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Vocational Qualifications at Key Stage 4 and Key Stage 5: who takes them and how they fit into students' programmes of study

Research Report

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List of abbreviations

KS4	Key Stage 4
KS5	Key Stage 5
L2	Level 2
L3	Level 3
PT	Performance table
AS Level	Advanced subsidiary level
A Level	Advanced level
DfE	Department for Education
FSMQ	Free Standing Maths qualification
GQ	General qualification
IB	International Baccalaureate
VQ	Vocational qualification
EPQ	Extended project qualification
GCSE	General certificate of secondary education
IGCSE	International general certificate of secondary education
FSM	Free school meals
IDACI	Income deprivation affecting children index
ICT	Information and communication technology
NVQ	National vocational qualification
GNVQ	General national vocational qualification

Executive Summary

Background

In 2010, the government announced their latest drive to raise the status of vocational qualifications in secondary education. This overhaul was subsequently enacted based on recommendations made by Alison Wolf in her review of vocational education. As a result, the Department for Education (DfE) introduced four new categories of vocational qualifications (renamed as applied and technical qualifications) for the Key Stage 4 and Key Stage 5 school and college performance tables: Technical Awards at Key Stage 4 and Applied Generals, Tech Levels and Technical Certificates at Key Stage 5. Only vocational qualifications that met the criteria for those categories would be approved for the DfE performance tables. These approval criteria changed the nature of vocational qualifications on offer to students at secondary level, affecting content, assessment structure, grading, size and progression requirements.

The reforms to vocational qualifications have not occurred in isolation but alongside reforms to accountability measures and general education. Together, they have various potential implications for how vocational education is used and perceived at secondary level. Whilst provision and uptake of vocational qualifications has increased in recent years, vocational education continues to be under-valued and sometimes treated as second best to academic qualifications by teachers, parents and students.

To date, little research has examined the new categories of vocational qualifications. It is important to understand their particular position in secondary education, given that they were intended to represent a group of "high-quality" and "rigorous" vocational qualifications. How do they fit into candidates' programmes of study and which types of students take them? How do these patterns differ from qualifications that do not meet the DfE's approval criteria? To what extent are these qualifications still associated with low-attaining students? The answers to these questions are particularly important given the DfE's recent consultation on post-16 qualifications at level 3 and below in England.

The current study

The aim of this study was to investigate the role that vocational qualifications play in students' educational pathways post-reform, by exploring who takes them and how they fit into students' programmes of study. Considering these aspects together enables us to understand more fully the extent to which vocational qualifications constitute a valuable part of the curricula for 14 to 19 year olds.

This study analysed data from the National Pupil Database (NPD). NPD extracts included educational data on whole cohorts of students in Key Stage 4 (14–16 year olds) and Key Stage 5 (16–18 year olds). For all analyses, the most recent data available was used: the cohort of students at the end of Key Stage 4 or Key Stage 5 in 2016/17. Therefore, for this study the DfE-approved vocational qualifications (e.g., Technical Awards) were based on the 2017 performance tables.

A range of statistics was produced to understand the place of vocational qualifications in students' programmes of study, as well as the demographic and educational characteristics of the students with vocational qualifications.

Analyses were carried out for categories of qualifications (e.g., Technical Awards, Applied Generals, Tech Levels, Technical Certificates) and educational pathways defined according to the percentage of each student's learning hours accounted for by academic and vocational qualifications (i.e., academic only, mostly academic, mixed, mostly vocational and vocational only pathways).

The outcomes of the statistical analyses are summarised below.

How do vocational qualifications fit into candidates' programmes of study?

Substantial percentages of candidates took at least one DfE-approved vocational qualification within Key Stage 4 or Key Stage 5. Technical Awards were taken by 43% of all Key Stage 4 candidates while 27% of all Key Stage 5 candidates took either an Applied General or a Tech Level with the latter percentage rising to 37% when looking at Key Stage 5 candidates who took at least one level 3 qualification (i.e., Key Stage 5 L3 candidates). Applied Generals contributed most to vocational uptake at Key Stage 5, taken by more than double the number of candidates who took Tech Levels. Level 2 Technical Certificates were taken by a much smaller minority (10%) of Key Stage 5 candidates. Vocational qualifications that were approved by DfE were considerably more popular than non-approved vocational qualifications at both Key Stage 4 and Key Stage 5.

Pathway analyses, which included vocational qualifications of all levels and types (not just DfE-approved qualifications), showed that vocational education formed part of a large group of candidates' programmes of study. 51% of Key Stage 4 candidates and 56% of Key Stage 5 candidates were on pathways that included at least one vocational qualification of any level or type.

The contribution that vocational qualifications made to candidates' programmes of study was different at Key Stage 4 compared to Key Stage 5. This was, to some extent, expected given the different accountability measures for the two key stages, which at Key Stage 4 place greater weight on GCSEs than on vocational qualifications. At Key Stage 4, for most students, vocational qualifications were only a small part of their programmes of study (84% of candidates were either on an academic only or mostly academic pathway; only 2% were on a vocational only pathway). However, at Key Stage 5 a much larger percentage of candidates took predominately vocational pathways. When looking at all Key Stage 5 candidates, this percentage was 28%, while amongst the level 3 candidates, 25% were following a fully vocational pathway.

There was also variation with regard to how the different DfE-approved vocational qualifications fitted into candidates' programmes of study. At Key Stage 4, Technical Award candidates mainly followed a mostly academic pathway. In contrast, Applied General and Tech Level candidates most commonly followed vocational only or mostly vocational pathways. Furthermore, Tech Level candidates were more likely to be on a vocational only pathway than Applied General candidates whereas Applied General candidates were more

likely to follow the more academic pathways. Level 2 Technical Certificates, on the other hand, were mostly part of a below level 3 pathway at Key Stage 5.

What qualifications do candidates take alongside vocational qualifications?

At Key Stage 4, the majority of Technical Award candidates took GCSEs. However, large minorities of candidates also took more than one type of vocational qualification, including non DfE-approved vocational qualifications.

At Key Stage 5, Applied Generals and Tech Levels diverged notably from each other as well as from AS/A Levels with regard to the particular academic and vocational qualifications with which they were combined. Applied Generals and Tech levels showed the starkest contrast with AS/A Levels with regard to the uptake of GCSE English or Mathematics. Approximately a quarter of candidates taking either type of approved vocational qualification also took GCSE English or Mathematics compared to under 10% of AS/A Level candidates. Slightly higher percentages of Applied General and Tech Level candidates also took a level 2 Technical Certificate or other level 2 vocational qualification than the percentage of AS/A Level candidates. In contrast, Applied Generals and Tech Level candidates were much less likely to take the EPQ than AS/A Level candidates. It is interesting to note that Core Maths, Free Standing Maths and Functional Skills showed similar uptake amongst Applied General, Tech Level and AS/A Level candidates.

Applied General and Tech Level candidates differed from each other primarily with regard to the uptake of AS/A Levels and level 2 Technical Certificates. AS/A Levels were taken by almost half of the Applied General candidates, which was almost double the percentage found for Tech Level candidates. On the other hand, Tech Level candidates were more likely than Applied General candidates to take level 2 Technical Certificates.

At Key Stage 5, level 2 Technical Certificates seemed to be part of below level 3 programmes of study. The vast majority of the candidates with level 2 Technical Certificates took GCSE English or Mathematics with only small percentages taking any level 3 academic or vocational qualifications at all.

Do vocational qualifications fill different subject needs to academic qualifications?

A way to evaluate whether different qualifications supported different subject needs was to determine the extent to which the same candidate took both vocational and academic qualifications in the same subject area. No overlap between vocational and academic qualifications would indicate that vocational qualifications are being used to fill subject gaps in the curriculum. However, if there were overlap this could be interpreted in different ways: for example, it could indicate that the different qualifications cover different aspects of a subject area, or that candidates have obtained two qualifications just by learning one set of content.

The analyses at Key Stage 4 and Key Stage 5 suggested that the DfE-approved vocational qualifications were covering some subject gaps that academic qualifications (such as GCSEs or AS/A Levels) did not cover.

At Key Stage 4, subjects had varying degrees of candidate overlap between Technical Awards and GCSEs. Subjects with the most candidate overlap were Art and Design, ICT, and Music and Performing Arts. Less candidate overlap between Technical Awards and GCSEs was found for Sport, Media and Communication, and Business, Finance and Law. Subjects (e.g., Construction) without any candidate overlap were always because there were no alternative qualifications in that subject rather than because no candidate took both.

At Key Stage 5, Humanities was the subject with the most candidate overlap between Applied Generals and AS/A Levels, exceeding that found for other subjects. Other subjects with sizeable candidate overlap included Business, Finance and Law, and Art and Design. In general, Tech Levels tended to have less candidate overlap with AS/A Levels than Applied Generals.

Who takes vocational qualifications?

The analyses looked at the following demographic and educational characteristics of candidates: gender, income-related deprivation, first language, ethnicity, school type, school gender composition, prior attainment, concurrent attainment and previous educational pathway.

In general, larger and more consistent differences were found between academic and vocational candidates at Key Stage 5 than at Key Stage 4.

At Key Stage 4, the candidates who took vocational qualifications looked very similar to the candidates who took academic qualifications with regard to most characteristics. Income-related deprivation and concurrent attainment were the only two characteristics that showed some evidence of varying according to vocational uptake. Regarding income-related deprivation, there were only notable differences between pathways but not between qualifications. Pathways with more vocational qualifications had slightly higher percentages of candidates from high deprivation backgrounds. Regarding concurrent attainment, the distributions of candidates who had achieved a 'good' pass in GCSE in English and Mathematics varied substantially and consistently with the proportion of vocational qualifications in the students' pathways: the more vocational the pathway was, the higher the percentage of candidates who had not passed their GCSE in English or Mathematics.

At Key Stage 5, most characteristics showed evidence of having a relationship with vocational uptake. For example, there were higher percentages of male than female students in the more vocational pathways as well as for most of the vocational qualifications including Applied Generals, Tech Levels and level 2 Technical Certificates. The opposite pattern (more females than males) was found for the more academic pathways and for both AS Levels and A Levels. There were also large differences for income-related deprivation at Key Stage 5, especially with regard to the percentages of candidates at the high or low ends of the deprivation scale. The percentage of high deprivation candidates increased consistently with increasingly vocational pathways and the percentage of low deprivation candidates decreased with increasingly academic pathways. Income-related deprivation also varied between specific vocational qualifications. Applied Generals had the highest percentage of high deprivation candidates and the lowest percentage of low deprivation

candidates; this was different to Tech Levels whose largest group of candidates were those from medium deprivation backgrounds. At Key Stage 5, the differences between the distributions of prior (Key Stage 4) attainment between academic and vocational pathways and qualifications were much larger than that found for the other characteristics: the higher the vocational proportion in the Key Stage 5 pathways the higher the percentage of candidates with low prior attainment and the lower the percentage of candidates with high prior attainment. Regarding type of school, the percentage of candidates from further education colleges was much higher in the more vocational pathways than in the more academic pathways, with the highest percentage in the vocational only pathway and the lowest percentage in the academic only pathway. For most of the other school types, especially comprehensive schools, the percentage of candidates was higher in the more academic pathways. Furthermore, further education colleges were particularly prominent amongst candidates with Tech Levels and non-approved vocational qualifications. Other characteristics (e.g., ethnicity, first language) showed less evidence of a relationship with vocational uptake, although their distributions still varied between the different pathways and qualifications.

Introduction

Many studies have highlighted large increases in the uptake and value of secondary-level vocational qualifications (i.e., for 14 to 18 year olds) over the past two decades (Cook, 2013; Jin, Muriel, & Sibieta, 2011; Richards, 2016; Universities UK, 2018; Wolf, 2011). At post-16 in particular, they have been credited with enabling larger number of students to enter university (Kelly, 2017; UCAS, 2018; Vidal Rodeiro, 2018; Williamson & Carroll, 2018). During the same period, however, these qualifications have faced criticism over their quality and capacity to prepare students for further education, university and work (Hodgson & Spours, 2013; Wolf, 2011) as well as being scrutinised with regard to the types of students who take them (Bursnall, Naddeo, & Speckesser, 2019; Wolf, 2011). Vocational qualifications have often been viewed by teachers as beneficial primarily for students who are disengaged from schools and for low attainers (Cook, 2013; Richards, 2016). It is not surprising, therefore, that empirical data has often shown that students who follow a vocational pathway typically have lower attainment and are more likely to come from economically disadvantaged backgrounds than those taking academic qualifications (Hupkau, McNally, Ruiz-Valenzuela, & Ventura, 2016; Smith, Joslin, & Jameson, 2015). It is equally not surprising that various researchers and policy makers have argued that vocational education is under-valued and treated as second-best to academic qualifications by teachers, parents and students (Bursnall et al., 2019; Cook, 2013; DfE, 2011; Hodgson & Spours, 2014; Richards, 2016; Sheilds & Masardo, 2015). This perception of vocational pathways as being low status can deter higher-attaining students, even if they are interested and have the aptitude for a vocational career, from following such pathways (Hodgson & Spours, 2014; Sheilds & Masardo, 2015).

In 2010 the government announced its latest drive to raise the status of vocational education in secondary education, highlighting its intention "*to ensure that they match the world's best*" (DfE, 2010, p.11). This overhaul was subsequently enacted based on recommendations made by Wolf in her review of vocational education (Wolf, 2011). The government did not require the development of a new type of vocational qualification as it had done in previous rounds of reform (e.g., GNVQ, 14-19 diploma) (Hodgson & Spours, 1997). Instead, the Department for Education (DfE) set out a new set of criteria that all vocational qualifications needed to meet to be approved for funding and inclusion in school and college performance tables. The approval criteria for these categories changed the nature of vocational qualifications on offer to students at secondary level, affecting, for example, their content, assessment structure, grading, size and progression requirements. In particular, for vocational qualifications to be approved by the DfE they now had to have some form of external assessment, which has typically been implemented as exam assessment (Vitello & Williamson, 2017). In addition, certain types of reformed qualifications not only had to have exams, but the exams had to be assessment hurdles in that candidates had to pass them to pass the whole qualification (Williamson, 2018). Prior to the reforms, vocational qualifications tended to avoid using exams at all. As such, this reform had major impacts on existing qualifications, for example, causing the removal of over 96% of non-GCSE qualifications from Key Stage 4 performance tables in 2014 (DfE, 2015a).

Following the reform, four categories of vocational qualifications were approved by the DfE and included in the school and college performance tables: Technical Award at Key Stage 4; Applied General, Tech Level and Technical Certificate at Key Stage 5.

Technical Awards are broad level 1 and 2 qualifications for 14 to 16 year olds "*that equip students with applied knowledge and associated practical skills, not usually acquired through general education*" (DfE, 2015a, p.4). Although they can focus on an industry or occupational group, they are not permitted to focus on a specific occupation.

Applied Generals are level 3 qualifications designed for "*post-16 students wanting to continue their education through applied learning…[and] fulfil entry requirements for a range of higher education courses"* (DfE, 2015a, p.10). It is important to note that there is no requirement for these qualifications to focus on an industry or occupational group. Because of this (and other reasons), there has been some inconsistency with regard to their status as vocational qualifications. For example, the DfE has labelled them as "applied" rather than vocational (or technical) qualifications in their post-16 skills plan and positioned them in the academic education route rather than the technical route (DfE/BIS, 2016). Yet, they have been classified as vocational qualifications for accountability purposes; Applied Generals are included within the DfE's "level 3 vocational measures" in the 2018 performance tables (DfE, 2019b). Moreover, Applied Generals continue to be discussed in the same context as other categories of vocational qualifications, especially Tech Levels, and have been contrasted with the academic offer of AS and A Levels more so than with each other. Therefore, in this report, we use the term 'vocational' in the broadest sense, encompassing qualifications focused on an industry as well as those that use applied learning.

Tech Levels is the second category of level 3 vocational qualifications included in the performance tables, and can be seen as the strongest vocational offer at level 3. They are designed for post-16 students who wish "*to specialise in a specific industry, occupation or occupational group…enabling entry to an Apprenticeship or other employment*" (DfE, 2015a, p.11). However, employment is not their only progression focus; Tech Levels are also intended to enable progression to higher education.

Finally, Technical Certificates are for post-16 students to study at level 2 (i.e., intermediate level qualifications) but have a specific vocational focus, enabling students to specialise in a specific industry, occupation or occupational group (DfE, 2015a). They are intended to enable students to progress to employment or a higher level technical qualifications including Tech Levels.

The reforms to the design of vocational qualifications have not occurred in isolation but have occurred alongside reforms to accountability measures and general education, which together have various potential implications for how vocational education is used and perceived at secondary level. At Key Stage 4, reforms to accountability measures have given more weight to GCSEs in EBacc subjects than to other qualifications (DfE, 2019b). Progress 8 and Attainment 8 measures only allow a maximum of three non-EBacc qualifications (e.g., Technical Awards) to count towards them. In contrast, at Key Stage 5, vocational qualifications seemed to have been given more prominence than in previous years. The school and performance tables were revised to include separated measures of level 3 vocational uptake (DfE, 2019b). These reforms to accountability measures also occurred alongside major reforms to general education. The content and demand of GCSEs was increased (Ofqual, 2013, 2018) and most GCSEs were required to be assessed entirely by examinations (Vitello & Williamson, 2017); while AS and A Level were decoupled from each other, and were changed from having a modular structure of assessment to a linear

one (Sutch, Zanini, & Benton, 2015; Vitello & Williamson, 2018). Although the reforms were intended to increase the rigour of academic and vocational qualifications, they may have affected perceptions of difficulty and/or provided other incentives in the new accountability system (Cook, 2013; Hodgson & Spours, 2014; Jin et al., 2011; NUS/OCR, 2014; Sutch et al., 2015).

