary Project Management: a sense of responsibility, critical attitude, decision-making ability and integrated problem handling. Within the workshop the current state of interdisciplinary environment will be evaluated, followed by an open discussion of key obstacles on the way to resolving the problem, resulting in practical recommendations how to create and develop an interdisciplinary environment at universities. Types of activities: problem-driven rather than theory-driven, requiring participants to be active and participatory. Small-scale training and intensive cooperation: active interaction in the framework of individual and team work.

Outline
Introduction
Expert evaluation of interdisciplinary environment development (individual task)
Criteria to evaluate the level of interdisciplinary environment development (teamwork)
Barriers to develop interdisciplinary environment at university (discussion)
Recommendations on how to enhance interdisciplinary environment at university (teamwork)
Actions and potential projects to implement recommendations (individual task)
General comments and conclusions

WA8 - Employability of Engineering Graduates

Maarten Pinxten ABSTRACT PREFER project Engineering graduates frequently display (1) a lack of transversal skills required by the labor market and (2) a lack of self-awareness of their own strengths and weaknesses and of who they are as an engineer. The objectives of the PREFER project are threefold. First, we aim to construct a Professional Roles Framework wherein the different roles engineers can take on in the beginning of their career are described, independent of the engineering disciplines (e.g., electronics, chemistry,...). Each role will be characterized with an associated set of transversal skills. Thereafter, a Test System will be developed in order to (1) increase engineering students' awareness of the multitude of professional roles in engineering and (2) to make them reflect on their own engineering identity and their interests, strengths and weaknesses. Third, we will explore how to implement these innovative tools into the engineering curriculum by running a number of pilots in the participating universities. In order to realize the PREFER objectives, a well-balanced consortium was built with both universities (University of Leuven [Belgium], Delft University of Technology [The Netherlands] and Dublin Institute of Technology [Ireland]) and companies (Engie, Siemens and ESB) involved. In order to develop reliable and valid test material, an experienced test development partner (BDO) is a member of the project team. To establish a stable connection with the engineering labor market, the three national engineering federations in Belgium, The Netherlands and Ireland were brought on board. These federations play an essential role in connecting higher education institutions with a large number of companies and SME’s hiring engineers. Validation in a wider European network of universities and companies will be tackled by respectively SEFI and FEANI. Goal of the workshop In this workshop we will discuss how engineering students can familiarize themselves with the wide variety of engineering positions in the labor market during their educational programmes. We will start from a couple of good practices that are currently organized at the university partners of the PREFER consortium (for example, company visits and short-term internships). Next, participants will be put to work in smaller groups to discuss what are the facilitating factors and/or barriers to implement such initiatives into the curriculum. Also, participants will be asked which transversal skills are considered important by their industry partners and which of these transversal skills young recruits often lack. Finally, we will jointly reflect on how engineering students can be triggered to reflect actively about their position in the labor market as an engineer and how we can motivate them to train specific transversal skills.
Meet the keynote

11:30am - 12:00pm, Sep 18
Meeting Room

Speaker:

Giovanni Azzone
Full Professor, Politecnico di Milano

12:00pm

WG7 - SEFI Physics WG meeting
12:00pm - 1:00pm, Sep 18
Meeting Room

1:00pm

Lunch - Buffet
1:00pm - 3:00pm, Sep 18
Biblioteca

2:00pm

WG8 - SEFI Gender and Diversity WG meeting
2:00pm - 3:00pm, Sep 18
Meeting Room

3:00pm

Societies Sharing Strategies for Success
3:00pm - 4:30pm, Sep 18
Auditorium

Engineering education societies share common challenges in terms of providing training opportunities to their members, maintaining membership levels, collaboration with single discipline societies, etc. This roundtable discussion provides an opportunity for society volunteers and staff to raise concerns, share information, experiences, and brainstorm potential solutions.
Poster Session I - Engineering Education Research
3:00pm - 5:30pm, Sep 18
Foyer

• The effectiveness and predictive value of interventions for bridging students in Engineering Technology; Lynn Van Den Broeck; Tinne De Laet; Marlies Lacante; Carolien Van Soom; Greet Langie
• Cross-Disciplinary Creative Engineering Education with Internet of Things Technologies; Hsiao-Ping Tsai; Chih-Yu Wen
• The Development of Engineering Creativity Scale; Te-Sheng Chang; Hung-Che Wang; Shang-Hsien Hsieh; Mei-Mei Song; Shih-Yao Lai
• Active Learning in Practice; Carsten Rützou
• Introducing Process Simulation in Junior Level Chemical Engineering Courses Using a Problem Based Approach; Norman Loney
• Secret Agents at Campus – mystery shopping feedback at a technical university; Leena Jarkko; Tiina Niemi; Verna Hahtola; Eila Pajarre; Kirsi Reiman
• The praxis of gender-inclusive science education in engineering; Jui-Hsuan Hung; Jeng-Yi Tzeng
• Development of Project-based Learning (PBL) for Internet of Things (IoT); Paweeya Raknim; Kun-Chan Lan
• Learning Augmented Reality (AR) through Interdisciplinary Project-based Learning (IPBL); Min-Chun Hu; Hsu-Chan Kuo; Kun-Chan Lan; Yuan-Chi Tseng; Tse-Yu Pan; Yi-Zhang Chen
• La Confluence: a study of the interplay of Non-cognitive and Cognitive Factors in determining the success of students on undergraduate engineering programmes.; Domhnall Sheridan; Michael Carr

UBC1 - University-Business Cooperation
3:00pm - 4:00pm, Sep 18
Room A

3 Subsessions

• A Project-Based ICT Education by Citizen Support System Development
  3:00pm - 3:15pm, Sep 18

• A preliminary Study of Integrating Creative Strategies in an “Industry 4.0” Project-based Course
  3:15pm - 3:30pm, Sep 18

• Interdisciplinary collaborative learning of creativity and projects
  3:30pm - 3:45pm, Sep 18

EER1 - Engineering Education Research
3:00pm - 4:00pm, Sep 18
Room B

4 Subsessions

• Curriculum Development in Engineering Education: Evaluation and Results of the Twente Education Model (TOM)
  3:00pm - 3:15pm, Sep 18

• Two-Year Colleges: Motivational Factors Among Older Engineering Students
  3:15pm - 3:30pm, Sep 18
Team Teaching Experiences in Engineering Education - A Project-Based Learning Approach  
3:30pm - 3:45pm, Sep 18

Tipping your toe in the ‘Emerging Technologies’ pond from an educational perspective.  
3:45pm - 4:00pm, Sep 18

