LEARNING AND WORK INSTITUTE

Lifelong learning and skills for longer lives

Building the case for investment in lifelong learning

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Phoenix Insights is a think tank set up by Phoenix Group to transform the way society responds to the possibilities of longer lives. We use research to lead fresh debate and inspire the action needed to make better longer lives a reality for all of us. The core of our work is focused on financial security, work, and learning and skills. Reimagining longer lives means making changes in all these areas. At the heart of all our work, we are committed to reducing inequalities and building a society that enables all of us, not just the fortunate few, to live better longer lives.

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Executive summary

Although lifelong learning has been associated with many benefits, participation has fallen substantially since 2010 with large inequalities in access to learning by age, socioeconomic group, region and nation, and prior educational attainment. The aim of this research was to build an evidence base on the employment-related impact of lifelong learning on individuals, employers and the wider economy by exploring the following research questions:

- What are the benefits of lifelong learning to individuals? How does it impact employment, earnings, benefits receipt and wider issues such as health and job satisfaction?
- How do the impacts of learning vary by prior qualification level or learner characteristics?
- What are the benefits to employers of investing in workplace training? How can employers be supported to effectively engage their workforce in training, and what are the main barriers to this?

Methods

The research used a range of quantitative and qualitative methods, including:

- **Evidence review.** This reviewed high quality causal evidence of impact from UK and international studies on the employment-related impacts of lifelong learning, drawing on academic and grey literature.
- **Secondary data analysis.** The UK Household Longitudinal Study (Understanding Society) and the Longitudinal Education Outcomes (LEO) datasets were used to identify the causal impact of learning on a series of outcome measures. Outcomes for individuals were examined over a period of three years after commencement of learning. Analysis of Understanding Society included respondents who reported participating in any type of training, regardless of who funded it. In contrast, the LEO dataset includes only individuals who participated in learning with an element of public funding.
- **Employer interviews.** L&W conducted 24 semi-structured interviews with employers from a mix of sizes, sectors and regions. Interviews focused on access to training, the benefits to employers and employees, and challenges associated with providing training.
- **Stakeholder workshops.** Two stakeholder workshops were held to share preliminary research findings and discuss their policy implications.

Benefits of learning to individuals

The impact of lifelong learning on employment

Our findings suggest that lifelong learning increases the likelihood of being in employment. Analysis of Understanding Society showed an increase of 4.5 percentage points (ppts) two years after starting training. LEO analysis similarly showed an increase of four ppts after two years. This is one of the first studies to assess the causal impact of lifelong learning on the likelihood of being in work; these findings are therefore a substantial contribution to the evidence base.

Further LEO analysis showed substantial variation in the impact of training on employment by prior qualification level. Impacts were higher for those with lower qualifications, with an increase of 8 ppts for individuals with no qualifications and 6.2 ppts for level 1. There was no impact for those with qualifications at level 4 and above, although it should be noted that this analysis is limited to a period of two-and-a-half years after commencement of training.

The impact of lifelong learning on earnings

Findings on the impact of lifelong learning on earnings varied. Understanding Society suggested participation in learning had a positive impact on net earnings of £1,389 per year two years after participation in training, whereas LEO showed a negative impact of around £1,600 per year on total taxable pay in the two tax years after starting a course. This would be consistent with participation in learning having a stronger negative impact on total taxable pay from employment initially, but the positive effects of training on net labour income two and three years after starting training then offsetting any negative impact on household finances over the longer term.

Further analysis of LEO showed substantial variation in the impact of training on earnings by prior qualification level. The negative impact of participation in learning on earnings was only apparent for those with prior qualifications at levels 2 upwards. This might be explained by differences in the likelihood of being in employment for those with differing levels of prior qualifications and by differences in the type or intensity of training undertaken.

Most studies examined in the evidence review found a positive impact of lifelong learning on earnings.[1] While participation in learning may have a short-term negative impact on earnings during, and immediately after, the start of training, the review of evidence suggests it raises earnings over the longer term.

[1] Cf. Conlon et al., 2011; Feinstein et al., 2004; Jenkins et al., 2003; Dorsett et al., 2016; Buscha, 2009; Schultheiss et al., 2022; Wiseman, 2013; Konings and Vanormelingen, 2010; Colombo and Stanca, 2008; Schwerdt et al., 2011

Employer perspective

Workplace learning comes in various forms, each tailored to meet the diverse needs and objectives of employees and organisations. Employers described a wide range of approaches to workplace learning, including internal learning sessions, self-led eLearning, compliance training, line management support, sector-specific training, formal accredited training, and learning beyond the workplace. Findings from employer interviews and the evidence review highlighted multiple benefits for employers of providing workplace learning, including:

- Contributing to employee retention
- Supporting recruitment
- Increasing innovation and productivity
- Influencing employee morale and wellbeing

Interviews with employers conducted for this research highlighted a number of key factors that can enhance engagement with, and experience of, workplace learning, including:

- Fostering a culture of learning
- Creating an engaging and accessible learning environment
- Understanding employees' motivations for learning

The main challenges to workplace learning identified by employers were:

- Time and resources
- Financial cost
- Engaging and motivating employees
- Securing quality and relevance

Benefits of learning to the wider economy

Analysis of LEO data found participation in learning reduced the likelihood of being in receipt of benefits from 11 weeks after start of training and this continued for the remainder of the two-and-a-half year analysis period. There was an average reduction in the time spent on out-of-work benefits over this period of 1.5 weeks. Again, there was variation by the level of prior qualification, with the greatest reduction in benefit receipt by those with lower prior qualification levels. Among those participating in training with no prior qualifications, there was a fall of 8.0 ppts in the proportion receiving benefits. In contrast, benefit receipt increased by 1.5 ppts for those with prior qualifications at level 4 or above.

Conclusions and recommendations

The findings demonstrate the clear benefits of lifelong learning to individuals, employers and the wider economy, albeit with effects varying between different groups of learners. In particular, the benefits of participation in learning are greatest for those who are the least qualified initially. It is vital that this group is supported to gain access to learning so that these benefits can be realised.

The reason for variations in the impact of lifelong learning by prior qualification level may be partly due to differences in the type of training undertaken by each group. If individuals with higher level prior qualifications were doing more intensive or longer courses, this might necessitate reducing their working hours (and thus experiencing a reduction in earnings) while completing training. Even after finishing training, it might take time to find higher paying work, especially if some individuals made a career change to a different occupation or industry after training. The benefits of participating in training may accrue over a longer period of time than it was possible to consider in the analysis.

Workplace learning is an important component of lifelong learning, and the findings demonstrate the wide range of benefits associated with it. However, employers identified a number of challenges to its successful implementation. This highlights the need for guidance and support for employers to realise the full benefits of training.

Finally, there is a need for further research on the impact of lifelong learning. Further subgroup analysis, to increase understanding of any differences in the impact of learning for different groups of learners would be beneficial. In addition, future analysis could examine the longer-term impacts of lifelong learning, the types of learning that are most beneficial for those with no or low-level qualifications, the impacts of learning in later career stages and the mechanisms underlying impacts.

Recommendations

1. **Local and national governments should set a clear goal to promote a lifelong learning culture and work with employers, trades unions, community groups and others to reduce inequalities in access to lifelong learning.** This requires a substantial and sustained increase in investment in learning, efforts to inspire people into learning and promote employer investment in skills, and the incorporation of lifelong learning into wider policy plans such as the delivery of clean energy and the expansion of housebuilding. It should also be included as a key focus in the Government's upcoming Post-16 Education and Skills Strategy White Paper.

2. **Local and national governments, employer representative bodies and trades unions should ensure that the benefits to employers of investment in workplace learning are clearly communicated and employers should seek to engage employees in workplace learning.** This should include creating an

accessible and inclusive learning environment and ensuring training is available in a variety of formats.

3. **Local and national governments should aim to increase the proportion of individuals qualified at or below level 2 who are participating in lifelong learning, given the evidence that this is effective in raising the likelihood of this group being in employment.** There are several ways to achieve this:
    a. Offering targeted incentives, such as differential funding rates for people with different qualification levels and adjusting commissioning structures to include quotas by prior attainment.
    b. An expansion in the Lifelong Learning Entitlement in England to provide more help and support for learners with the greatest need.
    c. Employment support programmes should ensure that individuals with low qualification levels are offered, and encouraged to access, learning opportunities prior to, or alongside, entering employment.

4. To encourage greater employer investment in training, the Government should consider **replacing the current Corporation Tax deduction for training spend and introduce a new Skills Tax Credit**. This could be modelled on the R&D tax credit and allow employers to deduct 230% of the cost of accredited training and apprenticeships from their tax liabilities. The Growth and Skills Levy could also require a certain proportion to be spent on training for individuals with lower prior qualification levels.

5. **Local growth plans, such as City Region and Growth Deals in Scotland and Local Growth Plans, Local Skills Improvement Plans and Local Get Britain Working Plans in England, should consider how to increase access to lifelong learning for those with low qualification levels** to encourage local growth and employment.

6. **Training providers and the National Jobs and Careers Service should ensure learners are aware of the potential long-term benefits of learning.** In addition, **local and national government and employers should take action to mitigate any negative short-term impact on earnings from participation in training for people in employment**. This could include:
    a. Offering support with living costs for individuals undertaking courses that require reduced working hours.
    b. Extending Train and Progress rules within Universal Credit to allow full-time training of up to a year without loss of benefit.
    c. Strengthening the right to request time off to train so that individuals can remain employed while retraining during a one-year unpaid career break.
    d. Increasing the number of apprenticeships offered by employers for career changers to support earning while learning.
    e. Employers, training providers, the National Jobs and Careers Service, employment support providers and others promoting the use of the

Financing your career change toolkit, which has been developed by Phoenix Insights and Careershifters to provide guidance on financing career change.

7. To encourage increased participation in learning, the Department for Education and Skills England should prioritise supporting lifelong learning of all kinds and at all levels. This could include **Skills England having a statutory duty or strategic priority to promote lifelong learning at all levels** on the lines of Medr (the new post-16 learning and skills body) in Wales.

Introduction

Lifelong learning is the practice of continuing to learn and develop skills throughout life. Learning as an adult can encompass a broad range of activities from informal learning for leisure to long-term formal accredited courses.

Lifelong learning has been associated with many benefits, including helping people to find work and build a career; improving health and wellbeing; and supporting community engagement and active citizenship. Its importance is growing as longer life expectancy combines with a rapidly changing economy and society. Research by Phoenix Insights demonstrates public support for this view, with 70 per cent of people agreeing that today's economy makes retraining more important than ever before.

However, participation in learning has fallen substantially since 2010 with large inequalities in access to learning by age, socioeconomic group, region and nation, and prior educational attainment. Research from L&W found that adults have gained seven million fewer qualifications in the last decade than if attainment had stayed at 2010/11 levels. There have been sharp falls in public investment over this period. Although budgets are now increasing, we have estimated that government spending on adult skills (excluding most forms of higher education) will still be £1 billion (20%) lower in 2025 than in 2010. Employer investment in training has fallen too and in 2022 was 26 per cent less per employee compared with 2005.

While there has been an overall decline in learning, L&W's Adult Participation in Learning Survey highlighted a recent rise in self-directed learning, including online, often for personal or leisure reasons, driven by the pandemic. This is positive, but local and national government and employers need to ensure that adults who want to engage in more formal learning and accreditation have the means to do so.

There is a wealth of evidence that seeks to understand the benefits of learning (including the aforementioned Adult Participation in Learning Survey), but it is worth noting that this is often based on associations rather than causal links. Much of the evidence base is also focused on initial full-time education, rather than lifelong learning. This research therefore aims to bring together, and create, robust, high-quality evidence to examine the causal link between lifelong learning and employment outcomes.

Research overview

The aim of this research is to build an evidence base on the employment-related impact of lifelong learning on individuals, employers and the wider economy.

The research has explored the following research questions:

- What are the benefits of lifelong learning to individuals? How does it impact employment, earnings, benefits receipt and wider issues such as health and job satisfaction?
- How do the impacts of learning vary by prior qualification level or learner characteristics?
- What are the benefits to employers of investing in workplace training? How can employers be supported to effectively engage their workforce in training, and what are the main barriers to this?

Definition of lifelong learning

For the purposes of the research, lifelong learning is interpreted as any education or training programme undertaken after completion of full-time education. The definition is intentionally broad, given the diversity of adult learning programmes. This includes work-based and work-related training; career-related education or training courses undertaken in leisure hours; employment interventions where education or training forms the main component; and education or training courses unrelated to work or careers.

Throughout the report, the terms 'lifelong learning', 'learning' and 'training' have been used interchangeably.

See highlight box at the end of the Methods section for further information on how the definition of lifelong learning has been applied within each strand of the research.

Methods

This research has involved a range of quantitative and qualitative methods, including an evidence review, secondary data analysis and modelling, employer interviews and stakeholder workshops.

Evidence review

The evidence review aimed to complement and inform the other research activities by reviewing UK and international studies on the impact of lifelong learning. Impacts considered in the review were primarily employment-focused, including benefit and employment outcomes, wage returns, career moves and impacts to business such as employee retention and productivity increases.

The review focused on identifying high quality causal evidence of impact. Evidence was assessed against two evidence frameworks – namely the Maryland Scientific Scale and NESTA Evidence Standards of Evidence - prior to inclusion. All evidence included in the review was assessed as being at level 3 or higher on both scales and studies that were not sufficiently robust were excluded from the review. A total of 22 studies were included.

Secondary data analysis and modelling

There were two components to the strand of the project involving the analysis of secondary data:

- Analysis of the UK Household Longitudinal Study (Understanding Society)
- Analysis of the Longitudinal Education Outcomes (LEO) dataset.

In both cases, the aim was to identify the causal impact of participation in training on a series of outcome measures. This report focuses on findings that were statistically significant at the 95 per cent level of confidence or better, indicating that the impact estimates are likely to reflect the true impact of participation in training rather than being due to sampling error. The following two subsections provide further details of the outcomes considered and the approach to the analysis.

