

New
Model

in Technology
& Engineering

A new model for teaching engineering

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PHEE/PHOMME Annual Conference

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I'm an excited volunteer ...
but 15 minutes is not enough time
to take you from a blank sheet of paper
to a totally new engineering university in Hereford.
This can only be a glimpse of the possibilities.
(At a slide a minute)

- ▶ £1 trillion or so – engineering sector turnover
- ▶ 58 – average age of a graduate engineer
- ▶ 6% of professional engineers are women
- ▶ 220,000 graduate engineers needed by 2020
- ▶ < 20,000 engineering graduates per year
- ▶ etc

**. . . really
aren't good**

- ▶ The Public
- ▶ Parents
- ▶ Prospective Students
- ▶ Employers
- ▶ Engineering Students

. . . are worse



Olin College
of Engineering

EPICS@Purdue

QUEST UNIVERSITY
CANADA



Integrated
Engineering
Programme



zeppelin universität

zwischen
Wirtschaft Kultur Politik



CORNELL
TECH



iFoundry
THE ILLINOIS FOUNDRY FOR INNOVATION
IN ENGINEERING EDUCATION



- ▶ Creating a laboratory for the nation
 - ▶ Admitting students differently
 - ▶ Establishing and delivering a different culture
 - ▶ Teaching differently
 - ▶ Assessing differently

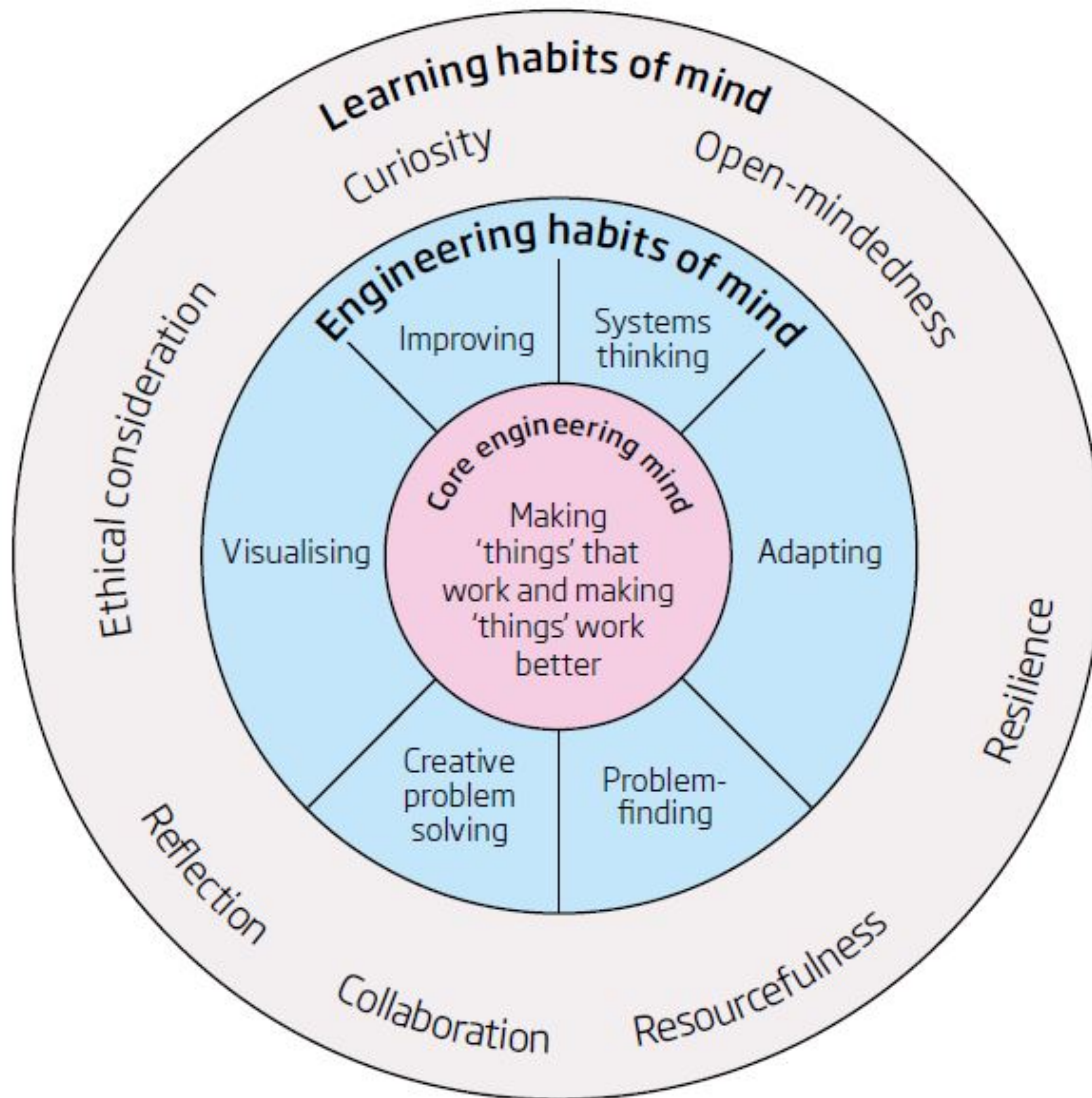
And never forgetting the critical importance of a high quality core engineering education