ES1 - Engineering Skills  
3:00pm - 4:00pm, Sep 18
Room C

4 Subsessions

Sustainable Desalinator - An EPS@ISEP 2016 Project  
3:00pm - 3:15pm, Sep 18

Teaching the art of communication through drawing  
3:15pm - 3:30pm, Sep 18

Entrepreneurship education for PhD students in engineering sciences  
3:30pm - 3:45pm, Sep 18

Improving Innovation and Multidisciplinary Competences Among Bachelor of Engineering Students  
3:45pm - 4:00pm, Sep 18

WTS2 - Technical Sponsored Workshops - NI & Quanser  
3:00pm - 4:00pm, Sep 18
Small Auditorium

Technical Sponsored Workshops - “NI & Quanser workshop - Preparing Undergraduates for Ambitious Engineering System Design” As complexity in modern engineering systems continue to grow, institutions face greater challenges addressing the needs of modern energy, transportation, communication, and health systems. The engineers of tomorrow must be proficient in a greater range of technical concepts and applications more than ever before to be ready to function in this rapidly evolving landscape. Institutions have begun exploring options, such as experiential learning and CDIO to accelerate the rate of discovery and produce more efficient learning and stronger intuition for complex engineering system design often found in the grandest and most ambitious modern engineering contexts.

WG9 - SEFI Sustainability and Engineering Education WG meeting  
3:00pm - 4:00pm, Sep 18
Meeting Room
PEE - Physics and Engineering Education
4:00pm - 5:00pm, Sep 18
Room A

4 Subsessions
- Using Mission Analysis Software GMAT to develop skills in Astrodynamics
  4:00pm - 4:15pm, Sep 18
- Incorporating a Motion Analysis Research Laboratory into a Dynamics Course using Model Eliciting Activities
  4:15pm - 4:30pm, Sep 18
- Videos in physics theory and laboratory teaching: usage and retention analytics
  4:30pm - 4:45pm, Sep 18
- ESPOL: a change exalted by our strengths
  4:45pm - 5:00pm, Sep 18

EER2 - Engineering Education Research
4:00pm - 5:00pm, Sep 18
Room B

4 Subsessions
- Vygotsky’s Zone of Proximal Development in Connection with Technology-Enhanced Learning Environments
  4:00pm - 4:15pm, Sep 18
- The ‘Kick-off project’ - an engaging entry to a transdisciplinary master education
  4:15pm - 4:30pm, Sep 18
- Engineering grand challenges and the attributes of the global engineer: a literature review
  4:30pm - 4:45pm, Sep 18
- Otherness and Belonging: Integration of Practitioner-Academics into an Engineering School at a Research Intensive Institution
  4:45pm - 5:00pm, Sep 18

ES2 - Engineering Skills
4:00pm - 5:00pm, Sep 18
Room C

4 Subsessions
- Approaches to the Identification of STEM Key Competencies in European University systems
4:00pm - 4:15pm, Sep 18

- Connecting the world with Internet of Things
  - 4:15pm - 4:30pm, Sep 18

- Enhancing employability through leadership training
  - 4:30pm - 4:45pm, Sep 18

- Employability and the knowledge, skills and competencies of engineering graduates – case study of Finnish Engineering Education
  - 4:45pm - 5:00pm, Sep 18

5:00pm

Coffee Break
- 5:00pm - 5:30pm, Sep 18
  - Foyer

SEE1 - Sustainability and Engineering Education
- 5:30pm - 6:30pm, Sep 18
  - Small Auditorium

4 Subsessions

- Self-dependent students in transdisciplinary projects tend to higher interest in sustainability research
  - 5:30pm - 5:45pm, Sep 18

- A guideline for planning and implementing an action-based and transnational course in higher engineering education: A Case for Sustainable Value Creation
  - 5:45pm - 6:00pm, Sep 18

- The EPS@ISEP – European Project Semester Program at ISEP Implementation results and ideas for improvement
  - 6:00pm - 6:15pm, Sep 18

- Sustainability literacy and engineering - Experiences from a literacy test as a teaching and assessment tool in Nordic universities
  - 6:15pm - 6:30pm, Sep 18

UBC2 - University-Business Cooperation
Innovation in Continuing Engineering Education with focus on gender and non-traditional students' pathways

5:30pm - 5:45pm, Sep 18

Continuing Engineering Education for Technology Transfer

5:45pm - 6:00pm, Sep 18

Collaborative PhD Tracks: Working together for Sustainability

6:00pm - 6:15pm, Sep 18

The European Journal of Engineering Education as a venue for engineering education research publication: a meta view

5:30pm - 5:45pm, Sep 18

Experiences on taking electronic exams at Tampere University of Technology

5:45pm - 6:00pm, Sep 18

Senior university teaching qualification via engineering education research and design

6:00pm - 6:15pm, Sep 18

Open Data in an Analysis of Higher Education in Engineering and Technology in Serbia

6:15pm - 6:30pm, Sep 18

Welcome Reception

7:30pm - 9:30pm, Sep 18

Angra Marina Hotel

Tue, Sep 19, 2017
Plenary session II - Transforming Engineering Technology Higher Education for the Digital Age

Transforming Engineering Technology Higher Education for the Digital Age There is a long rich history to the development of higher education as it is practiced in most developed countries in the world. Engineering education has a shorter history but sharing the same roots as higher education in general. The original intent of engineering education was to prepare graduates that could become the leaders in the development of the Industrial Age. Just as the Digital Age has become the catalyst for profound changes in society in general, it is also impacting higher education, specifically engineering education. With the world’s knowledge easily and instantaneously accessed through hand-held devices like mobile phones, what might higher education look like in the Digital Age? At Purdue University we are attempting to answer this question by transforming the learning experience of our students and transforming what it means to be a professor in higher education. This bold initiative is completing its third-year and the transformation of an entire college is beginning to take form.

