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Submitted to Curriculum and Assessment Review
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Foreword from the Review Chair

Background to the Review

Why does the Review matter?

What is in scope of the Review?

About this call for evidence

Who is this call for evidence for?

Section 1: About you

1 Are you responding as an individual or on behalf of an organisation?

Organisation

Section 1: About you

3 If you are responding on behalf of an organisation, which of the below best describes which part of the sector your organisation represents? [If more than one applies, please select the one that you think is most important to understanding your consultation response.]

Charity, social enterprise organisation or non-profit organisation

Please describe:

4 What is the name of your organisation?

Organisation name:
Engineering Professors' Council

5 What is your role within the organisation?

Job role:

Chief Executive

Section 1: About you

6 What is your name?

Name:
Johnny Rich

7 What is your email address?[Please note: If you are willing to be contacted about your submission, please provide your email address. You do not have to give your email address, and your views will be considered whether or not you provide this.]

Email address:
j.rich@epc.ac.uk

8 Are you happy to be contacted directly about your response?[Please note: The Review may wish to contact you directly about your responses to help our understanding of the issues. If we do, we will use the email address you have given above.]

Yes

9 Would you like us to keep your responses confidential?

No

Reason for confidentiality:

Definitions

Section 2: General views on curriculum, assessment, and qualifications pathways

10 What aspects of the current a) curriculum, b) assessment system and c) qualification pathways are working well to support and recognise educational progress for children and young people?

What is working well?:

Engineering is a strategically critical sector, accounting for one fifth of jobs in the UK and an even greater proportion of vacancies (EngineeringUK: https://www.engineeringuk.com/media/319071/euk-key-facts-and-stats-sept23.pdf), which illustrated the depth of shortages in the skills pipeline. Graduates and school-leavers with engineering skills are not only in demand in this sector, but the transversal skills associated with engineering (mathematical ability, analytical skills, problem-solving, creativity, practical resourcefulness, teamwork, etc) are also highly valued in almost every area of employment. Maintaining a pipeline of these skills is about more than ensuring the sustainability of the engineering sector; it is about the health of the whole labour market.
With that in mind, for entry to undergraduate engineering courses, the range of qualification pathways of recent years – including, but not limited to GCSEs, A levels, SQA Highers, and BTECs – has largely provided sufficient clarity regarded knowledge, skills and potential. BTECs have proved particularly effective at supporting pathways for pupils from lower socioeconomic backgrounds and the with lower previous academic attainment to nevertheless gain access to rewarding and much-needed roles in engineering.

11 What aspects of the current a) curriculum, b) assessment system and c) qualification pathways should be targeted for improvements to better support and recognise educational progress for children and young people?

What should be improved?:

a) Given the importance of BTECs to progression into engineering, there is concern at the recent decline in candidates with BTECs, especially as a pathway for students from lower socioeconomic backgrounds.
While T levels have value in their own right, their introduction has led to the displacement of BTECs rather than their replacement. Quite apart from the disappointing levels of availability and take-up of T levels, our members have expressed concern that pupils at 15 or 16 are less likely to choose the high-stakes option of a single course in a vocational area with which previous studies have given them no familiarity instead of opting for an engineering-related BTEC, say, in combination with other subjects.
An EPC research project (Makramalla, M., Atkins, C., and Rich, J., Engineering Professors Council, 2024: Maths for Engineering: Do T levels add up? https://epc.ac.uk/article/maths-for-engineering-do-t-levels-add-up/) also found that many universities had concerns about the suitability and rigour of the mathematical content of engineering-related T levels as a pathways to Level 4 and above. Even among those without concerns, it was widely acknowledged that support was needed to help these students transition. Nonetheless, there was wide recognition that the applied and active learning approach adopted in T levels was effective and would be welcomed more widely.
Meanwhile, EPC analysis of UCAS undergraduate admissions data confirms that, while three quarters of 18-year-olds accepted to undergraduate Engineering held A levels, nearly one in eight accepted applicants were BTEC holders. Without established, non-A level routes from level 3 into undergraduate engineering, the country's aspirations for Science, Engineering and R&D growth cannot be realised and, in their currently form, T levels will never be sufficient.
Half of undergraduate Engineering applications from those with BTECs in 2023 were held by applicants with the Extended Diploma – considered to be the 3 A level equivalent. Although the BTEC Extended Diploma acceptance route has contracted by nearly one-third since 2019 (a decline most pronounced following the 2021 Government announcement that public funding would be removed from "low-quality" level 3 courses that overlap with A Levels and T Levels) universities still want applicants with BTECs, whether in combination with A levels or not. The latest admissions data shows that applicants to Engineering were accepted across all levels of BTEC attainment. Only one in four BTEC Extended Diploma applications was rejected through the UCAS main scheme.
It is known that students from disadvantaged backgrounds are currently encouraged to do T-Levels and BTECs rather than A levels and EPC research shows that BTECs are predominantly the domain of the college sector when it comes to admissions (i.e. attractive to those leave the school system at 16).