Analysis of Understanding Society

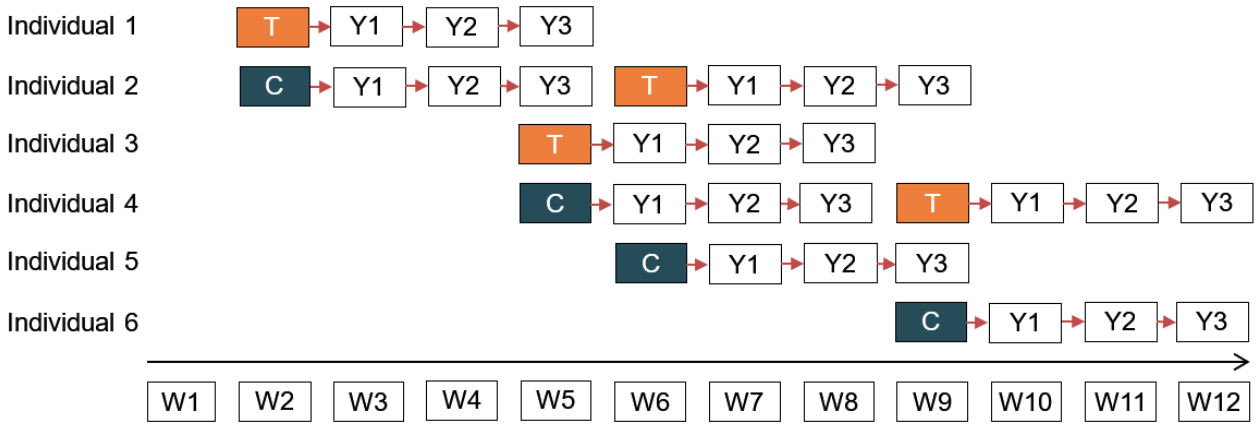
At the time the analysis was carried out, it was possible to track individuals at annual intervals over 12 waves of data collection spanning the period from January 2009 to May 2022 in Understanding Society.[2] The analysis focused on outcomes experienced by individuals who took part in training (referred to as the treatment group, or the

[2] A survey wave refers to each round of data collection for the survey. Fieldwork for Understanding Society survey waves are overlapping, so cross multiple calendar years. Nevertheless, each participant will generally complete a survey at annual intervals.

treated) in the three years following participation in training.[3] Women had to be aged between 16 and 57 when they started training to ensure that they were of working age for the entire period over which outcomes were observed, while men had to be aged between 16 and 61. It should be noted that due to a limited sample size, it was not possible to analyse outcomes for specific sub-groups (e.g. by prior qualification level) using Understanding Society data.

Outcomes for the treated were compared with those experienced by a matched comparison group who did not take part in any training over the same four-year period i.e. in the year that the treatment group participated in training and in the following three years when outcomes were observed.[4] Potential comparators were assigned to a pseudo-start year at random, to mimic the distribution of observed training start dates for those who did take part in training. Figure 1 illustrates how individuals participating in training in different waves of the survey were matched to comparators and then outcomes observed for both treatment and matched comparison groups in the three years following the initial wave when the treatment group started to participate in learning.

Figure 1: Approach to identifying the treatment and potential comparison groups in Understanding Society



Notes: T=treatment group; C=potential comparison group; W1-W12=Wave 1 to Wave 12.

[3] This means in practice that outcomes were observed at some point between January 2010 (the date the earliest interviews for Wave 2 of Understanding Society commenced) and May 2022 (the date the last interviews for Wave 12 of Understanding Society were completed). As there is substantial variation in the calendar date when outcomes would be observed for individuals, outcomes are likely to be affected by changes in the labour market over this period. However, as labour market changes are likely to have a similar effect on outcomes for both the treatment and matched comparison groups, it is unlikely that they would bias the impact estimates.

[4] There were no constraints on whether the treatment group did further training in successive years after they first participated in training. It is also possible that members of the treatment or comparison group did some training in the period before they started responding to Understanding Society.

Available data

Understanding Society collects rich data on individuals, making it possible to find close comparators for those in the treatment group in most cases. It also contains data on a series of outcomes thought likely to be influenced by participation in training:

- **Financial sufficiency**. This outcome measure was constructed from responses to a question which asked survey respondents how well they were managing financially, with answers on a five-item scale ranging from 'Living comfortably' to 'Finding it very difficult'. Responses of 'Living comfortably' and 'Doing alright' were coded to 1 and 'Just about getting by', 'Finding it quite difficult' and 'Finding it very difficult' were coded to zero.

- **Life satisfaction**. Respondents were asked to rate their satisfaction with their life overall on a seven-item scale ranging from 'Completely satisfied' to 'Completely dissatisfied'. The categories 'Completely' and 'Mostly satisfied' were grouped together and coded to 1 and all other categories, ranging from 'Somewhat satisfied' to 'Completely dissatisfied' were coded to zero.

- **General health**. Respondents were asked to rate their health on a five-item scale ranging from 'Excellent' to 'Poor'. Ratings of 'Excellent' and 'Very good' were combined and coded to 1 and ratings of 'Good', 'Fair' and 'Poor' were coded to zero.

- **Probability of being in paid employment**. This measure was coded to 1 if the respondent reported that they were currently self-employed or in paid full-time, or part-time, employment and zero otherwise.

- **Monthly net earnings from work**. This was the sum of net usual pay, net self-employed income and net pay in any second job.

Matching process

Propensity score matching (PSM) was used to estimate the outcomes that those who did training would have been expected to experience if they had not taken part (known as the counterfactual). These counterfactual outcomes were then compared to observed outcomes for those who participated in training to estimate the causal impact of training.

For PSM to provide a credible estimate of impact, it is necessary for the treatment and comparison groups to be well-matched on all observed and unobserved characteristics which influence both participation in training and the outcomes experienced as a result of participation. Observed characteristics which are expected to determine whether an individual takes part in training, as well as the outcomes that they experience, are used to estimate a propensity score for each individual (their likelihood of participating in training). Those who participate in training are then matched to individuals in the comparison group with a similar propensity score and

outcomes for the two groups compared to estimate the average impact of participation in training.[5]

Characteristics of treatment and comparison groups

Appendix A reports the characteristics of survey respondents in the treatment and matched comparison groups after matching. The appendix demonstrates that, after matching, the treatment and comparison groups were very similar across a wide range of observed characteristics. Close matches were found for a large proportion of those who participated in training (96 per cent) and so the findings of the impact analysis are likely to be representative of the vast majority of individuals who participated in training over the period considered.

Table 1 reports the characteristics of individuals who took part in learning, at the time they started their first course.[6] The table shows that almost one half of those who participated in training were female (48.6 per cent) and participants had a mean average age of 38.6 years. Around 1-in-5 participants were responsible for a child under the age of 16 (21.5 per cent) and 1-in-20 had caring responsibilities for an adult living in the same household (4.9 per cent). More than four-fifths (84.2 per cent) of individuals were in paid employment at the time they started learning. Over one-quarter (25.9 per cent) of those who started training had a longstanding health problem.[7]

Table 1: Population-weighted characteristics of the matched treatment group immediately prior to participation in training

Characteristic at baseline	Matched treatment group mean (per cent)	Matched treatment group standard error
Female	48.6	1.1
Age (years)	38.6	0.3
Age squared	1,616.6	20.5
Responsible for child under 16	21.5	0.8
Cares for adult in household	4.9	0.6
In paid employment	84.2	0.9

[5] The analysis used Epanechnikov kernel matching with a bandwidth of 0.0006. This weights all members of the comparison group within a given range of propensity scores in proportion to their similarity to the treatment group.

[6] The characteristics are population-weighted so they are representative of the wider population of training participants in the United Kingdom for whom it was possible to find matched comparators.

[7] This was defined as a long-standing physical or mental impairment, illness or disability that had either troubled the respondent over a period of at least 12 months or was likely to trouble them over a period of at least 12 months.

Characteristic at baseline	Matched treatment group mean (per cent)	Matched treatment group standard error
Long-standing health problem	25.9	1.0
Monthly total household net income (£)	3,311	50
Urban area	80.2	0.9
Married or living as couple	63.1	1.2
Owner occupier	69.2	1.3
Up to date with household bills	94.5	0.7
Higher degree	13.9	0.8
Degree	33.8	1.1
A-level	24.7	1.1
GCSE	19.9	1.0
No qualifications	2.1	0.3
Other	5.6	0.6
White	89.4	0.8
Mixed ethnicity	1.5	0.3
Asian	5.4	0.5
Black	3.2	0.5
Other ethnicity	0.5	0.2
London	12.6	0.8
North East	5.0	0.5
North West	10.1	0.6
Yorkshire and the Humber	7.7	0.7
East Midlands	8.9	0.7
West Midlands	8.2	0.7
East of England	10.1	0.8
South East	15.5	0.8
South West	9.5	0.7
Wales	3.0	0.4
Scotland	7.6	0.5
Northern Ireland	1.8	0.3
Wave of training start/pseudo-start	3.5	0.0

Notes: Based on data for 5,151 individuals observed in Understanding Society. Weighted to be representative of characteristics of the wider UK population of individuals who started some training over the period considered, after excluding those for whom no close matches could be found.

In terms of household characteristics, the mean monthly total household income for those who participated in learning was £3,311. Four-in-five (80.2 per cent) participants lived in an urban area and more than three-in-five (63.1 per cent) were married or living as a couple. Over two-thirds (69.2 per cent) were owner-occupiers and the vast majority were up-to-date (94.5 per cent) with their household bills.

Nearly one half (47.7 per cent) of all individuals who participated in training were educated to degree level or higher. Almost one-quarter (24.7 per cent) held A-levels or equivalent qualifications and only one-in-fifty (2.1 per cent) had no qualifications at all. Nine-in-ten (89.4 per cent) of those who participated in training were White, while around one-in-twenty (5.4 per cent) were Asian. Participants were most likely to be resident in London and the South East and least likely to be in the North East, Wales or Northern Ireland. On average participants started training in around the third or fourth wave after starting to participate in Understanding Society.

As Understanding Society is a UK-wide survey, it is not possible to make direct comparisons with the 2021 Census for England and Wales, but those participating in training were broadly comparable to the population of England and Wales within a similar age range in terms of the proportion female (50.8 per cent in the 2021 Census; 48.9 per cent in Understanding Society).[8] Those who started training were more likely to be married or living as a couple than the population of working age in England and Wales (57.0 per cent in the 2021 Census; 63.1 per cent in Understanding Society). They were also more likely to be qualified to degree level or above (37.0 per cent in the 2021 Census and 47.7 per cent in Understanding Society) or for their highest qualification to be at A-level (19.6 per cent in the 2021 Census and 24.7 per cent in Understanding Society). Those who embarked on training were much less likely to have no prior qualifications than the population of England and Wales in a similar age range (12.5 per cent in the 2021 Census and 2.1 per cent in Understanding Society). Finally, people who were White made up a greater share of those who took part in training than the population of working age in England and Wales (80.7 per cent in the 2021 Census; 89.4 per cent in Understanding Society). By contrast, people from an Asian background were particularly likely to be under-represented among those who started training, making up 10.1 per cent of the population of working age in the 2021 Census but only 5.4 per cent of those who did training according to Understanding Society.

[8] As noted above, as the analysis of Understanding Society is longitudinal, it focuses on individuals of working age over the period of participation in training and the observation of outcomes. The Census provides a snapshot of characteristics at a single point in time and so considers those aged between 16 and 64 on 21 March 2021. In practice this means that the sample used for the Understanding Society analysis is expected to be slightly younger, with women making up a smaller proportion of the total than in the 2021 Census data, given the earlier state pension age for women in particular in the early waves of Understanding Society.

Analysis of LEO

The LEO dataset provides a census of pupils who were educated at state schools in England from the 2001/02 academic year onwards. The analysis was based on data from the School Census, educational attainment at Key Stage 4 and Key Stage 5, participation in further and higher education (from the Individualised Learner Record and the Higher Education Statistics Agency) including qualifications attained, and data from the Department for Work and Pensions (DWP) on receipt of out-of-work benefits and His Majesty's Revenue and Customs (HMRC) on employment and earnings. Appendix B provides further details of each of these sources and a detailed description of how the datasets were combined to carry out the analysis.

The analysis focuses on learners who turned 16 in the 2001/02 academic year (referred to as the 2002 cohort). This cohort was born between September 1985 and August 1986 and individuals were around the age of 35 at the latest timepoint observed in the data (5 April 2021). The analysis explored the impact of participation in further learning at some point from the age of 25 onwards on outcomes experienced over a period of three years following the training start. This approach was taken to estimate the impact of training undertaken after the point when most of the cohort would have completed participation in full-time education.

The outcome measures considered in the LEO analysis were as follows:

- Whether the individual was employed at any point in each month over the 2.5-year period after starting to participate in training
- Whether the individuals claimed out-of-work benefits in each successive month over the 2.5 years after starting training
- The total number of weeks that the individual spent in employment in the 2.5 years after starting training
- The total number of weeks on out-of-work benefits in the 2.5 years after starting training
- Earnings in each of the two successive tax years following the start of training, defined as total taxable pay from employment within each tax year. As participation in training could start at any point in a tax year, this meant that there could be considerable variation between individuals in how long after starting learning the earnings outcomes were observed. For example, if a learner started training on 1 September 2010, earnings in the first year after starting training would be based on earnings in the 2011/12 tax year (6 April 2011 to 5 April 2012). If they started training on 6 April 2011, earnings in the first year after starting training would be based on earnings in the 2012/13 tax year (6 April 2012 to 5 April 2013). As a result, the LEO

earnings outcome measures would generally capture earnings at an earlier point in time after starting training than the Understanding Society earnings measures.

