*Q1: What, if any, are your principal concerns with the current post-18 education and funding system?*

Education for Engineering (E4E) is the body through which the engineering profession offers coordinated advice on education and skills policy to UK Government and the devolved Assemblies. It deals with all aspects of learning that underpin engineering. It is hosted by The Royal Academy of Engineering with membership drawn from the professional engineering community including all 35 Professional Engineering Institutions, the Engineering Council and EngineeringUK and the Engineering Professors' Council.

We have several concerns with the current higher education (HE) system. Many can be summed up by the proposition being put to a prospective student who is asked to make an 'investment' of £30,000 to £60,000, but who, unlike most people considering an investment of that size, receives no collateral when embarking on a university course. While there is good evidence of an average graduate premium based on past data, prospective students personally receive no guaranteed return for their investment. Furthermore, the investment they are making is negatively described as a debt. From that perspective, if making a rational, well-informed choice, it looks like a highly risky proposition.

The current post-18 education system, especially in engineering, is **insufficiently diverse and inclusive** because many students, especially those from certain backgrounds, are unwilling or unable to risk this investment in their future or have not studied the necessary subjects/achieved the grades to gain entry. The fourth industrial age will require different skills of future engineers and therefore engineering courses will require a more diverse input of talent – and courses will have to adapt to educate them. We will need more diverse routes into degree courses (Q6), and provide both financial and mentoring support to fully enable access and facilitate progression (Q7).

HE Engineering is an **expensive course** to run, with the tuition cost of offering a degree typically outstripping the per capita funding available (see Q5). It is critical that the current level of engineering education funding is at a minimum maintained and preferably increased; any reduction will have a destructive impact on the quality of students' learning and experience.

Engineering courses generally have a high amount of contact time (and may increase in response to TEF's 'teaching intensity' metrics), which means engineering students have less capacity to earn whilst studying, leading to **learner poverty**. A potential solution is discussed in Q8.

A lack of effective **careers education and guidance** in schools from a young age leads young people to make uninformed decisions about the subjects they will study. Improved careers education and guidance in schools will increase the diversity of the post-18 student body, which will have positive economic benefits.

Efforts to create a **market in higher education** – especially a price-driven system targeted at prospective students as consumers – have failed. We believe that efforts by the Government to adjust this market will result in unintended consequences – as has already happened with part-time learning (experiencing a 60% fall in numbers compared to 2010). Our concerns are addressed in Q2, and a potential solution offered in Q5. The Secretary of State has raised the prospect of **differential fees**. We believe this could be disastrous for both higher and further education, the economy, and the engineering sector in particular (Q5).

We believe that the **autonomy of HEIs** should be protected and the funding system should do as little as possible to compromise that. The UK has one of the strongest HE sectors in the world due in

no small part to its autonomy in allowing universities to decide how to spend their own funds independently of Government interference (Q6).

**Part 1: Choice and competition across a joined-up post-18 education and training sector**

*Q2: How do people make choices about what to study after 18? What information do they use and how do they choose one route over another: for instance, between academic, technical and vocational routes?*

The stated purpose of subject-level TEF is to inform student choice through recognition of teaching excellence and student outcomes, and therefore to disrupt the reputational market in HE. We believe is unlikely to succeed: prospective students are unlikely to understand the data and have their choices dictated by it. The market behaviour of students is too fractured with some being price-led (often inversely), some led by reputation and some by a host of complex factors.

Student choice is not made in a vacuum at age 17 or 18 (see Q11), and decisions are made on an instinctual or emotive basis rather than purely rational thinking. Information and rationality can nevertheless be fed into the formation of feelings, and therefore into decision-making.

*Who you are* (socio-economic class, regional location, parental and personal expectations, ethnicity and gender) is the greatest determinant of participation in higher education, much more than the information received about types of provision and courses. Socio-economic background has a significant impact on whether an individual attends university, and the type of university attended.[1] The difference in HE participation is also due to prior attainment: students from lower socio-economic groups are less likely to attend university because they are more likely to achieve poorer results throughout school.

The availability of courses and routes can also restrict the choices available to young people: engineering apprenticeships are often oversubscribed,[2] so a young person who knows they want to enter the engineering sector may 'choose' to enter an engineering degree, even though they would prefer to do so by a work-based learning route.

