

Activating Engineering Education

Professor Peter Goodhew FREng

CAETS: June 2013



Why innovation is needed
What might be done
How we might do it



Why?

Innovation in engineering education is overdue



Drivers are:

Employers' requirements

Students' expectations

Teachers' perceptions

The changing world

2012

Educating engineers to drive the
innovation economy

2010

Engineering graduates for industry

February 2010



2007

Educating Engineers for the 21st Century


June 2007



“Engineering graduates should be able to do something”

What?

Can teachers of engineering do better?



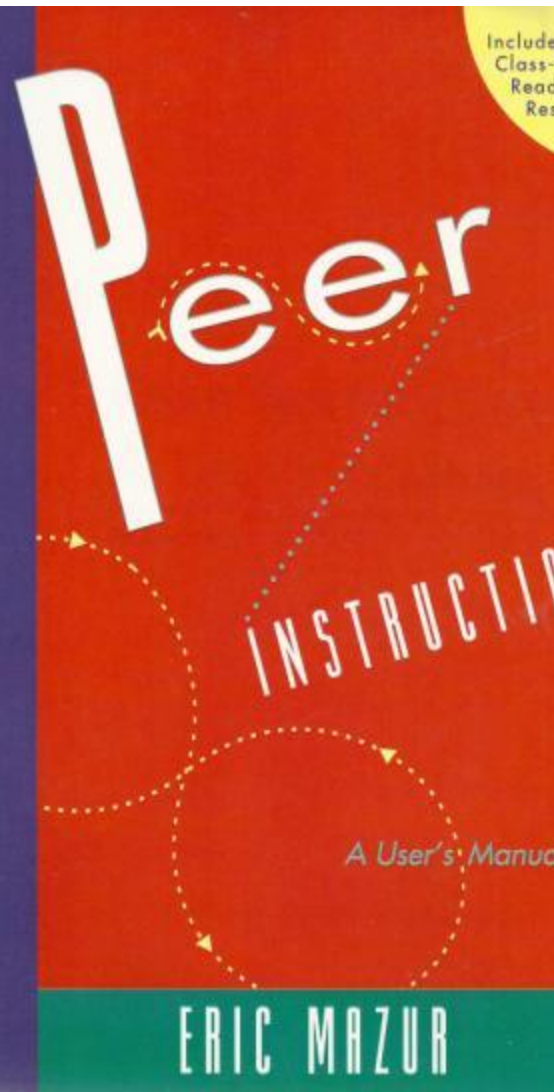
Yes, for example:
Active learning
Team working
Design, build, test
Concept questions

Published in 1971

The answer is “very little”

*“I use lectures to catch up on sleep, or
to update my Facebook page”*






Edward Crawley
Johan Malmqvist
Soren Ostlund
Doris Brodeur

Rethinking Engineering Education

The CDIO Approach

With Foreword by Charles M. Vest

 Springer

Teaching Engineering

All you need to know about engineering education but were afraid to ask

Peter J Goodhew



The School of Engineering's Active Learning Lab at The University of Liverpool



"I learn more from being asked questions, and having to respond"

A concept question

You are sitting in a boat in a small pond. You have a six-pack of beer. You throw it into the water and it sinks to the bottom.




Does the level of the water in the pond:

1. Rise?
2. Fall?
3. Stay the same?

How?

Can we persuade engineering teachers to change?



Externally-driven need
A coherent approach and plan
Internal leadership
(A modified learning environment)



The Royal Academy
of Engineering



Massachusetts
Institute of
Technology

Achieving excellence in engineering
education: the ingredients of
successful change

March 2012



“It is rare for Engineering faculty to come together to talk about education”

The Active Learning Lab at The University
of Liverpool



Active engineering students

Externally-driven need
A coherent approach and plan
Internal leadership
A modified learning environment

What will you remember from this presentation?

1. The titles of the RAEng reports?
2. The bridge shown in slide 2?
3. The name of the new teaching space at Liverpool?
4. The question about the boat and the beer?
5. My smiling face?



What might the future hold?



Modest advances in engineering
MOOCs?

Unknown technology and social behaviour
Global challenges

Over to you



... for questions or comments!