Together, the change to the nature of the vocational qualifications, their place in accountability measures as well as reforms to the academic provision have many potential consequences for vocational education. Cook (2013) reviewed evidence on the effect of changes to performance tables, and found that schools had started to reduce vocational provision at Key Stage 4 as soon as there was suggestion that reforms to vocational qualifications may occur and would not be included in performance tables. Richards (2016) examined Key Stage 4 uptake of vocational qualifications from 2006 to 2015 and found a sharp reduction from 2012 onwards, coinciding with reforms. Richards (2016) however, did not find this pattern for Key Stage 5 such that there was continuing increase in upta ke since 2006, which appeared to level off after 2013. Research prior to the reforms had also found that these two key stages patterned differently with regard to vocational education. For example, Hodgson and Spours (2014) found that Key Stage 4 students expressed positive engagement with vocational education within a mixed programme of study but that this opportunity to mix vocational and academic qualifications largely disappeared at Key Stage 5. This difference found between key stages highlights the importance of analysing the two key stages separately with regard to effects of reforms on vocational education.

Little research has examined the new categories of vocational qualifications (Technical Awards, Applied Generals, Tech Levels and Technical Certificates) more specifically. It is important to understand their particular position in secondary education, given that they were intended to represent a group of “high-quality” and “rigorous” vocational qualifications (DfE, 2015a, p.33). Many questions arise about these qualifications. How do they fit into candidates’ programmes of study and which kinds of students take them? How do these patterns differ from qualifications that do not meet the DfE’s approval criteria? How do these patterns differ from pre-reform patterns of vocational uptake? To what extent are these qualifications still associated with low-attaining students, for example? The answers to these questions are particularly important given the DfE’s recent consultation on post-16 qualifications at level 3 and below in England (DfE, 2019a).

The findings of the few studies that have looked at the new categories of vocational qualifications suggest that, although they still lag behind academic qualifications with regard to uptake, reputation and progression, there has been some changes to the relationship between vocational and academic qualifications.

The most direct insights into the status of the new vocational qualifications came from an annual survey into public perceptions of qualification s commissioned by Ofqual (YouGov, 2019). The 2018 survey was the first one that asked about Applied Generals (none of the surveys have asked about the other categories of approved vocational qualifications). It asked the public their views at the end of 2017, and showed poorer perceptions of Applied Generals than GCSE or AS/A Levels on several levels, including how well-understood the qualifications were perceived to be, how much trust people had in the qualification and how well they were perceived to prepare students for future study. The results, however, should

be taken with some caution as there were much higher instances of respondents selecting the "Don't know" option than disagreeing with statements, which is likely to be due to the fact that Applied Generals were a relatively new qualification, first introduced in the 2016 performance tables (DfE, 2014a). Perceptions of Applied Generals showed little change in the following year's survey overall, although there was some evidence of shifts in levels of agreement amongst different types of stakeholders, especially among the young people surveyed who showed improved perceptions of these qualifications. The DfE conducted a quantitative analysis of the new categories of qualifications as part of their study looking at students' highest study aims at the end of 2017. In general, the findings showed low uptake of Applied Generals and Tech Levels, with only a small percentage of students combining AS/A Levels with Applied Generals or Tech Levels. They also looked at a few characteristics of students taking these qualifications, which suggested that certain groups of Applied General candidates were lower attaining and more likely to come from a more deprived background than A Level candidates. However, it is difficult to interpret these conclusions as the analyses were conducted for different programmes of study (e.g., Applied Generals combined vs. not combined with A Levels) rather than specific qualifications, and not all qualifications or all combinations of qualifications were reported.

Other studies have looked at specific types of approved qualifications. For example, Child and Vitello (2018) interviewed teachers on their views of one type of Technical Award (Cambridge Nationals) and GCSEs. They found that certain teachers viewed Cambridge Nationals as appealing to lower-attaining students, reflecting the traditional view of vocational qualifications. But some teachers had started using these qualifications in a mainstream manner, replacing the GCSE in that subject with the Cambridge National, due to changes to the GCSE that they believed limited the knowledge and skills students could learn from the academic qualification. This practice had already taken place in some of the pre-reform Cambridge Nationals (e.g., ICT), as shown in previous research (Vidal Rodeiro, 2014).

To summarise, the reforms to vocational qualifications have changed the landscape of vocational education at secondary level education. This has occurred within the context of wider reforms to academic qualifications and secondary education system more generally. Therefore, it is important to understand the state of vocational provision and uptake following this recent round of reforms.

The aim of this study was three-fold: 1) to obtain a more up-to-date comprehensive view of vocational uptake with regard to candidates characteristics and programmes of study; 2) to compare the new categories of vocational qualifications with the other vocational and academic qualifications on the same levels; and 3) to compare vocational uptake at Key Stage 4 with that at Key Stage 5.

With this in mind, this project was divided into two strands of work:

1. Characteristics of candidates taking vocational qualifications;
2. The place of vocational qualifications in candidates' overall programmes of study.

Data

This research used data from the National Pupil Database (NPD). The NPD is a database held by the DfE, containing details of students in schools and colleges in England. Its extracts have information, for each academic year, on:

- Qualifications and attainment at the end of Key Stage 4 and Key Stage 5 for all students in England.
- Prior attainment data (e.g., Key Stage 2 test scores; GCSE and other qualifications taken at Key Stage 4).
- Students' characteristics such as gender, type of school attended, free school meals eligibility, ethnicity and income-related deprivation.

The analyses in this report focussed on the cohort of students who were at the end of Key Stage 4 or at the end Key Stage 5 in the academic year 2016/17 (this was the most recent data available at the time the research started).

Candidates

Key Stage 4

In this research, the students at the end of Key Stage 4 were defined as those who were in Year 11 by birth; that is they were 15 years old at the beginning of the academic year 2016/17. Only qualifications taken in one of the Key Stage 4 exam sessions for this cohort (summer 2017, summer or winter 2016, or winter 2015) were considered in this work. The current study focussed on the 581,685 candidates who had an attainment result in one of the Key Stage 4 sessions.

Key Stage 5

Students at the end of Key Stage 5 were defined as those who were in Year 13 by birth; that is, they were 17 years old at the beginning of the academic year 2016/17. Only qualifications taken in one of the Key Stage 5 exam sessions for this cohort (summer 2017, summer or winter 2016, or winter 2015) were considered in this work. The current study focussed on the 537,076 candidates who had an attainment result in one of the Key Stage 5 sessions. Note that a student did not have to achieve a qualification in the summer 2017 session to be included in this research (for example, students who achieved a qualification in summer 2016 and dropped out before the end of their Key Stage 5 years were included).

Qualification types

Qualifications were categorised into different types using the categorisation available in the NPD. However, revisions to the NPD-based categorisations were made if there was evidence suggesting a qualification was better suited to a different category. These revisions were needed for qualifications in some of the broadest NPD categories (e.g., other general qualification, vocationally related qualification (VRQ)). For example, some qualifications in the NPD's "other general" qualification category were Applied General qualifications, so they were categorised as vocational. In addition, some VRQ qualifications were in the academic subject Religious Education and, therefore, were re-categorised as academic[1]. Table 1 shows the main types and sub-types of qualifications considered in this research. There

[1] Decisions such as these inevitably involve some subjective judgement. However, the numbers of candidates involved are very small and are unlikely to have had a substantive impact on results.

were, however, three types of qualifications and assessment results that were excluded from our analyses, as they were less comparable to the main qualifications, for example, with regard to how they were taught within the Key Stage 4 and Key Stage 5 curricula. These were:

- graded exams in Music, Drama or Dance.
- language exams that were not part of a Key Stage 4 or Key Stage 5 academic qualification (e.g., GCSE/IGCSE, AS/A Level).
- attainment results for Baccalaureate qualifications that were not associated with a specific exam subject result, such as overall IB (International Baccalaureate) diploma result.

Candidates who had attainment results for excluded qualifications only were not included in all subsequent analyses. In addition, as qualifications may be retaken by candidates across different exam sessions, only the record with the highest grade in each case was kept, with all other results excluded from the analyses.

Table 1: Types of qualifications

Qualification main type	Qualification sub-type	Level
Academic	AS/A Level Advanced Extension Award GCSE/IGCSE IB Pre-U Other GQ EPQ	Levels 1 to 3
Applied Academic	Applied AS/A Level Applied GCSE/IGCSE	Levels 1 to 3
Vocational	Technical Award	Levels 1 to 2 (for 14-16 year olds)
	Technical Certificate	Level 2 (for 16-19 year olds)
	Applied General	Level 3
	Diploma VQ Other VQ NVQ GNVQ	Levels 1 to 3
Functional Skills	Functional Skills	Levels 1 to 3
Other qualifications in Mathematics	Free Standing Maths qualifications (or ones related to FSMQ) Core Maths	Levels 1 to 3
Entry Level Qualifications	Entry Level	Entry level

Subject areas

The subjects of the vocational qualifications were the basis of the subject classifications in this research. As the starting point, we inspected the DfE's subject categories of Key Stage 4 and Key Stage 5 vocational and technical qualifications documented in its lists of approved qualifications (for inclusion in the 2016-2018 performance tables).

We then mapped those subject groups to all the vocational and academic qualifications in the NPD data. As there were subject groups that seemed to cover a diverse range of subjects, we modified some of the categories for ease of interpretation. This resulted in 17 groups of subject areas that covered most of the qualifications in the NPD. However, there were several subjects that could not be assigned to one of those groups. Therefore, we supplemented these subject areas with two from the classification of academic qualifications used by Bramley (2014): Humanities and Languages. Finally, we decided to keep English as a separate subject area, given its importance in many accountability measures, especially in Key Stage 4. The final list of subject areas considered in the research is shown in **Error! Reference source not found.Error! Reference source not found.**.

Table 2: Subject areas (Key Stage 4 and Key Stage 5 qualifications)

Subject areas
Agriculture, Environment & Animal Care
Art & Design
Media & Communication
Music & Performing Arts
Business, Finance & Law
Construction
Engineering & Manufacturing
Hairdressing & Beauty
Health & Social Care
Public Services
ICT
Mathematics & Science
Preparation for Life and Work
Retail, Hospitality & Catering
Humanities (Social Science)
Sport
Travel & Tourism
Humanities (All)
Languages
English

Pathways

The Key Stage 4 and Key Stage 5 educational pathways (i.e., programmes of study) were defined according to the percentage of each student's learning hours accounted for by each category of qualifications (excluding GSCEs in English and Mathematics).
In order to create the pathways, each qualification was coded as either academic or vocational. This was determined by its qualification type and subject classification, as shown in Table 3. Note that Functional Skills and Entry Level Qualifications were academic or vocational depending on the subject (e.g., qualifications in Mathematics or English were academic; whereas qualifications in ICT were vocational). Mutually exclusive pathways were defined as follows:

- Academic only: all learning hours in academic qualifications
- Mostly academic: between 2/3 and all learning hours in academic qualifications

- Vocational only: all learning hours in vocational qualifications
- Mostly vocational: between 2/3 and all learning hours in vocational qualifications
- Mixed: between 1/3 and 2/3 of learning hours in vocational qualifications

For example, a Key Stage 4 programme with 75% of learning hours assigned to GCSEs and 25% assigned to BTEC study would be classified as 'mostly academic'. At Key Stage 4, the pathway categorisation was intended to capture the ways in which Key Stage 4 students' education varies. Hence, academic qualifications in English and Mathematics were excluded, as these are taken by virtually all students.

Table 3: Pathway groups for each qualification type and subject area

Qualification type (Table 1)	Subject area	Qualification pathway
Academic	[Any]	Academic
Applied academic	[Any]	Academic
Free Standing Maths	[Any]	Academic
Vocational	[Any]	Vocational
Functional Skills	ICT	Vocational
Functional Skills	Mathematics	Academic
Functional Skills	English	Academic
Entry Level Qualifications	[Any, except Mathematics, English or Humanities]	Vocational
Entry Level Qualifications	Mathematics	Academic
Entry Level Qualifications	English	Academic
Entry Level Qualifications	Humanities	Academic

Specific types of qualifications

For the analyses in the report, specific types of qualifications were compared. The groups were based on the vocational or academic nature of the qualification, and on the whether they were approved or not approved for inclusion in the DfE's 2017 performance tables (DfE, 2015a; 2015b). The table below shows the main groups considered in the Key Stage 4 and in the Key Stage 5 analyses (Table 4). Some qualifications not included in the table below were also considered in some of the analyses: Entry Level Qualifications (ELQ), L1/2 Applied Academic qualifications, Functional Skills qualifications, and Free Standing Maths qualifications.

Table 4 Groups of qualifications in the Key Stage 4 and Key Stage 5analyses

Type			**Qualifications[2]**
Key Stage 4	Level 1/2	Vocational	Technical Award Non-approved[3] VQ
		Academic	GCSE/IGCSE (only)[4] GCSE/IGCSE (at least one)
Key Stage 5	Level 3	Vocational	Any L3 VQ
			Applied General
			Tech Level
			Applied General or Tech Level
			Non-approved[3] L3 VQ
		Academic	AS Level
			A Level
			AS or A Level
			Core Maths
			L3 EPQ
	Level 2	Vocational	Technical Certificate
		Academic	GCSE English or Mathematics

Candidates' characteristics

Attainment

The attainment of Key Stage 4 students in this research was measured by several achievement indicators, which are briefly described below:

- *Average GCSE and equivalents points score*, as provided in the NPD (for details on how this is calculated, see DfE (2017)). This measure was used to divide students into three approximately equally sized groups: low attainment, medium attainment and high attainment. These groups were defined to provide a measure of how candidates compared to their peers in Key Stage 4.
- *Performance in GCSE English and Mathematics*. The achievement of certain 'benchmarks' is also important. In particular, gaining GCSEs at A*-C (9-4 in the reformed GCSEs) in both English and Mathematics is a key benchmark that has been used to indicate attainment in previous analyses of vocational qualification candidates (e.g., De Coulon, Hedges, Nafilyan, & Speckesser, 2017; Hupkau et al., 2016). Consequently, the indicator of attaining "good" GCSEs at grades in English and Mathematics available in the NPD was used[5].

[2] Note that the qualification groups occasionally overlap.

[3] Note that approved qualifications are those that were approved for use in the DfE's 2017 performance tables (DfE, 2015a, 2015b).

[4] The candidates with GCSEs/IGCSEs only did not take any other qualification (either vocational or academic) during Key Stage 4.

[5] Note that IGCSEs (regulated) are included in the indicator "achieving GCSEs at grades A*-C" but not in the indicator "achieving GCSEs at grades 9-4".

- *Key Stage 2 tests scores*. The average Key Stage 2 level across English and Mathematics was calculated. This measure was only calculated for candidates with valid levels in both subjects. In this research, Key Stage 2 scores were broken down into six categories, as used by the awarding bodies in England for the prediction of GCSE outcomes. Key Stage 2 scores are not usually available for students in independent schools. As a result, this measure of attainment was missing for a relatively large group of students.

For candidates at Key Stage 5, attainment was measured, in the first instance, by the average GCSE and equivalents points score (see above for details). This points score was used to divide students into three approximately equally sized groups: low prior attainment, medium prior attainment and high prior attainment. These attainment groups were defined across two populations:

- across all candidates in the Key Stage 4 cohort. This provided a measure of attainment unaffected by the fact that higher-attaining candidates at Key Stage 4 are more likely to go on to study at Key Stage 5 (e.g., Crawford, Meschi, & Vignoles, 2011), meaning that average prior attainment at Key Stage 5 is higher than in the wider population.
- across Key Stage 5 candidates. These were defined to provide a measure of how candidates compared to their peers at Key Stage 5.

Secondly, and in line with the measures considered for Key Stage 4 candidates, an indicator of gaining "good" grades in GCSE English and Mathematics was also used, in this case as a measure of prior attainment for the Key Stage 5 candidates. Note that "good" grades for these candidates are grades A*-C, as Key Stage 5 candidates took their GCSEs prior to the latest reform that introduced the 9-1 grading scale.

<u>Level of income-related deprivation</u>

The level of income-related deprivation of the students at both key stages was measured by two different indicators:

- *IDACI deprivation*: The level of income-related deprivation that students experience was inferred using the Income Deprivation Affecting Children Index (IDACI)[6]. This index is based on the student's home postcode, and describes the percentage of children in a very small geographical area (Lower Layer Super Output Area or LSOA) living in low income families. It varies between 0 and 1 and indicates how income deprived the area in which a student lives is. It cannot, however, indicate how income deprived the student actually is. This measure was used to divide students into three approximately equally sized groups: low deprivation (more affluent), medium deprivation and high deprivation.