Therefore, prospective students' circumstances necessarily constrain their choices and an emphasis on choice implies a much wider degree of freedom than exists for many people.

HE is not a price-driven market that can be controlled by adjusting tuition fee costs (Q5). Moreover, prospective students are not a homogenous group, and will attach different perceived values to different costs: for some, a course with higher costs reflects its worth; for others, a cheaper course is seen as better value. The association between debt-averse attitudes and planned participation in HE grew from 2002 to 2015, indicating that young people are now thinking more carefully about taking on debt.[3] Prospective students from a lower socio-economic background tend to be more debt-

[1] E Sundorph, D Vasiliev and L Coiffait, Reform (2017) *Joining the elite: how top universities can enhance social mobility.* Available at: http://www.reform.uk/wp-content/uploads/2017/09/Joining-The-Elite-how-top-universities-can-enhance-social-mobility.pdf (Accessed 1 May 2018)

[2] L Peacock (2013) ' Over 2,000 young people apply for just 50 places on EDF apprenticeship scheme' *The Telegraph,* 14 March. Available at: https://www.telegraph.co.uk/finance/jobs/9929780/Over-2000-young-people-apply-for-just-50-places-on-EDF-apprenticeship-scheme.html (accessed: 1 May 2018)

[3] C Callender and G Mason (2017) 'Does student loan debt deter Higher Education participation? New evidence from England', *Annals of American Political and Social Science*, 671 (1): 20-48, DOI:

averse, and this contributes to their lower rates of participation in HE; in contrast, students from other backgrounds have grown increasingly more debt-positive since 2002. The increase in number of poorer students entering HE is a result of the growing market:[4] their participation is *in spite of* funding changes, not *as a result of* them. The expansion of higher education has necessitated the intake of more students from less affluent backgrounds, but the proportion of more affluent students progressing to HE has almost reached saturation point.

*Q3: How do people make choices later in life about what further study to undertake?*

Prospective mature students/learners are cost-sensitive, but for complicated reasons and in complex ways: (lack of) employer support, improved prospects, and the level and flexibility of facilitating support (eg childcare) are highly influential. The current loan repayment system means they have a shorter repayment period, and therefore will pay back less of their loan in that time. This perceived negative association of never paying off the debt may discourage some prospective mature students. Moreover, the choice of course is often directed by the employer.

We believe the current framework for continuing further study is too complex and rigid, and does not respond to the needs of the market. Notable exceptions to this include: Birkbeck providing part-time evening courses, and the Open University providing part-time, online distance learning.

Greater flexibility in employee training is especially important for SMEs. An incremental approach to lateral and up-skilling will allow learners in the workplace to gain skills in an area of need at a time that suits them. For example, many engineers are technically capable but require training in other areas as they respond to technological advances and/or move into a more strategic or managerial role in their career

The development of hop on/hop off courses that a student could take at times that suit their circumstances, with an opportunity to accumulate and transfer credits, would be particularly important to the engineering sector, as their A-level subject choices may preclude students from engineering degree courses. Another potential flexible route into the engineering sector for mature students is a conversion into engineering course, similar to the law conversion course.

*Q4: In recent years we have seen continued growth in three-year degrees for 18 year olds. Does the system offer a comprehensive range of high quality alternative routes for young people who wish to pursue a different path at this age? How can Government encourage provision across a wider range of high quality pathways to advanced academic, technical and vocational qualifications?*

Three-year degree courses are only a small proportion of the courses offered by HEIs: most engineering degrees are at least four years. These are still much shorter than many international courses, which can lead to problems in the international recognition of UK engineers – and there has been no guarantee that UK degrees will continued to be recognised by the Bologna process after Brexit.

---

10.1177/0002716217696041. Available at: http://www.llakes.ac.uk/sites/default/files/58.%20Callender%20and%20Mason.pdf

[4] UCAS (2016) *End of cycle report.* Available at: https://www.ucas.com/file/86661/download?token=Ls6kLU5- (Accessed 1 May 2018)

Promotion of two-year degree courses risks devaluing the UK university brand, deterring international students and the income they bring. Just 0.2% of undergraduates in England currently study two-year degrees (which are not much cheaper than traditional 3-year courses),[5] and further demand is unevidenced.[6] Students often cannot work to earn money and gain practical experience whilst they are studying accelerated courses, and the courses themselves may struggle to meet the requirements to be accredited towards professional recognition.

