Department for Education

Further Education Skills Index

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Summary of findings

The Further Education (FE) Skills Index shows how the aggregate value of the skills supplied by the FE system each year has changed over time. It tracks the total productivity contribution of the FE system by aggregating estimated earnings returns for adult learners and apprentices who successfully complete their training.

The level of the index is dependent on both absolute numbers of learners achieving qualifications and the mix of qualifications achieved – a shift towards more valuable qualifications will cause the index to rise even if achievement numbers do not change and, similarly, a fall in the number of achievements will cause the index to fall even if the value of qualifications does not change.

The Skills Index covers funded training in England between 2012/13 and 2019/20 for FE learners over the age of 19 and apprentices of all ages, taking into account the provision type, level and sector subject area of the qualification. Training funded through the Adult Community Learning budget is not included.

Key findings in 2019/20

- The Skills Index has decreased almost every year since 2012/13, and in 2019/20 fell by 21% (its largest fall to date) against the backdrop of COVID-19 restrictions.
- The downward trend since 2012/13 has mainly been driven by a decline in FE learner numbers[1] leading to fewer achievers. The number of achievers in 2019/20 is less than half (47%) what it was in 2012/13.
- The number of achievers in 2019/20 was also impacted by COVID-19 restrictions, with disruptions to exams and breaks in learning leading to fewer achievements than would normally have been expected[2]. Achievements in both apprenticeships and classroom-based learning fell by around 21% in 2019/20.
- The value-added per learner was 6% greater in 2019/20 than it was in 2012/13, suggesting that learners across FE have shifted towards more valuable qualifications (particularly towards apprenticeships which typically have higher returns than classroom-based training).
- The provision mix has become more valuable for apprenticeships over time as apprentices have gradually shifted towards higher levels and more valuable subjects. However, it has become less economically valuable for classroom-based training as learners have shifted to lower levels and less economically valuable subjects.

[1] DfE (2020), Further education and skills: January 2021. The number of 19+ learners participating in FE and Skills fell from 3.3m in 2012/13 to 1.7m in 2019/20, and the number of apprentices fell from 870k to 720k in the same period.
[2] DfE (2020), Further education and skills: January 2021. In 2019/20, a higher number of records than normal were marked as 'results unknown' or 'learning continuing'. Further analysis found that most of these learners had either gone on to achieve in 2020/21 or have been marked as continuing learning beyond the original planned date.

1 Introduction

DfE aims to deliver an FE system that provides the skills that the economy and employers value to a greater number of people. The analysis in this report can be used to monitor and evaluate the value of the FE system in England.

1.1 Measuring the impact of FE on productivity

A key reason for the Government's investment in skills is to increase the productivity of the economy. Productivity is how much we produce with the resources we have available and determines how quickly a country's average income and welfare increases over time. Though the rate of productivity growth is influenced by a number of factors, a country's skills level is a major component, as giving people valuable knowledge, skills and behaviours boosts their productivity[3].

The Skills Index takes the increases in earnings attributable to different types of FE training and aggregates these to estimate a total impact on productivity. This assumes that in a well-functioning labour market, an individual's earnings reflect their productivity. This approach is well-established in academia and public policy analysis[4].

To assess the full impact of the FE system, DfE periodically produces full Net Present Value estimates compliant with the HM Treasury Green Book. The Skills Index adds to this by providing a simpler, more tractable measure that we can use to monitor changes in the value-added of the FE system over time. Full details on the Skills Index methodology can be found in section 2.

1.2 Using the Skills Index

We use the Skills Index to monitor the value of the FE system over time.

In the simplest terms, changes to the index are driven by numbers of achievers and the level and subjects of their qualifications. At a more detailed level, an increase (or decrease) in the Skills Index would be caused by one or more of:

1. An increase (decrease) in the number of learners;
2. An increase (decrease) in achievement rates;
3. A shift towards (away from) more economically valuable training, either through more (less) learning undertaken at higher levels or in more (less) valuable subjects.

The Skills Index **is not** intended to be:

- A full assessment of the total value generated by the FE system – Training also delivers economic value not captured by earnings returns, such as increased

[3] BIS (2015), UK skills and productivity in an international context
[4] See, for example, Becker (1975) and Mincer (1974), and HMT (2018), The Green Book

profits to employers, benefits to the Exchequer (greater tax revenue and lower welfare spending), and wider benefits to society rooted in greater and improved products and services.

- A full assessment of the productivity impact over a learner's lifespan – The Skills Index is based on the increase in annual earnings attributable to training over 3 to 5 years and does not capture the total increase in earnings over a lifetime.
- A timely measure for evaluating specific policy changes – This is because it takes a minimum of six years after a learner completes training before we can start estimating the earnings returns of their qualification.
- A method for tracking changes in the quality of qualifications delivered. The Skills Index monitors changes in the provision mix (i.e. the distribution of qualifications by level and subject). It does not currently track changes to the value of qualification levels and subjects which are based on one set of returns estimates and effectively assumed to remain fixed over time.

2 Data and methodology

2.1 Data sources and approach

The Skills Index covers funded training in England between 2012/13 and 2019/20 for FE learners over the age of 19 and apprentices of all ages, taking into account the provision type, level and sector subject area of the qualification. Training funded through the Adult Community Learning budget is not included.

The value-added is calculated separately for each provision type, level and sector subject area by multiplying together estimates of:

1. **The number of funded learners that achieved qualifications** in each academic year recorded through the Individualised Learner Record (ILR)[5]. Where learners achieved more than one qualification, their highest and latest qualification is taken. Headline numbers of achievements by provision type and level are regularly published on gov.uk[6].

2. **The proportion of learners expected to be employed** after achieving their qualification. We use static values from the sustained employment rate measure for the 2013/14 cohort, taken from DfE's 2020 Outcome-Based Success Measures statistics[7]. Estimates are provided in Annex A.

3. **The expected median real earnings** for employed achievers. These are static values calculated using the LEO dataset, based on learners exiting learning between academic years 2008/09 and 2013/14 and averaged over 3 to 5 years after the qualification. These are provided in Annex A.

4. **The expected percentage earnings returns** associated with achieving a qualification, as a percentage increase relative to non-achievers. These are static values derived from a regression analysis using data from the LEO dataset. As above, the returns are based on learners exiting learning between academic years 2008/09 and 2013/14 and averaged over 3 to 5 years after the qualification. These are provided in Annex A.

[5] In 2016/17 a number of Full Level 2 and Full Level 3 qualifications were reclassified by the ESFA for the 19-23 entitlement, to align with the 16-19 offer and recommendations in the Wolf Review of Vocational Education. These qualifications are included in the Skills Index according to their original classification to allow for a consistent time series.
[6] DfE (2021), Further education and skills: January 2021. The achievement figures in this publication differ from those used in the Skills Index. The apprenticeship achievement figures in the Further education and skills publication count the number of aims achieved rather than the number of unique learners, while the FE and Skills achievement learner volume figures include Community Learning, and learning at an unknown level, both of which are excluded from the Skills Index.
[7] DfE (2020), Further Education Outcome-Based Success Measures.

