

# Final report on the skills mismatches in Derby, Derbyshire, Nottingham and Nottinghamshire LEP, 2016/17

December 2018



## Contents

<b>Definitions and Groupings</b> .....	3
<b>Executive summary</b> .....	4
<b>1: Context – the demand and supply for skills in D2N2</b> .....	5
<b>1.1 Employment</b> .....	5
<b>1.2: Vacancies</b> .....	6
<b>1.3: Skills shortages</b> .....	9
<b>1.4: FE outcomes</b> .....	14
<b>2: Technical Skills Mismatches</b> .....	15
<b>2.1 Primary group analysis</b> .....	15
<b>2.2: Secondary groups in undersupply</b> .....	17
<b>2.3: Secondary groups in oversupply</b> .....	19
<b>Appendix 1: Mismatch trend analysis</b> .....	23
<b>Appendix 2: Potential biases of online vacancy data</b> .....	25
<b>Appendix 3: Methodology of the mismatch analysis</b> .....	27

## Definitions and groupings

---

This report's primary focus is on technical occupations. It defines a technical occupation as any for which 30% of the workforce or less are graduates (as indicated by the highest level of education identified in the labour force survey) and can be linked to relevant FE courses or apprenticeships.

Our technical definition is broken down into five primary groups to allow for more detailed analysis.

The groups are defined as follows:

- **Core technical:** these are technical occupations that are typically held by people with level 3 qualifications or above.
- **Semi-technical:** these are occupations that are typically held by people with level 2 qualifications or below. While further education can lead to these occupations, it is also possible that some people will enter them without having done an FE course or apprenticeship, given the relatively low level of skill required.
- **Public sector technical:** technical occupations that are predominantly in the public sector. Examples include care workers and teaching and educational support assistants
- **Privately funded training:** these are occupations which are not typically done by graduates, but nor are they unskilled. They are occupations that are technical in nature but for which publicly funded training is not commonly provided. An example is skilled drivers.
- **Technical – advanced:** these are occupations towards which FE can often provide a first step or foundation qualification. Entry into these occupations straight from FE is uncommon. They also include some occupations that are more advanced versions of those found in the core technical group. Examples include artists and designers and engineering professionals.

Alongside these five technical primary groups, sections of the analysis consider four additional non-technical primary groups:

- **Professional:** occupations from the standard professional and associate professional Standard Occupational Classification (SOC) major groups for which 30% of the workforce or more are graduates
- **Managers:** same as the standard SOC major group
- **Elementary:** same as the standard SOC major group
- **Other:** those occupations that are not in the professional, associate professional, managers or elementary SOC major groups but cannot be considered technical or professional for a variety of reasons. These make up less than 3% of total vacancies.

Each of these primary groups consists of a number of secondary occupation groups and each of these comprises of similar 4-digit SOC code occupations. For example, there are five electrician related occupations at the 4-digit SOC code level. These are grouped into the 'Electricians and electronic trades/technicians/engineers' secondary occupation group. Because this group is made up of occupations that predominantly require level 3 qualifications, it has been allocated to the core technical primary group.

All advertised salaries reported are median, unless otherwise stated, so that the very high salaries at one end of the distribution do not skew the estimates upwards.

## Executive summary

---

This report presents analysis on the demand and supply of technical and professional skills in the Derby, Derbyshire, Nottingham and Nottinghamshire (D2N2) Local Enterprise Partnership (LEP) area. It updates the interim 2016/17 mismatch report published in June 2018<sup>1</sup> and builds on the 2015/16 mismatch report completed in 2017.<sup>2</sup>

The report finds that there are a number of technical occupation groups for which there are significantly fewer FE courses being completed each year than there are skills shortage vacancies (those vacancies that employers struggle to fill due to skills shortages). While the situation has improved for many of these groups since 2015/16, there is still some way to go before levels of provision are able to satisfy the demand flowing from employers.

There are five core technical occupation groups for which employer demand is significantly undersupplied. These are occupations which enjoy good salaries and are typically done by someone with a level 3 technical occupation, and so FE provision is key to filling these vacancies. The core technical groups where there is an undersupply of courses relative to skills shortage vacancies are:

**Metals, tools and instruments manufacturing**

- Undersupply relative to SSVs: 630
- Median advertised salary: £24,800

**Electricians and electronic trades/technicians/engineers**

- Undersupply relative to SSVs: 590
- Median advertised salary: £30,500

**Engineering and planning/process/production technicians**

- Undersupply relative to SSVs: 420
- Median advertised salary: £27,500

**Building, civil and architectural engineering technicians**

- Undersupply relative to SSVs: 200
- Median advertised salary: £30,000

**IT engineers and technicians**

- Undersupply relative to SSVs: 180
- Median advertised salary: £26,000

There also continue to be occupation groups for which the number of course completions is higher than the number of skills shortage vacancies (SSVs). These include occupation groups such as sports and fitness instructors, artists and designers and beauticians. And so, while this data does not reflect those that are self-employed, in order to meet the skills shortages for technical occupations, re-prioritisation away from these groups may be necessary.

While of course skills shortage vacancies for technical roles represent a cost to the local economy, filling them provides an important opportunity to drive inclusive growth in the D2N2 economy. Despite enjoying an unemployment rate lower than the national average, D2N2 has a significantly

---

<sup>1</sup> Centre for Progressive Policy (2018) *Interim report on the skills mismatches in Derby, Derbyshire, Nottingham and Nottinghamshire LEP, 2016/17*

<sup>2</sup> Centre for Progressive Capitalism (2017) *A report on skills mismatches in Derby, Derbyshire, Nottingham, and Nottinghamshire LEP*. Available at:

[http://www.d2n2lep.org/write/Documents/Research%20Reports/Centre for Progressive Capitalism - D2N2 Final Report June 2017.pdf](http://www.d2n2lep.org/write/Documents/Research%20Reports/Centre%20for%20Progressive%20Capitalism%20-%20D2N2%20Final%20Report%20June%202017.pdf)

higher share of jobs that pay below the living wage. Therefore, the prevalence of skills shortage vacancies in technical occupations with strong advertised salaries described in this report is a chance for the skills system to ensure people do not become trapped in low-skill, low-paid work.

## 1: Context – the demand and supply for skills in D2N2

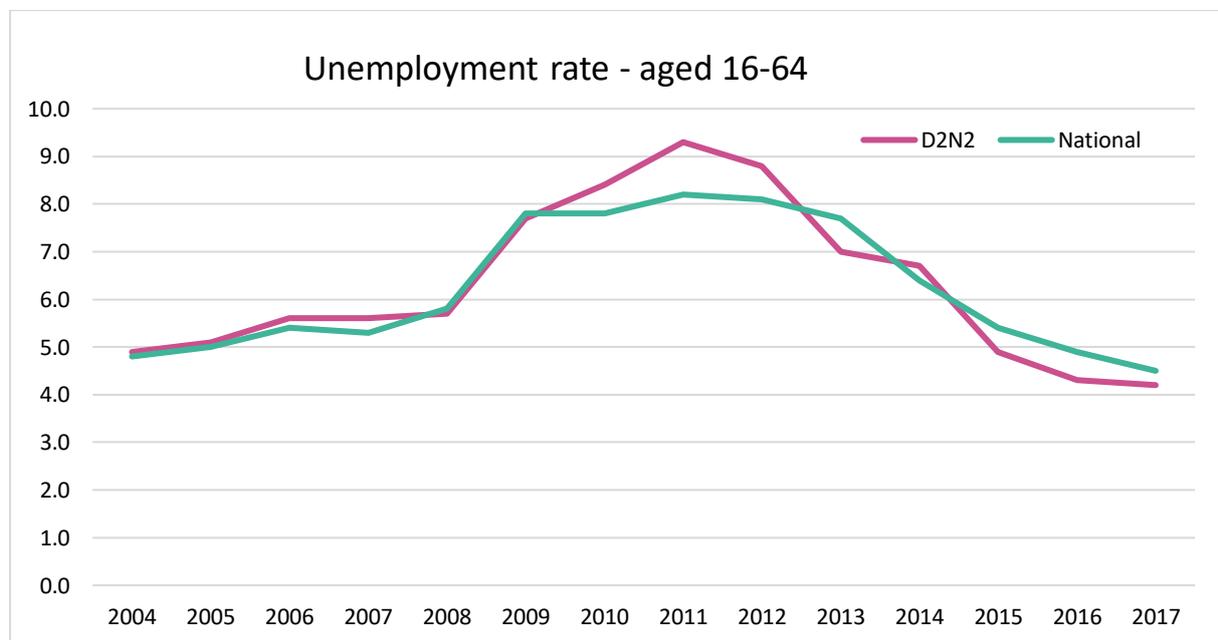
### 1.1 Employment

Unemployment in D2N2 closely tracked the national rate between 2004 and 2009, before raising above it for several years. Since 2015, however, unemployment has remained consistently below the national rate.

While D2N2’s recent employment record is encouraging, the area suffers from a particularly high proportion of employee jobs paid below the living wage as defined by the Living Wage Foundation.<sup>3</sup> An estimated 28% (228,000) of employee jobs were paid below the living wage in D2N2 in 2018, up from 25.9% (214,000) in 2017 and above the national rate of 22.8%. All but two of the local authorities in the D2N2 area performed worse than the national average in this regard, some significantly so. For example, 38.7% of employee jobs in Mansfield were paid below the living wage in 2018, almost 16 percentage points above the national average.<sup>4</sup>

It is clear that the area could benefit from moving people in low-paid work into skilled, well-paid technical careers. As outlined in section 1.3 and in more detail in section 2, there are a significant number of vacancies for technical roles with good salaries that employers in D2N2 struggle to fill due to a lack of candidates with appropriate skills.

**Chart 1: Unemployment rate of those aged 16-64, D2N2 vs Great Britain, 2004-2017**



<sup>3</sup> At the time of analysis, this was set at £10.20 per hour in London and £8.75 outside London in 2018, and £9.75 in London and £8.45 outside London in 2017.

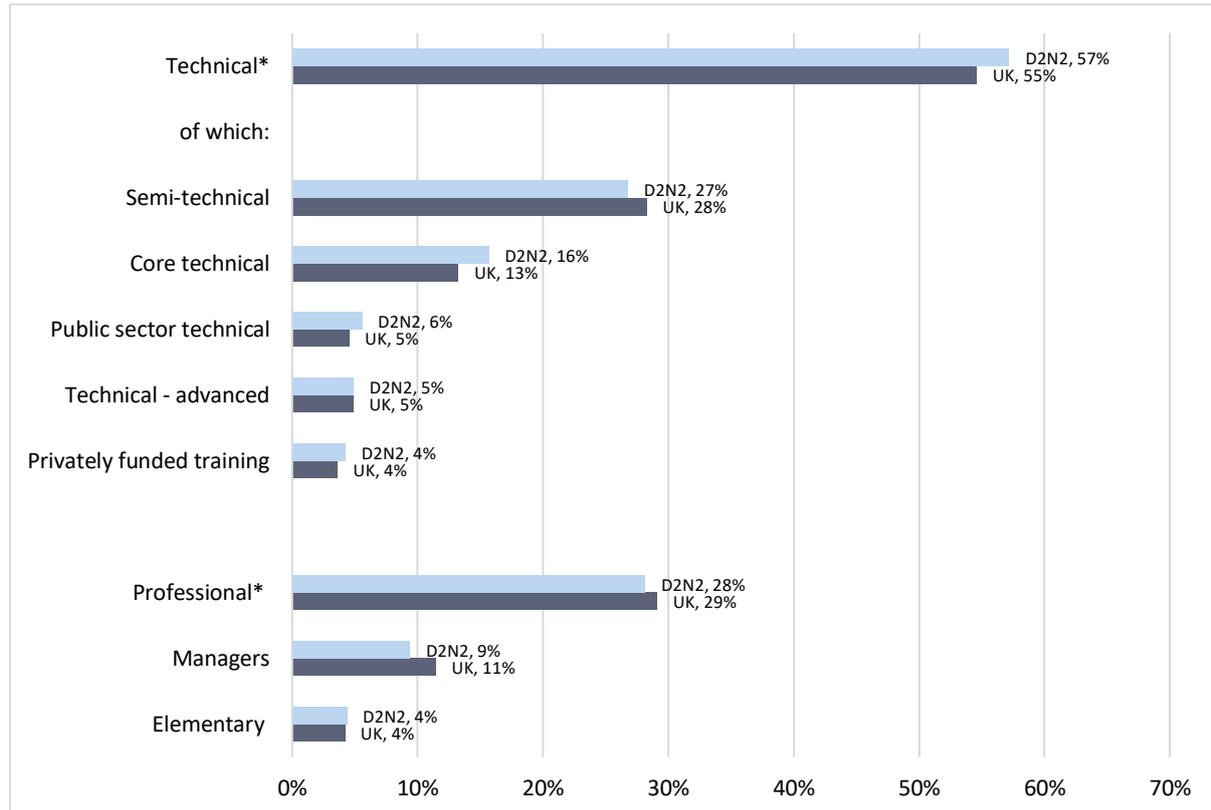
<sup>4</sup> Source: CPP analysis of Annual Survey of Hours and Earnings (ASHE) - Estimates of the number and proportion of employee jobs with hourly pay below the living wage, by work geography, local authority and parliamentary constituency, UK, April 2017 and April 2018

## 1.2: Vacancies

Technical vacancies made up 57% (104,300) of all vacancies in D2N2 in 2017, slightly higher than the 55% recorded nationally.

