Report

University Technical Colleges: Beneath the Headlines

NFER Contextual Analysis

National Foundation for Educational Research (NFER)

independent • insights • breadth • connections • outcomes

University Technical Colleges: Beneath the Headlines

NFER Contextual Analysis

Kelly Kettlewell
Daniele Bernardinelli
Jude Hillary
Claudia Sumner

How to cite this publication:
Kettlewell, K., Bernardinelli, D., Hillary, J. and Sumner, C. (2017). *University Technical Colleges: Beneath the Headlines. NFER Contextual Analysis.* Slough: NFER

Contents

Executive Summary

University Technical Colleges (UTCs) have been part of the schools' landscape since 2011, following the passing of the 2010 Academies Act. UTCs are new academies for 14- to 19-year olds where students combine technical and practical learning with academic study. At the start of the 2016/17 academic year, there were 48 UTCs in England.

When judged against a range of criteria such as student recruitment, attainment outcomes, and closures / conversions to different school types, it is clear that the introduction of UTCs has been very challenging. But is this the whole story? Have all UTCs had similar experiences? This research aims to look beneath the headline figures and examine the emerging data in its proper context, in order to assess what is really happening.

Most UTCs struggle to recruit students in sufficient numbers, but some are doing quite well

Although no UTC is currently operating at full capacity, there are wide variations in the rate which students are being recruited between UTCs. Three out of the 37 which have been open for at least two years are at or above 75 per cent capacity. Conversely, almost two-thirds of these 37 UTCs are operating at below 50 per cent capacity, which is unlikely to be sustainable in the medium term.

Given the context – that new schools often have difficulties establishing themselves, that UTCs are trying to attract students at a non-traditional age for moving school, and the reported lack of proper careers advice and information about options – it should not be surprising that some UTCs are struggling to recruit students. Expectations about what constitutes success in a UTC's early years need to be realistic.

UTC students have similar characteristics and prior attainment to their peers in "feeder schools"

While the UTC intake broadly mirrors that of the mainstream school demographic in terms of average characteristics and prior attainment, their students are less likely to come from the top 20 per cent of students nationally, based on Key Stage 2 outcomes. However, UTC students are more representative of their peers in their feeder schools which the UTC students previously attended.

About four in ten UTCs managed to attract intakes whose average Key Stage 2 attainment is at or above the national average for their academic year. However, there are also several UTCs with intakes whose Key Stage 2 attainment is well below the national average.

Students that go to UTCs have higher absence rates than peers in their feeder schools

At the start of Key Stage 3, absence rates for future UTC students are similar to their peers in the schools they attend during that phase. However, a significant difference emerges during the Key Stage 3 period, suggesting that there are some challenges with engagement for UTC students during that period. While absence rates are significantly higher for UTC students during Key Stage 4 compared to their peers in the schools they were previously at, the difference remained constant across the key stage as a whole.

On average, UTC students perform worse than their peers in feeder schools at Key Stage 4

The average Attainment 8 and Progress 8 scores for UTC students are significantly lower than their peers in their feeder schools. There are, however, large differences between the lowest and highest attaining

UTCs. Many are well below the Attainment 8 and Progress 8 national average, while a small number are achieving good Attainment 8 scores but are making less progress. However, we cannot tell how much of this progress made by UTC students while in secondary education can be attributed to their UTCs as no independent assessment is made of these students at the point they join their UTC.

There are questions about whether the headline performance measures fairly assess UTCs

Our analysis suggests that (at least some) of the poor performance of UTCs in the headline accountability measures may be because the academic measures do not recognise the composition or breadth of curriculum offered by most UTCs. In addition, UTCs are only responsible for two of the five years that students spend in secondary education, but are being held to account for all five years.

Key Recommendations

If the Government remains committed to UTCs being the best option for improving / promoting technical and vocational education, and for UTCs to continue to recruit students from age 14, they need to do more to help them establish themselves and thrive. The Government should:

- Independently assess students attending UTCs at the point of entry so that progress while in the institution can be properly measured and UTCs can be held to account for the time that the student attends the institution.

- Urgently examine how well the current headline accountability measures fit with the curriculum and purpose of UTCs, with the aim of ensuring that they do not disadvantage UTCs (or their students). If this concludes the headline measures do not assess

UTCs fairly, consideration should be given as to how the existing measures might be adapted or complemented with additional measures (for example, a greater focus on destination and employability skills measures) to better assess UTC performance.

- Review the non-accredited technical and vocational qualifications on offer in UTCs and provide guidance about suitable accredited alternatives where they exist. If necessary, work with awarding bodies to develop suitable qualifications that can be accredited.

- Conduct further work to review whether there are other disincentives in the system (for example, the impact on a school's funding) which may be hindering UTCs from recruiting pupils, and take appropriate action to address these to ensure there is a level playing field.

- Commission research into higher attaining UTCs to identify why they are more successful, and how they can be further supported so this can be replicated when future UTCs are set up.

- Continue to carefully monitor the performance of UTCs, and investigate their performance based on more appropriate performance measures.

Unless UTCs get more support from Government to overcome some of the inherent challenges they face, we believe they will continue to struggle and be vulnerable to closure. Over time, this may damage the credibility of the technical / vocational sector. If the Government is not prepared to provide this support, it might be best for it to reconsider the rationale and purpose of UTCs.

UTCs: the story so far

The Government's vision

UTCs were first introduced under the free schools policy as part of the 2010 Academics Act, which aimed to promote a more autonomous and self-improving school system. Initially called 'Technical Academies' (Cabinet Office, 2010), UTCs were created to promote diversity in the school system and to improve / promote vocational education.

The first UTC opened in September 2011, with a number opening in each subsequent year. In the 2016 Departmental Plan (DfE, 2016a) the Department for Education committed to the expansion of UTCs, to "ensure there is a University Technical College within reach of every city".

The current UTC landscape

At the start of the 2016/17 academic year, 48 UTCs[1] were open across England, with a further five scheduled to open in 2017 and one in 2018. The North West region[2] has the highest number of open UTCs (nine) while the North East currently has just one open UTC in operation, with another one planned for 2018. Most regions have either six or seven UTCs, with the exception of the East Midlands (three) and the North East (two).

