UTCs: are they delivering for young people and the economy?

Gerard Dominguez-Reig
and David Robinson

October 2018

EDUCATION POLICY INSTITUTE

Research Area:
Higher Education,
Further Education,
and Skills

About the authors

David Robinson, Director, Post-16 and Skills. David's background includes six years at the Department for Education, as the lead analyst first on school accountability and then on capital funding. David led on the analysis and research that informed the reforms to school accountability, most notably the development of the Progress 8 measure. He also led the economic analysis of the department's capital funding proposals during the 2015 Comprehensive Spending Review.

Gerard Domínguez-Reig, Senior Researcher, Post-16 and Skills. Gerard previously worked as a coordinator for the UNESCO Chair in Education and Technology at the Open University in Catalonia, and as a Policy and Research Assistant at the Centre for Legal Studies and Specialized Training for the Government of Catalonia. Gerard co-authored the EPI's 'Remaking tertiary education', 'Apprenticeships for Northern Growth', 'Education for our Economic Future', and 'Apprenticeship training in England –a cost-effective model for firms?'.

Acknowledgements

Jon Andrews is Director for School System and Performance and Deputy Head of Research at the Education Policy Institute. Prior to this, Jon worked in the Department for Education from 2003 to 2016. Jon is the principal author of EPI's 'The Performance of Local Authorities and Multi Academy Trusts' report and has co-authored reports on grammar and faith schools, school funding, the disadvantage gap, and world class standards.

Felix Bunting was a Research Intern at the Education Policy Institute. Felix is a Master of Physics (MPhys) student at the University of Oxford.

About the Education Policy Institute

The Education Policy Institute is an independent, impartial, and evidence-based research institute that promotes high quality education outcomes, regardless of social background. We achieve this through data-led analysis, innovative research and high-profile events.

Education can have a transformative effect on the life chances of young people, enabling them to fulfil their potential, have successful careers, and grasp opportunities. As well as having a positive impact on the individual, good quality education and child wellbeing also promotes economic productivity and a cohesive society.

Through our research, we provide insight, commentary, and a constructive critique of education policy in England – shedding light on what is working and where further progress needs to be made. Our research and analysis spans a young person's journey from the early years through to entry to the labour market.

Our core research areas include:

- Benchmarking English Education
- School Performance, Admissions, and Capacity
- Early Years Development
- Vulnerable Learners and Social Mobility

- Accountability, Assessment, and Inspection
- Curriculum and Qualifications
- Teacher Supply and Quality
- Education Funding
- Higher Education, Further Education, and Skills

Our experienced and dedicated team works closely with academics, think tanks, and other research foundations and charities to shape the policy agenda

This publication includes analysis of the National Pupil Database (NPD): https://www.gov.uk/government/collections/national-pupil-database

The Department for Education is responsible for the collation and management of the NPD and is the Data Controller of NPD data. Any inferences or conclusions derived from the NPD in this publication are the responsibility of the Education Policy Institute and not the Department for Education.

Contents

Foreword

The Education Policy Institute is an independent, impartial and evidence-based research institute which aims to promote high quality education outcomes for all, through analysis that both informs and influences the policy debate in England and internationally.

Since 2011, the Department for Education has allocated almost £330m of capital spending to help create a new type of educational institution - the University Technical College (UTC).

UTCs are 14-19 age range institutions which are set up to serve students who are interested in pursuing a more technical curriculum.

Since 2011, almost 60 UTCs have been established, although eight of these have since been closed and one has converted from UTC status to academy status.

The UTC programme has been controversial. Some see it as a giving a much needed boost to technical education - providing more curriculum choice for those who do not wish to follow a more "academic" curriculum - as well as increasing the numbers of students who are well prepared for the needs of the workplace. Others believe that the UTC model is flawed - either because they believe all students should pursue a more "academic" curriculum until at least age 16, or because they note that inserting 14-19 providers into a system where children normally only move education provider at age 16 is unlikely to succeed.

There has also been controversy about the performance of students in UTCs. Some have noted that UTC students seem to perform less favourably than other students when key Department for Education performance metrics are considered. The advocates of UTCs often argue, however, that the existing Departmental performance measures do not properly assess the value of UTCs but instead focus on measures which are designed around the traditional "academic" curriculum.

This EPI report seeks to inform the debate over the value of UTCs by providing as objective as possible an assessment of all of the different dimensions of UTC performance. The conclusions demonstrate that so far most aspects of UTC performance have been disappointing. This ought to lead at the least to a re-assessment of programme design, but also to a careful consideration of whether a 14-19 education model can function effectively in a system where at present the transition points are at ages 11, 16 and 18.

We welcome comment on this report and its conclusions.

Rt. Hon. David Laws

Executive Chairman

Education Policy Institute.

Executive summary

University Technical Colleges (UTCs) are 14-19 educational institutions with a focus on technical education. They are sponsored by at least one university and require the support of local or national employers.

As of October 2018, there are 50 open UTCs, while eight have closed and one has converted to an academy. Another UTC is set to close in August 2019. Because of the high rate of closures and apparent poor performance, many are now asking for the termination or a complete overhaul of the programme. UTCs have been criticised for failing to recruit enough students, and this report shows that those that have closed had significantly fewer students than UTCs that had opened in the same year, therefore failing to remain financially viable. UTCs recruit at age 14 while transitions in the English education system generally occur at ages 11 and 16, making recruitment potentially difficult for these institutions. Another common criticism is of UTCs' apparent poor performance in equipping students with good qualifications, which is investigated further in this report.

The aim of this report is to explore the provision and performance of UTCs in depth and consider whether the criticisms of UTCs are fair. This report also assesses whether UTC provision is line with local and national skills needs.

Key Findings

Provision for 14-16 year olds

Despite overall growth in the number of UTCs, many are experiencing falling student numbers

There were almost 12,800 students in UTCs in 2018, up by 16 per cent from just over 11,000 the previous year. However, a third of students are enrolled at one of the 20 UTCs with decreasing student numbers.

UTCs' intakes are similar to other institutions in terms of economic disadvantage and prior attainment…

13.1 per cent of UTC entrants were eligible for Free School Meals, similar to the average in their local authorities (13.5 per cent), and the average Key Stage 2 score of UTC students is only just below that of schools in their local authorities.

… but students are overwhelmingly male and more likely to have Special Educational Needs (SEN)

72 per cent of UTC entrants are male, and 16 per cent have Special Educational Needs (one percentage point more than schools in their local authority).

Non-GCSE qualifications are popular in UTCs as are GCSEs in science and technology subjects

4.4 per cent of qualifications taken during Key Stage 4 in UTCs are not GCSEs, more than twice the national average. Students are also more likely to choose GCSEs in Science, Technology, Engineering or Maths (STEM): 10 per cent of entries are in computer science (two per cent nationally), eight per cent are in chemistry and/or physics (almost twice the national average), 16 per cent in science general/combined (12 per cent nationally).

This demonstrates that UTCs are delivering a more technical and scientific curriculum, which is their stated mission.

Grades for 16 year olds

UTC students make less progress between primary school and their GCSEs than students in other institutions…

The government's headline secondary school performance measure, Progress 8, compares the grades students achieve in eight, mostly academic, subjects, with the grades of students with similar results at the end of primary school. UTC students make an average of 0.9 grades less progress than other students against this measure.

…even when considering just English and maths GCSEs…

UTC students are less likely to take all eight subjects required for Progress 8. However, even when considering English and maths GCSEs, UTC students make less progress than their counterparts in other institutions; 0.9 grades less in English and 0.4 grades less in maths.

…or measures that also include less academic subjects,…

Their performance in the "Open bucket" part of the Progress 8 measure, which allows up to three less academic subjects to be included, is also below average. UTC students entering three subjects in this "Open bucket" had a progress score of 0.8 grades less than their counterparts in other institutions.

…and this poor performance appears to persist when considering just their progress since joining the UTC

As UTC students don't start at the UTC until three years after they have left primary school, aged 14, we also consider data on their progress during Key Stage 4 alone. This analysis indicates that UTC students make three quarters of a grade less progress in achieving Progress 8 subjects than similar students in other institutions during Key Stage 4. This is a significant, negative variation from the average which should be of concern to policymakers.

This poor progress leads them to achieve below average grades by the age of 16

53 per cent of UTC students get at least a pass in English and maths, compared with 65 per cent in other state-funded mainstream schools, while 28 per cent get a strong pass or higher, compared to 44 per cent elsewhere. The average score in a suite of mostly academic subjects (Attainment 8) across UTCs is 38, compared to 47 in other institutions.

Provision for 16-19 year olds

Over half of students do not continue at their UTC beyond the age of 16…

Over half of UTC students do not continue from Key Stage 4 to Key Stage 5 in the same institution, with students with lower GCSE results, special educational needs, or those from disadvantaged backgrounds the least likely to continue. These figures are

surprising and potentially concerning, as the aim of UTCs is to offer a 14-19 phase of education.

…and even those who do are less likely to complete their studies than other students

63 per cent of UTC students doing occupation-specific (Tech level) qualifications completed their final assessment compared to a state-funded average of 83 per cent. For broader vocational (applied general) qualifications, 69 per cent of UTC students completed their final assessment compared with 81 per cent nationally. For academic (A level) qualifications, 80 per cent of UTC students completed their final assessment compared to 94 per cent nationally.

16-19 year old UTC students are more likely to study technical qualifications, and focus on science and technology subjects

Almost half of UTC students have a level 3 Tech level as their core aim, compared to only nine per cent of students in state-funded mainstream institutions, while fewer have level 3 academic (e.g. A levels) or applied general qualifications. They are also more likely to study STEM subjects, for example AS level maths, statistics, or manufacturing technologies, and vocational or technical qualifications in engineering and manufacturing. The technical nature of Key Stage 5 provision is consistent with the mission of UTCs.

Outcomes for 16-19 year olds

UTC students make poor progress in their A levels…

UTC students make a third of a grade less progress in level 3 academic (mostly A level) qualifications than similar students in other institutions. Accordingly, UTC students obtain a grade D on average, while students in state-funded mainstream schools achieve on average a grade C.

… average progress in technical and vocational qualifications…

The progress of UTC students in applied general qualifications is close to the national average, and above that of Further Education colleges. The same is true of their attainment in Tech levels. On average they achieve a distinction in both qualification types.

…and good progress when retaking their English and maths GCSEs

UTC students improve upon their original GCSE grades in English and maths more than students in other institutions: 0.34 grades more progress in English, and 0.30 grades more progress in maths. Given the high dropout rate at the age of 16 and that the original qualification would have been taken in the same institution, it is not clear that this reflects good outcomes for students.

UTC students are more likely to go on to do an

UTC leavers are three times as likely to start an apprenticeship than those from other institutions (20 per cent compared to seven per cent). This might mean that school-to-work transition is better

apprenticeship and less likely to go onto higher education

at UTCs. However, UTC students are less likely to go to university (41 per cent compared to 50 per cent).

Inspection results

A high proportion of UTCs are rated 'requires improvement' or 'inadequate' …

Almost one in five UTCs was rated 'inadequate' by Ofsted (more than twice the national average) and almost 40 per cent were rated 'requires improvement' (four times more than secondary schools). Only four per cent were found to be 'outstanding', compared to 22 per cent of secondary schools.

..and this is consistent across all inspection areas

Below-average performance is consistent across all Ofsted rating areas: effectiveness of leadership and management; quality of teaching, learning, and assessment; outcomes for pupils; and personal development, behaviour, and welfare. UTCs also obtained worse ratings for their 16-19 provision than other institutions.

Match with labour market needs

UTCs are training students for jobs in sectors where high-skilled employment is expected to grow

UTCs specialise in economic sectors where employment growth is projected. Case studies of four sectors relevant to UTCs (manufacturing, construction, IT, and health) show that, except for manufacturing, there is projected growth in demand for high-skilled professionals in technical industries. These are industries and occupations where UTC leavers might seek employment after leaving the UTC or completing further study.

Conclusions and recommendations

In summary, our analysis suggests that provision in UTCs is more technical-oriented than elsewhere, and linked to national skills needs, as successive governments had hoped. However, UTC students make poor progress during Key Stage 4 and the majority are unlikely to continue into Key Stage 5 in the same institution. Those that do tend to make poor progress in their A levels. However, for more vocational Key Stage 5 qualifications they demonstrate average performance, and certainly above the average of the Further Education colleges that might otherwise be the alternative for many UTC students. This generally poor overall performance, and the difficulties in recruiting enough students for many UTCs to remain financially viable, suggests that further investment in the UTC programme cannot at present be justified. Instead, we believe that policymakers should give consideration to the following changes to the programme:

Consider moving UTC admissions to age 16

In a number of countries, students make transitions before age 16, but this is not the case in England. Regardless of what the "right" age might be, the reality is England has a pre- and post-16 system. This means that admission at age 14 is not the norm and has failed to convince enough students, parents, carers and schools of its benefits, and there is no

evidence that participation in UTCs at age 14 is likely to rise significantly without more fundamental changes to the education system. This has also made it difficult for many UTCs to remain viable. Furthermore, students make less progress during Key Stage 4 than in other institutions, and with most of them not continuing in the same institution beyond age 16, it is not clear that students are currently benefiting from all-through 14-19 provision.

UTCs could become flagship level 3 technical institutions

UTCs' provision of level 3 technical qualifications is often delivered at a higher quality than that of the Further Education colleges that might otherwise be the alternative for many UTC students. With their recruitment age set at 16, UTCs should focus on delivering high-quality existing technical qualifications and eventually T-levels relevant to local and national skill needs. With UTCs offering only Key Stage 5, there would be an opportunity for them to deliver a differentiated, high-quality level 3 technical provision. Academic qualifications, when available, should support core training aims and future progression. Building on their relationships with employers and universities, provision should be further connected to the level 4+ provision in Institutes of Technology, National Colleges and other providers, in line with the progression pathways described in the Post-16 Skills Plan. Provision should be linked to the needs of local employers, reflected in the UTCs' specialisms.

Better destinations measures are needed

Currently, destination measures capture student destinations two terms after finishing Key Stage 5, but take no account of the educational pathway that young people have taken during Key Stage 5, nor their grades. This means it is not possible to differentiate between those institutions which have "good" destinations on account of their intake and those that are actually effective at leading young people into further education, training or suitable employment. This is particularly relevant for young people following a technical or vocational route. To this end, the destinations measures should be improved so that they allow for comparison with similar groups of students.

Introduction

University Technical Colleges (UTCs) are non-selective 14-19 educational institutions which combine academic and practical learning and maintain a focus on technical education. All UTCs are sponsored by at least one university, although other organisations, such as local Further Education colleges, can co-sponsor them. They also need to receive backing from employers, who co-develop the curriculum together with UTC staff. UTCs specialise in at least one subject area, although they usually have no fewer than two specialisms, one often being engineering, and the remaining ideally aligned to local skills needs or shortages. To that end, UTCs are expected to instil students with employability skills to make them work- and career-ready. Capacity should vary between 500 and 800 students and they require specialised equipment to simulate work-like environments.[1] [2]

UTCs are a sub-category of free schools, which were introduced under the Coalition Government in 2010 under the Academies Act. The Coalition Government expanded the free schools programme further in the Education Act 2011, by requiring local authorities in need of establishing a new school to explore the possibility of opening an academy or a free school, instead of a Local Authority-maintained school. This was known as the *academy or free school presumption*. In 2015 it was renamed the *free school presumption*, requiring *all* new schools to be set up as free schools.[3] [4] [5]

However, not all free schools are the same. UTCs, just like Studio Schools, recruit at a different age than most schools. While the education system in England generally transitions at ages 11 and 16, UTCs recruit pupils at age 14 (or Year 10). This means that students are recruited in the middle of secondary education, which does not come without challenges. This will be discussed in chapter 1.

As a result of spanning both pre-16 and post-16 education, UTC funding incorporates elements of both systems. For Key Stage 4 (14-16) they are funded through the National Funding Formula (NFF) for schools, while for Key Stage 5 the 16-19 funding formula applies. The NFF sets funding rates for pre-16 provision and is delivered through the Dedicated Schools Grant (DSG). Additional funding is also provided through the Pupil Premium. The DSG is currently structured in three blocks: schools, early years provision, and high-needs. The funding is set at a local authority level; local authorities are then responsible for establishing a local formula that will decide how funding will be distributed amongst schools.[6]

---

[1] "Scope note/definition of UTCs," Department for Education, 2012. Accessed July 13, 2018, http://webarchive.nationalarchives.gov.uk/20130102175908/http://education.gov.uk/vocabularies/educationtermsandtags/7317

[2] "What are UTCs?," Department for Education, 2012. Accessed July 13, 2018. http://webarchive.nationalarchives.gov.uk/20130102162244/http://education.gov.uk/a00198954/utcs

[3] Academies Act 2010

[4] Education Act 2011

[5] "The free school presumption Departmental advice for local authorities and new school proposers", Department for Education, May 2018. Accessed July 13, 2018. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/706171/Academy_and_free_school_presumption_departmental_advice.pdf

[6] "The national funding formula for schools and high needs. Policy document", Department for Education, September 2017. Accessed July 13, 2018 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/648532/national_funding_formula_for_schools_and_high_needs-Policy_document.pdf

The 16-19 funding formula allocates funding on a programme basis, as the rate varies with intensity and length of study and age of students. It also considers retention rates, the local labour market (area cost), and the background characteristics of pupils.[7]

In addition to this, UTCs may receive capital funding, business rates grants, Special Educational Needs/Alternative Provision top-up funding, post-opening grants (additional costs to establish a new school, with two elements: non-staffing resources, paid on per-pupil basis and worth £500 per pupil per year, and a leadership grant, a fixed-rate grant of £315,000 payable over three years), and transitional funding of £200,000 per year for a three-year period.[8] However, funding is not central to the questions explored in this report and will not be discussed in depth.

Although some elements of the UTC programme such as recruitment at the age 14 have been contested since their inception, recently their very existence has been questioned, as will be discussed in the following section. In this report we will explore whether and to what degree the most recurrent criticisms of UTCs are justified by analysing key elements of provision and outcomes. The report will be structured as follows:

In **chapter one**, the current situation of UTCs will be discussed, including the criticisms and controversies they are facing eight years on.

In **chapter two**, we will explore Key Stage 4 provision, analysing student characteristics, the curricular offer, and performance measures. Given that most published evidence is limited to Key Stage 4, we will mainly rely on existing research and published data. However, administrative data will be used for our analysis of UTCs' performance.

In **chapter three**, we will consider Key Stage 5 provision. We will discuss the qualifications offered and how they differ from secondary schools. We will finally examine performance against a number of indicators, including destinations. We will carry out an analysis of administrative and published data.

In **chapter four**, we will discuss Ofsted inspection outcomes for both UTCs that are open and those that closed, looking at both pre- and post-16 elements. We will investigate if outcomes vary with institutions' age. Results will be compared with other types of institutions.

In **chapter five**, we will explore whether the local labour market and skills needs in particular areas are linked to the establishment of UTCs and explore whether they specialise in fields where a strong increase in employment is expected. We will use the Department for Education's Employer Skills Survey and the extinct UK Commission for Employment and Skills' (UKCES) Working Futures' labour market projections, alongside other Office for National Statistics (ONS) data.

In addition to using the datasets mentioned above, which will be described in more depth in the chapters where they are used, the Education Policy Institute hosted a roundtable in July 2018 with representatives from a range of stakeholders to discuss preliminary findings and explore whether some explanatory factors were not captured in the data analysed. Participants represented the following sectors: University Technical Colleges, all-through schools, Further Education institutions,

[7] "16 to 19 Funding: how it works", Department for Education, February 2018. Accessed June 20, 2018 https://www.gov.uk/guidance/16-to-19-funding-how-it-works

[8] "A guide to new University Technical College revenue funding", Department for Education, August 2017

Higher Education institutions sponsoring UTCs, employers engaged in UTCs, and research organisations. Attendees were representatives from the following institutions:

- The Sydney Russell School
- Waverley Education Foundation
- Air Products PLC
- Brunel University
- College of Haringey, Enfield and North East London (CONEL)
- Edge Foundation
- London Design & Engineering UTC
- Oldham College
- Skanska Technology Limited
- Southbank Engineering UTC
- The Leigh UTC
- The Sydney Russell School
- Warwick University
- Waverley Education Foundation

The Education Policy Institute is grateful to all participants for attending our event and for their invaluable contributions. Discussions were held under Chatham House rules.

We are grateful to GL Assessment for providing EPI with aggregated Cognitive Abilities Test data.

Chapter 1. The current landscape: roll out and debates around UTCs eight years on

At the time of this publication:

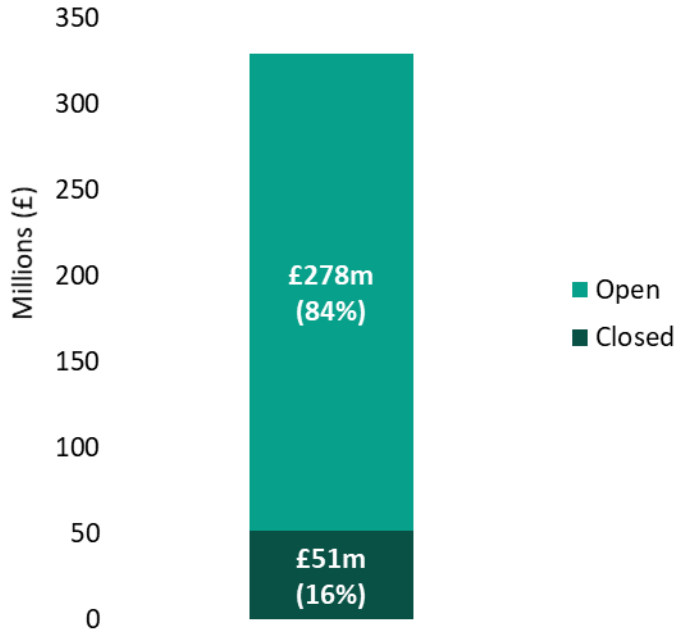
- There are 50 open UTCs;
- Eight UTCs have closed, while one has abandoned its UTC status and become an academy: Nottingham University Academy of Science and Technology, which started recruiting at Year 7 instead of Year 10 from September 2018;
- In July 2018, another UTC announced it will be closing in August 2019: UTC@Harbourside.

Table 1.1. List of UTCs currently open, closed, and that converted to a different institution type

UTCS open as of October 2018
Aston University Engineering Academy
Bristol Technology and Engineering Academy
Bucks University Technical College
Cambridge Academy for Science and Technology
Crewe Engineering & Design UTC
Derby Manufacturing UTC
Elstree UTC
Elutec - Academy of Design and Engineering
Energy Coast UTC
Engineering UTC Northern Lincolnshire
Global Academy UTC
Greater Peterborough UTC
Health Futures UTC
Heathrow Aviation Engineering UTC
JCB Academy
Leigh UTC
Lincoln UTC
Liverpool Life Sciences UTC
London Design and Engineering UTC
Medway UTC
Mulberry UTC
North East Futures UTC
Ron Dearing UTC
Scarborough UTC
SGS Berkeley Green UTC (South Gloucestershire)
Silverstone UTC
Sir Charles Kao UTC (now BMAT Stem Academy)
Sir Simon Milton Westminster UTC
South Bank Engineering UTC
South Devon UTC
South Wiltshire UTC
University Technical College Norfolk
UTC Bolton
UTC Leeds
UTC Oxfordshire
UTC Plymouth
UTC Portsmouth
UTC Reading
UTC Sheffield City Centre
UTC Sheffield Olympic Legacy Park
UTC South Durham
UTC Swindon
UTC Warrington
UTC@Harbourside (will close in August 2019)
UTC@MediaCityUK
Watford UTC
West Midlands UTC
Wigan UTC
WMG Academy for Young Engineers Coventry
WMG Academy for Young Engineers Solihull
UTCs that converted into a different institution type
Nottingham University Academy of Science and Technology
UTCs that are closed
Black Country UTC
Hackney University Technical College
UTC Central Bedfordshire
Daventry University Technical College
UTC Lancashire
Royal Greenwich UTC
Greater Manchester University Technical College
Tottenham University Technical College

According to the latest data from the Education and Skills Funding Agency (ESFA), the UTC programme has so far received just under £330m in capital funding. 16 per cent of this (or £51m) was invested in UTCs that have now closed (Figure 1.1). Calculations exclude UTCs that have converted to other types of institutions, and schools where works have not been completed. Responding to a Freedom of Information request from the Education Policy Institute, the ESFA confirmed that closed schools generated additional spending of over £230,000 in holding costs after closure.

Figure 1.1 Capital Funding for University Technical Colleges, by UTC status (open and closed)[9]



The Baker Dearing Educational Trust website groups UTCs according to one single specialism per institution, stating that 28 specialise in engineering, seven in science, 11 in digital subjects, and three in health. However, most UTCs specialise in more than one subject. Our analysis of individual UTCs' websites and prospectuses suggests that UTCs offer just under fifty specialisms, which we have grouped into thirteen broader groups to make analysis easier. Specialisms have been difficult to work out in some cases, given that information is reported with varying degrees of clarity. The proposed groups are for analytical purposes only and other grouping criteria could have been applied.

Figure 1.2 shows that 33 UTCs specialise in engineering, making it the most common specialism, followed by science and computing, technology and IT (10 each). Less technical oriented specialisms are rare, such as business and transport (two UTCs each) or travel (only one).

[9] "Free Schools Capital", Education and Skills Funding Agency, 19 July 2018 https://www.gov.uk/government/publications/capital-funding-for-open-free-schools

Figure 1.2 University Technical Colleges' broad specialisms[10]

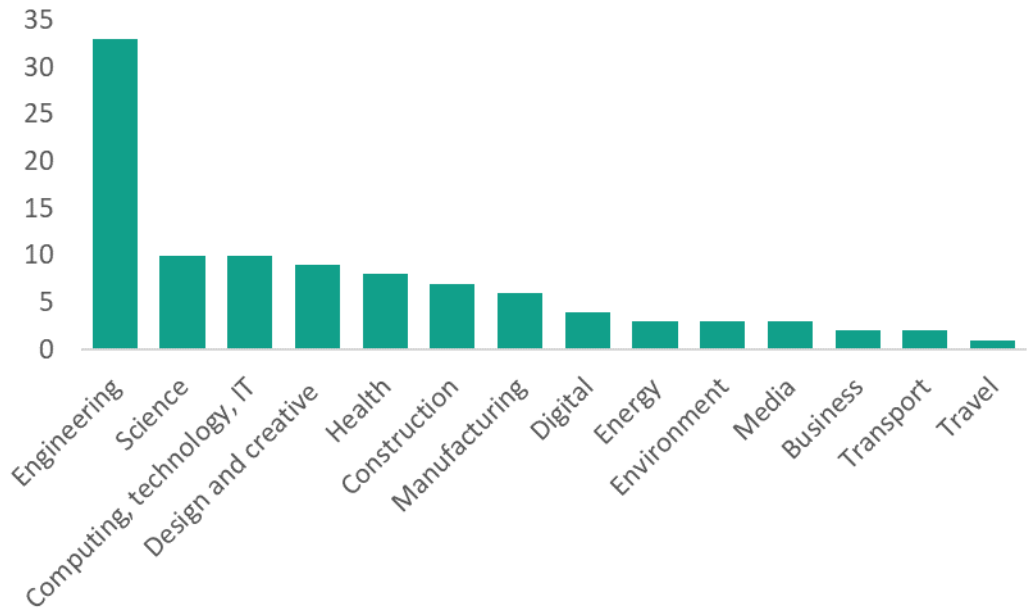
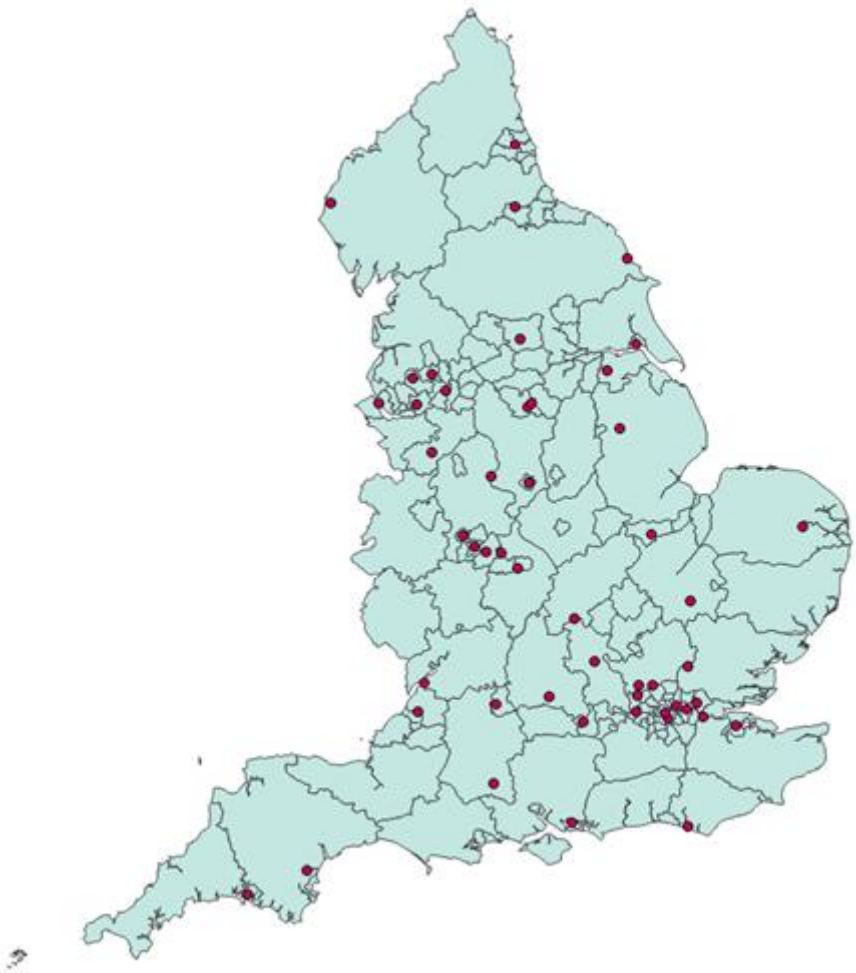


Figure 1.3 below shows that the number of UTCs varies across regions: seven UTCs are open in both the South East and London, while in East Midlands and the North East there are only three. In five English regions there are six UTCs open: West Midlands, the South East, Yorkshire and the Humber, and the East of England.