b) The numbers of pupils taking Design & Technology at GCSE have fallen by over a third in little over a decade. This is partly due to a fall in availability, which in turn is due to the resources needs of dedicated teaching space and expensive (potentially hazardous) equipment and materials and also a significant shortage of D&T teachers. These pressures have a feedback effect on each other creating a spiral of decline in the subject.
D&T is the closest corresponding subject area in the curriculum to engineering until level 3. Even at level 3, the Engineering A level has followed a similar path of decline to extinction, dealt the final blow by the fact that, because so few schools and colleges could offer it viably, higher education institutions could not express any expectation that students should have it, which in turn made it less attractive for students and less viable of schools and colleges.
It is hard for pupils to aspire to study subjects with which they are unfamiliar, let alone prepare to enter a sector that accounts for a fifth of the UK workforce and 27% of the economy. The decline of D&T and the complete absence of any curriculum content that is explicitly described as 'engineering' is a major contributing factor to the UK's significant shortfall in engineering skills (estimated to amount to one million workers at school-leaver or graduate level by 2030 owing to recruitment being significantly outstripped by retirement, see https://assets.nationbuilder.com/stonehaven/pages/179/attachments/original/1710280352/Stonehaven_Engineering_Recruitment_Research_280723.pdf?1710280
Given that skills that are often associated with engineering are also in high demand in non-engineering sectors of the economy, this suggests that it would be desirable not merely to create a sufficient pipeline for engineering but to create a surplus.
It is also worth noting that engineering industries are likely to be at the forefront of emerging challenges, particularly in relation to the climate, but also in other technologies. Having the knowledge and skills to enter those industries or at least engage with their activities should be a goal of the education system.

c) Research in higher education engineering education shows the success of the development of more student-centred and active-learning approaches to the curriculum which has been advocated for by thought leaders. An EPC/UCL review and survey highlights a spectrum of educational models to better support and recognise educational progress among learners and these offer an evidence-based framework of what works that can be applied

downstream.
Models emerging in engineering education provision include practical teaching; use of projects; dissertation projects; project-based learning, project-based initiatives and frameworks; and examples of new buildings driving curriculum innovation.
In a survey of Engineering departments, conducted by UCL and the Engineering Professors' Council, between 25% to 75% of the courses/modules taught at undergraduate level adopted active learning as the dominant form of teaching. Teamwork activities were deployed in between 25% and 50% of their courses. Examples of active learning activities included: group work and/or teamwork, competitions, interdisciplinary projects, work-based learning and fieldwork, entrepreneurship challenges and courses, and flipped classrooms.
Analysis of what works particularly well, and why, suggested that what 'worked well' was associated with the following student outcomes: skills development and deeper understanding; workplace-related projects and skills; thinking beyond their discipline; higher enthusiasm and creativity.
Hands-on/practical learning was a widescale approach to support learning in higher engineering education. The most relevant practical teaching approaches were predominantly 'projects' in teams or individually. Other frequently mentioned approaches used to develop experimental practical skills included 'experiments', 'workshops', 'makerspaces', 'fieldwork' and observations. CDIO (Edström and Kolmos 2014) was a frequently named as a framework to increase project activities.