What are UTCs?

UTCs are all-ability and mixed-sex state funded academies for 14- to 19-year-olds that:

- are sponsored by a University and employers who contribute to the development of the curriculum

- specialise in one or two technical areas, which are generally STEM-related, require highly specialised equipment and are linked to the skills gaps in their region

- value academic, technical and practical education equally

- have a curriculum ratio of 60 per cent academic to 40 per cent vocational / technical at key stage 4

- are smaller than most secondary schools, with an average capacity of around 600 students

- generally run a longer school day compared to other mainstream secondary schools

- focus on employability skills and employer-led projects

- do not have to follow the national curriculum or employ teachers with qualified teacher status. However they are judged against the same accountability measures as other schools.

---

[1] However, two of these UTCs, Lancashire and Tottenham did not recruit any year 10 pupils in September 2016
[2] Government Office Region

A challenging start

There has been significant public criticism of the UTC model in the educational / wider media, with a number of concerns expressed in relation to their viability, performance and cost. Some examples of the negative coverage include: 'Technical Colleges are Half Empty' (Bennett, 2017), 'Crisis Deepens as learners drop at two thirds of UTCs' (Camden, 2017) and 'Gove admits UTC experiment failed' (Burke, 2017).

Four UTCs have already closed or changed status to a different type of school and a further four have announced they will close or re-purpose in summer 2017. The main reason cited for these closures is a failure to recruit sufficient student numbers to ensure they are financially viable (Long and Bolton, 2017).

Financial viability is an ongoing issue for a number of UTCs, with the Department for Education reported to have concerns about the financial viability of nine UTCs (NAO, 2017). The creation of new school places at free schools (including UTCs) has been shown to be significantly more expensive than the expansion of mainstream secondary schools, mainly due to the need to purchase land for new school buildings (NAO, 2017). While we recognise that UTC finance is key to the future of this school model, this research focuses on other aspects of the model.

What has the Government done to support UTCs?

In October 2015, the Government revised the guidance on applications to open a UTC (DfE, 2016b). This emphasised the importance of the UTC entering into partnership arrangements, including partnering with successful secondary schools through multi-academy trusts (MATs), the value of secondary expertise and better targeting of the locations of future UTCs. This guidance was designed to ensure that new UTCs were better able to recruit the numbers of students to meet their capacity. However, concerns have been raised in relation to the role of UTCs within MATs, with some suggestions that mainstream secondary schools may be encouraging their under-performing students to transfer to UTCs in order to reduce the risk of low performance being attributed to their school (Cooke *et al.*, 2016).

As relatively few students change institution at age 14 in England, one of the main challenges faced by UTCs is attracting students at the end of Year 9. To address concerns that students and their parents are unaware of the existence of UTCs and the specialist options they offer, the Government introduced legislation in 2016 requiring schools to collaborate with other learning providers to ensure that young people are made aware of all of the progression routes available. The Technical and Further Education Bill (2017) includes a clause that requires schools to ensure that a range of education and training providers can access pupils aged 13 to 18 years (GB, Statutes, 2017).

The Government also introduced a statutory responsibility for all local authorities to write to parents with children in Year 9 to tell them of the opportunities at age 14. Although this legislation comes into force in September 2017, the Secretary of State for Education required schools to instigate it with immediate effect, so that schools wrote to parents in March 2017. The effect of this should start to be seen in the intakes for the 2017/18 academic year.

What research has there been to date?

Despite adverse reports about UTCs, little research has been undertaken to try to understand them – to assess their performance and the characteristics of the students who attend them. This partly reflects a lack of available performance data, as new cohorts of students work their way through the system. However, researchers are making efforts to consider the contribution of UTCs to the wider schools landscape, and to explore the latest available school performance data. Previous research to date has addressed the broader issue of 14-19 provision (Cooke *et al.*, 2016) and technical transitions (Thorley, 2017), finding that most UTCs operate significantly under capacity and perform poorly on EBacc and Progress 8 measures, despite attracting a broadly comprehensive student intake. The latter report recommends that UTCs should be changed to become high-quality providers of technical education for students aged 16–19.

What does this research aim to do?

This analysis aims to build on existing research into UTCs by comparing the characteristics and outcomes of UTC students with similar students at the schools they attended during Key Stage 3 prior to joining the UTC.

We have analysed the most recent data in order to explore the latest evidence on UTC students, and consider how the intake is evolving. Importantly, we believe the characteristics of students in UTCs should be compared with other students in their local area. This is because there may be important localised differences in the areas from which UTCs draw their students which are concealed when looking at national averages.

There is very little analysis exploring UTC performance beyond the headline accountability measures (EBacc and Progress 8). We have attempted to look beneath the headline data and consider whether the breadth of the curriculum on offer at UTCs is adequately recognised.

The research carried out to date has focussed on looking at UTC institutions as a group. However, little is known about whether all UTCs are the same or whether there are any differences between them in terms of the number of the students they attract, their characteristics and performance.

In light of this, we believe it is important to build on the very limited evidence base to further understand UTCs. Specifically this research has focused on the following research questions:

- Which mainstream schools are UTC students coming from at the beginning of Key Stage 4? What are their characteristics and how do these compare to other students who remained at the feeder schools that the UTC students came from?

- Is the intake of UTC students changing over time as UTCs become more established and greater in number and, if so, how?

- How well are UTCs performing when assessed using headline accountability measures? How well are these attuned to UTC curriculum and purpose?

- Are UTCs a homogenous group in relation to the size and characteristics of their intakes, and their performance outcomes?

Findings

Summary of the methodology

We analysed a number of different secondary data sources in this research including the National Pupil Database (for Year 10 and 11 cohorts from 2012/13 to 2016/17), DfE Performance data (2016), Ofsted data (2016), Schools, Pupils and their Characteristics data (2013 to 2016) and have undertaken a desk research exercise.