[10] Authors' calculations using information available on UTCs and the Baker Dearing Educational Trust websites.

Figure 1.3 UTCs open in England as of October 2018 [11]



Criticisms and controversies

UTCs were introduced to help students with an interest in technical education to thrive

Former Conservative Education Secretary Lord Baker was one of the instigators of UTCs and supported Gordon Brown's government initiative to introduce them, although the first UTC opened during the Coalition Government. The Baker Dearing Educational Trust, which he set up in 2010, promotes and supports existing UTCs.[12] Lord Baker wrote that "[b]y delivering a largely academic curriculum… [we] may be harming the prospects of young people whose natural talents are technical and practical."[13] This is an argument that the Social Mobility and Child Poverty Commission backed,

[11] Contains data from the Department for Education, available on get-information-schools.service.gov.uk
[12] https://www.utcolleges.org/about/
[13] Kenneth Baker, *A new vision for secondary education* (Bloomsbury, 2013)

as it concluded in a report published in 2015 that the scarcity of non-graduate post-18 educational routes was not helping disengaged young people return to education or training.[14]

Lord Baker also suggested that secondary education should span ages 14 to 18 and be structured in four pathways: a) career or vocational-oriented (provided through apprenticeships and work-based programmes), b) liberal arts (similar to the current GCSE/A level pathway), c) sports and creative arts, and finally d) a technical pathway, which would blend teaching and hands-on learning and would help technical-oriented students to develop their talents in a setting that allows them to do so. UTCs were introduced with the expectation that they would deliver the latter.[15]

UTCs were also created to increase diversity in the education sector, as were free schools and academies, and that was one of the main reasons behind the Academies Act 2010.[16]

One of the expectations was that UTCs would equip young people with skills that employers value, given that this kind of institution is required to build and maintain strong ties with the business world. Therefore, UTCs should help students develop: reasoning skills, problem-solving skills, work experience, decision-making skills, social skills such as confidence to speak in public, critical thinking, practical skills, and some business knowledge.

UTCs have faced criticism over student recruitment and poor performance

Eight years after the programme started, there are concerns around the current performance of UTCs, and whether they are enabling opportunities for technical-oriented students, as this section will discuss. It is often noted that nine UTCs have closed or changed status (with another one closing in 2019), which is a clear indication that the model is struggling to establish itself successfully.

There are two arguments that are usually given to illustrate the failure of UTCs:

Failing to recruit sufficient numbers of students. Recruitment at age 14 is proving challenging, with some commentators, including the Institute for Public Policy Research (IPPR), suggesting replacing it with an age 16 start.[17] The IPPR reported that in 2015/16, 13 UTCs failed to fill half or more of their Year 10 places, and overall 39 per cent of Year 10 places remained vacant that year.

The authors suggested that there are three kinds of barriers that UTC face to convince enough students to move to a UTC. Firstly, structural barriers were identified, some related to funding, as a student-led funding system creates incentives for schools to operate at full-capacity, and also linked to the fact that the system is structured for recruitment to happen at age 11 and 16, not 14. Some parents and young people might not even be aware that there is a chance for children to move to a more technical-oriented school at this uncommon transition age. Acknowledging this, the government introduced the *"Baker Clause"*, requiring schools to give technical education providers, including UTCs, the opportunity to talk to students in secondary schools to make them aware of non-academic alternatives.[18] However, the Department for Education has acknowledged that this new

[14] Social Mobility and Childhood Poverty Commission, *State of the Nation: Social mobility and child poverty in Great Britain* (2015)
[15] Kenneth Baker, 2013
[16] Robert Long and Paul Bolton, *University Technical Colleges* (House of Commons Library: 2017)
[17] Craig Thorley, *Tech Transitions. UTCs, Studio Schools, and technical and vocational education in England's schools'* (Institute for Public Policy Research, 2017)
[18] https://www.gov.uk/government/news/skills-minister-highlights-new-provider-access-law-for-schools

rule is being overlooked in some schools, threatening to intervene where the technical education sector is not granted access to students.[19] FE Week reported in July 2018 that only two of the ten biggest multi-academy trusts were fully compliant with the new requirement.[20]

Recently, the former Chancellor of the Exchequer George Osborne appeared before the Education Select Committee to state that:

> 'There was a question mark about starting it at 14. There is an argument, which I was digging into before I left office, which is moving school at 14 is not always the easiest thing for people to do and they are reluctant to do it. So in terms of whether the Government should allow more flexibility in the UTC model, and perhaps have kids starting earlier, I do not doubt it has worked very well in some cases, but it clearly has not worked in others. If I was back at the Treasury, I would be looking at that.'[21]

Secondly, IPPR also identified local barriers to recruitment, suggesting that some UTCs were not set up to respond to existing needs of the local education market. As a result, some may end up competing against local secondary schools instead of offering a distinct provision (this is something this report aims to test and explore further). Competition dynamics were also mentioned by Henri Murison, Vice-Chair of the Northern Powerhouse Partnership, as a serious challenge to the establishment of UTCs before the House of Commons' Education Select Committee.[22]

Thirdly, societal barriers seem to exist, as UTCs and technical education in general may be seen by some as second-best alternatives to other academic options.[23] [24]

Poor performance. Leading figures in the education world have criticised UTCs, arguing that they are not delivering for young people. Former Ofsted Chief Inspector Sir Michael Wilshaw claimed that some UTCs are underperforming due to poorly thought out curricula, placing low expectations on student achievement, offering weak and inconsistent teaching, and providing poor career guidance.[25] Similarly, Michael Gove, Education Secretary when UTCs were introduced, regretted that:

> 'There comes a point when the evidence has accumulated and the verdict is clear and even the most optimistic of us has to acknowledge that Godot won't arrive… I fear that's the point we've come to with University Technical Colleges.'[26]

In the same article, he went on to suggest that the longer students followed an academic curriculum, the more highly they performed in every area. Gove highlighted that UTCs performed badly against performance measures, thus restricting students' future opportunities.

---

[19] Jude Burke, "Baker clause update: DfE gears up to start 'direct intervention' as minister encourages providers to grass on schools', *FE Week,* August 7, 2018
[20] Alix Robertson, "Multi-academy trusts fail to implement Baker Clause', *FE Week*, January 26, 2018
[21] Education Select Committee, 2 May 2018, HC 819
[22] ibidem
[23] Will Cook, Craig Thorley, Jonathan Clifton, *Transitions at 14. Analysing the intake of 14-19 education institutions* (Institute for Public Policy Research, 2016)
[24] Craig Thorley, 2017
[25] "Speech at the Baker Dearing Trust conference", Michael Wilshaw, July 2016, accessed July 25, 2018 https://www.gov.uk/government/speeches/sir-michael-wilshaws-speech-at-the-baker-dearing-utc-conference
[26] Michael Gove, 'Dividing our children at 14 has not worked', *The Times*, February 10, 2017

But, to what degree are these criticisms fair to UTCs? There are two factors that are often cited as working against the success of UTCs:

Performance measures. Despite not being required to follow the national curriculum, and being expected to offer a technical focussed provision, UTCs are still judged against the same performance measures as other institutions; principally against the government's headline indicator for secondary school performance, Progress 8. As five or six of the eight subjects included in Progress 8 must be academic qualifications, and 40 per cent of the curriculum at UTCs is intended to be technical-oriented, it is suggested that this may work against UTCs.[27] [28] Also, UTCs account for only two of four years between the end of Key Stage 2 and the end of Key Stage 4, but they are held responsible for the whole period. Proponents of UTC suggest that, due to these two issues, there is a misalignment between the government's stated aims for UTCs and the performance measures the government uses to hold them to account. The Department for Education has acknowledged this and has pledged to change how performance tables are presented, not exempting UTCs from these measures but introducing a caveat statement and favouring other headlines measures, notably destinations.[29]

We explore these issues in detail later in this report and find they do not entirely explain the poor Key Stage 4 performance of UTCs.

Parity of esteem. Technical education does not enjoy the prestige commonly attached to academic pathways, which might have put UTCs on an unequal footing to other secondary education institutions from the outset. Sir Michael Wilshaw suggested that some schools might even be using UTCs in their area to "get rid" of students that might jeopardise their position in performance tables.[30] Previous EPI research has suggested that post-16 technical routes are scarce and poorly connected to higher levels of training, hampering progression to further education or training, and that traditional three-year university degrees have been favoured over technical alternatives.[31] [32]

[27] Kelly Kettlewell, Daniele Bernardinelli, Jude Hillary, Claudia Sumner, *University Technical Colleges: Beneath the headlines. NFER Contextual Analysis* (National Foundation for Educational Research, 2017)
[28]"Implementing the English Baccalaureate Government consultation response", Department for Education, July 2017. Accessed July 25, 2018 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/630713/Implementing_the_English_Baccalaureate_-_Government_consultation_response.pdf
[29] Neil McIvor to Ed Humpherson, 2018
[30] Michael Wilshaw, 2016
[31] Roy Andersen, Gerard Dominguez-Reig, Peter Sellen, *Educating for our economic future* (Education Policy Institute: 2017)
[32]Alison Wolf, Gerard Dominguez-Reig, Peter Sellen, *Remaking tertiary education: can we have a system that is fair and fit for purpose?* (Education Policy Institute: 2016)

Chapter 2. Key Stage 4

University Technical Colleges recruit at age 14, meaning that they provide Key Stage 4 and Key Stage 5 education. As existing research on the performance of UTCs during Key Stage 4 is more developed, our analysis will largely, though not entirely, synthesise existing published data and research.

This chapter will answer three questions:

- What are the characteristics of Key Stage 4 students going to UTCs and how do they compare to those in other institutions?
- What does the Key Stage 4 provision look like, and how does it differ from other institutions?
- How do students in UTCs perform against Key Stage 4 accountability measures, and are they doing significantly better or worse than pupils in other institutions?

The main sources used for this section are:

- Published data on Key Stage 4 subject take-up, performance, and destinations data, owned by the Department for Education.
- Performance data from the National Pupil Database, directly or from published sources.
- Existing literature, notably NFER's *University Technical Colleges: Behind the Headlines* report, and IPPR's *Transitions at 14: Analysing the intake of 14–19 education institutions* and *Tech transitions. UTCs, Studio Schools, and technical and vocational education in England's schools.*

Student characteristics

Previous research has suggested the following with regards to UTC students' characteristics: [33] [34]

- **Year 10 intake is overwhelmingly male**: in 2016/17, 71.6 per cent of Year 10 entrants were male, while only 28.4 per cent where female. The gap has narrowed since 2012/13, when 78.5 per cent of entrants were boys and only 21.5 per cent were girls.
- **UTCs are fairly representative with regards to students' background**: 13.1 per cent of UTCs' Year 10 students were eligible for Free School Meals in 2016/17, compared to 13.5 per cent of students in their local authorities (LAs). Evidence suggests that they draw equally from the most and the least affluent neighbourhoods.
- **SEND students are overrepresented in UTCs**, though the gap has narrowed over the years: in 2012/13, 23.6 per cent of UTC entrants were classified as having Special Educational Needs and Disabilities (SEND), versus 21.4 per cent in their LAs. The 2.2 percentage points gap narrowed down to only one in 2016/17, when 15.5 per cent of Year 10 pupils in UTCs had SEND, while their wider LA average was 14.5 per cent.
- **Similar prior attainment to the national average**: the average Key Stage 2 score in 2016/17 among UTC entrants was 28.1, very similar to schools in their local authorities (28.3) and the national average (28.2). Notwithstanding this, the schools UTCs draw from are more likely to

[33] Kelly Kettlewell, Daniele Bernardinelli, Jude Hillary, Claudia Sumner, 2017
[34] Will Cook, Craig Thorley, Jonathan Clifton, 2016

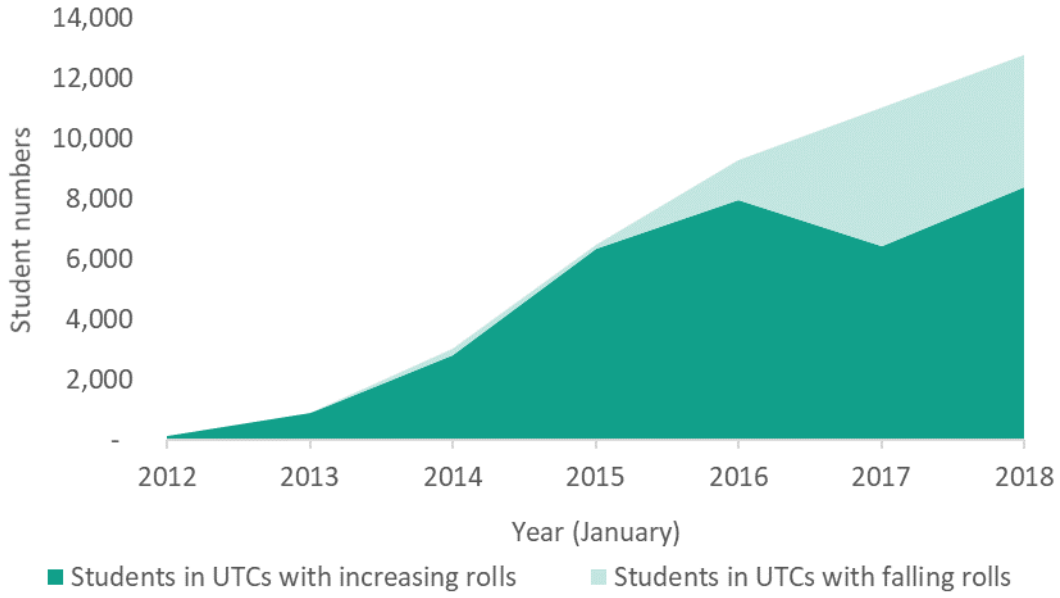
be rated 'inadequate' (10 per cents v five per cent nationally) and 'requires improvement' (just under 30 per cents v 20 per cent) than 'good' (45 per cent v 50 per cent) or 'outstanding' (15 per cent v under 25 per cent).

Provision

Despite overall growth in the number of UTCs, many are experiencing falling rolls

As mentioned earlier in this report, some UTCs are struggling to recruit enough students to remain viable and some have closed as a result. Figure 2.1 shows that student numbers in UTCs have been growing since their inception: there were almost 12,800 students in 2018, up by 16 per cent from just over 11,000 the previous year. However, the same chart shows that a significant share of students are enrolled at UTCs that experienced a decrease in total student numbers: about 4,400 or 34 per cent, yet down from 42 per cent in 2017. In 2018, 20 UTCs that were still open had fewer students than in the previous year.

Figure 2.1 Number of students in UTCs with increasing and decreasing student numbers[35]

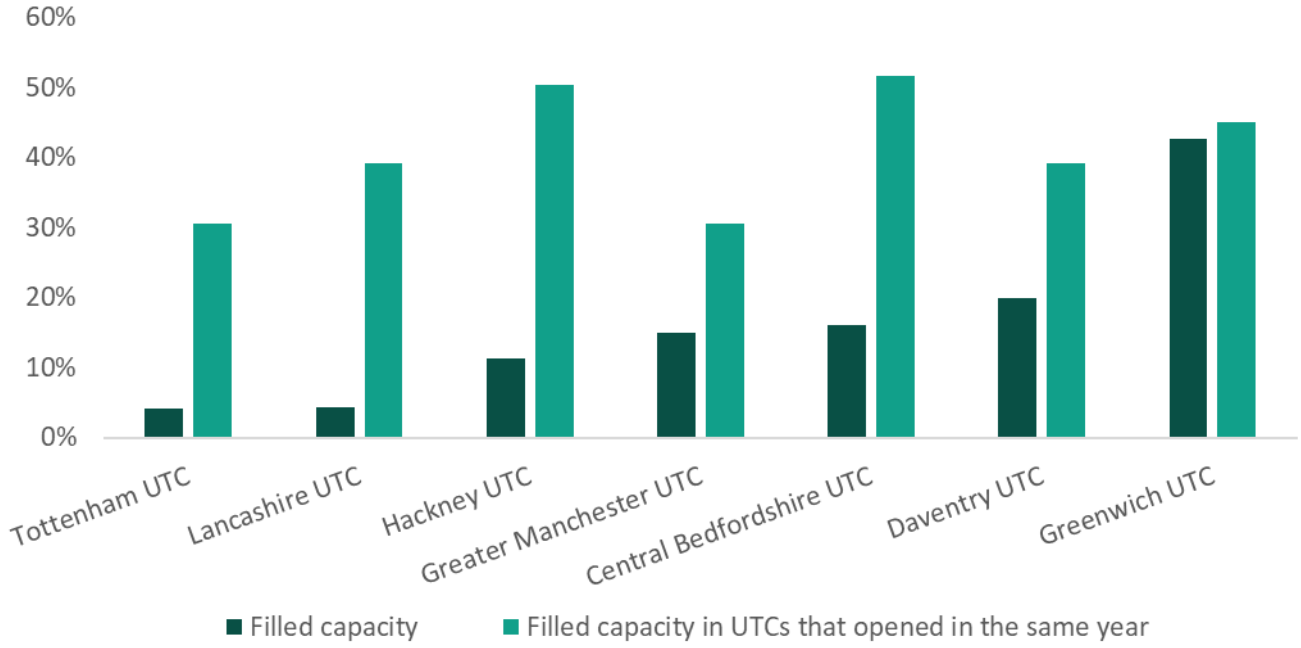


A decrease in the number of students going to a UTC is a warning sign, as suggested by the fact that the UTCs that have closed so far had a history of struggling to recruit sufficient student numbers to operate sustainably. Figure 2.2 shows that all closed UTCs had substantially fewer places filled than UTCs that opened in the same year, with the exception of the UTC Greenwich, for which that difference was small. For example, at Hackney UTC, the first UTC that closed for which we have comparable data, only 11 per cent of student places were filled the year before it closed, compared to 50 per cent at UTCs that opened in the same year (2013).[36]

[35] "Statistics: school and pupil numbers", Department for Education, various years

[36] Black Country UTC also closed in 2015, but there is no comparable data as it was the only UTC that was open in 2012

Figure 2.2 Proportion of student places filled at closed UTCs in the year before closure, compared to UTCs that had opened in the same year[37]



The nature of UTCs' partnerships with employers

University Technical Colleges were founded to allow technical-oriented students to develop their talents, and to equip young people with skills valued in the labour market. To that end, UTCs are required to partner with employers who will be involved in the design of curriculum.

Despite the variation in employer engagement across institutions that some have reported, we can see a link between the UTC specialisms and the employers involved. For example, the Heathrow Aviation Engineering UTC, which has a strong focus on aviation, is supported by companies such as Heathrow Airport Ltd, the Royal Aeronautic Society, the Aviation Skills Partnerships, and British Airways. Similarly, the Mulberry UTC, which specialises in creative industries and healthcare, has backing from relevant employers, including the British Film Institute, the Royal National Theatre, and a number of NHS-related organisations – and is sponsored by Goldsmith University of London, well known for its creative and culture study offer.[38] It is fair to say, however, that the level of information about employer support varies across UTCs.

Provision at UTCs should reflect employers' preferences and needs. This section will investigate whether, and to what degree, provision at UTCs differs from elsewhere. We will do so by exploring three elements of provision in UTCs, which will be compared to other institutions:

- **Types of qualifications offered**: although the Key Stage 4 qualification landscape is dominated by GCSEs, we will analyse whether the take-up of vocational alternatives to GCSEs is more common in UTCs than in other types of provision.
- **Technical orientation of GCSE provision**: GCSEs can be taken in very different subjects, ranging from computer science to arts or religious studies. We will test whether UTC students take up more technical GCSEs than students elsewhere.

[37] "Statistics: school and pupil numbers", Department for Education, various years
[38] Information related to employers supporting UTCs has been compiled from individual UTCs' websites.

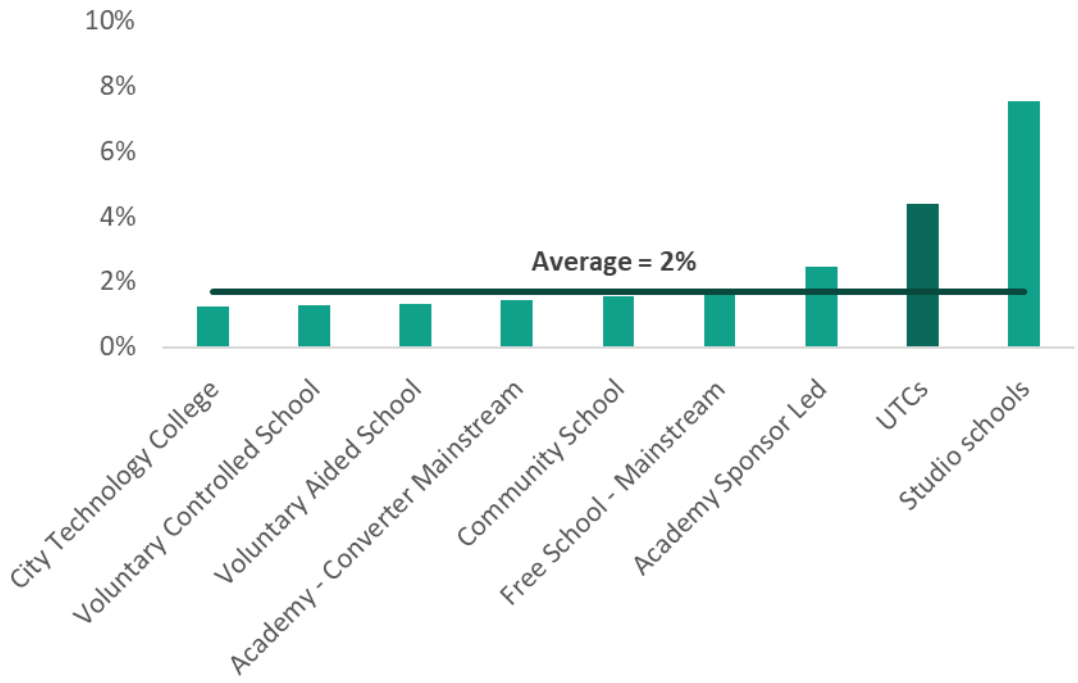
- **Take-up of EBacc subjects**: EBacc is the government's flagship policy to incentivise young people to study subjects that are expected to improve their outcomes. Some claim that the academic nature of EBacc subjects has made it difficult for UTCs to deliver a technical-oriented curriculum and do well against this academic-oriented measure at the same time. We will investigate if there is any difference in the take-up of these subjects between UTCs and other institutions.

Non-GCSE provision in UTCs represents twice the share of qualifications than elsewhere

There is a range of qualifications that can be taken at Key Stage 4, despite GCSEs being the most common. The most popular qualifications equivalent to GCSE tend to be technical or vocational-oriented:

- BTEC Firsts: skills-based qualifications that tend to be industry-specific and blend theory and practical experience.
- Cambridge Nationals / OCR: similar to the BTEC Firsts, these qualifications have a very strong vocational component.
- NVQs and VRQs: work-based qualifications, assessed in the job.[39]

Figure 2.3 Proportion of Key Stage 4 entries that are not GCSEs, by institution type, 2016/17 [40]



As the previous chart shows, 98 per cent of Key Stage 4 entries nationally are in GCSEs. However, we can see large differences between institutions. Vocational equivalents to GCSEs account for eight per cent of entries in Studio Schools, and 4.4 per cent in UTCs. This is no surprise, given that that Studio Schools are vocational, work-oriented institutions. UTCs, however, are technical rather than vocational, meaning there is an important academic and theoretical component to their provision.

[39] "GCSE equivalents: What you need to know", Michael Cheary, Reed, accessed July 25, 2018: https://www.reed.co.uk/career-advice/gcse-equivalents-what-you-need-to-know/
[40] Figure 2.3 – 2.6: "2017 secondary performance tables qualification and subject underlying data", Department for Education

One would therefore arguably expect them to sit between the national average and Studio Schools in terms of non-GCSE qualifications take up, as indeed they do.

Virtually no difference in the take-up of English and maths GCSEs

There is very little difference in the take-up of English and maths GCSEs between institutions, with virtually all students sitting them. 99.1 per cent of students at all state mainstream schools enter English GCSEs, with Studio Schools (97.2 per cent) and UTCs (98 per cent) at the bottom of the distribution.

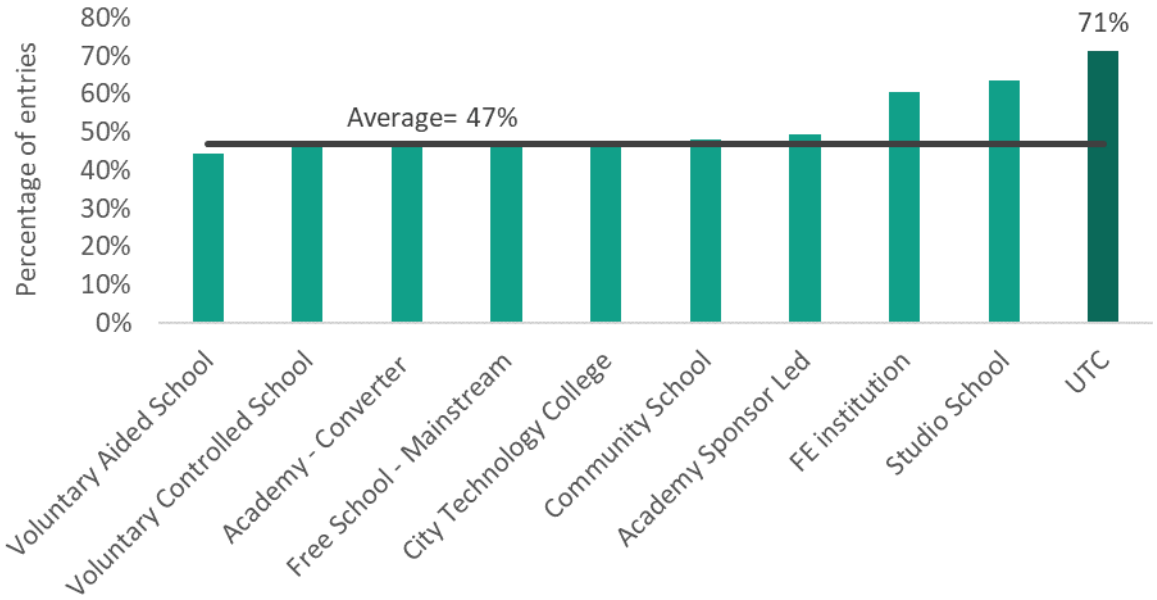
Similarly, 99.3 per cent of students at all state-maintained mainstream schools take up maths GCSE, with Studio Schools (97.1 per cent) and UTCs (97.7 per cent) having lower-than-average take-up rates.

Many more entries from UTC students are in STEM GCSEs

The number of GCSEs entries in STEM subjects is also a good indicator of the technical nature of provision. Consequently, we have worked out the proportion of GCSE entries in STEM subjects by institution type. We have excluded English and maths from this analysis (both from the number of STEM entries and from the total number of GCSE entries) given that they are compulsory, and this section's objective is to understand whether and how institutions vary their non-compulsory GCSE offer.[41]

As Figure 2.4 shows, 71 per cent of GCSE entries by UTC students are in STEM subjects, compared to 47 per cent nationally, a difference of 24 percentage points. Second to UTCs we find Studio Schools, with 64 per cent of entries in STEM subjects.

