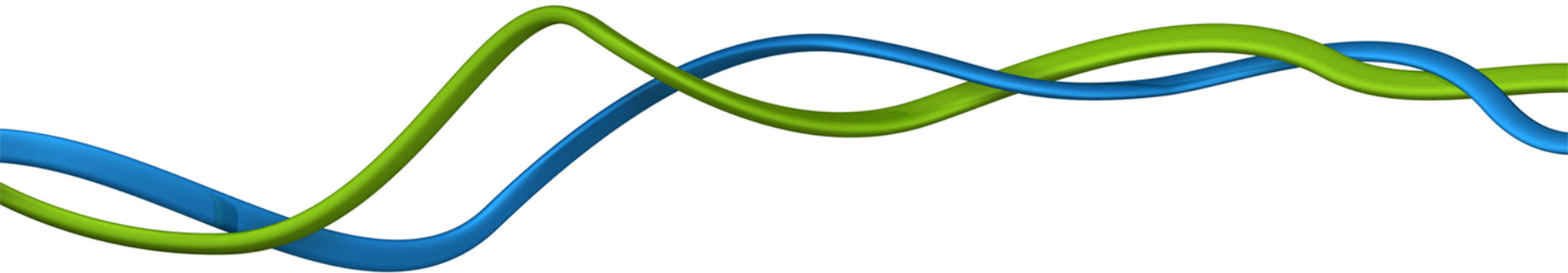




Challenges for Engineering Education research

Dr Rhys Morgan
Director, Engineering and Education
Royal Academy of Engineering





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Engineering skills crisis

By 2022...

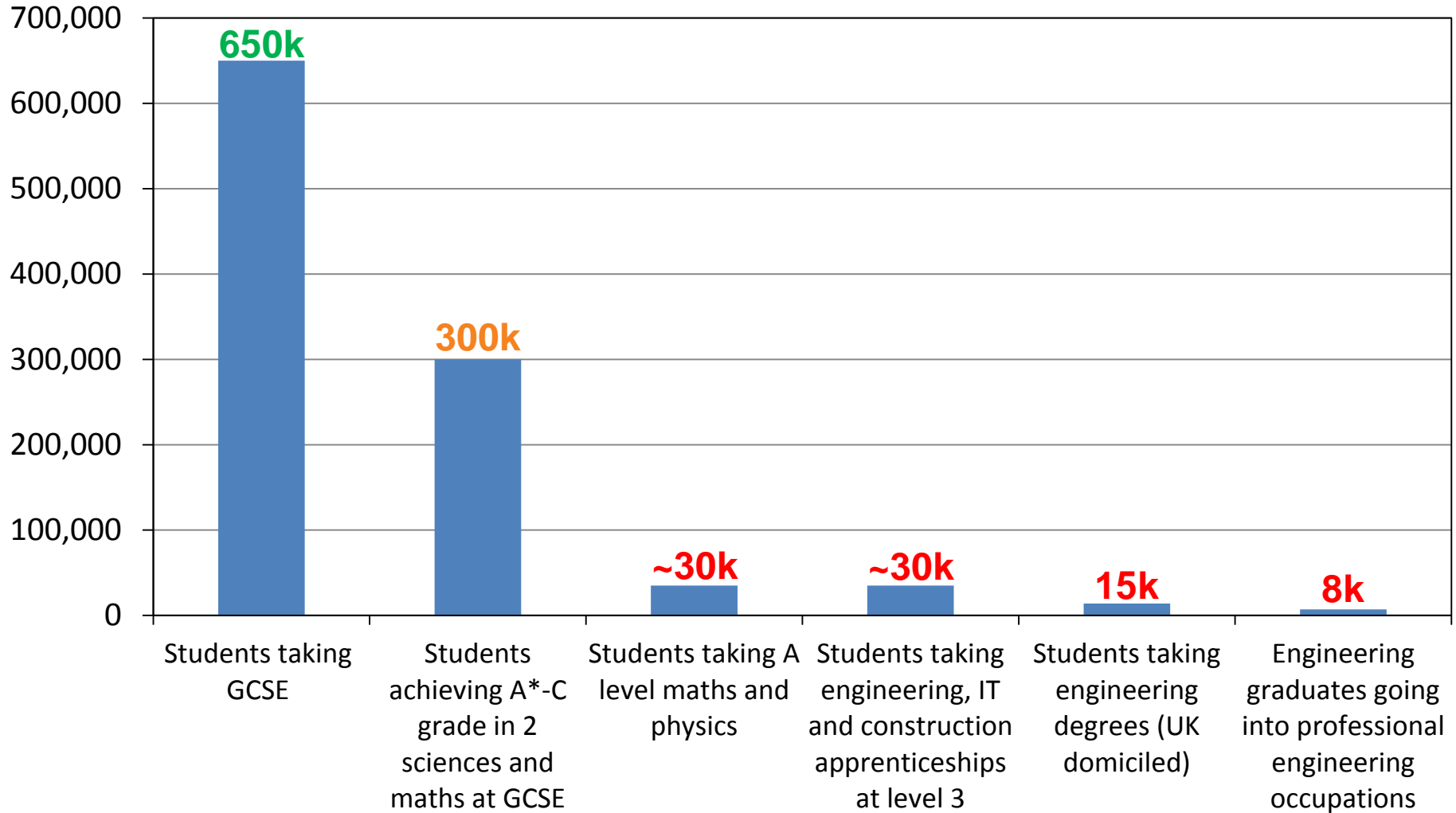
1.82 million engineers and technicians at all levels