The analysis of the LEO data followed a similar approach to the analysis of Understanding Society. The treatment group consisted of those who participated in learning from the academic year when they turned 25 onwards i.e. from the 2010/11 academic year onwards. The definition of lifelong learning is described in detail in the box at the end of this section. As the aim was to identify the impact of participation in training over a period of three years following the start of participation in learning, treated individuals had to start learning by some time in the 2017/18 academic year at the latest. Those who did not do any training at all between 2010/11 and 2020/21 were selected as potential comparators and then PSM was used to find close matches for individuals in the treatment group.[9]

Table 9 in Appendix B demonstrates that the characteristics of the matched comparison group were very similar to those of the treatment group after matching. The low number of individuals in the treatment group without close comparators (2.2 per cent) also suggests that the findings are likely to be representative of those for the full range of individuals who participated in training.

Given the large sample sizes available in the LEO data, it was possible to explore whether the impact of learning varied depending on the level of prior qualifications held. This involved repeating the PSM for each prior qualification group. For example, those with no prior qualifications who undertook training were matched to similar comparators who also had no prior qualifications. It should be noted that this analysis was possible only with the LEO data – the sample size for Understanding Society was too small for subgroup analysis.

Tables 10 to 14 in Appendix B show that across all attainment levels the characteristics of the matched comparison group were similar to those of the treatment group after matching. The numbers of individuals in the treatment group for whom no close matches were found were small relative to the size of the group (less than 5 per cent for all attainment levels), suggesting that the resulting impact estimates are likely to be representative of the findings for the vast majority of those with a given attainment level who took part in training.

Employer interviews

L&W conducted 24 semi-structured interviews with employers in May and June 2023. Interviews were carried out online or by telephone with employers of different sizes

[9] As with the Understanding Society data, the analysis was based on Epanechnikov kernel matching with a bandwidth of 0.0006.

across a mix of regions and sectors. All interviewees worked at a senior level with a level of internal responsibility for skills or training.

Interviews focused on access to training, the benefits of training to employers and employees, and challenges associated with providing training. Interview recordings were transcribed and analysed thematically.

For reference, any training, including part-time or evening courses, employer-organised training, day release, apprenticeships and government training schemes, would be included in the definition of training used in Understanding Society. In contrast, the LEO analysis would only include training undertaken with FE providers and supported by public funding, although this could also include some employer-organised training, such as apprenticeships.

Stakeholder workshops

Two stakeholder workshops were held in June and July 2023 to share preliminary findings from the evidence review and analysis of Understanding Society and discuss implications for individuals and employers. Stakeholders included representatives of local and national government, training providers, employers and employer representative groups, trades unions, third sector organisations and policy and research organisations. Workshop discussions focused on how access to lifelong learning could be increased for individuals, and how the benefits could be maximised for both individuals and employers.

Report structure

This report begins by examining robust evidence on the benefits of lifelong learning to individuals, drawing on a review of existing causal evidence and analysis of Understanding Society and LEO data. It then considers the employers' perspective, including benefits and challenges, and how employers could be encouraged to support lifelong learning at work. The report then assesses the benefits of learning to the wider economy, with a focus on its impact on claims for out-of-work benefits. It concludes by summarising the key findings of the analysis and discussing their implications.

Definition of lifelong learning by research method

As described above, in this report lifelong learning is defined as any education or training programme undertaken after the completion of full-time education. However, due to data limitations it has not been possible to use an identical definition across all research strands. This box provides an overview of the definitions used in each component of the research.

- **Evidence review.** This used the main definition of lifelong learning set out above. However, specific findings are necessarily based on the type and breadth of learning covered in individual pieces of evidence.

- **Employer interviews.** Again, this defined lifelong learning as set out above. The focus of the interviews was primarily on learning at, or arranged by, employers. However, there was some discussion of personal learning outside of work.
- **Analysis of Understanding Society.** Understanding Society provides data on whether participants reported participating in any training within the past year, including part-time or evening courses, employer-organised training, day release, apprenticeships and government training schemes. The analysis focused on any participation in training between 2009 to 2019 by individuals who were aged 16 to 57 for women or 16 to 61 for men when they started training to ensure that they were under state pension age when three-year outcomes were observed. The broad coverage of the data enabled the analysis to include all types of lifelong learning. However, the analysis was based on a substantially lower sample size than the analysis of LEO data (see below) and therefore had less statistical power. It was therefore more difficult to detect any impacts of learning. It is also important to note that as a panel-survey, Understanding Society is based on self-reported data and therefore may be subject to recall or response bias.
- **Analysis of LEO.** Due to data limitations, this used a narrower definition of lifelong learning. Information on Adult learning in LEO is derived from the ILR dataset. This includes further education courses, programmes such as apprenticeships and T levels and some community learning provision. However, the dataset only records learning undertaken with providers who have received some public funding. In addition, full data is available only for individuals born from September 1985 onwards and (at the time of the analysis) was only available up to April 2021. To maximise the period over which outcomes could be observed, the analysis focused on the earliest available cohort (born in the 1985/86 academic year). Lifelong learning was defined as learning that occurred from the academic year when the individual turned 25 onwards to seek to exclude the period when a high proportion of young people would be in full-time education. Only learning that had occurred by the 2017/18 academic year was included, to allow time for outcomes following participation in training to be observed. Therefore, the analysis only included learning that commenced between the ages of around 25 to 32. Despite these limitations, as FE providers in receipt of public funding are required to make ILR returns, LEO has a high degree of reliability. LEO is also a near-census of the age cohort, so the extremely large number of records enhances the likelihood of detecting any impact from participation in lifelong learning on the outcome measures.

Benefits of learning to individuals

Key findings

- Analysis of both Understanding Society and LEO suggested that lifelong learning increases the likelihood of being in employment. According to Understanding Society, participation in training increased the likelihood of being in employment by 4.5 percentage points (ppts) two years after starting training and by 4.2 ppts after three years. Findings were similar in the analysis of LEO data, where participation in learning increased the likelihood of being employed by around four ppts two years after starting training.

- Further LEO analysis showed substantial variation in the impact of training on employment by prior qualification level. Those with lower prior qualifications experienced the greatest positive impact from training on the likelihood of being employed. Participation in learning raised the likelihood that individuals with no prior qualifications were employed by 8 ppts, compared with a positive impact of 6.2 ppts for individuals with level 1 qualifications, 4.3 ppts for those with level 2 qualifications and 2.1 ppts for prior qualifications at level 3. No impact was identified for individuals with prior qualifications at level 4 or above.

- Findings on the impact of lifelong learning on earnings differed between Understanding Society and LEO. Understanding Society suggested participation in learning had a positive impact on net earnings from employment and self-employment of £1,389 a year two years after participation in training and £1,629 a year three years after training, whereas LEO showed participation in learning had a negative impact on gross earnings from employment of around £1,600 in each of the two tax years after starting a course. The differences in findings between these two sources may be partly due to earnings outcomes being measured at an earlier point in the LEO data, as well as differences in what each earnings measure captures i.e. net earnings from both employment and self-employment in the case of Understanding Society and taxable pay from employment only in the case of LEO. In both cases, learners may need to reduce working hours in the short term to spend time on training. If the training is undertaken to move into a different sector, it may also take time for the individual to gain sufficient experience to obtain higher-paying work.

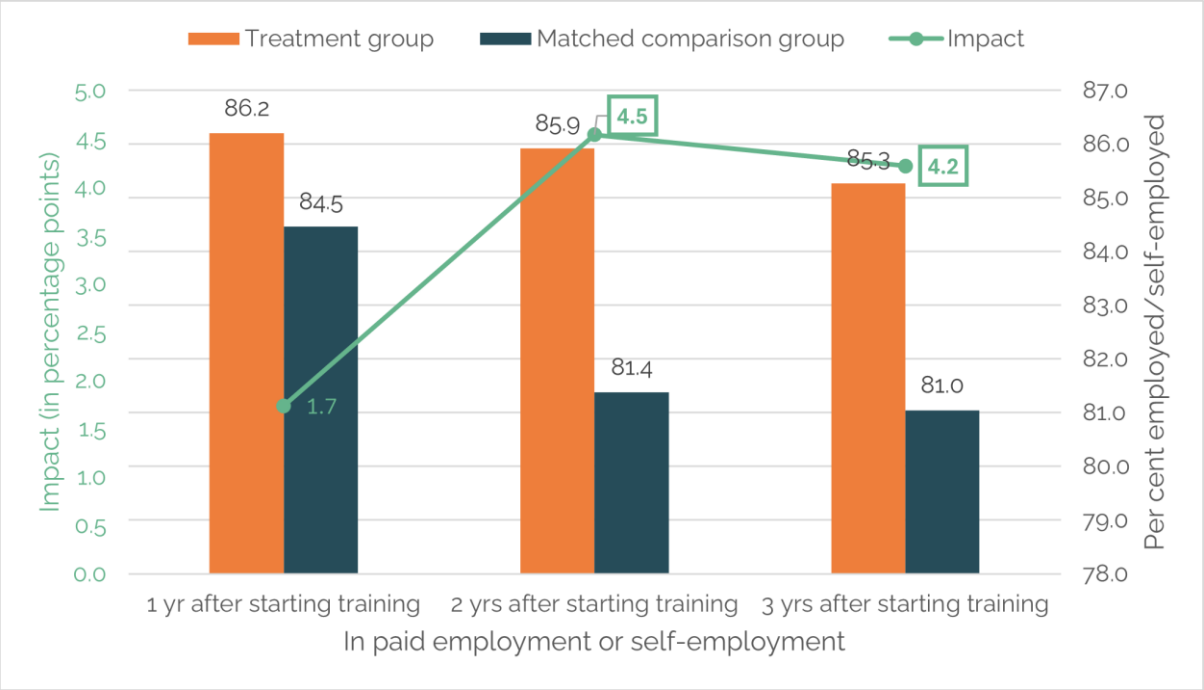
- Further analysis of LEO showed substantial variation in the impact of training on earnings by prior qualification level. The negative impact of participation in learning on earnings was only apparent for those with prior qualifications at levels 2 upwards. Learning did not have a detrimental impact on earnings for those with no prior qualifications, or those only previously qualified to level 1.

- Most studies examined in the evidence review found a positive impact of lifelong learning on earnings. While participation in learning may have a short-term negative impact on earnings during, and immediately after, the start of training, the review of evidence suggests it raises earnings over the longer term. This is consistent with findings on the impact of training on household finances from Understanding Society, where an initial negative impact on the likelihood participants reported living comfortably or doing alright one and two years after starting training disappeared by year three. As the LEO analysis focused on the impact of participation in training on earnings in the first two tax years following the start of training, it is possible that this timeframe was insufficient to capture any positive effects which might emerge over the longer-term. For example, Blanden et al. (2012) found that positive earnings effects only emerged around 4 years after participation in learning for women and 6 years after learning for men.

The impact of lifelong learning on employment

Figure 2 shows the percentage of those who undertook learning (the treatment group) and the percentage of the matched comparison group who were in paid employment or self-employment in each successive year after starting training, based on analysis of Understanding Society. The orange bar shows the percentage of those who participated in learning who were employed in each of the three following years, while the dark blue bar shows the percentage who would have been expected to be in paid employment or self-employment at each point if they had not participated in any learning. The green line shows the estimated impact of participation in training on the likelihood of being in paid employment or self-employment in each year i.e. the difference between the bars for the treatment group and the matched comparison group.

Figure 2: Percentage in paid employment or self-employment in successive years after starting training



Notes: Based on analysis of Understanding Society data for 5,151 individuals in the treatment group and 2,026 individuals in the comparison group. Impact estimates which are statistically significant at the 5 per cent level or better appear in a box and are highlighted in bold.

Participation in learning increased the likelihood of being in paid employment or self-employment by a statistically significant amount two and three years following the year of starting training. One year after starting learning, the employment rate for participants was estimated to be 1.7 percentage points higher than if they had not taken part in training, but this impact was below conventionally accepted levels of statistical significance (the 5 per cent level or better). After two years, participation in training raised the probability of being employed by 4.5 percentage points, but the estimated impact reduced slightly after three years, when it stood at 4.2 percentage points.

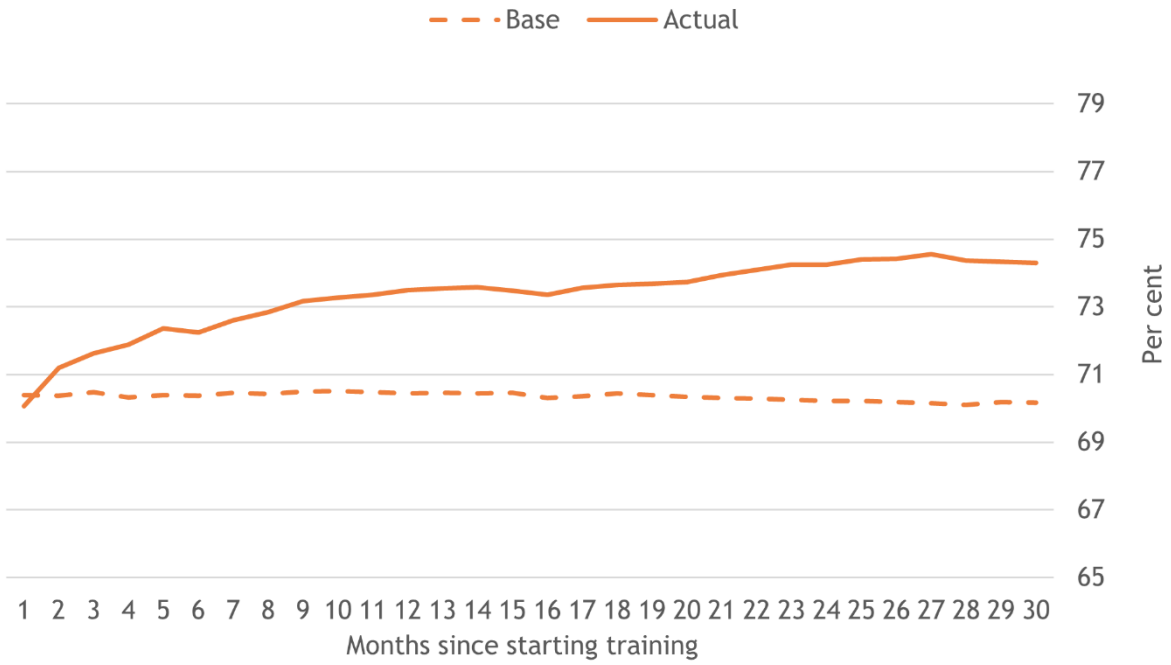
Analysis of LEO data also suggested that learning affected an individual's likelihood of being in employment.[10] Figure 3 shows the percentage of individuals in employment for two-and-a-half years after starting training,[11] compared with the percentage expected to be in employment (the base) if they had not undertaken any training over

[10] The LEO analysis considered the impact of participation in training on the likelihood of being employed, whereas the Understanding Society outcome measure included participation in paid self-employment.