These are then added together to create the total value-added for the entire FE system, such that the total value-added reflects changes in the number of achievers and the provision mix over time.

The total value-added is indexed to 2012/13 and an annual change figure is calculated.

We anticipate that improvements to the quality of qualifications will also improve economic outcomes. Currently in the Skills Index, quality, as measured by employment rates, median earnings and the earnings differential between achievers and non-achievers, is a static value for each combination of subject and level. We hold these estimates constant for the following reasons:

- The Skills Index is intended to reflect changes in employability and earning returns linked to changes in the qualifications that learners achieve, but not short-term changes due to wider economic conditions.
- We do not have sufficient data to update the employment and earnings returns for more recent cohorts. It takes a minimum of six years after a cohort of learners completes training to get data, and data from multiple cohorts is required, before we can update earnings returns.

We expect that changes to the FE system (e.g. the switch from apprenticeship frameworks to standards) will improve outcomes, however it will take a number of years before these filter through the earnings returns and the Skills Index.

2.2 Changes in methodology since last year

We have made adjustments to the data inputs and the methodology since last year's publication. This means that figures from previous years have changed. Although overall trends and indexed figures have remained broadly the same, the total value-added of the FE system is greater than previously reported. The following changes have been made:

- We have reverted to using static employment rates instead of updating these annually. This is to ensure the Skills Index reflects the value that the FE system delivers over time, rather than being affected by short-term changes to wider economic conditions. We use the employment rates for the 2013/14 cohort from DfE's OBSM statistics.
- We have improved the methodology and streamlined the data processing for calculating earnings returns, and in the process have updated these inputs with more recent data. See Annex B for detail.

Details of the impact of the different changes are set out below. Further work will be undertaken in the coming year to define the future update timetable for the employment rate and earnings returns inputs. This timetable will be included in future releases of the Skills Index.

Data inputs	Changes	Rationale for changes	Impact on Skills Index
Number of achievers	No change		
Employment rates	• Reverted to using static employment rates instead of updating these annually. • Applied the employment rates for the 2013/14 cohort from DfE's OBSM statistics.	• The Skills Index should reflect changes in employment linked to changes in qualifications rather than to short-term shocks in the economy. • OBSM provides the most complete assessment of employment linked to qualifications. We use OBSM rates for 2013/14 achievers (earliest available) to align with the cohorts on which earnings are based.	Minor impact on the Skills Index.
Median real earnings and percentage earnings returns	• Streamlined the data processing and updated the earnings returns for all apprenticeship levels and below level 2, full level 2, full level 3 and level 4+ classroom-based learning. • Kept the level 2 and level 3 earnings returns and median earnings used in previous versions.	• The figures can now be calculated internally and updated periodically when sufficient new data is available. • The returns update does not currently include these particular outputs but we intend to update them at a future date.	The improved estimates show higher earnings and returns on a number of qualifications (for example below level 2, level 2 health and social care, and engineering apprenticeships). This resulted in a 2ppt average increase on the Skills Index and a 48% average increase in total value-added, with increase greater for classroom-based learning (56%) than for apprenticeships (41%).

2.3 Measures

Value-added	The total increase in earnings generated by the FE system each year. This is indexed to the estimate for 2012/13 in order to create the Skills Index.
Annual change in value-added	The percentage change in value-added compared to the previous year.
Value-added per learner	The average value-added attributable to each learner that achieved a qualification.

3 Findings

3.1 Skills Index and total value-added

Overview

The Skills Index has decreased almost every year since 2012/13, and in 2019/20 fell by 21% (its largest fall to date) against the backdrop of COVID-19 restrictions. This has mainly been driven by a decline in FE learner numbers[8] leading to fewer achievers. The number of achievers in 2019/20 was also impacted by COVID-19 restrictions, with disruptions to exams and breaks in learning leading to fewer achievements than would normally have been expected[9].

- The number of learners who achieved a classroom-based course or an apprenticeship in 2019/20 is less than half (47%) what it was in 2012/13, and around 21% lower than in 2018/19.
- Until 2015/16, the decrease was largely driven by a fall in learners achieving classroom-based qualifications.
- The Skills Index then remained broadly unchanged between 2015/16 and 2017/18 when the number of achievers stabilised.
- Since 2018/19, a large drop in apprenticeship achievers has contributed to the steeper fall.

[8] DfE (2020), Further education and skills: January 2021. The number of 19+ learners participating in FE and Skills fell from 3.3m in 2012/13 to 1.7m in 2019/20, and the number of apprentices fell from 870k to 720k in the same period.
[9] DfE (2020), Further education and skills: January 2021. In 2019/20, a higher number of records than normal were marked as 'results unknown' or 'learning continuing'. Further analysis found that most of these learners had either gone on to achieve in 2020/21 or have been marked as continuing learning beyond the original planned date.

Figure 1: FE Skills Index by type of provision (2012/13 = 100)