Speaker:

Gary Bertoline
Dean & Distinguished Professor of Computer Graphics and Computer & Information Technology, Purdue University

Poster Session II - Curriculum Development / Physics and Engineering Education

• Investigation of a Line-Tracing Auto Guided Vehicle as an Educational Tool for Mechatronics; Long-Jyi Yeh, Ching-Chih Tai and Chih-Yun Chen• Employing Multi-Sensors to Implement Real-Time Neurofeedback System for Improving Performance of STEM Curriculum; Yu-Cheng Chien; Chia-Hung Lai; Shu-Hsien Huang • The study on the relationships among organizational culture, strategies of the TVE Reform Project and competitive advantage of TVE Institutions in Taiwan; Der-Fa Chen • Formula Student Competition as a Pedagogic Method: Automobile Engineering Degree Programme; Marko Mäkilouko • Student Experience and Motivation: Industrial Management Masters' Degree Programme; Marko Mäkilouko • CDIO as the definitive tool for Engineering Curriculum Development; Carlos Rioja Del Río; Mireya López Mesa; Daniel Sánchez Morillo; Arturo Morgado Estévez • Traditional and Modern Methods of Teaching, their Applicability and Effect on the Curriculum at UCM; Nenad Trajkovikj; Stefan Manev; Katerina Ilijovska; Teodora Trajkova; Stefan Serafimoski; Ivona Stojanovska; Tamara Kuretoska • A Survey of Robotic Competitions and its Impact in STEM and Engineering Education; Manuel Silva • Realizing an international student exchange program for Belarusian engineering students to Belgium; Joan Peuteman; Anik Janssens; Renaat De Craemer; Hans Hallez; Pol Coudeville; Christel Cornelly; Alain Maricau; Andy Degraeve; Glenn Strypsteen; Pieter Rauwoens; Anatolijs Zabasta • Inciting a Cognitive Conflict: A Challenge to Students in Introductory Mechanics; Bjarne Schmidt • EduPark: Real-time smart parking educational system; Aleksejs Zacepins; Vitalijs
SEE2 - Sustainability and Engineering Education
10:15am - 11:15am, Sep 19
Small Auditorium

4 Subsessions

- How to integrate Sustainability and Entrepreneurship in the Ba/Ma-Curricula?
  10:15am - 10:30am, Sep 19

- Evaluation of a Stand-Alone Course on Sustainability and Engineering through Student Self-Assessments based on Learning Outcomes
  10:30am - 10:45am, Sep 19

- Engineering and Sustainability Education in Nigeria
  10:45am - 11:00am, Sep 19

- Teaching sustainability to engineers: a systematic literature review
  11:00am - 11:15am, Sep 19

CD1 - Curriculum Development
10:15am - 11:15am, Sep 19
Room A

4 Subsessions

- Evaluation of the Implementation of New Framework Regulations for Engineering Education in Norway
  10:15am - 10:30am, Sep 19

- MINTgrün - Fluid Mechanics Project Laboratory: supporting and preparing students for their courses of study
  10:30am - 10:45am, Sep 19

- Confidence in and beliefs about first-year engineering student success
  10:45am - 11:00am, Sep 19

- Addressing student retention in an (English-medium) engineering college in the Middle East
  11:00am - 11:15am, Sep 19

EEE - Ethics in Engineering Education
10:15am - 11:15am, Sep 19
Room B
Proposing a Comprehensive Knowledge Map of Engineering Ethics for Engineering Education
10:15am - 10:30am, Sep 19

Articulation of Civil Engineering Ethics. What is the specific purpose of the profession?
10:30am - 10:45am, Sep 19

Ethics as a skill of software engineer?
10:45am - 11:00am, Sep 19

The Engineer; The Oblivious Prostitute?
11:00am - 11:15am, Sep 19

ES3 - Engineering Skills
10:15am - 11:15am, Sep 19
Room C

Learning to be an Engineer: Implications for the education system
10:15am - 10:30am, Sep 19

Students learning engineering skills together in cross year group integrated tutorials.
10:30am - 10:45am, Sep 19

Same same but different: Student views on the level of lecturer English and comprehensibility
10:45am - 11:00am, Sep 19

Meet the keynote
10:15am - 11:15am, Sep 19
Meeting Room

Speaker:

Gary Bertoline
Dean & Distinguished Professor of Computer Graphics and Computer & Information Technology, Purdue University

11:00am
Coffee Break
Dear deans of engineering present in SEFI2017 Annual Conference, Dear members of SEFI EEDC,
On behalf of the SEFI EEDC Chair Prof. Mike Murphy, DIT Dublin, and SEFI President-Elect, I would
like to invite you to attend a meeting that we shall organise in Terceira on 19 September 2017, 11:15-
12:45 (room tbc). On our agenda will be: The presentation of EEDC and its membership Our activities,
in terms of annual deans conventions like ECED 2017 held in Munich and its outcome, the Munich
Message (in annex) and other activities Open discussion Thank you to be so kind to confirm your
participation to Klara.ferdova@sefi.be, mike.murphy@dit.ie and francoise.come@sefi.be.

Poster Session III - Open and Online Engineering Education / Mathematics in Engineering
Eduacion / Gender and Diversity
11:30am - 3:00pm, Sep 19

• M-Learning as a convenient support to the learning process in computer science; Bernard Kambale;
Thierry Eude • Digimentors – enhancing digital teaching skills of engineering educators in Tampere
University of Applied Sciences; Juho Tiili; Sami Suhonen; Ilkka Haukijärvi • Teaching Engineering
Economy Using Internet; Waleed Ahmed; Essam Zaneldin; Mohamed Ismaeel Shekfa; Ali Hilal-Alnaqbi
• Year 1 with the Topic Tree: Lessons Learned; Kevin Sevilla; Euan Lindsay • Experiences of academic
advising at Masters’ level in multicultural groups; Pirjo Pletikäinen; Reetta Karinen • Online Support
of Project-based Learning; Panu Kiviluoma; Kaur Jaakma • Internet tool supporting autonomous work – 20
years after; Zbynek Skvor • Big Data Platforms for Education; David Garcia; Le Gruenwald; Jorge
Bernardino • A Parallel between Android and iOS Design Guidelines; Célio Neto; Jorge Bernardino •
The use of digital learning technology to minimize problems caused by heavy budget cuts on teachers;
Karsten Schmidt • ENGINEERING MATHEMATICS AND MODERN TECHNOLOGY; Qefsere Doko
Gjonbalaj; Luigj Gjoka • Increasing engineering gender and diversity equality through Humanitarian
Engineering education; Anh Tran; Jeremy Smith • Development of an Instructor Training Tool for
Inclusive Teamwork; Grace Panther; Kacey Beddoes; Stephanie Cutler; Wendi Kappers • Why Change
Works so Slowly? Occupational Choices of Women in STEM Between Motivational Strategies and
Societal Gender Backlash; Susanne Ihsen; Yves Jeanrenaud