1.06 million engineers at level 4+

7 out of 10 replacement demand

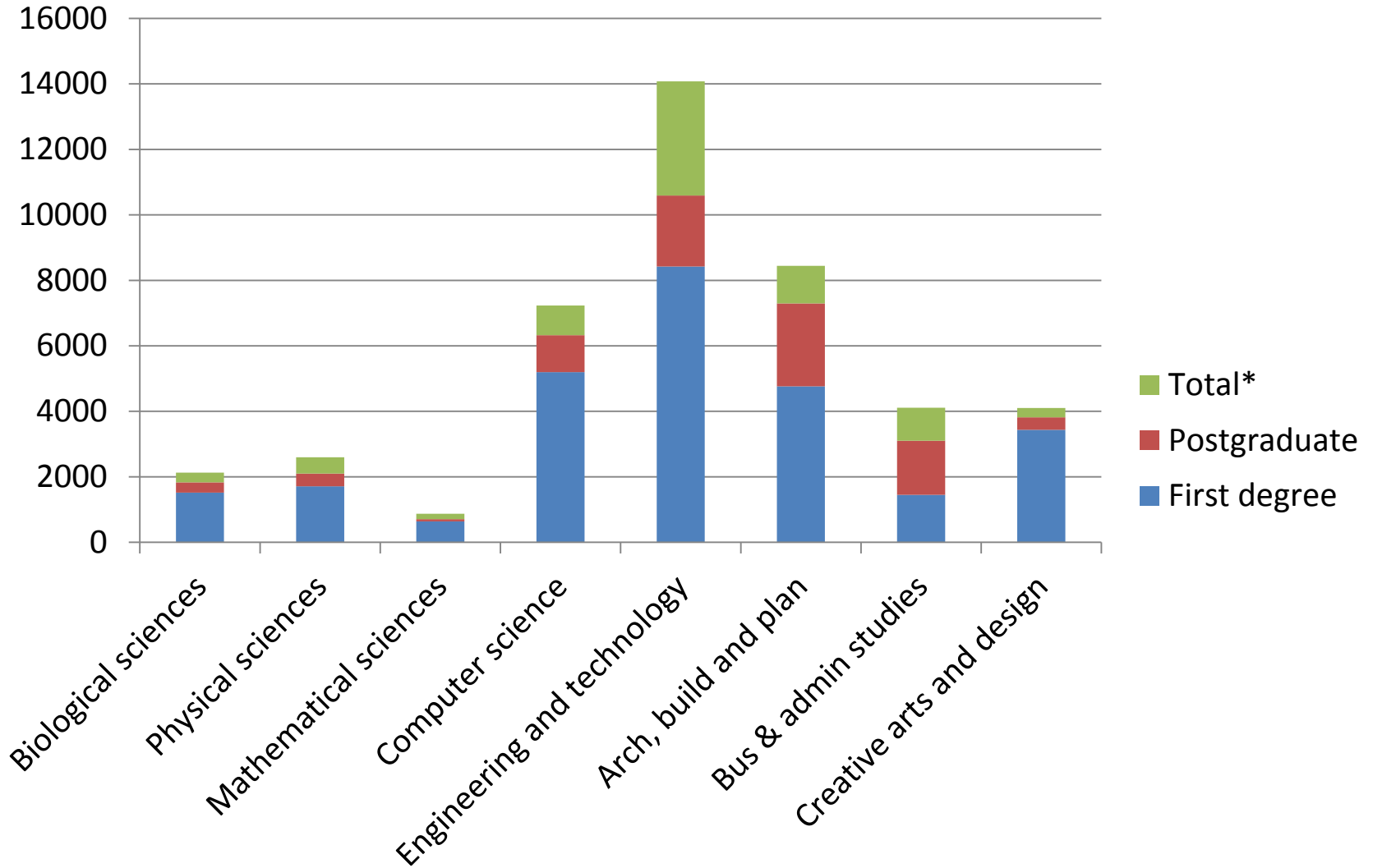
360,000 expansion

Engineering skills supply

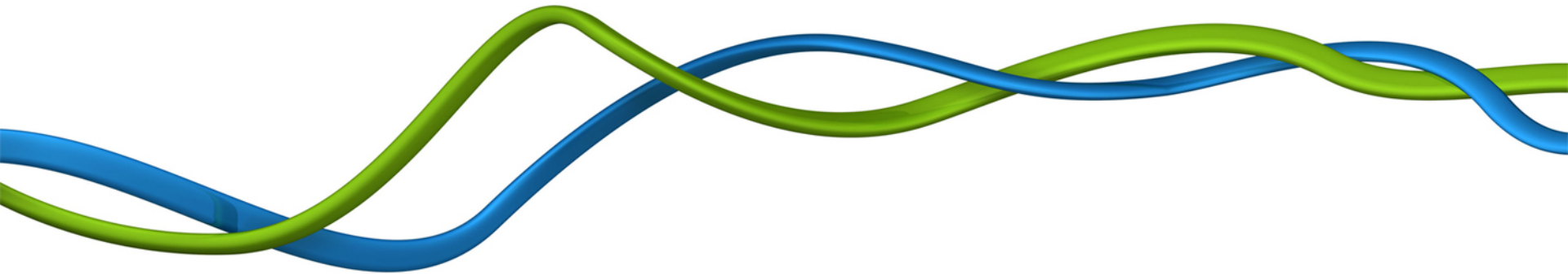


Data from JCQ, Data Service, HESA