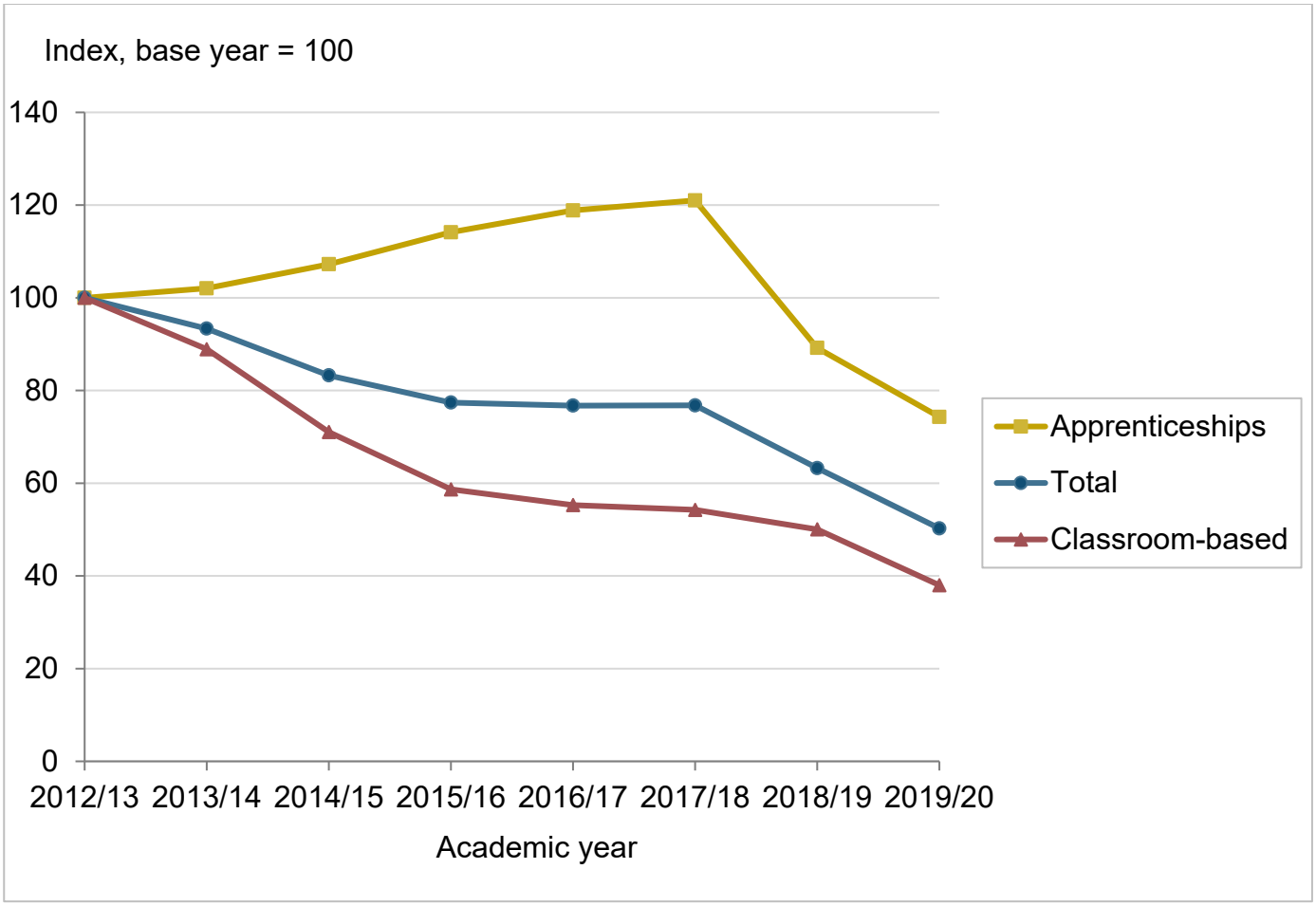
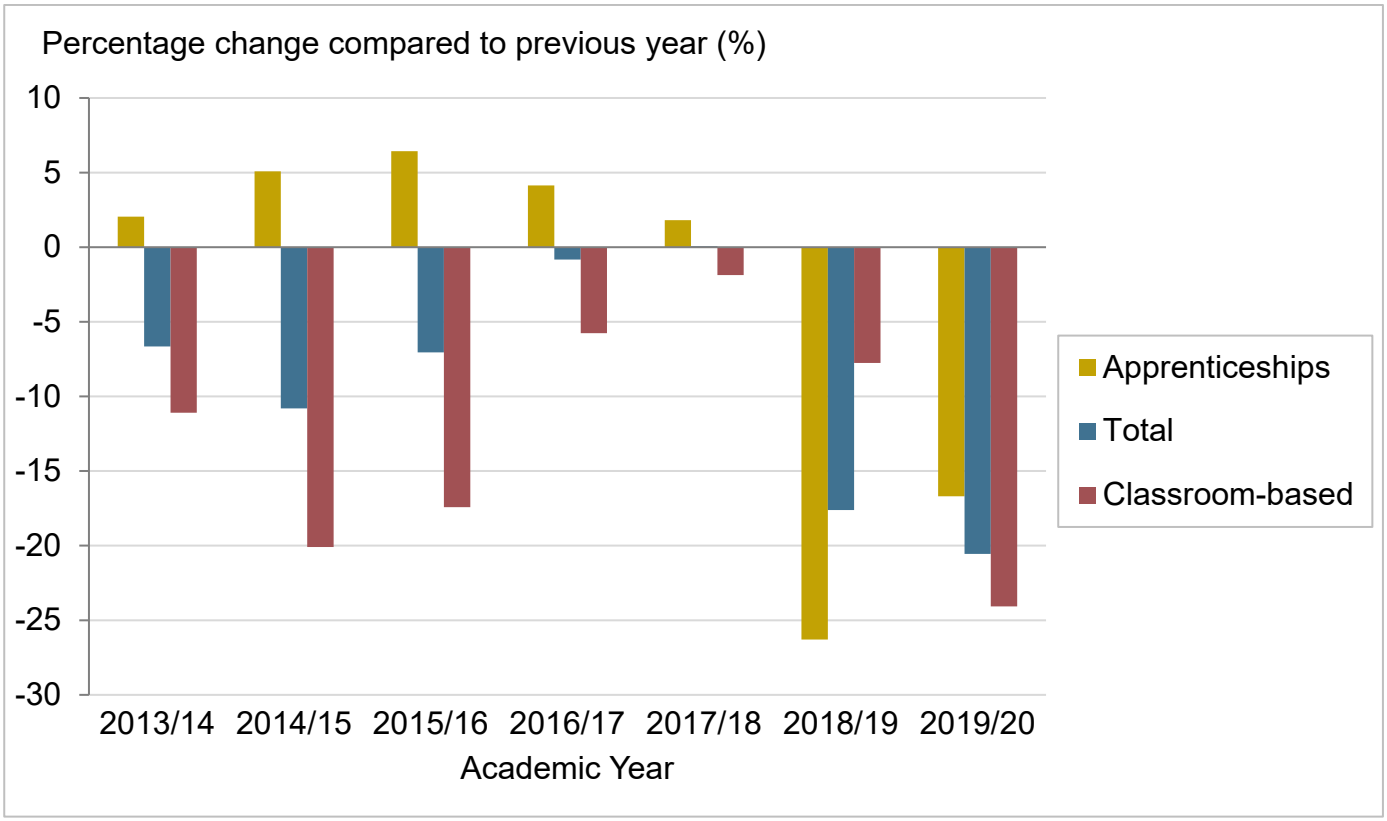


Figure 2: Annual change in the FE Skills Index by type of provision



Apprenticeships

The total value-added for apprenticeships[10] increased every year from 2012/13 to 2017/18 but fell by 26% in 2018/19 and by a further 17% in 2019/20.

- This is mainly driven by changes in the number of apprenticeship achievements, which increased by 10% between 2012/13 and 2016/17 but fell by 47% since 2017/18.
- Achievements in intermediate and advanced apprenticeships have fallen sharply since 2017/18, whilst the number of higher apprentices has increased.

The decline in apprenticeship achievements is due to various factors including:

- Intermediate apprenticeship starts have been falling since 2014/15 and advanced apprenticeship starts fell from 2016/17 to 2017/18 and again in 2019/20[11].
- The duration of apprenticeships is increasing, so there are fewer achievements in the short-term[12].
- In 2019/20, an increase in the number of breaks in learning due to COVID-19 has had a further impact on achievement rates[13].