OOEE - Open and Online Engineering Education
11:45am - 1:00pm, Sep 19

5 Subsessions

- Teacher Development in Massive Open Online Courses - Evaluating Reflective Practice in
a Sustainability MOOC
11:45am - 12:00pm, Sep 19
<table>
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<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>12:00pm - 12:15pm, Sep 19</td>
<td>An Internet of Engineering Lab Things</td>
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<tr>
<td>12:15pm - 12:30pm, Sep 19</td>
<td>Learning Analytics is about Learning, not about Analytics. A reflection on the current state of affairs.</td>
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<td>12:30pm - 12:45pm, Sep 19</td>
<td>Students’ Perceptions of Online Tools in CAD Education</td>
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<td>12:45pm - 1:00pm, Sep 19</td>
<td>ATHENS Course on Application of Ionizing Radiation</td>
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<td>11:45am - 12:00pm, Sep 19</td>
<td>Evaluating the flipped classroom approach in engineering education: Students’ attitudes, engagement and performance in an undergraduate sustainability course</td>
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<td>12:00pm - 12:15pm, Sep 19</td>
<td>How to foster a High-Tech entrepreneurial mind-set –</td>
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<td>12:15pm - 12:30pm, Sep 19</td>
<td>Team-based Learning: A Novel Approach to Teaching Engineering Subjects</td>
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<td>12:30pm - 12:45pm, Sep 19</td>
<td>Embedding social impact in engineering curriculum</td>
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<td>12:45pm - 1:00pm, Sep 19</td>
<td>Curriculum co-design using participatory rapid prototyping tools</td>
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<td>11:45am - 12:00pm, Sep 19</td>
<td>The circular economy in practice-focused undergraduate engineering education</td>
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<tr>
<td>12:00pm - 12:15pm, Sep 19</td>
<td>360 degree peer assessment to train engineering students in giving good quality feedback</td>
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| 12:15pm - 12:30pm, Sep 19  | How Entrepreneurial are Project-based Courses in Engineering Education?
12:15pm - 12:30pm, Sep 19

What can a child’s experiences tell us about engineering education activities?
12:30pm - 12:45pm, Sep 19

“Real” experiments or computers in labs – opposites or synergies? Experiences from a course in electric circuit theory.
12:45pm - 1:00pm, Sep 19

MEE1 - Mathematics in Engineering Education
11:45am - 1:00pm, Sep 19
Room C

4 Subsessions

Preparing students for engineering mathematics; a collaborative approach between Vocational Education at second level and third level educational institutions
11:45am - 12:00pm, Sep 19

Collaborative learning in Mathematics for Aerospace Engineering
12:00pm - 12:15pm, Sep 19

Computer assisted assessment in mathematics
12:15pm - 12:30pm, Sep 19

Evaluation of change in approach to problem solving through developing spatial thinking
12:30pm - 12:45pm, Sep 19

1:00pm

Lunch - Buffet
1:00pm - 3:00pm, Sep 19
Biblioteca

Lunch with SEFI Corporate Partners (by invitation)
1:00pm - 3:00pm, Sep 19

2:00pm

SEFI Working Group on Engineering Skills
2:00pm - 3:00pm, Sep 19
Small Auditorium

3:00pm
Introducing Sustainability in Engineering Education Curricula: an achievable outcome or a utopia?

Circular Economy Design Forum – A New Approach to Teaching

Engineering Education for Sustainable Cities in Africa: Case Studies from Kenya

Hands-on Experiments vs. Computer-based Simulations in Energy Storage Laboratories

Mind the gap: why do technical alumni stay in the technical sector

‘Comparisons are odious’: or are there lessons to be learnt?

The Effectiveness of Interactive Lectures on Students’ Knowledge and Attitude to Further Study

Course and campus choice in a multi-campus setting: Factors influencing study choices of (bio)engineering technology students

AEE1 - Attractiveness of Engineering Education

SEE3 - Sustainability and Engineering Education

EER5 - Engineering Education Research
### Room B

#### 4 Subsessions

- **Designing blended engineering courses**
  - 3:00pm - 3:15pm, Sep 19

- **Towards a New Curriculum to Support the Changing Front End Innovation Landscape**
  - 3:15pm - 3:30pm, Sep 19

- **A project based learning approach to teaching first and second order differential equations**
  - 3:30pm - 3:45pm, Sep 19

- **Breaking the Barriers in Language Learning – New Methods for Engineering Students to Learn Foreign Languages**
  - 3:45pm - 4:00pm, Sep 19

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### ES4 - Engineering Skills

- **Improving students' critical thinking and communication skills**
  - 3:00pm - 3:15pm, Sep 19

- **Exploring the Influence of Cohesion on Team Performance Behaviors in Software Engineering Education**
  - 3:15pm - 3:30pm, Sep 19

- **Designing an Integrated Approach to Realizing Communicative Self-Efficacy**
  - 3:30pm - 3:45pm, Sep 19

- **Are you ready to innovate? Engineering students’ perception of their skills to innovate**
  - 3:45pm - 4:00pm, Sep 19

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### EJEE Editorial Board Meeting (by invitation only)

- **Meeting Room**
  - 3:00pm - 4:00pm, Sep 19

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#### 4:00pm

**Technical visit - TERAMB**

- 4:00pm - 7:00pm, Sep 19

- **TERAMB**
TERAMB is the operator responsible for the management and operation of the Intermunicipal Landfill of Terceira island. Domestic waste and similar are allowed in Landfill and registered electronically. The landfill has waste storage areas, including an area for biodegradable waste, from dedicated delivery of waste resulting from the maintenance of green spaces and landscaped and an area for deposition of monos and bulky objects (mainly furniture, mattresses and wood) that with the entry into operation of the treatment and recovery of waste of Terceira island will be sorted and forwarded to recovery or to licensed operator. The water produced in the activity of the landfill are lixiviantes waters, which are characterized by dragging products in decomposition and chemically active substances that can cause soil and water contamination. To prevent this happening, the cells of disposing of waste from the landfill are properly sealed, and feature a system of drainage and captation of water lixiviantes, which collects the waters lixiviantes and the transports for treatment at ETAL (Lixiviantes water treatment plant). The most recent service is the production of electricity from waste that covers an important part of the island electricity demand.

Tecnical visit - "Pico Alto" Geothermal Field

○ 4:00pm - 7:00pm, Sep 19
🚩 "Pico Alto" Geothermal Field

"Pico Alto" Geothermal Field is a 3 MW pilot plant, whose construction involved the following services and equipment: "Pico Alto" geothermal Central electro-mechanical equipment and geothermal Central construction; Injection line and auxiliary equipment; "Pico Alto" geothermal Central 30kV substation; A 31.5/11 KV power transformer, 5.5 MVA and a service transformer.

