

Role of Quality assurance and accreditation in a Learning Outcomes based education



David Cleland
Engineering Council

Background to Outcomes-based Education in the UK

■ differentiator of degrees of same length

- **BSc** **3 years**
- **BEng** **3 years**
- **MEng** **4 years**
- **BEng + MSc** **4 years**



Background to Outcomes-based Education in the UK

- transparency (for students and employers)



Background to Outcomes-based Education in the UK

- allows innovation and diversity



Online Master's Degree Programs

new major:
ARCHITECTURAL ENGINEERING

WHERE: College of Engineering

WHO: Upcoming sophomores and juniors and younger students

WHAT: This degree focuses on the design of buildings and working with architects when dealing with structural design, mechanical, electrical and construction elements.

new major:
ENVIRONMENTAL ENGINEERING

WHERE: College of Engineering

WHO: Upcoming sophomores and juniors and younger students

WHAT: This degree focuses on air and water quality and purification of land, health and safety systems.

Background to Outcomes-based Education in the UK

■ reflects competence and Commitment statements for professional qualification



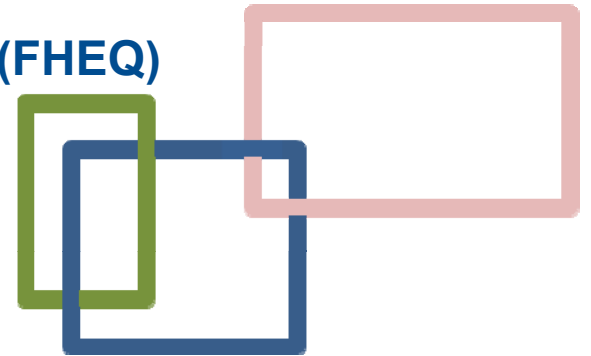
- A Knowledge and understanding
- B Design and development of processes, systems, services and products
- C Responsibility, management or leadership
- D Communication and inter-personal skills
- E Professional commitment

UK Quality Code

- to safeguard the academic standards of UK higher education
- to assure the quality of the learning opportunities that UK higher education offers to students
- to promote continuous and systematic improvement in UK higher education
- to ensure that information about UK higher education is publicly available.

UK Quality Code

- ■ a framework for Higher Education Quality (FHEQ)



- ■ Subject Benchmark Statements



Framework for Higher education Quality

Typical qualification	FHEQ Level
Doctoral degrees (eg PhD, EngD)	10
Masters degrees (eg MA, MSc, MRes) Integrated masters degrees (eg MEng)	7
Bachelors degrees with Honours (BEng)	6
Foundation degrees	5
Higher National Certificates (HNC)	4