Breaking the technical group down, 27% of vacancies are semi-technical, 16% are core technical, 6% are public sector technical, 5% are technical-advanced and 4% are for roles that require privately funded training. 28% of vacancies in D2N2 are professional in nature.

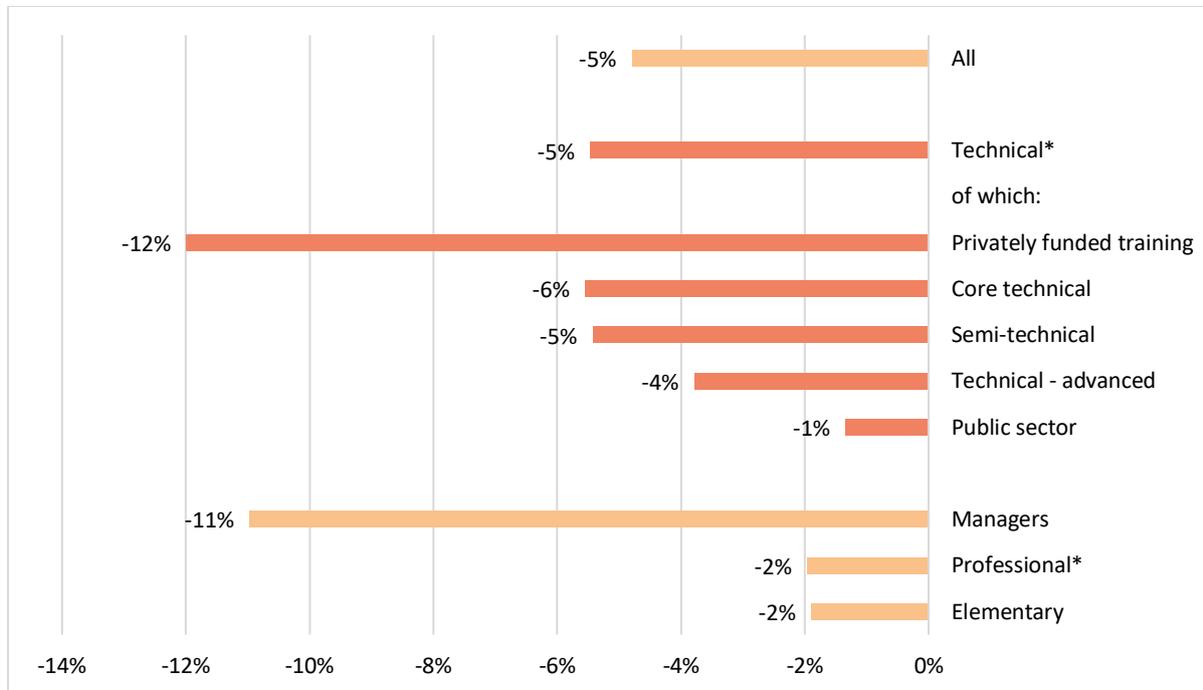
**Chart 2: Share of vacancies by primary occupation group, D2N2 vs UK average, 2017<sup>5</sup>**



<sup>5</sup> Source: CPP analysis of Burning Glass job vacancy data

The share of vacancies was largely unchanged between 2016 and 2017, with only minor increases and decreases recorded. The total number of online vacancies recorded in D2N2, however, fell by 5% between 2016 and 2017. Breaking this down, the number of vacancies fell by 7% for technical roles, by 12% for managers, by 4% for elementary roles and by 3% for professional roles.

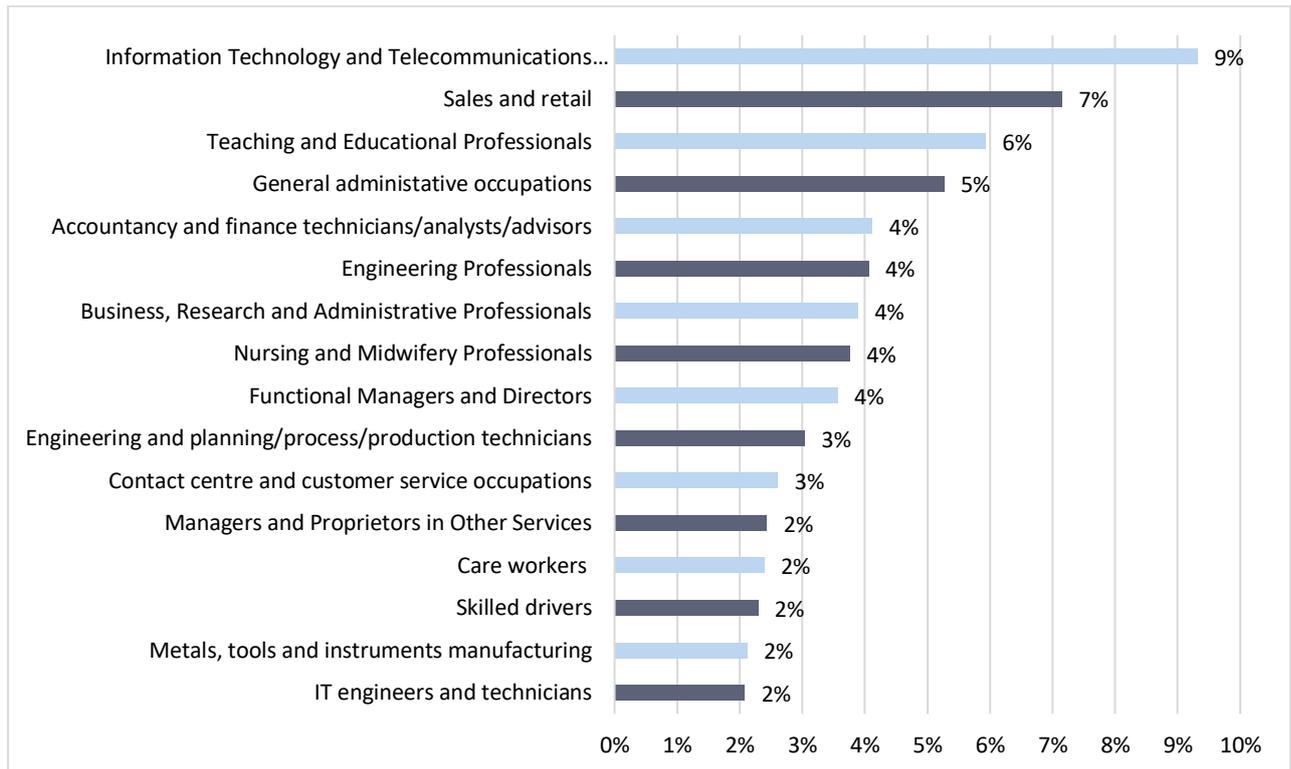
**Chart 3: Decline in number of vacancies by primary occupation group, D2N2, 2016 vs 2017<sup>6</sup>**



<sup>6</sup> Source: CPP analysis of Burning Glass job vacancy data

Chart 4 outlines the top secondary occupation groups most in demand from employers. The highest share of vacancies now belongs to IT professionals, with 9%, having previously been for sales and retail, which now accounts for 7% of the total. The demand for sales and retail positions among D2N2 employers is decreasing rapidly, with the number of vacancies falling by an average of 8% per year between 2012 and 2017. Similarly, administrative roles still account for a substantial share of vacancies, but this has been decreasing year on year. Roles related to IT and engineering, both professional and technical, make up a large share of total vacancies, having grown consistently since 2012.

**Chart 4: Top secondary occupation groups by share of total vacancies, D2N2, 2017<sup>7</sup>**

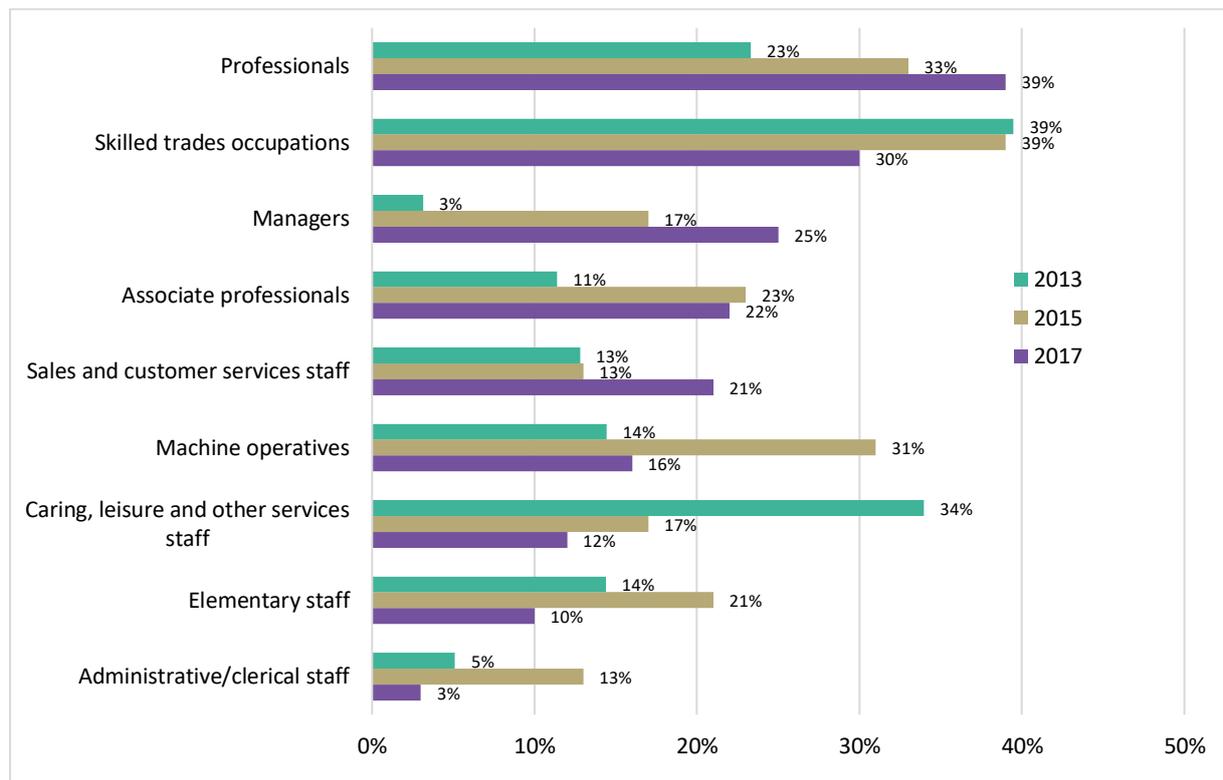


<sup>7</sup> Source: CPP analysis of Burning Glass job vacancy data

### 1.3: Skills shortages

Progress on skills shortage vacancy (SSV) density (the percentage of vacancies that employers report as difficult to fill due to skills shortages) has been mixed in D2N2. Chart 5 displays the SSV density for the 9 ONS major occupation groups. Significant increases were observed for professional, managerial and sales roles, while administrative, elementary, caring and machine operative roles saw decreases. The SSV density for skilled trades roles also fell, albeit from a high starting point. Note, these are snapshots in time, with employers consulted at one point in time, usually midway through the calendar year.