Tecnical visit - "Serra do Cume" wind farm

○ 4:00pm - 7:00pm, Sep 19
🚩 "Serra do Cume" wind farm

Terceira Island Wind Park is located in "Serra do Cume", in Praia da Vitória, at an average altitude of 500 meters. It consists of five turbines representing 16% of the island's energy. It is the most potent park of the Azores Islands (each turbine with power of 900KW, making an installed global power of 4.5 MW and an annual production of about 12 GWh.). Each turbine is located at an altitude of 55 meters and its blades are 44 meters in diameter, working 24 hours a day. About 5% of the electricity consumed, annually on Terceira Island, is provided by this wind farm. It avoids the annual consumption of 2 400 tonnes of fuel oil and 19 tonnes of lubricant, avoiding the emission to the atmosphere of 9000 tons of carbon dioxide.

Tecnical visit - Algar do Carvão

○ 4:00pm - 7:00pm, Sep 19
🚩 Algar do Carvão

The Algar do Carvão (Cavern of Coal) is an ancient lava tube or volcanic vent located in the central part of the island of Terceira. This is a remarkable internally-coated volcanic fireplace of siliceous meals formations, widened in the basal part and ending in a limpid pond. Contrary to what is generally occurring in other cases the chimney of this volcano is not completely obstructed, (either by fills or by landslides), which is not very frequent in this region. The visit implies a payment of 9€.
Plenary session III - The journey of integrating sustainable development in engineering education at Chalmers. Ups, downs, side tracks and vision

9:00am - 10:00am, Sep 20
Auditorium

The journey of integrating sustainable development in engineering education at Chalmers. Ups, downs, side tracks and vision Engineering education develops continuously in many aspects and sustainability is one of them. From a focus on mere technology to include environmental effects related to technology, it has turned towards the integration of a contemporary complex definition of sustainability as being the relationship between the three pillars of economical, societal and ecological sustainability. As a part of facing the challenge of that complexity, many universities e.g. develop routes to integrate engineering ethics, to relate educational goals to the seventeen Sustainable Development Goals, or to educate engineering students to address global societal challenges that are multidisciplinary in its nature. The story from Chalmers of leading and managing change regarding education for sustainable development (ESD) encompasses failed projects as well as working models. The talk will include both failures and models as valuable learning experiences. These hold several questions such as: What do students think about sustainable development courses and why? Why does a teacher not want to be taught? Is transformative learning necessary? What role can companies and society play in education for sustainable development? Chalmers current model to embed sustainable development will be presented including some examples which seem to work today, as well as challenges that are still to be overcome. Additionally, there will be a short reflection regarding the call for skills needed in a future digitized sustainable society.

Speaker:

Maria Knutson Wedel
Vice President of Education, Chalmers University
industrially oriented engineering skills: 4x4InSchools project; Claudia Fernandes; Luis Rocha; Ben Charles • Creating a Smart Learning Space: Learning With and From Student-generated Data about Learning; Roland Tormey; Cécile Hardebolle • Ethical Dilemmas of a Software Engineer; Andy Neumann; Jorge Bernardino • THE UNIVERSITY TUTORIAL ACTION PLAN. Experience in the School of Civil Engineering of the Universitat Politecnica de Valencia.; Ester Gimenez-Carbo; Esther Gómez-Martín; Ignacio Andrés-Doménech • Assessing an “incentives-driven” approach to engage undergraduate Engineering students in a developing Pacific country; Dhenesh Subramanian; Particia Kelly • E-Assessments to increase the perceived importance of Mathematics in the introductory phase of Engineering Education via bridging tasks; Mirjam Glessmer; Christian Seifert • Engineering curriculum development - socialization, soft skills and professional identity construction; Alexandra Badets

SEE4 - Sustainability and Engineering Education

○ 10:15am - 11:00am, Sep 20
📍 Small Auditorium

3 Subsessions

- Challenges for teaching sustainability and promoting diversity within a software engineering course
  ○ 10:15am - 10:30am, Sep 20

- Sustainability accreditation in engineering education: Comparison between Danish and French contexts
  ○ 10:30am - 10:45am, Sep 20

- Sustainable Transfer of a German PPBL model to a Mongolian environment: Intercultural Experiences, Reflections, & Recommendations
  ○ 10:45am - 11:00am, Sep 20

CD3 - Curriculum Development

○ 10:15am - 11:00am, Sep 20
📍 Room A

3 Subsessions

- Engineering Education Interdisciplinarity in Global Teams
  ○ 10:15am - 10:30am, Sep 20

- Recognition of Prior Learning: Is our performance test of English a good fit for the purpose?
  ○ 10:30am - 10:45am, Sep 20

- Linking Practical and Theoretical Learning to Understand Mechanics of Materials
  ○ 10:45am - 11:00am, Sep 20
Examining STEM Learning through memory retention: A research agenda
10:15am - 10:30am, Sep 20

A Teacher? A Mentor? A Friend? – Teacher Mentoring Experience at Tampere University of Technology
10:30am - 10:45am, Sep 20

Education of Innovation and creativity thinking on Industry 4.0 course and project
10:45am - 11:00am, Sep 20

Categorising student’s motivation as a basis to improve their learning strategy
10:15am - 10:30am, Sep 20

LEARNING DESIGN BASED ON FLIPPED CLASSROOM IN ENGINEERING
10:30am - 10:45am, Sep 20

Professional Roles and Employability of Future Engineers
10:45am - 11:00am, Sep 20

Meet the keynote
10:15am - 11:00am, Sep 20
Meeting Room

Speaker:

Maria Knutson Wedel
Vice President of Education, Chalmers University
Coffee Break
○ 11:00am - 11:30am, Sep 20
📍 Foyer

Plenary session IV - University-Business Cooperation
○ 11:30am - 1:30pm, Sep 20
📍 Auditorium

General topic: "Employer-identified competences"  A panel bringing together SEFI Conference corporate sponsors and partners of SEFI will be articulated on a series of short presentations describing the top 3 competences identified by the participants as the most relevant for their company for engineers. This will be followed by a debate between the panelists and a series of questions/answers with the audience.  Moderator: Prof. Martin Vigild, SEFI President