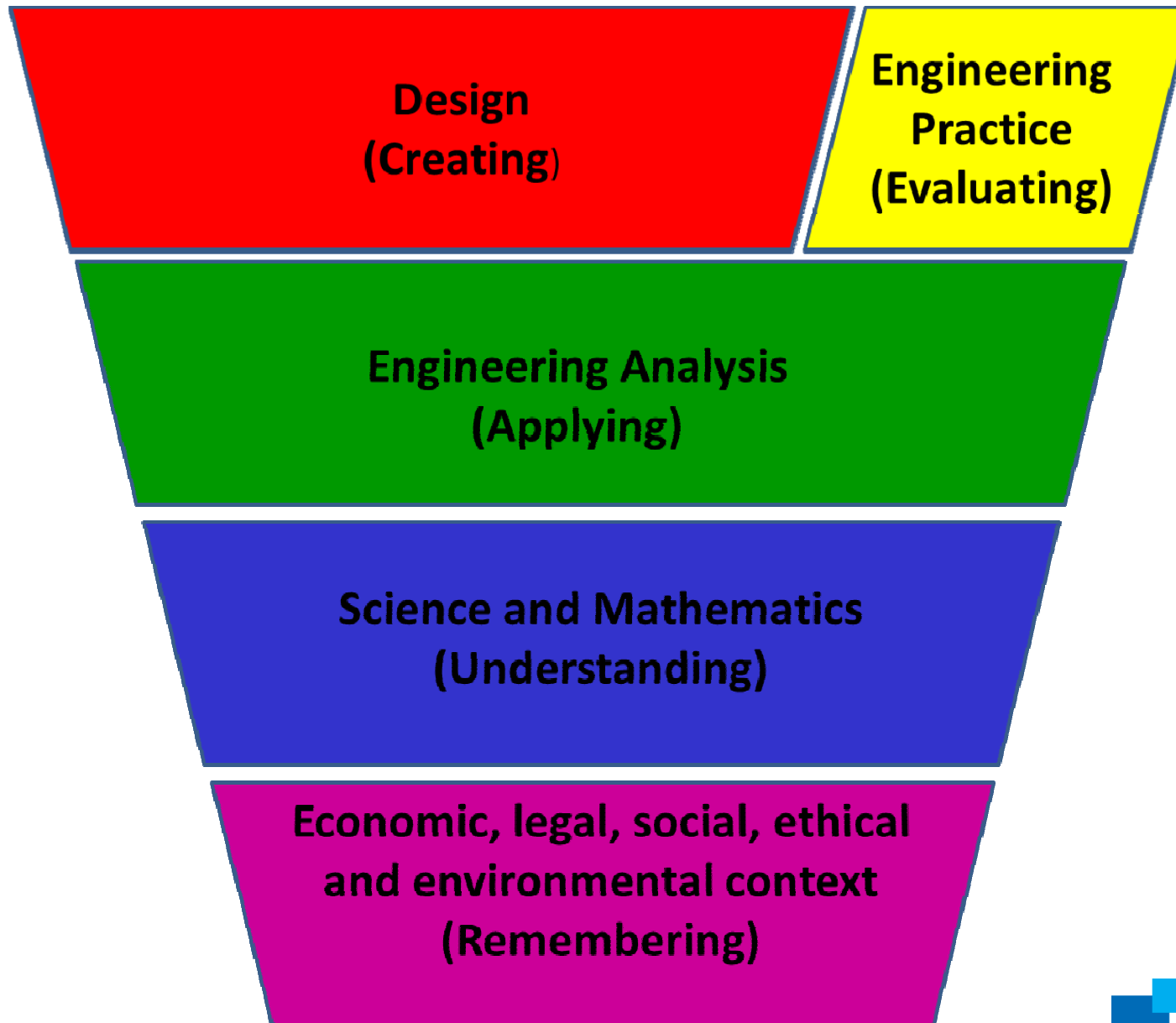
Subject Benchmark Statements (Engineering)

Quality assurance agency (QAA) and Engineering Council (EngC) agree to use a single set of statements:

**Accreditation of Higher
Education Programmes
AHEP**



Accreditation of Higher Education Programmes AHEP



Two global overarching frameworks

International Engineering Alliance

- The Washington accord (1989-Engineers)
- The Sydney accord (2001-Engineering Technologists)
- The Dublin Accord (2002-Engineering Technicians)



The European Network for Accreditation of Engineering Education (2006-ENAAE) with the EUR-ACE Accord (2014):

- EUR-ACE label for the Bachelor degree
- EUR-ACE label for the Master degree



EUR-ACE Programme Outcomes

Knowledge and Understanding;

Engineering Analysis;

Engineering Design;

Investigations;

Engineering Practice;

Making Judgement Skills;

Communication and Team-working Skills;

Learning Skills.