d) Exams correspond poorly to most activities in careers and support students who can retain knowledge for the duration of the exam, rather than exhibiting aptitude and understanding over time. A diverse model of assessment that still includes exams, but also other forms of assessment might better reflect learning that is useful beyond the classroom. There is now much evidence-based best practice scholarly research in innovative assessment approaches, heightened by the pandemic response in higher education including the opportunities presented by authentic assessment: continual assessment; project work; teamwork; self-assessment; peer assessment; average of multiple lower stakes exams; etc.
Engineering, for example, now widely deploys project-based learning and assessment, broadening the outlook on how to tackle problems (see (c) above).
Engineering academics report that summative assessment is not conducive to reflective practice. Continuous assessment, on the other hand, gives the learner an idea of where they are at key touchpoints, and they are not just left panicking at the end of the year. Summative examinations support students who can retain knowledge for the duration of the exam, rather than exhibiting aptitude and understanding over time.

Section 3: Social justice and inclusion

12 In the current curriculum, assessment system and qualification pathways, are there any barriers to improving attainment, progress, access or participation (class ceilings) for learners experiencing socioeconomic disadvantage?

Barriers for socioeconomically disadvantaged:

It is known that students from disadvantaged backgrounds are currently encouraged to do T-Levels and BTECs rather than A levels. EPC research shows that BTECs are predominantly the domain of the college sector when it comes to admissions (i.e. attractive to those who leave the school system at 16).
The removal of BTEC funding is presenting a barrier to attainment, progress, access or participation for learners experiencing socioeconomic disadvantage. EPC research (Engineering Opportunity) has shown that they are an effective driver of social mobility.
Continual changes to the curriculum available to non-A level students has created an uneven policy environment for higher education providers (at all levels) that attract and support non-traditional learners. A perpetual cycle of learning and relearning to accommodate non-traditional pathways represents a tax on those responding most rapidly to change.
We hear evidence from our members that regional disparities in subject availability are also problematic, where single Science GCSEs and Maths / Further Maths / Physics A levels are not consistently available.
Whether through selection criteria or – more widely – self-elmination, these subjects are almost a prerequisite for studying an engineering degree at the more selective universities (and, we suppose, the same is true for other similarly competitive higher qualifications in STEM).

13 In the current curriculum, assessment system and qualification pathways are there any barriers to improving attainment, progress, access or participation which may disproportionately impact pupils based on other characteristics (e.g. disability, sexual orientation, gender, race, religion or belief etc.)

Barriers based on protected characteristics:

It is known that students from disadvantaged backgrounds are currently encouraged to do T-Levels and BTECs rather than A levels, but this can reduce their choices when looking at university and other further study options.
Extended Diploma applicants are more commonly BME than White and BME applicants more likely to be accepted than their White counterparts. A decline in BTEC acceptances to Engineering HE since 2019 has, by and large, bypassed BME applicants.
Applicants with all types of disability are overrepresented among both BTEC Extended Diploma applicants and accepted applicants in Engineering.

14 In the current curriculum, assessment system and qualification pathways, are there any barriers in continuing to improve attainment, progress, access or participation for learners with SEND?

Barriers based on SEND:

The Review should take specialist advice from experts in designing space and working conditions for SEND and neurodivergent learners who may need support with sensory, organisational or other key factors to avoid discrimination. SEND support in schools is woefully underfunded and neurodivergent pupils chances of success are curtailed by the high-stakes assessment model which runs counter to the Equality Act.
Evidence suggests that timed, closed book, unseen, written exams discriminate against students with Specific Learning Difficulties and that the adjustments provided to redress this inequality fail to fully eliminate the awarding gap create a level playing field
Evidence at HE level points to a Universal Design for Learning UDL) approach which understands and pre-empts the needs of all pupils from the outset. There is much evidence of this on the ground in primary schools.