Three- and four-year degree courses offer better value for money for most students than accelerated degrees, allowing them to undertake work experience to consolidate their knowledge and develop their workplace skills. Industrial placements on 4- and 5-year degree programmes offer the same experience in greater depth. Engineering is a hybrid profession, requiring skills developed in the workplace as well as those gained through an academic qualification. In contrast to accelerated degrees, there is at least as strong a case to be made for four-year courses in the model of US liberal arts degrees that compensates for the early overspecialisation dictated by the UK school system.

A range of options is currently available to both 18-year olds and later life learners. Greater investment in careers education and guidance would help them be better aware of the options (and schools should be better recognised for the support they provide to their students rather than the current narrow metrics of qualifications gained and leaver destinations).

Different types of schools have different expectations for their students. The A level-UCAS route into HE is the path of least resistance for many, removing the responsibility for proactive decision-making from the student. We encourage Government to explore the development of low resistance pathways into employment, training and education, so that no route is more attractive because it is simpler rather than because it is better.

We would like to note that UCAS is a facilitator or broker – not an information resource that students refer to before deciding to consider HE (as the consultation suggests). A UCAS-style system for apprenticeships could similarly be a clearing house or an information resource, but the two are not the same.

*Q5: The majority of universities charge the maximum possible fees for most of their courses and three-year courses remain the norm. How can Government create a more dynamic market in price and provision between universities and across the post-18 education landscape?*

The majority of universities charge the maximum possible fees for most of their courses because that level of income is needed to run their facilities and maintain the academic standards of their courses. A more dynamic market in price and provision cannot be created between universities as that is not how student choice operates nor how it should operate.

---

[5] Department for Education (2017) *Accelerated degrees: Government consultation.* Available at: https://consult.education.gov.uk/higher-education-accelerated-degree-courses/widening-student-choice-in-hig/supporting_documents/Consultation%20document%20on%20accelerated%20degrees%20publication%2011%20December.pdf (Accessed 1 May 2018)

[6] E Pollard *et al.* Institute for Employment Studies/ Department for Education (2017) *Accelerated degrees in Higher Education: Literature Review.* Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/595637/Accelerated_Degrees_Literature_Review.pdf (Accessed 1 May 2018)

Engineering courses are run at a deficit: the cost of running the course is greater than sum of the fees charged and the HEFCE teaching grant contribution (and only some engineering courses receive extra funding for very high cost STEM subjects). Furthermore, the HEFCE teaching grant has decreased as a proportion of total teaching funds since 2010 leaving HEIs more dependent on fee income. Engineering courses have long contact hours and rapid technological change requires frequent investment in modern laboratory equipment so that students can be exposed to the latest engineering techniques. A reduction in fee income would mean graduating students are unfamiliar with current technology, making them less employable, and industry (which now must pay for their training) less competitive.

Engineering courses are systematically cross-subsidised in universities by other degree programmes, international student fees and research funding. Courses that are cheaper to run, but which currently attract the same fees as expensive courses, make a greater contribution to university infrastructure and cross-discipline services, such as libraries, IT facilities, welfare and careers services. Without this contribution, the experience and outcomes for *all* students would be damaged. Cross-subsidisation is not unique to universities: indeed, it is how most organisations operate commercially. It would be both impractical and counterproductive to attempt to limit universities' cross-subsidisation between departments and courses.

Differential fees could be implemented in a variety of ways, but all would be highly problematic:

a) Higher tuition fees for courses that are more expensive to run would discourage universities from offering a full range of courses and (certain groups of) prospective students from attending higher-cost courses;
b) Higher tuition fees for courses that generate higher-earning graduates is an unnecessary, unfair and awkward version of the current system, which is designed to ensure high earners pay back more than low earners in addition to their higher income tax contribution. Furthermore, rapid technological innovation means that earnings data quickly becomes outdated;
c) Lower tuition fees for courses that generate higher-earning graduates, to attract a wider pool of prospective students; and
d) Lower tuition fees for socially important courses, or courses required by the labour market, would decimate attendance on courses specialising in 'soft skills'; however, although many graduate jobs require highly developed critical thinking, analysis and interpretation skills, they do not require a specific qualification – and therefore it is difficult to link a particular employment outcome to a particular degree.