12:00pm

Poster Session V - Engineering Skills
○ 12:00pm - 3:00pm, Sep 20
📍 Foyer

• Recommendations for Electronic Laboratory Notebooks in Undergraduate Engineering Faculty: A student-led case study; Neil Cooke; Phil Robbins; Julia Lodge; Ian Shannon; Kamel Hawwash • Peculiarities of economics and business studies in technological faculties; Zaneta Simanaviciene; Rima Kontautiene; Daiva Laskiene; Vilda Giziene • An outline to optimize the quality assurance and role of the Examination Committees in higher education; Sonia M. Gomez Puente • Hungarian Engineering graduates , perceptions about their employability; Aniko Kalman • Gamification engage engineering skills in technical higher education: Experimental approach; Mark Stappers; Randy Kerstjens • Connecting staff expectations and student understanding of professional engineering skills in a multidisciplinary design challenge; Jennifer Griffiths; Rebecca Yerworth; Eve Hatten • Wooden Boat Building for Modern Naval Architecture Learning; Jp Wang; Wen-Ling Hong • The role of entrepreneurship and enterprise in engineering education. A case study in Japan, Korea, Sweden and Denmark.; Lena Gumaelius; Yongjin Lee; Kumiko Morimura; Anette Kolmos • Project Management Tools Education; Judith Santos; Jorge Bernardino • Are we transforming Engineers into Vendors ?; Ricardo Fernandes; Jorge Bernardino

Meet the EJEE Editor in Chief
○ 12:00pm - 1:00pm, Sep 20
📍 Room A

1:00pm

Lunch - Buffet
○ 1:30pm - 3:00pm, Sep 20
📍 Biblioteca
2:00pm

Coordination meeting of SEFI WGs - by invitation
⏰ 2:00pm - 3:00pm, Sep 20
📍 Meeting Room

3:00pm

SEFI General Assembly
⏰ 3:00pm - 5:00pm, Sep 20
📍 Auditorium

Poster Session VI - University-Business Cooperation / Engineering Skills
⏰ 3:00pm - 4:00pm, Sep 20
📍 Foyer

- Poster "CURRICULUM DEVELOPMENT FOR DUAL EDUCATION"; Kseniya Zaitseva; Laureano Jiménez Esteller; Yury Pokholkov
- Smart HEI-Business collaboration for skills and competitiveness; Anneli Kakko
- DEVELOPMENT OF A SERIES OF DESIGN BUILD PROJECTS TO PREPARE STUDENTS FOR INDUSTRIAL PLACEMENT; Gareth Thomson
- Role of support and counselling for the level and quality of employment of new graduates; Arttu Piri; Sanja Mursu; Jussi-Pekka Teini
- Realization of Industry 4.0 in Objective Identification and Smart Sense with OpenCV and NI Vision; Jia-Hao You; Zhe-Ming Yang; Cheng-Yen Yang; Wen-Hsuan Kuan; Sufen Chen; Hsiu-Ling Chen; Ming-Jyh Chen
- Education Approach in applied System Driven Product Development; Vahid Salehi; Jerry Safrati
- Evaluation of the Performance of Online Learning System with Interactive mechanism in the Practical Skill Course: A Case Study in Constructional Steelwork flame cutting skill; Chia-Hung Lai; Yu-Cheng Chien; Shu-Hsien Huang
- Challenges in the Curriculum Development – Steps to Collaborative Teaching; Mari-Selina Kantanen; Martta Ruottu
- Classical Engineering Education Coping with Engineering Profession Demands; Melany Ciampi; Claudio Brito; Rosa Vasconcelos; Luis Amaral; Henrique Santos; Victor Barros
- Why Entrepreneurship education and training in Politechnic of Porto graduate courses? Students' perception.; Teresa Pereira; Pilar Baylina; Rafael Pedrosa
- Teaching Professional Skills in Engineering Programmes: The Academic Perspective; Una Beagon; Brian Bowe
- Contributions to the algorithmization of the professional skills hierarchy in the engineering of castings manufacture from the perspective of circular economy.; Vasile Filip Soporan; Sandra Pădurețu; Viorica Samuila; Glad Conțițu

4:00pm

WA10 - Future development of teaching & learning in Engineering Education
⏰ 4:00pm - 5:30pm, Sep 20
📍 Room A

Pernille Andersson, Jørgen Bro Røn, Aage Birkkjær Lauritsen, Mona Lisa Dahms and Regner Bæk Hessellund

ABSTRACT This workshop will address strategies to enable a sustain development of teaching and learning in Engineering Education (EE). Different development strategies from the Danish
EE institutions will be presented and how CDIO and PBL actively are used. The activities within the Danish Engineering Education network for teaching and learning (IUPN) and how a national network can contribute to the development of EE will be addressed. The work in IUPN focus on strategies for continues teaching development for important reasons. EE need to ensure engineer students an efficient learning environment and thereby provide them with the capabilities they need to develop new and sustain solutions to present and coming challenges in the automatized future. An identified challenge is how to organise educators’ daily work that allows resources and time for research, teaching, teaching development and administration. In Denmark, there is a long tradition for promoting Active Learning and Project and Problem Based Learning in EE as well as in the entire Danish education system. Aalborg University is one of the leading universities globally developing and using Project Based Learning and the university holds a UNESCO-chair in PBL. Active Learning and Design Build Projects are cornerstones in the teaching paradigm CDIO. CDIO is the acronym for the engineering work process Conceive-Design-Implement-Operate and a teaching framework designed special for EE (Crawley et.al 2014). The Technical University of Denmark joined the CDIO network early and has ever since been taking part in the development of CDIO. Most of the providers of EE in Denmark are partners in the global CDIO network. At University of Southern Denmark, the DSMI model is used which has many similarities with CDIO (DSMI, SDU, 2015). Use of these paradigms is a natural development in Danish EE due to the teaching tradition based on Active Learning and projects. In Denmark, it is stated by the consolidation act regarding Higher Education that all staff new in the role as educators must go through a systematic supervised introduction to teaching and learning in order to proceed in their academic career. To meet this requirement there are mandatory teacher training programmes for new educators at all universities in Denmark. The conclusion is that there is a strong tradition to focus on teaching and learning development at the Danish universities and especially in Danish EE. In order to promote the development of Active Learning and enhance a continuous competence development in Teaching & Learning among educators in Danish EE a national Danish network for teaching and learning development in EE has existed in different formats since early 21 century. The present network is IUPN. The main objectives in IUPN is to create meeting places for educators to share good teaching practises, participate in discussions about the future of Danish EE and extend their network. Activities are working groups around three focus areas; innovation, sustainability and internationalisation, and the international conference “Exploring Teaching for Active Learning in Engineering Education” (ETALEE).
Inge Van Hemelrijck, Elsje Londers and Marjolijn Burman