15 In the current curriculum, assessment system and qualification pathways, are there any enablers that support attainment, progress, access or participation for the groups listed above? [e.g. socioeconomically disadvantaged young people, pupils with SEND, pupils who are otherwise vulnerable, and young people with protected characteristics]

Enablers:

Section 4: Ensuring an excellent foundation in maths and English

16 To what extent does the content of the national curriculum at primary level (key stages 1 and 2) enable pupils to gain an excellent foundation in a) English and b) maths? Are there ways in which the content could change to better support this aim? [Please note, we invite views specifically on transitions between key stages in section 9.]

English and maths - primary content:

Most university Engineering departments want applicants with BTECs, with or without A levels. The latest admissions data shows that applicants to Engineering were accepted across all levels of BTEC attainment. Only one in four BTEC Extended Diploma applications were rejected through the UCAS main scheme.
It is known that students from disadvantaged backgrounds are currently encouraged to do T-Levels and BTECs rather than A levels and EPC research shows that BTECs are predominantly the domain of the college sector when it comes to admissions (i.e. attractive to those leave the school system at 16). Extended Diploma applicants are more commonly BME than White and BME applicants more likely to be accepted than their White counterparts. A decline in BTEC acceptances to Engineering HE since 2019 has, by and large, bypassed BME applicants.
Applicants with all types of disability are overrepresented in both the BTEC Extended Diploma applicant and accepted applicant populations in Engineering.

17 To what extent do the English and maths primary assessments* support pupils to gain an excellent foundation in these key subjects? Are there any changes you would suggest that would support this aim? *These include SATs at the end of key stage 2, the phonics screening check and the multiplication tables check.

English and maths - primary assessment:

18 To what extent does the content of the a) English and b) maths national curriculum at secondary level (key stages 3 and 4) equip pupils with the knowledge and skills they need for life and further study? Are there ways in which the content could change to better support this aim?

English and maths - secondary content:

19 To what extent do the current maths and English qualifications at a) pre-16 and b) 16-19 support pupils and learners to gain, and adequately demonstrate that they have achieved, the skills and knowledge they need? Are there any changes you would suggest that would support these outcomes?

English and maths - qualifications:

Technical routes are still less well understood by most stakeholders (learners, educators, schools, colleges, parents, universities and employers) than traditional pathways. An understanding of the significant problems that T levels are encountering, including capacity in the system for industry placements (particularly at a regional level), is needed.
To help universities understand the suitability of the Maths content in engineering-related T levels as preparation for HE Engineering, the EPC undertook a research project to unpick and better communicate to higher education institutions what maths is contained within the T level and to help admissions staff understand the T level as a teaching mechanism. The research found that engineering-related T levels do contain significant maths content but that it is not as explicitly evidenced (when compared to A levels). Some universities consider the mathematical content to be inadequate, but there is also a view that the mathematical content that is included is effectively learnt through applied approached. However, this points to gaps and an inherent trade-off between applied and explicit learning.

20 How can we better support learners who do not achieve level 2 in English and maths by 16 to learn what they need to thrive as citizens in work and life? In particular, do we have the right qualifications at level 2 for these 16-19 learners (including the maths and English study requirement)?

Support for learners who do not achieve level 2 by 16:

21 Are there any particular challenges with regard to the English and maths a) curricula and b) assessment for learners in need of additional support (e.g. learners with SEND, socioeconomic disadvantage, English as an additional language (EAL))? Are there any changes you would suggest to overcome these challenges?

Challenges with curricula and assessment - changes to overcome these:

Section 5: Curriculum and qualification content

22 Are there particular curriculum or qualifications subjects* where: a) there is too much content; not enough content; or content is missing; b) the content is out-of-date; c) the content is unhelpfully sequenced (for example to support good curriculum design or pedagogy);d) there is

a need for greater flexibility (for example to provide the space for teachers to develop and adapt content)?Please provide detail on specific key stages where appropriate.*This includes both qualifications where the government sets content nationally, and anywhere the content is currently set by awarding organisations.

