1 About Pearson

1.1 Pearson is submitting evidence to the committee in its capacity as the largest provider of school, college, and work-based qualifications in the country. We also have a significant presence in the academic qualifications market through our provision of the full range of GCSEs and A-levels. In addition, as a FTSE 100 UK headquartered company, we have a real understanding of the need for highly skilled, well rounded employees.

1.2 Pearson strongly supports this focus on STEM skills. The findings of the CBI/Pearson Education and Skills Survey 2016 highlight the urgent need for more action to boost STEM skills, that shortages of people skilled in STEM has been a long-standing concern for businesses across the UK, and that this must be tackled effectively if the pace of future economic growth is not be held back. STEM skills are essential for many jobs in the high-growth sectors. The findings also show the growing opportunities open to those who develop the right skill sets, and highlight that the surveys have repeatedly shown that studying STEM subjects can give students an edge in competing for graduate career openings.

1.3 Pearson has a key role to play in the provision of STEM skills; through the development of relevant high-quality qualifications and surrounding materials to support effective teaching and learning.

2 Executive summary

2.1 Our submission is designed to draw the Committee’s attention to one specific issue in the UK STEM skills agenda: the decline in take-up of STEM skills vocational qualifications, and the work Pearson has been doing to address this.

2.2 Whilst Pearson fully supports the aims of the recent reforms to the Key Stage 4 curriculum, one of the less welcome effects has been to make it seem less important for schools and colleges to offer more skills-based vocational qualifications either alongside the EBacc, or potentially instead of the EBacc, where this would better suit the student.

2.3 To address this Pearson has developed new BTEC Tech Award qualifications in Engineering, IT and STEM for use by 14-16 year olds, designed to meet DfE’s Technical Award criteria for inclusion in Progress 8 performance measures. The qualifications can be used independently or as a group of qualifications covering the STEM area. The STEM Tech Award qualification is specifically designed to enable schools to offer students an opportunity to learn about, and show their aptitude for, the STEM sector in a way that complements an EBacc curriculum. IT and Engineering qualifications are alternatives for schools with more specialist provision.

3 STEM skills and the impact of changes to the Key Stage 4 curriculum

3.1 The Key Stage 4 curriculum has undergone significant changes following the introduction of reformed performance table and accountability measures from 2010 onwards.

3.2 Three key reforms have driven these changes:

- The EBacc was introduced in January 2011 as a means of encouraging a more traditional curriculum in schools.

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1 The Right Combination, CBI/Pearson Education And Skills Survey 2016, July 2016
Written evidence submitted by Pearson (GAP0047)

- Shortly afterwards the ‘equivalence’ of some vocational qualifications with academic qualifications was removed for the purposes of performance tables.
- Lastly, announced in October 2013, Attainment 8 and Progress 8 were introduced into performance measures from summer 2016. These incentivise schools to ensure pupils take qualifications that fill eight key subject slots: English; mathematics; three other qualifications in the EBacc subjects (sciences, computer science, geography, history and languages), and three further qualifications, which can be other GCSE qualifications in subjects not already counted, or other ‘high value’ vocational qualifications.

3.3 Pearson supports the aims of all three of these reforms: the introduction of the EBacc to ensure the great majority of students have access to a core of essential subject knowledge that provides a sound basis for progression in a wide variety of directions; the removal of ‘low value’ vocational qualifications from performance tables to ensure students are offered qualifications that help them progress; and the changes to the performance measures to facilitate the provision of a broad and balanced curriculum.

3.4 However, in our responses to the consultations on these reforms we outlined potential risks in the approach. One risk we were, and are, concerned about is the potential for the EBacc, and the Attainment 8 and Progress 8 measures, to make it seem less important for schools and colleges to offer more skills-based vocational qualifications either i) alongside the EBacc or ii) potentially instead of the EBacc, where this would better suit the student.

3.5 Whilst the introduction of Progress 8 as the key headline measure ensures the vast majority of Key Stage 4 students take an EBacc-rich curriculum, with at least five GCSEs in EBacc subjects, the additional incentive of meeting the full EBacc requirement requires a further two or three EBacc GCSEs (depending on whether separate or combined sciences are studied) and therefore gives the opportunity for only one or two additional subjects in the typical Key Stage 4 curriculum.

3.6 For example, if a student is identified by a school as being appropriate for an EBacc education, they could take 2 English GCSEs, 1 Maths GCSE, 2 or 3 Science GCSEs, History or Geography GCSE and 1 one GCSE in a Modern Foreign Language. This totals 7 or 8 GCSE qualifications that count towards the Progress 8 measure. This leaves a maximum of 1 curriculum slot for a creative or technical subject, and could mean that such subjects are being taken less by middle- to high-ability candidates.