In section 3.2, we compare Year 10 UTC students to their peers within the local authorities where the UTCs are based, and to the national cohort. We have also compared them to students who remained in the mainstream secondary schools that UTC students came from (which we call UTC feeder schools). These comparisons are based on data from the year 2016/17 Autumn census, unless otherwise specified.

To investigate whether UTCs are homogeneous, we look at the characteristics of the students they attracted and their performance. We group UTCs by the latest Key Stage 4 Attainment 8 and Progress 8 scores into three clusters; the highest attaining UTCs, the middle attaining UTCs and the lowest attaining UTCs. The UTCs are grouped using data for the 2014/15 Year 10 cohort as this is the latest cohort for which we have performance data (Key Stage 4 results for summer term 2016).

A comprehensive summary of the methodology can be found in Appendix A.

3.1 How many students are attending UTCs?

All UTCs are operating below capacity, but some are doing quite well

When considering UTC student numbers, it is important to bear in mind that UTCs, like all new schools, take time to establish themselves and build up to capacity. It is difficult for new schools to attract students when it does not have a proven track record. Furthermore, the scale of the challenge facing UTCs is all the greater as they are seeking to recruit students at age 14, which is an atypical transition point for students in England to change schools.

The capacity of UTCs range from 440 to 924 students, with most having a capacity of 600 students. No UTC was operating at or near their official capacity in September 2016. The three which were operating at or above three-quarters capacity in 2016/17 were Aston University Engineering Academy (87 per cent), the JCB Academy (79 per cent) and Sheffield UTC (75 per cent) while Silverstone UTC (74 per cent) and Health Futures (72 per cent) were close to the three-quarter mark. However, of the 37 UTCs that have been open for at least two years, only 14 are operating at or above 50 per cent capacity while nine are operating below 25 per cent capacity.

Most UTCs started by recruiting students into Years 10 and 12 in their first year of operation, so it is only in the second year of operation that student numbers could rise above 50 per cent capacity. Of the UTCs which had been open for at least three years, a few have continued to see large increases (by +10 percentage points) in their student numbers in their third year of operation,

indicating that some are continuing to grow after their first two years. However, many of the UTCs that had been open for at least three years saw a decline in student numbers in 2016/17.

As shown in Figure 3.1, the average number of students had been increasing year-on-year, albeit slowly, up until 2015/16. However, the average number of pupils per UTC levelled off in the 2016/17 academic year.

Figure 3.1 Number of open UTCs and average student numbers in UTCs

■ Number of Open UTCs ■ Average Number Of Students in UTCs
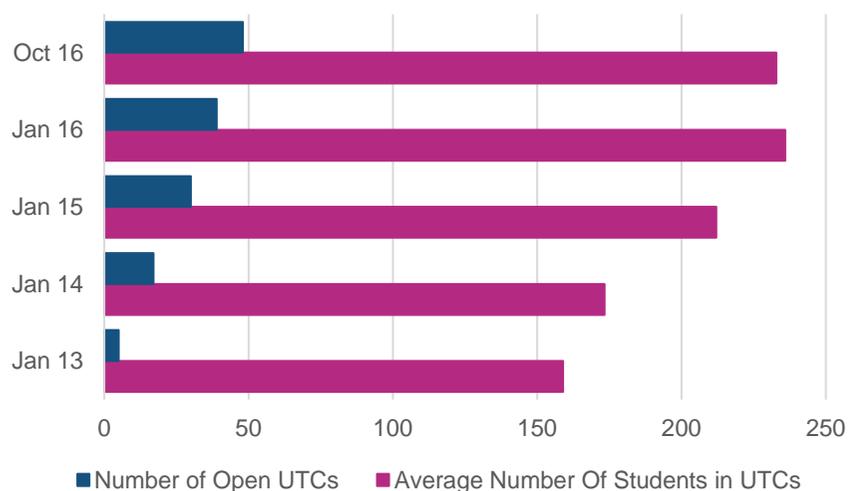
Source: Department for Education: Schools, Pupils and their Characteristics (2013-2016); September 2016 from Autumn School Census 2016

This, however, conceals big differences in recruitment between UTCs depending on how long they have been open for, as shown in Figure 3.2. This may partly be due to some schools opening with

smaller cohorts than their official capacity figures in their first few years of operation.

Figure 3.2 Average number of students by UTC cohort

■ Jan 2016 ■ Oct 2016
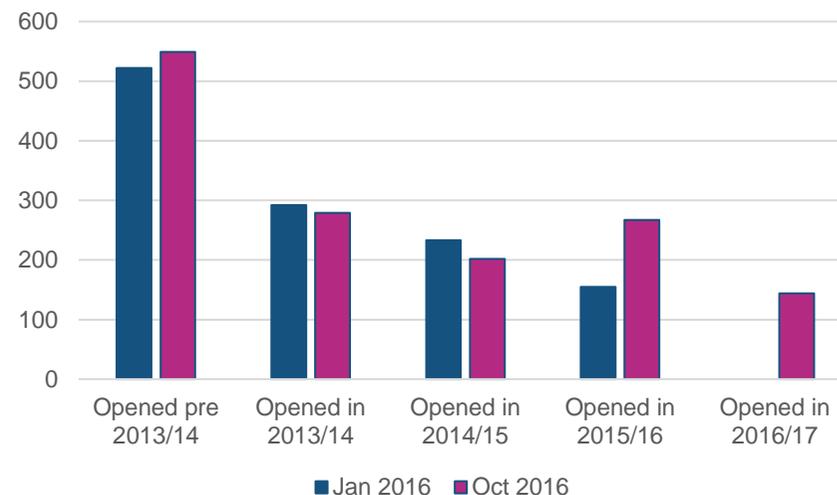
Note: The chart only includes UTCs which were open at the beginning of the 2016/17 academic year.

The longest standing UTCs have continued to increase their student numbers (up 5 per cent), although it should be noted that three of the original five UTCs in this cohort, which had low student numbers, have closed. Conversely the average number of students in UTCs which opened in 2013/14 and 2014/15 both fell in the latest year, by 5 per cent and 13 per cent, respectively. And while UTCs opening in 2015/16 show a large increase in numbers, this is due to them having students in each academic year rather than just Years 10 / 12, as is the practice of most UTCs in their first year. The number of students in UTCs opening in 2015/16 increased by 72 per cent, which is rather less than the doubling in numbers that might have been expected.