Subject content:

23 Are there particular changes that could be made to ensure the curriculum (including qualification content) is more diverse and representative of society?

Changes to ensure curriculum is more diverse and representative of society:

24 To what extent does the current curriculum (including qualification content) support students to positively engage with, be knowledgeable about, and respect, others? Are there elements that could be improved?

Respect for others:

25 In which ways does the current primary curriculum support pupils to have the skills and knowledge they need for life and further study, and what could we change to better support this?

Primary - skills and knowledge needed for life and further study:

26 In which ways do the current secondary curriculum and qualification pathways support pupils to have the skills and knowledge they need for future study, life and work, and what could we change to better support this?

Secondary - skills and knowledge for life and further study:

The numbers of pupils taking Design & Technology at GCSE have fallen by over a third in little over a decade. This is partly due to a fall in availability, which in turn is due to the resources needs of dedicated teaching space and expensive (potentially hazardous) equipment and materials and also a significant shortage of D&T teachers. These pressures have a feedback effect on each other creating a spiral of decline in the subject.
D&T is the closest corresponding subject area in the curriculum to engineering until level 3. Even at level 3, the Engineering A level has followed a similar path of decline to extinction, dealt the final blow by the fact that, because so few schools and colleges could offer it viably, higher education institutions could not express any expectation that students should have it, which in turn made it less attractive for students and less viable of schools and colleges.
It is hard for pupils to aspire to study subjects with which they are unfamiliar, let alone prepare to enter a sector that accounts for a fifth of the UK workforce and 27% of the economy. The decline of D&T and the complete absence of any curriculum content that is explicitly described as 'engineering' is a major contributing factor to the UK's significant shortfall in engineering skills (estimated to amount to one million workers at school-leaver or graduate level by 2030 owing to recruitment being significantly outstripped by retirement, see https://assets.nationbuilder.com/stonehaven/pages/179/attachments/original/1710280352/Stonehaven_Engineering_Recruitment_Research_280723.pdf?1710280
Given that skills that are often associated with engineering are also in high demand in non-engineering sectors of the economy, this suggests that it would be desirable not merely to create a sufficient pipeline for engineering but to create a surplus.
It is also worth noting that engineering industries are likely to be at the forefront of emerging challenges, particularly in relation to the climate, but also in other technologies. Having the knowledge and skills to enter those industries or at least engage with their activities should be a goal of the education system.

27 In which ways do the current qualification pathways and content at 16-19 support pupils to have the skills and knowledge they need for future study, life and work, and what could we change to better support this?

16-19 - skills and knowledge for life and further study:

BTECs provide a stable, tested pathway to higher education and employment in Engineering, particularly for disadvantaged learners. EPC research has shown that they are an effective driver of social mobility (Engineering Opportunity, https://epc.ac.uk/publication/engineering-opportunity-maximising-the-opportunities-for-social-mobility-from-studying-engineering/).
Senior academics tell us that inconsistency of content and approach between A level exam boards has evolved an industry of provider decision-making re: 16-19 A level (and other) provision. This, ultimately, impacts on pupil opportunity and success. The challenges presented by the mutual exclusivity of knowledge within A level exam boards presents difficulties with interdisciplinarity. Addressing this is particularly important given the proposed "unique" qualification for any given subject.

Section 6: A broad and balanced curriculum

28 To what extent does the current primary curriculum support pupils to study a broad and balanced curriculum? Should anything change to better support this?

primary - broad and balanced:

29 To what extent do the current secondary curriculum and, qualifications pathways support pupils to study a broad and balanced curriculum? Should anything change to better support this?

secondary - broad and balanced:

30 To what extent do the current qualifications pathways at 16-19 support learners to study a broad curriculum which gives them the right knowledge and skills to progress? Should anything change to better support this?