INTRODUCTION
The Faculty of Engineering Science at KU Leuven has over ten years of experience in providing an educational training programme for teaching assistants (TAs), usually PhD students with a teaching assignment. In September 2014, the new training programme SWEET² or 'Starters Week of Engineering and Education: Training for TAs' was introduced. This didactic programme aims at offering TAs support and guidelines for their teaching assignment. Besides enhancing the TAs' teaching skills, the improvement of the quality of education is aspired. The guiding principle in developing this TA training is the ‘teach as you preach’ principle (TAYP) [1]. The structure, keystones and principles of the training programme will be described to the participants, with emphasis on the TAYP-principle. DEMONSTRATION Subsequently, some of the formats used during the training programme, will be demonstrated by performing them on the participants themselves. Doing so, the participants will be able to experience the techniques themselves and share their findings and observations with the workshop-coaches during the reflection and discussion afterwards. Possible formats for the demonstration: Speeddate” (role playing) part of the module "Master’s thesis", covering topics as: student characteristics, Reflection on teaching style Build an observation post on Mars” (cooperative exercise) part of the module "Problem based learning", covering topics as: group dynamics “Facebook profiles” (buzz groups) part of the module "Exercises sessions”, covering topics as: student characteristics Placemat: What’s good guidance” (buzz groups) part of the module "Master’s thesis", covering topics as: reflection on teaching style, student characteristics, activating strategies - “Build a wall” (peer teaching) part of the modules "Problem based learning" and "Master’s thesis", covering topics as: reflection on teaching style “Video” (testimonial) part of the modules "Exercises sessions” and "Problem based learning", covering topics as: Communication within didactic team … QUESTIONS During the final part of the workshop, a discussion will be held, focusing on the following questions: Did you recognize the TAYP-principle? How? How do we evaluate these sessions in a more efficient way? How can we maintain quality in a feasible way? How do we transfer this to an online-module since the TAYP-principle is not transferable. Or is it? And now… lab sessions! Other ideas? Suggestions? As a conclusion of the workshop, the coaches would like to have feedback and ideas emerged from a broader perspective than their own institution. On the other hand, the coaches hope to inspire their peers who face similar challenges or projects.

WA7 - Workshop "Closing the gap: Cooperation between secondary schools and Engineering institutions"

Maarten Pinxten, Carolien Van Soom, Christine Peeters, Tinne De Laet, Lynn Van den Broeck and Greet Langie

Abstract
The readySTEMgo project aims to improve the retention rates of higher education STEM programmes by focusing on the academic readiness of incoming STEM-students. Led by the University of Leuven (KU Leuven), the project is carried out by three key partners (Hamburg University of Technology [Germany], University of Žilina [Slovakia] and KU Leuven [Belgium]), three supporting partners (Budapest University of Technology and Economics [Hungary], Aalto University [Finland], and University of Birmingham [UK]) and the European Society for Engineering Education (SEFI) as a network partner. We aim to identify those students with an increased propensity of dropping out in an early stage. To achieve this goal, three objectives were realized: the identification of the key STEM competencies that are required to be successful in a STEM study programme (objective 1). Existing diagnostic tests are selected and their predictive power on study success in the first year will be gauged in order to identify students at-risk (objective 2). Finally, we will investigated which intervention tools can support these at-risk students and we will measure the effectiveness of current remediation
programs (objective 3). Goal of the workshop In this workshop we will introduce the most salient findings of the readySTEMgo project at KU Leuven. Access to higher education in Belgium is based on an open-admission system: if students hold a diploma in secondary school, they are allowed to go to university. This results in a heterogeneous inflow of incoming students in terms of both math/science prior knowledge and attitudes and motivation. An increased propensity to drop-out of university often traces back to students’ educational background in secondary education. We have prepared infographics to inform students about the effects of their educational background on future academic success and we have disseminated our results on a large scale to secondary school teachers and staff members, government responsible, teaching assistants at university, etc. The prime focus of this workshop is to discuss the cooperation with secondary schools in different countries: How can we transfer our research findings to secondary schools? What are initiatives that can enhance cooperation of secondary school teachers as full partners in the transition from secondary education to higher education? How can we actively reach out to secondary schools and actively involve them in closing the distance between university and secondary education? How can we successfully align secondary and higher education curricula both in open admission and selective institutions?

**QAA - Quality Assurance and Accreditation**

- **5:30pm - 6:30pm, Sep 20**
- **Room A**

**4 Subsessions**

- **Revision of the Qualification Framework at the University of XXX, Part 1: Concepts**
  - **5:30pm - 5:45pm, Sep 20**

- **RTU Approach to pursuing excellence: sustainable integration of internal quality system in the strategy development. Pilot project review**
  - **5:45pm - 6:00pm, Sep 20**

- **Accreditation of Flemish Civil Engineers programmes (2016): an experience of cross-border Quality Assurance**
  - **6:00pm - 6:15pm, Sep 20**

- **Construction and exploration of the engineering education accreditation system with Chinese characteristics**
  - **6:15pm - 6:30pm, Sep 20**

**ES6 - Engineering Skills**

- **5:30pm - 7:00pm, Sep 20**
- **Small Auditorium**

**6 Subsessions**

- **Decision Skills in Engineering Education**
  - **5:30pm - 5:45pm, Sep 20**

- **Innovation engineering project in collaboration of three international universities**
  - **5:45pm - 6:00pm, Sep 20**
Teaching the management of innovation to engineers
6:00pm - 6:15pm, Sep 20

How to apprehend leadership related skills in a project management experiment?
6:15pm - 6:30pm, Sep 20

Contextualising the teaching and assessment of Engineering skills
6:30pm - 6:45pm, Sep 20

6:45pm - 7:00pm, Sep 20

WG11 - SEFI Attractiveness WG meeting
5:30pm - 6:30pm, Sep 20
Meeting Room

8:00pm
Gala dinner and SEFI Awards ceremony
8:00pm - 10:00pm, Sep 20
Terceira Golf Club

Thu, Sep 21, 2017

9:00am
Poster Session VII - Sustainability and Engineering Education
9:00am - 11:15am, Sep 21
Foyer