One of the issues that was thought to be affecting recruitment by UTCs and other technical and vocational institutions was a lack of information about the potential options available at age 14. The Government has recently legislated to address this, which includes a new statutory responsibility for local authorities to write to parents of Year 9 children to tell them about the opportunities at age 14. This happened for the first time in March 2017, so the impact on student recruitment should start to be seen from the 2017/18 academic year. Informal early sources suggest these measures are having a positive effect on new applications, but we need to wait for the official statistics to see whether this is the case.

Higher attaining UTCs have a higher intake compared to lower attaining UTCs

The average headcount for the highest attaining group of UTCs based on 2015/16 Key Stage 4 outcomes was 328 students in 2016/17. This compares to 124 for the UTCs with the lowest Key Stage 4 attainment. The two groups have similar profiles in terms of length of time the UTCs have been open, suggesting that the difference in headcount is not a reflection of the length of time these UTCs have been open, but a reflection of the differences in how well these two groups of institutions are able to recruit students.

3.2 Who is choosing to attend UTCs at Key Stage 4?

The intake of Year 10 students in UTCs is disproportionately male

Since the first cohort of UTCs opened, the Year 10 intake has, on average, been more than 70 per cent male. This may reflect the STEM specialism offered by the majority of UTCs, since evidence indicates that these subjects attract more males than females across schools, university and employment. There is an indication that the gender balance between UTC students is improving slightly. As illustrated in Figure 3.3, there has been a small year-on-year increase in the proportion of females attending UTCs.

Figure 3.3 Percentage of Year 10 in UTCs by gender over time
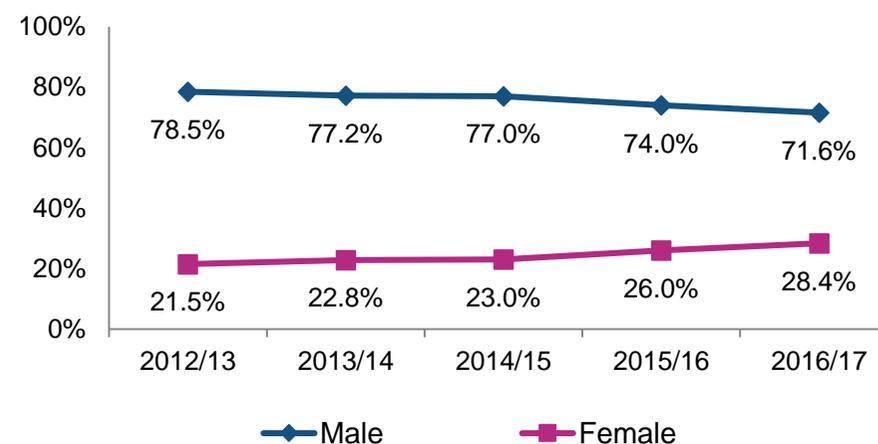
This narrowing of the gender gap has been seen across many UTCs, regardless of specialism. For example, Bristol Technology and Engineering Academy opened in 2013/14 with an intake that was 91.4 per cent male. This had fallen to 78.3 per cent by 2016/17. Liverpool Life Sciences UTC showed the opposite pattern; 31.0 per cent of students were male in 2013/14 compared to 36.2 per cent in 2016/17. This is one of three UTCs which have more females on roll than males, which is likely to be due to nature of the technical specialism subjects being offered.

It is unclear from the data why there has been this slight narrowing of the gender gap. Whether it reflects the recruitment strategies of the UTCs, a greater number of UTCs with specialisms more attractive to female students, or whether more young women are interested in studying engineering, maths and science cannot be determined from an analysis of secondary data alone.

## The characteristics of Year 10 students at UTCs are similar to other students in the local authority

The proportion of Year 10 students enrolling at a UTC who are eligible for free school meals (FSM) broadly reflects the proportion of Year 10 FSM students in the local authorities where UTCs are located. In 2013/14, there was a difference of half a percentage point (16.3 per cent in UTCs compared to 16.8 in local authorities). In 2016/17 this difference fell slightly to 0.4 percentage points (13.1 per cent in UTCs compared to 13.5 per cent).

The proportion of Year 10 UTC students with special educational needs (SEN) has fallen since the initial cohort (2012/13). This reflects a national downward trend in the proportion of students identified as

having SEN, but remains slightly higher than other students in the local authorities where the UTCs are located. In 2012/13, 23.6 per cent of Year 10 students in UTCs had SEN, compared with their wider local authority average of just over 21.4 per cent. By 2016/17 the proportion of the Year 10 intake with SEN was 15.5 per cent in UTCs compared to 14.5 per cent in their wider local authorities.

The lowest attaining UTCs have a much higher proportion of students with SEN

Figure 3.4 Percentage of students in UTCs who are FSM and SEN by attainment group (autumn 2016/17 Year 10 intake)
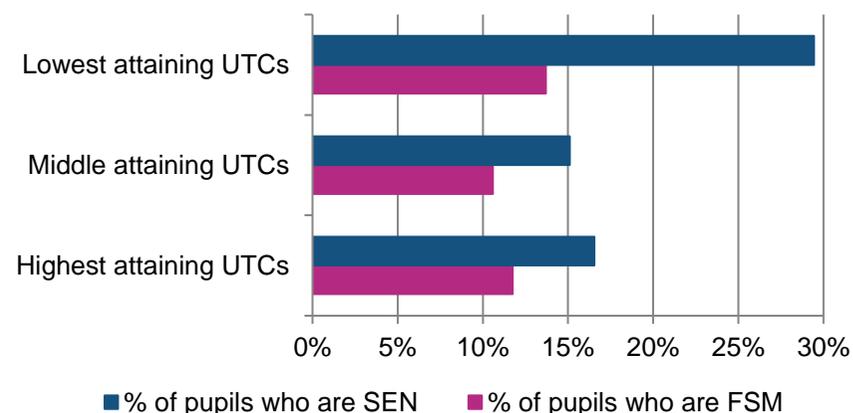

There was a relatively small difference in the proportion of students with FSM eligibility between the UTC attainment groups. However, the UTCs within the lowest attaining group have a substantially higher proportion of students with SEN compared to other groups.