  Students in both Key Stages were also grouped based on whether the IDACI score was below (low deprivation) or above (high deprivation) 0.20. The cut-off value of 0.20 was used because 0-0.20 is the lowest band of deprivation as stated by the Education Funding Agency and local authority funding is not allocated to students in this band (DfE, 2014b; EFA, 2016).

[6] For further information on IDACI calculation, including definitions of children, families, and income deprivation, see https://www.gov.uk/government/publications/english-indices-of-deprivation-2015-technical-report.

For the students in Key Stage 5, as with prior attainment, the deprivation groups were defined first across the Key Stage 4 cohort that candidates were part of, and then across the year group in Key Stage 5. This is again relevant because candidates experiencing lower deprivation at Key Stage 4 are more likely to go on to study at Key Stage 5 (e.g., Allen, Parameshwaran, & Thomson, 2016).

- *Free School Meals (FSM)*: The NPD provides a flag to indicate if a student has ever been recorded as eligible for free school meals on census day in any termly or annual Census in the last 6 years up to the students' current year. This measure can be used as a proxy for the level of deprivation (Ilie, Sutherland, & Vignoles, 2017).

Type / gender composition of school

The NPD listed the centre at which candidates gained their qualifications, indicated by the centre's Unique Reference Number (URN)[7]. This number was used to match candidates to the 'Edubase' database[8], providing information on the type of school and its gender composition (Gill, 2017).

- Based on their type, schools were classified into six groups at Key Stage 4 (comprehensive schools, secondary modern schools, selective schools, independent schools, post-16 institutions and other centres) and seven groups at Key Stage 5 (comprehensive schools, secondary modern schools, selective schools, independent schools, sixth form colleges, further education (FE) colleges and other centres).
- Based on their gender composition, schools at both Key Stage 4 and Key Stage 5 were classified into three groups: boys only, girls only and co-educational (i.e., mixed).

Other variables used from the NPD were:

- Gender (male/female).
- Language. The NPD collects information on the language to which a student was exposed during early development and used in the home or in the community. If a student acquired English subsequent to early development, then English is not their first language no matter how proficient in it they had become. In this work, the students' major language group (English or Other), as provided by the NPD, was used.
- Ethnicity. This was the student's major ethnic group, as provided by the NPD: Asian (not Chinese), Black, Chinese, White, Mixed or Any Other Ethic Group.

Note that some of the measures described above are collected as part of the annual school census (which is linked to the NPD), so they are primarily available only for students at state-maintained schools (which does not include independent schools and many sixth-form and further education colleges). This could lead to large amounts of missing data for some variables (e.g., IDACI deprivation, FSM, language or ethnicity), particularly at Key Stage 5. Therefore, for the Key Stage 5 cohort, the 2014/15 spring census, rather than the 2016/17, was used. This was done to improve coverage as the KS4 NPD contains more school

[7] In the NPD, each candidate was linked to one URN per exam year per exam session (winter or summer), which corresponded to his/her main provider in the corresponding reporting year. Because some candidates who took exams in more than one year had more than one URN (i.e., those who had changed main provider between years), we used the candidate's latest available (i.e., non-missing) URN for the Key Stage 5 analyses and the URN with the most entries for the Key Stage 4 analyses.

[8] Edubase is the DfE's register of educational establishments in England and Wales.

census data (due to a much greater proportion of KS4 candidates studying at schools required to complete the census).

Method

The statistical methods used to answer the research questions varied from simple descriptive statistics to more complex analyses using regression techniques.

Below is a list of the different analyses carried out in this research.

- Descriptive statistics on the candidates' programmes of study at both Key Stage 4 and Key Stage 5 (e.g., educational pathways; subject overlap between vocational and academic qualifications). Equivalent analyses for specific vocational qualifications (as shown in Table 4) were also carried out.

- Descriptive statistics on demographic and educational background characteristics of candidates following different programmes of study and taking specific qualifications at Key Stage 4 and Key Stage 5.

- Multilevel logistic regression analyses were carried out in order to look at the relationship between the uptake of vocational pathways and the demographic and educational characteristics of candidates.

Results are presented in turn, with Key Stage 4 analyses followed by Key Stage 5 analyses. For brevity, results of the regression analyses are not shown in this report, as they did not add much to the results from the descriptive analyses. They are, however, available from the authors upon request.

There was missing data on certain candidates' characteristics. Candidates with missing data were excluded from the descriptive analyses but included in the regression.

Results

Vocational qualifications at Key Stage 4

Programmes of study

Pathways

Table 5 shows that just under 50% of the students in this research followed an academic only pathway at Key Stage 4 and a further 35% followed a mostly academic pathway. Very small percentages of candidates took mostly vocational or vocational only pathways.

Table 5: Number and percentage of candidates in each educational pathway

KS4 Pathway	N	% (all candidates)
Academic only	281,356	48.7
Mostly Academic	203,829	35.3
Mixed	68,458	11.8
Mostly Vocational	12,110	2.1
Vocational only	11,977	2.1
Total number of candidates	*577,730*	100.0

Uptake of different types of qualifications

Table 6 shows the numbers and percentages of candidates who took specific types of vocational and academic qualifications at levels 1 and 2 whilst at Key Stage 4.

As can be seen in Table 6, vocational qualifications were present in many candidates' programmes of study at Key Stage 4. In fact, over 40% of the candidates took at least one DfE-approved vocational qualification (Technical Award), which includes reformed BTEC and Cambridge National qualifications. Table 6 also shows that around 11% of the Key Stage 4 cohort took vocational qualifications that were not approved for inclusion in the performance tables. Just under 45% of the candidates took GCSEs/IGCSEs only.

Table 6: Number of candidates who took specific types of vocational and academic qualifications

Qualification (Levels 1, 1/2 and 2)	N	% (all candidates)
Technical Award	247,211	42.8
Non-approved VQ	65,392	11.3
GCSE / IGCSE (only)	257,760	44.6
GCSE / IGCSE	569,132	98.5
Total number of candidates	*577,730*	*100.0*

Combinations of qualifications

Table 7 shows the percentages of candidates who took particular pairs of qualifications. One of the qualifications is labelled as the 'qualification of interest' and the other is the 'combined qualification'. The percentages were calculated relative to the qualification of interest (i.e., the percentage of candidates who took the 'qualification of interest' who also took the 'combined qualification').

Table 7: Combinations of qualifications - percentages relative to the number of candidates who took the qualification of interest

Qualification of interest		Combined qualification (% of the candidates taking the qualification of interest)		
Qualification	**Number of candidates**	**Technical Award**	**Non-approved VQ**	**GCSE / IGCSE (no English/Maths)**
Technical Award	247,211	100.0	11.3	99.0
Non-approved VQ	65,392	42.8	100.0	88.2
GCSE / IGCSE (no English/Maths)	562,163	43.6	10.3	100.0

Around 11% of the candidates who took a DfE-approved vocational qualification (Technical Award), also took vocational qualifications that were not approved for inclusion in the 2017 performance tables.

Just under 90% of the candidates with non-approved vocational qualifications took a GCSE or IGCSE (excluding English and Mathematics) and over 40% of them combined their non-approved vocational qualifications with Technical Awards.

It is also interesting to look at the percentages of candidates taking vocational qualifications from the perspective of the groups of candidates taking academic qualifications. Over 40% of the candidates taking GCSEs/IGCSEs (excluding English and Mathematics) took at least one Technical Award. Furthermore, 10% of these candidates took a non-approved vocational qualification.

Subject uptake

When considering all of the qualifications taken by the Key Stage 4 candidates (i.e., entry level to level 2), there were three broad subject areas with notably more entries than the other areas (Table 8). These were Mathematics and Science (34%), English (19%) and Humanities (16%). However, for these three areas, the entries were primarily for GCSEs/IGCSEs (and ELQs) rather than any of the categories of vocational qualifications.

Other subject areas were more common for certain types of vocational qualifications, with different types of vocational qualifications having different subject profiles. Technical Awards were mostly taken in ICT (53%), Sport (12%) and Business, Finance and Law (9%). Smaller percentages of Technical Award entries were in Health and Social Care (8%), Music and Performing Arts (6%) and Engineering and Manufacturing (4%). Non-approved vocational qualifications were taken mainly in Sport, Preparation for Life and Work, ICT, Music and Performing Arts, and in Retail, Hospitality and Catering.

More than one third of the ELQs (36.1%) were taken in Mathematics and Science, and a further 24% in Preparation for Life and Work. ELQs in English were taken by just over 5% of the candidates.

Table 9 shows the percentage of candidates (as opposed to qualification entries) taking at least one qualification across the different subject areas; this was broadly similar to the pattern for the entries shown in Table 8. The most notable difference in the distributions was found for GCSEs/IGCSEs. English, Mathematics and Science, and Humanities were still the three most popular subject areas with regard to the percentage of candidates taking qualifications in those areas (in fact, almost all candidates took English and Mathematics). However, there were several subject areas that, although they did not contribute to a large percentage of entries, were taken by a much larger percentage of candidates. These included Languages, Sport, ICT, Music and Performing Arts, and Art and Design.

Table 8: Entries in subject areas, grouped by qualification category

Subject area	All	Technical Award	Non-approved VQ	ELQ	GCSE IGCSE	Applied Academic
Agriculture, Environment & Animal Care	0.1	0.1	3.1	0.3	0.0	0.0
Art & Design	5.9	1.4	1.6	3.1	6.5	0.0
Business, Finance & Law	2.3	9.2	3.6	0.2	1.7	19.0
Construction	0.2	2.1	2.2	0.5	0.0	0.0
Engineering & Manufacturing	0.4	4.0	2.4	1.2	0.1	1.3
English	19.4	0.0	0.0	5.4	21.8	0.0
Hairdressing & Beauty	0.1	0.5	2.9	0.4	0.0	0.0
Health & Social Care	1.2	8.1	3.3	3.0	0.4	21.1
Humanities	15.7	0.0	0.0	5.7	17.5	0.0
ICT	6.2	53.3	9.5	8.5	2.8	0.0
Languages	5.8	0.0	0.0	3.1	6.4	0.0
Mathematics & Science	34.2	0.0	4.9	36.1	37.0	2.4
Media & Communication	0.9	1.4	0.3	1.0	0.9	0.0
Music & Performing Arts	2.6	6.3	7.9	0.9	2.4	0.0
Preparation for Life and Work	0.9	0.0	21.5	23.7	0.0	0.0
Public Services	0.0	0.0	1.8	0.0	0.0	0.0
Retail, Hospitality & Catering	0.8	1.1	6.0	0.9	0.1	50.3
Sport	3.2	11.6	28.7	5.9	2.3	0.0
Travel & Tourism	0.1	1.2	0.4	0.0	0.0	6.0
Total number of entries	*5,519,673*	*339,175*	*80,134*	*54,056*	*4,912,185*	*54,426*

Table 9: Percentage of candidates taking each subject area (percentage within each qualification category)

Subject area	Technical Award	GCSE IGCSE
Agriculture, Environment & Animal Care	0.2	0.2
Art & Design	1.9	47.1
Business, Finance & Law	12.5	14.4
Construction	2.8	0.0
Engineering & Manufacturing	5.0	1.2
English	0.0	96.0
Hairdressing & Beauty	0.6	0.0
Health & Social Care	10.7	3.6
Humanities	0.0	88.3
ICT	70.6	23.5
Languages	0.0	49.3
Mathematics & Science	0.0	99.4
Media & Communication	1.8	7.7
Music & Performing Arts	8.4	18.5
Preparation for Life and Work	0.0	0.0
Public Services	0.0	0.0
Retail, Hospitality & Catering	1.5	1.2
Sport	15.8	19.9
Travel & Tourism	1.6	0.0
Total number of candidates	*247,211*	*569,132*

Table 10 shows the extent of candidate overlap between Technical Awards and GCSEs/IGCSEs within the same subject area. This helps us to understand the place of vocational qualifications in candidates' programmes of study and whether or not such qualifications are filling subject gaps in the curriculum. No overlap between vocational and academic qualifications would indicate that vocational qualifications are being used to fill subject gaps in the curriculum. However, if there were overlap this could be interpreted in different ways: for example, it could indicate that the different qualifications cover different aspects of a subject area, or that candidates have obtained two qualifications just by learning one set of content.

There was a large degree of candidate overlap for Art and Design, such that 31% of the candidates who took a Technical Award in Art and Design also took a GCSE/IGCSE in this subject area. However, Art and Design is quite a broad area of study (i.e., it includes, for example, Graphics, Photography, Textiles, Fine Art, 3D Studies, …) so candidates could be taking completely different qualifications. Other areas with sizeable candidate overlap were ICT (although the overlap mainly occurs between GCSE in ICT and the Edexcel Certificate in Digital Applications) and Music and Performing Arts. Much less overlap for Technical Awards and GCSEs/IGCSEs was found in subject areas such as Sport, Media and Communication, and Business, Finance and Law.

Table 10: Subject overlap – number of candidates taking each subject in each type of VQ and the percentage of these who took the same subject at GCSE/IGCSE

Subject area	GCSE IGCSE	Technical Award	
	N (all)	N (all)	% with GCSE IGCSE
Agriculture, Environment & Animal Care	967	377	0.0
Art & Design	268,320	4,696	30.7
Business, Finance & Law	82,092	30,854	2.3
Construction	0	6,851	0.0
Engineering & Manufacturing	6,920	12,408	0.4
English	546,311	0	0.0
Hairdressing & Beauty	0	1,583	0.0
Health & Social Care	20,222	26,526	4.0
Humanities	502,678	0	0.0
ICT	133,624	174,521	23.0
Languages	280,601	0	0.0
Mathematics & Science	565,597	0	0.0
Media & Communication	43,662	4,559	1.8
Music & Performing Arts	105,436	20,875	16.5
Preparation for Life and Work	0	0	0.0
Public Services	0	0	0.0
Retail, Hospitality & Catering	6,772	3,590	0.3
Sport	113,263	39,067	2.6
Travel & Tourism	0	3,910	0.0

Candidates' characteristics

Pathways

Demographic characteristics

Table 11 shows candidates' demographic (non-educational) characteristics for each of the educational pathways considered at Key Stage 4[9].

There was a slightly larger percentage of male than female candidates in all pathways[10], although it was close to a 50-50 split in all cases. The largest gender difference was in the vocational pathway, where there were 52.1% males and 47.9% females.

[9] Note that there were candidates with missing data but these have not been included in the table. The number of candidates with missing data in each variable can be calculated using data from Table 5 and Table 11.

[10] This actually reflects the national gender split in the teenage population as a whole in the UK. See https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/articles/overviewoftheukpopulation/august2019/previous/v1 for details.

The difference in the proportions of students below and above the income-related deprivation threshold (0.20) was biggest in the more academic pathways (e.g., 15 percentage points in the academic pathway compared to 11 percentage points in the vocational pathway). Furthermore, the highest percentages of candidates from high deprivation backgrounds were found within vocational only and mostly vocational pathways. The mostly academic pathway had the highest percentage of candidates from low deprivation backgrounds. Similarly, the proportion of children with FSM increased with the increase in vocational qualifications within the candidates' programme of study. The differences between the proportions in the different pathways were, however, small.

The proportions of students with English as their first language were higher in the mixed pathways (mixed, mostly academic and mostly vocational) than the proportions in the academic only or vocational only pathways. However, again, the differences between the different pathways were small.

Ethnicity differences were more evident than language-related differences. For example, the percentage of White students was higher in the vocational pathways than in the more academic ones. On the contrary, the percentage of Asian (non-Chinese) or Chinese students was lowest in the vocational route, and highest in the academic only route. Furthermore, the percentage of Black students was lowest in the mixed routes and highest in the academic only route.

Educational characteristics

Table 12 shows candidates' educational characteristics (type of school and prior/concurrent attainment) for each of the educational pathways considered at Key Stage 4.

The distributions of candidates across the different school types varied substantially depending on the pathway. Candidates within mixed pathways (mostly academic, mixed, mostly vocational) were more likely to study in comprehensive schools than candidates from the other pathways, and were also more likely to be in secondary modern schools than other candidates. The opposite pattern was found for vocational only candidates.

Candidates from independent schools were more highly represented within the academic only and mostly academic pathways than within the other pathways. Note that the percentage of vocational students in independent schools was higher than the percentage of academic students. A possible explanation for this is the fact that there might have been students who were registered in independent schools to take their GCSEs (in Mathematics, English and Science) but took their vocational qualifications (e.g., functional skills, level 1 vocational qualifications…) in other centres, such as pupil referral units. In order to calculate the pathways, the above GCSEs were excluded, so those candidates appeared as vocational only in independent schools.

Candidates at post-16 institutions were more highly represented within the vocational only pathway than within any of the other pathways.

The academic only candidates were more likely to study in girls only or boys only schools than candidates in the other pathways, which is probably due to the fact that single-sex schools are often independent schools.