Classroom-based training

The total value-added for classroom-based training has decreased by 62% since 2012/13. It fell by 24% between 2018/19 and 2019/20, its steepest fall to date.

- This is primarily driven by a large decrease in the number of achievements at full level 2 and full level 3.
- The decline in classroom-based training achievements is also a result of the long-term falling trend in learner numbers.
- In 2019/20, achievement numbers were further impacted by COVID-19 which disrupted exams and assessments and caused a significant increase in breaks in learning and withdrawals.

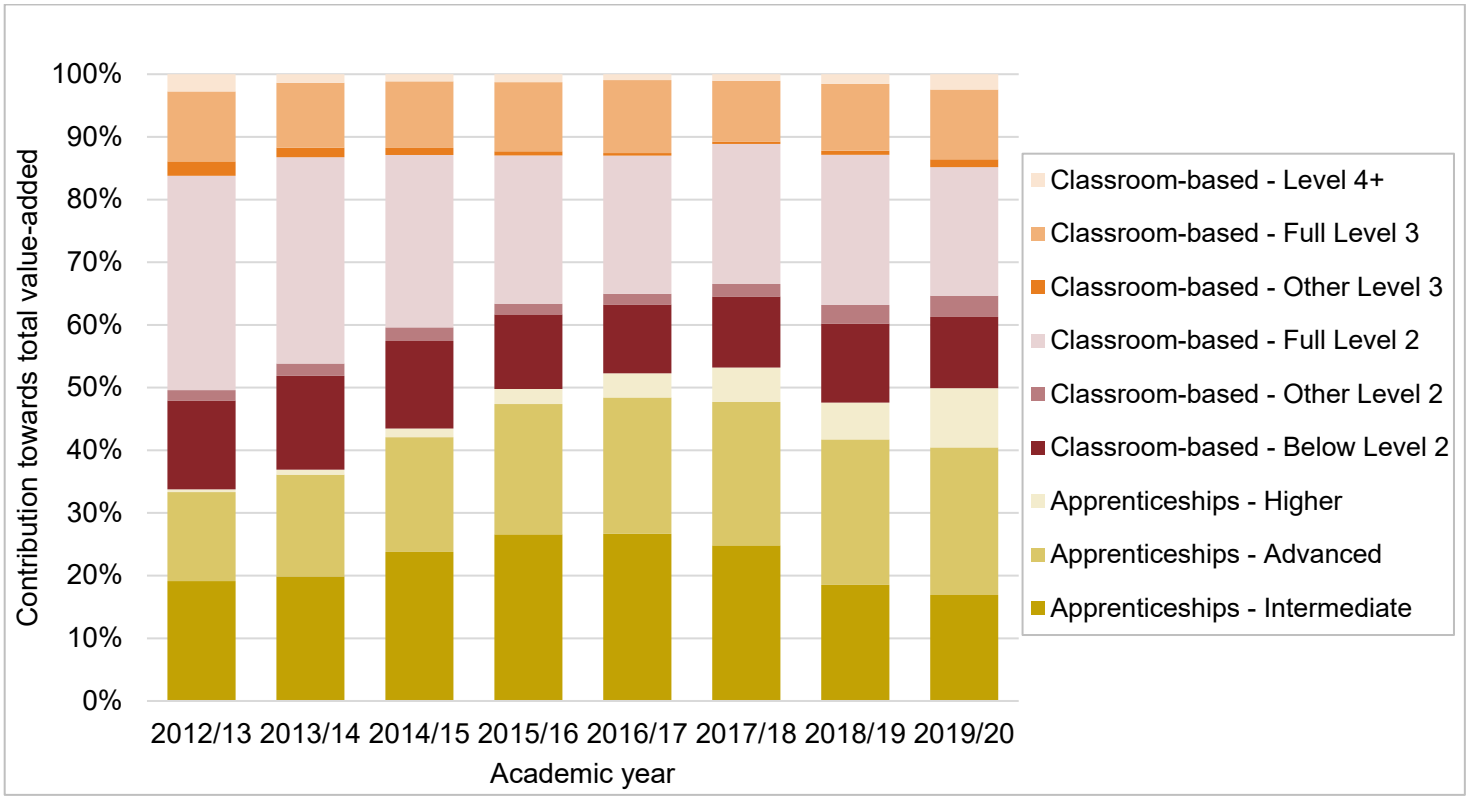
[10] In 2018/19, achievements in frameworks made up 85% of all apprenticeship achievements . It is still too early to have outcomes data for apprentices who train on standards, so the employment rates, earnings outcomes and returns estimates used in the Skills Index are based on frameworks. Standards are of higher quality and have additional training hours compared to frameworks; this may lead to changes in value-added in future as data on standards comes through.
[11] DfE (2021), Apprenticeships and traineeships: March 2021.
[12] DfE (2021), Apprenticeships and traineeships: March 2021.
[13] DfE (2021), Further Education and Skills: March 2021.

Contribution of different qualifications

In 2019/20, apprenticeships contributed 50% of the total value-added of the FE system even though they represented only 16% of achievements. This is because apprenticeships generally result in higher returns, higher employment, and higher earnings than classroom-based qualification at the same level (see Annex A).