Students attending UTCs have broadly similar prior attainment to their peers

Overall, successive Year 10 cohorts in UTCs have broadly similar *average* prior attainment to students in other mainstream secondary schools, as measured by Key Stage 2 Average Points Score. This has remained consistent since the 2012/13 intake. In 2016/17, the Key Stage 2 score for UTC pupils at Year 10 was 28.1, which is comparable to the average for the corresponding local authorities which was 28.3, and the national average of 28.2 for the same cohort.

While the average prior attainment for UTCs is broadly in line with mainstream secondary schools, are UTCs managing to attract students of all ability levels? In order to explore this, we looked at the full distribution of Key Stage 2 attainment for the Year 10 intake.

Figure 3.5 Proportion of UTC students by quintile of Key Stage 2 attainment (2016/17 Year 10 intake)
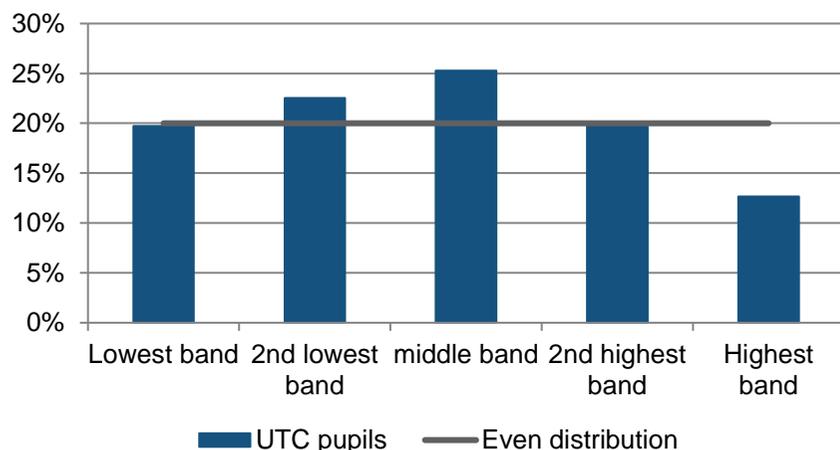
As shown in Figure 3.5, the intake is not equally representative across the whole distribution. Higher achieving pupils across all mainstream secondary schools are less likely to attend UTCs while students in the lower middle to middle quintiles are more likely to attend.

If, on the other hand, we look at the distribution of Key Stage 2 attainment within each feeder school, we can see that UTCs have attracted a more representative intake from those schools.

### Figure 3.6 Proportion of UTC students by quintile of Key Stage 2 attainment within their previous schools (2016/17 Year 10 intake)
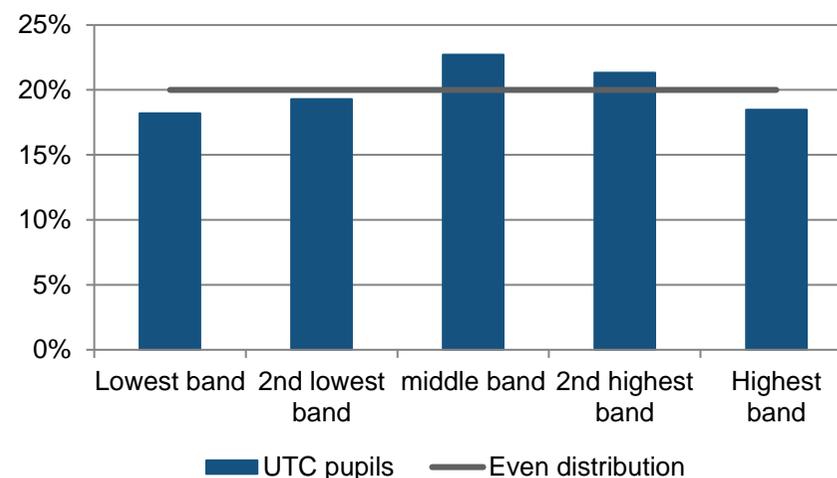
This suggests that feeder schools might not be nationally representative in terms of prior attainment of their intake. Figure 3.7 confirms this, showing fewer feeder school pupils represented in the top quintile of Key Stage 2 attainment. Overall, UTCs are attracting

students from across the ability spectrum in *their feeder schools,* but conversely students in the top 20 per cent of Key Stage 2 attainment nationally are less likely to be on roll in a feeder school.

Figure 3.7 Proportion of students in UTC feeder schools by quintile of Key Stage 2 attainment (2016/17 Year 10 intake)

Legend: Pupils in UTC feeder schools / Even distribution
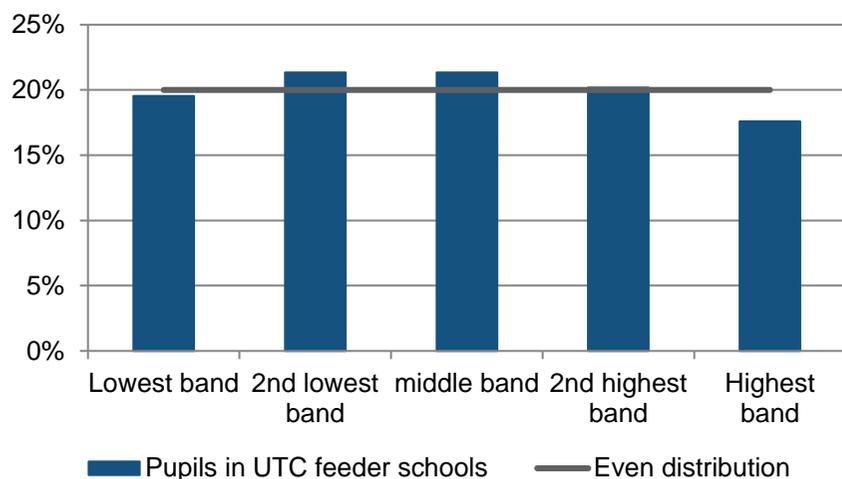
The prior attainment of students attending different UTCs varies widely

For 2016/17 Year 10 pupils, the prior attainment of students attending the highest attaining UTCs is higher than that of the students attending the lowest attaining UTCs – 28.8 compared to 27.1, a difference of almost two points.