[11] As outlined in the methods, LEO (at the time of the analysis) only includes data up to April 2021. The analysis included training commencing up to the 2017/18 academic year. For training started in 2017/18, outcomes data is therefore only available for a period of 2.5 years.

this period. From a starting point of around 70 per cent of the cohort being in employment, there was a gradual increase in the employment rate of learners. The gap between learners and the base rate was statistically significant from three months onwards, rising to four percentage points (an employment rate of 74 per cent) after two years.

Figure 3: Percentage of cohort employed in months following training start



Notes: Based on analysis of LEO data for 8,935 individuals in the treatment group and 44,770 individuals in the comparison group.

Table 2 provides a summary of the overall impact of participation in training on the number of weeks employed in the 2.5 years following the training start. The impact estimates are highlighted in bold where they are statistically significant at the 5 per cent level or better i.e. both the lower and upper bounds of the 95 per cent confidence interval are on the same side of zero. It shows that participation in training increases the amount of time spent in employment over this period by an average of 3.6 weeks. This finding is statistically significant.

Table 2: Impact of training on employment over the 2.5 years following training start

	Treatment group	Matched comparison group	Impact (difference)	95 per cent confidence interval	
				Lower bound	Upper bound
Number of weeks employed in 2.5 years following training start	94.2	90.6	**3.6**	2.3	4.8

Notes: Based on analysis of LEO data for 8,935 individuals in the treatment group and 44,770 individuals in the comparison group. Where the impact estimate is shown in bold, it is statistically significant at the 5 per cent level or better.

The evidence review did not identify any studies that assessed the average impact of participation in lifelong learning on the employment rate. However, a Spanish study based on data from the Spanish Adult Education Survey in 2007 and 2011 (i.e. before and after the 2008 financial crisis) found that in times of economic crisis, individuals who have engaged in formal lifelong e-learning activities are more likely to have an employment contract (Martínez-Cerdá et al., 2017).

Factors influencing the impact of lifelong learning on employment

Prior qualification level

Further analysis of LEO data found the impact of learning on the likelihood of being employed varied with the level of prior qualifications. It should be noted that this analysis was only conducted with LEO data, as the sample size for Understanding Society was too small for sub-group analysis. Figure 4 to Figure 8 track the estimated impact of training for two-and-a-half years after commencement, for individuals with different levels of prior qualification.[12]

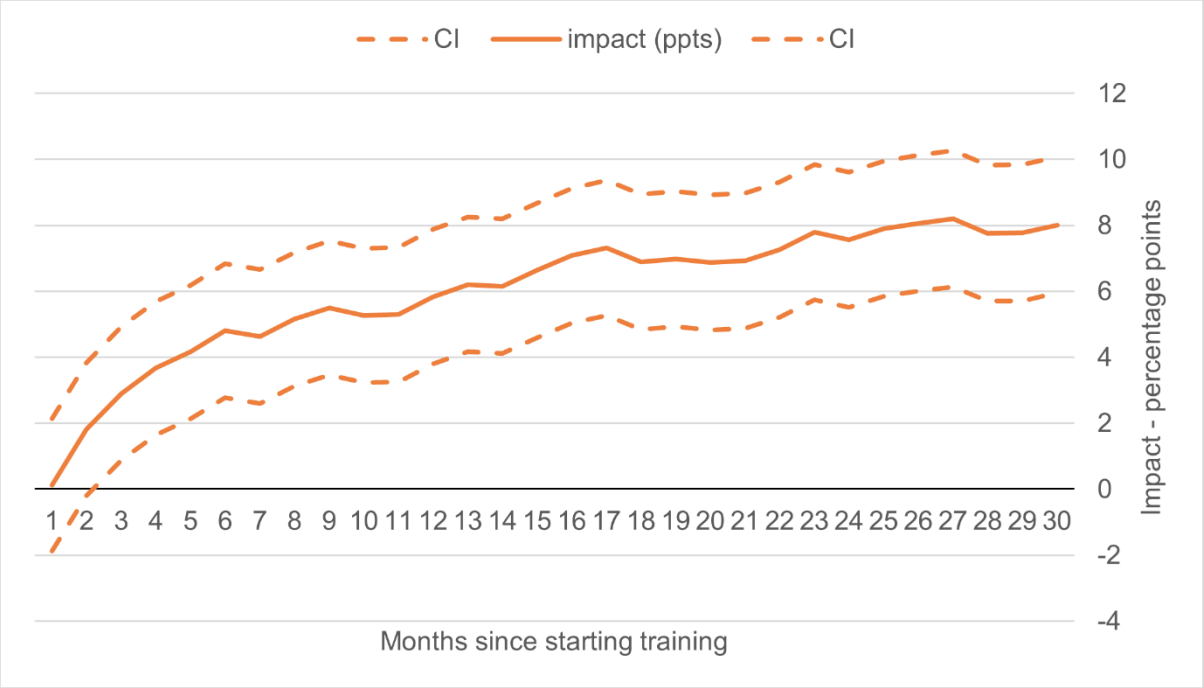
The greatest impact was for those with lower qualification levels before embarking on training, with the impact diminishing as the level of prior qualification increased. For individuals with no prior qualifications (Figure 4), participation in learning had a positive impact on the likelihood of being employed from approximately two months after starting training onwards. This increased steadily over time, plateauing at around 8

[12] Most of the figures in this report contain 95 per cent confidence intervals either side of the impact estimate, represented by broken lines. If both the lower and upper confidence interval are on the same side of zero on the vertical axis, this indicates that participation in training has a statistically significant impact.

percentage points after two years. The impact was similar for individuals previously qualified to level 1 (Figure 5), but with a smaller effect (6.2 percentage points after two and a half years) than for those with no prior qualifications.

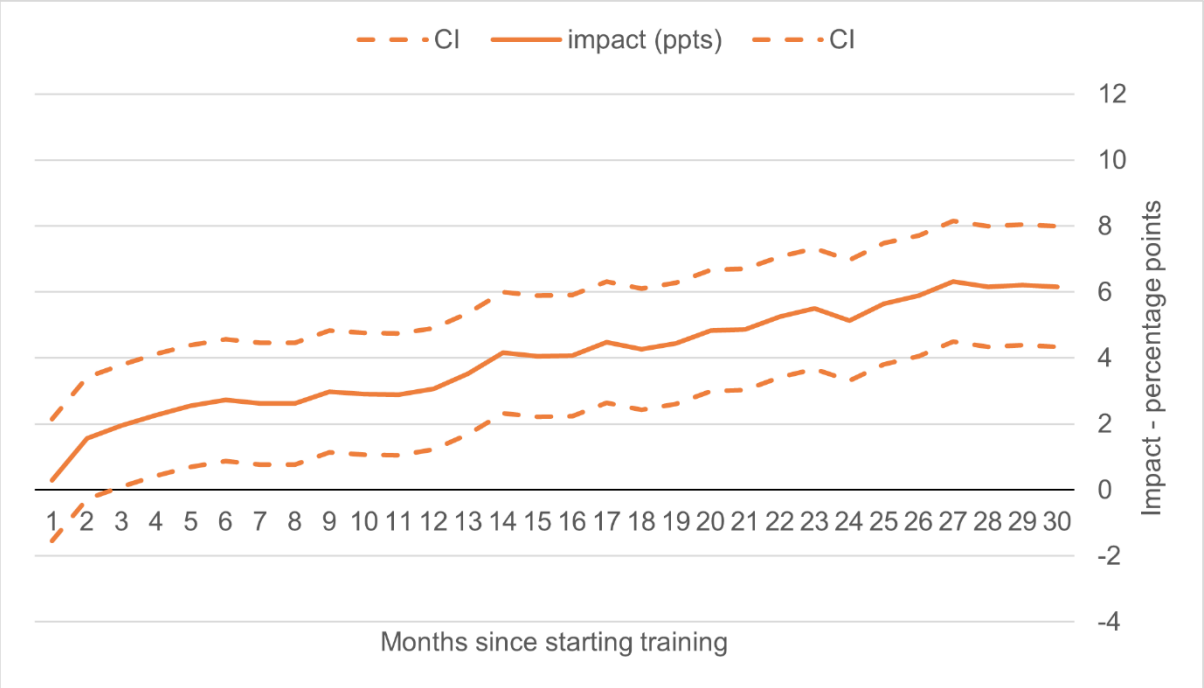
Individuals previously qualified to levels 2 and 3 also experienced a positive impact from participating in learning, but with smaller effect sizes. For individuals with prior qualifications at level 2 (Figure 6), positive effects took longer to emerge than for those with lower levels of prior attainment – becoming apparent after around seven months. However, these effects were then sustained and grew over time to reach 4.3 percentage points after two and a half years. The positive effect of participating in learning was less pronounced for those previously qualified to level 3 (Figure 7). For this group, sustained positive impacts only started to emerge 16 months after starting learning and peaked at 2.1 percentage points two years after the training start. No impact from training on the likelihood of being employed was identified for individuals with prior qualifications of level 4 or above (Figure 8), at least over the two-and-a-half year period considered in the analysis.

Figure 4: Percentage of those with no prior qualifications employed in months following training start



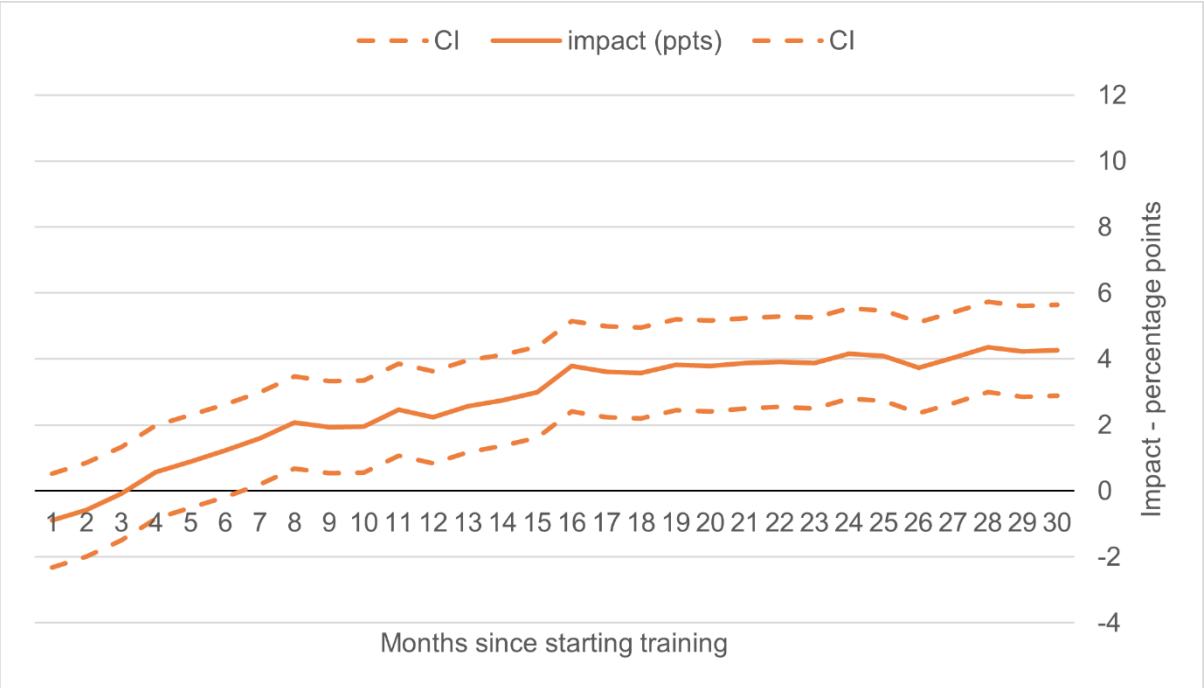
Notes: Based on analysis of LEO data for 4,630 individuals in the treatment group and 6,445 individuals in the comparison group. CI=upper and lower bounds of 95 per cent confidence intervals.