Graduates in engineering jobs



What does this mean for engineering education research?





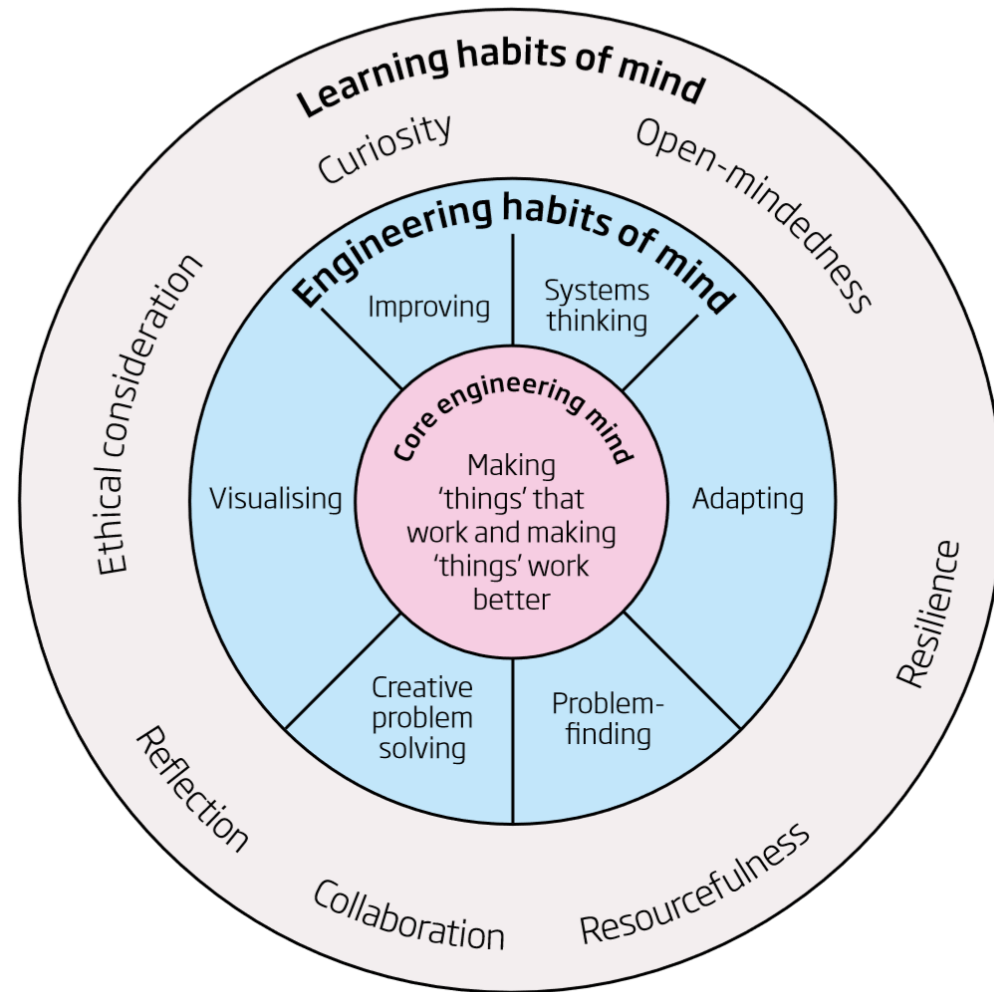
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Key challenges