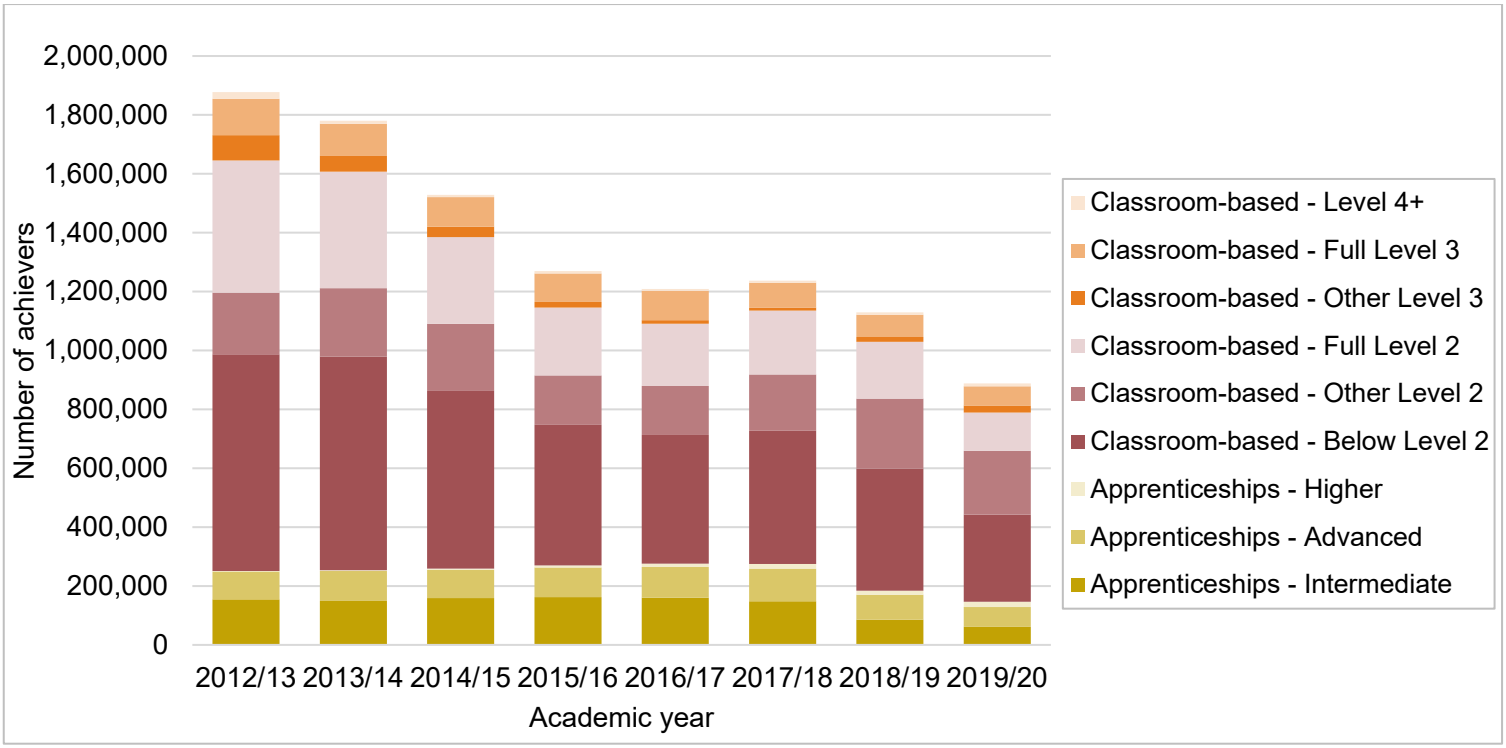
- Changes in the composition of the value-added are driven by changes in the relative number of achievements at each level.
- The contribution of apprenticeships towards the total value-added increased from 34% in 2012/13 to 53% in 2017/18 when apprenticeship achievements were rapidly increasing. Their contribution has fallen slightly back to 50% in 2019/20 when achievements were falling.
- The contribution of higher apprenticeships has gradually increased from 0% in 2012/13 to 9% in 2019/20 as the number of achievers increased more than tenfold.
- On the other hand, the contribution of classroom-based full level 2 training has decreased from 34% in 2012/13 to 20% in 2019/20 as the number of achievers fell by 71%.

Figure 3: Contribution of each provision type and level[14] towards total value-added



[14] In 2016/17 some Full Level 2 and Full Level 3 qualifications were reclassified (see page 7). These qualifications are included in the Skills Index according to their original classification.

Figure 4: Number of achievers at each provision type and level[15]



3.2 Value-added per learner

Overview

The value-added per learner gives a better sense of how changes in the provision mix (level and subject) has affected the value-added of the FE system over time, putting aside the impact of falling achievement numbers.

The value-added per learner was 6% greater in 2019/20 than it was in 2012/13, suggesting that learners across FE have shifted towards more valuable qualifications.

- The value-added per FE learner increased by 19% between 2012/13 and 2016/17. This is mostly due to a shift towards apprenticeships which typically have higher employment rates and earnings returns than classroom-based training.
- It then fell by 2% in 2017/18 and a further 10% in 2018/19 mainly due to a fall in value-added per learner for classroom-based qualifications and a decline in the proportion of apprenticeship achievements.
- It has since stabilised in 2019/20 at 6% above the 2012/13 figure.

The provision mix has become more valuable for apprenticeships and less valuable for classroom-based training.

[15] In 2016/17 some Full Level 2 and Full Level 3 qualifications were reclassified (see page 7). These qualifications are included in the Skills Index according to their original classification.

Figure 5: Value-added per learner by type of provision (2012/13 = 100)