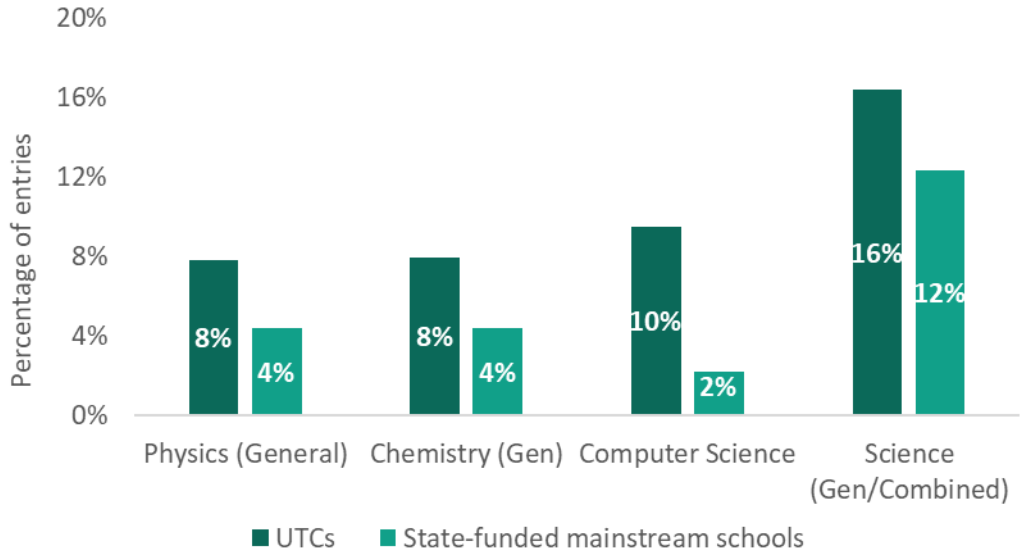
Figure 2.4 Proportion of GCSE entries in STEM subjects (excluding English, maths, and English literature), 2016/17



[41] The list of STEM GCSEs considered can be found in Annex 1

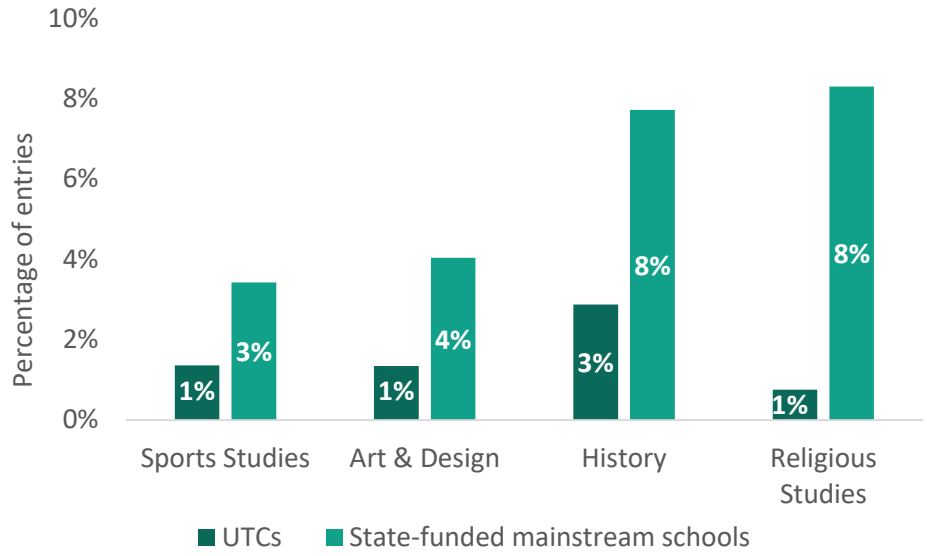
Figure 2.5 shows that one in ten GCSE entries from UTC students are in computer science, while they represent just over two per cent of entries in other state-funded mainstream schools. Similarly, many more GCSE entries by UTC students are in chemistry and/or physics (around eight cent of entries each) than in other institutions (4.4 per cent). While over 16 per cent of GCSE entries from UTC students are in science (general/combined), this is the case for only approximately 12 per cent of entries elsewhere.

Figure 2.5 Proportion of GCSE entries in subjects popular among UTC students compared to other institutions (excluding English, maths, and English literature), 2016/17



Inevitably, some subjects are a lot less popular in UTCs than elsewhere. For example, eight per cent of GCSE entries from other institutions are in religious studies, while less than one per cent of entries from UTCs are in that subject. History sees a similar pattern: less than eight per cent of entries from schools other than UTCs are in history, compared to three per cent from UTCs. Sports and arts are a lot less popular in UTCs than elsewhere too, with only 1.4 per cent of GCSE entries from UTC students being in sports subjects versus 3.4 per cent nationally, and only 1.3 per cent of entries from UTC students are in arts and drama compared to about four per cent in other institutions.

Figure 2.6 Proportion of GCSE entries in subjects popular in non-UTC providers, compared to UTCs (excluding English, maths, and English literature), 2016/17



Take-up of all EBacc subjects is less than half the national average

According to the government's website: 'The EBacc refers to a combination of subjects that the government thinks is important for young people to study at GCSE.

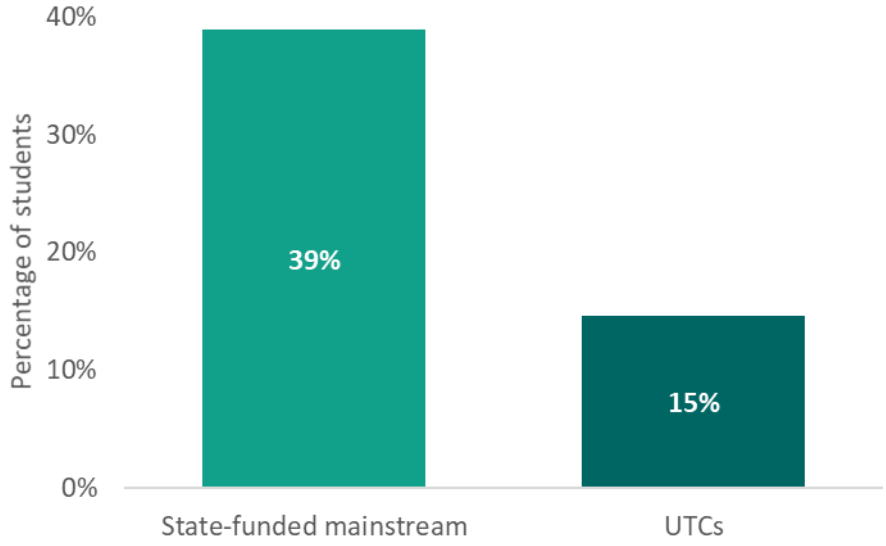
It includes:

- English language and literature
- maths
- the sciences
- geography or history
- a language'[42]

Although UTCs' technical orientation should position them well to deliver maths and sciences, the three remaining subjects do not have a specific technical component. Whether that leaves UTCs worse off compared to other institutions will be discussed later on. The chart below shows that, while almost 40 per cent of students in state-funded mainstream schools enter all EBacc components, just under 15 per cent of pupils in UTCs do so.

[42] "English Baccalaureate (EBacc). Policy paper", Department for Education, December 2017, accessed July 24, 2018: https://www.gov.uk/government/publications/english-baccalaureate-ebacc/english-baccalaureate-ebacc

Figure 2.7 Percentage of students entered for all EBacc components, 2016, by school type[43]



In conclusion, the analysis in this section has shown that provision at UTCs differs from institutions. First, students in UTCs take twice as many non-GCSE qualifications as the national average, although less so than Studio Schools. Second, a substantially higher proportion of GCSEs entries from students in UTCs are in STEM subjects than elsewhere. Third, UTC students are a lot less likely to enter all components of EBacc. Our analysis also suggests that concerns around low student recruitment are right, and that most UTCs that closed had been recruiting fewer students than those that were founded in the same year and remain open.

Performance

In this section we consider how well UTCs provide young people with GCSEs and other qualifications by the end of Key Stage 4, typically at the age of 16. While many institutions that cover Key Stage 4 will see GCSEs as a natural stepping-off point for their provision, for UTCs GCSEs are only the mid-point for their provision, and the end of Key Stage 5, at age 18 or 19, will typically be the end point.

We consider the following measures:

- **Achievement in English and maths:** the proportion of pupils achieving a grade 5 (strong pass) or above in English and maths, and an additional measure showing the proportion achieving a grade 4 (pass) or above.
- **Achievement in academic subjects**: percentage of pupils in a school achieving the English Baccalaureate: it measures the proportion of students achieving a grade 5 or above in English and maths, and a grade C or above in other qualifying subjects. There is also an additional metric measuring how many have achieved a grade 4 or above in English and maths and a grade C or above in the other subjects (see Box 1 for an explanation of subject grades).
- **Average grades in eight, mostly academic, subjects (Attainment 8)**: this is a compound metric measuring attainment in maths (double weighted), English (double weighted if a student takes both English language and English literature), three qualifications counting in

[43] "SFR01/2018: GCSE and equivalent results in England 2016/17 (revised)", Department for Education, 2018

the EBacc (including science, humanities, languages, etc), and three further qualifications either counting for EBacc or from a list of approved vocational qualifications. Students get a maximum of nine points for each GCSE or approved qualification entered.

- **Progress in the achievement of eight, mostly academic, subjects (Progress 8)**: this is a value-added metric that measures the progress made by a pupil between the end of primary school and the end of Key Stage 4, benchmarked against students with similar prior attainment. As the baseline for this progress measure is the end of Key Stage 2, it will include the impact of students' time in Key Stage 3, before they joined the UTC. A 0 score would mean that a student has not made any more or less progress than similar students nationally, while a -1 would mean that he or she has progressed one grade less than students with similar prior attainment, and a +1 that his or her progress is one grade above that of students with similar prior attainment.
- **Progress during Key Stage 4:** Progress 8 measures the progress made by students between the end of Key Stage 2 and the end of Key Stage 4. This means UTCs are held accountable for progress made during both Key Stage 3 and Key Stage 4, despite only offering provision in the latter. To measure the progress made in Key Stage 4 alone, we have used data from GL Assessment's Cognitive Abilities Test (CAT4). CAT4 assessment is a service provided by GL Assessment to educational institutions, and notably UTCs, and measures attainment across four areas: quantitative, verbal, non-verbal, and spatial. The CAT4 assessment is taken at the beginning of Key Stage 4 and therefore can act as a baseline for a purely Key Stage 4 progress measure. GL Assessment use the assessment to forecast the Attainment 8 scores for pupils taking the assessment, based on the actual Attainment 8 scores of pupils achieving similar CAT4 results. These predictions can then be compared to pupils actual scores to create a progress, or 'value-added', score. This is akin to the way that Progress 8 scores are derived, but with a Year 10, rather than Year 6 baseline.
- **Student retention**: we consider the proportion of students continuing to Key Stage 5 in the same institution. [44]

The analysis below shows how UTCs perform against these measures, compared to other types of institutions. The performance data analysed in this section reflects results for the 2016/17 academic year. In general, and if we were to only judge UTCs performance for how they perform against these metrics, their students generally perform worse than those in other institutions.

Note that from 2018, GCSEs will be graded between 1 and 9, with 4 being a pass (former C grade) and 5 a strong pass. Full details can be found in Box 1.

[44] "Secondary accountability measures Guide for maintained secondary schools, academies and free schools", Department for Education, August 2018. Accessed August 15, 2018: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/696998/Secondary_accountability-measures.pdf

Box 1. Equivalence between old and new GCSE grades

From August 2017 the government introduced new GCSE grades, replacing the old letter-based system. Although there is no exact correspondence between the old and the new system, the Department for Education has published a guide on grade equivalence. In short, anyone previously receiving an A-A* will now be in the 7-9 range, while those who would have obtained a C or a B will now get a 4-6. Students who would have failed and therefore obtained between a G and a D will now receive a grade between 1 and 3.

GCSE Grades

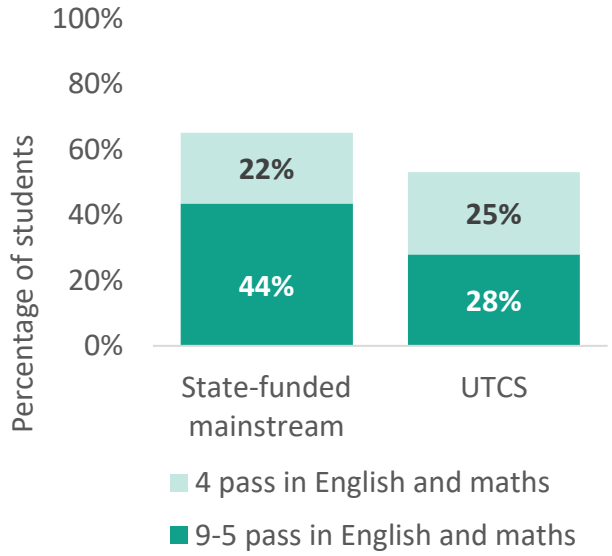
New Grading Structure	Old Grading Structure
9	A*
8	
7	A
6	B
5	
4	C
3	D
2	E
1	F G
U	U

Source: http://newgcses.campaign.gov.uk

English and maths attainment is comparatively poor

Only 53 per cent of UTC students get a 4 or higher in their English and maths GCSEs, compared to 65.1 per cent in all state-funded mainstream schools. The gap is even wider for the proportion getting a grade 5 or higher: 27.9 per cent in UTCs compared to 43.5 per cent elsewhere.

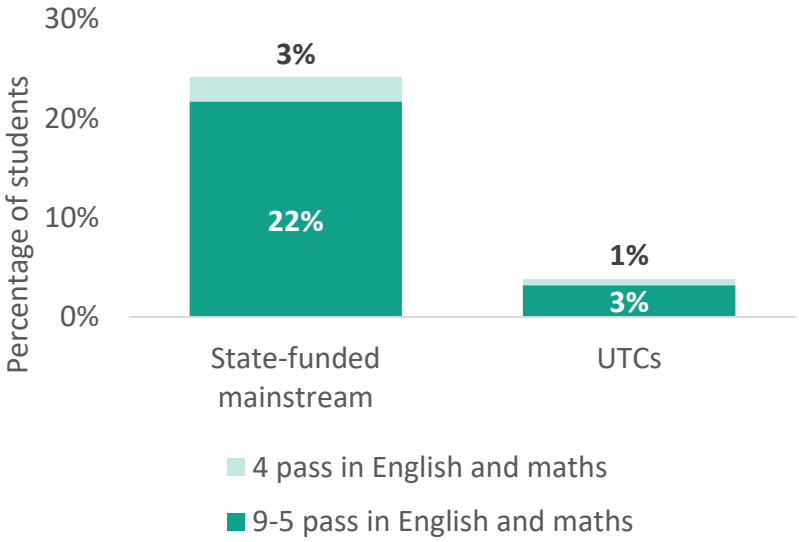
Figure 2.8 Proportion of students with 9-4 and 9-5 pass in English and maths GCSEs, 2016/17[45]



EBacc achievement is low compared to other institutions

UTC students also have lower EBacc scores than students in other institutions. While 24.2 per cent of students in state-funded mainstream schools achieved all EBacc components including a grade 4 or above in English and maths, the proportion falls to 3.8 per cent in UTCs. This is largely because, as mentioned previously, only 14.6 per cent of UTC students enter all EBacc components, compared to 38.9 per cent in all state-funded mainstream schools on average.

Figure 2.9 Proportion of students achieving all EBacc components including a pass in English and maths, 2016/17



Attainment 8 scores are lower than average, and the gap is larger for high attainers

The average Attainment 8 score is also lower among UTC students than in state-funded mainstream schools on average: 37.5, compared to 47.1 in other institutions (Figure 2.10). Attainment varies

[45] Figures 2.8 – 2.12: "GCSE and equivalent results in England 2016/17 (revised)", Department for Education, July 2018

between levels of prior attainment at Key Stage 2, yet for all categories UTCs have lower average scores than other institutions: the average score of lower attainers in UTCs is 21, compared to 25 in all state-funded mainstream schools; middle-attainers' average attainment score is 33 in UTCs compared to 41 in other institutions; and it is 48 for high attainers in UTCs compared to 61 elsewhere (Figure 2.11).[46]

Figure 2.10 Average Attainment 8 score in UTCs and state-funded mainstream schools, 2016/17

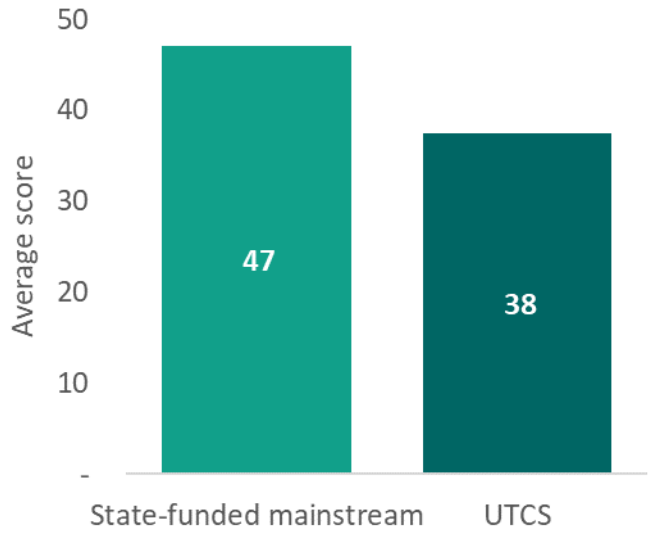
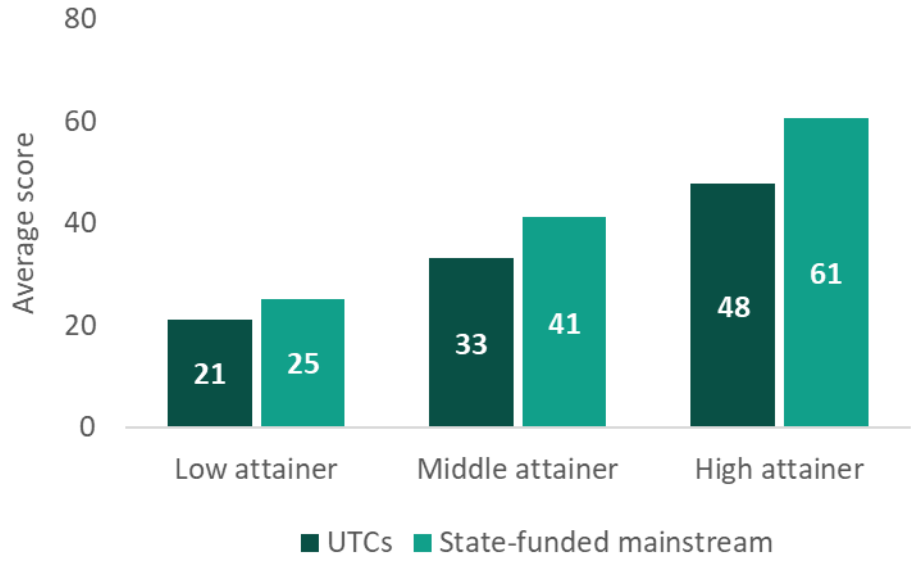


Figure 2.11 Average Attainment 8 score in UTCs and state-funded mainstream schools, by prior attainment, 2016/17

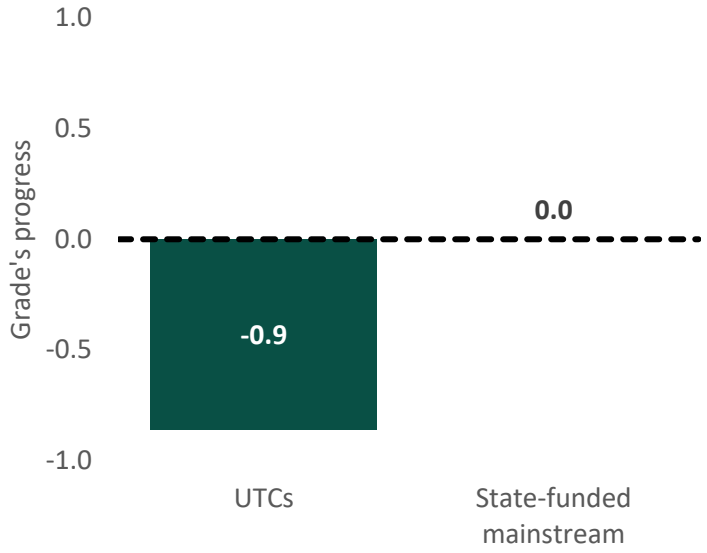


UTC students make less progress than similar students in other institutions, irrespective of the number of entries to Attainment 8 buckets

[46] Low attainers are those below the expected level (level 4) at Key Stage 2; middle attainer those at the expected level; and high attainers those above the expected level.

According to Progress 8 scores, UTC students make, on average, 0.9 grades less progress than students with similar prior attainment nationally, whilst the average for all state-funded mainstream schools is zero.

Figure 2.12 Progress 8 score, by type of institution, 2016/17

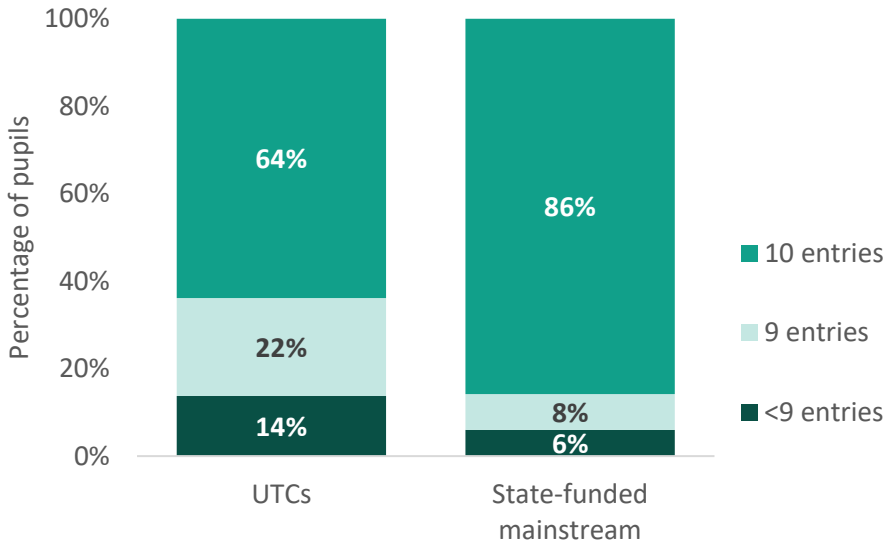


One potential reason for UTC pupils' relatively poor progress is that UTCs do not enter their pupils into enough eligible subjects (for inclusion in Attainment 8). It may also be that they are making better progress in a smaller number of subjects. We attempt to test both assumptions in this section.

Figure 2.13 shows the number of entries for UTCs compared to all state-funded mainstream schools. Note that because maths and English are double weighted there are effectively 10 subjects included, rather than eight.[47] The figure shows that UTC pupils do enter fewer eligible subjects than pupils in other institutions; 86 per cent of all pupils enter into 10 subjects, but this figure is only 64 per cent for UTC pupils. And only six per cent of all pupils entered less than nine entries, but this figure is 14 per cent for UTC pupils.

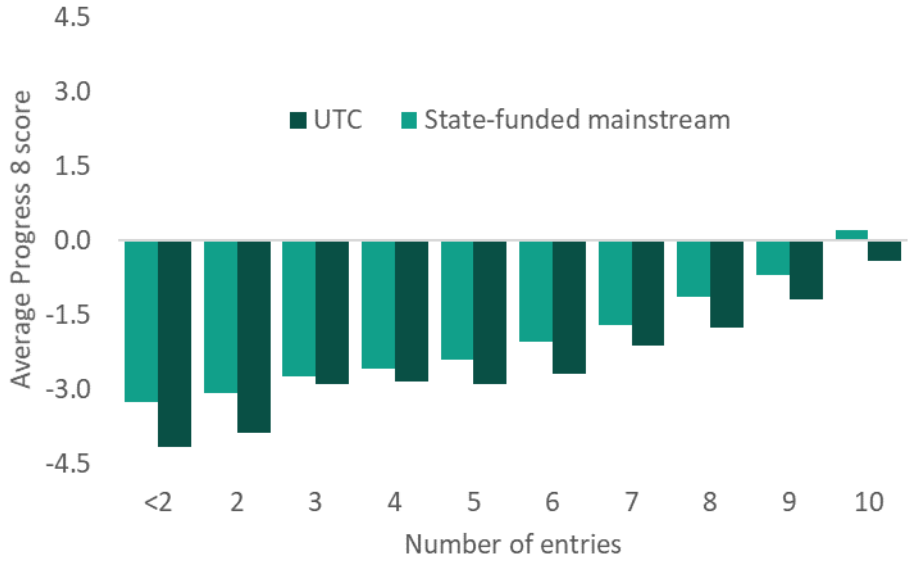
[47] English is double weighted only when pupils take both English language and English literature. The best grade of the two qualifications is used.

Figure 2.13 Number of eligible Attainment 8 / Progress 8 subjects entered into, 2016/17 [48]



The previous figure shows that UTC pupils do enter fewer eligible qualifications, but does this fully explain their poorer Progress 8 scores? Figure 2.14 shows that even controlling for the number of entries, UTC pupils still tend to have lower average Progress 8 scores than in state-funded mainstream institutions. UTC pupils with all 10 entries have an average Progress 8 score of -0.4, compared with a score of 0.2 for pupils in all state-funded mainstream institutions. Thus, regardless of the number of Attainment/Progress 8 entries, UTC students make less progress than the average for all mainstream students.

Figure 2.14 Progress 8 score by number of eligible Progress 8 subjects entered into, 2016/17

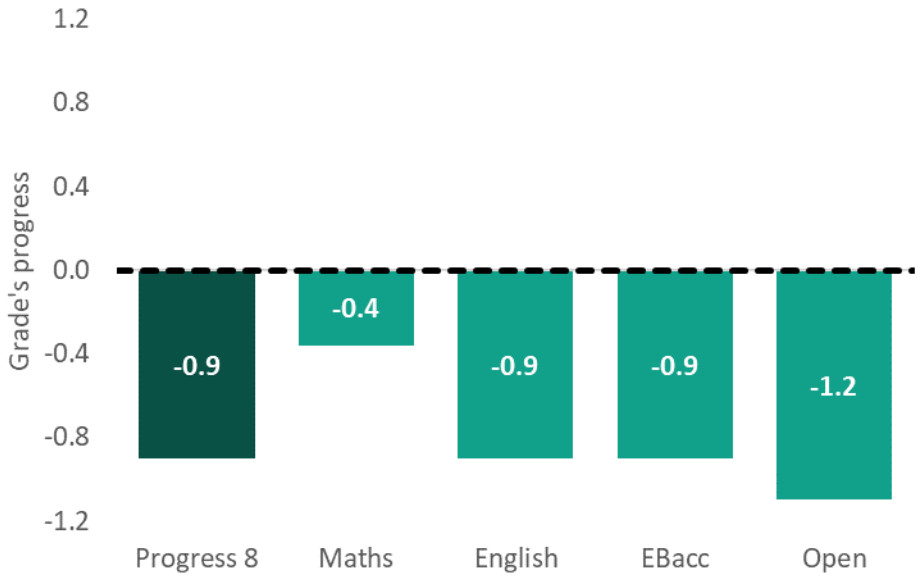


At the beginning of this section we presented the different Attainment 8 buckets that secondary schools are judged against, which also apply to UTCs. Progress 8 is built upon those buckets and can be disaggregated to understand where UTC pupils are making more or less progress. Breaking down the Progress 8 score by bucket, it becomes clear that UTCs do less badly compared to other

[48] Figure 2.13- 2.19: Authors' calculations using the National Pupil Database

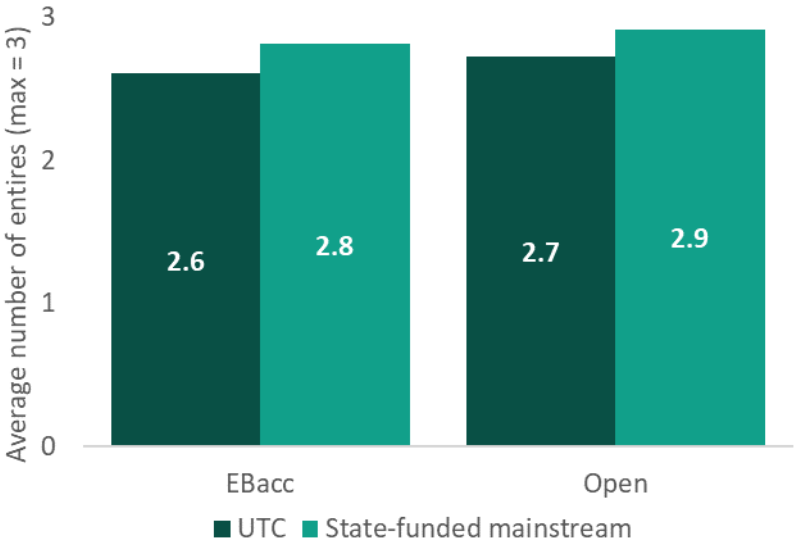
institutions against the maths measure (-0.4), followed by English and EBacc (both -0.9) and finally the Open element (-1.2).

Figure 2.15 Progress 8 scores in UTCs by bucket, 2016/17



One of the reasons given by UTC advocates to explain lower Progress 8 scores is that UTCs normally have fewer entries in Progress 8 buckets, which then counts as a 0 score. This argument was also raised at our roundtable. The analysis below, however, suggests that fewer entries fail to explain lower progress rates among UTC students. Figure 2.16 shows that, in fact, there are not large differences between UTCs and state-funded schools: the average number of entries in Progress 8 EBacc and Open buckets at UTCs are 2.6 and 2.7 respectively, while for state-funded mainstream schools it is 2.8 and 2.9.