The data shows that there are substantial differences between UTCs in terms of prior student attainment. In 2016/17, the national average

for Key Stage 2 average points score for Year 10 pupils was 28.2. Students attending UTC Oxfordshire had the highest average prior attainment score at 29.4, while students at Daventry UTC had the lowest, with 25.4. Of the 46 UTCs with a Year 10 intake in September 2016, 17 have an intake with a Key Stage 2 average point score above the national average. Conversely 29 UTCs are below the national average for the corresponding cohort, including three that were classified as high performing based on 2015/16 Key Stage 4 attainment / progress, and all those classified as low performing.

Why are some UTCs attracting higher achieving students than others?

The large variations in the number and characteristics of the students that UTCs are able to recruit could be due to a number of reasons. For example, some UTCs may have better quality recruitment processes. Alternatively some UTCs may find it easier to recruit students because of the technical specialisms they offer or because they have one or more high-profile, well respected employers / universities with high local visibility associated with them. Another possibility might be due to a lack of good or outstanding secondary school places in the local area in which the UTC is based.

The number and quality of students does not appear to vary according to specialism, region (excluding London, where to date UTCs have not had a strong track record), numbers of employers involved or curriculum.

3.3 How do absence rates for UTC and non-UTC students compare?

UTC students have higher than average absence rates during Key Stage 3 and 4

In the absence of attainment data for the end of Key Stage 3, it is difficult to measure how much progress students make while at a UTC. However, we can investigate the absence history of students as a proxy for engagement in education during Key Stage 3.

In order to investigate absence, we matched Year 11 UTC students in 2015/16 to similar students in their feeder schools. Students were matched using a mixed matching method (see methodology section) based on gender; ethnicity; eligibility for FSM; SEN; and prior attainment at Key Stage 2. A number of students could not be adequately matched so this comparison is based on a sample of 1803 UTC students out of a total of 1942.

This analysis showed that in the first year of Key Stage 3, the absence rates of future UTC pupils were marginally higher than their peers in the comparison group, albeit not significantly so. However, while absence rates increased for both groups during Key Stage 3, they grew more strongly for future UTC students and a statistically significant gap in absence rates opened between UTC students and the comparison group.

We also found that UTC students continued to have significantly higher absence rates during Key Stage 4 compared to the matched comparison group. However, this difference stayed broadly the same across the two year period as a whole.

This analysis of absence rates suggests that many UTC students may have faced some challenges in terms of engagement in school, which started during their Key Stage 3 years, and which are likely to have increased the scale of challenge faced by UTCs.

3.4 How do UTC students perform at Key Stage 4?

UTC students perform less well at Key Stage 4 than similar students in feeder schools

To measure UTC student performance at Key Stage 4, we looked at the attainment of UTC students to the matched comparison group.

As shown in Table 3.1, when compared to similar students who remained in feeder schools, students in UTCs:

- are entered for significantly fewer GCSEs or equivalent qualifications

- achieve significantly fewer qualifications at level 2 or above

- achieve a significantly lower score in the English Baccalaureate (EBacc) English component

- achieve a similar score in the EBacc mathematics component

- achieve a slightly lower score in EBacc science (though note the footnote at the bottom of the table).

When we consider student performance in relation to the new headline accountability measures, we can see that UTC students achieve significantly lower average scores on Attainment 8 and Progress 8.

Table 3.1   Differences in attainment between UTC and non-UTC students at Key Stage 4 (2015/16 attainment data)

	UTC students	Comparison group	Difference
Number of valid GCSE or equivalent entries	8.8	9.5	**-0.7***
Number of qualifications achieved at Level 2	4.8	6.1	**-1.3 ***
Average attainment 8 score	44.6	48.5	**-3.9 ***
Average Progress 8 Score	-0.54	-0.13	**-0.40***
Score in EBacc English	4.6	5.1	**-0.5 ***
Score in EBacc Maths	4.9	4.9	0.0
Score in EBacc Science +	4.8	4.9	-0.1

*   Difference is statistically significant

+   Care should be taken when interpreting the EBacc science data as this subject has a lower student uptake (about 90 per cent) compared to English and maths (close to 100 per cent). This may result in a slightly larger chance of a student studying science being matched to a non-science student during the matching process, which means the science estimates are subject to a slightly wider margin of error.

There is wide variation in the attainment of students at different UTCs

Table 3.1 presents quite a negative picture about the outcomes UTC students achieve as a whole, but is this the case for all UTCs?

Table 3.2   Differences between highest attaining UTCs and lowest attaining UTCs at Key Stage 4 (2015/16 data)

	Highest attaining UTCs	Lowest attaining UTCs	National average
Average Progress 8 score	-0.23	-1.09	-0.03
Average Attainment 8 score	48.8	36.0	49.9
Per cent achieving A*-C English and maths	57.4%	21.4%	63.0%
Per cent students entered for EBacc	7.1%	11.5%	39.7%
Average Progress 8 score for English	-0.33	-1.10	-0.04
Average Progress 8 score for Maths	0.22	-0.67	-0.02

Looking at the attainment of all UTC students as a group conceals a wide variation in student outcomes between different UTCs. As Table 3.2 highlights, students at the higher attaining UTCs perform better at GCSE English compared to the lowest attaining UTCs. They also show particularly strong progress in maths, even better than the national average. However, the overall Progress 8 scores achieved by UTC students in the highest attaining UTCs are still below the national average.