Figure 5: Percentage of those with highest prior qualification at level 1 employed in months following training start



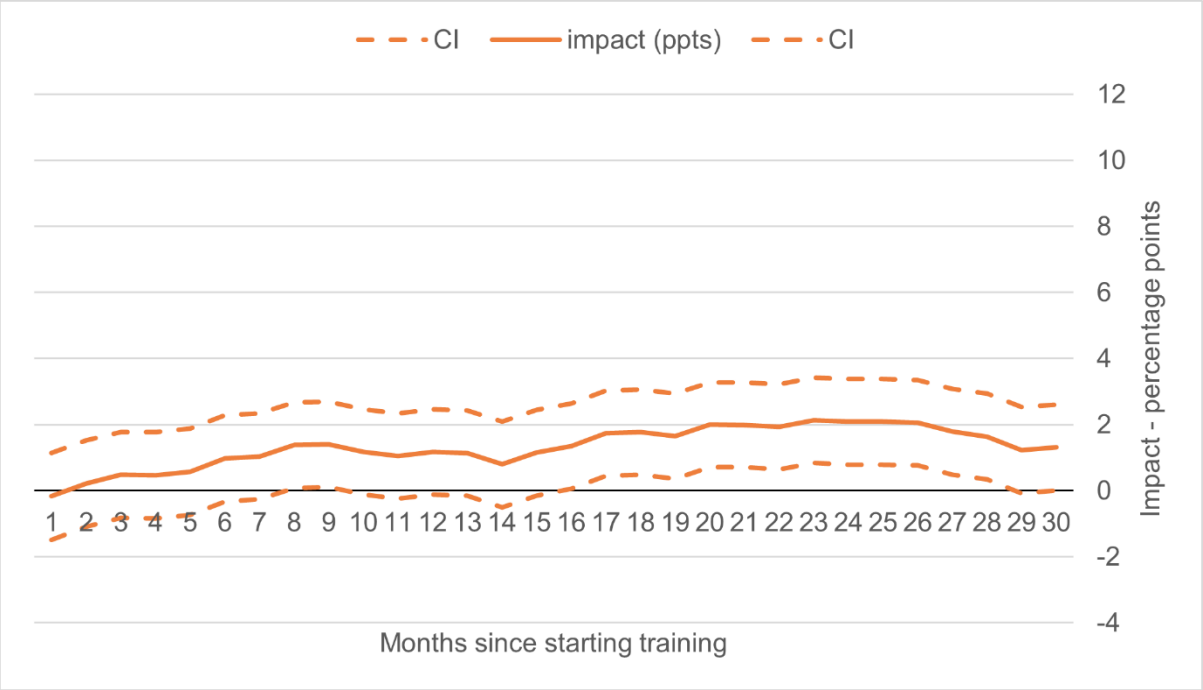
Notes: Based on analysis of LEO data for 3,760 individuals in the treatment group and 18,840 individuals in the comparison group. 5 treated individuals were off support. CI=upper and lower bounds of 95 per cent confidence intervals.

Figure 6: Percentage of those with highest prior qualification at level 2 employed in months following training start



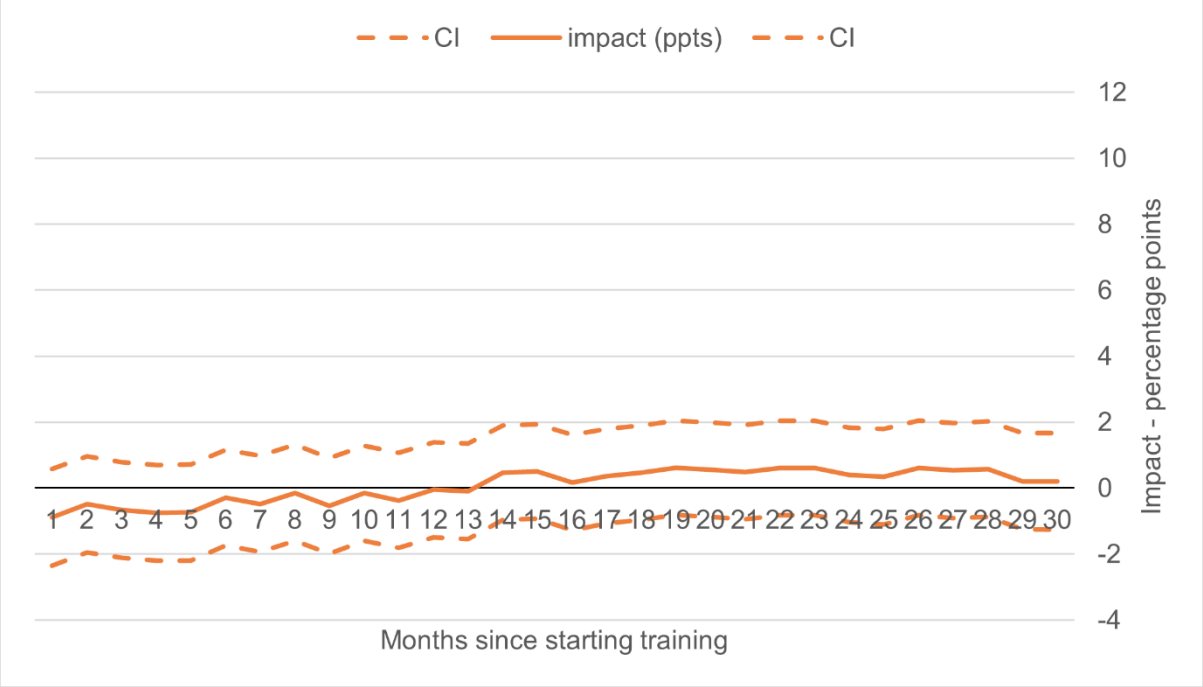
Notes: Based on analysis of LEO data for 5,505 individuals in the treatment group and 27,645 individuals in the comparison group. CI=upper and lower bounds of 95 per cent confidence intervals.

Figure 7: Percentage of those with highest prior qualification at level 3 employed in months following training start



Notes: Based on analysis of LEO data for 4,975 individuals in the treatment group and 25,110 individuals in the comparison group. CI=upper and lower bounds of 95 per cent confidence intervals.

Figure 8: Percentage of those with highest prior qualification at level 4 or above employed in months following training start



Notes: Based on analysis of LEO data for 3,010 individuals in the treatment group and 15,625 individuals in the comparison group. 115 treated individuals were off support. CI=upper and lower bounds of 95 per cent confidence intervals.

The differential impact of participation in learning by prior qualification level was also apparent in the impact on time spent in employment (Table 3). LEO data showed that participation in training increased the average amount of time spent in employment over the 2.5 years following the start of training for most attainment groups, with the exception of those qualified to level 4 or above. The positive impact of participation in learning on time spent in employment was greatest for those with the lowest levels of prior qualifications. On average, those with no prior qualifications spent an additional 7.1 weeks in employment as a result of undertaking training. Participation in training increased the time spent in employment for those with only level 1 qualifications by 4.7 weeks, compared with a positive training effect of 3.0 weeks for those with level 2 qualifications and 1.5 weeks for those with level 3 qualifications. Training had no detectable impact on the number of weeks spent in employment over the 2.5 years following the start of training for those who were already qualified to level 4 or above.

Table 3: Estimated impact of training on number of weeks employed in the 2.5 years following training start, by prior qualification level

	Treatment group	Matched comparison group	Impact (difference)	95% confidence interval	
				Lower bound	Upper bound
No prior qualifications	50.8	43.7	**7.1**	4.8	9.5
Highest prior qualification at level 1	71.2	66.4	**4.7**	2.6	6.9
Highest prior qualification at level 2	90.9	87.9	**3.0**	1.4	4.6
Highest prior qualification at level 3	103.8	102.3	**1.5**	0.0	3.0
Highest prior qualification at level 4 or above	111.5	111.5	0.0	-1.6	1.6

Notes: Analysis for those with no prior attainment based on 4,630 individuals in the treatment group and 6,445 individuals in the comparison group, with 35 treated individuals off support. Analysis for those with highest prior qualification at level 1 based on 3,760 individuals in the treatment group and 18,840 individuals in the comparison group, with 5 treated individuals off support. Analysis for those with highest prior qualification at level 2 based on 5,505 individuals in the treatment group and 27,645 individuals in the comparison group, with 25 treated individuals off support. Analysis for those with highest prior qualification at level 3 based on 4,975 individuals in the treatment group and 25,110 individuals in the comparison group, with 45 treated individuals off support. Analysis for those with highest prior qualification at level 4 or above based on 3,010 individuals in the treatment group and 15,625 individuals in the comparison group, with 115 treated individuals off support. Differences

statistically significant at the 5 per cent level or better highlighted in bold. Note that HESA Statistical Disclosure Control rules have been applied, so all counts are rounded to the nearest multiple of 5.

Level of qualification attained

The evidence review found limited evidence of a link between the level of qualification attained as a result of participating in lifelong learning and the probability of being employed. However, a UK study of below level 2 learning in the 2005/06 academic year found that achieving a level 1 qualification had a positive impact on the amount of time spent in employment for all age groups, as did an entry-level qualification for individuals aged 25 or over (Wiseman et al., 2013).

Occupation type

The evidence review identified one study that showed a link between lifelong learning and employment for technical occupations in the Swiss labour market, but no link between lifelong learning and employment for occupations with a stronger emphasis on soft skills[13]. Participation in training by workers in technical occupations raised the employment rate by four percentage points. However, participation in training was not found to affect the likelihood of being in employment for those in occupations requiring primarily soft skills. The authors deduced that participation in learning helps workers in technical occupations to remain up to date with the latest advances and thereby reduces the risk of unemployment (Schultheiss and Backes-Gellner, 2022).

We were not able to analyse the impact of lifelong learning on employment by occupation in the data analysis.

The impact of lifelong learning on the likelihood of returning to employment

The evidence review identified two studies that found that lifelong learning increased the likelihood of returning to employment after a period out of the labour market. One UK study, using data from the National Child Development Study[14] (NCDS), found that those who were out of the labour market in 1991 were more likely to be in work in 2000 if they had undertaken lifelong learning. Occupational qualifications increased the likelihood that men returned to the labour market, while participation in one or more types of lifelong learning (including academic, vocational, and occupational) raised the probability of returning to employment for women (Jenkins et al., 2003). A follow-up paper that analysed NCDS data over this period but focused specifically on women drew similar conclusions, finding that obtaining qualifications as an adult increased the likelihood of economically inactive women transitioning into paid employment (Jenkins, 2006).

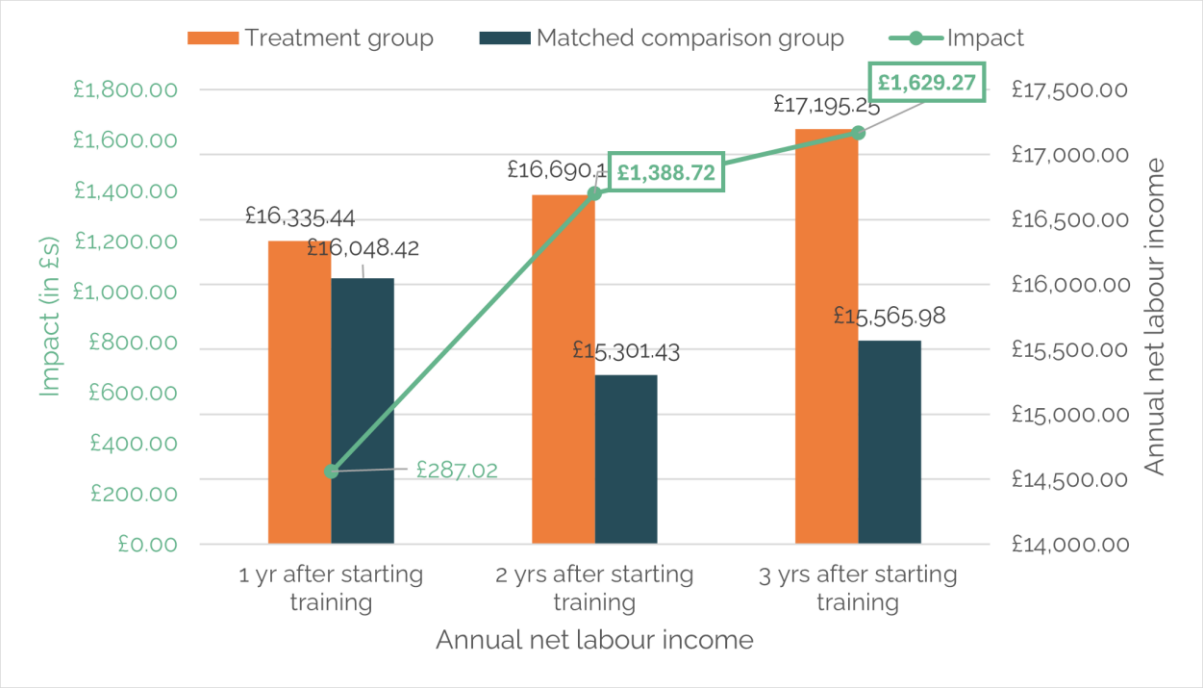
[13] The research used machine learning to analyse job advertisement data from 1950 to 2019.

[14] The National Child Development Study tracks more than 17,000 people born in Great Britain in a single week of 1958.

The impact of lifelong learning on earnings

Analysis of Understanding Society found limited evidence that participation in lifelong learning increased net earnings from employment and self-employment in each of the three years following the start of training. Figure 9 shows that earnings for those who took part in some learning were very similar to those of the matched comparison group one year after starting training. Training did have a statistically significant impact on earnings two years after participation, raising annual net labour income by an average of £1,389. This boost to earnings increased to an average of £1,629 a year after three years and again was statistically significant.

Figure 9: Annual net labour income in successive years after starting training



Notes: Based on analysis of Understanding Society data for 5,151 individuals in the treatment group and 2,026 individuals in the comparison group. Impact estimates which are statistically significant at the 5 per cent level or better appear in a box and are highlighted in bold.

In contrast, analysis of LEO data suggested that learning had a negative impact on individuals' earnings in each of the two tax years after starting a training course, although in this case the earnings measure captured total taxable pay from employment, rather than net earnings from employment and self-employment. Table 4 shows the earnings in each tax year for the treatment and matched comparison groups. The earnings of those who undertook training were estimated to be around £1,600 lower in each of the two tax years after starting training than expected if they had not started a training course. Although this is surprising given the positive average employment effects for much of the two-year period after starting training, it is possible that even if participation in training increases the likelihood of the individual being employed, it may reduce earnings if it is necessary to work fewer hours while

undertaking training. Also, if the reason for training is to embark upon a career in a different sector, it is possible that individuals experience a reduction in earnings compared with those who do not undertake training, at least while they become established in a new field. The period of two tax years covered in the LEO analysis may therefore have been insufficient to pick up any positive impacts of training on total taxable pay from employment, which may be more likely to appear in the medium- to long-term.