16-19 - broad and balanced:

Technical routes are still less well understood by most stakeholders (learners, educators, schools, colleges, parents, universities and employers) than traditional pathways. An understanding of the significant problems that T levels are encountering, including capacity in the system for industry placements (particularly at a regional level), is needed.
Our members have repeatedly told us that employer-led Apprenticeship and T level development has led to narrow Standards representing a small number of large employers (with SME interests largely sidelined). Meeting employers' short-term interests may often be a cheaper or quicker alternative for them than investment in technology, more efficient processes or the professional development of a long-term workforce. However, by the time Standards start to deliver a workforce trained to the supposed needs, the investment may well have been necessitated and the labour shortfalls addressed. It is critical to the development of new qualifications and Standards that voices are heard that represent the interests of learners over the longer term – their career lifetime, for which they need to acquire flexible and resilient skills that can develop over as circumstances and the labour market change.

31 To what extent do the current curriculum (at primary and secondary) and qualifications pathways (at secondary and 16-19) ensure that pupils and learners are able to develop creative skills and have access to creative subjects?

support for creative skills and access to creative subjects:

Section 6: A broad and balanced curriculum

32 Do you have any explanations for the trends outlined in the analysis and/or suggestions to address any that might be of concern?

Explanations of trends or suggestions to address:

The declining trajectory of Further Maths, Physics and Maths A levels is commonly linked in our network to the supply of high-quality teachers. We also hear from our members that regional disparities in subject availability are also problematic, where single Science GCSEs and Maths / Further Maths / Physics A levels are not consistently available. The contrast in this availability with the independent sector creates a significant advantage for their pupils when it comes to progression, particularly to more selective universities.
EPC research shows that a future pipeline imperative, the students' own interests, and collaboration with university careers services are all key to encouraging graduates to become Physics teachers.

Section 6: A broad and balanced curriculum

33 To what extent and how do pupils benefit from being able to take vocational or applied qualifications in secondary schools alongside more academically focused GCSEs?

secondary - benefit from vocational qualifications:

34 To what extent does the current pre-16 vocational offer equip pupils with the necessary knowledge and skills and prepare them for further study options, including 16-19 technical pathways and/or A levels? Could the pre-16 vocational offer be improved?

vocational offer - equip for further study and improvement suggestions:

Section 7: Assessment and accountability

35 Is the volume of statutory assessment at key stage 1 and 2 right for the purposes set out above?

volume of assessment at key stage 1 and 2:

36 Are there any changes that could be made to improve efficacy without having a negative impact on pupils' learning or the wider education system?

key stage 1 and 2 assessment improvements:

37 Are there other changes to the statutory assessment system at key stages 1 and 2 that could be made to improve pupils' experience of assessment, without having a negative impact on either pupils' learning or the wider education system?

key stage 1 and 2 assessment improvements to experience:

38 What can we do to ensure the assessment system at key stages 1 and 2 works well for all learners, including learners in need of additional support in their education (for example SEND, disadvantage, EAL)?

key stage 1 and 2 assessment works for ALL learners:

Section 7: Assessment and accountability

39 Is the volume of assessment required for GCSEs right for the purposes set out above? Are there any changes that could be made without having a negative impact on either pupils' learning or the wider education system?

volume of assessment at GCSEs:

40 What more can we do to ensure that: a) the assessment requirements for GCSEs capture and support the development of knowledge and skills of every young person; and b) young people's wellbeing is effectively considered when assessments are developed, giving pupils the best chance to show what they can do to support their progression?