The performance of students at the highest attaining UTCs reflects the higher prior attainment of their students. However, the progress data also shows that students who choose to attend a higher attaining UTC make more progress than their peers at the lower performing UTCs, albeit lower than the average progress made by all students nationally.

3.5 How well do headline accountability measures judge UTC performance?

Although UTCs do not perform so well in headline accountability measures, it is questionable whether these measures fairly assess UTCs

It appears that students attending UTCs are not studying or achieving as many qualifications as their peers and not making as much progress between Key Stages 2 to 4 as students who attend mainstream secondary schools.

However, is a simplistic reading of the headline data appropriate in this context, given the aims and purpose of UTCs? On one hand, the

Government's policy may be that core academic qualifications represent a student's best chance to achieving good employability, and the headline measures are therefore an important end in themselves. Conversely, commonly used accountability measures may not be appropriate for UTCs because:

- students attend a UTC for just two of the five years between Key Stages 2 and 4, but UTCs are held to account for their students' progress over the full five years

- academic performance measures do not fully recognise the technical and vocational share of the UTCs' curriculum or some of the qualifications that their employer sponsors wish their students to study

- UTCs are set up with the explicit intention to devote a significant part of their curriculum to focusing on employability skills and employer-led projects, which the headline accountability measures do not take into account.

These factors are discussed in more detail below.

Measuring progress between Key Stages 2 and 4

UTC students move from their previous school into a UTC at the beginning of Key Stage 4 (Year 10). Prior to this, they will have spent Key Stage 3 (Years 7, 8 and 9) in a mainstream secondary school.

There is no standardised, independent measurement of student attainment prior to starting at a UTC, making it difficult to measure the value added by the UTC. Consequently, while there is a divergence in attainment between UTC and non-UTC students between Key Stages 2 and 4, there is not enough relevant data

available on individual students to determine when this divergence takes place – during Key Stage 3 or Key Stage 4. The current accountability system attributes all progress made (or lost) to the institution in which students complete their Key Stage 4 qualifications (GCSE and equivalents). While this is appropriate for a mainstream secondary school where students join at 11 years old, this does not work well for a UTC. The attainment of individual students may have dropped in Years 7, 8 and 9, before they attended the UTC.

As noted earlier in this report, given the lack of an independent Key Stage 3 assessment, we analysed absence data as a proxy for assessing the level of school engagement at Key Stage 3. This revealed a significantly higher level of absence throughout Key Stage 3 among UTC students when compared with their peers. This suggests that there are some differences in relation to the level of school engagement between UTC and non-UTC students during Years 7, 8 and 9. These students may have fallen behind their peers before they left their feeder school, so could be starting Key Stage 4 at the UTC at a lower baseline level. But in the absence of an independent assessment, we just do not know what added value UTCs are achieving for their students.

The UTC curriculum and qualifications studied do not easily align with academic performance measures

There is a mismatch between the UTC curriculum, which is designed to be 60 per cent academic and 40 per cent technical at Key Stage 4 and Attainment 8 / Progress 8, which only allow up to 30 per cent credit for technical / vocational qualifications in the open slots. Vocational qualifications do not count at all towards the EBacc.

The UTC curriculum is meant to be designed in collaboration with the employer sponsors and University partners so that it is aligned with the specialisms of the UTC and meets the needs of employers. However, some qualifications valued by employers, such as some vocational qualifications, are not approved for inclusion in the Attainment 8 / Progress 8 measures. They may also require a greater amount of teaching time.

These factors may be contributing to some of the findings we observed when looking at Attainment 8 scores for UTC students. Our analysis showed that in seven of the 26 UTCs with Key Stage 4 scores in 2015/16, less than 50 per cent of students filled all Attainment 8 slots, with students less likely to fill the 'EBacc' slots than the 'open' slots. Overall, 63.6 per cent of all UTC students filled all Attainment 8 slots compared to a national average of 80.1 per cent.

As a result of these issues, UTCs are likely to perform less well when compared to mainstream secondary schools using academic performance measures such as Attainment 8 and Progress 8.

The headline measures do not adequately measure the broader employability skills or outcomes that UTCs that have been set up to deliver

A UTC curriculum focuses on providing students with employability skills and offers substantial opportunities for students to work on employer-led projects. Despite the importance of these to the UTC offer, these elements of the curriculum are not measured at all through the qualifications approved for headline accountability measures.

As well as not measuring important parts of the UTC curriculum, the headline accountability measures lack the breadth to measure the wider purpose and outcomes that UTCs have been set up to deliver. The existing measures do not attempt to capture the value of employers being strongly engaged in UTCs or what successful outcomes may be achieved through doing this well. For example, destinations of students after they leave UTCs should be an important indicator of how well UTCs are helping them to achieve good outcomes. While initial self-reported data from UTCs on destinations suggests promising outcomes, we need to wait for the Government's official statistics to assess this properly. But while the Government publishes official data on destinations, these are not part of the headline accountability measures at Key Stage 4 for UTCs.

We believe it is important to look at UTCs against their purpose as this will provide a fairer, broader assessment of how successful they are. As more data becomes available, there is a pressing need for further research, in particular looking at measuring the key outcomes which UTCs were set up to deliver.

In summary, the Government's policy may be that core academic qualifications represent a student's best chance to achieving good employability so therefore headline accountability measures should apply to all students whatever institution they study in. There are, however, legitimate questions about whether these headline accountability measures assess a UTC's curriculum fairly. Our analysis suggests that the poor performance of UTCs may, to some extent, be a consequence of the official performance measures not fully recognising the breadth of curriculum offered by most UTCs. These headline measures are likely to be an important factor which influences the decisions made by potential students and their parents / carers about whether to move to a UTC, as well as informing Ofsted judgements. In order to better assess UTCs' performance against their curriculum, consideration should be given as to how the existing measures might be adapted or complemented with additional measures.

References

Cabinet Office, Cameron, D. and Clegg, N. (2010). *The Coalition: Our Programme for Government.* London: Cabinet [online]. Available: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/78977/coalition_programme_for_government.pdf [15 June, 2017].