- Defining engineering
- Teaching students without physics and/or maths
- Addressing the challenge of graduates leaving engineering for other sectors
- The higher vocational education pathway
- The impact of TEF on the importance of teaching in the HE landscape

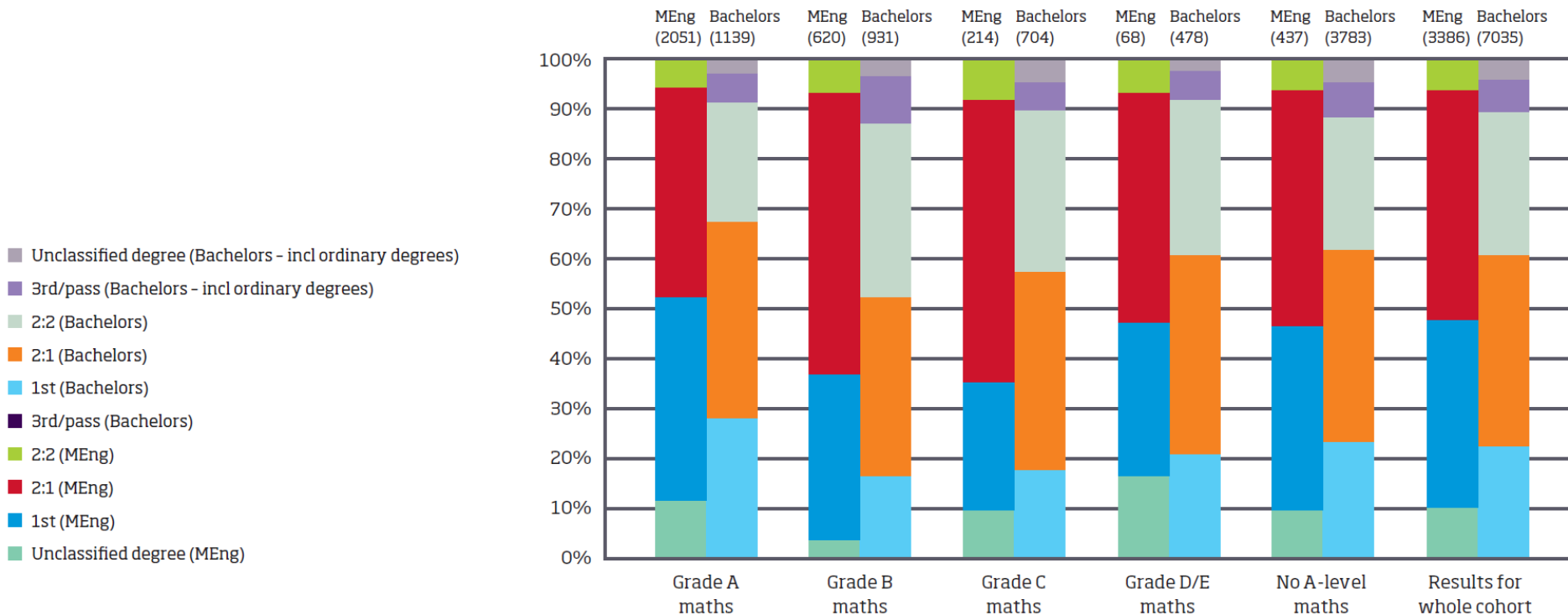
Defining engineering

- What should engineering students know?
- What should they be capable of doing?
- How do we create breadth and depth of knowledge across disciplines