**Chart 5: Skills shortage vacancy density by ONS major occupation group, D2N2, 2013-2017<sup>8</sup>**

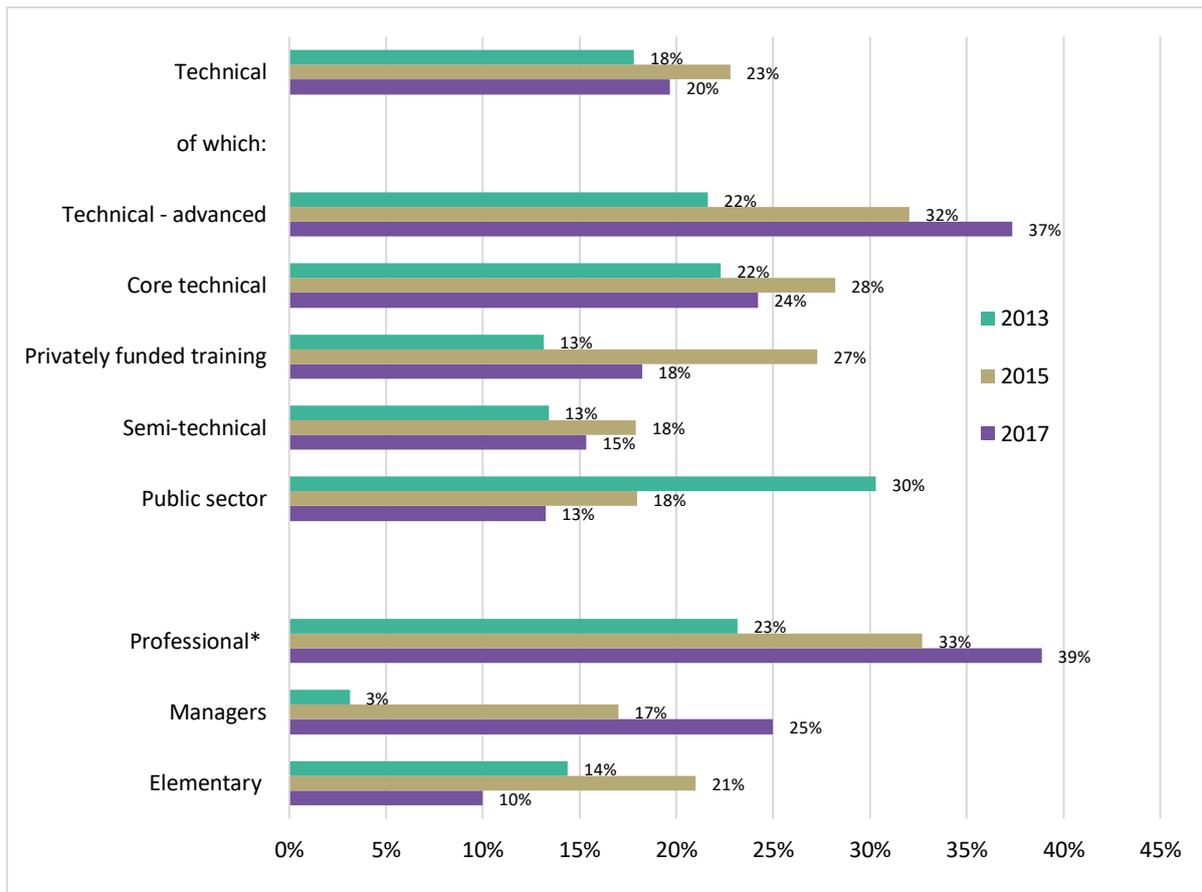


<sup>8</sup> Source: CPP analysis of Employer Skills Survey 2013, 2015 and 2017

Taking a weighted average of the SSV densities for the 9 ONS major occupation groups gives estimates for the primary occupation groups used in this report, displayed in chart 6. 20% of technical vacancies in D2N2 in 2017 were estimated to be difficult to fill due to skills shortages, which equates to 20,860 vacancies.

The SSV density for the broad technical group increased from 18% to 23% between 2013 and 2015 and then decreased to 20% 2017. This trend is defied by advanced technical roles, which saw an increase in SSV density in 2015 and 2017, and public sector technical roles which saw a decrease in 2013-2015 and 2015-2017.

**Chart 6: Estimated skills shortage vacancy density by primary occupation group, D2N2, 2013-2017<sup>9</sup>**

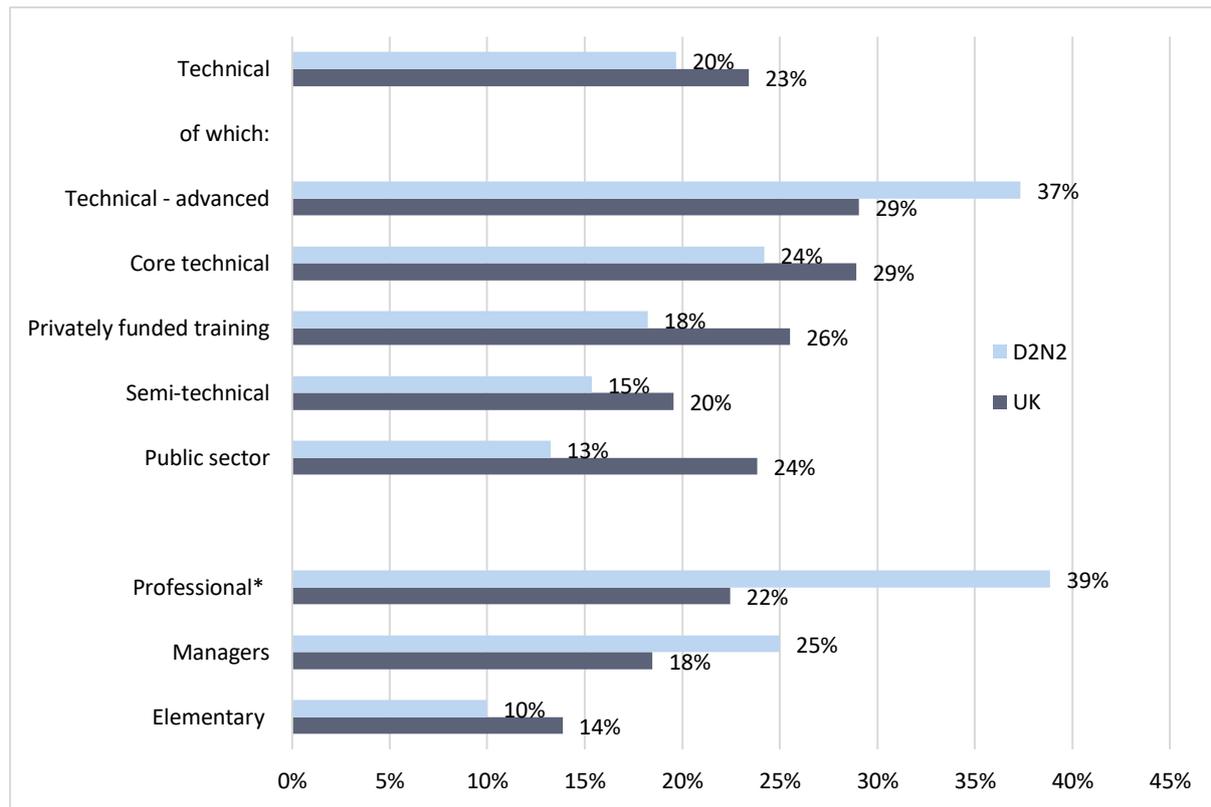


<sup>9</sup> Source: CPP analysis of Employer Skills Survey 2013, 2015 and 2017

Employers in D2N2 are less likely to find skills shortages to be a barrier to filling vacancies for technical roles than the UK average (20% vs 23%). They are, however, significantly more likely to struggle to fill professional (39% vs 22%) and managerial (25% vs 18%) roles than the UK average.

This is not to say that filling technical vacancies is not a problem in D2N2. That employers struggle to fill one in five technical vacancies (rising to almost two in five for advanced technical roles and one in four for core technical roles), represents as significant constraint on the ability of businesses in the area to grow and prosper.

**Chart 7: Estimated skills shortage vacancy density by primary occupation group, D2N2 vs UK average, 2017<sup>10</sup>**



<sup>10</sup> Source: CPP analysis of Employer Skills Survey 2017

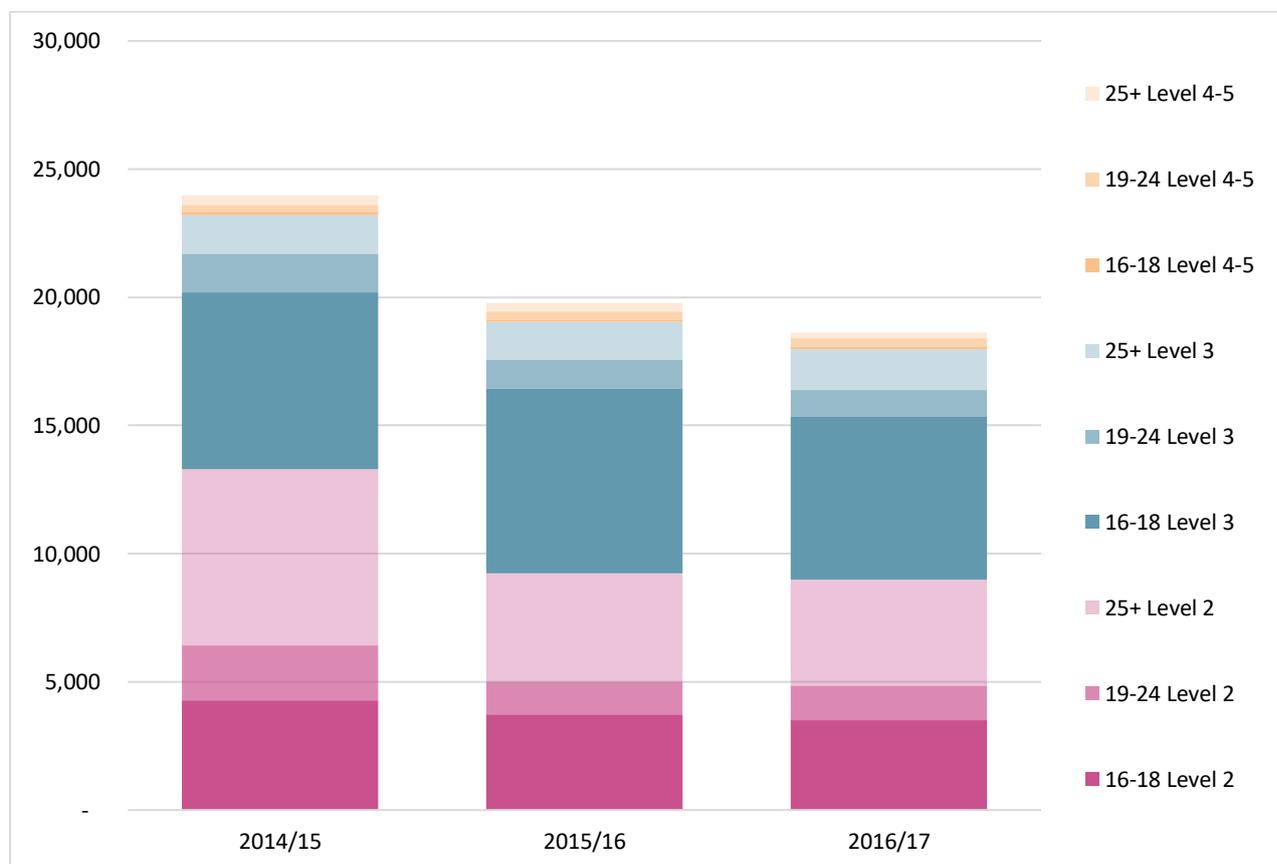
### 1.4: FE course and apprenticeship completions

2016/17 saw a continuation in the decrease in total FE course completions, falling to 18,615 from 23,982 in 2014/15. As such, there are unlikely to be enough course completions to fill the estimated 20,860 skills shortage vacancies present as of 2017. Therefore, reprioritisation of provision within FE is unlikely to be sufficient and D2N2 should work to reverse the decline in FE courses.

16-18 year olds taking level 3 qualifications remain the largest share of completions, though the overall number has decreased since 2015/16. The higher course levels continue to be the smallest share of all total completions for each age group.

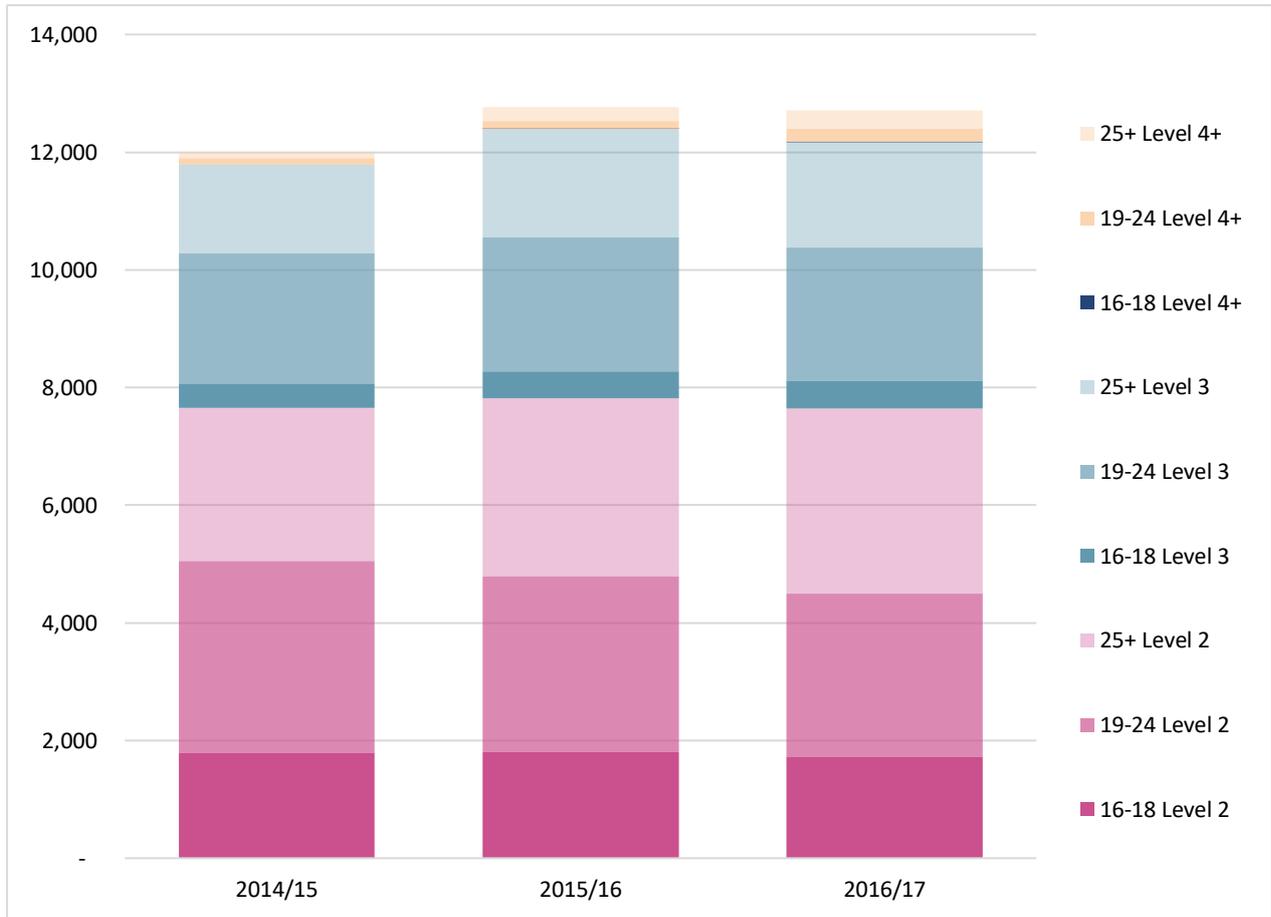
As shown in chart 9, the total number of apprenticeship course completions in 2016/17 has declined slightly from 2015/16.

