

**ISEE 2012 - Sheffield - The Edge**  
**International Symposium for Engineering Education**  
19<sup>th</sup>-20<sup>th</sup> July 2012

**Reception & Registration**  
**Wed 18 July 2012, 6.30pm,**  
**The Edge**

**DAY 1**

19<sup>th</sup> Thur

8.00

**Registration**

8.45-9.00

**Conference start - Welcome by Prof. Mike Hounslow**

9.00-9.45

**Opening Keynote: *Teaching Engineering: Can we do it better?* -Prof Peter Goodhew**

There are many techniques for improving the education of engineering undergraduates. Everyone at this conference has probably engaged with at least one, and knows of many more. We will hear further examples during the conference sessions. My task in this presentation will be to suggest ways in which each of us can decide what techniques to deploy from this vast armoury of possibilities, while at the same time continuing to enjoy teaching (and the rest of life). Among the issues to be explored are: different techniques for different purposes; when to innovate; how to change your module (or, worse, someone else's module); how to raise the resources to change anything, and; how to discover whether your change made a positive difference.

**Session 1**

9.45-10.25

9.45-10.05

Paper 12: '*Use of a Research Role Playing Exercise to Fast Track the Development of Early Stage PhD Researchers*', B Wynne, C Hinchliffe, P Prangnell and R Goodall

10.05-10.25

Paper 23: '*Engaging the disengaged indefinitely, and with no budget: creating a sustainable model for Student Library Ambassadors*', Mike Clifford, Elizabeth Gadd, Jenny Coombs, Carol Hollier, Ginny Franklin Paul Maynard, Peter Willmot, Maurice Fitzgerald and Karen McCormick

**Coffee break**

**Session 2**

10.50-12.10

10.50-11.10

Paper 30: '*Experiences of using a web based virtual shell and tube heat exchanger experiment by adult continuing learners*', Edmond Byrne, John Barrett, Tomáš Jiríček, Alan Kelly and Colm O Sullivan

11.10-11.30

Paper 29: '*Understanding thresholds in first year engineering: Digging beneath Mohr's Circle*', Kathleen M. Quinlan, Sally Male, Johnny Fill, Zahira Jaffer, Artemis Stamboulis and Caroline Baillie

11.30-11.50 Paper 5: *'Using MATLAB to create cheap and accessible virtual laboratories'*, John Rossiter

11.50-12.10 Paper 4: *'Engineering in Recording'*, Jeremy Wells

### Lunch

13.30-14.00

**Keynote: Mick Steeper, Siemens VAI Metals Technologies Ltd**

Mick Steeper is Technology Manager in the UK for Siemens VAI, the metals processing arm of the Siemens group. He has long experience of industry initiatives aimed at engaging young people with engineering in schools, colleges and universities. Mick will introduce three case studies, exemplifying these initiatives at three different levels:

- Engineering Everywhere: this schools-based activity developed and delivered by Siemens' STEM Ambassadors, takes engineering into the classroom with hands-on demonstrations of what at first appear to be trivial and familiar systems, but which turn out to be revealing and stimulating problems with wide possibilities for extended learning.

- The Making of a Plate: a mentored group project for materials science undergraduates at the University of Sheffield, aimed at giving students a representative experience of what a career in the steel industry is like. A rather more conventional group project engagement with the University's Mechanical Engineering undergraduates will also be described.

- steeluniversity.org: participating in the development of an e-learning resource, one that aims to teach the technology of the steel industry to university students and early-career industry staff alike.

The way that Siemens plc is organising itself to improve its teaching-level University liaison (by taking a collection of ad hoc individual engagements and giving the staff concerned the support and resources needed to focus their delivery) will also be presented, and the early results of a broadened model, expanded from the former "research trickle-down" concept, will be shared.

Mick will conclude with his observations on what industry as a whole holds in store for its recruits, and whether the training and early career development of young engineers is really delivering a continuation of learning in the workplace.

### Session 3

14.00-15.00

14.00-14.20 Paper 65: *'Leveraging commercial technologies to implement hands-on project-based learning of engineering principles'*, Graham Green, Hannah Wade and Mark Walters

14.20-14.40 Paper 55: *'Implementing a maths support system for first-year engineering students'*, Jonathan Cole, Tim Crawford and Mohammad Zubairi

14.40-15.00 Paper 14: *'Investigating the Use of Audio Feedback in Engineering Mathematics Modules'*, Kate Durkacz and Elaine Mowat