The Industrial Strategy relies on the strength of engineering and related disciplines and the Government must invest sufficiently in HE engineering to facilitate UK industry capability and competitiveness.

If a market in HE exists, is in the graduates produced by universities– and this could be harnessed to greater effect. Institutions could be rewarded through a graduate contribution paid by employers, operating using the same principle as the apprenticeship levy, with the focus switching from the apprenticeship itself to the level of learning and training provided, and the employability this confers, thereby linking income earned by graduates with the income received by their *alma mater* HEI. This would incentivise universities to generate *employable* graduates from all their courses, ensuring strong support for productive disciplines such as engineering.

*Q6: What barriers do current and new education and training providers face in developing innovative or diversified provision?*

Education and training providers are restricted by funding frameworks which limit their ability to respond to student demand: a hop on/hop off approach to further education and training (discussed in Q3), for example, can only be funded by the individual.

That said, HE engineering is already innovative. However, excellence frameworks (REF and TEF) discourage innovation, as institutions adopt tried and tested approaches not because they are best, but because other approaches may involve risk or may not be aligned to be properly recognised within the frameworks. Similarly, university league tables also limit innovation by HEIs, encouraging them to become homogeneous and focused on a small number of narrow metrics.

The demand for models not already provided is unevidenced:[7] two-year degree courses already exist at a handful of institutions, but student participation is low (0.2%).[8] Our preference for longer courses is discussed in Q4.

*Q7: How can Government further encourage high-quality further education and higher education provision that is more flexible: for example, part-time, distance learning and commuter study options?*

Alternative forms of delivery should be pursued to enfranchise more people and engage more diverse groups of people in education, not because there is any expectation that they may be cost-saving. Less immersive forms of education are often less effective because participants are less engaged and lack a sense of community, but nevertheless may be successful. However, some alternative models would struggle to meet the requirements for accreditation towards professional recognition.

The funding of other types of education provision will have to follow a new model: part-time and full-time students have different attitudes to debt. As well as tuition costs, maintenance and 'facilitation' costs (the indirect costs of making it possible or practical for an individual to enter study) will also require funding. Facilitating individuals who would benefit most from non-traditional courses to enter education is especially important and could be achieved not only through direct funding, but by measures such as better on-campus childcare, incentives to employers to allow career breaks and careers guidance.

It is possible that some of the success of the UK HE system is because institutions are able to select students who will succeed. The Open University has been historically important by educating students in a way that suits their circumstances and diverse approaches like this must be supported.

*Q8: To what extent do funding arrangements for higher education and further education and other post-18 education and training act as incentives or barriers to choice or provision: both at the*

---

[7] E Pollard *et al.* Institute for Employment Studies/ Department for Education (2017) *Accelerated degrees in Higher Education: Literature Review.* Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/595637/Accelerated_Degrees_Literature_Review.pdf (Accessed 1 May 2018)

[8] Department for Education (2017) *Accelerated degrees: Government consultation.* Available at: https://consult.education.gov.uk/higher-education-accelerated-degree-courses/widening-student-choice-in-hig/supporting_documents/Consultation%20document%20on%20accelerated%20degrees%20publication%2011%20December.pdf (Accessed 1 May 2018)

*individual and provider level? How does this impact on the choices made by prospective students and learners? What can Government do to improve incentives and reduce barriers?*

Cost is a barrier for some students, especially for those most under-represented in HE, who face the largest conceptual barriers, in terms of tuition fees and maintenance and facilitation costs. It is iniquitous that students from poorer backgrounds are likely to end up owing far more than those from wealthier backgrounds. We support the immediate return of a means-tested grant to address this.