Several measures of prior and concurrent attainment, as discussed earlier, were considered to classify the students at the end of Key Stage 4.
There were hardly any differences in the prior attainment of the students, measured by their Key Stage 2 results, by different pathways. These results appear to contradict previous research (see for example Cook, 2013; Richards, 2016), which showed that vocational qualifications had been viewed by teachers as beneficial primarily for low attaining students. This contradiction could be due to changes in the cohorts taking the qualifications (perhaps due to different perceptions of the new categories of vocational qualifications), or due to the fact that the prior attainment measure (Key Stage 2 scores) is from three years before the students made their choices about Key Stage 4 qualifications.
Regarding concurrent attainment, much higher percentages of candidates in the more academic pathways than candidates in the other pathways achieved grades 9-4 in GCSE English and Mathematics. In fact, 65% and 63% of the candidates in the academic only and mostly academic pathways respectively did so, compared to just 3.2% in the vocational only pathway or 22.8% in the mostly vocational pathway. There were hardly any differences in the average GCSE and equivalents points score of the students between the different pathways. This could be due to the fact that this concurrent attainment measure includes all qualifications (vocational and academic) and, although vocational candidates seem to achieve lower grades at GCSE English and Mathematics, the average GCSE and equivalents points score could be higher for them due to good performance in the other qualifications they take.

Table 11: Candidate demographic characteristics for each pathway (excluding candidates with missing data)

Demographic Characteristics		Academic only		Mostly Academic		Mixed		Mostly Vocational		Vocational only	
		N	%	N	%	N	%	N	%	N	%
Gender	Female	137,376	48.8	99,428	48.8	33,766	49.3	5,872	48.5	5,734	47.9
	Male	143,980	51.2	104,401	51.2	34,692	50.7	6,238	51.5	6,243	52.1
IDACI deprivation	Low	83,649	33.5	64,228	33.7	21,450	33.3	3,698	32.5	3,391	32.3
	Medium	83,167	33.3	63,186	33.1	21,441	33.3	3,776	33.1	3,351	32.0
	High	83,247	33.3	63,432	33.2	21,431	33.3	3,917	34.4	3,741	35.7
Income-related deprivation (0.20)	Low	144,388	57.7	110,628	58.0	37,145	57.7	6,443	56.6	5,842	55.7
	High	105,675	42.3	80,218	42.0	27,177	42.3	4,948	43.4	4,641	44.3
FSM	No	183,508	73.2	139,674	73.0	46,916	72.8	8,256	72.4	7,557	72.0
	Yes	67,038	26.8	51,557	27.0	17,524	27.2	3,155	27.6	2,940	28.0
First language	English	209,739	83.5	163,386	85.2	55,408	85.8	9,765	85.2	8,856	84.0
	Other	41,540	16.5	28,396	14.8	9,204	14.2	1,696	14.8	1,682	16.0
Ethnicity	White	180,616	76.0	155,365	78.7	54,236	82.5	9,436	83.2	6,391	82.2
	Black	13,639	5.7	10,558	5.3	2,764	4.2	475	4.2	380	4.9
	Asian (not Chinese)	26,269	11.1	19,255	9.8	5,279	8.0	811	7.1	486	6.3
	Chinese	1,236	0.5	644	0.3	112	0.2	13	0.1	8	0.1
	Mixed	11,534	4.9	8,611	4.4	2,606	4.0	480	4.2	413	5.3
	Any Other	4,259	1.8	2,995	1.5	745	1.1	133	1.2	97	1.2

Table 12: Candidate educational characteristics for each pathway (excluding candidates with missing data)

Educational Characteristics		Academic only		Mostly Academic		Mixed		Mostly Vocational		Vocational only	
		N	%	N	%	N	%	N	%	N	%
School type	Comprehensive	223,813	79.9	170,498	84	57,280	84	10,164	84.3	9,405	78.9
	Independent	26,427	9.4	9,926	4.9	3,163	4.6	523	4.3	1,218	10.2
	Selective	10,807	3.9	8,134	4.0	2,735	4.0	464	3.8	410	3.4
	Secondary Modern	8,406	3.0	6,342	3.1	2,273	3.3	405	3.4	333	2.8
	Post-16 institution	1,139	0.4	699	0.3	229	0.3	50	0.4	107	0.9
	Other	9,676	3.5	7,445	3.7	2,513	3.7	449	3.7	440	3.7
School Gender	Boys only	13,668	4.9	9,051	4.5	3,004	4.4	550	4.6	607	5.1
	Girls only	20,656	7.4	13,174	6.5	4,355	6.4	789	6.5	813	6.8
	Co-educational	246,023	87.8	180,854	89.1	60,845	89.2	10,720	88.9	10,498	88.1
KS 2	Low	109,222	47.1	84,476	47.1	28,843	47.6	5,064	47.4	4,614	47.1
	Medium	54,162	23.4	42,279	23.6	13,973	23.1	2,524	23.6	2,334	23.8
	High	68,281	29.5	52,481	29.3	17,742	29.3	3,102	29.0	2,840	29.0
KS 2 (Prediction Groups)	01	68,281	29.5	52,481	29.3	17,742	29.3	3,102	29.0	2,840	29.0
	02	54,162	23.4	42,279	23.6	13,973	23.1	2,524	23.6	2,334	23.8
	03	75,527	32.6	58,302	32.5	19,741	32.6	3,490	32.6	3,169	32.4
	04	22,191	9.6	17,135	9.6	5,895	9.7	1,053	9.9	928	9.5
	05	10,723	4.6	8,419	4.7	2,994	4.9	490	4.6	491	5.0
	06	781	0.3	620	0.3	213	0.4	31	0.3	26	0.3
KS 4	Low	89,224	32.6	67,881	34.2	23,056	34.6	4,045	34.4	3,844	33.2
	Medium	8,9812	32.9	66,566	33.6	22,350	33.6	4,028	34.3	3,822	33.1
	High	94,342	34.5	63,886	32.2	21,151	31.8	3,684	31.3	3,896	33.7
GCSE English and Maths achieved grade 9-4	No	97,331	34.6	74,824	36.7	40,423	59.0	9,348	77.2	11,593	96.8
	Yes	184,025	65.4	129,005	63.3	28,035	41.0	2,762	22.8	384	3.2

Specific qualifications

Demographic characteristics

Table 13 shows candidates' demographic (non-educational) characteristics for each of the specific qualifications considered at Key Stage 4[11]. In general, differences across the different qualifications were small, although some are worth highlighting.

Table 13: Candidate demographic characteristics for specific qualifications (excluding candidates with missing data)

Demographic characteristics		Technical Award		Non-approved VQ		GCSE / IGCSE (only)	
		N	%	N	%	N	%
Gender	Female	120,811	48.9	31,943	48.8	125,879	48.8
	Male	126,400	51.1	33,449	51.2	131,881	51.2
IDACI Deprivation	Low	77,770	33.5	20,349	33.7	76,907	33.6
	Medium	77,004	33.2	20,138	33.3	76,272	33.3
	High	77,512	33.4	19,936	33.0	76,036	33.2
Income-related deprivation (0.20)	Low	134,324	57.8	35,012	57.9	132,620	57.9
	High	97,962	42.2	25,411	42.1	96,595	42.1
FSM	No	169,640	72.9	44,294	73.2	168,225	73.3
	Yes	63,091	27.1	16,254	26.8	61,427	26.7
First Language	English	199,536	85.5	51,527	84.9	192,672	83.7
	Other	33,856	14.5	9,184	15.1	37,654	16.3
Ethnicity	White	193,759	80.1	46,404	80.1	166,641	76.3
	Black	12,138	5.0	2,671	4.6	12,720	5.8
	Asian (not Chinese)	22,025	9.1	5,189	9.0	23,469	10.8
	Chinese	648	0.3	164	0.3	1,012	0.5
	Mixed	10,095	4.2	2,688	4.6	10,615	4.9
	Any Other	3,364	1.4	841	1.5	3,848	1.8

There was a slightly larger percentage of male than female candidates taking each qualification; however, there were no differences in the gender distribution between the qualifications shown in Table 13.

The differences in the proportions of students below and above the deprivation threshold (0.20) across the different qualifications were very small. The patterns were very similar for the other two measures of deprivation considered in the report (i.e., deprivation group based on IDACI and FSM eligibility).

[11] Note that there were candidates with missing data but these have not been included in the table. The number of candidates with missing data in each variable can be calculated using data from Table 6 and Table 13.

The proportions of students with English as their first language was highest amongst candidates with vocational qualifications than amongst candidates who took GCSEs/IGCSEs only. However, as above, the differences across the different qualifications were small.

Ethnicity differences were slightly more noticeable than language-related differences, particularly between candidates taking GCSEs/IGCSEs only and candidates taking other qualifications. For example, the percentage of White students was lowest for GCSE/IGCSE candidates (76% compared to around 80% in the vocational qualifications). On the contrary, the percentage of Asian, Black or Chinese students was higher in the group of candidates who took GCSEs/IGCSEs only than in any of the other groups. This is consistent with the ethnicity patterns across pathways shown in Table 11.

Educational characteristics

Table 14 shows candidates' educational characteristics (type of school and prior/concurrent attainment) for each of the specific qualifications considered at Key Stage 4.

There were very similar distributions of school type across the two different types of vocational qualifications (approved and non-approved). However, there were some differences between the candidates who took GCSEs/IGCSEs only and the other groups of candidates. In particular, candidates with GCSEs/IGCSEs only were less likely to study in comprehensive schools than candidates with vocational qualifications were. These candidates were, however, more likely to be in independent schools.

Similarly, academic only candidates (those taking just GCSEs/IGSCEs) were less likely to study in co-educational schools than candidates with vocational qualifications (independently of the vocational qualification). This is probably due to the fact that single-sex schools are often independent schools.

As mentioned earlier, several measures of prior and concurrent attainment were considered to classify the students at the end of Key Stage 4. There were hardly any differences in the prior attainment of the students, measured by their Key Stage 2 results, across the different types of qualifications.

Regarding concurrent attainment, much higher percentages of candidates who took GCSEs/IGCSEs than candidates who took vocational qualifications achieved a 9-4 grade in GCSE English and Mathematics. In fact, 66% of such candidates did so, compared to 46% amongst students taking non-approved vocational qualifications. The percentage achieving the 9-4 threshold amongst candidates with Technical Awards was somewhere in the middle (around 57%).

Table 14: Candidate educational characteristics for specific qualifications (excluding candidates with missing data)

Educational characteristics		Technical Award		Non-approved VQ		GCSE /IGCSE (only)	
		N	%	N	%	N	%
School type	Comprehensive	207,375	84.2	54,074	83.0	205,183	79.9
	Independent	11,277	4.6	3,919	6.0	2,4113	9.4
	Selective	9,862	4.0	2,540	3.9	9,900	3.9
	Secondary Modern	7,915	3.2	1,917	2.9	7,650	3.0
	Post-16 institution	835	0.3	300	0.5	1,030	0.4
	Other	8,994	3.7	2,373	3.6	8,898	3.5
School Gender	Boys only	10,888	4.4	2,951	4.5	12,451	4.8
	Girls only	15,791	6.4	4,355	6.7	18,846	7.3
	Co-educational	219,623	89.2	57,828	88.8	225,549	87.8
KS 2	Low	103,126	47.2	26,815	47.4	100,209	47.1
	Medium	51,337	23.5	13,263	23.4	49,835	23.4
	High	64,038	29.3	16,522	29.2	62,724	29.5
KS 2 (Prediction Groups)	01	64,038	29.3	16,522	29.2	62,724	29.5
	02	51,337	23.5	13,263	23.4	49,835	23.4
	03	70,940	32.5	18,544	32.8	69,268	32.6
	04	21,007	9.6	5,336	9.4	20,385	9.6
	05	10,417	4.8	2,741	4.8	9,849	4.6
	06	762	0.3	194	0.3	707	0.3
KS 4	Low	82,767	34.4	21,466	33.8	81,684	32.6
	Medium	80,971	33.7	21,253	33.5	82,391	32.9
	High	76,779	31.9	20,809	32.8	86,420	34.5
GCSE English and Maths achieved grade 9-4	No	106,135	42.9	35,579	54.4	88,559	34.4
	Yes	141,076	57.1	29,813	45.6	16,9201	65.6
KS4 pathway	Academic only	0	0.0	0	0.0	257,760	100.0
	Mostly Academic	171,339	69.3	39,932	61.1	0	0.0
	Mixed	61,166	24.7	14,739	22.5	0	0.0
	Mostly Vocational	10,376	4.2	3,950	6.0	0	0.0
	Vocational only	4,330	1.8	6,771	10.4	0	0.0

When we considered an alternative measure of concurrent attainment (Key Stage 4 points score), the percentage of candidates in the top attainment group was slightly higher amongst candidates with GCSEs/IGCSEs only than amongst any other group of candidates.

Finally, we had a look at the pathways that candidates with vocational qualifications were following. Table 14 shows that candidates taking Technical Awards were more likely to be on a mostly academic pathway (perhaps taking one or two of these qualifications alongside their more academic GCSEs/IGSEs). Very few of these candidates (just below 2%) were following a vocational only pathway.

Higher percentages of candidates with non-approved vocational qualifications followed a vocational only (10%) or a mostly vocational pathway (6%) than candidates with Technical Awards (2% and 4%, respectively). However, the majority of these candidates followed a mostly academic pathway, as found for the Technical Award.

Vocational qualifications at Key Stage 5

Programmes of study

Pathways

Two educational pathways were calculated for each candidate in Key Stage 5: one pathway was based on all the qualifications candidates had taken in the Key Stage 5 period (KS5-all pathway) and the second was based only on their level 3 qualifications (KS5-L3 pathway). The KS5-all pathway was computed because it was important to determine the extent to which vocational qualifications were part of candidates' entire set of qualifications. The KS5-L3 pathways was computed because level 3 qualifications are of particular interest for Key Stage 5, as students are expected to progress to level 3 qualifications at this stage of education, having achieved level 2 by the end of Key Stage 4. In addition, level 3 qualifications are the primary requirements for entry to university and highly valued by the labour market.

As Table 15 shows, whichever way the pathways were calculated, the largest group of candidates followed an academic only pathway. For both the KS5-all and KS5-L3 pathways, the percentage of academic only candidates was more than double the percentage of candidates in any of the other pathways. The distribution of candidates amongst those other pathways, however, differed depending on how the pathways were calculated. Regarding the KS5-all pathways, there was a relatively even spread of candidates amongst the four pathways comprising vocational qualifications, although a slightly larger percentage followed the vocational only pathway than the others. In contrast, when looking at the level 3 pathways, much smaller percentages of candidates took the mostly academic, mixed or mostly vocational pathway compared to the vocational only pathway. In addition, just over a quarter did not have a level 3 pathway at all, having not taken any level 3 qualifications in the Key Stage 5 period.

Table 15: Number and percentage of candidates in each educational pathway

KS5 pathway	Based on all KS5 qualifications		Based on L3 qualifications only		
	N	% all candidates	N	% all candidates	% L3 candidates
Academic only	237,952	44.6	233,555	43.8	58.8
Mostly Academic	73,737	13.8	29,037	5.4	7.3
Mixed	70,029	13.1	21,006	3.9	5.3
Mostly Vocational	66,342	12.4	14,680	2.8	3.7
Vocational only	85,426	16.0	99,073	18.6	24.9
No Level 3 pathway	-	-	136,135	25.5	-
All candidates	*533,486*	*100.0*	*533,486*	*100.0*	-
L3 candidates	-	-	*397,351*	*74.5*	*100.0*

Uptake of different types of qualifications

Table 16 presents the numbers and percentages of candidates who took specific types of vocational and academic qualifications, with percentages expressed with reference to the total Key Stage 5 cohort as well as to the sub-group of level 3 candidates.

Table 16 shows that level 3 vocational qualifications formed part of a large group of candidates' programmes of study; over 30% of all Key Stage 5 candidates and 41% of level 3 candidates took at least one level 3 vocational qualification. The vast majority of those candidates had taken at least one of the DfE-approved vocational qualifications: Applied Generals or Tech Levels approved for the 2017 performance tables. Applied Generals, however, were taken by a much larger percentage of candidates than Tech Levels. In addition, a large number of candidates took a level 3 vocational qualification that was not approved by the DfE for their performance tables, although this amounted only to small percentage of candidates.

AS and A Levels had more widespread uptake than level 3 vocational qualifications, taken by over half of all Key Stage 5 candidates (55%) and the vast majority of level 3 candidates (74%). The EPQ was taken by a sizeable yet small minority of candidates while Core Maths was taken by less than 1% of candidates.

Level 2 Technical Certificates were taken by a small minority of candidates: 6% of all Key Stage 5 candidates. Interestingly, they were taken by 8% of level 3 candidates.

A GCSE in English or Mathematics was taken in Key Stage 5 by a large minority of candidates, including 29% of level 3 candidates.