Table 4: Earnings in tax years following training start

	Treatment group	Matched comparison group	Impact (difference)	95 per cent confidence interval	
				Lower bound	Upper bound
Earnings in tax year following training start (£)	£13,649.67	£15,239.35	**-£1,589.68**	-£2,378.40	-£800.96
Earnings 2 tax years following training start (£)	£14,241.23	£15,801.78	**-£1,560.55**	-£2,297.32	-£823.78

Notes: Based on analysis of LEO data for 8,935 individuals in the treatment group and 44,770 individuals in the comparison group. Where the impact estimate is shown in bold, it is statistically significant at the 5 per cent level or better.

Most studies examined in the evidence review found that lifelong learning had a positive impact on wages. For example, one UK study found that an increase of one percentage point in the proportion of employees participating in training was associated with a 0.3 percentage point increase in wages (Dearden et al., 2006).[15] Another UK study using the British Household Panel Survey (BHPS) (the precursor to Understanding Society) from 1991 to 2006 reported that men and women experienced a 20 per cent increase in hourly earnings 10 years after gaining a lifelong learning qualification (Blanden et al., 2012). An evaluation of the UK Skills for Life programme[16]

[15] This study uses data from 1983 – 1996 data from a British industry panel survey, and is only based on production rather than service sectors.

[16] At the time of publication, the Skills for Life programme was designed to improve literacy, numeracy and language skills of adults and young people (aged 16 to 17) who had left full-time education. Literacy, numeracy and ESOL training was offered, free of charge, to those without qualifications at Level 2.

found that participation increased the average annual take-home pay two years on by £558 a year (Meadows and Metcalf, 2007).

Assessing the longer-term economic outcomes of lifelong learning, a paper published by the Department for Business, Innovation and Skills estimated that the lifetime benefit associated with gaining a level 3 vocational qualification was between £37,000 (for NVQ[17] level 3) and approximately £89,000 (for BTEC[18] level 3 qualifications)[19]. For acquiring a level 2 qualification, the lifetime benefits were estimated to range from between £35,000 and £57,000 for BTEC qualifications and between £42,000 and £71,000 for City & Guilds qualifications. The net benefit associated with gaining NVQ level 2 qualifications was slightly lower, standing at between £18,000 and £42,000 (Conlon et al., 2011).

Numerous other studies linking lifelong learning with an increase in wages were also identified.[20] A number of studies were also identified which explored the impact of lifelong learning on earnings for particular groups – these are outlined (where relevant) in the sub-sections which follow.

Taken together with our analysis, these findings suggest that lifelong learning has a positive impact on earnings in the longer term. However, our results show that this can be preceded by a short-term drop in earnings during training and in the years immediately after its completion. This may be due to the need to reduce working hours while completing training, or learners experiencing a short-term reduction in earnings while they become established in a new career.

Factors influencing the impact of lifelong learning on earnings

Prior qualification level

Analysis of LEO data showed that the impact of participation in training on total taxable pay from employment varied with the level of prior qualification of the learner. Table 5 shows the earnings in each tax year for the treatment and matched comparison group for each level of prior attainment. It should be noted that this analysis was only conducted with LEO data, as the sample size for Understanding Society was too small for sub-group analysis.

The results suggest that the initial negative impact of training on earnings does not occur for individuals with lower levels of prior qualifications. Participation in training did

[17] National Vocational Qualification

[18] Business and Technology Education Council

[19] This study used data from the 1970 British Cohort Study and the Labour Force Survey between 1996 and 2009.

[20] Cf. Conlon et al., 2011; Feinstein et al., 2004; Jenkins et al., 2003; Dorsett et al., 2016; Buscha, 2009; Schultheiss et al., 2022; Wiseman, 2013; Konings and Vanormelingen, 2010; Colombo and Stanca, 2008; Schwerdt et al., 2011

not affect earnings for individuals with no prior qualifications or level 1 qualifications within the first two tax years following completion of training. However, for those with qualifications at level 2, level 3, or level 4 and above prior to starting training, earnings appeared to be reduced in each of the tax years following the training start. For those with a level 2 qualification, earnings were an average of around £1,000 lower in the first year after commencing training than they would have been if no training had been undertaken. In the second tax year, earnings were reduced by around £730 as a result of taking part in training, suggesting perhaps that the negative effect of training on earnings for this group might fall over time.

For those with level 3 qualifications, participation in training reduced earnings by around £2,150 in the first tax year after starting training and £2,170 in the following tax year. The negative impact of participation in training on earnings was even more evident for those who were qualified to level 4 or above prior to starting training. For this group, earnings were reduced by around £4,800 in the first tax year after starting training and £5,170 in the second tax year after starting training.

However, it is also apparent that expected annual earnings in the absence of participation in training (the figures for the matched comparison group) varied greatly by the level of prior qualification. Those with no qualifications could expect to earn an average of £4,823 in the second tax year if they did not undertake any training, compared with an average of £26,673 at the same point for those who were qualified to level 4 or above.

Table 5: Earnings in tax years following training start, by prior qualification level

	Treatment group	Matched comparison group	Impact (difference)	95 per cent confidence interval	
				Lower bound	Upper bound
Earnings in tax year following training start (£)					
No prior qualifications	£4,374.82	£4,625.85	-£251.04	-£613.09	£111.02
Highest prior qualification at level 1	£7,687.19	£8,202.09	-£514.90	-£1,075.48	£45.69

Highest prior qualification at level 2	£11,320.76	£12,323.58	**-£1,002.82**	-£1,491.34	-£514.30
Highest prior qualification at level 3	£15,068.55	£17,220.80	**-£2,152.25**	-£2,596.13	-£1,708.36
Highest prior qualification at level 4 or above	£20,779.20	£25,363.72	**-£4,584.52**	-£5,314.72	-£3,854.32
Earnings 2 tax years following training start (£)					
No prior qualifications	£4,995.60	£4,823.29	£172.31	-£208.14	£552.77
Highest prior qualification at level 1	£8,442.49	£8,553.63	-£111.14	-£733.47	£511.19
Highest prior qualification at level 2	£11,963.08	£12,690.43	**-£727.35**	-£1,212.46	-£242.23
Highest prior qualification at level 3	£15,619.66	£17,789.14	**-£2,169.47**	-£2,637.23	-£1,701.72
Highest prior qualification at level 4 or above	£21,506.82	£26,672.84	**-£5,166.02**	-£5,948.64	-£4,383.41

Notes: Analysis for those with no prior attainment based on 4,630 individuals in the treatment group and 6,445 individuals in the comparison group, with 35 treated individuals off support. Analysis for those with highest prior qualification at level 1 based on 3,760 individuals in the treatment group and 18,840 individuals in the comparison group, with 5 treated individuals off support. Analysis for those with highest prior qualification at level 2 based on 5,505 individuals in the treatment group and 27,645 individuals in the comparison group, with 25 treated individuals off support. Analysis for those with highest prior qualification at level 3 based on 4,975 individuals in the treatment group and 25,110 individuals in the comparison group, with 45 treated individuals off support. Analysis for those with highest prior qualification at level 4 or above based on 3,010 individuals in the treatment group and 15,625 individuals in the comparison group, with 115 treated individuals off support. Impact estimates that are statistically significant at the 5 per cent level or better are highlighted in bold. Note that HESA Statistical Disclosure Control rules have been applied, so all counts are rounded to the nearest multiple of 5.

The reason for the variation in impact by prior qualification level may be partly due to differences in the type of training undertaken by each group. Individuals with lower prior qualifications were more likely to be out of work at the time they started training than those with higher-level qualifications. Therefore, they may be more likely to have been doing shorter courses focused on increasing their likelihood of entering work, which might explain why they did not experience a negative impact on earnings.

By contrast, since those with higher prior qualifications were more likely to be employed, it is probable that the training was undertaken to enhance the prospects for long-term progression, rather than with the aim of entering work. If this involved doing more intensive or longer courses, this might necessitate reducing their working hours (and thus experiencing a reduction in earnings) for a period of time in order to complete training. Course duration and/or intensity tends to increase with level, and so the impact of this is likely to be greater for individuals with higher prior qualifications. Even after finishing training, it might take time to find employment which allows them to make use of any new qualifications or to progress into higher paying work. This is particularly likely for those with higher-level qualifications initially, given that they were more likely than those with lower-level qualifications to be in higher-paid work before embarking on training.

Gender

There is conflicting evidence on the relationship between lifelong learning, wages and gender. For example, Australian research using data from the 2001 to 2011 waves of the Household, Income and Labour Dynamics in Australia Survey found consistent, but limited, evidence of a positive impact from lifelong learning on men's wages, but not on women's (Coelli and Tabasso, 2019).

Other studies found positive effects for both men and women. For example, sequential UK studies by Dorsett et al. analysing BHPS data from 1991 to 2007 found lifelong learning to be associated with wage increases for both men and women[21]. In relation to men, their research found that lifelong learning had modest effects for those who did not upgrade their highest level of qualification, and significant effects for those who did. It also found that lifelong learning can provide a one-off boost to wage growth for men in stable employment (Dorsett et al., 2010). Their subsequent research found lifelong learning had a positive effect on women's hourly earnings. Wage effects of six to 11 per cent were seen for lifelong learning which did not upgrade qualifications and 22 to 32 per cent for those which did (Dorsett et al., 2011).

There may also be an interaction between age and gender. For example, a previously mentioned UK study using BHPS data observed that while the effect of lifelong learning on wages was similar for men and women, women experienced positive

[21] Lifelong learning was defined as the acquisition of any qualifications after the age of 25.

earnings impacts sooner than men – four years after learning for women, compared with six years for men (Blanden et al., 2012).

Age

Evidence suggests that the impact of lifelong learning on wages may be more pronounced for younger workers. For example, a UK study using BHPS data from 1991 to 2006 found that only men aged under 35 and women under 49 experienced positive wage effects from lifelong learning (Buscha et al., 2009). German research also concluded that only younger workers experience an increase in wages following participation in training (Lang, 2012).

A more recent UK study which also used BHPS data from 1991 onwards[22] found that an increase in educational attainment boosted the earnings of men aged 30 who were educated to level 3 or below whose highest qualification was not academic. For men aged 45, the wage returns to educational attainment were lower than for the younger age group, but were still statistically significant at the ten per cent level for those who were initially educated to level 1 or 2 (Dorsett et al., 2016). These results are similar to our LEO analysis, which found a less negative impact for those with lower prior qualification levels.

A UK report published by Department for Business, Innovation and Skills that analysed data from the Labour Force Survey between 1996 and 2009 found an earnings advantage associated with gaining intermediate vocational qualifications (levels 2 and 3) below the age of 25. For example, for men with BTEC level 3 qualifications, the marginal earnings premium ranges from between 12 and 15 per cent when the qualification was acquired below the age of 25, compared with 7 per cent for those gaining the qualification above the age of 30. For women, the relationship is more nuanced. For example, gaining a BTEC level 3 between the ages of 17 and 25 was associated with an earnings premium of 6 to 15 per cent, whereas between the ages of 26 and 30 it was associated with a 15 per cent earnings premium. Above the age of 30 it was associated with an earnings premium of five per cent (Conlon et al., 2011).

Australian research using data from the 2001 to 2011 waves of the Household, Income and Labour Dynamics in Australia Survey suggested that engaging with learning is more economically beneficial for younger adults, and less so for those participating some years after leaving school (Coelli and Tabasso, 2019).

Socioeconomic status

While most studies in the evidence review found that participation in lifelong learning had a positive effect on wages, a small number did not. A UK study by Bukodi using British Cohort Study 1970 data found that individuals from socioeconomically disadvantaged backgrounds were more likely to obtain further vocational

[22] This study included the final BHPS wave from 2007

qualifications than those from more advantaged backgrounds, but that these proved to be of variable value in the labour market (Bukodi, 2016). They observed that individuals whose socioeconomic status decreased were just as likely to attain further qualifications as those who increased their status. The study concluded that acquiring new vocational qualifications does not increase men's chances of increasing socioeconomic status. For women, the picture is more complex; obtaining new vocational qualifications is linked to increased chances of upwards mobility, but it also brings about higher risks of downward mobility (Bukodi, 2016).

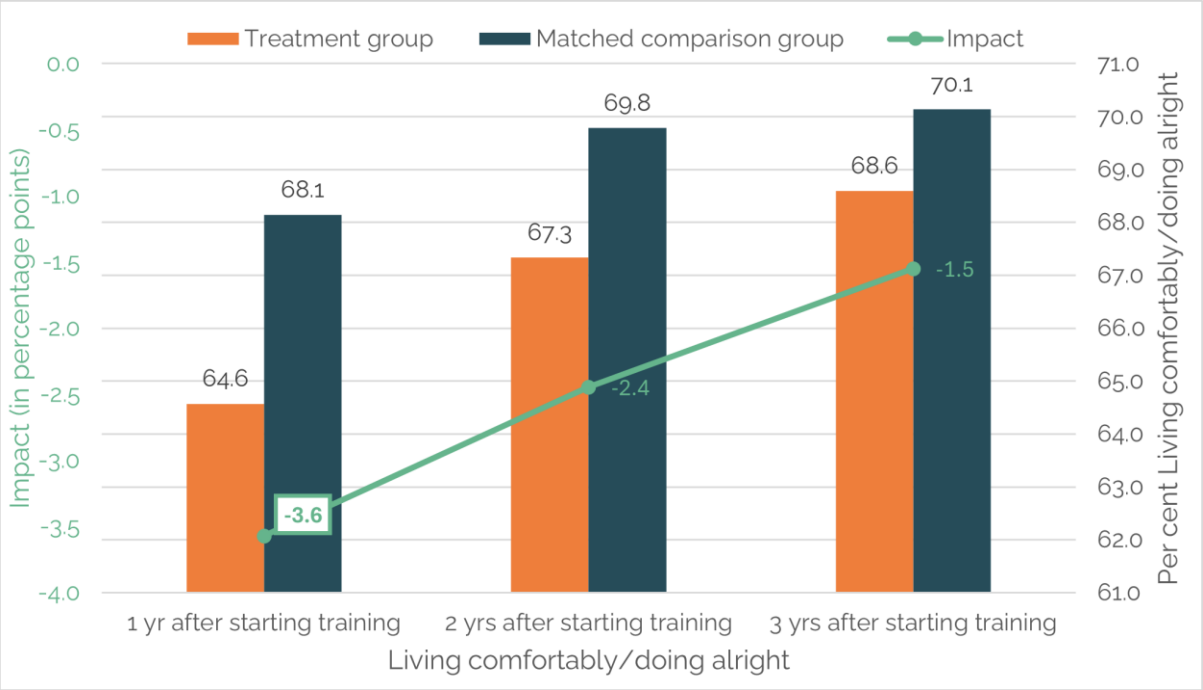
Two previously mentioned studies, both using data from BHPS between 1991 and 2006, examined the impact of lifelong learning on social position using the CAMSIS scale of socioeconomic classification.[23] The older study found that while an increase in earnings after lifelong learning was only apparent for younger adults, occupational status returns were more common for middle-aged men and women (Buscha et al., 2009). The more recent study suggests that where men and women experience a 20 per cent increase in hourly earnings ten years after gaining a lifelong learning qualification, they also experience a 10 per cent return to their CAMSIS score over the same period (Blanden et al., 2012).