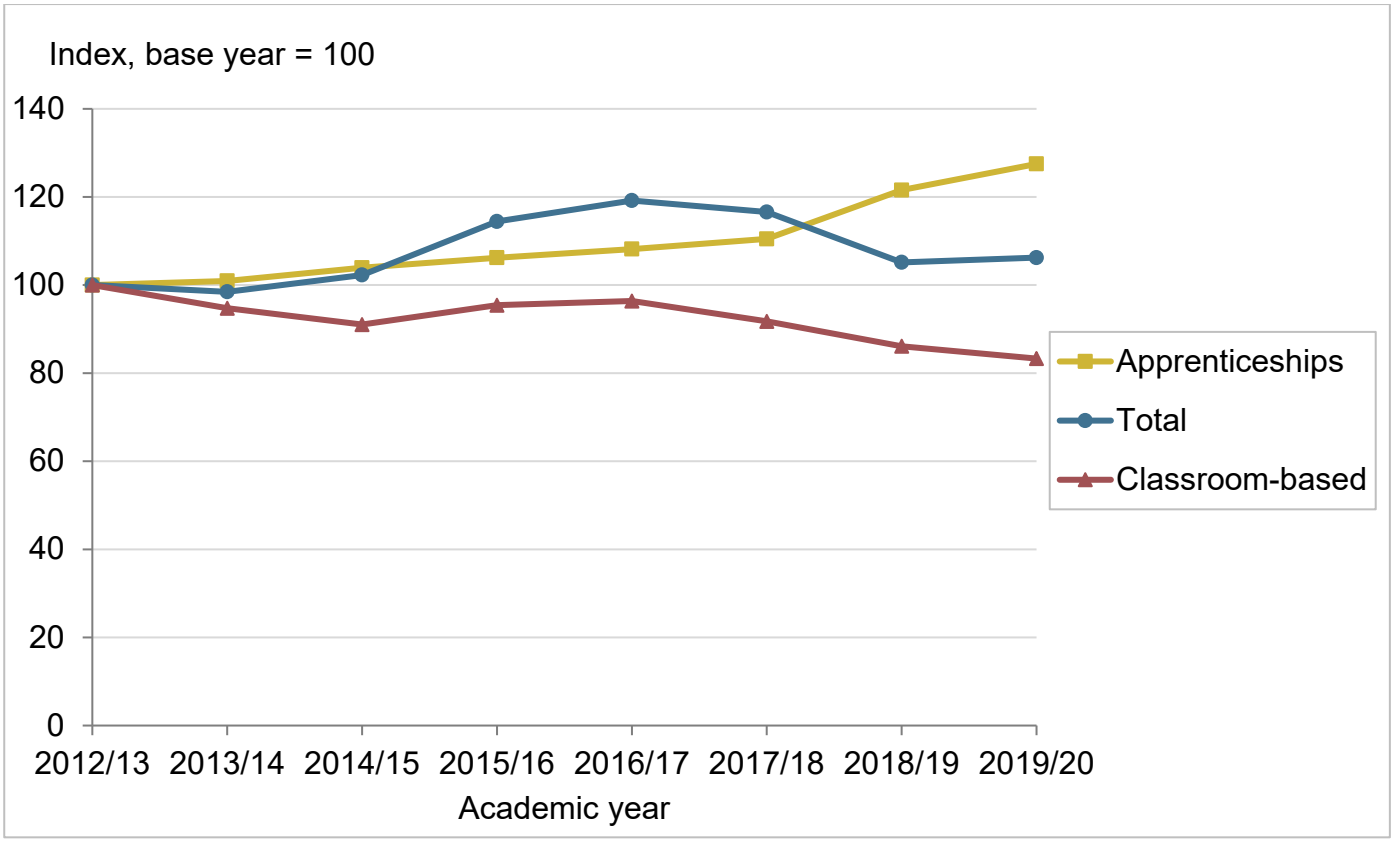
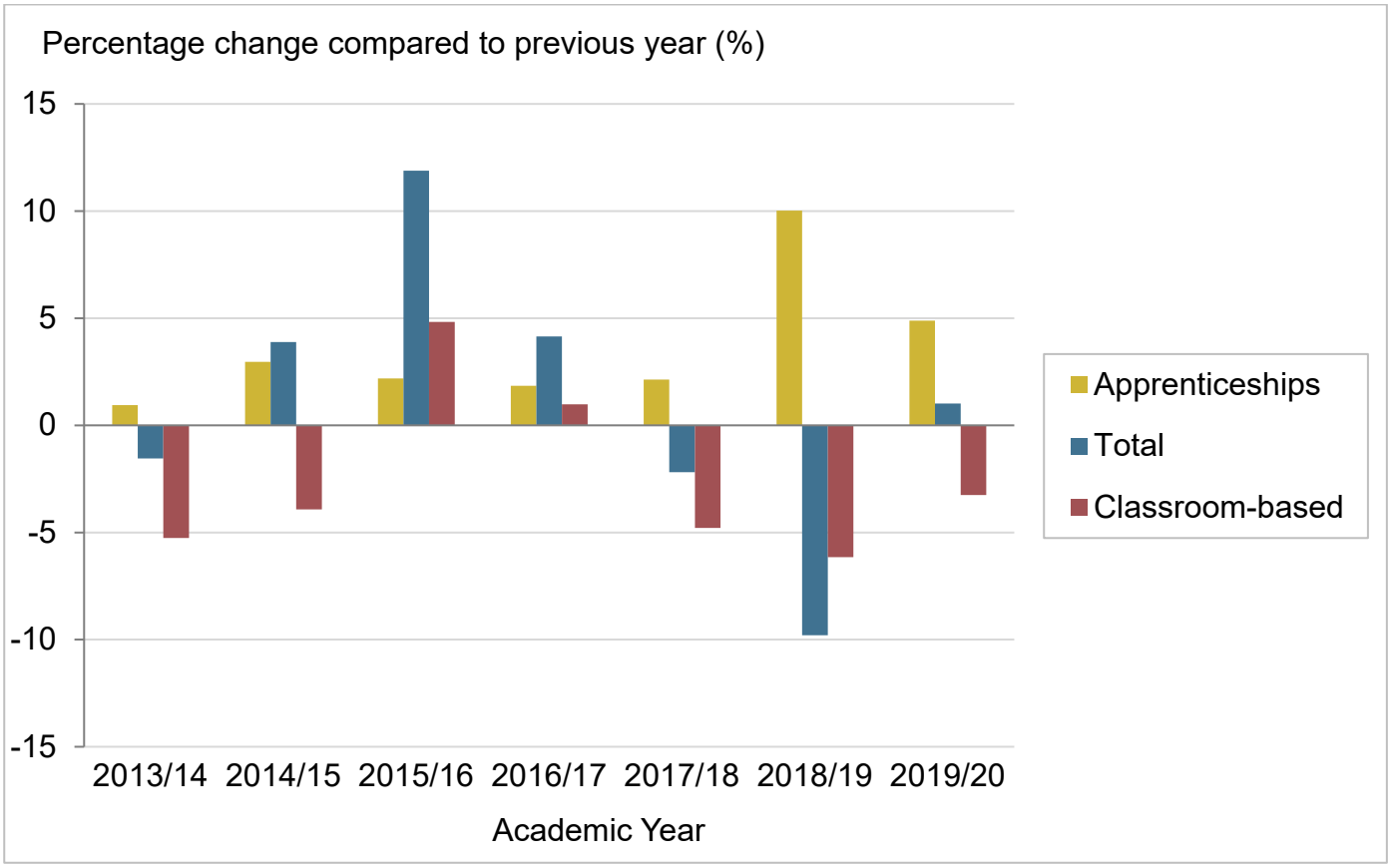


Figure 6: Annual change in value-added per learner by type of provision



Apprenticeships

The provision mix for apprenticeships has become more valuable over time, with the value-added per apprentice increasing by 27% since 2012/13.

- This increase is partly due to a shift from intermediate towards higher and advanced level apprenticeships which have higher employment and earnings returns.
- It is also caused by a shift over time towards apprenticeships in sector subject areas with higher earnings returns – towards engineering, construction and ICT qualifications and away from retail, business and leisure qualifications.

Classroom-based training

The provision mix for classroom-based training has become less valuable over time, with the value-added per learner in classroom-based training falling by 17% since 2012/13.

- This can partly be explained by a shift away from full level 2 qualifications towards other level 2 qualifications which typically have lower employment and earnings returns, as well as a shift towards sector subject areas with lower earnings returns (particularly towards health).
- The value-added slightly increased in 2015/16 and 2016/17 which can be explained by an increase in the proportion of full level 3 achievers in these years.

4 Tables

Table 1: FE Skills Index by type of provision (2012/13 = 100)

	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
Total	**100**	**93**	**83**	**77**	**77**	**77**	**63**	**50**
Apprenticeships	100	102	107	114	119	121	89	74
Classroom-based	100	86	71	59	55	54	50	38

Table 2: Annual change in the FE Skills Index by type of provision (%)

	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
Total	**-**	**-7%**	**-11%**	**-7%**	**-1%**	**0%**	**-18%**	**-21%**
Apprenticeships	-	2%	5%	6%	4%	2%	-26%	-17%
Classroom-based	-	-11%	-20%	-17%	-6%	-2%	-8%	-24%

Table 3: Contribution of each provider type and level[16] towards total value-added (%)

	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
Apprenticeships	**34%**	**37%**	**43%**	**50%**	**52%**	**53%**	**48%**	**50%**
Intermediate	19%	20%	24%	27%	27%	25%	18%	17%
Advanced	14%	16%	18%	21%	22%	23%	23%	24%
Higher (Level 4+)	0%	1%	1%	2%	4%	5%	6%	9%
Classroom-based	**66%**	**63%**	**57%**	**50%**	**48%**	**47%**	**52%**	**50%**
Below Level 2	14%	15%	14%	12%	11%	11%	13%	11%
Other Level 2	2%	2%	2%	2%	2%	2%	3%	3%
Full Level 2	34%	33%	27%	24%	22%	22%	24%	20%
Other Level 3	2%	2%	1%	1%	0%	0%	1%	1%
Full Level 3	11%	10%	11%	11%	12%	10%	11%	11%
Level 4+	3%	1%	1%	1%	1%	1%	2%	2%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

[16] In 2016/17 some Full Level 2 and Full Level 3 qualifications were reclassified (see page 7). These qualifications are included in the Skills Index according to their original classification.