Figure 2.16 Number of entries in Progress 8 EBacc and Open buckets, 2016/17



The two figures below show average Progress 8 scores in the EBacc and the Open buckets at both UTCs and state-funded mainstream schools, by number of entries in each bucket. In all cases, UTCs

have lower scores than other institutions. This means that, even accounting for the number of entries in the different buckets, UTC still do worse against progress measures than other institutions.

Figure 2.17 Progress 8 score in the EBacc bucket, by number of entries, 2016/17

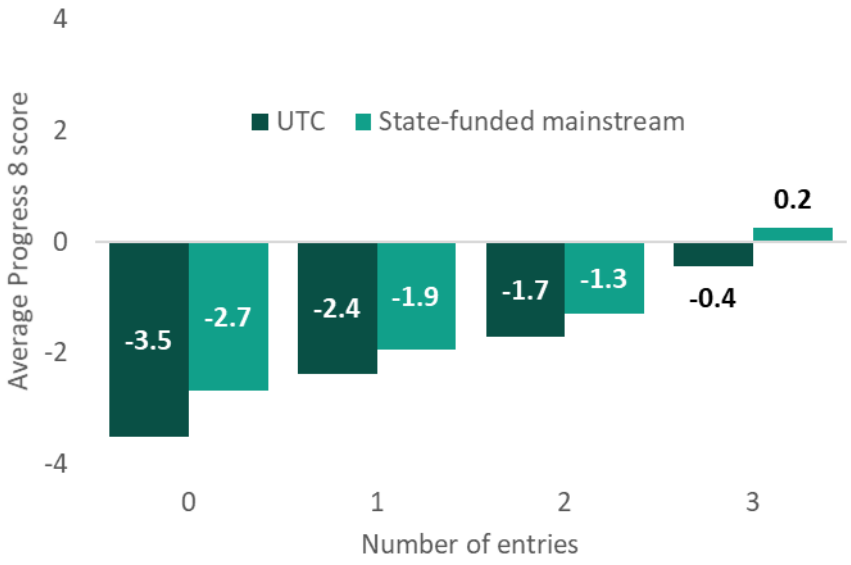
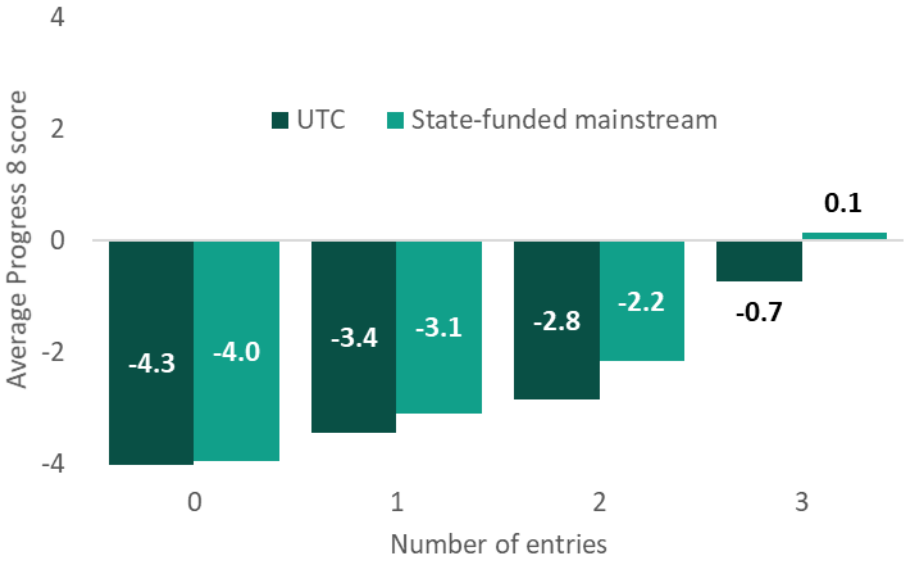
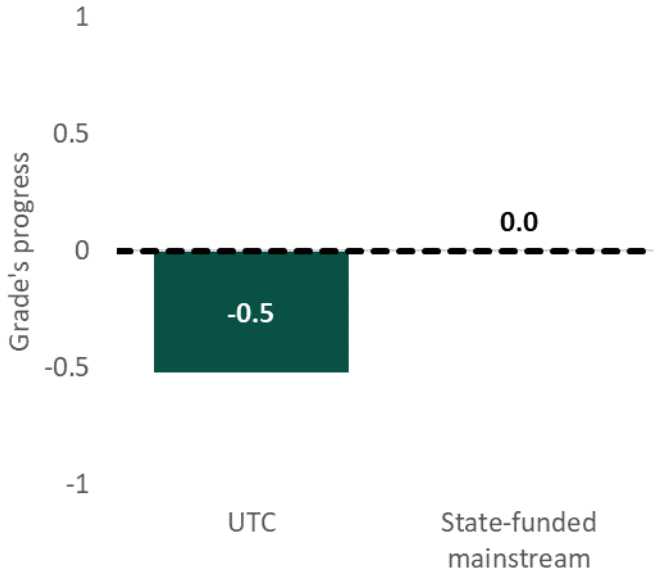


Figure 2.18 Progress 8 score in the Open bucket, by number of entries, 2016/17



The same holds true for students who enter at least two sciences, where UTCs have a high number of entries. Figure 2.19 shows that they make a progress of half grade less in science EBacc than in state-funded mainstream schools.

Figure 2.19 Progress in science EBacc subjects, for those entering at least two sciences, 2016/17



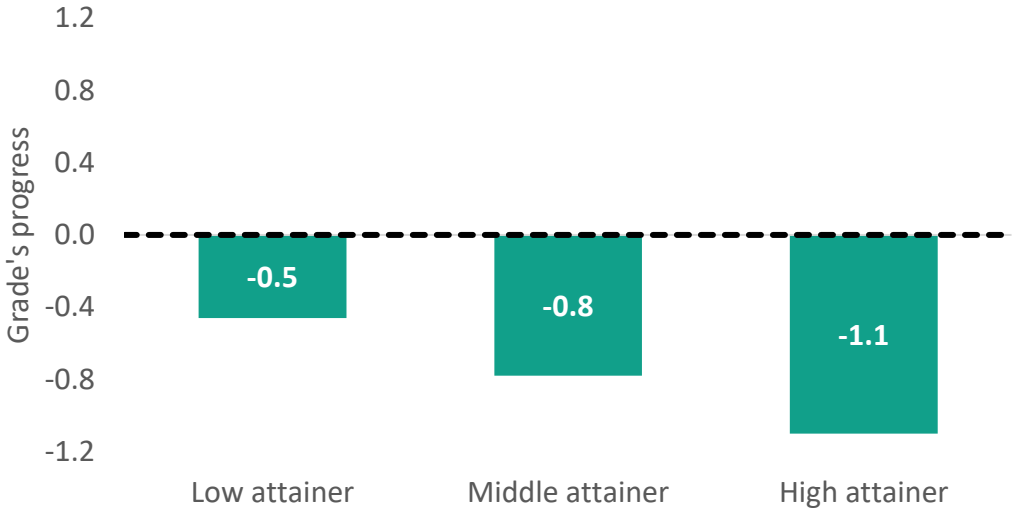
Higher attainers make less progress than lower and middle attainers

Figure 2.20 shows the differences in progress by students' levels of prior attainment, which is based on their performance in reading and maths at Key Stage 2. Low attainers are those below the expected level (level 4) at Key Stage 2; middle attainers those at the expected level; and high attainers those above the expected level.[49]

Even though the average progress for all learners is less than the national average, this poor progress is particularly acute for high attainers, who make over a grade's less progress than the national average for high attainers. Low attainers in UTCs make half a grade's less progress on average than similar students nationally and middle attainers make four-fifths of a grade's less progress.

[49]"Revised GCSE and equivalent results in England 2016 to 2017 Quality and methodology information", Department for Education, January 2018. Accessed August 15, 2018: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/676213/SFR01_2018_QualityandMethodology.pdf

Figure 2.20 Average Progress 8 score of UTC students by level of prior attainment, 2016/17[50]



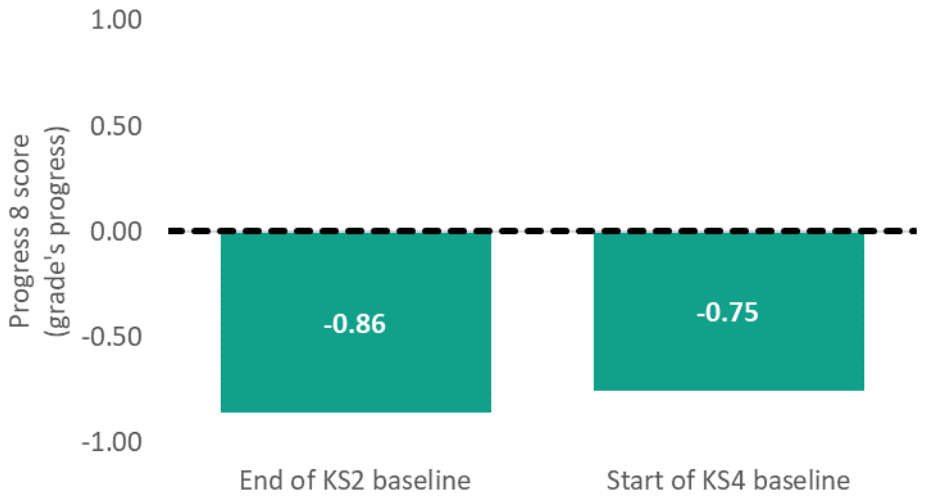
UTC students make more progress when a Key Stage 4 baseline is considered, but still fare worse than other institutions

Progress 8 measures the progress made by students between the end of Key Stage 2 and the end of Key Stage 4. This means UTCs are currently held accountable for progress made during both Key Stage 3 and Key Stage 4, despite only offering provision in the latter. To measure the progress made in Key Stage 4 alone, we have used data from GL Assessment's Cognitive Abilities Test (CAT4) to act as a Key Stage 4 baseline.

The data from GL Assessment indicates that UTC students were predicted an Attainment 8 score of 45.5. Figure 2.21 shows that, if we compare the average of UTC students' actual Attainment 8 score with this predication we derive a 'Progress 8' score of -0.75. The official, Key Stage 2 baseline, version of Progress 8 gives a score of -0.86.[51] This suggests that whilst some of the poor performance may be due to pre-UTC provision, the majority of this poor score remains even when only students' time studying at their respective UTCs is considered.

[50] "SFR01/2018: GCSE and equivalent results in England 2016/17 (revised)", Department for Education, 2018
[51] Two decimal digits are given here for clarity of comparison, while we use one decimal digits elsewhere - a Progress 8 score of -0.9

Figure 2.21 Progress 8 score with Key Stage 2 baseline and Key Stage 4 baseline, 2016/17 [52]



Some caveats need to be made with regards to this comparison:

- CAT4 Assessment data is based on the results of 20 UTCs taking the test between the 31st August 2015 and March 2016, meaning it might not be representative of all UTCs.
- As we do not have access to the pupil-level GL Assessment data we cannot be sure that Attainment 8 prediction and Attainment 8 actual scores used to derive the 'Progress 8' score are based on exactly the same pupils.
- Whilst a large number of schools inform GL Assessment's Attainment 8 predictions, they may not be exactly nationally representative. For example, they are known to slightly over-represent UTCs and Grammar schools.

These caveats are important and suggest that the derived Progress 8 score might not be exact. However, their impact is unlikely to be sizable. As such the derived score should be indicative of the progress of UTC students during Key Stage 4, in achieving Attainment 8 subjects.

Low levels of continuation to Key Stage 5

Here we consider whether UTCs operate as all-through 14-19 institutions, or if many students don't continue beyond the age of 16. Figure 2.22 below shows where pupils at the end of Key Stage 4 (aged 16) go next. Specifically, whether they spend five-six months in a single destination. The plurality of UTC students go on to school sixth forms, which for this purpose also includes UTCs. In most cases this will be UTC students continuing into Key Stage 5 in the same institution. However, over a quarter go onto an FE college, and one in eight students go on to do an apprenticeship, possibly as a result of the close employer relations that UTCs maintain.

[52] Authors' own calculations with National Pupil Database and GL Assessment data

Figure 2.22 Post-Key Stage 4 destinations, Year 11 UTC students, 2014/15 cohort[53]

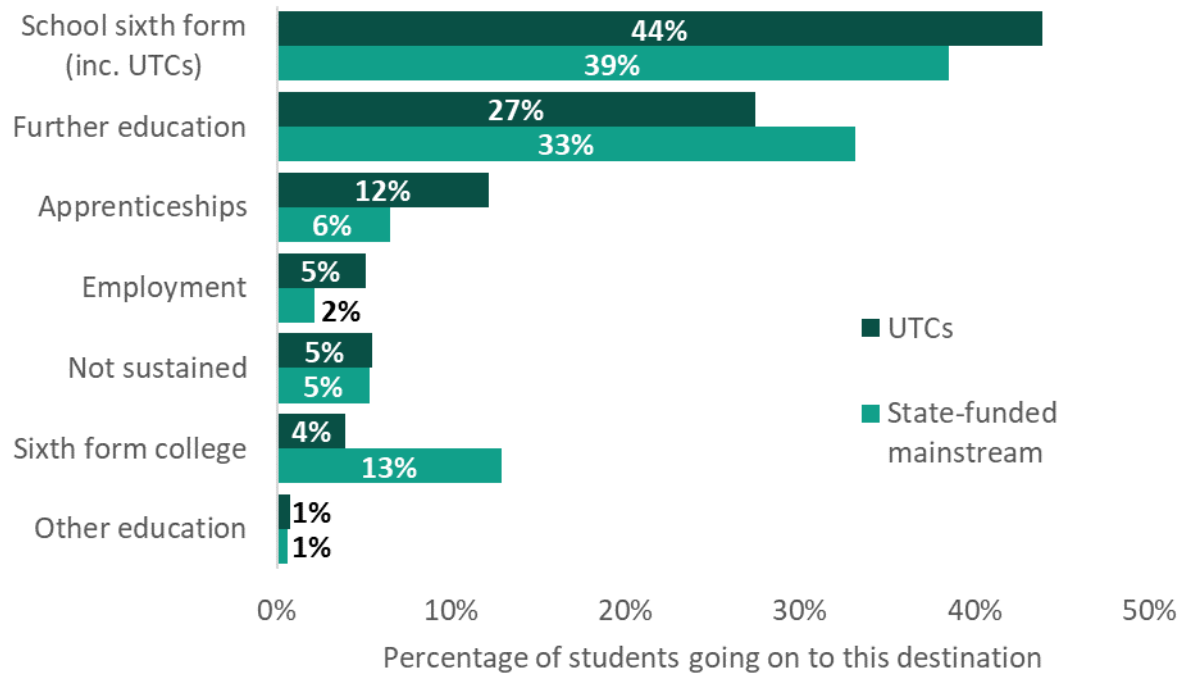


Figure 2.23 considers what proportion of UTC students continue from Year 11 to Year 12 in the same institution. These figures will differ from those in Figure 2.22 as it is from a different cohort, and students are not required to sustain their destination over a six-month period. However, it shows a similar picture and confirms that over half of UTC students do not continue from Key Stage 4 into Key Stage 5 in the same institution. It is therefore important to consider whether UTCs are truly operating as all-through 14-19 providers.

[53] "Destinations of KS4 and KS5 pupils: 2016", Department for Education, 2017 and Department for Education's Freedom of Information Request

Figure 2.23 Retention from Year 11 (Key Stage 4) to Year 12 (Key Stage 5), 2015/16[54]

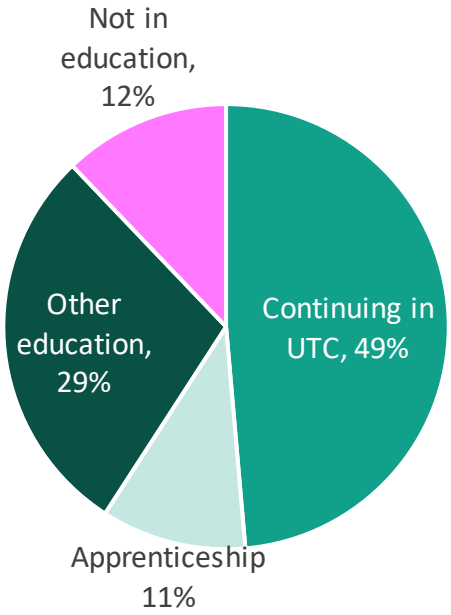


Figure 2.24 Retention from Year 11 (Key Stage 4) to Year 12 (Key Stage 5) by pupil characteristic, 2015/16[55]

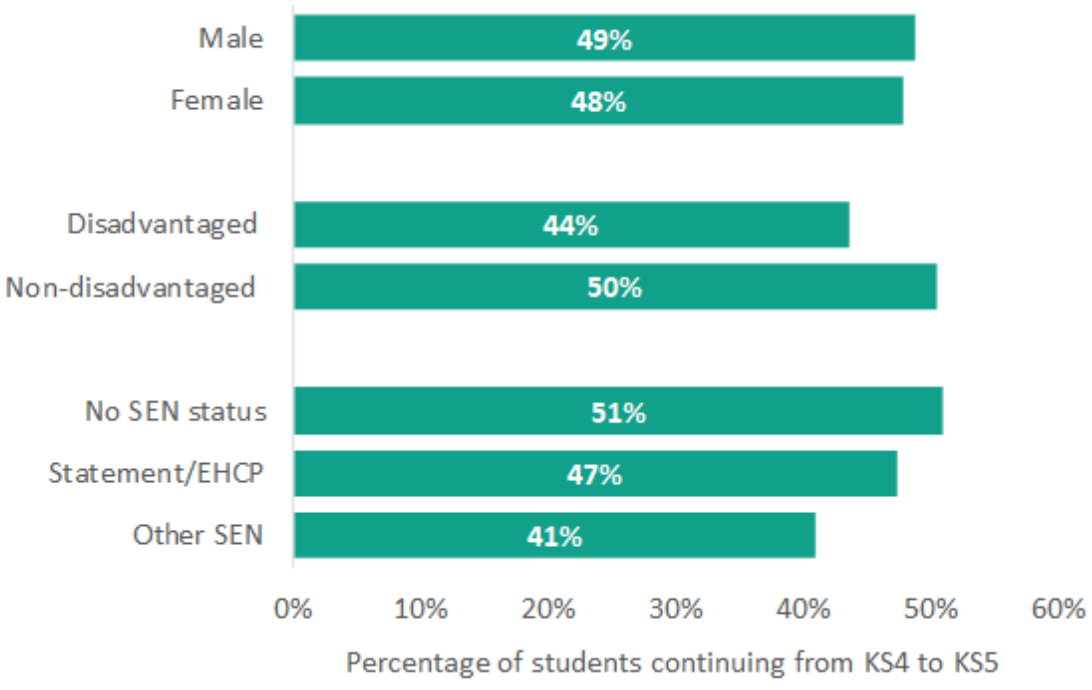
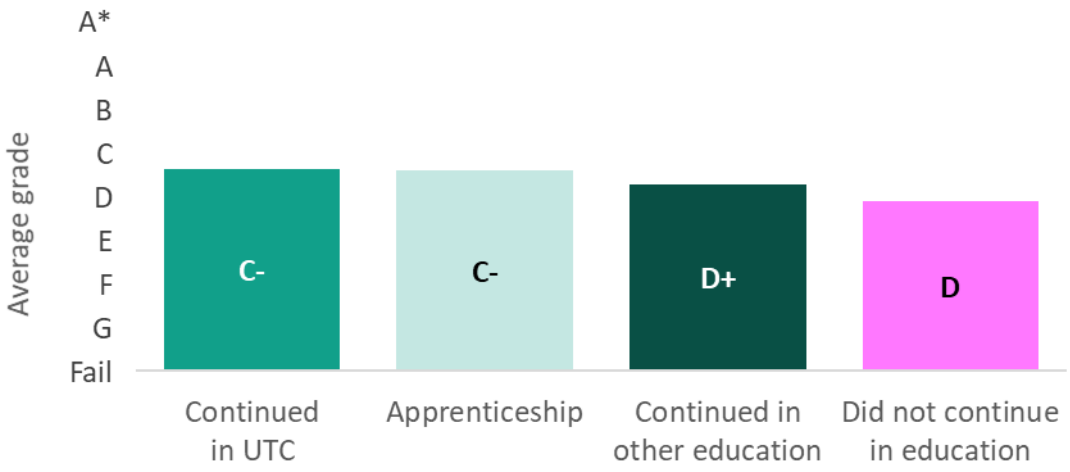


Figure 2.24 shows how the Key Stage 4 to Key Stage 5 continuation rates vary by student characteristics. Male and female students appear equally likely to continue in the UTC from Key Stage 4 to Key Stage 5. However only 44 per cent of disadvantaged students continued in 2015/16,

[54] Authors' calculations using Young People's Matched Administrative Dataset (YPMAD)
[55] Authors' calculations using Young People's Matched Administrative Dataset (YPMAD). Figures for "Statement/EHCP" are based on 28 pupils only, and should be treated with caution.

compared with 50 per cent of more affluent students. 41 per cent of students with Special Educational Needs statements or Education, Health and Care Plans (generally those with higher levels of need) continued to Key Stage 5, compared with 51 per cent student with no special educational needs. Figure 2.25 shows that students who continued to Key Stage 5 in the same UTC tended to have slightly higher GCSE grades (in English and maths) than those taking apprenticeships, continuing in other education institutions or those not continuing in education, where the difference was equivalent to three quarters of a grade.

Figure 2.25 Average English and maths GCSE grade, Key Stage 5 continuers v others, 2015/16[56]



Summary of Key Stage 4 performance

In conclusion, UTCs, on average, do worse than the national average against all Key Stage 4 performance measures. We have seen that, when compared against other institutions:

- Fewer UTC students obtain a pass in English and maths.
- Fewer UTC students enter all EBacc components, or achieve them.
- UTCs have a lower average Attainment 8 score.
- Students in UTCs make, on average, 0.9 grades less progress between the end of Key Stage 2 and the end of Key Stage 4, when considering a suite of mostly academic subjects (Progress 8).
- This poor progress appears to remain even when controlling for the number of subjects studied and when measures are adapted to consider only students' progress whilst at the UTC. Progress also appears poor when just considering English and maths GCSEs.
- Students with lower prior attainment do worse against attainment measures than those with higher prior attainment, although the latter make the least progress.
- Over half of UTC students do not continue from Key Stage 4 to Key Stage 5 in the same institution, with students with lower GCSE results, Special Educational Needs, or those from disadvantaged backgrounds the least likely to continue.

A common criticism of UTCs is that they perform poorly against Progress 8, the government's headline indicator of secondary school performance. UTC advocates fairly point out that Progress 8

[56] Authors' calculations using Young People's Matched Administrative Dataset (YPMAD)

is a poor measure of the value added by UTCs, as it measures student progress from the end of Key Stage 2 to the end of Key Stage 4. This means that UTCs are held accountable for the progress of students during Key Stage 3, before they have joined the UTC. Furthermore, they make the case that as Progress 8 is largely (but not entirely) focussed on academic subjects, it is biased against UTCs, where provision is deliberately more technical than in other institutions. Lastly, they suggest that measuring pupils' achievements at the end of Key Stage 4 does not fairly reflect the fact that UTCs are 14-19 institutions, so measuring performance at 16 might be premature.

Our analysis suggests that, whilst these arguments may indeed suggest that Progress 8 has certain flaws as a measure of UTC performance, they do not entirely explain the poor Key Stage 4 performance of UTCs. The progress of UTC students in achieving Progress 8 subjects remains well below average even when considering just their time in Key Stage 4. And whilst it may or may not be a fair expectation for all UTC pupils to study the full academic programme required to achieve good Progress 8 scores, we would argue that it is reasonable to expect UTCs to provide students with good English and maths GCSEs. Yet progress in these subjects is also well below average. Additionally, whilst it may also be reasonable to see the end of Key Stage 4 as only the mid-point of students' journey to achieve the requisite skills and qualifications, the reality is that, with 51 per cent of students not continuing from Key Stage 4 to Key Stage 5 in the same institution, it is actually the end point for the majority of students.

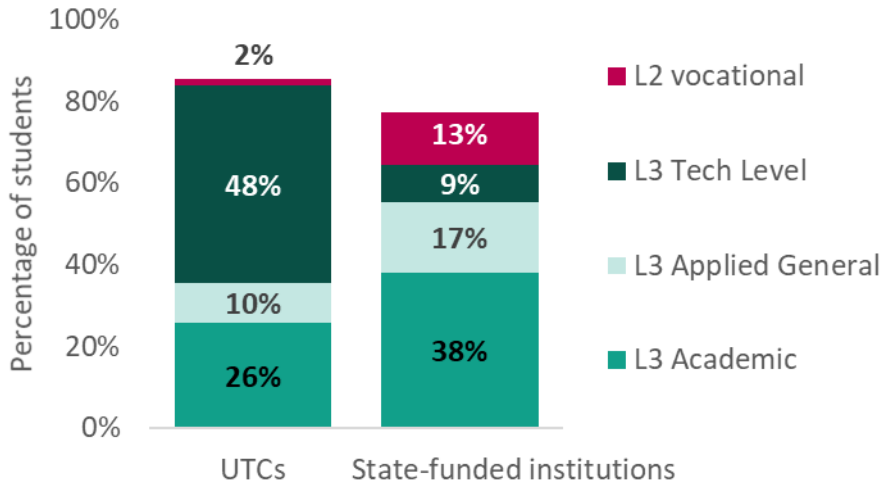
This analysis makes a strong case that UTCs are not providing well for young people up to the age of 16.

Chapter 3. Key Stage 5

Provision

Just as we did with Key Stage 4, we seek to understand whether, and if so to what degree, Key Stage 5 provision at UTCs differs from other institutions. One way of doing so is looking at the core aims of students, which reflect a student's main study programme.[57] Figure 3.1 shows big differences between UTCs and state-funded institutions. While 48 per cent of students have level 3 Tech levels as their core aim, this is the case for only nine per cent in state-funded institutions, where the most popular core aim is level 3 academic qualifications (38 per cent, compared to only 26 per cent of UTC students), mainly A levels. The chart also shows that more students in state-funded institutions have level 3 applied general and level 2 vocational qualifications as their main aims than those in UTCs, with the latter being marginal among UTC students.

Figure 3.1 Core aims of students, 2016/17[58]



However, core aims alone do not provide the whole picture, given that students may be taking qualifications beyond their core aims. This is particularly important in UTCs, as most were set up to equip students with rigorous academic knowledge and also technical skills via a combination of A levels and other technical or vocational qualifications. Figure 3.2 shows the proportion of students taking different qualifications, by school type. More students do level 3 academic qualifications at UTCs (62 per cent) than at state-funded schools (51 per cent), and a lot more do level 3 Tech levels at UTCs (45 per cent) than elsewhere (10 per cent).[59] Differences in the take-up of level 3 applied general and level 2 English qualifications are small, but there are gaps in enrolment on level 2 maths and level 2 vocational qualifications: twice as many students do level 2 maths in state-funded

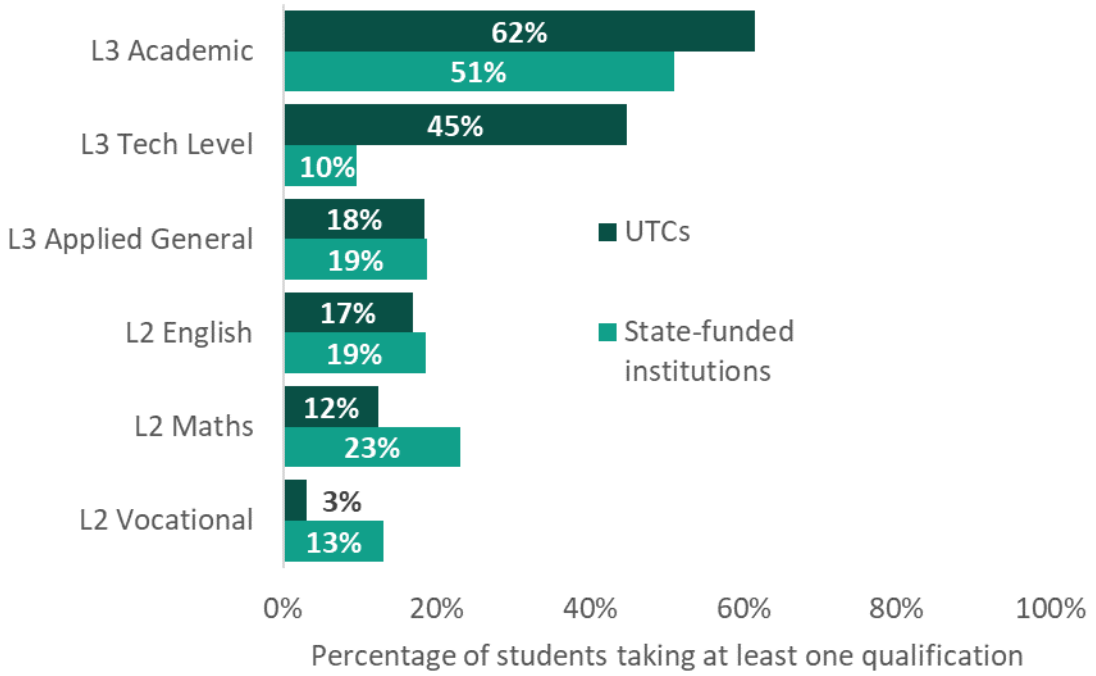
[57] "16 to 18 accountability measures: technical guide for measures in 2017 and 2018", Department for Education, December 2017. Accessed August 20, 2018: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/707674/16-18_Accountability_Measures_Technical-Guide.pdf

[58] A level and other 16 to 18 results: 2016 to 2017 (revised)" Department for Education, 2018

[59] The proportion who have entered at least one Tech level is lower than the proportion who have a Tech level as not all of those who have a Tech level as a core aim actually complete (and therefore enter an exam for) their qualification.

institutions as in UTCs. There also are four times more students in state-funded institutions doing level 2 vocational qualifications than in UTCs.