Impact of lifelong learning on household finances

The analysis of Understanding Society found that individuals who participated in training were less likely to report that they were living comfortably or doing alright one year after starting training than the matched comparison group (Figure 10). Training reduced the likelihood of participants saying that they were living comfortably or doing alright by 3.6 percentage points one year after starting training. However, this negative impact on household finances from participation in training disappeared after two years, when it was no longer statistically significant. By this point those who participated in training were no less likely to report that they were living comfortably or doing alright than those who did not undertake any training and this was also the case three years after starting training.

[23] More information about the CAMSIS scale is available here: CAMSIS Social Interaction and Stratification scales: Construction Overview (stir.ac.uk)

Figure 10: Percentage reporting living comfortably/doing alright in successive years after starting training

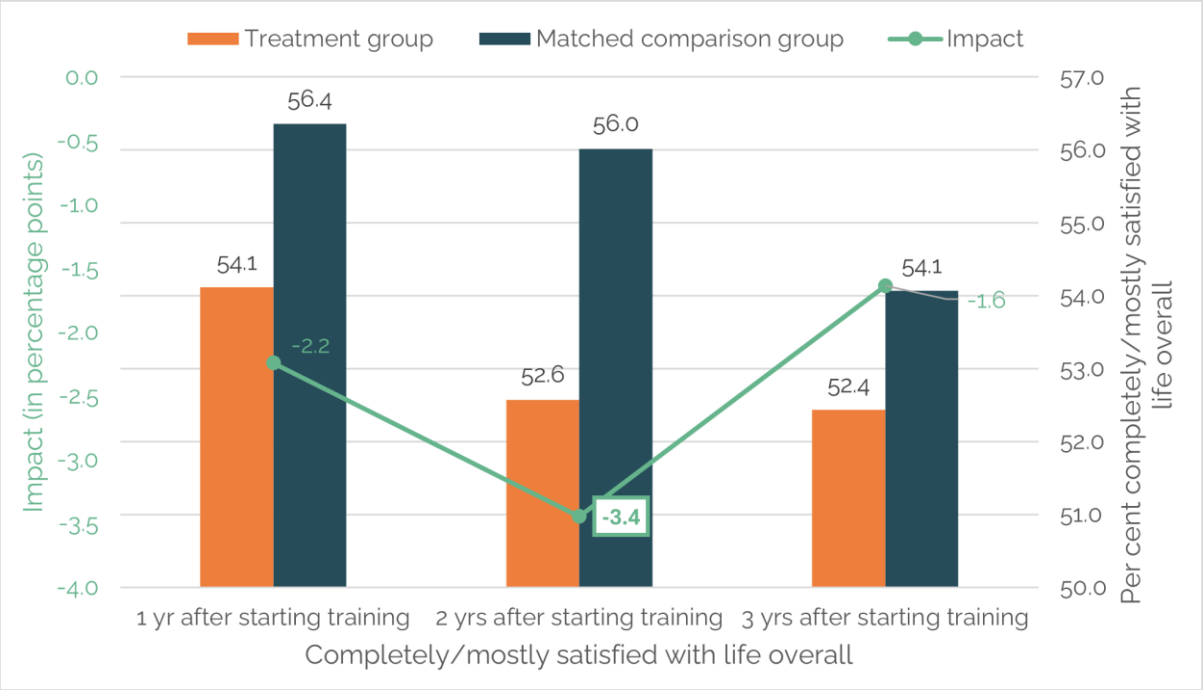


Notes: Based on analysis of Understanding Society data for 5,151 individuals in the treatment group and 2,026 individuals in the comparison group. Impact estimates which are statistically significant at the 5 per cent level or better appear in a box and are highlighted in bold.

Impact of lifelong learning on life satisfaction

Participation in training had no discernible impact on life satisfaction one and three years following the start of training (Figure 11). Although participation in training appeared to result in lower life satisfaction two years after starting training, by year three, a similar proportion of the treatment and matched comparison groups reported that they were completely or mostly satisfied with their life overall.

Figure 11: Percentage completely/mostly satisfied with life overall in successive years after starting training

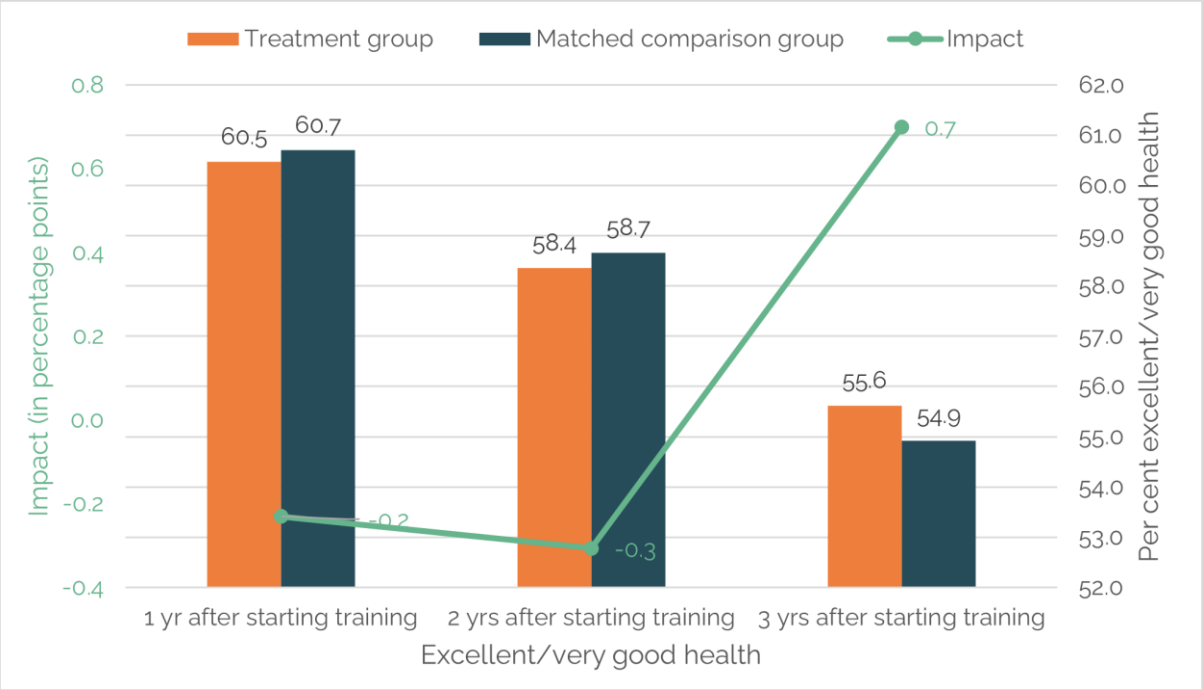


Notes: Based on analysis of Understanding Society data for 5,151 individuals in the treatment group and 2,026 individuals in the comparison group. Impact estimates which are statistically significant at the 5 per cent level or better appear in a box and are highlighted in bold.

Impact of lifelong learning on health

Undertaking training did not affect the likelihood that participants reported being in excellent or very good health in each of the three years following the start of training. The percentage of the treatment and matched comparison groups who reported being in excellent or very good health was similar in all three years and the impact estimates were not statistically significant (Figure 12).

Figure 12: Percentage reporting excellent/very good health in successive years after starting training



Notes: Based on analysis of Understanding Society data for 5,151 individuals in the treatment group and 2,026 individuals in the comparison group. Impact estimates which are statistically significant at the 5 per cent level or better appear in a box and are highlighted in bold.

Employer perspective

Key findings

- Employers described a wide range of approaches to workplace learning, including internal learning sessions, self-led eLearning, compliance training, line management support, sector-specific training, formal accredited training, and learning beyond the workplace.
- For employers, the benefits associated with workplace learning include helping to support employee retention, contributing to career progression and increased earnings, and boosting staff confidence and performance. Employers also felt that workplace learning made them more attractive to potential job candidates and increased workforce productivity.
- The main challenges to workplace learning identified by employers were time, resources and financial implications. It was also necessary to ensure that training is high quality and relevant to employees, and employees are motivated to engage in training.
- Methods identified to increase employee engagement with learning included fostering a culture of learning, working to understand employees' motivations for learning, creating an accessible learning environment and responding to the diverse learning styles and requirements of employees.

This section of the paper explores employers' views on the benefits of workplace learning for individual employees and for organisations more broadly. Employers were purposefully sampled to ensure a broad representation across a range of characteristics. This included a mix of small, medium and large employers, and employers from a wide range of sectors such as health and social care, retail, automotive, IT and law. Interviewees were restricted to individuals at a management level, with responsibilities for skills/training.

Different approaches to workplace learning

Workplace learning comes in various forms, each tailored to meet the diverse needs and objectives of employees and organisations. Understanding the types of workplace learning and their benefits and limitations is crucial for designing and enhancing effective programmes. Types of workplace learning, from less formal to more formal, are explored in the subsections below.

Internal learning sessions

Interviews with employers found that most had a programme of internal training events. These included lunch-and-learn sessions, masterclasses and workshops, some of which were delivered by staff in-house or occasionally by external trainers. Subjects

covered in these training sessions were varied, often responding to the needs of the business or staff team. For example, an employer working in the retail sector had recently run workshops focused on staff absence and how to have difficult conversations at work. Another employer in the charity sector mentioned that they had run sessions on topics including race equality and child protection.

Self-led eLearning

Some employers were utilising internal or external learning hubs where employees have access to training materials. In terms of third-party learning platforms, the most frequently mentioned in interviews was LinkedIn Learning; others included Coursera, Citation Atlas, and Perks at Work. For the most part, employers explained that staff were free to access these online resources as and when they wished, rather than it being required of them. It was mentioned by some employers that they were able to see which training resources staff were accessing via these platforms which helped to build a better understanding of learning and development needs across their organisation.

Compliance training

Most organisations were offering mandatory compliance training covering topics such as health and safety, GDPR or sector-specific regulations. Employers considered this type of training vital for keeping staff updated on the latest rules and regulations. For instance, an employer working in accountancy explained that staff awareness of tax guidelines was crucial for advising clients and providing relevant advice. A charity organisation required their staff to complete safeguarding training as part of the induction process.

Line management support

In most sectors support through line management was available to employees at all career stages. In interviews employers reflected on their performance and appraisal processes, which included identifying employee development opportunities. This one-on-one support was seen as instrumental in individual skill development and career progression. Although not raised in the interviews, it is important to note that variability in quality of line management would therefore be likely to have a substantial impact on the experience of individual employees.

Sector-specific training

Sector-specific training was tailored to the unique requirements of a particular sector or job role. This was especially common where specific qualifications were essential for a position, or for sector-specific compliance training. For example, an employer working in health and social care noted that all staff received basic life support training as a necessary pre-requisite for the job.

Formal accredited training

Besides professional accreditation linked to job roles, some employers were supporting staff to complete qualifications with an external provider. Apprenticeships, and postgraduate programmes such as MBA qualifications, were being offered by employers of varying sizes in the retail, automotive, education and security sectors. Other accredited training mentioned by employers included PRINCE 2 project management and level 2 awards.

Learning beyond the workplace

Some employers encouraged and supported employees to pursue non-work-related learning, whether related to personal interests, hobbies, or wellbeing. Some employers noted the importance of enhancing employees' personal lives as well as work lives and saw support for this type of learning as contributing to a good work/life balance.

The importance and value of workplace learning

Employers who took part in this research highlighted multiple benefits associated with providing workplace learning, including:

- contributing to **employee retention**, allowing individuals to progress within the organisation and potentially earn higher salaries
- being more **attractive to potential job candidates** as an employer known to value learning and investing in its employees' development
- increased **employee confidence and performance**, which in turn improves overall business performance
- influencing **employee morale and wellbeing**, which boosts job satisfaction.

Recruitment and retention

There is some limited evidence to suggest that lifelong learning opportunities contribute to employee retention. A German study found that training programmes targeted at older workers (aged 50 to 65) resulted in women – particularly those on lower wages – being less likely to retire, though the same link could not be confirmed for men (Berg et al., 2017). Additionally, Norwegian research exploring the effects of adult education for those above the age of 40 suggested that access to formal education among older workers contributed to longer working lives, with overall effects similar for both men and women (Midtsundstad and Nielsen, 2019).

In interviews for this research, one of the most frequently cited benefits of having a workplace learning offer was the positive effect on employee retention. Employers explained that employees who receive training were more likely to remain loyal to the

organisation, appreciating the investment made in their personal and professional growth.

> "If people feel that the business is investing in them then that has a big impact on retention which obviously is great for the business because recruitment is expensive." *(Employer, Health and Social Care sector)*

Another commonly cited benefit to employers was that a good quality learning programme serves as an effective recruitment tool. Employers highlighted that being recognised as an organisation committed to employee development can attract talented employees.