Table 4: Number of achievers by provision type and level[17] (learners counted once each year, at highest level of achievement)

	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
Apprenticeships	**251,000**	**253,800**	**259,000**	**269,700**	**275,800**	**274,900**	**184,200**	**146,300**
Intermediate	154,600	149,100	158,900	162,400	160,200	148,300	85,600	61,400
Advanced	94,800	102,000	95,800	100,400	104,600	111,000	84,800	67,200
Higher (Level 4+)	1,600	2,700	4,300	6,900	11,000	15,700	13,800	17,700
Classroom-based	**1,626,600**	**1,526,400**	**1,269,500**	**1,000,000**	**933,200**	**961,800**	**945,400**	**742,000**
Below Level 2	736,100	725,400	603,500	477,300	437,300	452,300	414,300	296,200
Other Level 2	209,400	232,200	227,600	168,300	134,900	165,000	211,600	188,000
Full Level 2	448,900	396,000	295,000	230,500	243,100	243,100	219,300	158,800
Other Level 3	85,500	53,000	35,000	19,000	11,200	10,200	16,100	23,500
Full Level 3	123,800	109,300	100,500	96,800	100,700	84,700	76,000	65,200
Level 4+	22,800	10,600	7,800	8,100	6,000	6,600	8,100	10,200
Total	**1,877,600**	**1,780,200**	**1,528,400**	**1,269,700**	**1,209,000**	**1,236,800**	**1,129,600**	**888,300**

Table 5: Value-added per learner by type of provision (2012/13 = 100)

	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
Total	**100**	**98**	**102**	**115**	**119**	**117**	**105**	**106**
Apprenticeships	100	101	104	106	108	110	122	127
Classroom-based	100	95	91	96	96	92	86	83

Table 6: Annual change in value-added per learner by type of provision (%)

	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
Total	**-**	**-2%**	**4%**	**12%**	**4%**	**-2%**	**-10%**	**1%**
Apprenticeships	-	1%	3%	2%	2%	2%	10%	5%
Classroom-based	-	-5%	-4%	5%	1%	-5%	-6%	-3%

[17] In 2016/17 some Full Level 2 and Full Level 3 qualifications were reclassified (see page 7). These qualifications are included in the Skills Index according to their original classification.

Annex A: Employment rates, median earnings and earnings returns

Table 7: Employment rates, median earnings and earning returns for classroom-based qualifications

Provision type and level	Sector subject area	Employment rates	Median earnings	Earning returns	Value-added per learner
Classroom-based – Below level 2	All	49%	13,329	5%	299
Classroom-based – Other Level 2	All	61%	15,607	1%	123
Classroom-based – Full Level 2	Health, Public Services and Care	84%	14,193	14%	1,467
	Agriculture, Horticulture and Animal Care	69%	19,099	14%	1,613
	Engineering and Manufacturing Technologies	74%	20,522	6%	860
	Construction, Planning and the Built Environment	81%	24,510	16%	2,724
	Information and Communication Technology (ICT)	62%	16,427	4%	392
	Retail and Commercial Enterprise	60%	15,784	13%	1,086
	Leisure, Travel and Tourism	78%	16,120	5%	599
	Arts, Media and Publishing	53%	13,362	11%	699
	Education and Training	73%	10,145	7%	481
	Preparation for Life and Work	75%	15,049	10%	1,026
	Business, Administration, Finance and Law	71%	19,151	8%	1,011
Classroom-based – Other Level 3	All	79%	16,545	3%	417
Classroom-based – Full Level 3	Health, Public Services and Care	72%	14,444	13%	1,199

Provision type and level	Sector subject area	Employment rates	Median earnings	Earning returns	Value-added per learner
Classroom-based – Full Level 3	Science and Mathematics	53%	14,076	11%	740
	Agriculture, Horticulture and Animal Care	69%	17,432	18%	1,846
	Engineering and Manufacturing Technologies	73%	27,556	12%	2,164
	Construction, Planning and the Built Environment	74%	28,278	19%	3,336
	Information and Communication Technology (ICT)	46%	17,072	14%	972
	Retail and Commercial Enterprise	67%	17,621	15%	1,537
	Leisure, Travel and Tourism	66%	16,719	8%	818
	Arts, Media and Publishing	50%	12,919	12%	696
	History, Philosophy and Theology	55%	12,903	12%	767
	Education and Training	80%	13,360	13%	1,229
	Business, Administration, Finance and Law	72%	20,891	13%	1,724
Classroom-based – Level 4+	All	87%	21,584	11%	1,870

Table 8: Employment rates, median earnings and earning returns for apprenticeships

Provision type and level	Sector subject area	Employment rates	Median earnings	Earning returns	Value-added per learner
Apprenticeship – Intermediate	Health, Public Services and Care	91%	14,046	18%	1,940
	Agriculture, Horticulture and Animal Care	85%	16,496	13%	1,611
	Engineering and Manufacturing Technologies	92%	21,053	22%	3,477
	Construction, Planning and the Built Environment	86%	18,772	20%	2,693
	Information and Communication Technology (ICT)	91%	20,735	27%	4,020
	Retail and Commercial Enterprise	88%	14,481	12%	1,368
	Leisure, Travel and Tourism	86%	15,788	5%	646
	Business, Administration, Finance and Law	91%	17,140	11%	1,546
Apprenticeship – Advanced	Health, Public Services and Care	92%	14,011	10%	1,175
	Agriculture, Horticulture and Animal Care	88%	19,518	15%	2,243
	Engineering and Manufacturing Technologies	92%	27,677	37%	6,906
	Construction, Planning and the Built Environment	91%	24,460	19%	3,560
	Information and Communication Technology (ICT)	89%	20,296	28%	3,938
	Retail and Commercial Enterprise	90%	16,300	9%	1,210

Provision type and level	Sector subject area	Employment rates	Median earnings	Earning returns	Value-added per learner
Apprenticeship – Advanced	Leisure, Travel and Tourism	81%	17,897	7%	945
	Business, Administration, Finance and Law	92%	19,705	11%	1,805
Apprenticeship – Higher	All	93%	23,844	23%	4,163

Annex B: Methodology for estimating earnings returns

Background

The methodology for estimating earnings returns in FE was established and refined by a series of research projects led by the University of Westminster during 2012 through 2015. The estimates used in previous editions of the Skills Index were taken from:

- BIS Research Paper Number 195: Estimation of the labour market returns to qualifications gained in English Further Education, Bibby et. al. (2014); and
- Further analysis based on BIS Research Paper Number 195: Further disaggregation – employment and earnings by sector group, Cerqua et. al. (2015).