Table 16: Number of candidates who took specific types of vocational and academic qualifications

Type		Qualifications	N	% all candidates	% L3 candidates
Level 3	Vocational	Any L3 VQ	163,796	30.7	41.2
		Applied General	108,208	20.3	27.2
		Tech Level	49,106	9.2	12.4
		Applied General or Tech Level	145,073	27.2	36.5
		Non-approved L3 VQ	30,036	5.6	7.6
	Academic	AS Level	278,081	52.1	70.0
		A Level	245,973	46.1	61.9
		AS or A Level	293,332	55.0	73.8
		Core Maths	3,493	0.7	0.9
		EPQ	37,617	7.1	9.5
Level 2	Vocational	Technical Certificate	33,343	6.3	8.4
	Academic	GCSE English or Maths	114,416	21.4	28.8
All candidates			*533,486*	*100.0*	-
L3 candidates			*397,351*	*74.5*	*100.0*

Combinations of qualifications

Table 17 presents the percentages of candidates who took particular pairs of qualifications. One of the qualifications is labelled as the 'qualification of interest' and the other is the 'combined qualification'. The percentages should be interpreted relative to the qualification of interest such as "X% of candidates who took the 'qualification of interest' also took the 'combined qualification'". The findings revealed variations in patterns between the different types of vocational qualifications, suggesting that they may suit different programmes of study.

Almost half of the candidates who took Applied Generals (45.4%) also took an AS/A Level, with almost a third having taken a full A Level. Smaller, yet sizeable, percentages of Applied General candidates also took a different type of level 3 vocational qualification (Tech Level or other non-approved vocational qualification). It was not common for Applied General candidates to take a level 2 Technical Certificate, an EPQ, Core Maths, Free standing Maths or a Functional Skills qualification.

In contrast to the Applied General candidates, Tech Level candidates were less likely to have taken an AS or A Level but more likely to have taken a level 2 Technical Certificate. A small minority also took non-approved level 3 vocational qualifications alongside their Tech Level.

Candidates taking a non-approved level 3 vocational qualification were similar to the Applied General candidates with regards to some combined qualifications but similar to the Tech Level candidates with regard to others. The difference that stands out most between these candidates and both the Applied General and Tech Level candidates was the uptake of Functional Skills, which was much higher amongst candidates who took non-approved vocational qualifications.

Taking a GCSE in English or Mathematics was far more common amongst candidates who took vocational qualifications either at level 2 or level 3 than those taking AS or A Levels. However, they were most common for candidates taking level 2 vocational qualifications.

It is also interesting to look at the percentages of candidates taking vocational qualifications from the perspective of the groups of candidates taking academic qualifications. Amongst the group of AS/A Level candidates, almost a fifth took an Applied General, and it is interesting to note that this percentage was higher than the percentage taking the EPQ. Much smaller percentage of candidates took any of the other qualifications alongside their AS/A Levels.

With regard to the EPQ and Core Maths, which are two qualifications intended to be part of a level 3 curriculum, it was clear that they formed part of different programmes of study. Almost all of the EPQ candidates were AS/A Level candidates, with another sizable minority taking Applied Generals alongside their EPQ. Much smaller percentages of EPQ candidates took any of the other listed qualifications. In contrast, the Core Maths candidates were slightly less likely to take AS/A Levels, although the majority still had them as part of their programme of study. More starkly, Applied Generals were taken by a much larger percentage of Core Maths candidates than EPQ candidates.

Level 2 qualifications had a different profile of combinations than the level 3 qualifications. In particular, candidates with these qualifications were most likely to take a GCSE in English or Mathematics and a Functional Skills qualification than candidates taking the other qualifications. A small, yet still sizable, minority took Applied Generals.

Subject uptake

When considering all of the qualifications taken by the Key Stage 5 candidates (i.e., entry level to level 3), there were two broad subject areas with notably more entries than the other areas (Table 18). These were Mathematics and Science (28%) and Humanities (20%). However, for both of those areas, the entries were primarily for AS/A Levels rather than any of the categories of vocational qualifications. In particular, for Humanities, apart from AS/A Levels, this subject area was only found for Applied Generals and non-approved level 3 vocational qualifications, but this represented only less than 2% of entries in either case. For Mathematics and Science, a few categories of vocational qualifications had a slightly more substantial entry size; for example, it represented 11% of the Applied General entries.

Table 17 Combinations of qualifications - percentages relative to the number of candidates who took the qualification of interest

Qualification of interest		Combined qualification (% of the candidates taking the qualification of interest)										
Type	**Number of candidates**	**Applied General (L3)**	**Tech Level (L3)**	**Non-approved L3 VQ**	**AS/A Level**	**A Level**	**EPQ**	**Core Maths (L3)**	**Free standing Maths (any)**	**Functional skills (any)**	**L2 Technical Certificate**	**GCSE English/ Maths**
Applied General	108,208	100.0	11.3	7.8	45.4	32.6	3.3	1.0	1.2	1.2	1.5	25.9
Tech Level	49,106	24.9	100.0	8.5	25.3	17.0	2.4	1.3	0.7	0.7	8.7	26.9
Non-approved L3 VQ	30,036	28.0	13.9	100.0	40.0	28.0	3.6	0.5	0.8	10.9	6.7	26.8
AS/A Level	293,332	16.8	4.2	4.1	100.0	83.9	12.5	0.9	1.1	1.0	0.4	8.0
A Level	245,973	14.4	3.4	3.4	100.0	100.0	14.5	0.9	0.9	0.3	0.1	6.0
EPQ (L3)	37,617	9.5	3.1	2.8	97.6	94.7	100.0	1.1	0.7	0.2	0.1	4.4
Core Maths (L3)	3,493	32.5	18.3	4.0	78.4	64.6	11.8	100.0	0.7	0.9	1.3	8.2
L2 Technical Certificate	33,343	4.9	12.7	6.0	3.3	0.7	0.1	0.1	0.8	34.9	100.0	51.7
GCSE English/Maths	114,416	24.5	11.5	7.0	20.6	12.8	1.4	0.3	1.2	23.2	15.1	100.0

Other subject areas were more common for certain types of vocational qualifications, with different types of vocational qualifications appearing to have different subject profiles. Applied General entries were most commonly in the area of Business, Finance and Law (24%) followed by Sport (20%). Smaller, yet still relatively large, percentages of Applied General entries were in Health and Social Care, ICT, Mathematics and Science, and Music and Performing Arts. In contrast, for Tech Levels, those subjects each constituted less than 10% of entries. Instead, the most common subject areas for Tech Levels were Media and Communication, Engineering and Manufacturing, Agriculture, Environment and Animal Care, and Art and Design. Three subject areas stood out for the non-approved level 3 vocational qualifications, which were Public Services, Health and Social Care, and Sport, representing between 12 and 26% of entries.

Level 2 Technical Certificates were most commonly taken in Construction, followed by Hairdressing and Beauty, Engineering and Manufacturing, Agriculture, Environment and Animal Care, and ICT.

Table 19 shows the distribution of candidates (as opposed to qualification entries) across the different subject areas, which was broadly similar to the pattern for the entries shown in Table 18. The most notable difference in distribution was found for AS/A Levels. Humanities, and Mathematics and Science were still the two most popular subject areas, with regard to the percentage of candidates taking qualifications in those areas. However, there were several subject areas that, although they did not contribute to a large percentage of entries, were taken by a much larger percentage of candidates, which included English, Business, Finance and Law, as well as Art and Design.

The final set of subject-related findings shows the extent of candidate overlap between each category of level 3 vocational qualifications and AS/A Levels (Table 20). No overlap between vocational and academic qualifications would indicate that vocational qualifications are being used to fill subject gaps in the curriculum. However, if there were overlap this could be interpreted in different ways: for example, it could indicate that the different qualifications cover different aspects of a subject area, or that candidates have obtained two qualifications just by learning one set of content.

For Applied Generals, there was a large degree of candidate overlap for Humanities, such that over half of the candidates who took an Applied General in Humanities also took and an AS/A Level in this broad subject area. Other areas with sizeable overlap for Applied Generals were Mathematics and Science, Business, Finance and Law, Art and Design, and Music and Performing Arts. The category of non-approved vocational qualifications showed a similar pattern as the Applied Generals, with the exception that it also showed a large candidate overlap with AS/A Levels for Sport, and Media and Communication.

Tech Levels showed a somewhat different pattern of candidate overlap with AS/A Levels than Applied Generals or non-approved level 3 vocational qualifications. For most subject areas, there was less candidate overlap between Tech Levels and AS/A Levels. Only one subject area had an overlap greater than 10%, which was Business, Finance and Law, with another four areas having overlap of between 5 and 10% (Art and Design, Media and Communication, Music and Performing Arts, and Sport).

Table 18: Entries in subject areas, grouped by qualification category

Subject area	All	Applied General (L3)	Tech Level (L3)	Non-approved L3 VQ	AS/A Level	L2 Technical Certificate
Agriculture, Environment & Animal Care	0.8	0.1	12.0	1.7	0.1	11.1
Art & Design	4.7	5.7	11.7	1.0	6.0	0.0
Business, Finance & Law	7.3	24.0	5.8	6.5	7.8	5.6
Construction	1.1	0.02	3.6	0.5	0.0	21.9
Engineering & Manufacturing	1.5	0.5	16.5	1.4	0.2	13.5
English	9.7	0.0	0.0	0.0	9.0	0.0
Hairdressing & Beauty	0.7	0.0	1.8	3.5	0.0	16.6
Health & Social Care	3.1	13.7	6.5	17.9	1.0	3.2
Humanities	20.1	0.2	0.0	1.8	31.7	0.0
ICT	3.8	12.8	10.3	3.5	2.2	10.3
Languages	2.6	0.0	0.0	0.0	3.6	0.0
Mathematics & Science	27.6	10.9	0.0	0.8	30.5	0.0
Media & Communication	3.1	1.3	17.8	5.0	3.7	3.6
Music & Performing Arts	2.8	10.5	4.2	8.0	2.6	3.9
Preparation for Life and Work	5.6	0.1	0.0	5.2	0.0	0.0
Public Services	0.7	0.0	0.01	26.4	0.0	0.0
Retail, Hospitality & Catering	0.8	0.0	0.5	4.2	0.03	5.2
Sport	3.6	19.8	0.1	12.4	1.5	0.8
Travel & Tourism	0.6	0.6	9.1	0.2	0.2	4.2
Unknown	0.004	0.0	0.0	0.0	0.0	0.0
Total number of entries	*2,523,434*	*164,868*	*61,564*	*37,356*	*1,514,492*	*34,898*

Table 19: Percentage of candidates taking each subject area (percentage within each qualification category)

Subject area	Applied General (L3)	Tech Level (L3)	Non-approved L3 VQ	AS/A Level	L2 Technical Certificate
Agriculture, Environment & Animal Care	0.08	10.53	1.77	0.34	11.16
Art & Design	6.24	10.91	1.10	17.47	0.02
Business, Finance & Law	27.00	7.28	7.64	23.42	5.22
Construction	0.03	3.66	0.58	0.00	22.62
Engineering & Manufacturing	0.69	16.41	1.66	0.49	13.94
English	0.00	0.00	0.00	27.99	0.00
Hairdressing & Beauty	0.00	2.25	4.16	0.00	16.98
Health & Social Care	16.15	6.31	20.79	2.87	3.38
Humanities	0.28	0.00	2.27	65.11	0.00
ICT	16.43	12.64	3.41	7.27	10.58
Languages	0.00	0.00	0.00	10.56	0.00
Mathematics & Science	12.59	0.00	1.02	50.24	0.00
Media & Communication	1.34	17.23	6.13	10.67	3.81
Music & Performing Arts	10.96	4.55	8.43	7.39	4.11
Preparation for Life and Work	0.09	0.00	6.24	0.00	0.00
Public Services	0.00	0.01	23.35	0.00	0.00
Retail, Hospitality & Catering	0.00	0.64	4.35	0.11	4.61
Sport	22.16	0.18	12.05	4.81	0.75
Travel & Tourism	0.93	8.96	0.24	0.57	4.44
Total number of candidates	*108,208*	*49,106*	*30,036*	*293,332*	*33,343*

Table 20: Subject overlap – number of candidates taking each subject in each type of VQ and the percentage of these who took the same subject as an AS/A Level

Subject area	AS/A Level	Applied General		Tech Level		Non-approved L3 VQ	
	N (all)	N (all)	% with AS/A Level	N (all)	% with AS/A Level	N (all)	% with AS/A Level
Agriculture, Environment & Animal Care	992	86	1.16	5,169	0.15	533	1.50
Art & Design	51,250	6,747	13.13	5,358	8.83	330	22.73
Business, Finance & Law	68,700	29,214	13.51	3,576	14.71	2,295	16.38
Construction	0	37	0.00	1,795	0.00	173	0.00
Engineering & Manufacturing	1,450	744	3.23	8,056	0.88	500	0.20
English	82,108	0	0.00	0	0.00	0	0.00
Hairdressing & Beauty	0	0	0.00	1,107	0.00	1,249	0.00
Health & Social Care	8,405	17,480	0.89	3,101	0.35	6,245	1.95
Humanities	190,988	306	51.31	0	0.00	681	67.99
ICT	21,327	17,783	4.97	6,206	2.19	1,024	8.30
Languages	30,983	0	0.00	0	0.00	0	0.00
Mathematics & Science	147,376	13,627	16.00	0	0.00	307	55.70
Media & Communication	31,309	1,447	6.36	8,459	7.09	1,841	14.23
Music & Performing Arts	21,673	11,857	11.94	2,234	5.95	2,532	14.02
Preparation for Life and Work	0	93	0.00	0	0.00	1,875	0.00
Public Services	0	0	0.00	6	0.00	7,012	0.00
Retail, Hospitality & Catering	322	5	0.00	315	0.00	1,307	0.31
Sport	14,118	23,978	3.50	88	5.68	3,620	16.49
Travel & Tourism	1,660	1,004	0.30	4,402	0.32	72	8.33

Candidates' characteristics

Pathways

Demographic characteristics

Table 21 shows the demographic (non-educational) characteristics of candidates who followed each of the KS5-all pathways, which were those derived from all qualifications that candidates had taken during the Key Stage 5 period. Table 22 shows these demographics for the KS5-L3 pathways, which were derived only from the level 3 qualifications that candidates had taken.

First, regarding the KS5-all pathways, there was a larger percentage of male than female candidates within all pathways, except the academic only pathway where there were 54% females and 46% males. The largest gender difference was for the mixed pathway where there were 56% males compared to 44% females. The KS3-L3 pathway results showed a larger gender gap for the academic-only pathway than found for the KS5-all academic pathway (10.8 vs. 8.4 percentage points gap). Compared to the KS5-all pathways, there was also a reverse gender difference for mostly academic candidates, where female candidates outnumbered male candidates. There were smaller gender differences for the other three level 3 pathways. It is important to highlight that the largest gender difference by far, across all the pathways, was amongst candidates without any level 3 qualifications, where there was a much higher percentage of male than female candidates (60% vs. 40%).

However, there was a clearer, more systematic relationship between income-related deprivation and the proportion of vocational qualifications in the level 3 pathways than that found for the KS5-all pathways. For both of the IDACI ranked groupings (KS4 and KS5 ranks), the higher the vocational proportion in the KS5-L3 pathway the higher the percentage of candidates from high deprivation background and the lower the percentage of candidates from low deprivation backgrounds. The academic only, mostly academic and mixed groups each had a higher proportion of low deprivation candidates than high deprivation candidates whereas the opposite was found for the mostly vocational and vocational only pathways. There was little difference in the proportion of candidates from medium deprivation backgrounds, varying by a few percentage points between the pathways. The deprivation measures with binary groups (IDACI deprivation below 0.20 or above and FSM eligibility) showed that deprivation differences systematically decreased with increasing amounts of vocational qualifications in the pathway, although all pathways had a higher proportion of candidates from low deprivation backgrounds than candidates from high deprivation backgrounds. Candidates without any level 3 qualifications showed some of the largest deprivation differences, compared to any of the level 3 pathways, with much larger proportions of candidates from high deprivation backgrounds and much smaller proportions from low deprivation backgrounds.

With regard to language-related differences, amongst the KS5-all pathways the vocational only pathway stood out as being the most different to the other four pathways. A much lower percentage of candidates whose first language was not English were following a vocational only pathway. The other pathways showed similar language differences. Amongst the KS5-

L3 pathways, there were similar percentages of candidates without an English first language across all the pathways, although the smallest percentage was still found for the vocational only pathway. Regarding candidates without any level 3 qualifications, an even smaller percentage did not have English as their first language compared to any of the level 3 pathways.

Ethnicity differences were particularly evident with regard to Black and Asian (non-Chinese) candidates amongst KS5-all and KS5-L3 pathways as well as with regard to White candidates amongst the KS5-L3 pathways more specifically. In any case, there was no clear relationship between these differences and the proportion of vocational qualifications in the pathway. Amongst the KS5-all pathways, there was a larger percentage of Black candidates amongst the mostly vocational candidates compared to candidates in the other four pathways, but a much smaller percentage in the vocational only pathway. This pattern was similar for the KS5-L3 pathways except that the mostly academic pathways had the lowest percentage of Black candidates amongst the level 3 pathways. For both KS5-all and KS5-L3 pathways, there was a higher percentage of non-Chinese Asian candidates amongst the mostly vocational pathway and much smaller percentages amongst the vocational only pathway. Regarding candidates without any level 3 qualifications, there was a higher percentage of White candidates and a much smaller percentage of non-Chinese Asian candidates than in the other pathways.