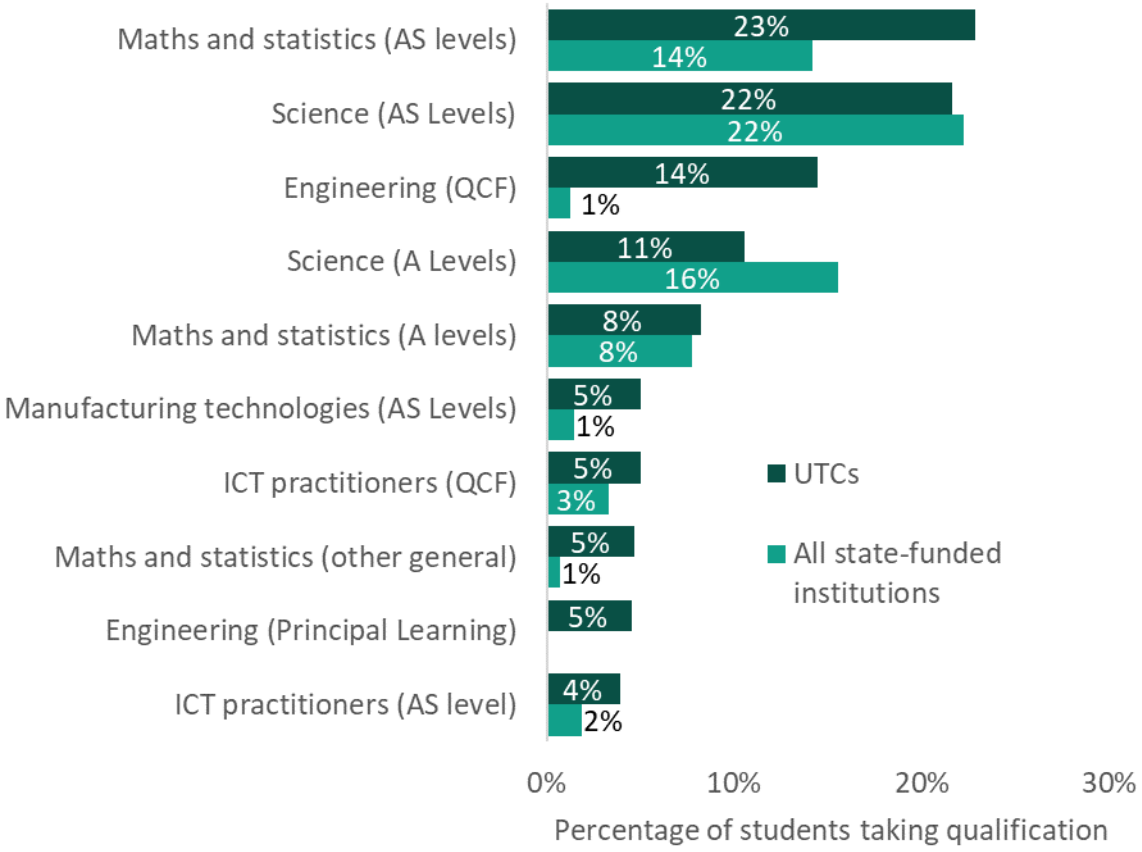
Figure 3.2 Proportion of students taking at least one qualification, by qualification type, 2016/17 [60]



The previous figures reflect the different nature of qualifications taken at UTCs compared to other institutions, but tell us very little, if anything, about content or subject preferences. Figure 3.3 illustrates the most popular level 3 subjects among UTC students compared to the national average. The chart shows that maths (or statistics) AS levels are the most popular qualification taken by 16-19 year olds in UTCs. This is closely followed by AS levels in the sciences. Unsurprisingly, given the nature of UTCs, vocational engineering qualifications (QCF and principal learning) are notably more popular in UTCs. Interestingly, fewer students take up science A levels in UTCs than in other institutions, yet it remains a popular subject.

[60] "A level and other 16 to 18 results: 2016 to 2017 (revised)", Department for Education, 2018

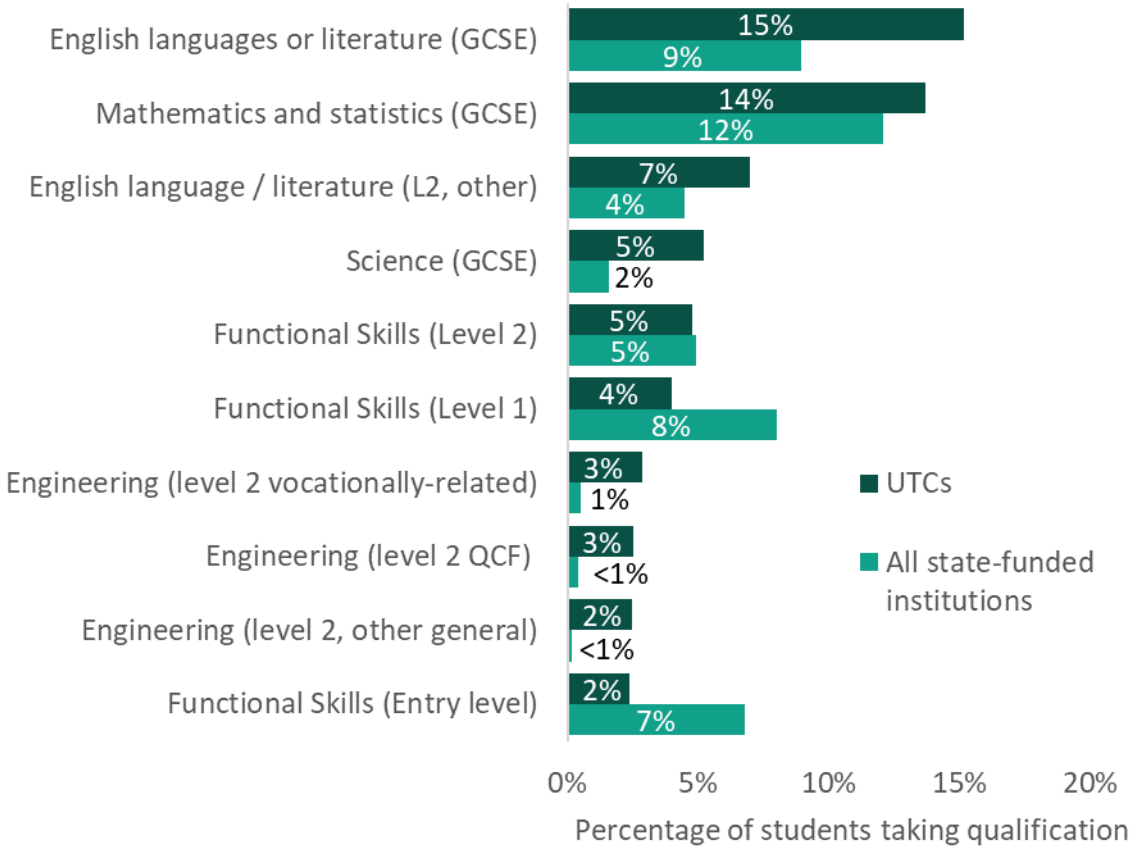
Figure 3.3 Most popular level 3 qualifications taken by 16-19 year olds, 2015/16[61]



We have shown before that there is some level 2 provision for Key Stage 5 students. Figure 3.4 shows that English and maths GCSEs are the most popular sub-level 3 qualifications taken by 16-19 year olds in UTCs, with 15 per cent taking English and 14 per cent taking maths. Science GCSEs are also relatively popular in UTCs, which may indicate that student have either failed or not taken these qualifications at the end of Key Stage 4. Functional skills and engineering qualifications are also relatively popular, albeit they are taken by less than five per cent of students.

[61] Authors' calculations using Young People's Matched Administrative Dataset (YPMAD)

Figure 3.4 Most popular levels 1, 2 or entry level qualifications taken by 16-19 year olds, 2015/16[62]



Performance

In this section we consider how well UTCs equip young people with the skills and qualifications they need for entry to the labour market, or for further study. We consider a range of measures based on what they achieved by the time they leave the UTC, typically at age 18 or 19. We concentrate on the achievement of level 3 qualifications, and of level 2 (e.g. GCSE) English and maths qualifications, for those that did not achieve them during Key Stage 4. We use the government's existing performance metrics and separate students into those studying academic, Tech levels (vocational and occupation specific) and applied general (vocational, but not occupation specific) qualifications. We do not include performance measures for level 1 qualifications, and only include English and maths level 2 qualifications (English and maths and technical certificates) as other sub-level 3 qualifications only make up a very small proportion of UTC provision.

Specifically, we consider the following measures:

- **Progress in level 3 subjects -** Level 3 Value Added: this measure shows the progress each student makes between Key Stage 4 and graded level 3 qualifications. This is done by comparing students' level 3 grades with the grades of all students nationally who had similar levels of attainment at Key Stage 4. This score is expressed as a proportion of a grade above

[62] Authors' calculation using Young People's Matched Administrative Dataset (YPMAD)

or below the national average. This measure is available for both academic (principally though not entirely A levels) and applied general qualifications. Unlike Progress 8, which is used to assess progress between the end of Key Stage 2 and Key Stage 4, this measure considers progress made during a student's time in the UTC, albeit only the last two to three years (i.e. only during Key Stage 5).

- **Grades relative to students taking the same vocational subjects -** Completion and attainment: this measure shows how well students achieve compared to those taking the same qualifications. It compares the attainment of students with the national average attainment for each qualification and treats non-completion of the course as a fail. The scores for each qualification are aggregated to give an overall provider score expressed as a proportion of a grade above or below the national average.
- **Average grades –** Attainment: this measure shows the average grade / points achieved by students in level 3 academic, applied general and Tech level qualifications.
- **Retention:** this measure shows the proportion of pupils completing their main qualifications, to understand whether drop-out is an issue. Students are counted as retained if they have completed the learning activities leading to the learning aim. However, they may not have gained the qualification if they did not then sit the exam. As such we also include a measure showing the proportion of pupils both "retained and assessed".

Figures for UTCs against these measures are compared with those for all state-funded institutions, as well as Further Education (FE) colleges. Figures for FE colleges are shown as they are the main alternative provider type for young people seeking to study technical qualifications.

Below average performance in academic qualifications

Figure 3.5 Attainment in level 3 academic qualifications, 2016/17 [63]

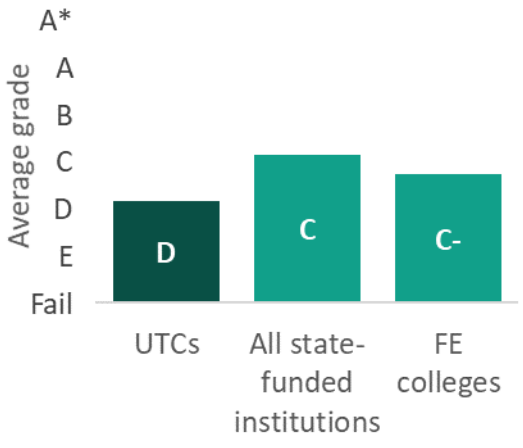
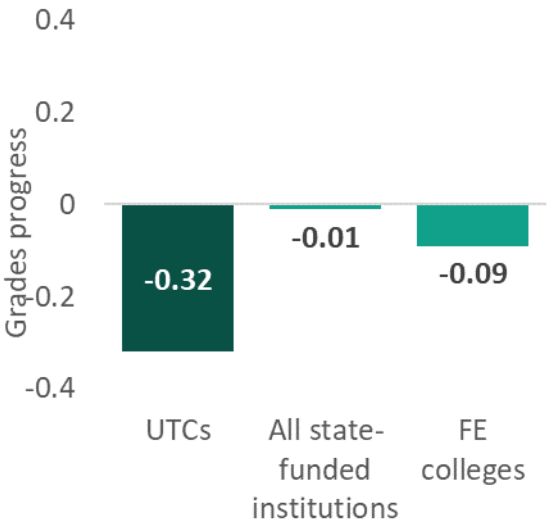


Figure 3.6 Progress in level 3 academic qualifications, 2016/17 [64]

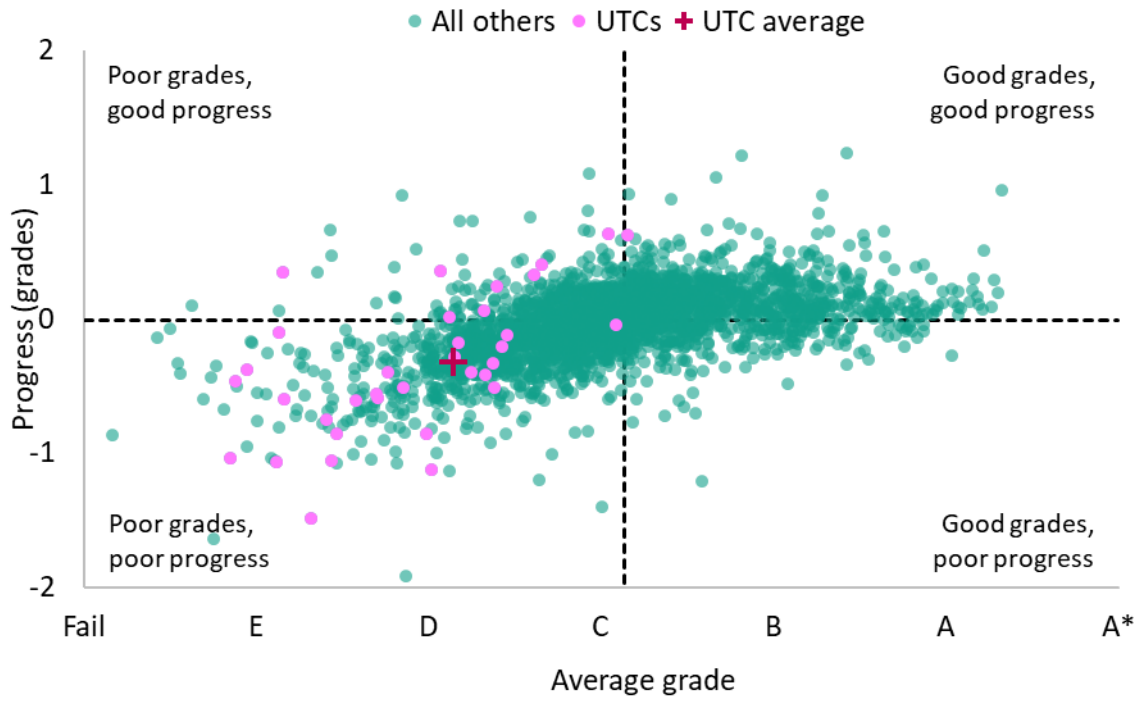


The charts above show that, on average, students in UTCs leave with a whole grade lower in academic qualifications than those in other institutions. They also make around a third of a grade's less progress than the state-funded average, and almost a quarter of a grade less than students in FE

[63] "A level and other 16 to 18 results: 2016 to 2017 (revised)", Department for Education, 2018
[64] Ibid

colleges. However, these averages hide significant variation. The following chart shows both the attainment and progress for all 16-18 providers.

Figure 3.7 Attainment in level 3 academic qualifications (individual schools), 2016/17[65]



The chart shows that whilst the majority of UTCs have both poor average grades and poor progress, there is some variation. All but one of the UTCs analysed had lower-than-average grades, and only nine had above average progress scores. This leaves 26 of 36 UTCs with both below average grades and below average progress in level 3 academic qualifications.

In addition, Figure 3.8 below shows students doing level 3 academic qualification are less likely to complete their studies than students in other institutions, with 80 per cent of pupils both retained to the end of their qualification and then assessed compared to a state-funded average of 94 per cent. Another 10 per cent were retained, but not assessed.

[65] "School Performance Tables: 2016/17", Department for Education, 2018. Note that providers with less than six students entered are excluded from this provider level analysis, due to data protection considerations. 35 UTCs are shown and one is excluded. None of the rest had any students completing level 3 academic qualification in 2017.

Figure 3.8 Retention in level 3 academic qualifications, 2016/17 [66]

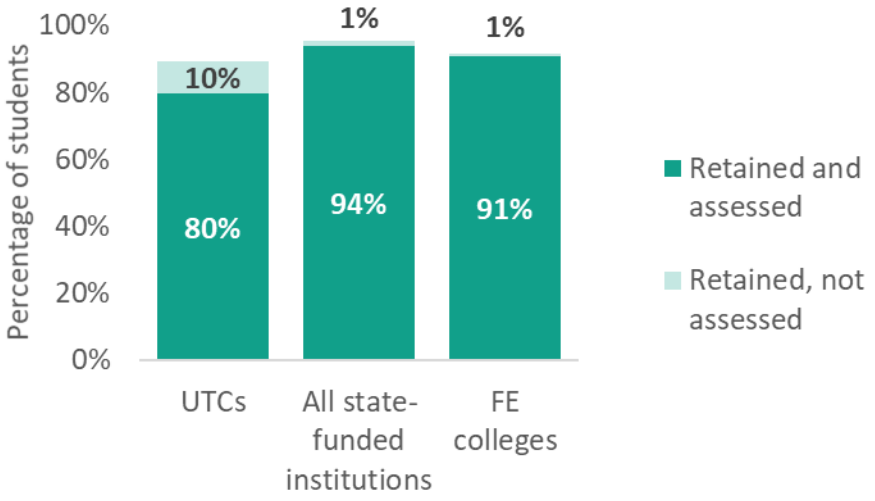


Figure 3.9 Retention in level 3 academic qualifications (individual UTCs), 2016/17 [67]

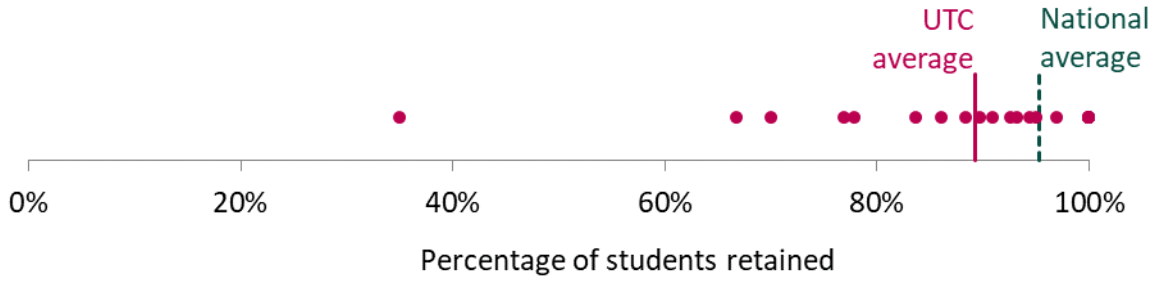


Figure 3.9 shows that there is again some variation around average performance, with eight UTCs achieving above average retention in level 3 academic qualifications, including one UTC achieving 100 per cent retention. However, this still leaves 14 UTCs with below average retention, including one in which only around a third of pupils completed their study programme.

Average and highly variable performance in applied general qualifications

[66] "A level and other 16 to 18 results: 2016 to 2017 (revised)", Department for Education, 2018

[67] "School Performance Tables: 2016/17", Department for Education, 2018. 22 UTCs are shown and seven are suppressed due to small numbers. None of the rest had any students eligible for inclusion in this measure in 2017.

Figure 3.10 Attainment in level 3 applied general qualifications, 2016/17[68]

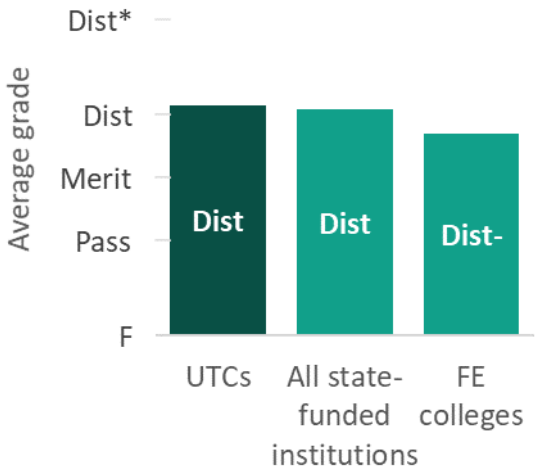
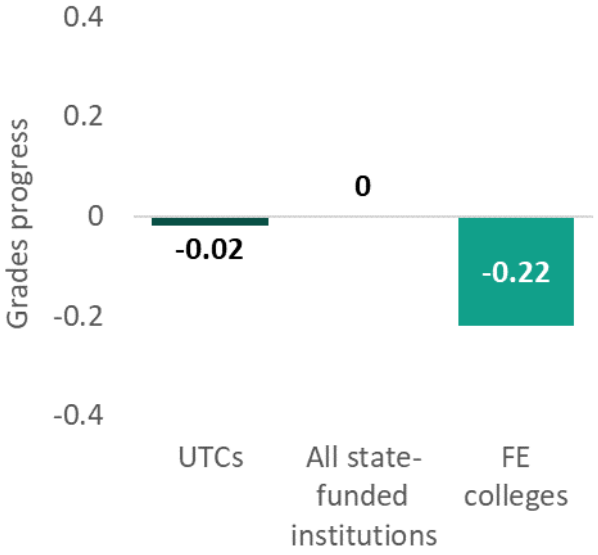
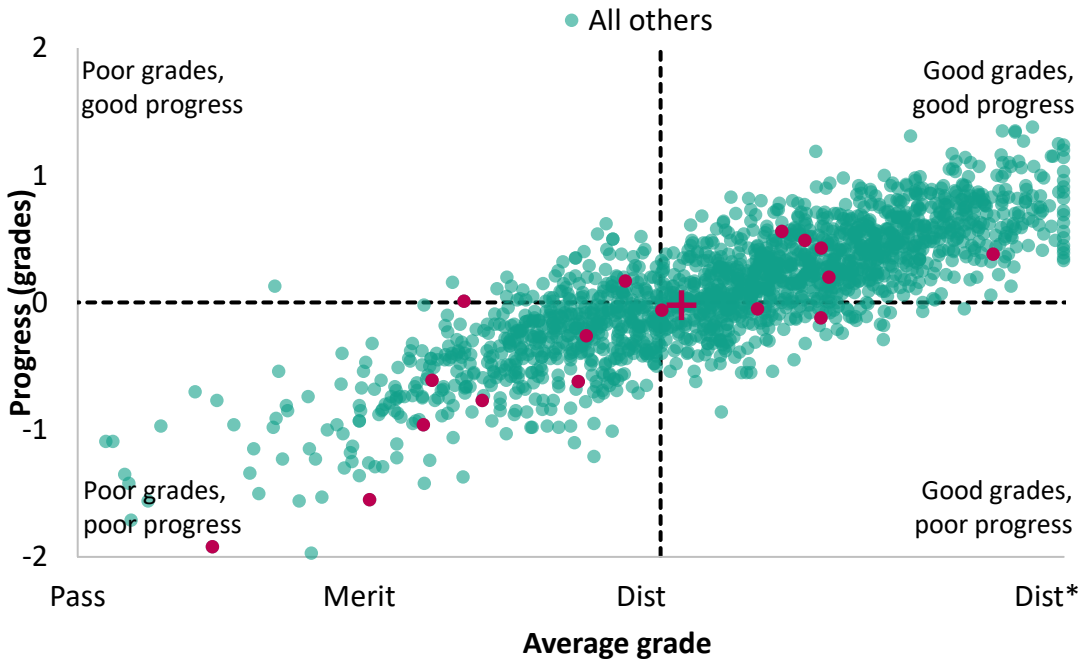


Figure 3.11 Progress in level 3 applied general qualifications (L3VA), 2016/17[69]



The charts above show that, on average, students in UTCs leave with very similar grades in applied general qualifications (broad vocational qualifications) to those in other institutions, with both achieving a distinction on average. They also make very similar levels of progress to the average of those in other institution types, and about a fifth of a grade's more progress than students in FE colleges.

Figure 3.12 Attainment in level 3 applied general qualifications (individual schools), 2016/17[70]



[68] "A level and other 16 to 18 results: 2016 to 2017 (revised)", Department for Education, 2018

[69] Ibid

[70] "School Performance Tables: 2016/17", Department for Education, 2018. 17 UTCs are shown and 11 are suppressed due to small numbers. None of the rest had any students eligible for inclusion in this measure in 2017.

Again, these averages hide some variation.[71] The chart above shows that whilst UTCs fit quite well within the national distribution of scores, there are some notable outliers at both ends of the attainment distribution for applied general qualifications; one UTC is in the top six per cent of institutions with the highest attainment, whilst another is in the bottom one per cent.

Figure 3.13 Retention in level 3 applied general qualifications, 2016/17[72]

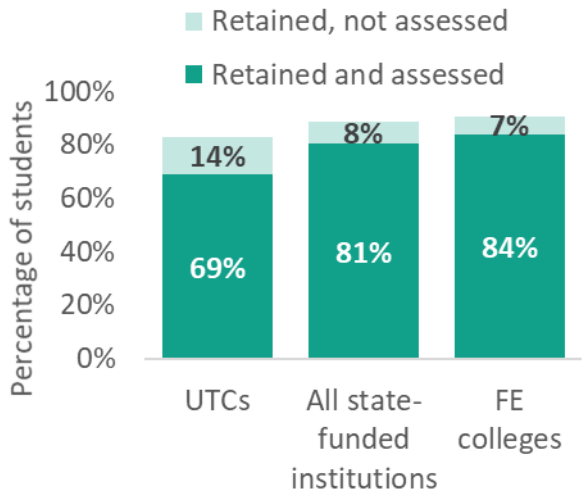
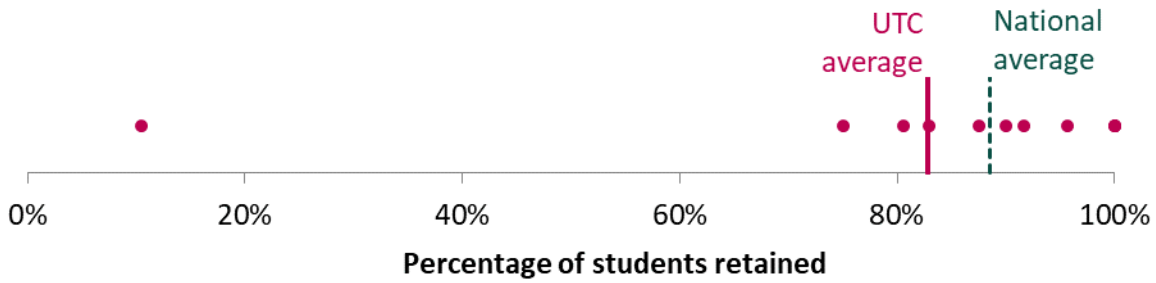


Figure 3.14 Retention in level 3 applied general qualifications (individual UTCs), 2016/17 [73]



Figures 3.13 and 3.14 above shows that pupils studying level 3 applied general qualifications in UTCs are less likely to complete their studies than pupils in other institutions; 83 per cent of them complete their learning, compared to 89 per cent in other institutions. However, 14 per cent of those completing their learning do not go on to take their final exams, compared to 8 per cent across England. These poor retention figures appear to be at least partly driven by the very low retention score from just one UTC, with only one in ten students there completing their studies. Three UTCs have all of their students completing their applied general qualifications.

[71] 17 UTCs are shown and 11 are suppressed due to small numbers. None of the rest had any students eligible for inclusion in this measure in 2017.
[72] "A level and other 16 to 18 results: 2016 to 2017 (revised)", Department for Education, 2018
[73] "School Performance Tables: 2016/17", Department for Education, 2018. 11 UTCs are shown and 5 are suppressed due to small numbers. None of the rest had any students eligible for inclusion in this measure in 2017.

Mixed performance in Tech level qualifications

The picture of the UTCs performance in delivering level 3 Tech level (occupation specific) qualifications is more complex. The figures below show how UTCs compare to the national average for state funded institutions and FE colleges.