Improved funding of access activity for universities has been positive in encouraging HEIs to engage students from disadvantaged backgrounds, but HEI spending on outreach per student varies from £200-£1000, with no correlation to increased diversity at that institution.[9] Pooling access resources would create opportunities for students to attend an institution that works best for them. Employers – who have in interest in ensuring they have a wide pool of graduates for recruitment – could also help improve access to HE. Furthermore, although there is a model for access in HE, a similar system does not exist in FE.

Not all barriers are financial: barriers could be reduced if improved careers education and guidance were available in schools and to parents. A lack of the confidence and resilience instilled/ encouraged by social capital is another barrier; as is a lack of desire to become a lone trailblazer and standard bearer in a non-diverse institution, or to conform to an uncomfortable new environment.

**Part 2: A system that is accessible to all**

*Q9: What particular barriers (including financial barriers) do people from disadvantaged backgrounds face in progressing to and succeeding in post-18 education and training?*

Some perceived financial barriers to disadvantaged students could be combatted: through, for example, a systems change, or a massive project of educating parents and students. Negative perceptions could be outweighed by positive actions if disadvantaged groups receive more funding, although bursaries, for example, work primarily to keep individuals in education, rather than attract them to it.

Learners from disadvantaged backgrounds can partially cover their financial commitments through part-time work, which has the advantage of improving their workplace skills, but also leaves them with less time for their studies (especially problematic in courses such as engineering with a high number of contact hours). Learners from disadvantaged backgrounds are further disadvantaged by their lack of social capital: they do not have the contacts to obtain a 'better' part-time job.

Equality (providing all students the same level of support and funding) and equity (providing different levels of support and funding to different students, so that they can benefit from equal opportunities) are different. Disadvantaged students require *more* support, not the same amount as other groups, to gain the same advantages, even before they enter university. Students from disadvantaged backgrounds who then enter university with lower grades, or without studying facilitating subjects, will require different forms of teaching support.

[9] E Sundorph, D Vasiliev and L Coiffait, Reform (2017) *Joining the elite: how top universities can enhance social mobility* Available at: http://www.reform.uk/wp-content/uploads/2017/09/Joining-The-Elite-how-top-universities-can-enhance-social-mobility.pdf. (Accessed 1 May 2018)

Progression from HE into employment contains further barriers for those from disadvantaged backgrounds. LEO and earnings metrics are affected by existing social capital: graduates from disadvantaged backgrounds are less likely to get a graduate-level job, progress more slowly when they do, and can be restricted from other jobs which select candidates based on the subjects they studied and grades achieved at A-level.

*Q10: How should students and learners from disadvantaged backgrounds best receive maintenance support, both from Government and from universities and colleges?*

Longer courses such as engineering will automatically result in higher maintenance as well as higher tuition debt, and poorer students end up owing more money than richer students. We wholeheartedly support the use of staged maintenance grants for their support. Additional facilitation payments and other forms of support (see Q7) must also be provided to those whose circumstances mean they require it.

**Part 3: Delivering the skills the UK needs**

*Q11: What challenges do post-18 education and training providers face in understanding and responding to the skills needs of the economy: at national, regional and local levels? Which skills, in your view, are in shortest supply across the economy? And which, if any, are in oversupply?*

HEI funding is based on student demand, not on skills needs – and student demand and skills needs are disconnected. There is currently no incentive for institutions to respond to the skills needs of the economy, and little incentive for industry to engage with the education of the future workforce.

Prospective students could, theoretically, make choices based on LEO data about what and where to study at age 18, but it is unrealistic to imagine that 13-year olds choosing their GCSE subjects that will ultimately influence what they will study in later life could, would, or even should do this. They are more likely to choose on the basis of their aspirations, ambitions and values – and are more likely to be satisfied (and arguably successful) in their careers as a result. Even those who engage with the data expertly may well dismiss it on the basis that it only describes general trends in the past, and that high-earning careers are not necessarily the most socially or economically valuable or the right fit for their individual circumstances.

It is well established that engineers are in short supply in the UK: EngineeringUK predicts an annual shortfall of between 37,000 and 59,000 engineering graduates and technicians.[10] This is partly because engineering courses are particularly good at imparting transferable skills, so engineering graduates are in demand for a variety of jobs. There must be an oversupply of engineering graduates to meet the needs of the economy. There is an oversupply of graduates from subjects made especially familiar to young people through their own experiences or from exposure to media, for example, forensic sciences or media studies – but these courses can be effective in generating graduates with transferable skills. Linking graduate employability to HEI income would incentivise universities to support and assist students to analyse the transferable skills gained over the course of their degree.