GCSE assessments - support development of knowledge and skills and considers wellbeing:

41 Are there particular GCSE subjects where changes could be made to the qualification content and/or assessment that would be beneficial for pupils' learning?

changes to GCSE qualification content or assessment:

Section 7: Assessment and accountability

42 Are there ways in which we could support improvement in pupil progress and outcomes at key stage 3?

support pupil progress and outcomes at key stage 3:

43 Are there ways in which we could support pupils who do not meet the expected standard at key stage 2?

support pupils who do not meet expected standard at key stage 2:

Section 7: Assessment and accountability

44 To what extent, and in what ways, does the accountability system influence curriculum and assessment decisions in schools and colleges?

accountability system influence curriculum and assessment decisions:

45 How well does the current accountability system support and recognise progress for all pupils and learners? What works well and what could be improved?

accountability system support and recognise progress for ALL pupils:

46 Should there be any changes to the current accountability system in order to better support progress and incentivise inclusion for young people with SEND and/or from socioeconomically disadvantaged backgrounds? If so, what should those changes be?

accountability system changes to support SEND or socio-economically disadvantaged:

Section 8: Qualification pathways 16-19

47 To what extent does the range of programmes and qualifications on offer at each level meet the needs and aspirations of learners?a) Level 3 b) Level 2c) Level 1 and entry level

extent to which programmes and qualifications meet needs and aspirations of learners:

48 Are there particular changes that could be made to the following programmes and qualifications, and/or their assessment that would be beneficial to learners:a) AS/A level qualificationsb) T Level and T Level Foundation Year programmesc) Other applied or vocational qualifications at level 3d) Other applied or vocational qualifications at level 2 and below

changes to programmes and qualifications:

Exams correspond poorly to most activities in careers and support students who can retain knowledge for the duration of the exam, rather than exhibiting aptitude and understanding over time.
High stakes exams are also inherently sexist: during an A level or GSCE exam period of around a month, half the students are likely to have to sit between a fifth and a quarter of their exams while menstruating. Two-thirds of girls report feeling less able to perform in time-limited assessments during their period (Plan International 2021, https://www.hepi.ac.uk/2024/01/22/period-poverty-in-uk-higher-education-addressing-stigma-and-empowering-students/). Securing any academic accommodations in these circumstances is challenging given that – despite the ubiquity of menstruation – it still carries much stigma, especially for younger women.
A diverse model of assessment that still includes exams, but also other forms of assessment might better reflect learning that is useful beyond the classroom. There is now much evidence-based, best practice, scholarly research in innovative assessment approaches, heightened by the pandemic response in higher education including the opportunities presented by authentic assessment: continual assessment; project work; teamwork; self-assessment; peer assessment; average of multiple lower stakes exams; etc.
Engineering, for example, now widely deploys project-based learning and assessment, broadening the outlook on how to tackle problems. Engineering academics report that summative assessment is not conducive to reflective practice. Continuous assessment, on the other hand, gives the learner an idea

of where they are at key touchpoints, and they are not just left panicking at the end of the year. Summative examinations support students who can retain knowledge for the duration of the exam, rather than exhibiting aptitude and understanding over time.

49 How can we improve learners' understanding of how the different programmes and qualifications on offer will prepare them for university, employment (including apprenticeships) and/or further technical study?

improve understanding on how programmes and qualificatoins will prepare them for future:

Technical routes are still less well understood than traditional pathways. T levels were not originally conceived as a basis for HE progression; and HE understanding and acceptance reflects this (as evidenced by entry requirements to Engineering which sometimes state a need for the virtually inconceivable combination of T level with A level Maths).
To help universities understand the suitability of Maths content in engineering-related T levels as preparation for HE Engineering, the EPC undertook a research project to unpick and better communicate to higher education institutions what maths is contained within the T level and to help admissions staff understand the T level as a teaching mechanism. The research found that engineering-related T levels do contain significant maths content but that it is not as explicitly evidenced (when compared to A levels). Some universities consider the mathematical content to be inadequate, but there is also a view that the mathematical content that is included is effectively learnt through applied approached. However, this points to gaps and an inherent trade-off between applied and explicit learning.
Continual changes to accommodate non-A level students has created an uneven policy environment for providers (at all levels) that attract and support non-traditional learners. A perpetual cycle of learning and relearning to accommodate non-traditional pathways represents a tax on those responding most rapidly to change. A recent gathering of Engineering admissions experts also highlighted those continual changes to the level 3 curriculum, and disparate curriculum content between examination boards, were hard to stay abreast of over a prolonged period of time. The experience of Physics A level candidates now, for example, is unrecognisable from a generation or more ago.
Foundation years in Engineering are likely to become more important as level 3 curriculum and assessment is reviewed, not less. Their future should be assured.
Exams correspond poorly to most activities in careers and support students who can retain knowledge for the duration of the exam, rather than exhibiting aptitude and understanding over time. A diverse model of assessment that still includes exams, but also other forms of assessment might better reflect learning that is useful beyond the classroom.