Figure 3.15 Attainment in level 3 Tech level qualifications, 2016/17[74]

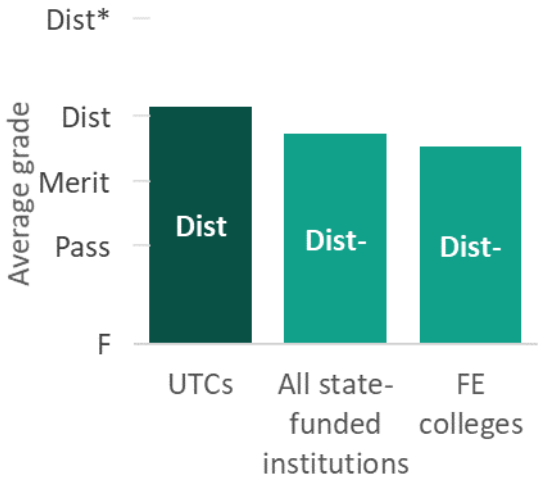


Figure 3.16 Retention in level 3 Tech level qualifications, 2016/17[75]

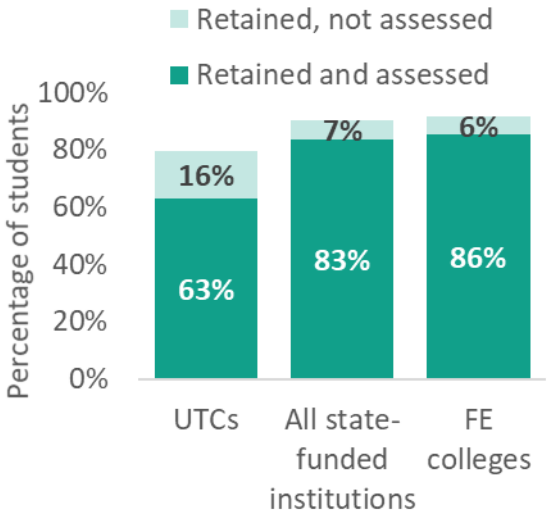


Figure 3.17 Completion and attainment in level 3 Tech level qualifications, 2016/17[76]

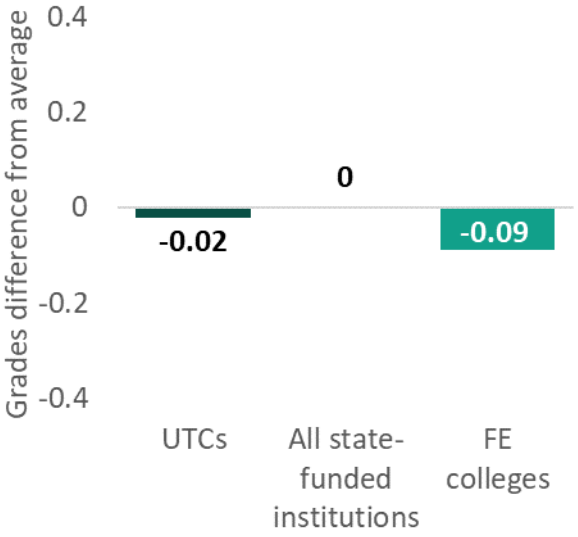


Figure 3.15 shows that students studying Tech level qualifications in UTCs achieve higher grades than those in other institutions; a distinction rather than a distinction minus. However, figure 3.16 shows they have below average retention; 79 per cent rather than over 90 per cent. Figure 3.17 shows that when students grades are compared with the grades of students taking the same qualifications, UTC students' grades are very similar to the national average and are slightly better than the grades in FE colleges. Taken together, this suggests that students doing Tech levels at UTCs

[74] "A level and other 16 to 18 results: 2016 to 2017 (revised)", Department for Education, 2018
[75] Ibid
[76] Ibid

are more likely to drop out, but those who don't often end up achieving a similar or marginally better than average grade.

Figures 3.18 and 3.19 show that UTCs are fairly evenly distributed around the UTC average with respect to attainment, and completion and attainment. However, as was observed in the figures for academic and applied general qualifications, there are some significant poor performing outliers on the retention measure (Figure 3.20). In this case, four out of 28 UTCs retained less than half of their students to the end of their studies, three more than might be expected if UTC retention was distributed as per all providers.

Figure 3.18 Attainment in level 3 Tech level qualifications (individual UTCs), 2016/17[77]

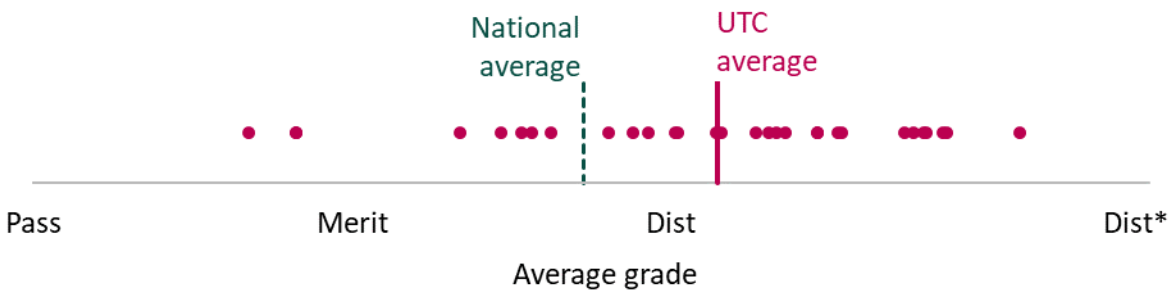
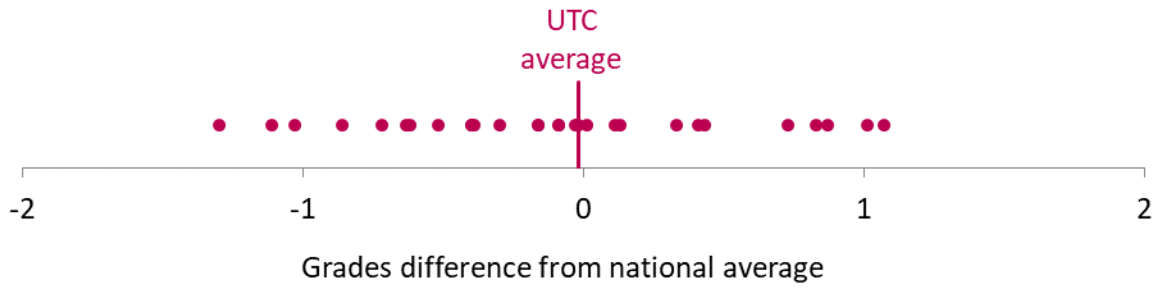
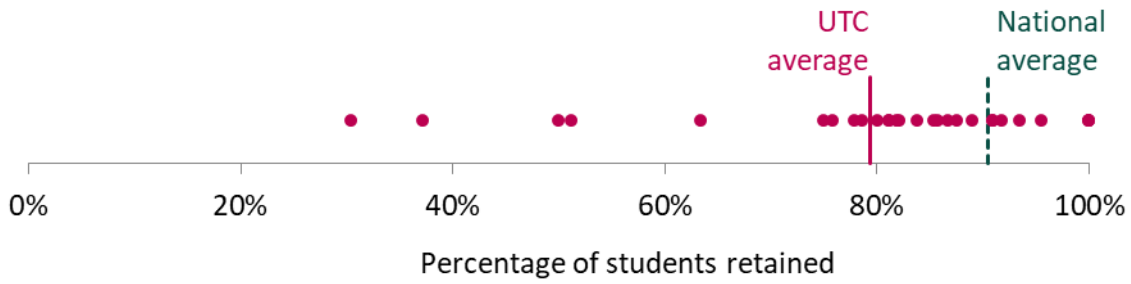


Figure 3.19 Completion and attainment in level 3 Tech level qualifications (individual UTCs), 2016/17[78]



[77] "School Performance Tables: 2016/17", Department for Education, 2018. 30 UTCs are shown. None of the rest had any students eligible for inclusion in this measure in 2017.
[78] Ibid. 30 UTCs are shown and 1 is suppressed due to small numbers. None of the rest had any students eligible for inclusion in this measure in 2017.

Figure 3.20 Retention in level 3 Tech level qualifications (individual UTCs), 2016/17[79]



Relatively high achievement of the Technical Baccalaureate

In 2017 the government introduced the Technical Baccalaureate performance measure (colloquially the Tech Bacc). It is intended to reinforce the value of technical and vocational training and qualifications taken by 16 to 19-year-olds. The Tech Bacc is awarded to students who achieve:

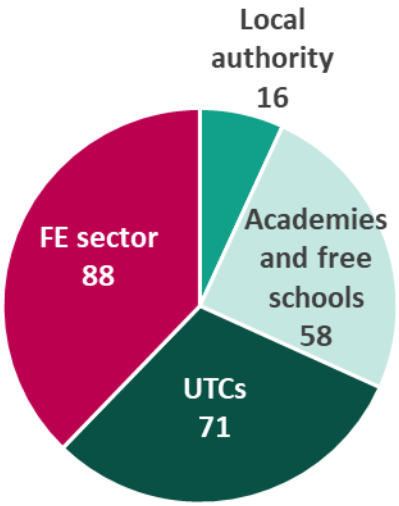
- an approved Tech level qualification,
- a level 3 maths qualification,
- an extended project.

Students achieving the Tech Bacc are eligible for a small funding uplift.

Figure 3.21 shows that 71 Tech Bacc were achieved in UTCs, accounting for 29 per cent of all Tech Bacc achieved. This is despite UTC accounting for only one per cent of the student population. However, the proportion of students achieving the Tech Bacc in UTCs is still very low, at only three per cent, compared to 0.1 per cent of all state funded institutions.

[79] "School Performance Tables: 2016/17", Department for Education, 2018. 28 UTCs are shown and 3 are suppressed due to small numbers. None of the rest had any students eligible for inclusion in this measure in 2017.

Figure 3.21 Number of Tech Bacc achieved, by institution type, 2016/17[80]



[80] "A level and other 16 to 18 results: 2016 to 2017 (revised)", Department for Education, 2018

High performance in level 2 English and maths retakes

Where UTCs seem to do substantially better than average is at progress in level 2 English and maths. This mainly relates to students who need to retake these subjects as they failed their GCSEs at Key Stage 4. UTC Key Stage 5 students make one third of a grade more progress in level 2 English than similar students elsewhere, and 0.30 grades more progress in maths (Figures 3.22 and 3.23). Although more research is needed to understand why UTC students make more progress in level 2 qualifications than those in other institutions, it might be partly explained by the fact that UTC provision spans Key Stage 4 and Key Stage 5, so perhaps UTCs may not all treat the end of Key Stage 4 as the end point for GCSE maths and English provision.

Figure 3.22 Progress in GCSE (L2) English, 2016/17[81]

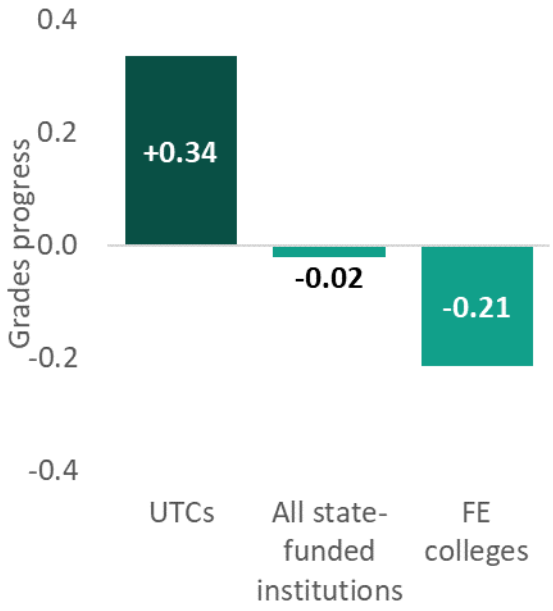
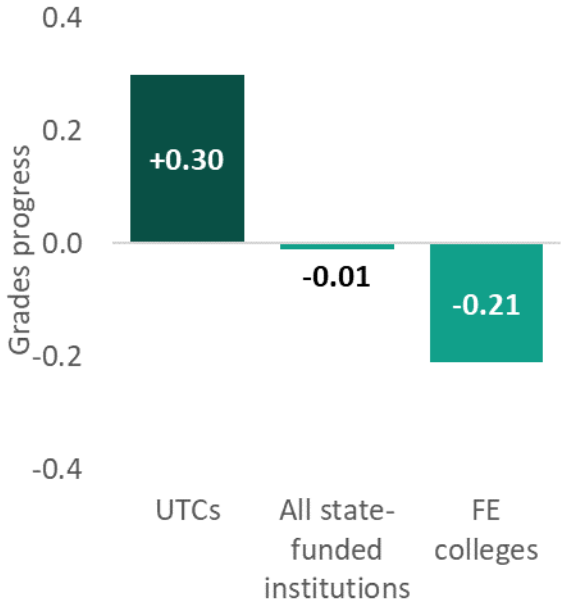


Figure 3.23 Progress in GCSE (L2) maths, 2016/17[82]



Destinations

In this section we consider where student go next once they have finished studying at their respective UTCs (post Key Stage 5). Here we use the Department for Education's destinations data derived from college and university enrolments and tax and benefits data. Due to a lag in the availability of destinations data, the destinations shown are for students who left their UTCs in 2014/15. The measure considers young people's activity in the two terms following their departure. Because of the data lag and because of the relative infancy of UTCs, destinations data are only available for 15 UTCs, with 615 students. Therefore, although the results may be indicative, they may not be completely representative of all UTCs. Similarly, with the first free schools opening in September 2011, destination data for these might not provide a representative picture, as only a very small proportion of them had Key Stage 5 leavers in 2014/15, and some might have been older independent schools rebranded.

The measures only include students who had entered level 3 qualifications. This will not give the full picture of what all young people go on to do as only around 60 per cent of all young people (and 80

[81] "A level and other 16 to 18 results: 2016 to 2017 (revised)", Department for Education, 2018
[82] Ibid

per cent of UTC students) enter qualifications at this level. As such, many lower achieving pupils will not be included in these measures.

Figure 3.24 Post Key Stage 5 destinations for level 3 learners, 2014/15 cohort[83]

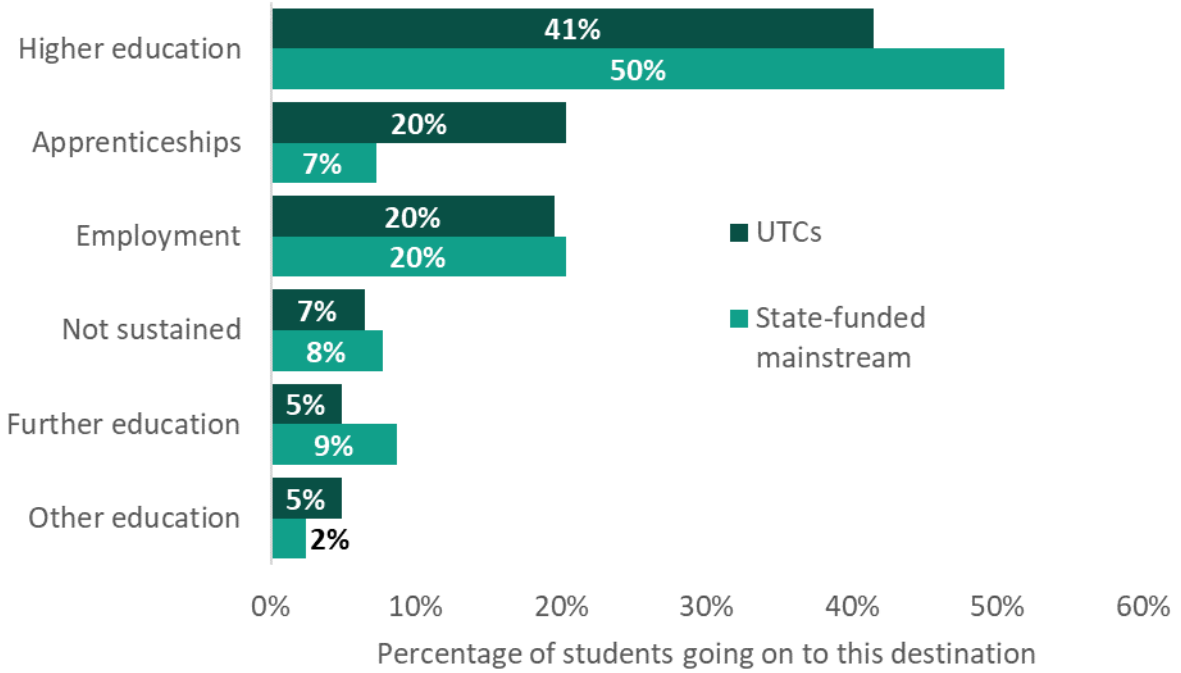
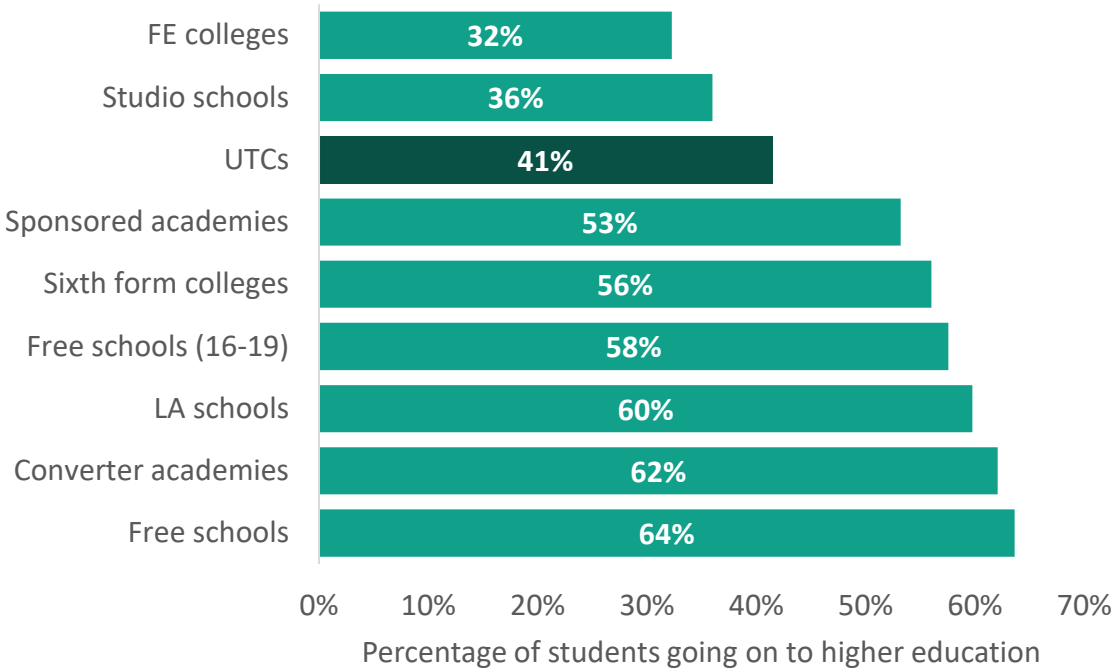


Figure 3.24 shows the destinations of UTC students doing level 3 qualifications. More students go on to higher education than any other destination, with 41 per cent of students following this route. However, this is nine percentage points less than the figure for all students in state-funded mainstream institutions. Figure 3.25 shows that this is the third lowest figure for any institution type, with only Studio Schools and FE colleges seeing fewer students continuing to higher education. UTC students also appear less likely to go onto study further education, with five per cent of UTC students taking this route, compared to nine per cent of all level 3 students.

[83] "Destinations of KS4 and KS5 pupils: 2016", Department for Education, 2017 and Department for Education's Freedom of Information response

Figure 3.25 Key Stage 5 level 3 students going onto higher education, by instituion type, 2014/15 cohort[84]



Instead of continuing onto higher or further education, UTC students appear much more likely to take up apprenticeships; 20 per cent of UTC students go onto apprenticeships, compared with just seven per cent of all level 3 students. This is emphasised in Figure 3.26 which shows how the proportion of level 3 students going on to apprenticeships compares to other institution types. It is clear that UTCs are an outlier in this regard; the next closest institution types are Studio School, FE colleges and Free Schools, but even they have less than half the proportion of students continuing on to apprenticeships. Indeed, Figure 3.27 shows that all but one UTC had a higher proportion of leavers doing apprenticeships than the national average (though note that this is only for a subset of 10 UTCs for which data for this measure are available).

These high apprenticeship figures may come as no surprise as UTCs must have backing from local or national employers, who then work closely with the UTC staff to co-develop the curriculum. These close links would appear then to benefit both students, who have a better chance at securing an apprenticeship, and the employers, who will be more able to identify potential apprentices who are well suited to their organisation.

The proportion of UTC students going on to unsustained destinations (those Not in Employment, Education or Training, or NEET) is similar to that in the wider student population, at seven per cent.

[84] "Destinations of KS4 and KS5 pupils: 2016", Department for Education, 2017 and Department for Education's Freedom of Information response

Figure 3.26 Key Stage 5 level 3 students going on to apprenticeships, by instutiton type, 2014/15 [85]

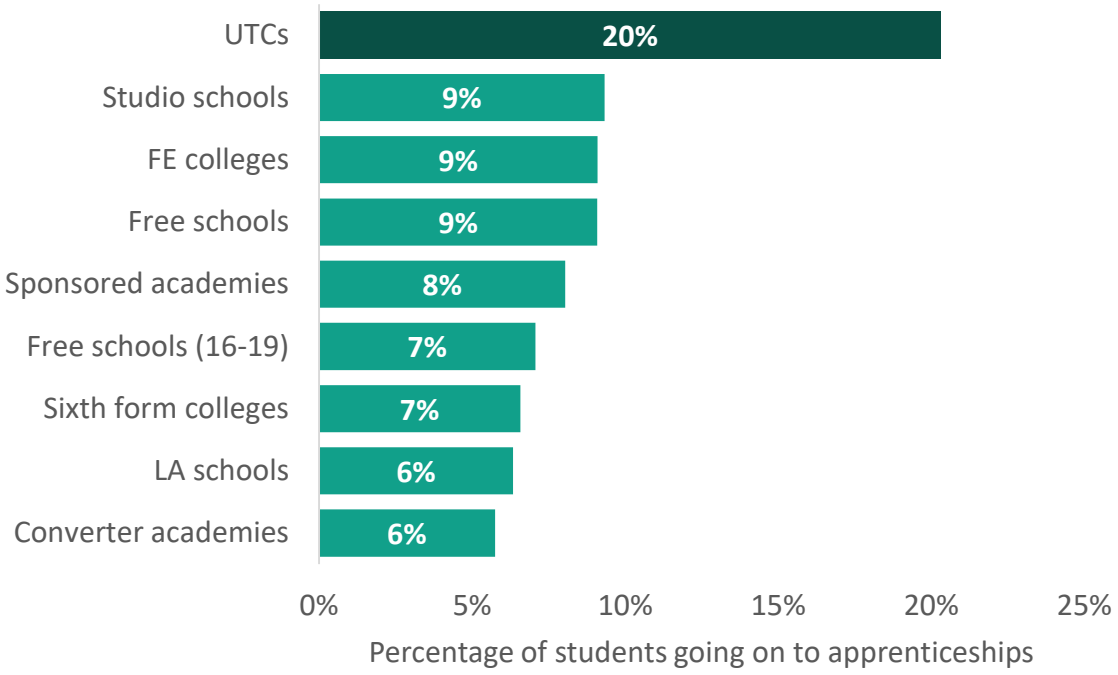
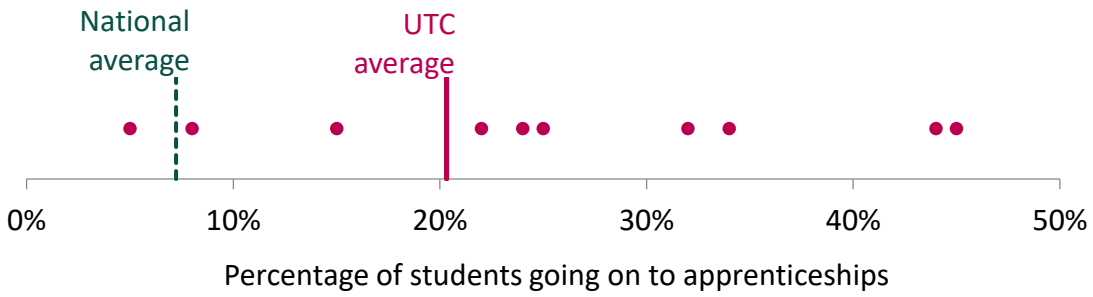


Figure 3.27 Key Stage 5 leavers going on to apprenticeships (individual UTCs)[86]



Summary of Key Stage 5 provision and performance

In conclusion, we have seen that on average and when compared against other institutions:

- Key Stage 5 provision at UTCs is heavily skewed towards technical and vocational qualifications, and subjects such as maths, science, IT engineering and manufacturing. However, most UTC students do still take level 3 academic qualifications alongside their core vocational qualifications.
- UTC students make poor progress in their level 3 academic (mostly A or AS level) qualifications.
- The achievement or progress of UTC student in applied general and Tech level qualifications is close to the national average, and above that of Further Education colleges.
- UTC students make above average improvements when retaking GCSE English and maths.

[85] "Destinations of KS4 and KS5 pupils: 2016", Department for Education, 2017 and Department for Education's Freedom of Information response

[86] Only 10 UTCs are shown and two are suppressed due to small numbers. None of the rest had any students eligible for inclusion in this measure in 2017

- UTC students are more likely to drop out of their studies part way through.
- UTC students are less likely to progress to higher education, but more likely to progress to an apprenticeship.

This analysis illustrates that the performance of UTCs is more mixed in Key Stage 5 than at Key Stage 4. Whilst performance in academic subjects remains poor, performance in technical and vocational subjects remains similar to the national average, and above the levels seen in the Further Education colleges that might otherwise be an alternative for young people wishing to study similar qualifications.

Whilst the high performance on GCSE English and maths retakes may point to an educational model that sees the end of Key Stage 4 as the mid rather than end point for provision, it is important to remember that around half of UTC students do not continue at the UTC after the end of Key Stage 4. Therefore, they are unlikely to reap any benefits from this provision.

Our high-level analysis of the destinations of young people leaving UTCs shows indicates they are directly benefitting from the UTCs' links with employers, with significant proportions going onto apprenticeships.

Chapter 4. Ofsted inspection outcomes

UTCs are subject to the same inspection framework as other state-funded institutions. Historically, new schools, including UTCs, became eligible for inspection during their second year of opening – generally from their fifth term. From the 2015/16 academic year, this was revised so that schools would not usually be inspected until their third year.[87]

As such, because UTCs generally open with year groups in years 10 and 12 and then grow as pupils move through the school, the majority of first inspections occur when the school has pupils in each year group. However, due to their relative infancy and the relatively low number of UTCs, any analysis is based upon a small number of inspections.

Direct comparisons with other institutions are also complicated by reforms to the Ofsted inspection framework. The inspection framework was revised in 2012 and this also affected the frequency of inspections. Those schools previously rated as 'satisfactory' (and more recently 'requires improvement') would be inspected again more quickly than those rated as 'good'. Schools rated as 'outstanding' would not be inspected again unless Ofsted's risk assessment approach identified a serious decline in standards.

All UTC inspections have been carried out against the new framework. However, it is not fair to compare them only to other institutions that have been assessed against this framework since the risk-based approach means that such schools will be disproportionately lower performing schools. Instead, we make the comparison against the latest inspection outcome for all schools regardless of when they were inspected. This approach is consistent with statistics published by Ofsted.

Throughout Ofsted data analysis, only UTCs and other institutions which are open are considered. Criteria for still being open is whether they appear in the Ofsted Report data released on 31st March 2018. At this point, 26 currently open UTCs had received at least one Ofsted inspection. This analysis excludes schools which have changed type or seen other change to their operating form (e.g. joining a multi-academy trust).

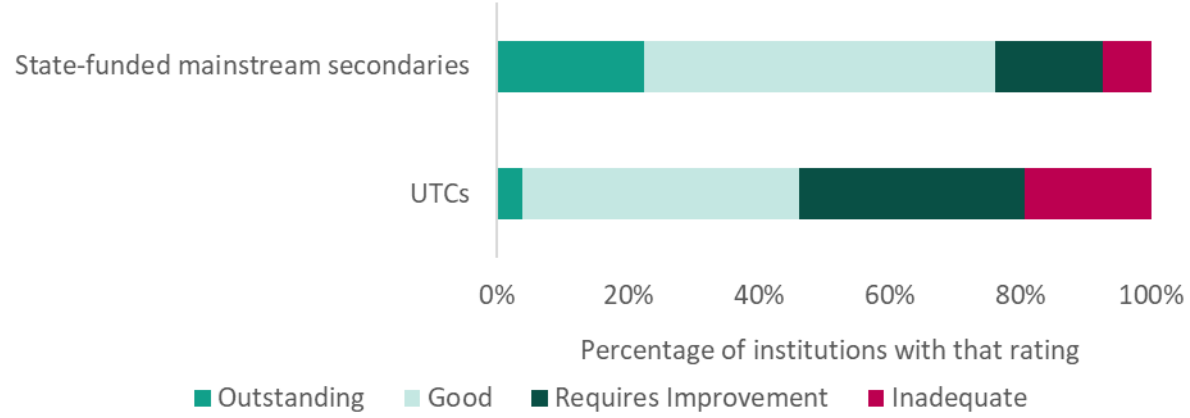
It is also important to consider that Ofsted inspections will use the Department for Education's secondary and 16-19 performance measures (described in previous chapters) to inform their judgements. It has already been discussed that, in general, these measures do not align well with the aims and provision of UTCs, meaning that misalignment could be adversely affecting Ofsted judgments.