**Chart 8: Total FE course completions by level and age, D2N2, 2014/15 -2016/17<sup>11</sup>**



<sup>11</sup> Source: CPP analysis of the ESFA Localities Datacube

**Chart 9: Total apprenticeship course completions by level and age, D2N2, 2014/15 -2016/17<sup>12</sup>**

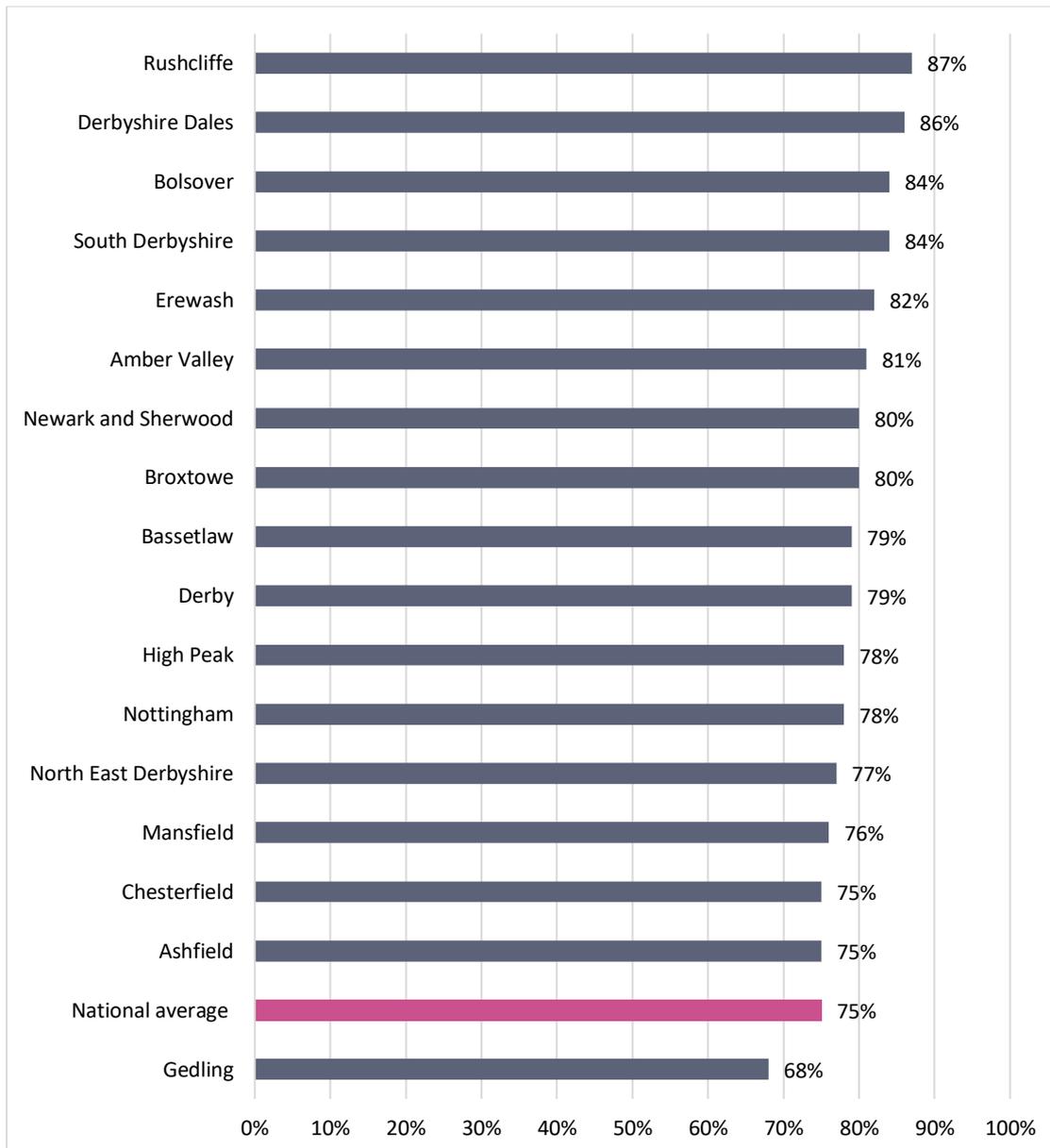


<sup>12</sup> Source: CPP analysis of the ESFA Localities Datacube

## 1.5: FE outcomes

Outcomes from further education are generally above the UK average in D2N2. 16 of the 17 local authorities in the LEP area have sustained positive destination rates (defined as being in sustained education or employment within 12 months of completion) higher than the national average. Positive destination rates in Rushcliffe and Derbyshire Dales are more than 10% higher than the national average.

**Chart 10: Sustained positive destination rate all apprenticeships, all traineeships, and adult (19+) FE and skills learners, D2N2 local authorities vs national average, 2016/17<sup>13</sup>**



<sup>13</sup> Source: DfE Further Education Outcome Based Success Measures. This data does not include 16-18 year old learners. It includes all apprenticeships, all traineeships, and adult (19+) FE and skills learners.

## 2: Technical Skills Mismatches

---

This section of the analysis looks at the supply and demand of skills for technical occupations, firstly at the primary group level (core technical, semi-technical, public sector technical and technical – advanced) and then at the secondary group level (for example, IT engineers and technicians and electricians). The Education and Skills Funding Agency (ESFA) datacube is analysed and courses are mapped to corresponding technical occupations to highlight potential over- or undersupply of various skill sets.

Trend analysis is presented in appendix 1 for secondary groups. Here it is important to note that the total number of technical vacancies in D2N2 rose by 47% between 2014/15 and 2015/16 and then fell by 9% between 2015/16 and 2016/17, from 126,700 to 115,800. Over the same periods, the number of FE course completions fell by 18% and then 6%. The number of apprenticeship completions grew between 2014/15 and 2015/16 by 6% from 12,000 to 12,760, before falling slightly to 12,710 in 2016/17.

The charts include data on apprenticeships, which also form a key part of how policy can combat skills shortages. Occupation groups with large skills shortage vacancies and few FE course completions will be in a better position to tackle the skills shortages if there are a good amount of apprenticeships. According to government data, 77% of apprentices stay with the same employer after finishing.<sup>14</sup> The number of apprenticeships, however, is not taken into account for mismatch calculations.

### 2.1 Primary group analysis

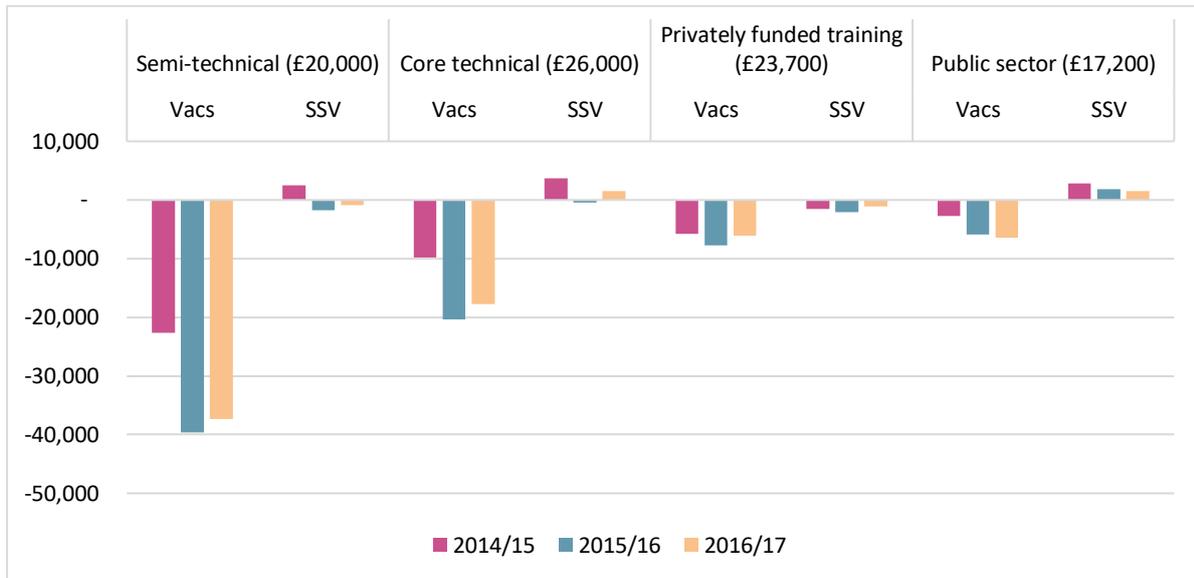
Chart 11 presents the potential over and undersupply of technical courses in D2N2 at the primary group level. There was a potential undersupply of 860 courses relative to skills shortage vacancies for semi-technical roles in 2016/17. Conversely, the core technical group appears to be oversupplied, with roughly 1,500 more course completions than skills shortage vacancies.

The technical-advanced group has not been included here because entry into these occupations straight from FE is uncommon, and so the occupations in this group have not linked with any FE courses. However, there is survey and anecdotal evidence that these occupations are not completely unattainable via the FE route. They include occupations, for example, relating to engineering and IT that, according to Labour Force Survey data are often done by people with a level 3 qualification. As such, while not included in the figures, the number of skills shortage vacancies for these kinds of positions should not be excluded completely, particularly in relation to the core technical group.

---

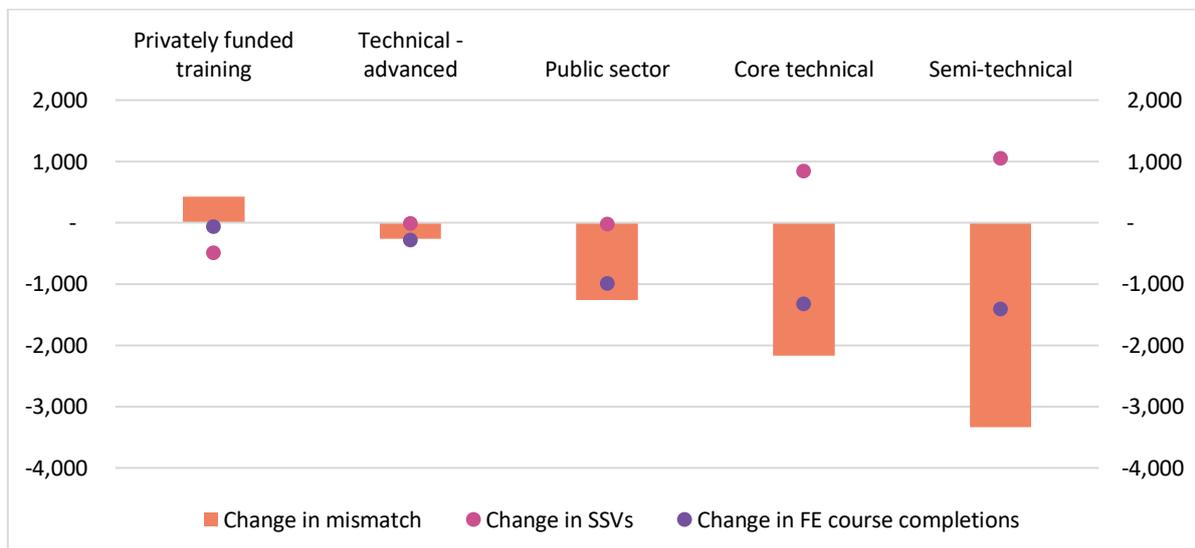
<sup>14</sup> <https://www.gov.uk/government/publications/key-facts-about-apprenticeships/key-facts-about-apprenticeships>

**Chart 11: The number of FE course completions relative to total vacancies and skills shortage vacancies for selected primary occupation groups, D2N2, 2014/15-2016/17<sup>15</sup>**



While the picture for the semi-technical and core technical primary groups is one of relative balance, this may change in the future. As chart 12 shows, the number of FE course completions for these groups has fallen sharply since 2014/15 and, at the same time, the number of skills shortage vacancies has increased. Left unaddressed, this trend could result in a significant overall undersupply of FE course completions for these groups.