Table 21: Candidate demographic characteristics for KS5-all pathways (excluding candidates with missing data)

Demographic Characteristics		Academic only		Mostly Academic		Mixed		Mostly Vocational		Vocational only	
		N	%	N	%	N	%	N	%	N	%
Gender	Female	128,935	54.2	36,149	49.0	30,894	44.1	30,736	46.3	38,328	44.9
	Male	109,017	45.8	37,588	51.0	39,135	55.9	35,606	53.7	47,098	55.1
IDACI deprivation (within KS4 cohort)	Low	82,443	43.0	21,474	33.3	16,431	25.6	16,828	26.8	25,114	31.1
	Medium	60,650	31.7	21,567	33.5	21,920	34.2	21,366	34.1	28,535	35.3
	High	48,480	25.3	21,396	33.2	25,797	40.2	24,503	39.1	27,152	33.6
IDACI deprivation (within KS5 cohort)	Low	78,885	41.2	20,427	31.7	15,536	24.2	15,925	25.4	23,786	29.4
	Medium	61,687	32.2	21,536	33.4	21,619	33.7	21,179	33.8	28,522	35.3
	High	51,001	26.6	22,474	34.9	26,993	42.1	25,593	40.8	28,493	35.3
Income-related deprivation (0.20)	Low	125,746	65.6	36,028	55.9	30,829	48.1	31,029	49.5	44,540	55.1
	High	65,827	34.4	28,409	44.1	33,319	51.9	31,668	50.5	36,261	44.9
FSM	No	159,796	83.3	47,120	73.0	41,373	64.4	43,019	68.5	58,240	71.9
	Yes	32,125	16.7	17,430	27.0	22,894	35.6	19,806	31.5	22,734	28.1
First language	English	161,482	84.2	55,367	85.5	54,898	85.1	52,940	84.2	74,503	91.9
	Other	30,375	15.8	9,368	14.5	9,603	14.9	9,918	15.8	6,606	8.1
Ethnicity	White	145,254	76.4	51,463	80.2	51,415	80.4	48,635	78.0	70,092	87.0
	Black	9,872	5.2	3,269	5.1	3,410	5.3	4,353	7.0	2,781	3.5
	Asian (not Chinese)	21,556	11.3	5,877	9.2	5,591	8.7	5,793	9.3	4,156	5.2
	Chinese	1,281	0.7	210	0.3	118	0.2	123	0.2	84	0.1
	Mixed	8,826	4.6	2,482	3.9	2,562	4.0	2,543	4.1	2,812	3.5
	Any Other	3,327	1.7	896	1.4	845	1.3	883	1.4	602	0.7

Table 22: Candidate demographic characteristics for each KS5-L3 pathway (excluding candidates with missing data)

Demographic Characteristics		Academic only		Mostly Academic		Mixed		Mostly Vocational		Vocational only		No L3 pathway	
		N	%	N	%	N	%	N	%	N	%	N	%
Gender	Female	129,431	55.4	15,697	54.1	10,477	49.9	6,910	47.1	48,265	48.7	54,262	39.9
	Male	104,124	44.6	13,340	45.9	10,529	50.1	7,770	52.9	50,808	51.3	81,873	60.1
IDACI deprivation (within KS4 cohort)	Low	85,368	44.9	10,985	40.2	7,128	35.8	4,377	31.4	28,518	30.4	25,914	21.9
	Medium	60,054	31.6	9,382	34.3	6,692	33.6	4,693	33.7	32,472	34.6	40,745	34.4
	High	44,652	23.5	6,947	25.4	6,088	30.6	4,859	34.9	32,932	35.1	51,850	43.8
IDACI deprivation (within KS5 cohort)	Low	81,802	43.0	10,480	38.4	6,772	34.0	4,174	30.0	27,023	28.8	24,308	20.5
	Medium	61,201	32.2	9,455	34.6	6,750	33.9	4,671	33.5	32,365	34.5	40,101	33.8
	High	47,071	24.8	7,379	27.0	6,386	32.1	5,084	36.5	34,534	36.8	54,100	45.7
Income-related deprivation (0.20)	Low	128,677	67.7	17,626	64.5	11,739	59.0	7,582	54.4	50,529	53.8	52,019	43.9
	High	61,397	32.3	9,688	35.5	8,169	41.0	6,347	45.6	43,393	46.2	66,490	56.1
FSM	No	163,052	85.6	22,868	83.6	15,772	79.1	10,636	76.2	68,883	73.2	68,337	57.5
	Yes	27,322	14.4	4,480	16.4	4,163	20.9	3,321	23.8	25,219	26.8	50,484	42.5
First language	English	160,170	84.2	23,470	85.9	16,695	83.8	11,389	81.7	81,957	87.1	105,509	88.1
	Other	29,965	15.8	3,841	14.1	3,216	16.2	2,546	18.3	12,097	12.9	14,205	11.9
Ethnicity	White	143,935	76.4	21,711	80.0	15,373	77.7	10,490	75.9	75,737	81.1	99,613	84.0
	Black	9,624	5.1	1,210	4.5	1,134	5.7	925	6.7	5,421	5.8	5,371	4.5
	Asian (not Chinese)	21,579	11.5	2,750	10.1	2,100	10.6	1,579	11.4	7,340	7.9	7,625	6.4
	Chinese	1,323	0.7	123	0.5	66	0.3	42	0.3	144	0.2	118	0.1
	Mixed	8,677	4.6	987	3.6	832	4.2	541	3.9	3,617	3.9	4,571	3.9
	Any Other	3,291	1.7	350	1.3	277	1.4	247	1.8	1,074	1.2	1,314	1.1

Educational characteristics

First, amongst the KS5-all pathways, the distributions of candidates across the different Key Stage 5 school types varied substantially depending on the pathway. The percentage of candidates from FE colleges was much higher in the more vocational pathways than in the more academic pathways, with the highest percentage in the vocational only pathway and the lowest percentage in the academic only pathway. For most of the other school types, especially comprehensive schools, the percentage of candidates was higher in the more academic pathways.

The distributions of the Key Stage 5 school types across the KS5-L3 pathways were generally similar to those found for the KS5-all pathways for the academic only and vocational only pathways. The most notable differences between the KS5-L3 and KS5-all pathways were found for the mostly academic, mixed and mostly vocational pathways. There were much higher percentages of candidates from comprehensive schools within those three KS5-L3 pathways such that the majority of candidates came from those schools rather than from FE colleges. However, the second largest group of candidates in each of these pathways came from sixth-form or FE colleges.

The pattern of school gender composition and the distributions of Key Stage 4 school types were similar for the KS5-all and KS5-L3 pathways. The academic only candidates were more likely to come from girls only or boys only schools than candidates in the other pathways. This may be due to the fact that single-sex schools are often independent or selective schools. Regarding the type of school candidates attended at Key Stage 4, candidates following an academic only pathway at Key Stage 5 were much more likely to have attended an independent or selective school compared to candidates taking a large proportion of vocational qualifications. Vocational only, mostly vocational or mixed candidates were slightly more likely to have come from secondary modern schools.

Regarding prior attainment and its relationship to vocational uptake, the findings for the KS5-all pathways were different to those for the KS5-L3 pathways. Considering the KS5-all pathways first, most of the candidates who followed an academic only pathway had high prior attainment, with a small minority having low prior attainment. The mostly academic pathway had a more even distribution of candidates with low, medium or high attainment. In contrast, the majority of the mixed and mostly vocational pathways had low prior attainment, with small percentages of high attaining candidates. The vocational only pathway, however, was the only pathway where candidates with medium prior attainment were the majority, although like the other vocational pathways it also had a large percentage of candidates with low prior attainment.

A more systematic relationship between prior attainment and vocational uptake was found for the KS5-L3 pathways, especially with regard to the highest and lowest levels of prior attainment. For both of the Key Stage 4 average points score attainment groupings (i.e., KS4 and KS5 cohorts), the higher the vocational proportion in the KS5-L3 pathway the higher the percentage of candidates with low prior attainment and the lower the percentage of candidates with high prior attainment. It was only in the academic only pathway where the

majority of candidates had high prior attainment. In the other pathways, except vocational only pathway, the majority of candidates had medium prior attainment.

Regarding the percentages of KS5-L3 candidates who achieved a level 2 in English and Mathematics (that is, GCSEs graded A*-C), the academic only and mostly academic group had similarly high percentages of these candidates. The percentage of these candidates, for the most part, decreased with increasing vocational qualifications, with a particular sharp decrease within the vocational only pathway compared to the other pathways. Within the vocational only pathway, only approximately half of the candidates had achieved a level 2 in English and Mathematics compared to over 71% in each of the other pathways.

There was also a more systematic relationship between the Key Stage 4 pathway candidates had followed and the extent to which their Key Stage 5 pathway contained vocational qualifications when looking at candidates' level 3 pathways than their KS5-all pathways. Amongst the KS5-all pathways, most of the academic only candidates had either followed an academic only or mostly academic pathways at Key Stage 4, with the former being a lot more common. The mostly academic and vocational only candidates more often had followed one of those two more academic pathways, but they were also more likely to have followed a mixed pathway at Key Stage 4. In contrast, the mixed and mostly vocational candidates were more likely to have followed a mixed or mostly vocational pathway compared to the other types of candidates. The vocational only candidates appeared more similar to the mostly academic candidates than to the candidates with more vocational qualifications. In contrast, the percentage of Key Stage 4 academic only candidates was lower in KS5-L3 pathways with more vocational qualifications. Candidates following a KS5-L3 vocational only pathway were more likely to have followed a Key Stage 4 vocational only pathway than candidates from any of the other pathways while candidates following a KS5-L3 academic only pathway were less likely to have followed a Key Stage 4 mostly academic pathway than candidates from any of the other pathways.

Candidates without a level 3 pathway showed a different profile to any level 3 pathway with regard to most of the educational characteristics. The vast majority of candidates came from an FE college with the second largest percentage from comprehensive schools, but they only made up a much smaller minority. Almost all of the candidates came from co-educational schools. The majority of these candidates had attended a comprehensive school at Key Stage 4 but a larger percentage had attended an 'other' school type than amongst level 3 candidates. For all measures of prior attainment, it was clear that the majority of these candidates had low prior attainment, although a substantial minority had a medium level of prior attainment. Regarding Key Stage 4 pathway, the largest group of candidates had followed a mostly academic pathway, followed by a mixed pathway and a slightly smaller but still substantial minority had followed an academic only pathway. Much smaller percentages of candidates had followed a mostly vocational or vocational only pathway, although these percentages were higher than found for any of the level 3 pathways.

Table 23: Candidate educational characteristics for each KS5-all pathway (excluding candidates with missing data)

Educational characteristics		Academic only		Mostly Academic		Mixed		Mostly Vocational		Vocational only	
		N	%	N	%	N	%	N	%	N	%
KS5 School type	Comprehensive	10,8177	46.0	25,931	35.9	14,281	21.2	14,475	22.3	8,080	10.2
	Independent	33,450	14.2	2,467	3.4	488	0.7	365	0.6	230	0.3
	Selective	22,157	9.4	1,652	2.3	109	0.2	50	0.1	14	0.0
	Secondary Modern	2,678	1.1	1,167	1.6	889	1.3	1,009	1.6	565	0.7
	Sixth form college	40,732	17.3	11,142	15.4	6,129	9.1	7,936	12.2	5,061	6.4
	FE college	26,685	11.3	29,023	40.2	44,459	65.9	40,043	61.8	63,590	80.0
	Other	1,425	0.6	801	1.1	1,091	1.6	922	1.4	1,935	2.4
School Gender	Boys only	16,554	7.0	1,441	2.0	492	0.7	541	0.8	390	0.5
	Girls only	20,522	8.7	2,642	3.7	659	1.0	740	1.1	379	0.5
	Co-educational	198,270	84.2	68,101	94.3	66,299	98.3	63,523	98.0	78,706	99.0
KS4 School type	Comprehensive	166,579	74.1	58,725	86.2	58,419	88.7	58,245	90.3	74,073	90.2
	Independent	32,550	14.5	3,221	4.7	1,167	1.8	1,288	2.0	1,373	1.7
	Selective	18,700	8.3	1,696	2.5	366	0.6	285	0.4	709	0.9
	Secondary Modern	5,120	2.3	2,459	3.6	2,803	4.3	2,832	4.4	3,345	4.1
	Post-16 institution	186	0.1	204	0.3	248	0.4	198	0.3	147	0.2
	Other	1,649	0.7	1,796	2.6	2,882	4.4	1,681	2.6	2,505	3.0
KS4 attainment (within KS4 cohort)	Low	15,423	6.9	25,554	37.9	40,728	62.8	34,076	53.3	22,973	28.4
	Medium	56,936	25.4	21,120	31.3	19,112	29.5	27,346	42.8	49,140	60.7
	High	151,974	67.7	20,799	30.8	5,021	7.7	2,542	4.0	8,908	11.0
KS4 attainment (within KS5 cohort)	Low	19,909	8.9	28,089	41.6	44,852	69.2	42,853	67.0	32,625	40.3
	Medium	65,697	29.3	21,729	32.2	16,365	25.2	19,384	30.3	42,208	52.1
	High	138,727	61.8	17,655	26.2	3,644	5.6	1,727	2.7	6,188	7.6
English and Maths (A*-C)	No	49,229	21.8	32,755	47.6	49,266	74.0	52,853	81.6	17,852	21.5
	Yes	176,421	78.2	36,061	52.4	17,323	26.0	11,907	18.4	65,238	78.5
KS4 pathway	Academic only	136,283	61.2	26,061	38.6	18,031	27.6	18,689	29.2	27,628	33.8
	Mostly Academic	75,289	33.8	28,193	41.8	27,355	41.9	28,596	44.7	36,803	45.0
	Mixed	8,978	4.0	9,810	14.5	14,684	22.5	13,404	20.9	13,698	16.8
	Mostly Vocational	1,104	0.5	2,004	3.0	3,255	5.0	2,334	3.6	2,090	2.6
	Vocational only	979	0.4	1,398	2.1	1,984	3.0	972	1.5	1,518	1.9

Table 24: Candidate educational characteristics for each KS5-L3 pathway (excluding candidates with missing data)

Educational characteristics		Academic only		Mostly Academic		Mixed		Mostly Vocational		Vocational only		No L3 pathway	
		N	%	N	%	N	%	N	%	N	%	N	%
KS5 School type	Comprehensive	111,785	47.9	17,267	59.5	10,764	51.3	7,525	51.3	15,124	15.5	8,479	6.8
	Independent	34,043	14.6	844	2.9	336	1.6	243	1.7	310	0.3	1,224	1.0
	Selective	23,393	10.0	388	1.3	106	0.5	52	0.4	6	0.0	37	0.0
	Secondary Modern	2,685	1.2	902	3.1	686	3.3	530	3.6	1,024	1.1	481	0.4
	Sixth form college	42,249	18.1	6,965	24.0	3,799	18.1	3,645	24.8	9,492	9.8	4,850	3.9
	FE college	18,560	8.0	2,597	8.9	5,247	25.0	2,483	16.9	70,853	72.8	104,060	83.9
	Other	513	0.2	73	0.3	62	0.3	191	1.3	467	0.5	4,868	3.9
School Gender	Boys only	17,044	7.3	640	2.2	368	1.8	273	1.9	654	0.7	439	0.4
	Girls only	21,752	9.3	1,037	3.6	448	2.1	329	2.2	788	0.8	588	0.5
	Co-educational	194,474	83.4	27,360	94.2	20,188	96.1	14,067	95.9	95,839	98.5	122,971	99.2
KS4 School type	Comprehensive	165,495	73.7	25,705	89.8	18,705	90.4	13,012	89.8	88,795	92.1	104,329	86.5
	Independent	33,844	15.1	1,261	4.4	726	3.5	496	3.4	1,945	2.0	1,327	1.1
	Selective	19,838	8.8	517	1.8	324	1.6	167	1.2	703	0.7	207	0.2
	Secondary Modern	4,837	2.2	1,093	3.8	876	4.2	699	4.8	4,169	4.3	4,885	4.0
	Post-16 institution	105	0.0	9	0.0	10	0.0	9	0.1	164	0.2	686	0.6
	Other	420	0.2	55	0.2	55	0.3	101	0.7	637	0.7	9,245	7.7
KS4 attainment (within KS4 cohort)	Low	4,402	2.0	1,230	4.3	1,928	9.3	2,213	15.3	33,229	34.5	95,752	82.0
	Medium	59,451	26.5	15,418	53.8	14,027	67.8	10,040	69.3	55,288	57.4	19,430	16.6
	High	16,0754	71.6	12,001	41.9	4,748	22.9	2,233	15.4	7,864	8.2	1,644	1.4
KS4 attainment (within KS5 cohort)	Low	8,433	3.8	2,649	9.2	3,784	18.3	3,923	27.1	46,720	48.5	102,819	88.0
	Medium	69,517	31.0	16,300	56.9	13,473	65.1	8,999	62.1	44,244	45.9	12,850	11.0
	High	146,657	65.3	9,700	33.9	3,446	16.6	1,564	10.8	5,417	5.6	1,157	1.0
English and Maths (A*-C)	No	366,32	16.3	4,093	14.3	4,422	21.4	4,116	28.4	44,480	46.1	108,212	87.5
	Yes	188,141	83.7	24,560	85.7	16,285	78.6	10,375	71.6	52,067	53.9	155,22	12.5
KS4 pathway	Academic only	140,720	63.2	13,063	45.9	8,520	41.5	5,372	37.4	32,125	33.5	26,892	22.5
	Mostly Academic	75,541	33.9	13,112	46.1	9,587	46.7	6,674	46.4	44,544	46.5	46,778	39.2
	Mixed	5,934	2.7	2,149	7.6	2,234	10.9	2,112	14.7	16,471	17.2	31,674	26.5
	Mostly Vocational	289	0.1	104	0.4	189	0.9	191	1.3	2,121	2.2	7,893	6.6
	Vocational only	122	0.1	17	0.1	18	0.1	21	0.1	494	0.5	6,179	5.2

Specific level 3 qualifications

Demographic characteristics

Table 25 shows the demographic (non-educational) characteristics of candidates who took specific types of level 3 vocational or academic qualifications.