50 To what extent is there enough scope and flexibility in the system to support learners who may need to change course?

scope and flexibility to support learners changing course:

51 Are there additional skills, subjects, or experiences that all learners should develop or study during 16-19 education, regardless of their chosen programmes and qualifications, to support them to be prepared for life and work?

skills, subjects or experiences that all learners should develop or study during 16-19:

A diverse model of assessment that includes other approaches might better reflect learning that is useful beyond the classroom. Exams correspond poorly to most activities in careers and the almost exclusive use of final summative examinations is an assessment method that corresponds to vanishingly few challenges later in working life. The high-stakes, cliff-edge nature of summative exams (with all-too-often unreliable grading) puts a great deal on stress on the emotional well-being of pupils with little, if any identifiable benefit when compared to other assessment approaches.
A balance of assessment should be used to include examinations but also report writing, presentations and other formats to better prepare students for 'real-life' situations and university studies. Employment is not assessed by examination and a proliferation of approaches is key to mirroring work environments. Educational assessment needs to keep up or will be obsolete before implementation of these proposals is completed.
A future-proof education system must recognise the importance of personal attributes that ensure our next generation is work-ready (e.g., entrepreneurial, inquisitive, collaborative and ethical). 21st century 16-19 education should not be based only on knowledge, but also skills. There is an opportunity to learn from Engineering's development and regular review of the Accreditation of Higher Education Programmes (AHEP), which has recently considered in detail the role and emphasis on skills and knowledge required to be a successful engineer.
There is a valuable opportunity here to decompartmentalise the curriculum to harness the golden threads of education and join up all components within a unified approach. EEP (including study skills) is currently commonly operationalised as an add-on, which is not assessed and is undervalued by learners or educators. There is evidence that reflection and critical skills for metacognition are essential to good pedagogy and learning. A greater focus on independence and independent thinking, including self-led learning can be regarded on a spectrum or as progression (noting that there are inclusivity considerations here).
CEIAG should be continuous (starting from an early level and ongoing throughout every educational stage) and contiguous (building incrementally on previous interventions and learning). Employability should focus on wide and reflective careers and skills education rather than repetitive "meet an employer" activities. These are useful, but need to be conducted within a metacognitive framework of understanding, otherwise for most students, most encounters with employers feel tangential if they are not specific to an idea they already hold about what they might want to consider doing. Ideally, all employer engagement should feel pertinent to all students because they are able to reflect on common features of employability rather than on the specifics of a potentially irrelevant job.

Section 9: Other issues on which we would welcome views

52 How can the curriculum, assessment and wraparound support better enable transitions between key stages to ensure continuous learning and support attainment?

wraparound support enabling transitions between key stages:

Section 9: Other issues on which we would welcome views

53 How could technology be used to improve how we deliver the curriculum, assessment and qualifications in England?

how can technology be used to improve delivery of curriculum, assessment and qualifications :

Section 9: Other issues on which we would welcome views

54 Do you have any further views on anything else associated with the Curriculum and Assessment Review not covered in the questions throughout the call for evidence?

Any further views:

As there is currently no A level in Engineering, proxy level 3 subjects are typically used to assess suitability for further study. HE providers and subject experts can ensure that steps to broaden the curriculum are fit for purpose and support progression.