**Chart 12: Change in mismatch, skills shortage vacancies (SSVs) and FE course completions for selected primary technical groups, D2N2, 2014/15-2016/17<sup>16</sup>**



<sup>15</sup> Source: CPP analysis of ESFA Localities Datacube, Burning Glass job vacancy data by 4-digit SOC code, Employer Skills Survey 2013, 2015 and 2017 and Labour Force Survey UK data on highest qualification of workers by 4 digit SOC code

<sup>16</sup> Source: CPP analysis of ESFA Localities Datacube, Burning Glass job vacancy data by 4 digit SOC code, Employer Skills Survey 2013, 2015 and 2017 and Labour Force Survey UK data on highest qualification of workers by 4 digit SOC code

## 2.2: Secondary groups in undersupply

It is important to note that the primary groups show aggregate mismatch figures and so may hide important mismatches at the secondary group level. For example, suppose there are 1,000 more FE course completions than SSVs for beauticians but 1,000 fewer FE course completions than SSVs for IT engineers and technicians. At the aggregate level the system is in balance – the 1,000 surplus for beauticians balances out the 1,000 deficit for IT engineers and technicians. However, in reality the 1,000 extra people who have beautician skills will not be able to fill the skills shortages from the deficit of IT skills. As such, it is vital that skills mismatches are understood at the secondary group level.

### Core technical

*Metals, tools and instruments manufacturing (Median advertised salary: £24,800)*

During 2016/17 there were 3,420 total vacancies, an estimated 920 skills shortage vacancies and 290 FE course completions for metals, tools and instruments manufacturing. The potential undersupply of courses relative to skills shortage vacancies was thus 630 in 2016/17. The undersupply has improved slightly from the 960 recorded in 2015/16, but is still significantly worse than the undersupply of 580 in 2014/15, principally due to the increasing number of vacancies (see appendix 1 for trend analysis).

*Electricians and electronic trades/technicians/engineers (Median advertised salary: £30,500)*

In 2016/17 there were 590 more skills shortage vacancies for electrician roles than there were relevant course completions in the D2N2 area. This is down from 1,010 in 2015/16 but still worse than the 460 undersupply in 2014/15. In 2016/17 there were 3,080 vacancies, 990 skills shortage vacancies and 400 FE course completions for this group.

*Engineering and planning/process/production technicians (Median advertised salary: £27,500)*

In 2016/17 there was a potential undersupply of engineering technicians course completions of 420 relative to the number of skills shortage vacancies in D2N2. During this period, there were 4,930 total vacancies, an estimated 1,090 skills shortage vacancies and 670 FE course completions. The potential undersupply has fallen from 520 in 2015/16 but is still worse than the slight oversupply recorded in 2014/15. Not included in these figures are related engineering occupations from the technical-advanced primary group.

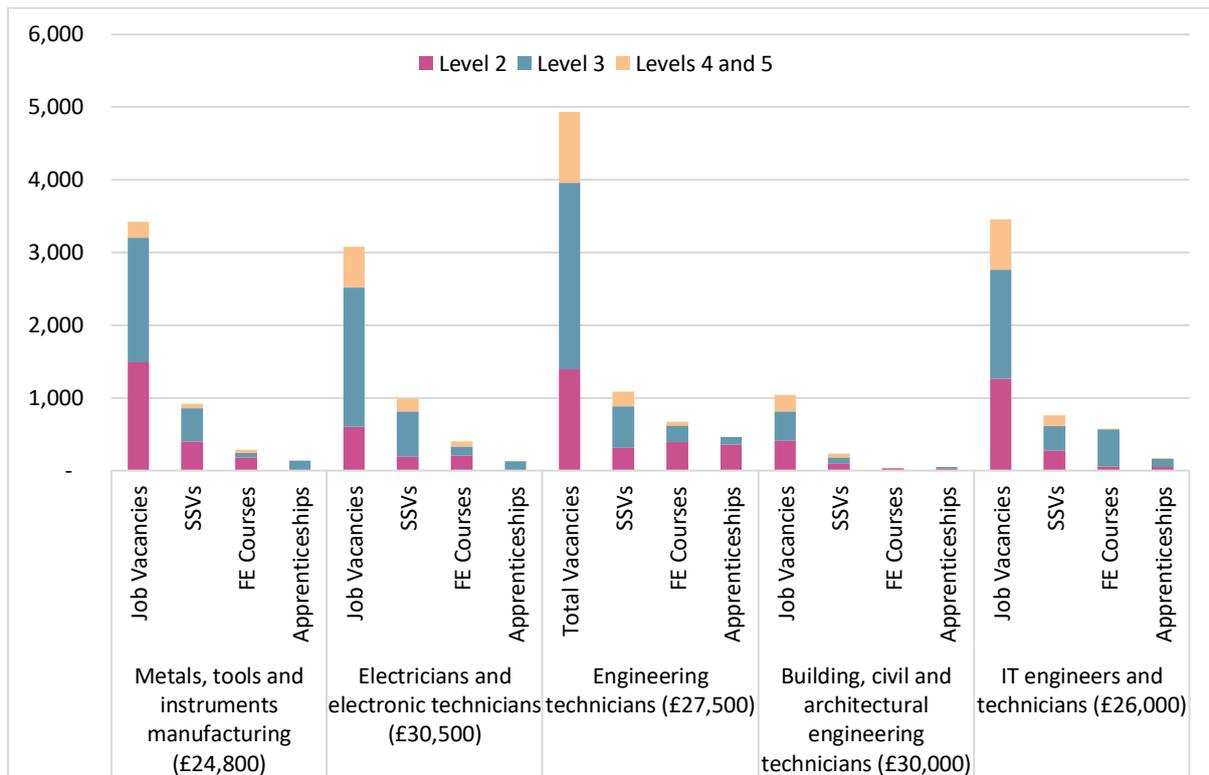
*Building, civil and architectural engineering technicians (Median advertised salary: £30,000)*

In 2016/17 there were an estimated 230 skills shortage vacancies for building, civil and architectural engineering technicians, but only 30 related FE courses completions. This gave an estimated undersupply of 200, down slightly from 230 in 2015/16. There were 50 relevant apprenticeships completed in 2016/17.

*IT engineers and technicians (Median advertised salary: £26,000)*

In D2N2 in 2016/17 there were 3,460 vacancies for IT engineers and technicians and an estimated 760 of which can be classed as skills shortage vacancies. During this period there were 580 course completions, meaning a potential undersupply of 180 relative to skills shortage vacancies. Again, the situation between 2014/15 and 2015/16 worsened – from an oversupply of 30 to an undersupply of 190 – but has improved slightly since then. As with engineering technicians, there are a number of occupations related to IT that are not included in the IT engineers and technicians group due to their professional nature.

**Chart 13: Total vacancies, skills shortage vacancies (SSVs), FE course completions and apprenticeship completions for selected secondary occupation groups, D2N2, 2016/17<sup>17</sup>**



### **Semi-technical**

#### *Sales and retail (Median advertised salary: £22,500)*

There were an estimated 2,360 sales and retail skills shortage vacancies in 2016/17, compared to 140 FE course completions, leaving an estimated undersupply of 2,200. In contrast to the general trend, this undersupply has worsened since 2015/16 from 2,080.

#### *Accountancy and finance technicians (Median advertised salary: £21,300)*

The estimated shortfall of FE course completions for accountancy and finance technicians in D2N2 in 2016/17 was 620, down from 700 in 2015/16. There were 6,860 vacancies in 2016/17, 680 of which can be classed as difficult to fill due to skills shortages. There were also 60 related FE course completions.

#### *Chefs (Median advertised salary: £18,500)*

There was an estimated undersupply of 520 chef-related FE course completions relative to the 750 skills shortage vacancies in 2016/17. The undersupply has improved from 840 since 2016/17, but it was still above the 370 recorded in 2014/15.

<sup>17</sup> Source: CPP analysis of ESFA Localities Datacube, Burning Glass job vacancy data by 4-digit SOC code, Employer Skills Survey 2017 and Labour Force Survey UK data on highest qualification of workers by 4 digit SOC code

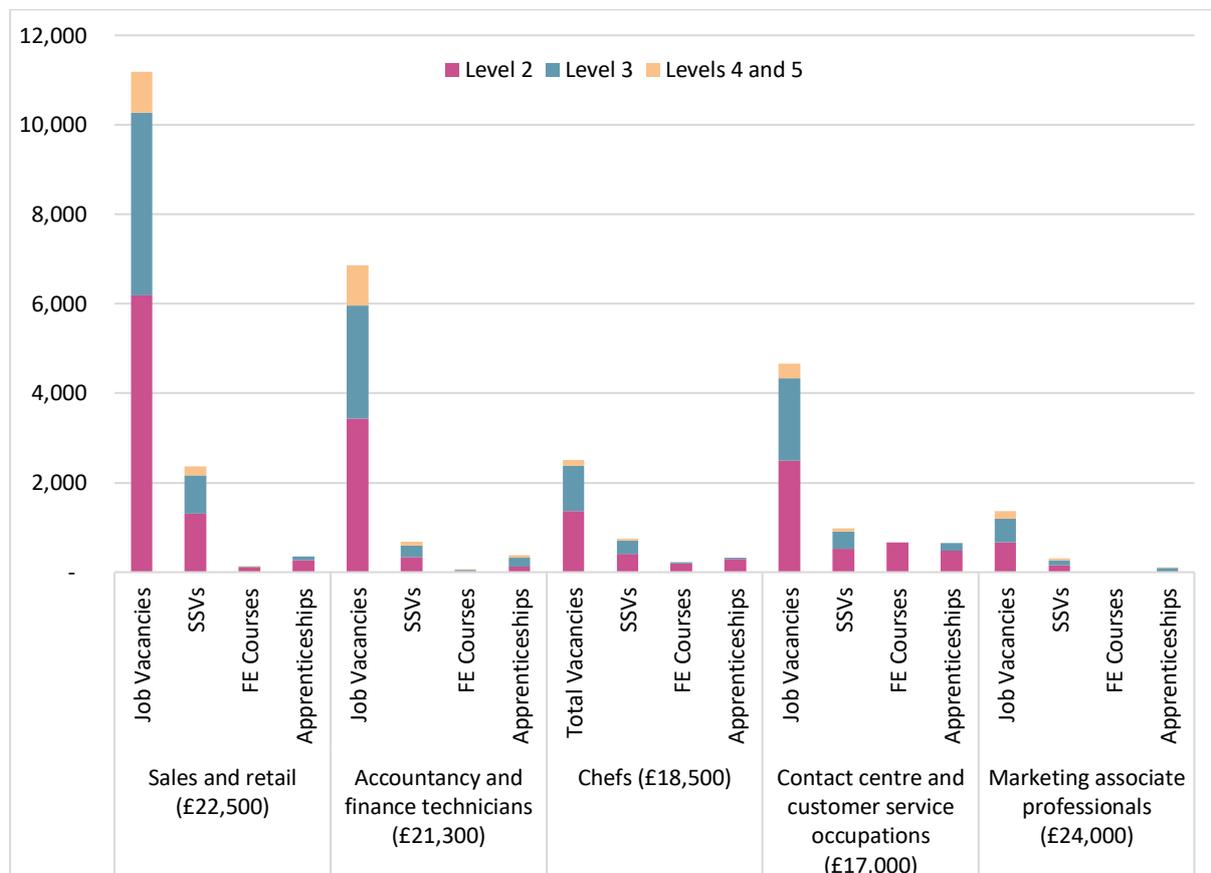
*Contact centre and customer service occupations (Median advertised salary: £17,000)*

For both 2014/15 and 2015/16 the contact centre and customer service occupations group had a surplus of FE course completions relative to skills shortage vacancies. However, in 2016/17 there was an undersupply of 320, owing largely to a sharp fall in related level 2 FE course completions.

*Marketing associate professionals (Median advertised salary: £24,000)*

There were no marketing-based FE course completions in 2016/17 or 2015/16, although there were 20 in 2014/15. As such, there was an undersupply of 310 courses relative to skills shortage vacancies in D2N2 in 2016/17.

**Chart 14: Total vacancies, skills shortage vacancies (SSVs), FE course completions and apprenticeship completions for selected secondary occupation groups, D2N2, 2016/17<sup>18</sup>**



**2.3: Secondary groups in oversupply**

In order to meet the skills shortages for technical occupations outlined above, re-prioritisation may be necessary.

It is likely that self-employment levels in some of the occupation groups discussed below will be relatively high. For example, 39% of those working as sports and fitness instructors and assistants in

<sup>18</sup> Source: CPP analysis of ESFA Localities Datacube, Burning Glass job vacancy data by 4 digit SOC code, Employer Skills Survey 2017 and Labour Force Survey UK data on highest qualification of workers by 4 digit SOC code

2017 were self-employed.<sup>19</sup> Furthermore, encouraging entrepreneurship is clearly key for developing a strong local economy.

However, there is still a strong case for some reprioritisation in further education provision given that skills shortages exist side by side with course surpluses in D2N2. There is also significant evidence to suggest that self-employed earnings are considerably below that of full employees. A report for the Department for Business Innovation & Skills found that the estimated median annual earnings for all self-employed was £10,800 in 2013/14, compared to £20,000 for all employees.<sup>20</sup>

Note, the presence of skills shortage vacancies is not necessarily inconsistent with well balanced FE courses or even a surplus of FE courses, either at the primary or secondary occupation group level. At the primary level, a surplus of one secondary group can cancel out a deficit of another secondary group, even though the skills are not interchangeable.