## Coffee break

### Session 4

- 15.20-16.40    15.20-15.40    Paper 16: *'Materials education: adapting to needs of the 21st Century'*, Arlindo Silva, Ana G. Pereira-Medrano, Hannah Melia, Mike Ashby and Marc Fry
- 15.40-16.00    Paper 20: *'Chemical engineering curriculum: Are we preparing graduates ready to face future challenges?'* Jarka Glassey
- 16.00-16.20    Paper 25: *'Is attending lectures relevant anymore in engineering education?'* John Fitzpatrick, Kevin Cronin and Edmond Byrne
- 16.20-16.40    Paper 36: *'Enhancing engineering employability in the 21st Century; handling uncertainty and complexity through 'new entrepreneurship'*, Edmond Byrne
- 16.40-17.30    **Closing Keynote: 'The Tyranny of the Lecture' - Prof. Eric Mazur (Harvard)**  
Most -if not all- of the important skills in our life are acquired outside the traditional classroom setting. Yet we continue to teach using lectures where students passively take down information. Instead, we should really focus on the assimilation of that information and shift the focus from teaching to helping students learn. Over the past 20 years, instructors world-wide have begun to adopt Peer Instruction to get students to think in class. With the advent of new technology, the process can be significantly improved. A new data-analytics driven audience response system does away with multiple choice questions and helps instructors design better questions, manage time and process flow, and optimizes the discussions in the classroom.
- 17.30-18.30    **Posters Session**  
Papers presented as posters: 7, 8, 15, 17, 19, 24, 28, 31, 32, 35, 37, 40, 56, 61, 67
- 19.30            **Conference Dinner**

**DAY 2**20<sup>th</sup> Fri8.30-9.00 **Keynote Prof. David Wood****Session 5:**

9.00-10.20

- 9.00-9.20 Paper 41: '*Global Engineering Challenge: a curriculum innovation to inspire rather than assess*', Rachel Horn and Trish Murray
- 9.20-9.40 Paper 45: '*Content on Demand for Fourth Year Advanced Materials and Manufacturing Students*', Dermot Brabazon, Lynda Donovan, Andrew Egan, Michael O'Mahony and Barry Smyth
- 9.40-10.00 Paper 27: '*The Engineers Toolbox of Employability*', Danielle George and Paul Rawlinson
- 10.00-10.20 Paper 50: '*Enhancing employability: transfer of student-led activity*', Glynis Perkin, Alison Ahearn and Fiona Lamb

**Coffee break****Session 6**

10.40-12.40

- 10.40-11.00 Paper 49: '*Continuous feedback for integration of software engineering knowledge and skills through student workshops*', Konstantinos Dimopoulos
- 11.00-11.20 Paper 6: '*Using continuous assessment to generate continuous learning in engineering maths*', Jonathan Cole
- 11.20-11.40 Paper 58: '*What can go wrong with group work and peer assessment? A case study*', Martin Pitt
- 11.40-12.00 Paper 22: '*International Frameworks for Accrediting Engineering Education*', Ian Freeston
- 12.00-12.20 Paper 2: '*Broader training of engineers on intellectual foundations?*' Panayiotis Tsakiroopoulos

**Lunch**

13.30-14.00

**Keynote Dr Claire Hinchliffe, CDT in Advanced Metallic Systems****Session 7**

14.00-14.40

- 14.00-14.20 Paper 13: '*Integrating Sustainability into Civil Engineering Education: Curriculum Development & Implementation*', Derek Sinnott and Ken Thomas
- 14.20 14.40 Paper 64: '*Engineering Education and Sustainability*', David Wood

**Coffee break**

## Session 8

- 15.00-15.40 15.00-15.20 Paper 52: *Implementation of Structured Engineering PhD Programmes in Ireland*, Denise McMorrow, Sumsun Naher and Dermot Brabazon
- 15.20-15.40 Paper 48: *Congruence between non technical market required competences and competences met by new engineering programmes and graduates. The case of Spain*, Jose Albors-Garrigos, Blanca De Miguel Molina and Maria De Val Segarra Oña

15.40-16.10 **Closing Keynote:** How many engineers do we need? -**Dr Rhys Morgan** Head of Secretariat for E4E, The Royal Academy of Engineering; in this role he advises the Government and Devolved assemblies of the UK on all aspects of education policy that affect the formation of engineers.

There is an apparent perennial contradiction of media scaremongering that manufacturing and productive industries are in decline in the UK and yet at the same time we hear employers are in desperate need of skilled engineers and technicians for their businesses. On top of this we hear that graduate engineers are unable to find employment. What is actually going on? Surely if there's a shortage we should be paid like bankers!

The Royal Academy of Engineering has been examining the present and future demand for engineers across the UK economy and the supply 'pipeline' to science, engineering and technology careers. Is our education system producing enough young people with the right qualifications to progress into engineering and is there anything we can do about it? Is the problem that engineering just isn't cool? What radical changes can we make?

16.10-16.30 Awards for best Poster Prizes & Conference close - **Prof. Paul White**

**6 Keynote papers**  
**26 Oral Presentations**  
**15 Posters**