Students without maths/physics

- No statistical correlation between degree classification and A level maths results (or lack of maths) for MEng or BEng



Graduate destinations

Destinations of Leavers from Higher Education (DLHE) summary of "Most important activity" for UK domiciled, full-time engineering graduates (10, 421 students)

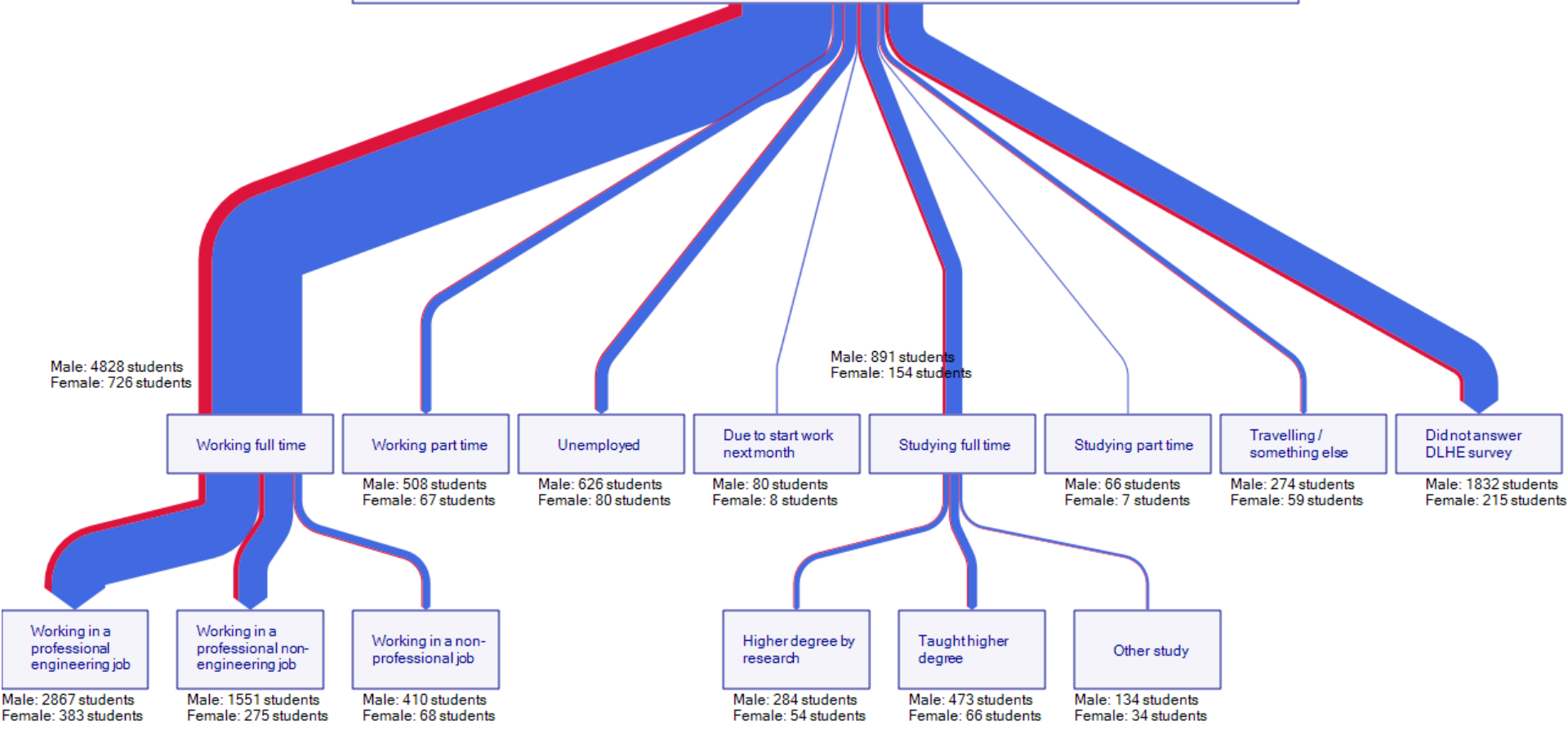
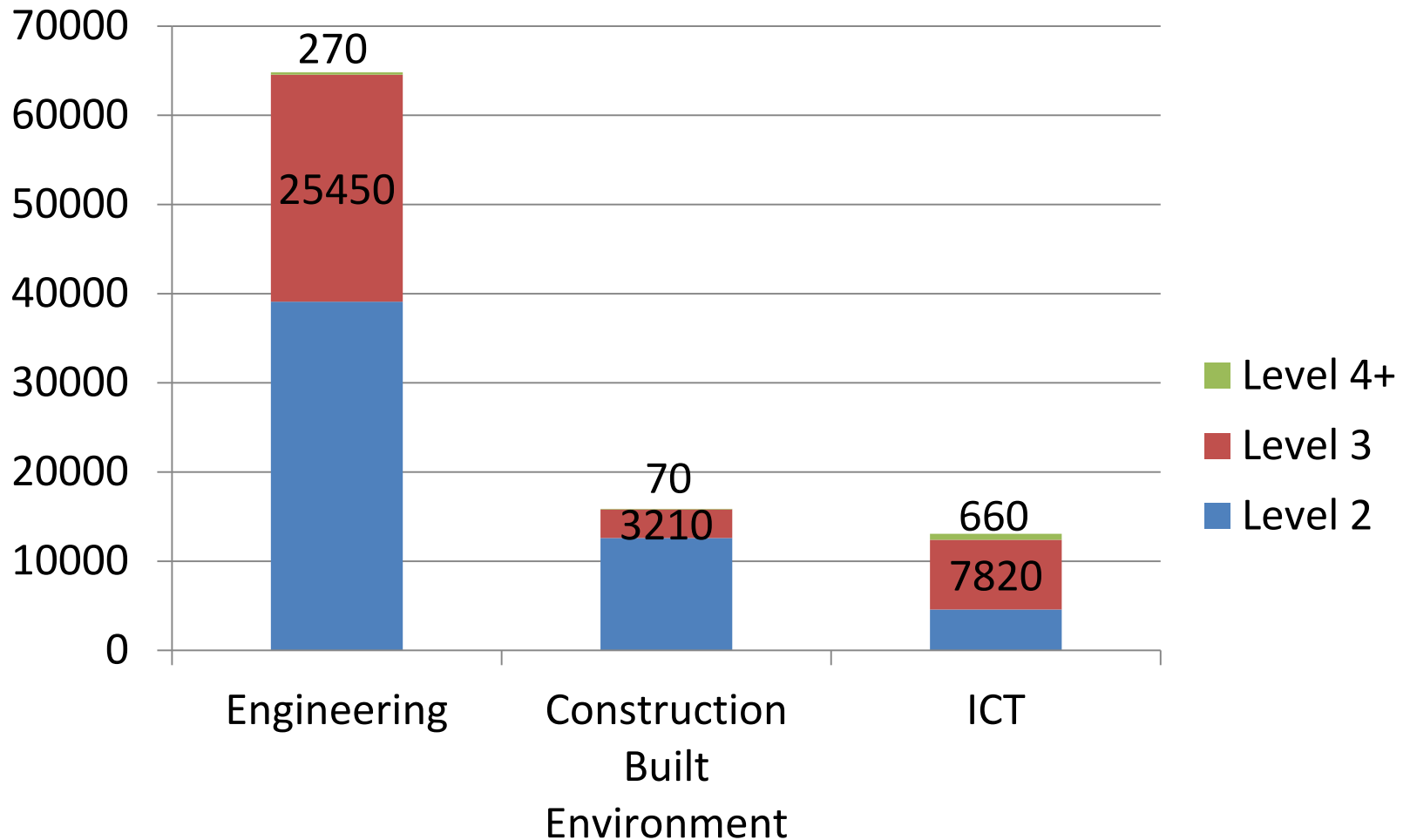


Image from "Pathways to success..." report. Royal Academy of Engineering 2015

Higher vocational education

- Up to 2000 Degree apprenticeships starts in 2015/16





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Teaching excellence framework