- Opportunities to Share Ideas & Practice Among Engineering Education Initiatives; Gareth Thomson
- Sustainable Energies – the Beauty and the Beast; Nidia S. Caetano; João S. Rocha; José C. Quadrado; Manuel C. Felgueiras
- What is a Sustainable Engineering Curriculum? Rethinking the Curriculum Studies with ANT and Object Oriented Ontology; Brad Tabas
- Sustainable design of products and services course: designing through materials’ sustainability lenses; Jordi Segalas
- SPECIFIC LEARNING ENVIRONMENTS FOR FOSTERING STUDENTS’ SUSTAINABILITY MINDSET; Kseniya Zaitseva; Yury Pokholkov
- Strengthening students innovation and entrepreneurship competences via student driven extended projects that cross the boundaries of formal courses, extra-curricular activities, and universities.; Timothy Hobley; Lars Jensen
- An example of acknowledgment of training for sustainable development through labeling; Antoine Lanthony; Alexis François; Gérald Majou de La Débutrie; Clara Doly-Tacconi
- Assessing creativity in students: A cultural perspective; Fernando Rodríguez-Mesa; Bente Nørgaard; Chunfang Zhou; José-Ismael Peña-Reyes
- Transforming Engineering Education: DESIGN must be the core; Roger Hadgraft
- Connections between engineering students’ overall impression of courses in environment and sustainable development and cognitive challenges for competences in interdisciplinarity; Ulrika Lundqvist
### AEE2 - Attractiveness of Engineering Education
- **AEE2 - Attractiveness of Engineering Education**
  - **9:00am - 10:00am, Sep 21**
  - **Room A**

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<tr>
<th>Subsession</th>
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<tr>
<td>Using Service Learning for Improving Student Attraction and Engagement in STEM studies</td>
<td>9:00am - 9:15am, Sep 21</td>
<td>Room A</td>
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<td>Not always a nerd: exploring the diversity in professional identity profiles of STEM students in relation to their career choices.</td>
<td>9:15am - 9:30am, Sep 21</td>
<td>Room A</td>
</tr>
<tr>
<td>Open Assignments in a First-Year Students' Project</td>
<td>9:30am - 9:45am, Sep 21</td>
<td>Room A</td>
</tr>
</tbody>
</table>

### EER7 - Engineering Education Research
- **EER7 - Engineering Education Research**
  - **9:00am - 10:00am, Sep 21**
  - **Room B**

<table>
<thead>
<tr>
<th>Subsession</th>
<th>Time</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>The effect of increasing Learner Autonomy in engineering laboratories for Foundation Year students</td>
<td>9:00am - 9:15am, Sep 21</td>
<td>Room B</td>
</tr>
<tr>
<td>Emphasizing peer learning in a virtually flipped classroom.</td>
<td>9:15am - 9:30am, Sep 21</td>
<td>Room B</td>
</tr>
<tr>
<td>Engineering Problem-Solving as a Window on Epistemic Sophistication</td>
<td>9:30am - 9:45am, Sep 21</td>
<td>Room B</td>
</tr>
</tbody>
</table>

### SEE5 - Sustainability and Engineering Education
- **SEE5 - Sustainability and Engineering Education**
  - **9:00am - 10:00am, Sep 21**
  - **Room C**

<table>
<thead>
<tr>
<th>Subsession</th>
<th>Time</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minor in sustainable design for engineering design education. Experience at UPC Barcelona Tech</td>
<td>9:00am - 9:15am, Sep 21</td>
<td>Room C</td>
</tr>
<tr>
<td>Teaching Energy Storages by means of a Student Battery Cell Test System</td>
<td>9:15am - 9:30am, Sep 21</td>
<td>Room C</td>
</tr>
</tbody>
</table>
Around the world in 36 hours - understanding the dynamics of the global product design relay marathon
   🕒 9:30am - 9:45am, Sep 21

Education for Sustainable Development through Service Learning in Engineering
   🕒 9:45am - 10:00am, Sep 21

10:00am

CD4 - Curriculum Development
   🕒 10:00am - 10:45am, Sep 21
   📍 Room A

   3 Subsessions
   • Engineering Course Specially Designed to Face Retention Issue
     🕒 10:00am - 10:15am, Sep 21
   • Passing our students while we fail upwards: Reflections on the inaugural year of CSU Engineering
     🕒 10:15am - 10:30am, Sep 21
   • Transition from high schools to engineering education
     🕒 10:30am - 10:45am, Sep 21

EER8 - Engineering Education Research
   🕒 10:00am - 10:45am, Sep 21
   📍 Room B

   3 Subsessions
   • Searching for a viable approach to project work in engineering education
     🕒 10:00am - 10:15am, Sep 21
   • How student-generated peer-assessment rubrics use affective criteria to evaluate teamwork.
     🕒 10:15am - 10:30am, Sep 21
   • Case study: Engineering education, Industry 4.0, security, and competencies-based assessment
     🕒 10:30am - 10:45am, Sep 21

UBC3 - University-Business Cooperation
   🕒 10:00am - 10:45am, Sep 21
   📍 Room C
3 Subsessions

- **Co-designing a new engineering curriculum with industry**
  - 10:00am - 10:15am, Sep 21

- **The Influence of Government Supported CPD of Engineers on the Development of Engineering Education: TPU case**
  - 10:15am - 10:30am, Sep 21

- **A professional doctorate in technology: Fueling Industry 4.0**
  - 10:30am - 10:45am, Sep 21

Meet the keynote

- **10:00am - 10:45am, Sep 21**
- **Meeting Room**

**Speaker:**

**Dorte Rich Joergensen**

Principal Sustainability Engineer, Technical Authority Sustainability, Atkins

**NEW Master in Development Practice - MDP**

- **10:00am - 10:45am, Sep 21**
- **Small Auditorium**

The MDP is an interdisciplinary master degree program that prepares students to better identify and address the challenges of sustainable development. This MDP program consist of two years of coursework in four intersecting macro disciplines: health, natural, social, and management sciences -- combined with crosssectorialfield training. The MDP is part of the global network of universities and collaborating organizations and have been developed according to recommendations outlined in the report of the International Commission on Education for Sustainable Development Practice. It is led by the Earth Institute (Columbia University). The MDP program is designed for: Generalist development practitioners; Specialist development practitioners; Policy administrators and professionals; Private-sector professionals and Educators.

**Coffee Break**

- **10:45am - 11:15am, Sep 21**
- **Foyer**

11:00am

**Plenary session V - Delivery Excellence for Sustainability on Mega Projects**
Delivery Excellence for Sustainability on Mega Projects

Delivering sustainability excellence on multi-billion dollar projects requires an on-going learning and growth environment. The blueprint behind the delivery of major programmes such as London 2012 - the greenest games ever which saw 11,000 project staff at peak - will be presented, with a focus on the outcomes of infrastructure design. In addition, observations will be shared on the knowledge and skills engineering professionals need to enable a sustainable construction industry which is playing its part in addressing climate change and bringing hope for the future.

Speaker:

Dorte Rich Joergensen
Principal Sustainability Engineer, Technical Authority Sustainability, Atkins