Department for Education (2016a). *Single Departmental Plan: 2015 to 2020.* London: TSO [online]. Available: https://www.gov.uk/government/publications/department-for-education-single-departmental-plan-2015-to-2020/single-departmental-plan-2015-to-2020 [15 June, 2017].

Bennett, R. (2017). *Technical Colleges are Half Empty.* London: The Times [online]. Available: https://www.thetimes.co.uk/article/tech-colleges-mvdhhzzhf [15 June, 2017].

Camden, B. (2017). *Crisis Deepens as Learners Drop at two Thirds of UTCs.* London: FE Week [online]. Available: http://feweek.co.uk/2017/04/28/crisis-deepens-as-learners-drop-at-two-thirds-of-utcs/ [15 June, 2017].

Burke, J. (2017). *Gove Admits the UTCs Experiment has Failed.* London: FE Week [online]. Available: http://feweek.co.uk/2017/02/10/gove-admits-the-utcs-experiment-has-failed/ [15 June, 2017].

Long, R. and Bolton, P. (2017). *University Technical Colleges* (Briefing Paper 07250). London: TSO [online]. Available: http://researchbriefings.files.parliament.uk/documents/CBP-7250/CBP-7250.pdf [15 June, 2017].

National Audit Office (2017). *Capital Funding for Schools.* London: TSO [online]. Available: https://www.nao.org.uk/wp-content/uploads/2017/02/Capital-funding-for-schools.pdf [15 June, 2017].

Department for Education (2016b). *Opening a UTC.* London: TSO [online]. Available: https://www.gov.uk/government/collections/opening-a-utc [15 June, 2017].

Cook, W., Thorley, C and Clifton. J. (2016). *Transitions at 14: Analysing the Intake of 14–19 Education Institutions.* London: IPPR [online]. Available: http://www.ippr.org/publications/transitions-at-14 [15 June, 2017].

Great Britain. Statutes (2017). *Technical and Further Education Act 2017. Chapter 19.* London: TSO [online]. Available: http://www.legislation.gov.uk/ukpga/2017/19/pdfs/ukpga_20170019_en.pdf [15 June, 2017].

Thorley, C. (2017). *Tech transitions: UTCS, Studio Schools, and Technical and Vocational Education In England's Schools.* London: IPPR [online]. Available: http://www.ippr.org/publications/tech-transitions [15 June, 2017].

Appendix A: Methodology

In order to provide the most up-to-date picture, we have made use of the latest available data wherever possible in the report.

Methodological notes for report	
Student numbers	We have compared student numbers by UTC since 2013 (or the institution's opening year if later). For the academic years 2012/13, 2013/14, 2014/15 and 2015/16, we used data from the January School Census, as reported by the *Schools, Pupils and their Characteristics* Statistical First Release (SFR). As the January 2017 data for the 2016/17 academic year had not yet been published at the time of publication, student numbers for the 2016/17 academic year are based on National Pupil Database (NPD) data from the Autumn School Census, which was collected in October 2016.
UTC clusters	In the report, we grouped UTCs into high, middle and low attaining clusters based on their 2015/16 Key Stage 4 outcomes, which is the latest available attainment data at the time of publication. UTCs were ranked from highest to lowest according to their Attainment 8 and Progress 8 outcomes. The two ranks were then added together and UTCs were split into three equal groups of nine institutions based on this combined ranking. The UTCs included in this clustering are those that had a new intake of Year 10 pupils in 2014/15, the cohort for which Key Stage 4 outcomes in 2015/16 are available. For this reason, the Royal Greenwich UTC (which became an 11-19 free school in September 2016) is included in the classification. Additionally, the Black Country UTC was included, and classified as low attaining, as its new cohort did not reach the end of Key Stage 4. Other schools that were still open during the period, but did not have a new Year 10 intake in 2014/15 and a corresponding attainment data in 2015/16 (e.g. Central Bedfordshire UTC) were not included. All UTCs which opened in the 2015/16 and 2016/17 academic years were excluded as they did not have any Key Stage 4 outcomes in 2015/16.

Analysis of student characteristics	The analysis of UTC pupil characteristics was based on data from DfE's National Pupil Database. We analysed individual characteristics and prior attainment of Year 10 students from the Spring Census of the 2012/13, 2013/14, 2014/15 and 2015/16 academic years. For Year 10 students in the 2016/17 academic year, we used data from the 2016/17 Autumn School Census. For each new intake at Year 10, we identified "feeder schools" by looking at which schools UTC pupils were enrolled at in Year 9, the academic year before they joined the UTC.
Pupil matching	For the purpose of analysing absence and attainment of UTC pupils, year 11 pupils on roll at a UTC in 2015/16 were matched to pupils with similar characteristics on roll in a feeder school at the end of Key Stage 4. Pupils were matched based on their gender, ethnicity, eligibility for free school meals (FSM), special educational needs (SEN) and Key Stage 2 average point score. The matching was performed using Mahalanobis distance matching on individual characteristics, mixed with propensity score matching on Key Stage 2 attainment. A UTC student was only matched to a similar student in one of the feeder schools that had provided students to the UTC the student attended (as opposed to any UTC). To test the sensitivity of the analysis, we used other matching approaches which produced broadly similar results.
Absence	The analysis of absence rates and trends for UTC students is based on a comparison to a matched sample of their peers from one of their feeder schools. We used data from the National Pupil Database for students who were in Year 11 in the 2015/16 academic year, tracked these students' back to Year 7, and calculated average overall absence rates for each academic year. We also calculated overall average overall absence rates for each pupil across Key Stage 3 and Key Stage 4.
Attainment	The analysis of attainment outcomes for UTC students was based on a comparison with a matched sample of their peers from one of their feeder schools. Although not reported here, the simple comparison of average outcomes was supported and confirmed by a regression analysis on the same data. We analysed Key Stage 4 attainment data from the NPD for the 2015/16 academic year, in conjunction with school level data from the same year published by DfE in their *Compare School and College Performance* tool.

NFER provides evidence for excellence through its independence and insights, the breadth of its work, its connections, and a focus on outcomes.

- independent
- insights
- breadth
- connections
- outcomes