Overall provision and individual areas disproportionately 'requires improvement' or 'inadequate'

As Figure 4.1 shows, UTCs lag behind the average for state-funded mainstream institutions in terms of overall effectiveness. This is notable in terms of the higher proportion of UTCs which are graded 'inadequate' or 'requires improvement': over half of inspected UTCs received these grades, compared to less than a quarter of all institutions. Similarly, only four per cent of UTCs received an 'outstanding' for their overall provision, compared to 22 per cent of all institutions.

[87] "Policy statement for inspecting new schools and schools that undergo a change in status", Ofsted, July 2018

Figure 4.1 Overall effectiveness of UTCs compared to other institutions [88]

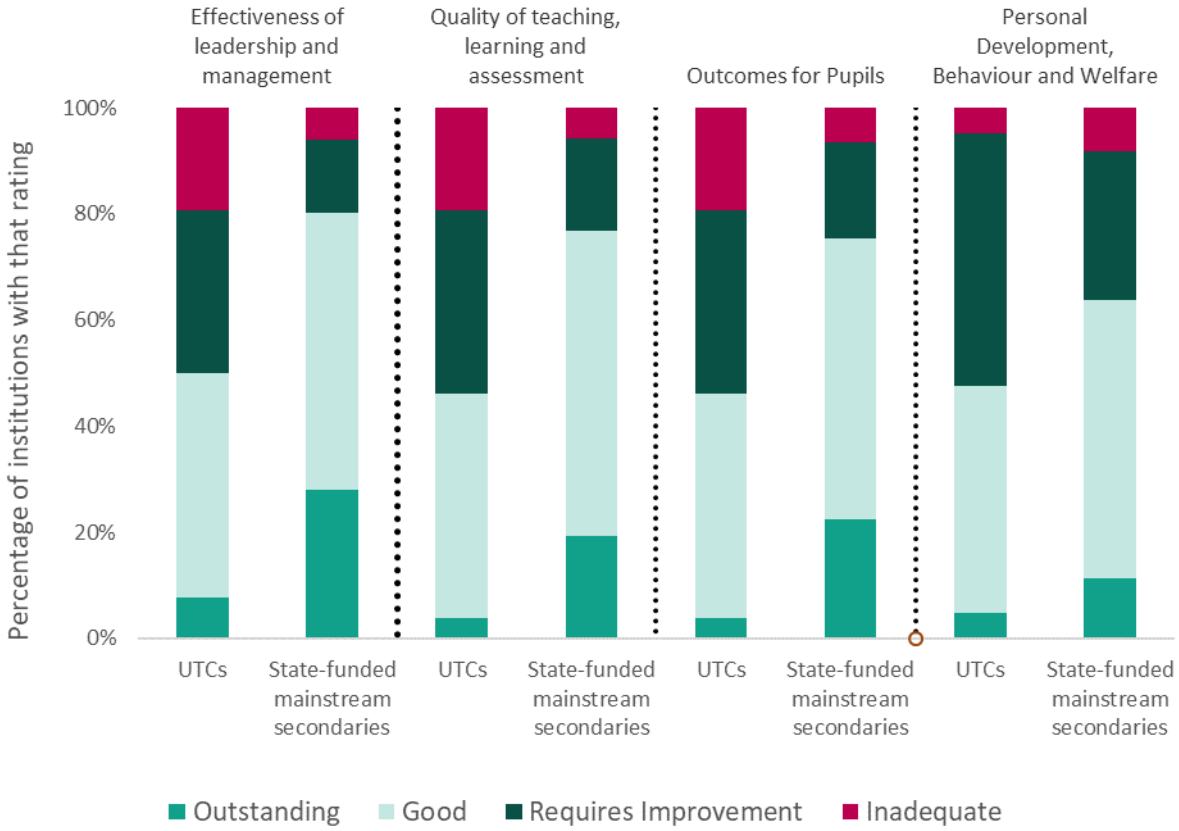


The grade for overall effectiveness reflects the school's performance across a range of areas. Ofsted's handbook specifically mentions the capacity of the school to meet provisions for students with SEND (who are overrepresented at UTCs), and the effectiveness of its focus on spiritual, moral, social and cultural development.

Some grading areas are consistently rated 'inadequate' across UTCs. Ofsted reports often discuss failures among governors to correctly hold the school leadership to account. Provision both for literacy and in the areas the UTCs specialise in is also often found to be disappointing. Reports also highlight concerns around poorly matching courses to students, and poor progress levels for disadvantaged students and those with SEND.

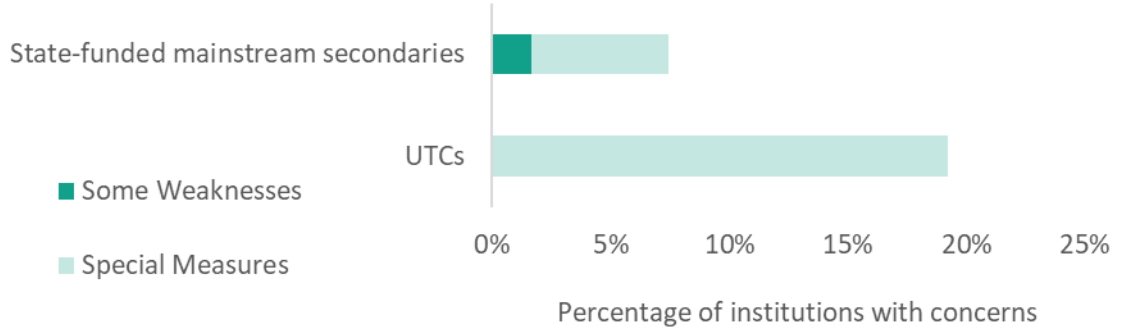
[88] All charts in this section have been created with data from the Department for Education obtained from https://get-information-schools.service.gov.uk/

Figure 4.2 Effectiveness of UTCs compared to other institutions, by area



The results for individual grading areas tend to reflect similar results to overall effectiveness, as Figure 4.2 shows. The consistently higher rates of 'inadequate' and 'requires improvement' are concerning as they reflect negatively upon the ability of UTCs to provide education at a similar standard to the national average.

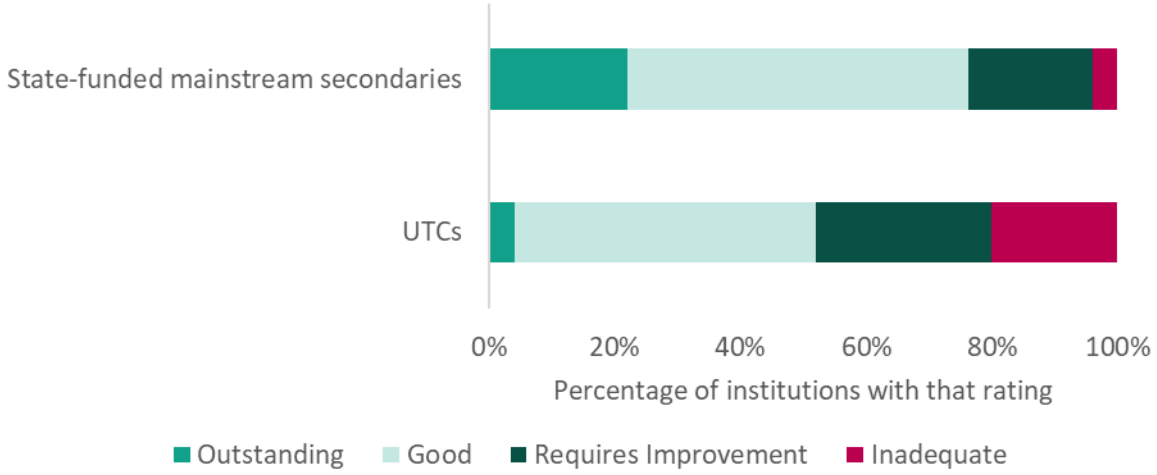
Figure 4.3 Proportion of institutions by type of category of concern



In addition to giving grades for specific criteria, Ofsted can also grade schools as having *some weakness* or being in *special measures* if the school is particularly underperforming. Compared to all secondary schools, UTCs are more likely to have a category of concern, with higher rates of UTCs in *special measures.* This indicates that significant concerns are more likely to be found in UTCs.

Ofsted judgement of post-16 provision in UTCs is also more negative than in other institutions

Figure 4.4 Ofsted grading results for standard of post-16 education provision



For many UTCs, their first cohorts will not yet have completed Key Stage 4, which combined with the low number of UTCs with an Ofsted inspection at all, means only 25 UTCs have a specific post-16 grade.

Figure 4.4 shows that post-16 performance reflects similar concerns to other criteria, with UTCs having larger rates of 'requires improvement' and 'inadequate' than the average across the state sector for mainstream secondaries. 48 per cent of UTCs with post-16 inspection grades have their post-16 provision graded as 'requires improvement' or 'inadequate', compared to a 23 per cent average across the sector.

No strong evidence that the age of UTCs has an influence on Ofsted ratings

Figure 4.5 Overall effectiveness of UTCs by days since opening date

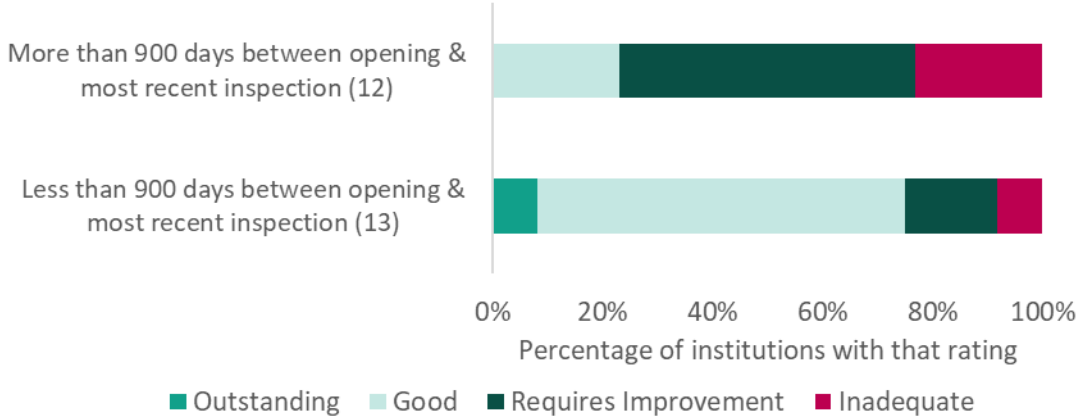


Figure 4.5 shows that UTCs that have been open for longer tend to have worse inspection outcomes. Over three quarters of UTCs open for more than 900 days were graded as 'requires improvement' or 'inadequate', compared to almost a third of UTCs open for less than 900 days. This suggests that there is little evidence that the underperformance of UTCs is strongly linked to the schools being in the first years of operation. In fact, the possibility that the poorer Ofsted results reflected the

relative youth of UTCs was investigated, with our analysis showing no evidence that older UTCs perform better than newer UTCs.

Seven of the UTCs that have closed had had an inspection, with three rated 'inadequate' and four 'requires improvement'. None of them were in *special measures* or were found to have *serious weaknesses*, yet UTC@Harbourside, which is set to close in August 2019, is in special measures.

Conclusions

Ofsted data paints a picture of particularly poor performance for UTCs. Ofsted inspections are however informed by the Department for Education's secondary performance measures, which, due to their only partial overlap with students' time in a UTC, could provide an incomplete picture of UTC performance. Though our own analysis indicates that, on average, UTCs are performing below average in Key Stage 4. Even so, it is clear that poor Progress 8 scores cannot alone explain the poor inspection outcomes presented here. For example, poor progress scores would typically be taken into account in the student outcomes area, whereas UTCs also have poor inspection outcomes in the *leadership & management* and *personal development, behaviour & welfare* areas.

Chapter 5. UTCs: what do they mean for local and national skills gaps and the labour market?

One aim for University Technical Colleges is to provide employers with the skills that are, or will be, in demand in engineering, manufacturing, and other sectors with a technical component. In this section, we will explore the match between UTCs and the needs of the labour market, both local and national, current and forecast. The data used will feature a combination of:

- **Skills needs** - The Employer Skills Survey 2017. The survey asks employers about current vacancies and the degree to which these are hard to fill, the skills required of their workforce, and training provision. Formerly commissioned by the since-closed UK Commission for Employment and Skills (UKCES), the Department for Education will be delivering future waves of the survey. The 2017 sample is made up of 87,430 employers.
- **Labour market characteristics** - ONS' official labour market statistics (Nomis), which provide information on the characteristics of local economies and labour markets. 2016 data is shown.
- **Industrial or sectoral structure** - ONS data on the increase in the value of the economy due to the production of goods and services (Gross Value Added) in the different economic sectors, by Local Authority in the UK in 2015.
- **Future sector needs** – The UK Commission for Employment and Skills' (UKCES) Working Futures tracks recent trends of vacancies in different sectors over a number of years, and includes projections of demand for workers across sectors broken down by the required skill level. The most recent version, published in 2018, is from 2016.

It is important to note that, when using and comparing different datasets, economic sectors will not always match, but comparisons are offered to the closest level of similarity.

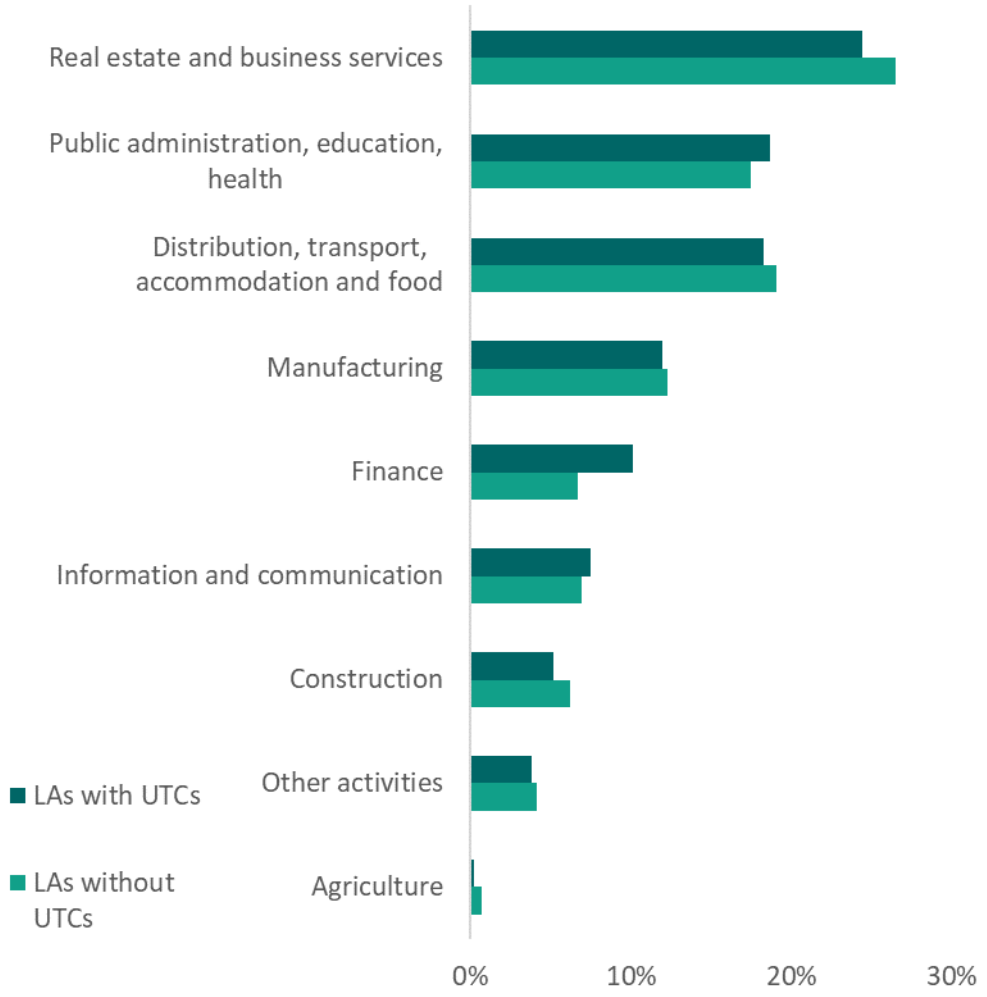
UTCs and the match with local skills and labour market demand

This subsection explores potential differences between areas with UTCs and those without, to investigate whether UTCs and their students are well placed to benefit from employment and other engagement opportunities from the local labour market.

Local authorities with UTCs have broadly similar industries to other areas

Given that UTCs are established to train the technical professionals of the future, one could expect that sectors such as manufacturing, construction, or information technology might be more dominant in areas where UTCs have been established. Figure 5.1 shows that, if anything, manufacturing makes up a marginally smaller proportion of the local economy in areas with UTCs: 12.3 per cent compared to 12.6 per cent in areas without UTCs. However, the situation reverses when London is excluded, as many UTCs can be found in the capital, where manufacturing represents a smaller share of the local economy. Nonetheless, the difference is still very small: manufacturing accounts for 12.6 per cent of Gross Value Added (GVA) in areas with UTCs and 12.3 per cent in areas without UTCs.

Figure 5.1 Sectoral distribution of Gross Value Added by Local Authority type, 2015[89]

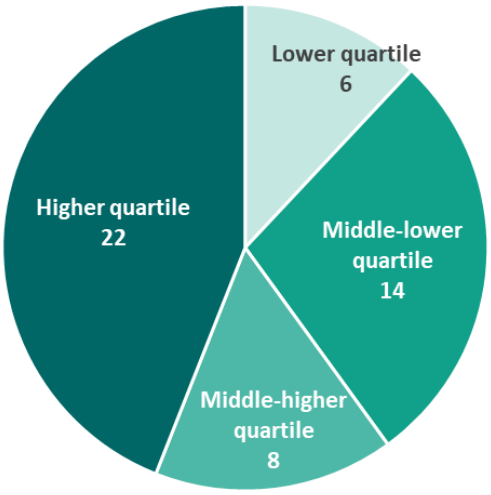


UTCs are in areas with more jobs per capita

Figure 5.2 shows that areas with UTCs tend to have higher job density (jobs per capita) than those without: 22 UTCs are found in areas in the higher quartile for job density, while only six are set up in LAs in the lower quartile.

[89] "Regional Gross Value Added (Income Aproach) by Local Authority in the UK – 2015", Office for National Statistics, 2016

Figure 5.2 Distribution of UTCs by Local Authority job density, 2016 [90]



UTCs are in areas with more large employers

The vast majority of British companies are small and medium, with fewer than 250 employees. Large businesses account for just over 0.5 per cent of the total, according to UKCES data. They do, however, represent a much larger proportion of available employment.[91]

Areas with UTCs have, on average, a higher proportion of big employers than those without. In areas with a UTC, 0.54 per cent of all employers have more than 250 workers, compared to 0.46 per cent of employers in areas without UTCs. Whilst these proportions are small, this means that while LAs with UTCs account for 38 per cent of all businesses, they are home to 42 per cent of all big employers (250+ employees).[92] Though small, this difference might be an important one, as a higher concentration of big employers might help create the conditions to establish a UTC in a particular area, given the level of resources that sponsoring companies need to devote to engage with UTCs.[93]

Our analysis also shows that differences in the extent of skills shortages of LAs with and without UTCs exist but are too small to draw conclusions. The 2017 Employer and Skills Survey offers data on vacancy numbers, skills shortages and skills gaps. The data shows that 19.1 per cent of employers in LAs with UTCs reported that they had skills shortage vacancies or skills gaps, slightly more than the 18.2 per cent of employers reporting so in LAs without UTCs. They also have more vacancies relative to employment (4 per cent v 3.6 per cent) and more of these are deemed hard to fill (33.5 per cent v 31.9 per cent).

UTCs are in areas with marginally more high-skilled and labour-intensive jobs

[90] "Job density", Office for National Statistics, Nomis, 2016
[91] According to ONS data on employers by size: https://www.ons.gov.uk/businessindustryandtrade/business/activitysizeandlocation/adhocs/005696numberofworkplacesandemployeesbyenterprisesizeintheuk2001to2015
[92] Authors' calculations using Employer Skills Survey 2017
[93] Tami McCrone, Kerry Martin, David Sims, Chloe Rush, *Evaluation of university technical colleges Report – Year One* (National Foundation for Educational Research, 2017)

Areas with UTCs have a higher proportion of jobs which fall in the labour-intensive category;[94] 21.2 per cent compared to 20.5 per cent in areas without UTCs. LAs with UTCs also have a slightly higher share of high-skilled employment, including managers, directors, and senior officials; and technical and associate professionals. On the other hand, they have fewer middle-skilled and service-intensive jobs. Middle and low-skilled jobs are at a higher risk of automation in the medium term. Though UTC students might appear to fit in this middle-skilled category, and therefore to be vulnerable to these changes, UTCs advocates suggest that they are well placed to train the high-skilled technicians of the future. [95] [96]

In conclusion, local authorities where UTCs are established do not have, on average, a largely different industrial structure or substantially more vacancies prompted by skills shortages than other areas. On the other hand, they have a higher density of jobs, a greater presence of big employers, and more vacancies that are hard to fill.

However, this seems insufficient to explain why UTCs are established in their current locations. Participants in our roundtable in July 2018 suggested that the local context was crucial to understand such decisions, and that needs of individual employers in specific sectors are very likely to help explain the establishment of UTCs. This is in line with our findings, which suggest that big employers in areas with skills gaps might have driven the establishment of UTCs. However, more qualitative research is needed to understand how employers interact with other relevant actors in their local education landscape.

UTCs and the match with national skills and labour market demand

This section will explore whether UTCs are training young people for sectors and occupations that either have a high number of vacancies nationwide or that are projected to grow in the UK in the coming years. We consider the projected growth in both sectors and occupations. Sectors refer to industries, while occupations reflect the level of skills and specialisation needed to perform specific jobs. As an example, the manufacturing sector is made up of different occupations, from people undertaking elementary tasks (caretakers, for example) to high-skilled professionals (managers, directors, high-skilled technicians).

As discussed, UTCs aim to train the engineers and manufacturers of the future and the Baker Dearing Educational Trust specifically identifies the engineering, science, health, and digital sectors as the target sectors.[97] Consequently, our analysis focuses on sectors or industries relevant to these specialisms: manufacturing, construction, information technology, and health. Although the professional scientific and technical sector is also relevant to UTCs, we only found one subsector in it that is strongly linked to the skills UTC students might develop, so we will not study it in great depth.

[94] Requiring the lowest level of skills and includes process plant and machine operatives and other elementary roles

[95] Hasan Bakhshi, Jonathan M. Downing, Michael A. Osborne and Philippe Schneider, *The Future of Skills: Employment in 2030* (Pearson and NESTA, 2017)

[96] Joe Dromey and Clare McNeil, *Skills 2030: Why the adult skills system is failing to build an economy that works for everyone*, (Institute for Public Policy Research, 2017)

[97] https://www.utcolleges.org/

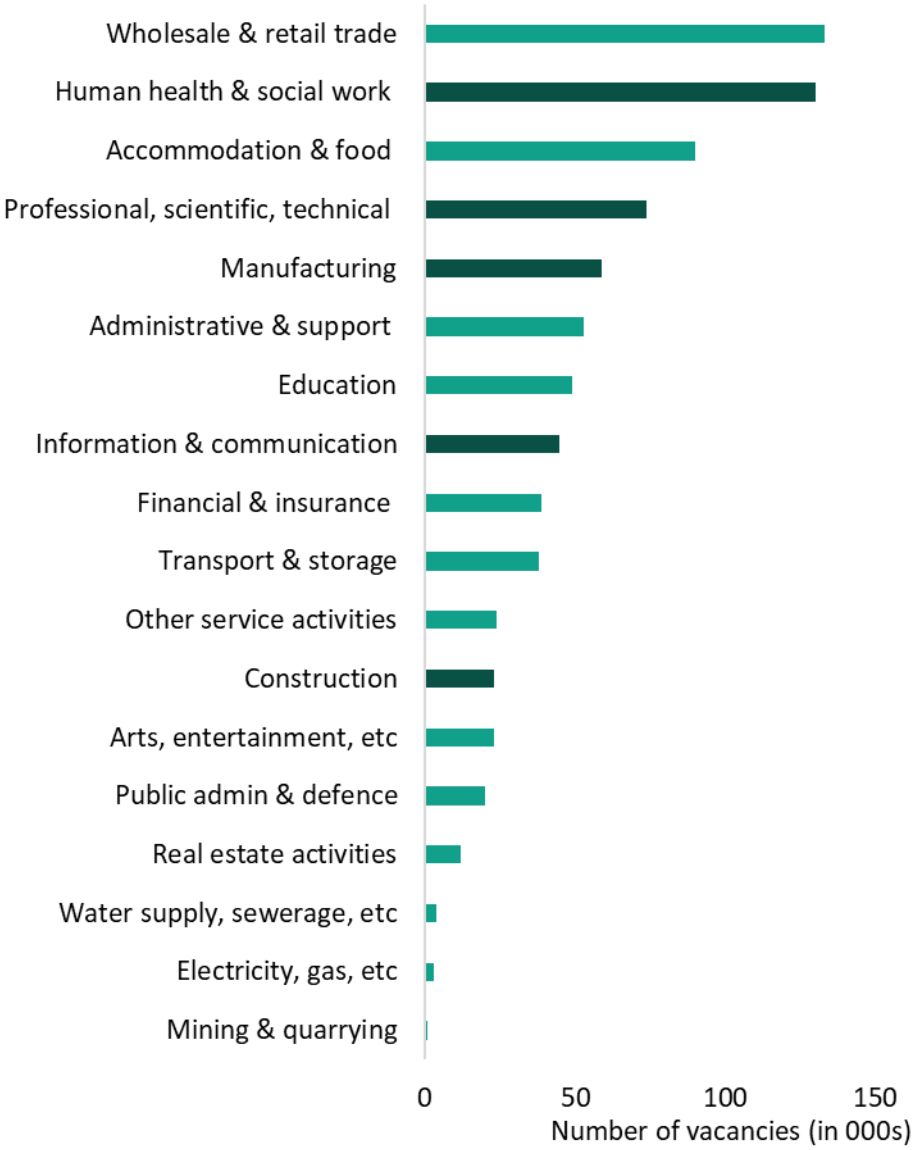
With regard to occupations, our analysis will consider those where technical skills are required and the level of specialisation is high or medium-high, namely: professional occupations (e.g. engineering and IT professionals); associate professional and technical occupations (e.g. science, engineering, and production technicians); and skilled trades occupations (e.g. vehicle, electronic, and construction trades).

It should be noted that sector and occupation categories are quite broad, and therefore may not match exactly onto the skills and qualifications provided to UTC students. However, they do give an indicative sense of the match of UTC provision and the needs of the labour market.

Large number of existing vacancies in relevant sectors

In the period between March and May 2018, there were 130,000 vacancies in the health and social work sector, while the professional, scientific and technical sector, and manufacturing sectors, had 74,000 and 59,000 vacancies respectively. There were 45,000 vacancies in the information and communication sector, and 23,000 in construction.

Figure 5.3 Number of vacancies by sector (March-May 2018), in 000s [98]

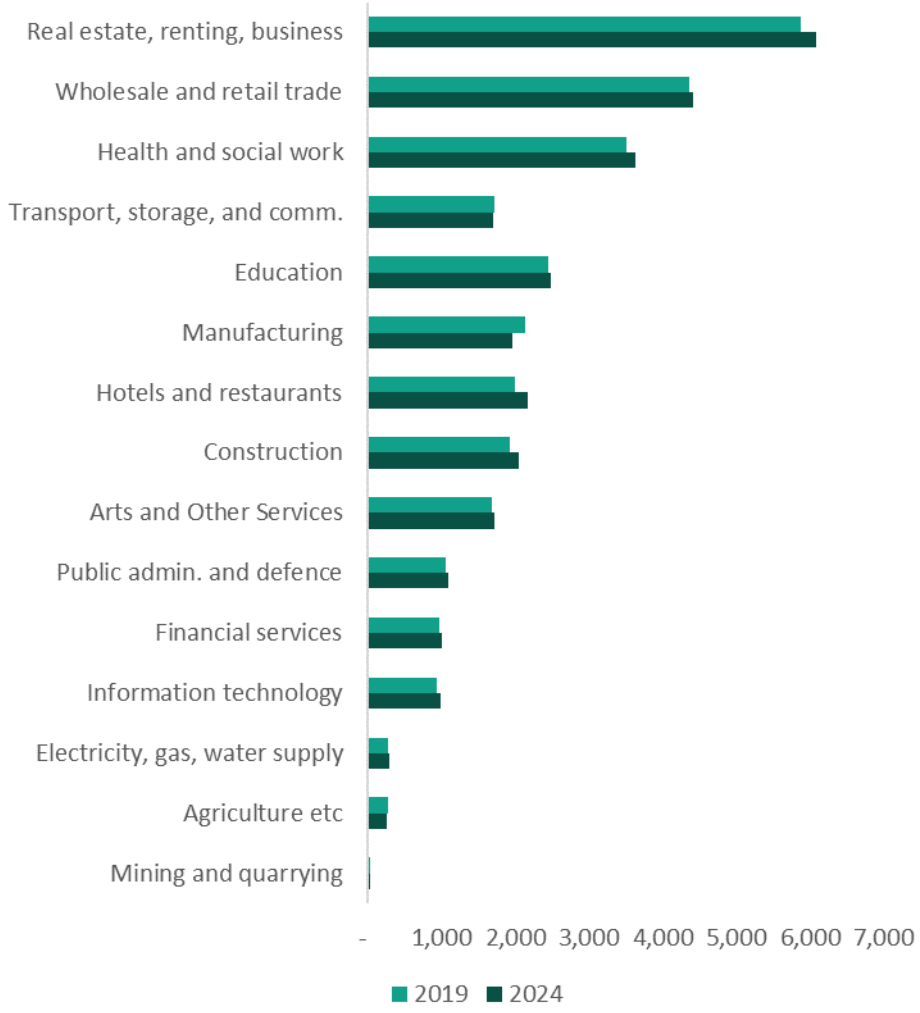


Forecast fall in employment in the manufacturing sector

Figure 5.4 below shows the projected change in employment in the UK between 2019 and 2024, by sector. Over this five-year period, overall employment is expected to grow by 2.2 per cent or 644,000 jobs, with the number of people working up from 29.2 million to 29.9 million. However, some industries are projected to reduce the volume of employment they generate. For example, manufacturing is expected to lose eight per cent of its workforce, or 170,000 jobs. This is the greatest expected decrease across all sectors, in an industry that is closely linked to the subjects taught at UTCs. Conversely, there is some growth in construction over the period (110,000).