There are a number of reasons why a surplus of courses at the secondary group level doesn't necessarily imply there are no skills shortage vacancies:

- Any reduction in skills shortages from 2016/17 course completions will only be captured in future data
- Not everyone completing an FE course will go on to closely related employment
- It is possible that the courses are not producing all of the required skills
- This analysis is still, to some extent, at the aggregate level, hiding some variation at the four-digit SOC code level

### ***Core technical and semi-technical***

#### *Sports and fitness instructors and assistants (Median advertised salary: £21,000)*

There were 1,250 more FE course completions related to sports and fitness instructors and assistants than there were skills shortage vacancies in D2N2 in 2016/17, up slightly from 1,200 in 2015/16. The vast majority of FE course completions were at levels 2 and 3, with only 10 at either level 4 or 5.

#### *Media production officers, operators and producers (Median advertised salary: £21,000)*

There were only estimated to be 10 skills shortage vacancies for media production officers, operators and producers in D2N2 in 2016/17. There were more than 1,000 relevant course completions, however, giving an estimated oversupply of 1,030.

#### *Beauticians and related occupations (Median advertised salary: £21,600)*

There were 1,080 FE completions for the beauticians and related occupations group in 2016/17, compared to just 60 skills shortage vacancies, giving an estimated oversupply of 1,020. This is up from an oversupply of 800 in 2015/16.

#### *Veterinary nurses and animal care (Median advertised salary: £18,900)*

<sup>19</sup> Source: ONS, Employment by Occupation

<sup>20</sup> BIS (2016) *The income of the self-employed*. Available at:

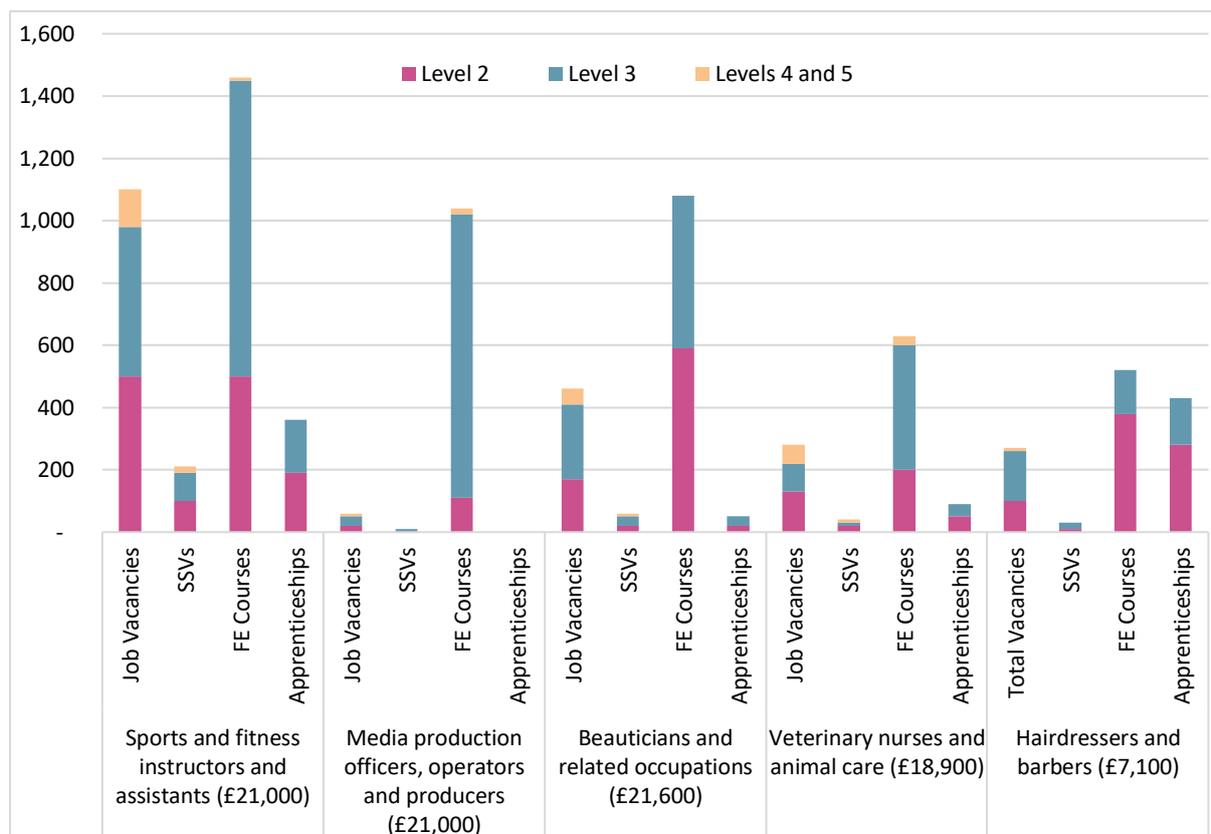
[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/500317/self-employed-income.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/500317/self-employed-income.pdf)

The veterinary nurses and animal care occupation group recorded a potential undersupply of 590 in 2016/17, with 630 FE course completions and 40 skills shortage vacancies. There were also 90 related apprenticeship completions.

*Hairdressers and barbers (Median advertised salary: £7,100)*

There were 270 vacancies for hairdressers and barbers in D2N2 in 2016/17, but only 30 can be classed as skills shortage vacancies. Given that there were 520 related FE course completions, there was an estimated oversupply of 490. This is down from 700 in 2014/15 and 610 in 2015/16 due to a drop in course completions.

**Chart 15: Total vacancies, skills shortage vacancies (SSVs), FE course completions and apprenticeship completions for selected secondary occupation groups, D2N2, 2016/17<sup>21</sup>**

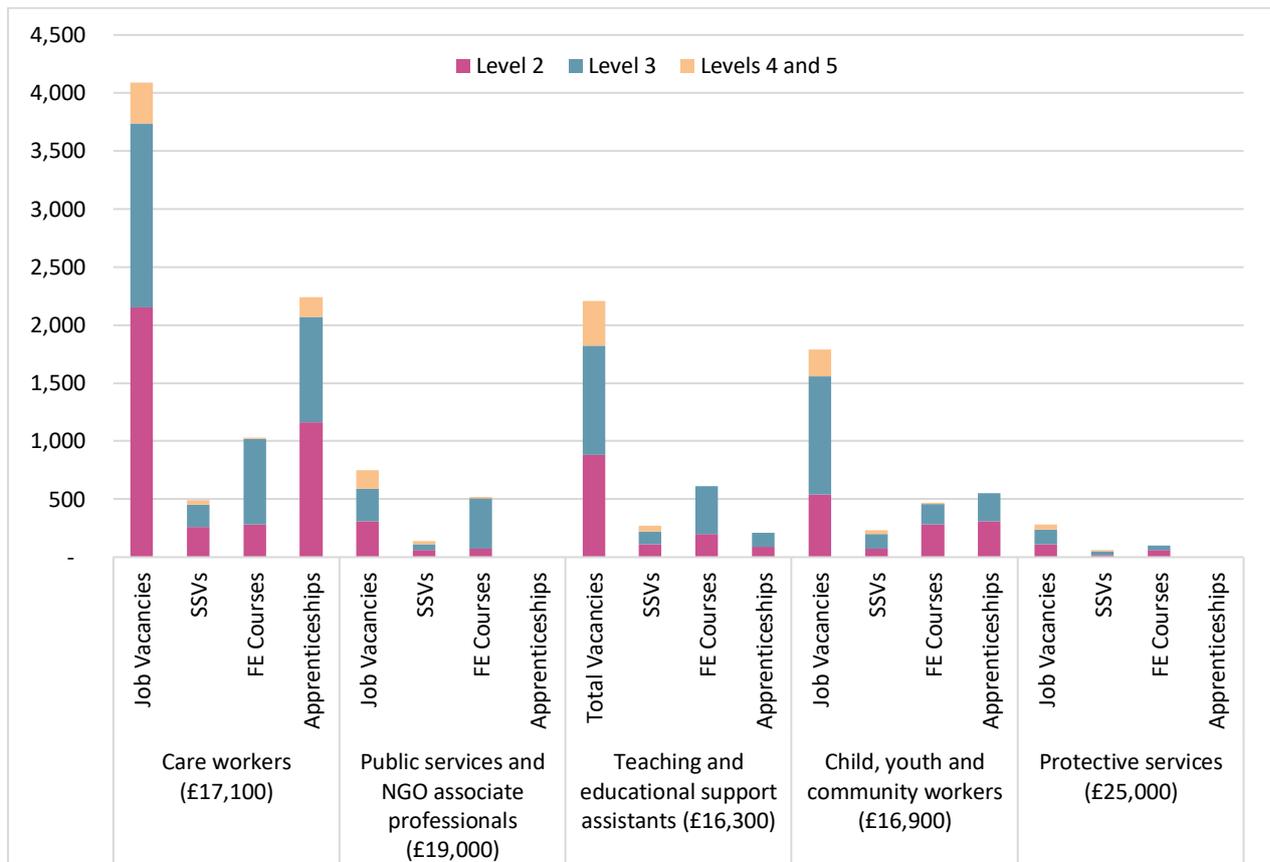


**Public sector technical**

Each of the secondary occupation groups predominantly in the public sector experienced an undersupply of courses relative to total vacancies, but an oversupply relative to skills shortage vacancies. This is due to the relatively low skills shortage density of public sector occupations. It is likely that factors other than a lack of skills are causing recruitment problems in these occupations, such as low pay (see median salaries in the chart) or poor working conditions.

<sup>21</sup> Source: CPP analysis of ESFA Localities Datacube, Burning Glass job vacancy data by 4-digit SOC code, Employer Skills Survey 2017 and Labour Force Survey UK data on highest qualification of workers by 4 digit SOC code

**Chart 16: Total vacancies, skills shortage vacancies (SSVs), FE course completions and apprenticeship completions for selected secondary occupation groups, D2N2, 2016/17<sup>22</sup>**



## 4: Conclusions and next steps

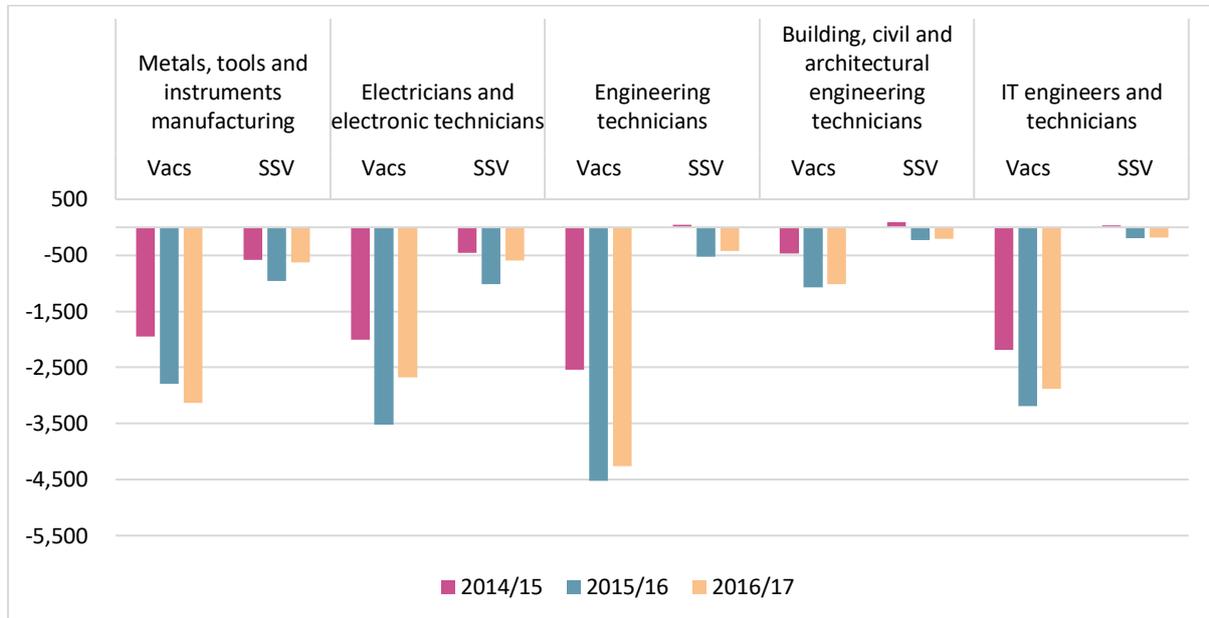
This report demonstrates that D2N2 can play an active role in building a more effective local skills system, where learners have opportunities to make informed decisions that could improve their employment and earnings outlook. This requires a realignment of provision so that more learners are taking courses in high demand from employers, and fewer are taking courses for which demand is weak.

A key route to achieving better aligned provision is to give prospective learners the information they need to make informed choices. The data compiled for this report can be used to bolster careers advice and guidance in D2N2 by making it truly evidence based. However, to do so effectively requires disseminating this complex data in ways that are both informative and engaging for young people and adults making decisions about their educational futures. Therefore, to ensure that this report leads to lasting change the first step is to conduct workshops with young learners in Derby and Nottingham to develop and test the best ways in which to disseminate the findings contained in this report.