*Q12: How far does the post-18 education system deliver the advanced technical skills the economy needs? How can Government ensure there is world-class provision of technical education across the country?*

[10] Engineering UK (2018) *State of the Nation.* Available at: http://www.engineeringuk.com/umbraco/surface/report/ReturnReport/?file=pdf (Accessed 1 May 2018)

The UK education system specialises more and earlier than international models. This does not help the economic needs of the country and prevents diversity and inclusion. The post-18 education system can only deliver advanced technical skills if technical skills and work-related learning are embedded into schools at a far younger age, and students understand how the subjects they study relate to real world situations. Industry can play a major role in ensuring that education providers are aware of the skills required, so that they can be taught at all levels of education.

**Part 4: Value for money for graduates and taxpayers**

*Q13: How should students and graduates contribute to the cost of their studies, while maintaining the link that those who benefit from post-18 education contribute to its costs? What represents the right balance between students, graduates, employers and the taxpayer?*

A market in post-18 education will only help deliver a solution if commonality between the needs of the various stakeholders can be found and the market is structured to incentivise stakeholders to pursue that commonality. After all, graduates are, almost always, taxpayers: the stakeholders are not mutually exclusive groups.

The TEF attempts to link student outcomes with student recruitment levels and therefore income, but is neither a strong enough nor the correct lever to achieve this. HEIs and FE institutions must have a strong investment in the success of their graduates and former learners.

There must also be a good talent pipeline for sectors of the economy that are not well paid but which require a degree: for example, nursing, teaching and social work. Surely the role of the taxpayer is to invest in subjects that result in social as well as economic gain?

*Q14: What are the most effective ways for the Government and institutions to communicate with students and graduates on the nature and terms of student support?*

Careers education and guidance must start early, targeting both prospective students and their parents, and be delivered by professionals in the field, not the current system of in-house, mostly unqualified teachers.

The term 'student loan' is unhelpful: it is not an accurate description, and risks conflating student loan 'debt' with other types of debt, resulting in young people either perceiving student loans negatively because of their association with other forms of debt, or perceiving other forms of debt positively because they do not understand how they differ from student loans.

*Q15: What are the best examples of education and training providers ensuring efficiency in the method of course provision while maintaining quality? And what are the challenges in doing this?*

UK HE already costs less to the taxpayer than almost any other system in the developed world per head, and generates good quality outputs: the current model is already both efficient and high quality.[11]

[11] OECD (2016) *How much do tertiary students pay and what public support do they receive?* Available at: https://www.oecd-ilibrary.org/docserver/5jlz9zk830hf-en.pdf?expires=1524844701&id=id&accname=guest&checksum=04F41B8472CA239687A2C095E3887FD6 (Accessed 1 May 2018)

Cross-subsidy is required to maintain and increase efficiency in HE, ensuring that participants of low cost courses can access valuable non-course related infrastructure, and that high-cost courses are not prohibitively expensive for poorer prospective students.

Online and distance learning is a model that can work in some situations. The Open University is an excellent example of a lower cost, good value for money provider that ensures potential students who would be precluded from other institutions and types of courses because of their circumstances can still gain qualifications.

*Q16: What are the ways that Government can increase the value for money of post-18 education?*

An intention to create a market driven by student demand will be unsuccessful because prospective students are not in a position to know what is in their own long-term interests, let alone those of the economy. Furthermore, a prospective student's values and their long-term financial interests are not likely to be precisely aligned. An inefficient and ineffective market is created because students demand courses that do not deliver the economic, social and cultural outcomes the government would like to see. A more efficient market could be created if the country's economic needs – the needs of the employers and of the regional industrial strategy – are connected to the income of post-18 education providers.

The emphasis on measuring performance in HE is costly and has resulted in resources being diverted from teaching into administration to supply the information for initiatives such as REF and TEF, and into student resources and welfare to support the NSS. Value can only be achieved by increasing funding: if the system is correctly resourced then high quality output will be achieved.