[98] "VACS02: Vacancies by industry", Office for National Statistics, 2018. Dark green colour indicates UTC-relevant sectors

Figure 5.4 Projected employment by sector, 2019 and 2024, in 000s[99]



Forecast growth in technical occupations, alongside small fall in skilled trades occupations

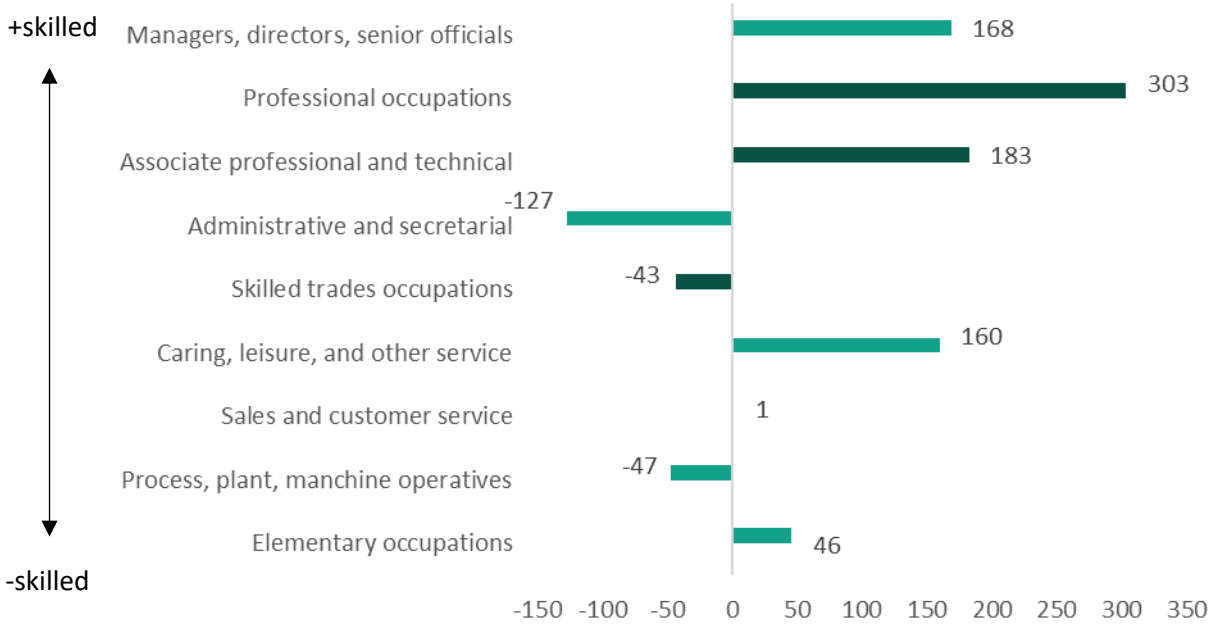
The projected trends in employment by sector do not tell us much about the skills that will be required in the labour market of the future. Some argue that England is transitioning to an hourglass economy, meaning that the future employment distribution will concentrate at both ends of the skills continuum, while mid-level jobs are at higher risk of automation and hollowing-out. [100] [101] Figure 5.5 shows the expected changes in employment by occupation, sorted by level of skills required.[102] [103]

There is predicted to be significant growth in most of the occupations relevant to UTCs (highlighted in dark green colour). Associate professional and technical occupations are expected to create

[99] Figures 5.4 – 5.9: UKCES, 'Working Futures 2014-2014', 2016
[100] Craig Holmes and Ken Mayhew, *The changing shape of the UK job market and its implications for the bottom half of earners,* (Resolution, 2012)
[101] Steve McIntosh, *Hollowing out and the future of the labour market* (Department for Business, Innovation, and Skills, 2013)
[102] "Standard Occupational Classification 2010 Volume 1 Structure and descriptions of unit groups" Office for National Statistics, 2010
[103] We only give numbers for the nine big job groups, which can be further disaggregated up to 25 groups.

183,000 new jobs over the period, and around 303,000 new positions are projected in professional occupations. Meanwhile, there is expected to be a fall of 43,000 in skilled trades occupations.

Figure 5.5 Projected employment change between 2019 and 2024 by occupation, in 000s

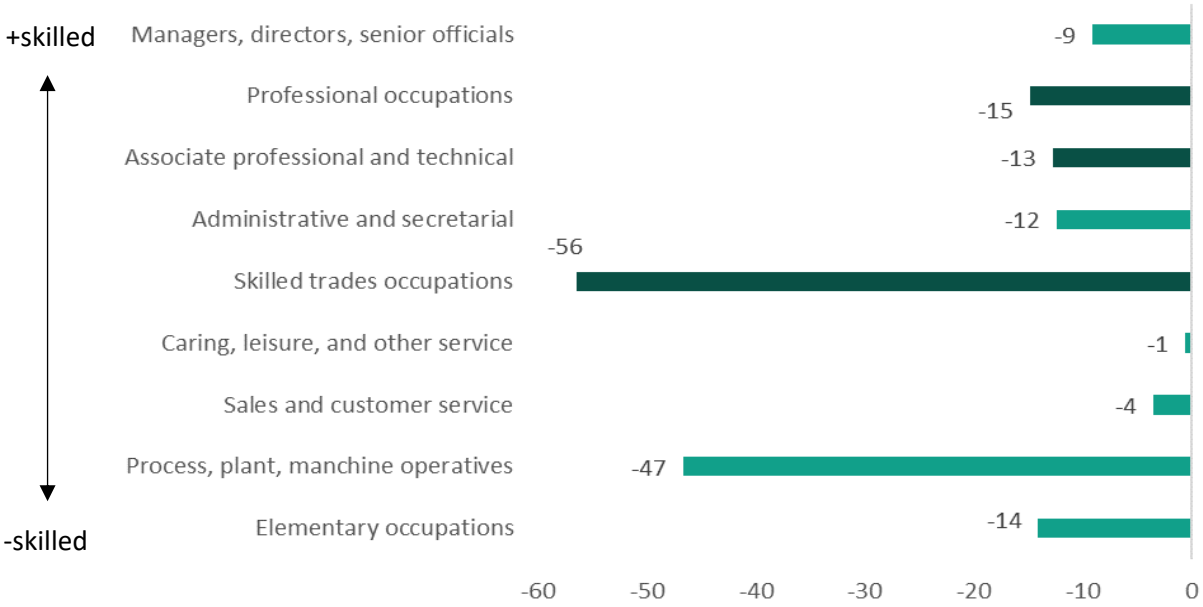


Whilst figures 5.4 and 5.5 tell us about either changes in sectors or occupations, this information is most powerful when we consider changes for occupations within a particular sector. Therefore, below we present four case studies for some of the sectors UTCs specialise in: manufacturing, construction, information technology, and health. The focus will remain the three relevant occupations already mentioned: professional occupations; associate professional and technical; and skilled trade occupations.

Case study 1: Manufacturing

UKCES' Working Futures data forecasts that, between 2019 and 2024, 170,000 jobs in the manufacturing sector will vanish. Job destruction will occur across all occupations but will be especially acute in one of the UTC target occupations, skilled trades, which will account for one third of the total fall in employment. The occupations requiring the highest level of skills will be the most resistant to job destruction and are expected to represent a greater share of total employment in the sector by the end of the period. However, they will still experience a reduction in the volume of jobs: 15,000 in professional occupations, and 13,000 in associate professional and technical occupations.

Figure 5.6 Projected employment change in the manufacturing sector between 2019 and 2024 by occupation, in 000s



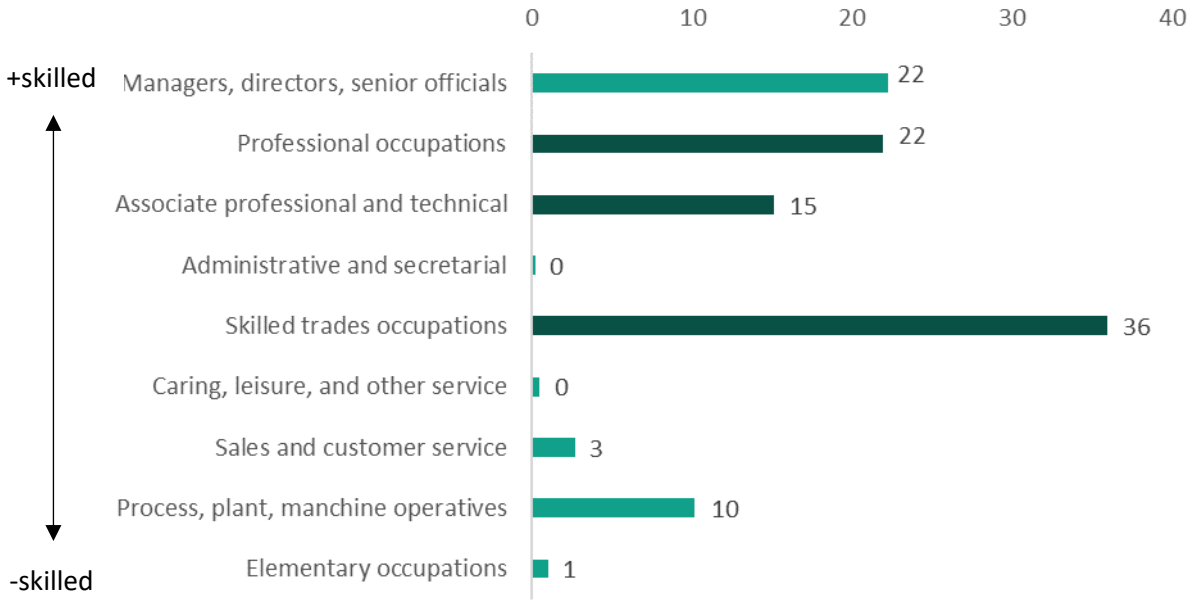
Case study 2: Construction

The construction sector requires employees with a wide range of skills and levels of specialisation. Among those, we also find engineers and highly skilled technical professionals, making construction a relevant sector to UTC leavers.

The construction sector is projected to generate 110,000 new jobs between 2019 and 2024, which makes it one of the fastest growing industries in both absolute and relative terms. According to the forecast, employment in the sector will grow by 5.8 per cent over the period, third only to the hospitality and catering sector and information technology.

The chart below shows that most of this growth will come from occupations for which UTCs train their students: skilled trades occupations (36,000 new vacancies), professional occupations (22,000) and associate professional and technical (15,000). Expansion will be relatively small in other middle- and low-skilled occupations.

Figure 5.7 Projected employment change in the construction sector between 2019 and 2024 by occupation, in 000s

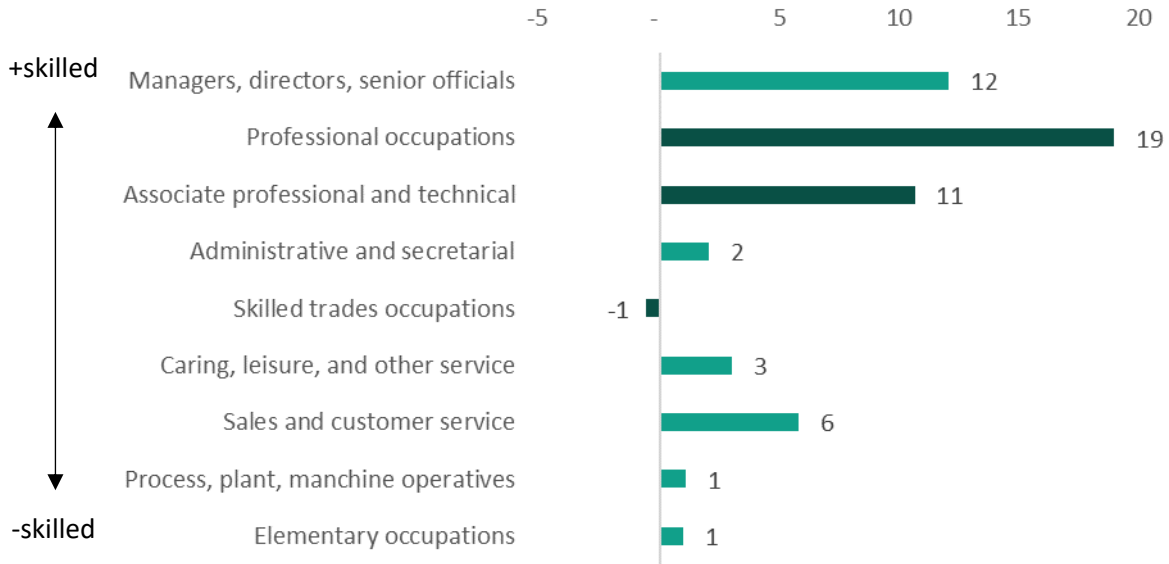


Case study 3: Information Technology

Some UTCs specialise in computing, technology, or have a digital focus. Therefore, the evolution of employment in the information technology sector is relevant to many UTC leavers.

Overall employment in this sector is expected to experience a 5.8 per cent increase between 2019 and 2024, which means just over 54,000 additional jobs. Employment is only expected to go down in one of the UTC target occupations: skilled trades, by 1,000 jobs. The largest growth in absolute numbers will occur in high-skilled occupations, with the two UTC target occupations projected to grow by 19,000 (professional occupations) and 11,000 (associate professional and technical).

Figure 5.8 Projected employment change in the information technology sector between 2019 and 2024 by occupation, in 000s



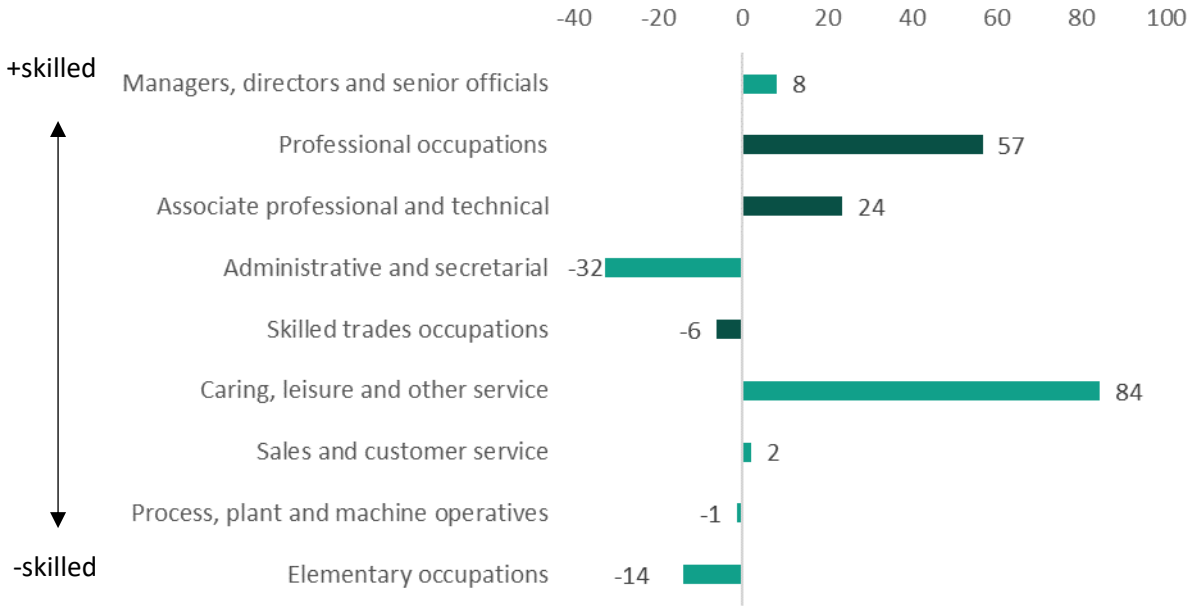
Case study 4: Health and social work

Some UTCs specialise in health, medicine, health technologies or health engineering. It is therefore relevant to analyse whether employment is expected to expand in this sector, and if so, what level of skills the new jobs would require.

Employment in this sector is projected to grow by 3.4 per cent over the 2019-2024 period, equivalent to just under 121,000 new jobs. There are two sources of employment growth in this industry. First, a large increase in the demand of very high-skilled professionals is expected, also in our target occupations: almost 57,000 in professional occupations and 24,000 associate professional and technical staff will be required. Second, the middle-low skilled caring occupations are forecast to surge by six per cent, adding more than 84,000 new jobs, probably reflecting that this industry group also includes social care.

Conversely, employment in middle-skilled occupations will fall, also affecting skilled trades occupations, which are projected to require 6,000 fewer workers at the end of the period.

Figure 5.9 Projected employment change in the health and social work sector between 2019 and 2024 by occupation, in 000s



Conclusions

There seemed to be a consensus among the participants in our roundtable that whilst national trends are important, local trends might be more relevant, because it is the interaction between local actors (employers, universities, educational institutions) that prompts the establishment of UTCs. In addition, many UTC leavers go on to fill apprenticeships and vacancies in the local area, so the local economic needs seemed to be perceived as more relevant than the national context. And there was a general agreement that, due to their scale, UTCs cannot and should not be expected to provide all high-skilled technical professionals that new employment will rely on, but that they should be part of a coordinated, joint national offer. Attendees also noted that the sectors and occupations presented here were still very broad and therefore were not describing the specific nature of roles suitable for UTC leavers.

Nevertheless, whilst there will be significant local variation, national trends will impact upon local labour markets. As such the findings here are of importance for the wider UTC national strategy and policies.

We find that areas with UTCs tend to have more large employers, higher numbers of jobs, and more vacancies that are hard to fill. However, differences are very small and by no means conclusive. UTCs specialise in sectors where the present level of vacancies is high or average, such as health and manufacturing. Our analysis shows that, with the exception of manufacturing, where employment is forecast to fall, all sectors in which UTCs specialise are projected to grow, especially in high-skilled occupations.

This suggests that the targeting of any new UTCs could be improved, so that they are established in in areas of high skills needs, along with suitable sponsorship from universities and large employers, and that UTC students might benefit from a broad focus on the sectors that will need new skilled workers. It also suggests that UTCs would benefit their students most by preparing them for continuation to higher levels of study, such as sub-bachelor (level 4 or 5) or bachelor (level 6) qualifications.

Conclusions and policy recommendations

This report has investigated the value of UTCs for students and the labour market. Our analysis shows that UTCs offer a more technical provision both at Key Stage 4 and Key Stage 5, meaning that more technical- and vocational-oriented students might, in theory, benefit from UTCs' curricular offer. Students are also a lot more likely to start an apprenticeship after leaving a UTC, suggesting that school-work transition might be better than elsewhere. Employers' involvement in co-designing the institution's curriculum, providing students with career advice, and even delivering work experience, might therefore be proving successful.

However, many UTCs are struggling to recruit a sufficient number of students, and this has led to a number of closures. This is largely a consequence of UTCs recruiting at age 14, while the English education system generally transitions at age 11 and 16. The scale of this challenge to the sustainability of UTCs as currently defined means that any small-scale policy modification is unlikely to address this issue.

This report highlights the overall poor performance of UTCs in delivering qualifications, which although not true of all UTCs, may also be contributing to their recruitment problems. For example, UTCs perform below average at Key Stage 4 against the government's headline indicator for secondary school performance, Progress 8.

It has been claimed that Progress 8, which is shared with parents through school performance tables and informs Ofsted inspections, might be unfair to UTCs. The measure considers the progress made between the end of Key Stage 2 and Key Stage 4, while UTCs start their provision at Key Stage 4. This means that UTCs are made accountable for a phase of education over which they have no control. In addition, the headline measures have a strong academic focus that, it could be argued, are biased against UTCs, which were set up to deliver technical education. This has been acknowledged by the Department for Education. Ofsted is also working on a new inspection framework that is expected to be less reliant on Progress 8 and other headline measures and more on the breadth and characteristics of the curriculum.

However, our analysis has indicated that UTC students also make less progress during Key Stage 4 than students in other institutions. In fact, they make three-quarters of a grade less progress during Key Stage 4 than in other institutions.

The poor performance of UTCs holds true even when focussing just on English and maths GCSEs, which can be considered the core of any Key Stage 4 curriculum, whether largely academic or vocational. It also holds true when controlling for the fact that UTC students take less eligible qualifications than their peers in other institutions.

Performance at Key Stage 5 is more mixed, with UTCs performing poorly at level 3 academic qualifications (A levels), both in terms of attainment and progress. Their performance in both level 3 applied general qualifications and Tech levels is at least average, and above that of Further Education colleges. Where UTCs seem to do particularly well is at level 2 English and maths retakes, where their students make more progress than in other institutions. Retention, however, is an issue across all qualifications, and most students do not complete the transition from Key Stage 4 to Key Stage 5.

Most UTCs are rated by Ofsted as 'inadequate' or 'requires improvement', and many more are in *special measures* or are reported to have *serious weaknesses* than other institutions. This is consistent across all the areas, not just those that are likely to take into account pupil progress, and including 16-19 study programmes. We have found no evidence that the time a UTC has been opened has any positive effect on their Ofsted ratings.

The report shows that UTCs are training students in industries where there is an expected growth in high-skilled technical jobs. This is the case for construction, health, and IT, among others. However, participants in our roundtable suggested that the needs of local employers, which are difficult to capture by national statistics, are in part driving the establishment of UTCs in particular areas. More research is needed to test this point. Attendees also mentioned that, with around 50 open, skill gaps cannot be fixed by UTCs alone.

Considering the above, it is fair to say that whilst UTCs might, in theory, perform an important function in delivering students well-equipped with skills in demand in the labour market, in practice they are not delivering in their current structure. Therefore, there is no evidence to support further expansion of the programme. However, the **recommendations** below would strengthen the programme:

Consider moving UTC admissions to age 16

In a number of countries, students make transitions before age 16, but this is not the case in England. Regardless of what the "right" age might be, the reality is England has a pre- and post-16 system. This means that admission at age 14 is not the norm and has failed to convince enough students, parents, carers and schools of its benefits, and there is no evidence that participation in UTCs at age 14 is likely to rise significantly without more fundamental changes to the education system. This has also made it difficult for many UTCs to remain viable. Furthermore, students make less progress during Key Stage 4 than in other institutions, and with most of them not continuing in the same institution beyond age 16, it is not clear that students are currently benefiting from all-through 14-19 provision.

UTCs could become flagship level 3 technical institutions

UTCs' provision of level 3 technical qualifications is often delivered at a higher quality than that of the Further Education colleges that might otherwise be the alternative for many UTC students. With their recruitment age set at 16, UTCs should focus on delivering high-quality existing technical qualifications and eventually T-levels relevant to local and national skill needs. With UTCs offering only Key Stage 5, there would be an opportunity for them to deliver a differentiated, high-quality level 3 technical provision. Academic qualifications, when available, should support core training aims and future progression. Building on their relationships with employers and universities, provision should be further connected to the level 4+ provision in Institutes of Technology, National Colleges and other providers, in line with the progression pathways described in the Post-16 Skills Plan. Provision should be linked to the needs of local employers, reflected in the UTCs' specialisms.

Better destinations measures are needed

Currently, destination measures capture student destinations two terms after finishing Key Stage 5, but take no account of the educational pathway that young people have taken during Key Stage 5, nor their grades. This means it is not possible to differentiate between those institutions which have "good" destinations on account of their intake and those that are actually effective at leading young people into further education, training or suitable

employment. This is particularly relevant for young people following a technical or vocational route. To this end, the destinations measures should be improved so that they allow for comparison with similar groups of students.

Bibliography

Andersen, Roy, Dominguez-Reig, Gerard, and Sellen, Peter. *Education for our Economic Future.* Education Policy Institute, 2017

Baker, Kenneth. *14-18-A New Vision for Secondary Education*. A&C Black, 2013

Burke, Jude. 'Baker clause update: DfE gears up to start 'direct intervention' as minister encourages providers to grass on schools'. *FE Week*, August 8, 2018

Bakhshi, Hasan, Downing, Jonathan M., Osborne, Michael A., and Schneider, Philippe. *The Future of Skills: Employment in 2030*. Pearson and Nesta, 2017

Cheary, Michael. *GCSE equivalents: What you need to know*, Reed

Cook, Will, Thorley, Craig, and Clifton, Jonathan. *Transitions at 14. Analysing the intake of 14-19 education institutions*. Institute for Public Policy Research, 2016

Department for Education. *Scope note/definition of UTCs. 2012*

Department for Education. *What are UTCs?* 2012

Department for Education. *16 to 18 accountability measures: technical guide. For measures in 2017 and 2018.* 2017

Department for Education. *The national funding formula for schools and high needs. Policy document*. 2017

Department for Education. *English Baccalaureate (EBacc). Policy* paper. 2017

Department for Education. *Implementing the English Baccalaureate Government consultation response*. 2017

Department for Education. *Revised GCSE and equivalent results in England 2016 to 2017 Quality and methodology information.* 2018

Department for Education. *16 to 19 Funding: how it works*. 2018

Department for Education. *The free school presumption Departmental advice for local authorities and new school proposers.* 2018

Department for Education. *A guide to new University Technical College revenue funding*. 2018

Department for Education. *Secondary accountability measures Guide for maintained secondary schools, academies and free schools.* 2018

Dromey, Joe, and McNeil, Clare. *Skills 2030: Why the adult skills system is failing to build an*

economy that works for everyone. Institute for Public Policy Research, 2017

Education Select Committee, 2 May 2018, HC 819

Gove, Michael. 'Dividing our children at 14 has not worked', *The Times*, February 10, 2017

Holmes, Craig, and Mayhew, Ken. *The Changing Shape of the UK Job Market and its Implications for the Bottom Half of Earners*. Resolution Foundation, 2012

Kettlewell, Kelly, Bernardinelli, Daniele, Hillary, Jude, and Sumner, Claudia. *University Technical Colleges: Beneath the Headlines. NFER Contextual Analysis*'. National Foundation for Educational Research, 2017

Long, Robert, and Bolton, Paul. *University Technical Colleges*. House of Commons Library, 2017

McCrone, Tami, Martin, Kerry, Sims, David, and Rush, Chloe. *Evaluation of university technical colleges Report – Year One* . National Foundation for Educational Research, 2017

McIntosh, Steve. *Hollowing out and the future of the labour market*. Department for Business, Innovation & Skills, 2013

Neil McIvor to Ed Humpherson, letter, 13 August 2018

Office for National Statistics. *Standard Occupational Classification 2010. Volume 1 Structure and descriptions of unit groups.* 2010

Ofsted. *Policy statement for inspecting new schools and schools that undergo a change in status.* 2018

Robertson, Alix. 'Multi-academy trusts fail to implement Baker clause'. *FE Week*, January 26, 2018

Social Mobility and Childhood Poverty Commission. *State of the Nation 2015: Social Mobility and Child Poverty in Great Britain.* 2015

Thorley, Craig. *Tech Transitions. UTCs, Studio Schools, and technical and vocational education in England's schools'*. Institute for Public Policy Research, 2017

Wilshaw, Michael, 'Speech at the Baker Dearing Trust conference'. *Ofsted*, 21 July 2016

Whittaker, Freddie. 'UTC@Harbourside is the ninth UTC to close', *FE Week*, July 2, 2018

Wolf, Alison, Dominguez-Reig, Gerard and Sellen, Peter. *Remaking Tertiary Education. Can we have a system that is fair and fit for purpose?* Education Policy Institute, 2016

Annex 1: List of STEM GCSEs

Our analysis of STEM GCSEs take-up in chapter 2 included the following subjects in the STEM (Science, Technology, Engineering, or Maths) category (in alphabetical order):

- Additional Science
- Applied Sciences
- Astronomy
- Biology
- Chemistry (General)
- Computer Science
- Computer Technology
- D & T (Design and Technology) Engineering
- D & T Product Design
- D & T Resistant Materials
- D & T Textiles Technology
- Electronic Engineering (General)
- Electronics (Physics)
- Engineering Studies
- Environmental Science
- Food Science/Technology
- Food Technology
- Further Additional Science
- Health Studies
- Human Biology
- Manufacturing (General)
- Manufacturing Technology
- Physics (General)
- Science (General/Combined)
- Statistics