3.7 To date the reforms have had the unintended consequence of contributing to the fall in take-up of vocational STEM subjects, which could in turn, contribute to the UK STEM skill shortages. In addition, from the point of view of the student, an over-emphasis on EBacc subjects may not be the best way to ensure they have the best chance of progressing successfully.

3.8 The Sutton Trust raised a similar concern in their Research Brief: Changing the subject:

“In setting the EBacc as the ‘gold standard’ Key Stage 4 curriculum, we risk deprioritising the educational experiences of those for whom it is inappropriate. This group of pupils – whether 10% or 30% of cohort – deserve to receive a curriculum that will equip them with the right skills to progress to further study and onto work. To this end, the Government should review the value of Key Stage 4 routes that include vocational qualifications and consider whether explicit guidance through a Technical Baccalaureate would raise the status and focus on the experiences of these pupils.”

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2 Research Brief: Changing the subject, Sutton Trust, July 2016
The decline in take-up of STEM skills vocational qualifications

4.1 The specific issue Pearson has identified is that, while EBacc subjects often suit middle- to high-ability students; this is also the very group of students we want to be encouraging to consider a STEM-based technical education post-16. Whilst it is possible to progress to post-16 learning in many technical subjects from an EBacc curriculum, learners who have not studied such subjects pre-16 have less of an idea of what working in the sector might involve and the aptitude they may have for it. This lessens their likelihood to exercise the choice to progress to technical education post-16 even if they are potentially suited to it and level 3 deliverers will have less of an idea of a student’s suitability for further technical education. There are a number of initiatives aimed at ensuring students are exposed to STEM in schools, but the well-documented sensitivity of schools to qualifications-based performance measures means that such enrichment activities are rarely prioritised as much as would be ideal.

4.2 In their 2016 report The State of Engineering, Engineering UK picks up on the issue. The report analyses the engineering industry’s capacity for growth and details engineering in education, training and employment. It shows that following the reforms entries to traditional GCSE science subjects have fallen. (Entries, though still relatively small, have however increased to newer GCSE STEM subjects such as computing, engineering and further additional science.)

4.3 Their concern, however, is the decline in take-up of vocational STEM pathways which they point out as offering students a viable alternative pathway to higher level study. For all STEM subjects (except other sciences) the number of completions has declined since 2013/14. For example, total engineering level 2 BTEC completions declined by 12.5% between 2013/14 and 2014/15, and the number of construction completions fell by a quarter. They highlight that this decline in particular is concerning as, according to the association of graduate recruiters, construction companies are expected to have among the largest increase in vacancies of any sector (22.1%) in the 2014/15 recruitment season.

How Pearson has addressed the potential gap in the skills based curriculum

5.1 In order to ensure as many students as possible are given the opportunity to study STEM subjects at 14-16, Pearson has developed new BTEC Tech Award qualifications in Engineering, IT and STEM for use by 14-16 year olds. These have been designed to meet DfE’s Technical Award criteria for inclusion in Progress 8 performance measures.

5.2 The BTEC Tech Award qualifications have been designed to complement an EBacc curriculum by building from, rather than duplicating, learning undertaken in GCSE EBacc subjects such as Science, Maths and Computer Science.

5.3 The BTEC Tech Award qualifications can be used independently or as a group of qualifications covering the STEM area. The STEM Tech Award is specifically designed to widen student perception of what working in STEM involves and to help them understand and prove their aptitude for STEM subjects in a way that complements an EBacc curriculum by focussing on using STEM methodologies. The qualification is designed to enable schools with limited engineering resources to still provide a strong learning experience. IT and Engineering qualifications are alternatives for schools with more specialist provision.

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5.4 The BTEC Tech Award qualifications assess the outcomes of practical and project-based work in order to broaden students’ learning experiences and augment the academic focus of GCSEs. They are designed to develop learner understanding of the STEM sector and their aptitude for it.

5.5 Whilst Pearson cannot offer a full solution to the issue of lack of time spent on the broader STEM area in schools, we can support others by ensuring that learning in STEM is reflected in qualifications achieved and that those qualifications are genuinely useful to students in helping them decide on and secure opportunities to continue learning in STEM. Pearson has recently reached out to organisations involved in promoting the teaching of STEM in schools in order to see how we might support them in their work through the new BTEC Tech Award qualifications we will be offering for September 2017.

January 2017