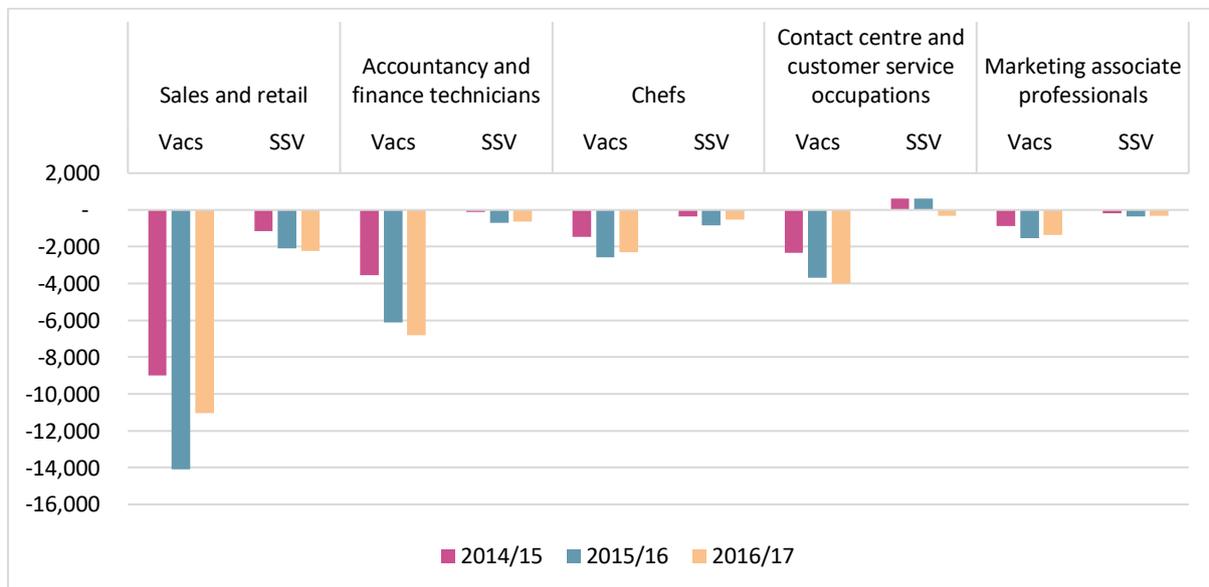
<sup>22</sup> Source: CPP analysis of ESFA Localities Datacube, Burning Glass job vacancy data by 4-digit SOC code, Employer Skills Survey 2017 and Labour Force Survey UK data on highest qualification of workers by 4 digit SOC code

## Appendix 1: Mismatch trend analysis

**Chart 17: The number of FE course completions relative to total vacancies and skills shortage vacancies for selected secondary occupation groups, D2N2, 2014/15-2016/17<sup>23</sup>**



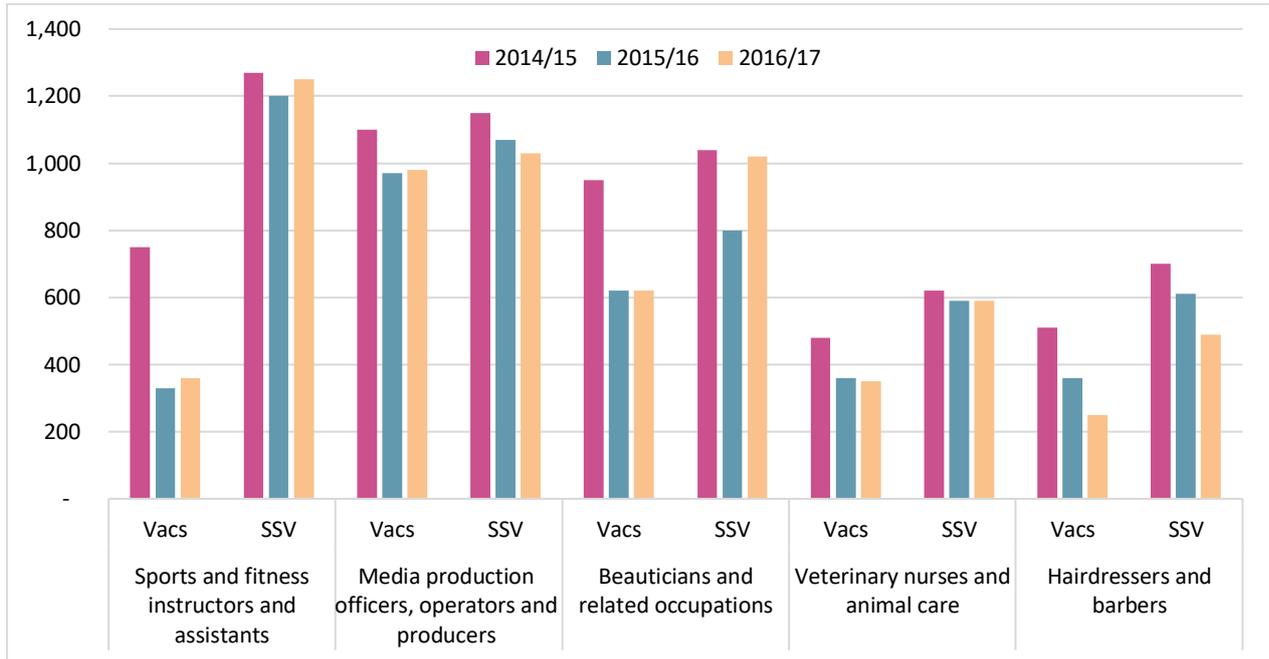
**Chart 18: The number of FE course completions relative to total vacancies and skills shortage vacancies for selected secondary occupation groups, D2N2, 2014/15-2016/17<sup>24</sup>**



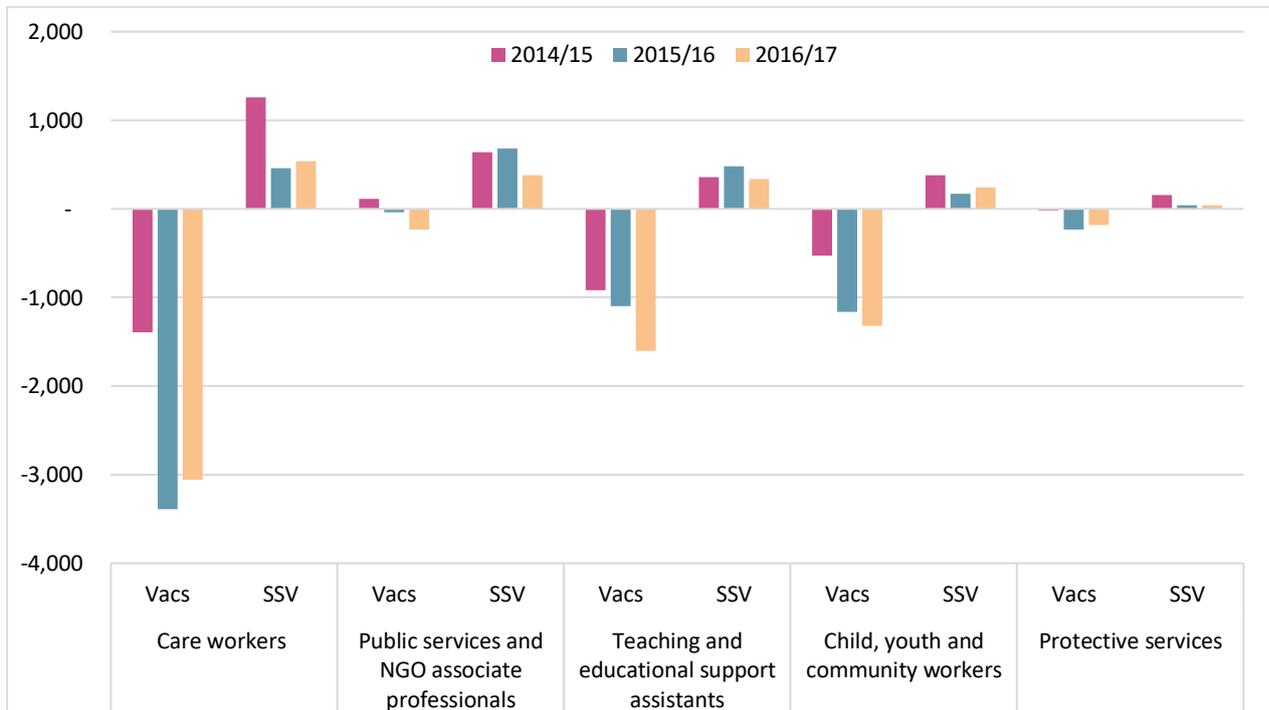
<sup>23</sup> Source: CPP analysis of ESFA Localities Datacube, Burning Glass job vacancy data by 4 digit SOC code, Employer Skills Survey 2013, 2015 and 2017 and Labour Force Survey UK data on highest qualification of workers by 4 digit SOC code

<sup>24</sup> Source: CPP analysis of ESFA Localities Datacube, Burning Glass job vacancy data by 4 digit SOC code, Employer Skills Survey 2013, 2015 and 2017 and Labour Force Survey UK data on highest qualification of workers by 4 digit SOC code

**Chart 19: The number of FE course completions relative to total vacancies and skills shortage vacancies for selected secondary occupation groups, D2N2, 2014/15-2016/17<sup>25</sup>**



**Chart 20: The number of FE course completions relative to total vacancies and skills shortage vacancies for selected secondary occupation groups, D2N2, 2014/15-2016/17<sup>26</sup>**



<sup>25</sup> Source: CPP analysis of ESFA Localities Datacube, Burning Glass job vacancy data by 4-digit SOC code, Employer Skills Survey 2013, 2015 and 2017 and Labour Force Survey UK data on highest qualification of workers by 4 digit SOC code

<sup>26</sup> Source: CPP analysis of ESFA Localities Datacube, Burning Glass job vacancy data by 4-digit SOC code, Employer Skills Survey 2013, 2015 and 2017 and Labour Force Survey UK data on highest qualification of workers by 4 digit SOC code

## Appendix 2: Potential biases of online vacancy data

---

Burning Glass vacancies are scraped from job posting websites. To assess the reliability of Burning Glass data compared with UK labour market statistics CPP has compared three sets of data with Burning Glass vacancies. The data sets used were the ONS's Annual Survey of Hours and earnings by industry (SIC 2010); the ONS's JOBS02: Workforce jobs by industry for total employment (SIC 2010); and EMP04 data for employment by occupation (SOC).

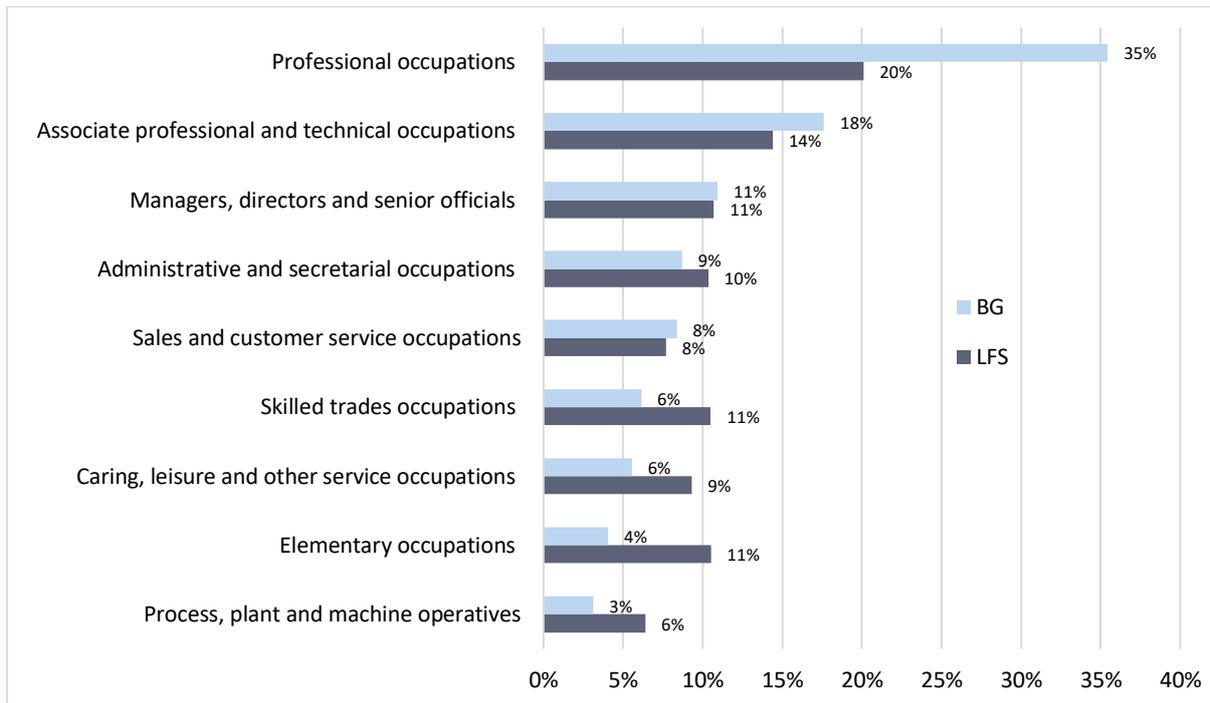
For each data set, the percentage of total employment or total vacancies of each occupation or industry was calculated. This was then used to compare with Burning Glass vacancy figures to establish the difference in the distribution of industries and occupations as a percentage of the whole workforce.