Both categories of DfE-approved vocational qualifications (Applied Generals and Tech Levels) were taken by slightly more male than female candidates, with the gender difference larger for Tech Levels than Applied Generals. The opposite gender distribution was found for the non-approved level 3 vocational qualifications.

All of the measures of income-related deprivation showed that the distributions of deprivation differed most between the academic qualifications (AS Levels and A Levels) on the one hand and vocational qualifications on the other hand. When looking at the deprivation measure with three categories (high, medium and low), it was found that AS and A Levels were taken by a higher percentage of candidates from low deprivation backgrounds, followed by a smaller percentage of candidates with medium deprivation, and an even smaller percentage of high deprivation candidates. There was a more complex pattern for vocational qualifications. For each type of vocational qualification, there was a similar percentage of candidates from low, medium and high deprivation groups, although which groups were more or less dominant varied, to some extent, by qualification type and deprivation measure. In particular, the Applied Generals were taken by higher percentages of high deprivation candidates, followed by medium deprivation and then low deprivation candidates. In contrast, Tech Levels and non-approved vocational qualifications were taken primarily by candidates with medium deprivation and in most cases the next largest was the low deprivation group.

There was also a noticeable division between the qualifications with regard to the percentage of candidates whose first language was not English. Tech Levels and non-approved vocational qualifications had similar percentages of non-English candidates, which were lower than those of the other vocational and academic types of qualifications. Applied Generals had slightly higher percentages of non-English candidates than the other qualifications.

Ethnicity differences were particularly evident with regard to White, Black and Asian (non-Chinese) candidates. There was a larger percentage of White candidates who took the Tech Levels and non-approved vocational qualifications compared to the other qualifications, and a smaller percentage of Black and Asian (Chinese) candidates.

Educational characteristics

Table 26 shows the educational characteristics of candidates who took specific types of level 3 qualifications. The distributions of candidates across the different Key Stage 5 school types varied substantially depending on the type of qualification. In particular, each of the categories of vocational qualifications were mostly comprised of candidates from three types of centres: comprehensive schools, FE colleges and sixth-form colleges, together making up over 94% of candidates in each vocational category. There were, however, some differences

in the distribution of those school types between the three vocational categories. For example, FE college candidates were more common amongst the Tech Level and non-approved vocational candidates than amongst the Applied General candidates. In contrast, Applied General candidates were more commonly from comprehensive schools than the Tech Level or non-approved vocational candidates. AS/A Levels candidates were predominantly from comprehensive schools, followed by sixth form colleges and then independent schools.

The AS/A Levels candidates were more likely to come from girls or boys only schools than candidates who took any of the vocational qualifications. There were slight differences between the categories of vocational qualifications with regard to uptake from single-sex schools.

There were also some differences in patterns between the qualifications with regard to the type of school candidates attended at Key Stage 4. The vast majority of candidates who took any of the level 3 vocational qualifications came from comprehensive schools, while the next largest minority had come from secondary modern schools. The majority of AS/A Level candidates also came from comprehensive schools but a much larger minority came from independent schools and selective schools than found amongst the vocational cohorts.

All of the measures of prior attainment analysed showed that lower and middle attainers made up a larger percentage of the vocational cohorts than the AS/A Level cohort. There was, however, some variation in the more specific distributions between the three categories of vocational qualifications and between the different measures of prior attainment. For every vocational category, the majority of candidates had medium levels of prior attainment relative to their whole Key Stage 4 cohort. In most cases, the next larger group had low prior attainment and a small, yet still substantial, minority had high prior attainment.

Table 27 shows the educational pathways of candidates who took specific level 3 academic and vocational qualifications. The Key Stage 4 results indicate which pathways candidates followed before starting those level 3 qualifications whereas the Key Stage 5 results indicate the pathways that candidates were following whilst taking those qualifications, thus, showing which pathways the level 3 qualification were part of.

Most of the vocational candidates had either followed an academic only or mostly academic pathways at Key Stage 4, with the latter being a lot more common. Another substantial minority had followed a mixed pathway at Key Stage 4. In most cases, the different vocational qualifications had similar patterns. In contrast, the AS/A Levels were predominantly taken by candidates who had followed an academic only pathway, with a smaller yet still substantial percentage having followed a mostly academic pathway. Much smaller percentages of AS/A Level candidates had followed any of the other three more vocational pathways.

At Key Stage 5, each of the types of level 3 vocational qualifications analysed formed part of every KS5-all and KS5-L3 vocational pathway, with large numbers of candidates following each of those pathways. There were, however, differences in the distributions of candidates across the pathways, varying by type of vocational qualification as well as by type of educational pathway (KS5-all vs. KS5-L3). When looking at the KS5-all pathways, all of the

types of vocational qualifications were most commonly taken by candidates following vocational only or mostly vocational pathways; between 30% and 35% of those vocational candidates followed one of those two pathways. For Applied Generals, similar, smaller, percentages of candidates followed the mostly academic and mixed pathways. Tech Levels had a slightly higher percentage of candidates following the vocational only pathway than the other vocational qualifications and a much smaller percentage following a mostly academic pathway. The findings for the KS5-L3 pathways varied in one main way: for all of the vocational qualifications, the majority of candidates followed a vocational only pathway, which was accompanied by much smaller percentages of candidates following a mostly vocational pathway.

Table 25: Candidate demographic characteristics for specific level 3 vocational and academic qualifications (excluding candidates with missing data)

Demographic Characteristics		Applied General		Tech Level		Non-approved L3 VQ		AS Level		A Level	
		N	%	N	%	N	%	N	%	N	%
Gender	Female	52,709	48.7	22,557	45.9	16,415	54.7	151,251	54.4	137,233	55.8
	Male	55,499	51.3	26,549	54.1	13,621	45.3	126,830	45.6	108,740	44.2
IDACI deprivation (within KS4 cohort)	Low	32,729	31.9	15,786	33.6	9,662	34.4	103,832	43.3	93,086	44.9
	Medium	34,455	33.6	16,645	35.4	10,059	35.8	76,976	32.1	66,110	31.9
	High	35,439	34.5	14,615	31.1	8,356	29.8	59,012	24.6	48,153	23.2
IDACI deprivation (within KS5 cohort)	Low	31,072	30.3	14,974	31.8	9,163	32.6	99,389	41.4	89,192	43.0
	Medium	34,399	33.5	16,703	35.5	10,091	35.9	78,221	32.6	67,340	32.5
	High	37,152	36.2	15,369	32.7	8,823	31.4	62,210	25.9	50,817	24.5
Income-related deprivation (0.20)	Low	56,157	54.7	27,202	57.8	16,748	59.7	158,903	66.3	140,764	67.9
	High	46,466	45.3	19,844	42.2	11,329	40.3	80,917	33.7	66,585	32.1
FSM	No	77,699	75.6	36,111	76.6	21,582	76.8	203,111	84.6	178,870	86.1
	Yes	25,096	24.4	11,021	23.4	6,537	23.2	37,083	15.4	28,789	13.9
First language	English	85,834	83.6	41,584	88.3	25,483	90.7	202,379	84.4	175,515	84.6
	Other	16,867	16.4	5,506	11.7	2,621	9.3	37,504	15.6	31,848	15.4
Ethnicity	White	77,774	76.3	39,452	84.4	24,064	86.2	183,132	77.0	158,929	77.3
	Black	7,065	6.9	1,804	3.9	972	3.5	12,148	5.1	10,000	4.9
	Asian (not Chinese)	11,009	10.8	3,371	7.2	1,688	6.0	26,640	11.2	22,946	11.2
	Chinese	276	0.3	119	0.3	48	0.2	1,480	0.6	1,384	0.7
	Mixed	4,285	4.2	1,540	3.3	944	3.4	10,511	4.4	9,047	4.4
	Any Other	1,525	1.5	477	1.0	203	0.7	3,963	1.7	3,293	1.6

Table 26: Candidate educational characteristics for specific level 3 vocational and academic qualifications (excluding candidates with missing data)

Educational Characteristics		Applied General		Tech Level		Non-approved L3 VQ		AS Level		A Level	
		N	%	N	%	N	%	N	%	N	%
KS5 School type	Comprehensive	41,068	38.2	10,352	21.3	8,244	28.0	140,622	50.6	124,974	50.9
	Independent	1,168	1.1	154	0.3	567	1.9	26,867	9.7	31,591	12.9
	Selective	333	0.3	52	0.1	169	0.6	22,644	8.2	22,288	9.1
	Secondary Modern	2,686	2.5	707	1.5	464	1.6	4,387	1.6	3,797	1.5
	Sixth form college	19,292	18.0	5,730	11.8	4,336	14.7	54,559	19.6	47,994	19.5
	FE college	42,333	39.4	31,310	64.5	15,538	52.8	27,915	10.0	14,436	5.9
	Other	535	0.5	220	0.5	134	0.5	772	0.3	607	0.2
School Gender	Boys only	1,577	1.5	327	0.7	258	0.9	16,550	6.0	16,583	6.7
	Girls only	2,105	2.0	298	0.6	499	1.7	21,422	7.7	21,600	8.8
	Co-educational	103,741	96.6	47,905	98.7	28,700	97.4	23,9839	86.3	207,535	84.5
KS4 School type	Comprehensive	96,697	91.3	44,365	92.0	26,524	90.4	213,255	79.1	182,525	75.8
	Independent	2,876	2.7	928	1.9	1,149	3.9	29,037	10.8	32,856	13.6
	Selective	1,098	1.0	452	0.9	336	1.1	19,698	7.3	18,989	7.9
	Secondary Modern	4,621	4.4	2,160	4.5	1,178	4.0	6,919	2.6	5,896	2.4
	Post-16 institution	110	0.1	69	0.1	29	0.1	123	0.0	77	0.0
	Other	538	0.5	269	0.6	123	0.4	581	0.2	443	0.2
KS4 attainment (within KS4 cohort)	Low	23,513	22.2	11,921	24.7	8,203	28.0	8,737	3.2	4,679	1.9
	Medium	64,573	61.0	29,974	62.1	15,345	52.3	93,004	34.5	70,805	29.4
	High	17,854	16.9	6,342	13.1	5,789	19.7	167,950	62.3	165,374	68.7
KS4 attainment (within KS5 cohort)	Low	35,791	33.8	17,993	37.3	11,249	38.3	17,041	6.3	9,862	4.1
	Medium	56,997	53.8	25,718	53.3	13,424	45.8	102,130	37.9	81,056	33.7
	High	13,152	12.4	4,526	9.4	4,664	15.9	150,520	55.8	149,940	62.3
English and Maths (A*-C)	No	36,161	34.1	17,508	36.3	11,168	38.0	41,755	15.5	37,768	15.7
	Yes	69,885	65.9	30,783	63.7	18,201	62.0	228,079	84.5	203,172	84.3

Table 27: Candidates' educational pathways for specific level 3 vocational and academic qualifications (excluding candidates with missing data)

Educational pathway		Applied General		Tech Level		Non-approved L3 VQ		AS Level		A Level	
		N	%	N	%	N	%	N	%	N	%
KS4 pathway	Academic only	39,048	37.1	17,153	35.8	10,967	37.6	155,414	58.1	144,074	60.3
	Mostly Academic	49,165	46.8	22,332	46.6	13,147	45.1	99,699	37.3	85,642	35.8
	Mixed	14,921	14.2	7,459	15.6	4,387	15.0	11,438	4.3	8,647	3.6
	Mostly Vocational	1,695	1.6	814	1.7	550	1.9	704	0.3	454	0.2
	Vocational only	318	0.3	173	0.4	116	0.4	156	0.1	73	0.0
KS5-all pathway	Academic only	0	0.0	0	0.0	0	0.0	204,045	73.4	214,582	73.2
	Mostly Academic	21,003	19.4	3,050	6.2	6,784	22.6	42,371	15.2	43,932	15.0
	Mixed	20,355	18.8	6,361	13.0	4,819	16.0	21,872	7.9	23,223	7.9
	Mostly Vocational	35,083	32.4	17,467	35.6	8,979	29.9	9,793	3.5	11,595	4.0
	Vocational only	31,767	29.4	22,228	45.3	9,454	31.5	0	0.0	0	0.0
KS5-L3 pathway	Academic only	0	0.0	0	0.0	0	0.0	219,071	78.8	230,143	78.5
	Mostly Academic	21,185	19.6	3,048	6.2	6,740	22.4	27,968	10.1	29,020	9.9
	Mixed	16,824	15.5	5,189	10.6	3,179	10.6	19,898	7.2	20,907	7.1
	Mostly Vocational	12,161	11.2	4,830	9.8	2,256	7.5	11,144	4.0	13,262	4.5
	Vocational only	58,038	53.6	36,039	73.4	17,861	59.5	0	0.0	0	0.0

Specific level 2 technical qualifications

Table 28 shows the demographic (non-educational) characteristics of candidates who took level 2 Technical Certificates at Key Stage 5. The level 3 Tech Level findings are presented alongside these results to provide context to the patterns.

Table 28: Candidate demographic characteristics for specific level 2 vocational qualifications (excluding candidates with missing data)

Demographic Characteristics		Technical Certificate (L2)		L3 Tech Level (for reference)	
		N	%	N	%
Gender	Female	14,053	42.1	22,557	45.9
	Male	19,290	57.9	26,549	54.1
IDACI deprivation (within KS4 cohort)	Low	8,576	27.1	15,786	33.6
	Medium	11,664	36.8	16,645	35.4
	High	11,443	36.1	14,615	31.1
IDACI deprivation (within KS5 cohort)	Low	8,055	25.4	14,974	31.8
	Medium	11,608	36.6	16,703	35.5
	High	12,020	37.9	15,369	32.7
Income-related deprivation (0.20)	Low	16,370	51.7	27,202	57.8
	High	15,313	48.3	19,844	42.2
FSM	No	21,423	67.5	36,111	76.6
	Yes	10,328	32.5	11,021	23.4
First Language	English	28,833	90.6	41,584	88.3
	Other	2,976	9.4	5,506	11.7
Ethnicity	White	27,723	87.9	39,452	84.4
	Black	930	2.9	1,804	3.9
	Asian (not Chinese)	1,631	5.2	3,371	7.2
	Chinese	33	0.1	119	0.3
	Mixed	1,002	3.2	1,540	3.3
	Any Other	235	0.7	477	1.0

Table 29 shows the educational characteristics of candidates who took level 2 Technical Certificates (again, with level 3 Tech level findings included for reference).

Table 29: Candidate educational characteristics for specific level 2 vocational qualifications (excluding candidates with missing data)

Educational characteristics		Technical Certificate (L2)		L3 Tech Level (for reference)	
		N	%	N	%
KS5 School type	Comprehensive	1,045	3.2	10,352	21.3
	Independent	51	0.2	154	0.3
	Selective	4	0.0	52	0.1
	Secondary Modern	62	0.2	707	1.5
	Sixth form college	1,035	3.2	5,730	11.8
	FE college	30,061	92.9	31,310	64.5
	Other	92	0.3	220	0.5
School Gender	Boys only	18	0.1	327	0.7
	Girls only	31	0.1	298	0.6
	Co-educational	32,301	99.8	47,905	98.7
KS4 School type	Comprehensive	29,695	92.1	44,365	92
	Independent	284	0.9	928	1.9
	Selective	96	0.3	452	0.9
	Secondary Modern	1,566	4.9	2,160	4.5
	Post-16 institution	104	0.3	69	0.1
	Other	511	1.6	269	0.6
KS4 attainment (within KS4 cohort)	Low	22,578	70.2	11,921	24.7
	Medium	8,724	27.1	29,974	62.1
	High	870	2.7	6,342	13.1
KS4 attainment (within KS5 cohort)	Low	25,454	79.1	17,993	37.3
	Medium	6,107	19.0	25,718	53.3
	High	611	1.9	4,526	9.4
English and Maths (A*-C)	No	24,461	75.5	17,508	36.3
	Yes	7,934	24.5	30,783	63.7
KS4 pathway	Academic only	7,891	24.6	17,153	35.8
	Mostly Academic	14,192	44.3	22,332	46.6
	Mixed	7,771	24.3	7,459	15.6
	Mostly Vocational	1,510	4.7	814	1.7
	Vocational only	678	2.1	173	0.4

Table 30 shows the educational pathways of candidates who took level 2 Technical Certificates. The Key Stage 4 results indicate which pathways candidates followed before starting those qualifications, whereas the Key Stage 5 results indicate the pathways that candidates were following whilst taking those qualifications, thus showing which pathways the level 2 vocational qualifications were part of.