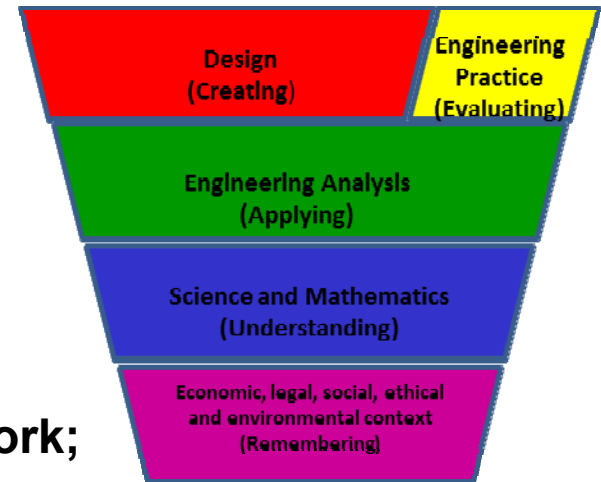


Learning outcomes in practice ... Positive aspects

- **Programme outcomes are well established and related to Subject Benchmark Statements;**
- **Accreditation in Engineering has substantial experience in using these to assess degree programmes;**
- **Evidence that Internal Programme Reviews and Accreditation Visits/Reports lead to positive changes;**
- **Academics feel less constrained and more able to innovate.**

Learning Outcomes in practice ... Challenges

- Differentiate between Threshold and Typical standards
- Focus on higher order of applying, evaluating etc rather than knowledge;
- Avoid plagiarism;
- Differentiate between collaboration and teamwork;
- Robust methods for assessing engineering practice;
- Skills and awareness often assessed indirectly.



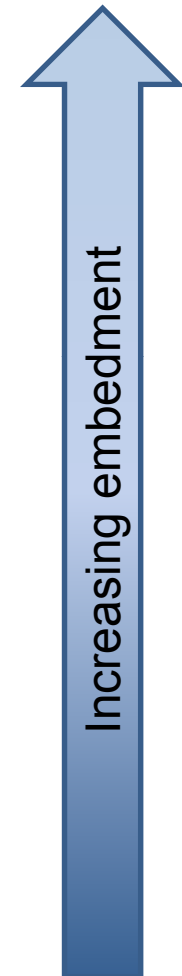
Learning Outcomes in practice ... Challenges

Designing programme outcomes

Module Learning outcomes aligned with Programme Outcomes

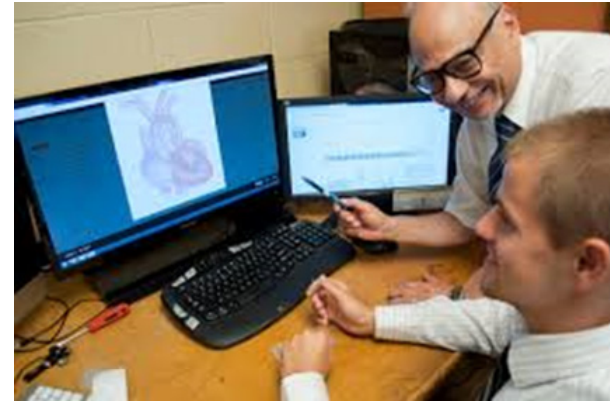
Setting assessments to test that Learning Outcomes have been met.

Differentiating between failure to meet a Learning Outcome and Module failure.



AHEP Learning Outcomes ... Engineering Practice

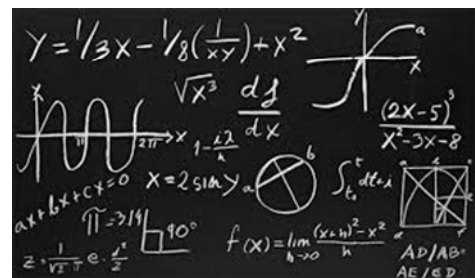
1. Understanding of context
2. Knowledge of materials
3. Ability in laboratory skills
4. Understanding of technical literature
5. Knowledge of legal issues
6. Understanding of codes of practice
7. Awareness of quality issues
8. Ability to work with uncertainty
9. Understanding & ability to work in different roles



AHEP Learning Outcomes ... Engineering Practice

Science & mathematics

Excellent
★



Engineering Practice



Economic, legal etc context



Could do better

★
Excellent

Engineering analysis



Room for improvement

Thank you

www.engc.org.uk