- Judgements made by panel: academic experts in learning and teaching, student reps, and employer/profession reps
- Judgements made against an assessment framework, based on evidence submitted
- Panels will consider how excellent teaching is demonstrated
- Student fees to increasingly differentiate according to the TEF level awarded

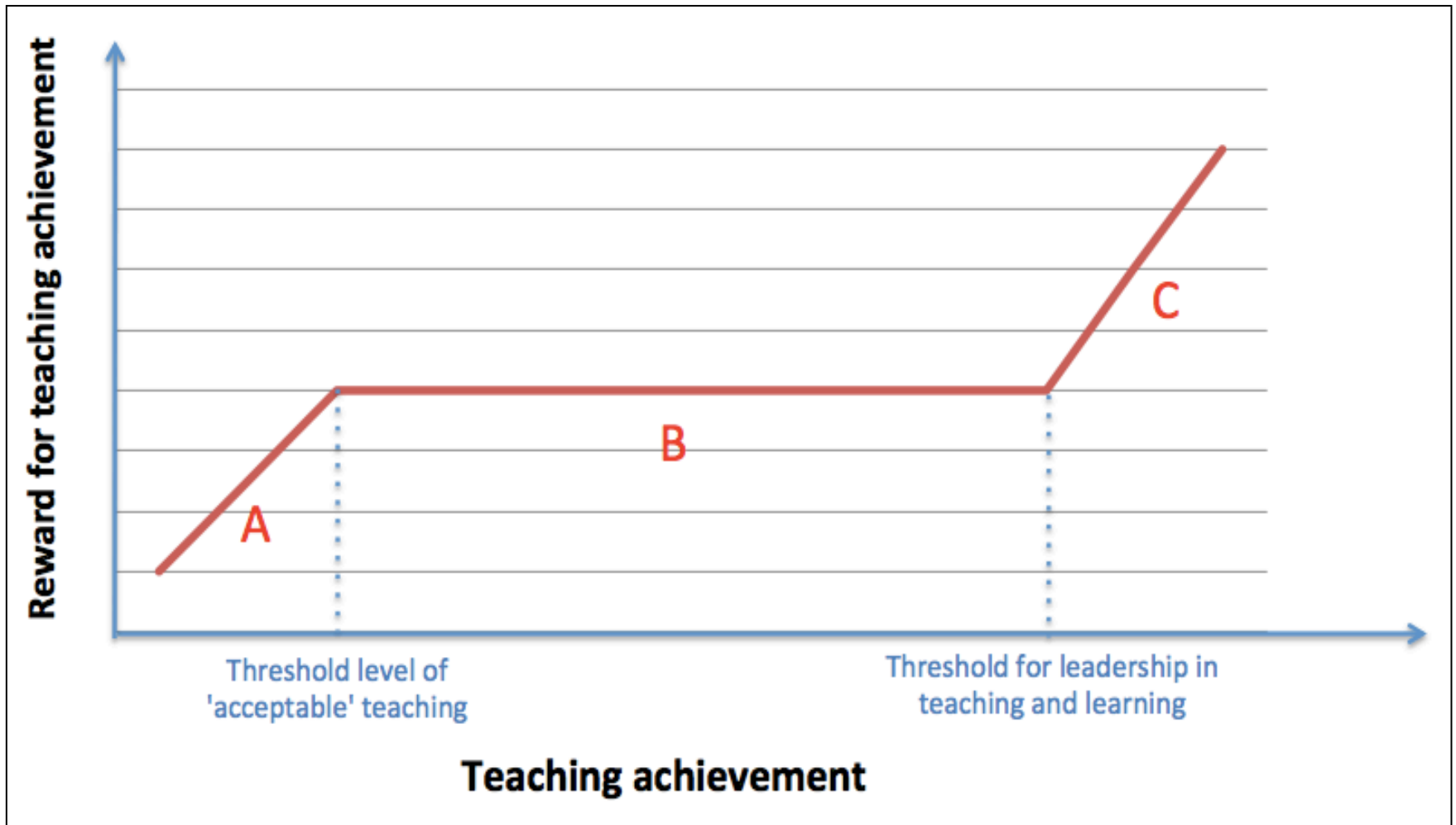


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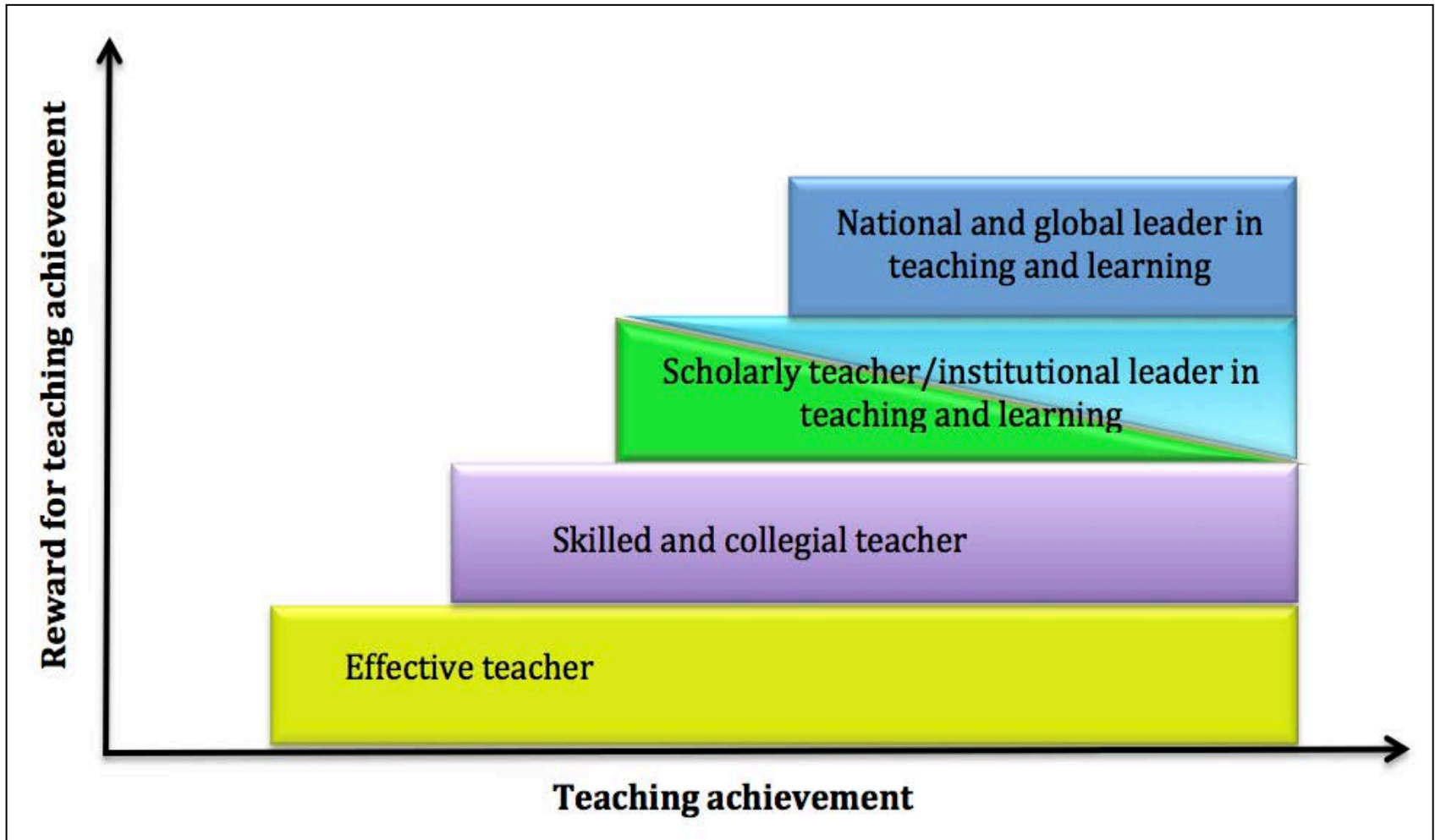
Teaching quality - TEF

- Reward and encourage teaching practices that:
 - provide an appropriate level of contact and stimulation
 - encourage student effort
 - are effective in developing their knowledge, skills and career readiness
- There is a strategic and effective approach to understanding the ways in which students are intellectually challenged and engaged in the curriculum and their learning
- The courses, curriculum design, teaching and assessment are effective in developing all students' knowledge and skills.

Measuring teaching excellence



Measuring teaching excellence



Thank you.

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