Analysis of occupations suggests that Burning Glass tends to over-estimate the distribution of professional occupations and under-estimate elementary occupations. For example, EMP04 puts professional occupations at 20% of the workforce, compared to 35% of Burning Glass advertised vacancies. In contrast, elementary occupations make up 10.51% of EMP04 jobs but only 4.07% of Burning Glass roles. Mild over-estimation of distribution occurs in associate professional and technical occupations while mild under-estimation occurs in skilled trades occupations. This is possibly due to online postings generally reflecting a higher proportion of skilled positions and fewer entry-level, manual labour openings, which may be advertised more locally or in more traditional places of advertising, such as newspapers and industry networks.

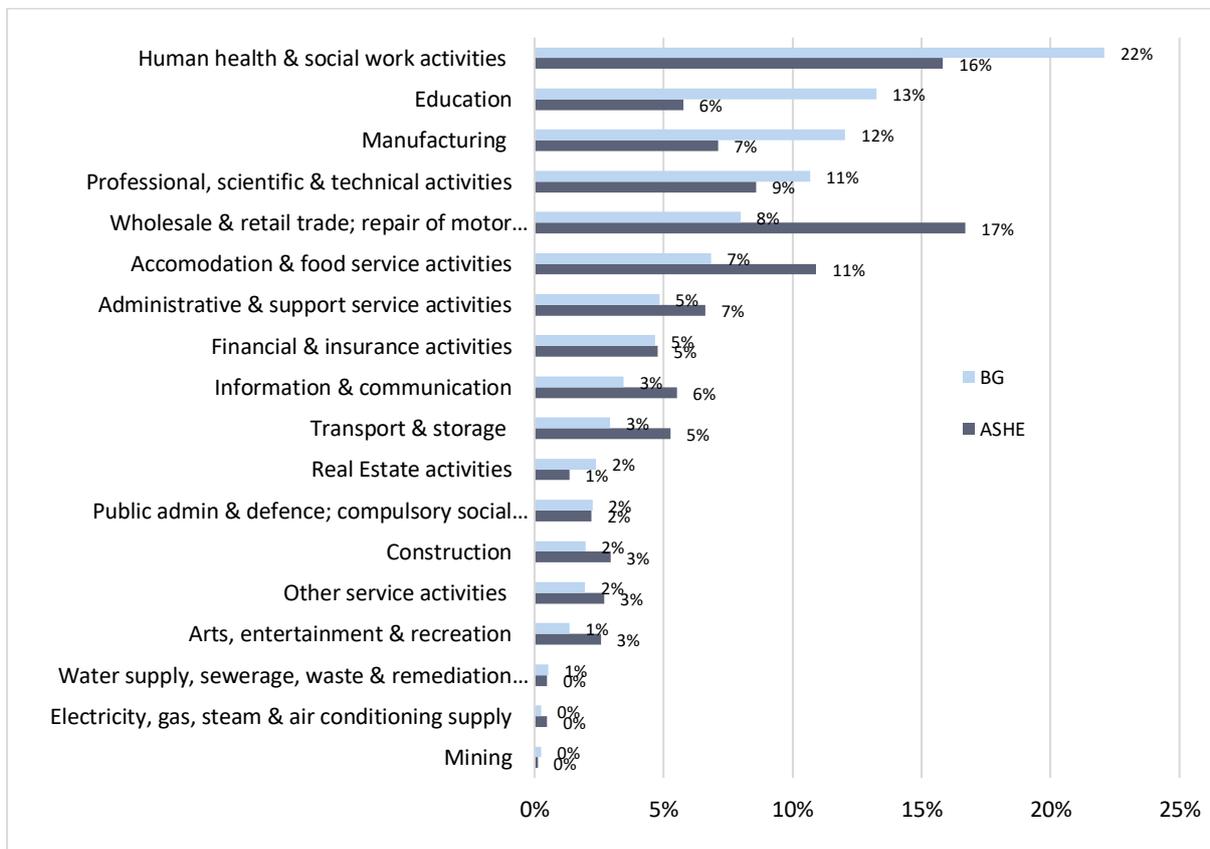
In terms of industries, Burning Glass has a significantly higher proportion of vacancies Education and Human health & social work activities than in the ASHE vacancies data. Education has the highest discrepancy, representing 6% of ASHE vacancies but 13% of Burning Glass advertised roles. More manual industries, namely wholesale & retail trade, and accommodation & food service activities were under-represented in Burning Glass vacancies. As stated above, this is likely due to the fact that roles requiring less education are underrepresented on Burning Glass, thus leading to the under-coverage of less-skilled industries.

For most industries Burning Glass data is within 2% of the ASHE and JOBS02 distribution figures in 7 of the 18 industries and within 1% in another 6. The discrepancy is larger when relating to occupations, only within 1% in two of the nine occupations. Research has shown that employers may publish adverts to gauge the available talent pool, or one ad may be used to fill multiple vacancies.

**Chart 19: Distribution of occupations as a percentage of total employment from the Labour Force Survey (LFS) and distribution of occupations as a percentage of total advertised vacancies captured by Burning Glass (BG), UK, 2017.**



**Chart 20: Distribution of industries as a percentage of total advertised vacancies captured by Burning Glass (BG) and in ASHE Vacancies, UK, 2018.**



## Appendix 3: Methodology of the mismatch analysis

---

The focus of the mismatch analysis is predominantly on the differences between the number of course completions and the number of skill shortage vacancies, rather than the number of total vacancies. The difference between course completions and the total number of vacancies should be seen as the maximum mismatch possible. This is because people already working in similar jobs may fill a certain portion of the total number of vacancies. In other words, a proportion of any potential undersupply of FE course completions relative to total vacancies can often be explained by industry churn. Using an estimate of the number of skill shortage vacancies controls for this because employers are, by definition, struggling to fill these from the existing labour supply. The true annual requirement of course completers for each subject is likely to lie somewhere between the two, given that some roles will be filled by new entrants to the industry before they would be classed as skills shortage vacancies. The course completion undersupply figures using skills shortage vacancies presented below should therefore be seen as conservative estimates.

The objective of the mismatch analysis is to identify possible skill areas where technical provision could be improved to better align the supply of skills with the demand coming from employers. The intuitive benefits of increasing provision in this manner are clear: learners will be more likely to gain economically valuable skills that will allow them to access high skill technical careers; businesses will be better able to source the skilled labour they need to remain competitive and grow; and the wider local economy will benefit from an effective labour market.

### Data sources:

- **College-based technical courses:** ESFA LEP datacube data on the number of completions by individual learning aim (based on all skills providers within the LEP).
- **Apprenticeships:** Skills Funding Agency's LEP Data Cube data on the number of completions by pathway chosen for each apprenticeship framework (based on all skills providers within the LEP).
- **Job vacancies:** Burning Glass' LEP level data on vacancies by four-digit SOC code.
- **Education level:** Labour Force Survey's (LFS) UK data by four-digit SOC code. Data are not available at the LEP level. Note, the LFS was used instead of Burning Glass data for advertised minimum education level as this specific part of their data is drawn from a small sample since only a small number of adverts specify this.
- **Skills shortages:** 2015 and 2017 Employer Skills Surveys

### Scope of the demand-side analysis of technical vacancies

Vacancies are scraped from job posting websites. While all types of vacancies are considered, the vast majority (~97%) are full time roles. Unless otherwise stated, vacancy data is for the academic year.

### Scope of the supply-side analysis

For the number of completions of college-based courses, only 'education and training', 'traineeships' and 'community learning' funded courses were included. The small number of courses funded via 'workplace learning' (which has largely been phased out in favour of apprenticeships) were excluded since trainees on this route are in employment.

Only technical courses with a significant time commitment required for completion were included. This was defined as certificates (130 to 260 hours of learning) and diplomas (370 or more hours of

learning). Awards, which can require as little as 10 hours of learning, were not included. AS and A-levels were also excluded given the report’s focus on technical education and training.

### Calculating skills shortage vacancies

The Employer Skills Survey provides estimates of skills shortage vacancy density at the LEP level for each of the ONS’s major SOC groups. The skills shortage vacancy densities used for CPP occupation groups are calculated using a weighted average of those for the ONS’s major SOC groups.

### Comparing supply and demand

FE courses, apprenticeships, vacancies (at the four-digit SOC code level) and skills shortage vacancies are matched into 60 common technical occupation sub-groups using CPP’s Skills Mapping System. The system acts as a bridge between the supply side and demand side skills data, to allow for meaningful comparison.

Mapping of courses and apprenticeships into sub-groups was carried out principally through desk-based research. The general process is as follows:

- Identify skills, expected job roles and common progression routes for each individual course or apprenticeship
- Match these with the skills and typical job roles from the four-digit SOC codes
- Triangulate with further research on employment destinations for each type of course (where available)

Mapping of four-digit SOC code occupations into sub-groups was done through rigorous analysis of the skills required for each role and establishing groups for which there was a significant level of common skills. This was carried out primarily through desk-based research using the ONS’s SOC hierarchy, which includes detailed information on entry requirements, common tasks and related jobs.

These 60 sub-groups then make up the primary technical groups, outlined in the definitions section above.

## Example mapping - Electricians and electronic trades/technicians/engineers (secondary occupation group)

### Jobs

Burning Glass job vacancy data		Labour Force Survey UK-level data on the existing workforce (used to apportion the total number of job vacancies to levels)				
SOC code (4 digit)	SOC occupation (4 digit)	Degree or equivalent (Level 6)	Higher education (Levels 4 and 5)	GCE A level or equivalent (Level 3)	GCSE grades A*-C or equivalent (Level 2)	No qualification
3112	Electrical and electronics technicians	1%	18%	61%	20%	0%
2123	Electrical engineers	16%	23%	46%	10%	5%
5241	Electricians and electrical fitters	2%	11%	64%	20%	3%
5249	Electrical and electronic trades n.e.c.	5%	14%	54%	22%	5%



5250	Skilled metal, electrical and electronic trades supervisors	2%	14%	59%	21%	5%
------	---	----	-----	-----	-----	----

As the highest average education level is level 3 (57%), electricians and electronic trades/technicians/engineers goes in the core technical primary group.

### Apprenticeships

Skills Funding Agency LEP data cube	
Framework	Pathway
Electrotechnical	All
Power industry	All
Electrical and Electronic Servicing	All
Electricity industry	All
Engineering Manufacture - Electrical and Electronic Engineering	All
Engineering Technology	Electrical/Electronics
Engineering	Electrical and electronic engineering
Engineering Manufacture (Craft and Technician)	Electrical and electronic engineering

### FE courses

Skills Funding Agency LEP data cube
BTEC HNC Diploma in Electrical and Electronic Engineering (QCF)
BTEC HND Diploma in Electrical and Electronic Engineering (QCF)
Diploma in Electrical Installations (Buildings and Structures) (QCF)
Diploma in Electrical/Electronic Engineering (QCF)
Diploma in Electrotechnical Services (Electrical Maintenance) (QCF)
NVQ Diploma in Installing Electrotechnical Systems and Equipment (Buildings, Structures and the Environment)
Diploma in Providing Electronic Security and Emergency Systems (QCF)
Diploma in Electrical and Electronic Engineering Technology (QCF)
Diploma in Electrical Installation (QCF)
Extended Diploma in Electrical/Electronic Engineering (QCF)
NVQ Diploma in Electrical and Electronic Engineering (QCF)
NVQ Diploma in Installing Electrotechnical Systems and Equipment (Buildings, Structures and the Environment) (QCF)
Certificate in Electrical and Electronic Engineering Technology (QCF)
Diploma in Electrical Power Engineering - Distribution and Transmission (Technical Knowledge) (QCF)
Diploma in Electrical Power Engineering - Wind Turbine Maintenance (Technical Knowledge) (QCF)
Diploma in Electronic, security and emergency systems (QCF)
NVQ Diploma in Electrical Power Engineering - Wind Turbine Operations and Maintenance (QCF)
Certificate in Installing, Testing and Ensuring Compliance of Electrical Installations in Dwellings (QCF)

Diploma in Installing Engineering Construction Plant and Systems Electrical (QCF)
BTEC HND Diploma in Electronic Engineering (QCF)
Certificate in Electrical Power Engineering - Distribution and Transmission Technical Knowledge (QCF)
Certificate in Knowledge of Electronic Security and Emergency Systems (QCF)
Certificate in Providing Electronic Security and Emergency Systems (QCF)
Certificate in Electrical Power Engineering - Distribution and Transmission Technical Knowledge (QCF)
NVQ Certificate in Highway Electrical Systems (QCF)
Diploma in Auto Electrical and Mobile Electrical Principles (QCF)
NVQ Diploma in Bus and Coach Engineering and Maintenance (Electrical) (QCF)
Diploma in Power Engineering (QCF)
Diploma in Electrical Power Engineering - Underground Cables (QCF)
BTEC HND Diploma in Electrical Engineering (QCF)
BTEC HNC Diploma in Electrical Engineering (QCF)