

Experience-Led Engineering Degrees

An overview from the Engineering Subject Centre

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Overview of presentation

- View from Engineering Subject Centre
- Examples of current practices in engineering education that meet some of the requirements for experience-led degrees
- Drivers for innovation in teaching
- How can we formulate a taxonomy for experience-led degrees?

The Engineering Subject Centre

- One of 24 subject centres in the Higher Education Academy
- Supports learning and teaching in engineering across the UK
- Network of engineering academics (~250 departments at 100 HE Institutions)
- Well established links with professional bodies and wider engineering community
- Hosted at Loughborough University



The Engineering Subject Centre's mission is to work in partnership with the UK engineering community to provide the best possible higher education learning experience for all students and contribute to the long term health of the engineering profession.

This is achieved through **aims**:

- Sharing effective practice
- Supporting departmental change
- Informing and influencing policy
- Promoting engineering education research
- Championing teaching

For more information
www.engsc.ac.uk



Innovation taking place at all levels

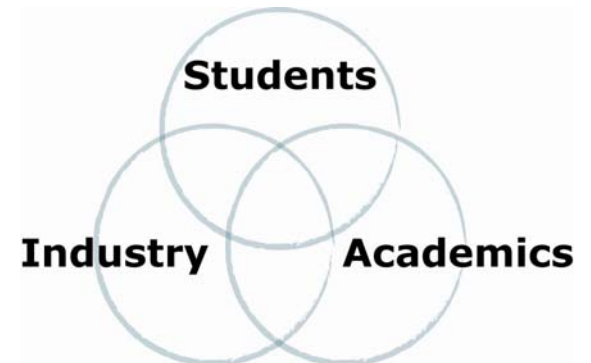
Current examples

- Institutional
- Departmental
- Individual

Institutional level

74 Centres for Excellence in Teaching and Learning (CETLs), for example:

- **Enquiry-based Learning, Manchester University**
 - **Creativity, Sussex and Brighton Universities**
 - **Inter-Disciplinary Ethics Applied, University of Leeds**
 - **Assessment for Learning, Northumbria University**
 - **The Blended Learning Unit, University of Hertfordshire**
- **Engineering CETL , Linking industry with education, Loughborough University**



Departmental level

- Case studies to follow
- Smaller scale change eg. Mini Projects funded by Engineering Subject Centre
 - Funding £3500
 - Underpinning research/evaluation
 - Defined outputs, eg publication

Example: Design of an Objective Assessment Tool to Evaluate Students' Basic Electrical Engineering Skills, Nandini Alinier University of Hertfordshire

Individual

Dave Pearce, Department of Electronics, University of York

Impact of Animated Visual Models in
Enhancing Student Understanding of Complex
Processes - *using a series of animated
demonstrations and simulations in lectures to
allow students to see the operation of the
systems and algorithms.*



Gary Lock, Mechanical Engineering, Bath

Fluid Mechanics with Historical Perspective -
an innovative approach to lectures



Just some examples of Engineering
Subject Centre Teaching Awards

Innovation in response to national agendas

- Assessment and feedback
- Student recruitment
- Widening Participation
- Student retention
- Disability
- e-Learning
- Internationalisation
- Sustainable Development
- Ethics
- Enterprise and entrepreneurship
- Employability
- Work-based learning
- Employer engagement

What makes an Experience-Led Degree?

- Integration of technical, operational and business skills (Sainsbury Review 2007)
- Meets the constantly evolving requirements of industry (RAEng 2007)
- Motivates students to become engineers on graduation
- Appeals to wider range of students
- Multi-disciplinary approach
- Meets the requirements of UKSPEC

And more

Can we start to build a taxonomy based on existing practice?

- a **Enhancement of Traditional Lecture/Tutorial/ Laboratory Teaching**
- b **CDIO Implementation**
- c **Enquiry-Based Learning Approaches** (including Project-based, Problem-Based and Scenario-Based)
- d **Industrial Placements**
- e **Industry Sponsorship** (Bespoke Courses)
- f **Blended (e-learning and face to face) Learning**

Today's workshop will inform the development of this taxonomy

This is just a starting point

How will we evaluate effective practice?

- Need to be clear about objectives and how these will be measured
- Understand drivers for change
- Be clear about baseline and context
- Value for money - realistic costings

In summary

- Plenty of examples of innovation that are starting to address requirements for 'Experience-Led Engineering Degrees'
- Innovation driven by 'top-down' and 'bottom-up' initiatives
- Large and small scale
- Mix-and-match approach
- Universities and departments adopt different approaches to fit with their mission and needs of students
- Need to develop methods to evaluate effective practice