- ▶ The whole person
- ▶ Identifying and assessing “learning habits of mind”
- ▶ Not requiring maths + physics – but
- ▶ still looking for good students
- ▶ Women, apprentices, service leavers
- ▶ Career developers

West Point
experience:
grit vs dropout

Curiosity, grit and passion

Engineering habits of mind nmite.org.uk



- ▶ Culture of excitement and inclusiveness
- ▶ Safe to fail, safe also to super excel
- ▶ Collaboration in the classroom – students, faculty & industry
- ▶ Closer to work, but still very much education
- ▶ “Owned” by its faculty and students
- ▶ Embedded in and balanced by its community

“Real Worlding” higher education

A great bit of engineering

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- ▶ Because that's the focus (and where the rewards lie)
- ▶ Deep integration of engineering, humanities and core business knowledge and skills
- ▶ Interdisciplinary at all levels – focused on application
- ▶ Embracing technology for content and customisation – freeing the classroom for learning and doing
- ▶ Intense – meaningful – practical

Learning to become a “Liberal Engineer”

- ▶ Assessed for competence
- ▶ Rapidly productive as employees
- ▶ Recognised for quality
- ▶ Commercially or academically contributory
- ▶ Good citizens
- ▶ MEng in Liberal Engineering

Ready to contribute (and change the world)

- ▶ Project and problem-based learning, in blocks; no terms or semesters
- ▶ Lectures only for inspiration, so very few
- ▶ 46-week year; accredited MEng + 6-month internship within 3 years
- ▶ Students as partners, with industry, in curriculum development
- ▶ No separate Departments; mix of Engineers and HASS

Ready to contribute (and change the world)

Who are we?

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To redefine engineering for a whole new generation . . .

- ▶ Students with high quality applied engineering education
- ▶ Educated within a culture that produces ethical, innovative, interdisciplinary, globally aware graduates
- ▶ Led by a constantly-evolving, employer-informed curriculum
- ▶ Inspired by outstanding teachers and practitioners who motivate and develop the skills required of great 21st century engineers
- ▶ Creating the problem-solving, breakthrough employees and innovators of tomorrow

Aspiring to be *the* best new university for applied engineering education.

Anywhere.

IMechE / RAEng “Big Ideas”

CDIO “Future of engineering education” et al

“Teaching Engineering” www.teachingengineering.liv.ac.uk

UCL Centre for Engineering Education “conversation series”

Aston / Robin Clark “Engineering Education Research
Network”

RAEng Engineering Education Web hub development

Pink Floyd

Some background

Engineering education is rather important to our societies (and their economies)

- The grand challenges need engineers;
- The UK needs to double its output of engineers;
- Engineering is a team game;
- Not all engineering is quantitative.

Another brick in the wall

Engineering education
We don't need your rigmarole
We don't need examinations
We don't need the memory load
We'll just show you we can do it
Don't pre-judge our learning mode

Come help us . . .

Come learn with us . . .

It is very exciting . . .

For “exciting” read “fun”