These earnings returns have now been updated internally, applying the same modelling methodology defined by Bibby et. al. (2014) to a more recent set of learners. The latest data spans those who had completed courses between academic years 2008/09 and 2013/14 and their earnings up to the financial year 2016/17.

Overview of returns estimation methodology

The methodology established by Bibby et. al. (2014) to estimate earnings returns uses a multiple regression model to isolate the effect on earnings for those who achieve a qualification, compared with those who start but do not achieve. The regression model controls for other observable characteristics[18] and is run to estimate effects on (logged) earnings in each of years 3, 4 and 5 after completion, which are then averaged to provide a final value.

The estimates are presented as percentage increase in earnings that occur as a result of achieving a qualification. This is an average effect across those achieving a qualification at that level for the first time, and those who may have retrained or extended their knowledge at the same level.

This returns estimation approach has been validated through both the detailed work in the original research programme and in subsequent research. Chapter 6 of Bibby et. al. (2014) provides an assessment of the robustness of the achiever/non-achiever comparison to derive the returns. The Centre for Vocational Education Research (CVER) has also compared[19] this counterfactual against a method looking at learners in

[18] Sex; age; region; ethnicity; Index of Multiple Deprivation (IMD); prior attainment, duration of study; number of previous FE learning spells; sector subject area; the number of days an individual was on active benefits in the year before learning; whether an individual has an inactive benefit spell in the year before learning; number of days in sustained (6 months) employment an individual has just before learning. OLASS learning and academic qualifications are also excluded from the dataset.
[19] Settling the counterfactual debate: Is there a preferable counterfactual when estimating the returns to vocational qualifications? (CVER, 2018)

possession of qualifications at the level below, including the impact on earnings differentials.

Updated administrative dataset

The multiple regression modelling uses a dataset constructed by joining a longitudinal view of the Individualised Leaner Record (ILR) to relevant data from the Longitudinal Educational Outcomes (LEO) study.

- Learning activity recorded on the ILR is combined into “spells”, so that a learner’s full activity can be connected (including across summer holidays) to allow identification of the highest and latest learning aim for use in the regression.
- Data on earnings, employment and benefits is then taken from LEO data to derive a range of outcome measures at yearly intervals after the completion of that highest and latest learning aim. Within this, earnings are converted to constant prices (2017 in the current dataset).

The original research by Bibby et. al. (2014) pre-dated the creation of the full LEO methodology and a significant part of the research was focussed on the construction of a prototype database. This linked ILR with the same benefit information (from Department for Work and Pensions data) and PAYE employment and earnings histories (from HMRC data) that are now used in LEO. This dataset spanned learners completing during 2004/05 to 2008/09, with earnings up to the financial year 2011/12.

To produce updated estimates we have refreshed the dataset construction process, to make use of the LEO datasets. We have also used more recent data spanning learners who had completed courses between academic years 2008/09 and 2013/14 and their earnings up to the financial year 2016/17.

Other changes implemented as part of the refreshed dataset construction approach include: extending the age coverage of the apprenticeships cohort to include 16-18 year olds; including qualifications at Level 4 and 5 for the first time; refining the method for defining learning spells; and (via the now established LEO process) improved linkage between education, and benefits and tax records, with improved data cleansing.

Changes in the earnings returns

The Skills Index uses returns estimates associated with different levels of learning and, where available, different Sector Subject Areas (SSA).

In order to produce statistically significant returns estimates, the regression methodology requires a sufficiently large cohort of non-achievers and these are not available at detailed SSA level for all types and levels of courses. As a result, we only produce more detailed SSA Tier 1 estimates for Full Level 2 and Full Level 3 learning (for both

Classroom-based and Apprenticeship courses). Estimates for Other Level 2 and 3 Classroom-based learning have not yet been updated, as further work is required on refining the data structures to properly isolate these qualifications within learning spells. For these types of courses the Skills Index still uses the 2014 estimates.

Table 9 shows the updated estimates and a comparison to the 2014 estimates where possible. The subject-level estimates from Cerqua et. al. (2015) were based on a subject classification different to SSA so Table 10 only shows the updated estimates.

Table 9: Summary of overall changes in earnings returns estimates (3-5 average) by course type and level

Provision type	Level	2014 estimate	Updated estimate	Difference
Classroom-based (19+)	Below level 2	2%	5%	+3ppt
	Other Level 2	1%	N/A	N/A
	Full Level 2[2]	11%	9%	- 2ppt
	Other Level 3	3%	N/A	N/A
	Full Level 3[2]	9%	16%	+7ppt
	Level 4/5	N/A	11%	N/A
Apprenticeships (16+)[1]	Intermediate[2]	11%	14%	+3ppt
	Advanced[2]	16%	17%	+1ppt
	Higher	N/A	23%	N/A

1. 2014 estimates for apprenticeships were based on adults aged 19+ whereas the updated estimates cover the whole 16+ apprenticeship cohort.
2. These values are not used in the Skills Index model but are presented here to illustrate overall differences resulting from the refreshed and restructured data – see Table 10 for values used in the model.

Table 10: SSA Tier 1 earnings returns estimates (3-5 year average) used in 2021 Skills Index – based on updated returns dataset[3]

Sector Subject Area (Tier 1)	Intermediate Apprenticeship	Advanced Apprenticeship	Classroom-based Full Level 2	Classroom-based Full Level 3
Health, Public Services and Care	18%	10%	14%	13%
Science and Mathematics				11%
Agriculture, Horticulture and Animal Care	13%	15%	14%	18%
Engineering and Manufacturing Technologies	22%	37%	6%	12%
Construction, Planning and the Built Environment	20%	19%	16%	19%
Information and Communication Technology (ICT)	27%	28%	4%	14%
Retail and Commercial Enterprise	12%	9%	13%	15%
Leisure, Travel and Tourism	5%	7%	5%	8%
Arts, Media and Publishing			11%	12%
History, Philosophy and Theology				12%
Education and Training			7%	13%
Preparation for Life and Work			10%	
Business, Administration, Finance and Law	11%	11%	8%	13%

3. The updated estimates used in the 2021 Skills Index are now based on SSA Tier 1 and cannot be directly compared with those from 2015.

Get in touch

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