Regarding the Key Stage 4 pathways, in comparison to the level 3 Tech Level candidates, those taking level 2 Technical Certificates were less likely to have followed an academic only

pathway and more likely to have followed one of the more vocational pathways, especially the more mixed pathways.

When looking at the KS5-all pathways, the level 2 Technical Certificates were most commonly taken as part of a mixed pathway. The vast majority of candidates were not following any level 3 pathways; that is, they did not take any level 3 qualifications at Key Stage 5. Amongst the candidates who did follow a level 3 pathway, the vast majority took only vocational qualifications (i.e., no level 3 academic qualifications).

Table 30: Candidate educational pathways for specific level 2 vocational qualifications (excluding candidates with missing data)

Educational pathway		Technical Certificate (L2)		L3 Tech Level (for reference)	
		N	%	N	%
KS4 pathway	Academic only	7,891	24.6	17,153	35.8
	Mostly Academic	14,192	44.3	22,332	46.6
	Mixed	7,771	24.3	7,459	15.6
	Mostly Vocational	1,510	4.7	814	1.7
	Vocational only	678	2.1	173	0.4
KS5-all pathway	Academic only	0	0.0	0	0.0
	Mostly Academic	5,312	15.9	3,050	6.2
	Mixed	11,014	33.0	6,361	13
	Mostly Vocational	7,942	23.8	17,467	35.6
	Vocational only	9,075	27.2	22,228	45.3
KS5-L3 pathway (all candidates)	Academic only	787	2.4	0	0.0
	Mostly Academic	140	0.4	3,048	6.2
	Mixed	89	0.3	5,189	10.6
	Mostly Vocational	120	0.4	4,830	9.8
	Vocational only	7,166	21.5	36,039	73.4
	No L3 pathway	25,041	75.1	0	0.0
KS5-L3 pathway (L3 candidates only)	Academic only	787	9.5	0	0.0
	Mostly Academic	140	1.7	3,048	6.2
	Mixed	89	1.1	5,189	10.6
	Mostly Vocational	120	1.4	4,830	9.8
	Vocational only	7,166	86.3	36,039	73.4

Summary and conclusions

How do vocational qualifications fit into candidates' programmes of study overall?

Substantial percentages of candidates took at least one DfE-approved vocational qualification within Key Stage 4 and Key Stage 5 education (in the cohort year ending 2016/2017). Technical Awards were taken by 43% of all Key Stage 4 candidates while 27% of all Key Stage 5 candidates took either an Applied General or a Tech Level qualification with the latter percentage rising to 37% when looking specifically at Key Stage 5 candidates with at least one level 3 qualification. Applied Generals contributed most to vocational uptake at Key Stage 5, taken by more than double the number of candidates who took Tech Levels. Technical Certificates (level 2 vocational qualifications offered at Key Stage 5), in contrast, were taken by a much smaller minority (10%) of candidates. These percentages are much higher than those found by the DfE (2019c), which only looked at candidates' highest study aims within one academic year (2016 to 2017), whereas this current study looked at qualifications taken throughout the two-year Key Stage periods (winter 2015 to summer 2017). Moreover, vocational qualifications that were approved by the DfE were considerably more popular than non-approved vocational qualifications at both Key Stage 4 and Key Stage 5. In each case, the approved qualifications were taken by approximately four times as many candidates as the number who took non-approved vocational qualifications of the same level.

The pathway analyses, which included vocational qualifications of all levels and types, showed that vocational education more widely formed part of an even larger group of candidates' programmes of study. 51% of Key Stage 4 candidates and 56% of Key Stage 5 candidates were on pathways that included at least one vocational qualification of any level or type (i.e., they were not following an academic only pathway). This percentage was slightly lower (42%) when looking at the sub-group of Key Stage 5 candidates taking level 3 qualifications

Despite the overall similarity of vocational uptake between the two Key Stages, the contribution that vocational qualifications made to candidates' programmes of study was different at Key Stage 4 compared to Key Stage 5. This was, to some extent, expected given the different accountability measures, which at Key Stage 4 place greater weight on GCSEs than vocational qualifications (Cook, 2013; DfE, 2019b).

At Key Stage 4, for most students, vocational qualifications were only a small part of their programmes of study. 84% of candidates were either on an academic only or mostly academic pathway. This is partly explained by the fact that for key accountability measures students need to take (at least) eight qualifications of which five need to be academic qualifications in EBacc subjects (DfE, 2019b) and there are no specific incentives for taking vocational qualifications. However, at Key Stage 5 a much larger percentage of candidates took predominately vocational pathways. When looking at all Key Stage 5 candidates, this percentage was 28.4%, while amongst the level 3 candidates 24.9% were following a fully vocational pathway.

There was also variation with regard to how the different DfE-approved vocational qualifications fit into candidates' programmes of study. At Key Stage 4, Technical Award candidates followed the mostly academic pathway to a higher percentage than found for other level 2 qualifications (e.g., non-approved vocational qualifications). In contrast, Applied General and Tech Level candidates most commonly followed predominantly vocational pathways. There were also differences between Applied Generals and Tech Levels such that Tech Level candidates were more likely to be on a vocational only pathway than Applied General candidates whereas Applied General candidates were more likely to follow the more academic pathways. The level 2 Technical Certificates, on the other hand, were mostly part of a below level 3 pathway at Key Stage 5.

What other qualifications do candidates take alongside vocational qualifications?

The combinations of qualifications that candidates took alongside the DfE-approved vocational qualifications revealed interesting insights into how these qualifications fit into candidates' programme of study. This is especially the case at Key Stage 5 where a more diverse range of qualifications are taken and where there is more than one type of approved vocational qualification.

At Key Stage 4, the majority of Technical Award candidates took GCSEs. However, large minorities of candidates also took more than one type of vocational qualification.

At Key Stage 5, Applied Generals and Tech Levels diverged notably from each other as well as from AS/A Levels with regard to the particular academic and vocational qualifications with which they were combined. Applied Generals and Tech levels showed the starkest contrast with AS/A Levels with regard to the uptake of GCSE English or Mathematics. Approximately a quarter of candidates taking either type of approved vocational qualification also took a GCSE in English or Mathematics compared to under 10% of AS/A Level candidates. Slightly higher percentages of Applied General and Tech Level candidates also took a level 2 Technical Certificate or other level 2 vocational qualification than the percentage of AS/A Level candidates. In contrast, Applied Generals and Tech Level candidates were much less likely to take the EPQ than AS/A Level candidates. It is interesting to note that Core Maths, Free Standing Maths and Functional Skills showed similar uptake amongst Applied General, Tech Level and AS/A Level candidates.

Moreover, Applied General and Tech Level candidates differed from each other primarily with regard to the uptake of AS/A Levels and level 2 Technical Certificates. AS/A Levels were taken by almost half of the Applied General candidates, which was almost double the percentage found for Tech Level candidates. On the other hand, Tech Level candidates were more likely than Applied General candidates to take level 2 Technical Certificates.

At Key Stage 5, level 2 Technical Certificates seemed particularly to be part of below level 3 programmes of study. The vast majority of these Technical Certificate candidates took GCSE English or Mathematics with only small percentages taking any level 3 academic or vocational qualifications.

Do vocational qualifications fill different subject needs to academic qualifications?

At both Key Stage 4 and Key Stage 5, academic and vocational qualifications tended to be popular in different subject areas. GCSEs and AS/A Levels were most commonly taken in Mathematics and Science, with English, and Humanities also common at GCSE. In contrast, Technical Awards were mostly taken in ICT, Sport, and Business, Finance and Law. Applied Generals showed a similar pattern to Technical Awards, mostly being taken in Business Finance and Law, followed by Sport. Tech Levels showed a different subject profile; they were mostly taken in Media and Communication, Engineering, and Agriculture. Moreover, level 2 Technical Certificates were mostly taken in Construction and Hairdressing.

A way to evaluate whether different qualifications supported different subject needs was to determine the extent to which the same candidate took both vocational and academic qualifications in the same subject area. No overlap between vocational and academic qualifications would indicate that vocational qualifications are being used to fill subject gaps in the curriculum. However, if there were overlap this could be interpreted in different ways: for example, it could indicate that the different qualifications cover different aspects of a subject area, or that candidates have obtained two qualifications just by learning one set of content.

At Key Stage 4, subjects had varying degrees of candidate overlap between Technical Awards and GCSEs. Subjects with the most candidate overlap were Art and Design, ICT, and Music and Performing Arts. Less candidate overlap between Technical Awards and GCSEs was found for Sport, Media and Communication, and Business, Finance and Law. Subjects (e.g., Construction) without any candidate overlap were always because there was no alternative qualification in that subject rather than because no candidate took both. At Key Stage 5, Humanities was the subject with the most candidate overlap between Applied Generals and AS/A Levels, exceeding that found for other subjects. Other subjects with sizeable candidate overlap included Business, Finance and Law, and Art and Design. In general, Tech Levels tended to have less candidate overlap with AS/A Levels than found for Applied Generals.

Who takes vocational qualifications?

The analyses looked at the following demographic and educational characteristics of candidates: gender, income-related deprivation, first language, ethnicity, school type, school gender composition, prior attainment, concurrent attainment (for Key Stage 4 only) and previous educational pathway (for Key Stage 5 only). In general, larger and more consistent differences were found between academic and vocational candidates at Key Stage 5 than at Key Stage 4.

At Key Stage 4, the candidates who took vocational qualifications looked very similar to the candidates who took academic qualifications with regard to most characteristics. Gender, school gender composition and prior attainment (Key Stage 2 level) showed very similar (in some cases, almost identical) distributions across the different academic and vocational pathways and qualifications. Ethnicity, school type and language showed differences between pathways and qualifications but there was no obvious relationship between their

distributions and vocational uptake. Income-related deprivation and concurrent attainment were the only two characteristics that showed some evidence of varying according to vocational uptake at Key Stage 4. Regarding income-related deprivation, there were only notable differences between pathways but not between qualifications. Pathways with more vocational qualifications had slightly higher percentages of candidates from high deprivation backgrounds.

Concurrent attainment showed the largest differences at Key Stage 4, but the magnitude of these differences depended on which measure of attainment was used. The measure of attainment based on average Key Stage 4 points score showed small differences between the pathways and qualifications, and was less systematically related to vocational uptake. In contrast, the distributions of candidates who had achieved a 'good' pass in GCSE in English and Mathematics varied substantially and consistently with the proportion of vocational qualifications in the pathway. The more vocational the pathway was, the higher the percentage of candidates who had not passed their GCSE in English or Mathematics. This increased substantially from mostly academic to mixed and kept increasing until the vocational only pathway, in which almost all the candidates had not achieved 'good' passes in GCSE English or Mathematics.

At Key Stage 5, statistically significant differences were found for all characteristics. Most characteristics showed evidence of having a relationship to vocational uptake; these were gender, income-related deprivation, prior (Key Stage 4) attainment, school type and school gender composition. First language and ethnicity were the only two characteristics that showed no obvious evidence of a relationship with vocational uptake, although their distributions varied in several ways between the different pathways and qualifications.

Regarding gender, there were some small, yet consistent, gender differences between the academic and vocational qualifications taken at Key Stage 5. There were higher percentages of male than female students in the more vocational pathways as well as for most of the vocational qualifications including Applied Generals, Tech Levels and Technical Certificates. The gender difference was largest for Tech Levels and level 2 Technical Certificates. The opposite pattern (more females than males) was found for the more academic pathways and for both AS Levels and A Levels. Furthermore, the female dominance for the academic only pathway was larger amongst the level 3 pathways than amongst the overall Key Stage 5 pathways. These findings suggest there is greater gender disparity in particular educational contexts.

There were large differences for income-related deprivation at Key Stage 5, especially with regard to the percentages of candidates at the high or low ends of the deprivation scales. The level 3 pathways showed a simpler, more straightforward relationship between deprivation and the proportion of vocational qualifications in the pathway; the percentage of high deprivation candidates increased consistently with increasingly vocational pathways and the percentage of low deprivation candidates increased with increasingly academic pathways. Income-related deprivation also varied between specific vocational qualifications. Applied Generals had the highest percentage of high deprivation candidates and the lowest percentage of low deprivation candidates, which was different to Tech Levels. AS/A Levels had decreasing percentages of candidates across low, medium and high deprivation groups respectively whereas the vocational qualifications had a more even balance of these groups.

At Key Stage 5, the differences between the distributions of prior (KS4) attainment between academic and vocational pathways and qualifications were much larger than that found for other characteristics, as was the case for GCSE attainment in the Key Stage 4 analyses. However, the relationships between prior attainment and pathway were different between the KS5-all and KS5-L3 analyses. There was a clearer, more systematic relationship between prior attainment and the proportion of vocational qualifications in the level 3 pathways. Yet, in contrast to the Key Stage 4 findings, the patterns were relatively consistent across the measures of KS4 attainment (i.e., passes in GCSE in Mathematics and English, and average KS4 points score). In both cases, the higher the vocational proportion in the level 3 pathways the higher the percentage of candidates with low prior attainment and the lower the percentage of candidates with high prior attainment. It was only in the level 3 academic only pathway where the majority of candidates had high prior attainment. In all the level 3 vocational pathways, the majority of candidates had medium prior attainment, except the vocational only pathway which was just under 50%. Similar patterns were found amongst vocational qualifications; candidates taking vocational qualifications were more similar to each other than to candidates taking AS or A Levels. AS and A Levels appeared much more selective with regard to prior attainment; almost all candidates were either from higher or medium attainment. Vocational qualifications, on the other hand, were taken by candidates with a much wider range of prior attainment.

Regarding school type at Key Stage 5, the percentage of Key Stage 5 candidates from FE colleges was much higher in the more vocational pathways than in the more academic pathways, with the highest percentage in the vocational only pathway and the lowest percentage in the academic only pathway. For most of the other school types, especially comprehensive schools, the percentage of candidates was higher in the more academic pathways. There was much more variation in school types between the different vocational qualifications, especially large variation with regard to the percentage of candidates in FE colleges and comprehensive schools. In particular, FE colleges were particularly prominent amongst candidates with Tech Levels and non-approved vocational qualifications.

For the gender composition of Key Stage 5 schools the academic only pathway stood out from all the pathways in having a higher percentage of candidates from single-sex schools.

Overall, there were much more unequal distributions of characteristics amongst candidates taking level 2 qualifications or not taking any level 3 qualifications. These candidates stood out as being notably different to the groups of candidates taking level 3 academic or level 3 vocational qualifications at Key Stage 5. In particular, candidates not taking any level 3 qualifications at all were much more likely to be male than female, to come from high-deprivation backgrounds, to attend FE colleges, and to have low prior attainment.

Conclusions

Several conclusions and implications can be drawn when considering the findings from all sections above together.

- Vocational qualifications, especially DfE-approved ones, contributed to a large percentage of students' Key Stage 4 and Key Stage 5 education. However, vocational qualifications were more dominant within students' programmes of study at Key Stage 5 than at Key Stage 4, with a much larger percentage of candidates taking a vocational only pathway at Key Stage 5. Key Stage 4 programmes were mostly comprised of GCSEs for the vast majority of students. Therefore, any changes to vocational qualifications will impact a substantial number of students but with different effects at Key Stage 5 than Key Stage 4.

- The students who took vocational qualifications at Key Stage 4 had a different profile of characteristics than those who took vocational qualifications at Key Stage 5. The Key Stage 4 students who took vocational qualifications were very similar to those who took academic qualifications with regard to many characteristics, including gender, income-related deprivation and prior attainment. In contrast, at Key Stage 5, there were larger differences between vocational and academic students for most of the characteristics analysed.

- There was little evidence that vocational qualifications targeted low-attaining students. At Key Stage 4, there were hardly any differences in the prior attainment of the students, measured by their Key Stage 2 results, across the different types of qualifications. Regarding concurrent attainment, higher percentages of candidates who took GCSEs/IGCSEs than candidates who took vocational qualifications achieved a 9-4 grade in GCSE English and Mathematics. In fact, 66% of such candidates did so, compared to 46% amongst students taking non-approved vocational qualifications. The percentage achieving the 9-4 threshold amongst candidates with Technical Awards was somewhere in the middle.
  At Key Stage 5, the level 3 vocational qualifications tended to be more wide-reaching than AS/A Levels with regard to candidate attainment; and the largest group of candidates had medium rather than low levels of attainment. The AS/A Levels were more selective, taken predominately by high attaining students. In contrast, low attaining candidates were predominately following level 2 or below pathways at Key Stage 5 rather than level 3 vocational qualifications.

- There was, however, notable variation amongst the different types of vocational qualifications at Key Stage 4 and Key Stage 5 with regard to programmes of study. For example, Applied Generals were more likely to be taken alongside AS/A Levels than Tech levels were. There were also differences in the subjects taken for Applied Generals, Tech Levels and AS/A Levels. These findings suggest caution in interpreting the DfE's categories of qualifications as a homogenous set.

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