Career progression and increased earnings

Some employers reflected that work-related learning has the potential to contribute to staff progression, both internally within the organisation and externally within the wider sector. Employers described how learning can enable employees to diversify their skill sets, explore different roles, and develop a well-rounded understanding of an organisation. Having these opportunities can contribute to a more informed and strategic approach to an employee's career development. This is consistent with the findings of a study by Ullah (2025) which found that participating in employer-provided training permanently increased the likelihood of being in a managerial role.

When asked about the possibility of employees receiving training and then moving on to new opportunities elsewhere, employers responded that this was not a major concern. Some expected this and saw it as somewhat inevitable. One employer believed it was ultimately beneficial to the sector as a whole.

> "Actually we want people to develop, because actually, ultimately, they'll probably go on probably and work in the automotive sector or somewhere similar in part of the ecosystem, and that is what we're about as a non-profit trying to keep a safe automotive sector in the UK". *(Employer, Automotive sector)*

However, it should be noted that these findings contradict previous research that identify this as a common problem for employers.[24]

The perceived impact of learning on career progression seemed to vary by organisation size, with some smaller employers having more limited progression opportunities compared with larger employers. The type of sector also influenced the extent to which progression was possible. Notably, sector-specific skills acquired

[24] C.f. Cominetti, N. *et al*. (2022) 'Train in vain? Skills, tasks, and training in the UK labour market. *Resolution Foundation.*

through work-related learning were seen as instrumental in advancing to roles where accreditation is mandatory, such as accountancy or teacher training programmes.

Learning was noted to have a direct bearing on employees' earnings, although employers were more likely to report career progression over increased earnings specifically. Interview findings revealed some sectoral differences, in particular, employees who acquired specialised technical skills or obtained industry-recognised certifications were more likely to have higher earnings. These sectors, which included accountancy, law and teaching, placed value on up-to-date skills and certifications. This is consistent with other evidence on the wage returns to employer-provided training, where the magnitude of the effects was greatest when the training resulted in a qualification (Ullah 2025).

Innovation and productivity

There is wider evidence suggesting that work-related training influences employee productivity, and to a larger extent than it does wages. A UK study found that an increase of one percentage point in the proportion of employees doing training was linked to a 0.6 percentage point increase in productivity and 0.3 percentage point increase in wages (Dearden et al., 2006). Similarly, a report published in Belgium stated that the productivity premium for a trained employee was around 23 per cent on average (compared with an untrained employee), while the wage premium was 12 per cent (Konings and Vanormelingen, 2010).[25]

Employers interviewed for this research highlighted that learning and development in the workplace helps to increase employees' confidence in their roles and leads to enhanced performance. This heightened confidence improves task efficiency and effectiveness, fostering a culture of innovation and boosting workplace productivity.

Some employers believed that high quality learning or training acts as a conduit for adopting industry best practices, ensuring the organisation remains up to date with emerging sector trends and developments. **Employers also reflected on the benefits of having a well-trained workforce particularly on customers, service users, and clients.** Some identified that well designed training helps to animate policies, such as GDPR, which might otherwise seem abstract if communicated solely through written documents. Through practical training, employees are better equipped to grasp and implement policies effectively.

[25] This finding was also supported by an Italian study which reported that increasing training intensity by one percentage point results in a 0.07 percentage point rise in productivity. It too concluded that the effect of training on wages is much smaller than the effect on productivity (Colombo and Stanca, 2008).

Mini case study 1

An employer in the charity sector was offering their staff the opportunity to complete a level 2 qualification in Independent Advocacy, as well as GDPR and safeguarding training. In their experience, workplace training leads to a higher quality and more relevant support offer for their service users.

“For me it's about-, there's what it brings to the service user, what it brings to the individual and what it brings to the organisation. So, I think if you've got someone who's well trained and learned for that service user, you know you're kind of bringing them the up-to-date-, the best service, the knowledge, the experience and the competencies and the safe and legal aspect of things.”

In their view, offering workplace training also helps to bring about staff commitment and dedication to the organisation, as well as giving individuals a sense of accomplishment.

“I personally think there is nothing better than seeing a member of staff who is doing their learning and they can see how it's impacting them and they're learning and developing and feeling more confident, thinking, 'I could do that, I could take on that,' [...] You see that positivity, sometimes they come back with comments on how that's impacted them outside of the workplace. So I think it's fairly-, I find it's really good for morale.”

Wellbeing and employee satisfaction

Employers highlighted that workplace learning influences employee morale and wellbeing. Acquiring new skills and knowledge elevates confidence, enabling employees to approach challenges with self-assurance. In addition, it can contribute to a healthy work/life balance, boosting job satisfaction.

> "People like to see that they're growing and learning and, you know, we do see every year now in our employee engagement survey, really positive feedback about the opportunities to develop." *(Employer, Automotive sector)*

Some employers who took part in our research supported employees to engage in non-work-related learning in various ways, from offering volunteering days, flexible working for employees to pursue their interests or providing access to financial resources for hobby-related activities, for example. Employers described how this can benefit both themselves and their employees through increased job satisfaction, a boost in workplace morale, and a sense of work/life balance, all of which contribute to a more engaged and motivated workforce.

Mini case study 2

A law firm explained that some of their staff are required to take part in continuing professional development to maintain their qualifications. There is also mandatory training for all staff on topics including GDPR and health and safety. They had introduced a volunteering scheme, intended to boost employee engagement and retention, which has evolved into an avenue to engage in non-work-related training.

"We've recently introduced volunteering days, and the aim of that originally was social interaction with perhaps local agencies and things, charities and stuff in our community. But some people use that for going off and doing training that's nothing to do with the requirements of their job, and so we encourage that. It's only 2 days a year they're allowed to do it, but they might go off and learn how to hang-glide, or I don't know, something like cooking skills, something completely different from the workplace. And again, I think there's a positive in that, it's such a positive for us as an employer to offer people the opportunity to do that kind of thing. It becomes an engagement, part of the engagement and the retention, I think."

Effective employee engagement in workplace learning

Research with employers highlighted a number of key factors that can enhance engagement with, and experience of, workplace learning. Important factors that emerged included fostering a culture of learning across the organisation and creating an engaging and accessible learning environment, as well as recognising and responding to different individual learning styles.

Fostering a culture of learning

The culture of learning within organisations is a key factor influencing participation in training, including attitudes towards learning and development at all levels. **Employers interviewed described how line managers have an important role to play in actively engaging in constructive conversations about learning and framing it positively**, to ensure that employees view learning as a valuable opportunity for personal growth and professional advancement, rather than a distraction from their core responsibilities. It was also noted that employees would benefit from line managers providing guidance on available learning options and how they align with individual development and organisational goals.

Moreover, effectively communicating the tangible benefits of learning is a fundamental step in contributing to a learning culture. **Employers reflected on the importance of being clear about why learning is important, how it can lead to career advancement, and how it supports individual progress**.

Mini case study 3

One employer - a research institute – was offering a bespoke PhD training program and undergraduate internships, among other learning initiatives. They described how they used case studies and real-life examples as part of a campaign to showcase how learning enhances career development.

"So, we get people to do courses that they wouldn't necessarily self-select for their own training and development, but because they end up doing them, often it's months later when they look back and reflect on their training opportunities and go, 'Oh, I get it now, I can see why you made us do that training and it's so valuable.' So, I think there's a whole really interesting question about lifelong learning, you know, what's the motivation, how do you get people to engage with it, how do you get people to see the benefits? If it's self-selecting, what will encourage people to select things that they may not have considered before? So, we do a lot around testimonials, case studies, trying to show how it's been beneficial."

Creating an engaging and accessible learning environment

Employers interviewed highlighted that learning offers that are engaging and efficient can help to boost employee participation. It was suggested that forming internal learning committees that capture employee feedback and develop engaging courses would be an effective strategy to improving workplace learning offers.

Employers were asked how they deliver training and whether formats have changed over time. Most employers were offering a mix of online and in-person training and felt this worked well. **With the pandemic accelerating a shift to online learning, employers noted that the ability to offer more learning opportunities virtually, including webinars, made learning more accessible and convenient for their staff.** Online learning was considered particularly advantageous when employees are geographically dispersed or have limited time due to other commitments.

However, online learning is not without its challenges. Some employers reported that staff may find online learning less engaging compared with in-person sessions. Additionally, it was noted that not all employees feel comfortable with online learning and virtual discussions. There was recognition of generational differences in learning styles where younger employees were generally seen as more adept at digital learning, while some older team members faced challenges in this area. Despite these issues, there was a consensus among employers that the quality of online learning is gradually improving.

Nonetheless, many employers believe that face-to-face learning remains the most effective. In-person formats offer opportunities for networking, group discussions, and interaction with instructors. Employers reflected that staff can often find it easier to engage and ask questions in a physical setting. Coordinating in-person sessions can be

more complex when considering geographically dispersed staff, but many employers still see the value in facilitating these physical learning opportunities.

"I think e-learning can be a little bit flat and it can be a little bit boring and you get discouraged quite easily. If you're in a group setting, it only has to be 2 or 3 colleagues, just sat down together. You know each other, you're comfortable, so I think that seems to work better" *(Employer, Security sector)*

Employers recognised the value of a blended learning approach, combining both online and in-person formats. This approach allows flexibility, catering to the diverse needs and preferences of employees. This flexibility has become even more critical with the rise of remote and hybrid work due to the pandemic. For example, an employer in our research who was working for a heating business gave an example of mental health awareness training that was mandated for all managers to complete virtually but was also delivered by a trained facilitator in small, in-person groups. They felt it was important to give staff options.

> "We've just made all of our managers do mental health awareness training online, but […] we've got somebody from Think Mental Health who's going to come and deliver some face-to-face mental health training, which is quite good because I always think it's a good idea to have that blend of-, give people the options […] we want to give you the option to be able to go to somebody and ask those questions that you can't ask at a computer." *(Employer, Construction sector)*

In addition to offering learning in different formats to meet individual learning styles, employers were also translating learning materials into multiple languages to reach all employees, including those with language barriers. Some employers also suggested that internal systems and platforms could be streamlined to make it easier for staff to access and engage with learning resources.

Understanding employees' motivations for learning

When considering the dynamics of workplace learning engagement, it's crucial to understand the various factors that influence who engages with learning. Interviews with employers identified that **the level of experience of staff often played a role, with newer employees typically showing more motivation for learning and development** aligned with their career goals, whereas longstanding or more experienced staff members might be less inclined to engage with learning.

> "One thing that we identify and see is that people get to a certain level within their career, and they start to disengage from the learning because they feel that they've got the knowledge that they need, that they want." *(Employer, Accounting)*

The attitude of both employees and line managers towards learning was also considered important. Employees who intrinsically value their growth and actively seek out learning opportunities tend to be more engaged in workplace learning. It was also noted that a line manager's attitude towards learning, and whether they encourage their staff to take up opportunities, influences who is more or less likely to engage.

Other employers reflected that **engagement with training varies by role.** For example, employees who typically work in office-based roles can often find online learning more accessible than those in other roles which may be more customer facing and where they do not have day-to-day access to online devices. This suggests that customising learning to the specific needs and context of different job roles can significantly impact engagement.

Inclusivity is a crucial aspect of workplace learning. Employers explained how identifying barriers to participation faced by staff and developing strategies to boost the confidence of hesitant learners can ensure that all employees, regardless of their background, have access to valuable learning opportunities. Additionally, employers emphasised the importance of being mindful of potential disparities in engagement based on privilege or background. Ensuring equality and inclusivity in learning opportunities is a vital step in making sure all employees feel they can actively engage in workplace learning. Although it was not specifically highlighted in interviews, it should be noted that this is particularly important for neurodiverse staff and individuals with learning difficulties or disabilities.

Challenges associated with workplace learning

Embracing workplace learning brings a number of benefits; however, it is not without its challenges. This section explores the challenges highlighted by employers including the time required and cost of delivering workplace learning, difficulties with encouraging and motivating staff to engage, and ensuring training is relevant and high quality.

Time and resources needed to deliver workplace learning

One of the challenges most frequently cited by employers was the allocation of time and resources needed to deliver effective workplace learning. For some employers, finding suitable training slots that accommodated varying work schedules proved to be a complex task. For instance, employers in hospitality faced the specific challenge of locating training providers willing to cater to early morning training needs. For other employers, integrating training within already demanding workloads was a concern.

> "In reality, many people had to fit training into their work. This often meant working harder, compressing tasks into less time, or accruing TOIL to make up

> for time spent in training. It was theoretically built into our capacity, but it didn't always translate seamlessly into practice." *(Employer, Children's Charity)*

This challenge of allocating resources to deliver workplace learning seemed to be more pronounced for certain employers. For instance, a manufacturing company that offered extracurricular training had faced logistical difficulties in providing suitable in-person spaces or locations for production line staff to participate in learning (who also were less likely to have access to technology), in comparison to their staff in functions such as HR or Marketing, who typically had day-to-day access to laptops or tablets and could therefore more easily access e-learning modules.

> "Venue challenges in training were quite common because we couldn't simply show up at a hotel with the specialised equipment needed for our training sessions." *(Employer, Health and Social Care sector)*

Financial cost of providing learning in the workplace

Some employers noted that financial considerations were a factor when deciding whether to release staff for learning purposes. This was a particular concern for smaller businesses, where associated costs and potential productivity losses due to employee absence were significant factors. It was noted that some senior staff members, not limited to smaller organisations, who are less inclined toward workplace learning can share similar concerns around the costs of training. Gaining support from senior management and addressing potential resistance was cited by some employers as a challenge to both developing training packages and creating a culture of learning.

> "We often faced resistance from directors who questioned the cost and productivity impact of staff being away from their roles. Explaining that it was an investment, which ultimately led to better-trained staff or equipment use, was challenging. Short-term concerns often outweighed long-term benefits in their view." *(Employer, Manufacturing and Retail sector)*

Engaging and motivating employees

Employee engagement and motivation can be a challenge for some employers. In interviews, mandatory training was highlighted as sometimes facing resistance, especially when employees found compliance-related modules unengaging. This suggests that transparent communication about the benefits of learning, framed as an investment in employees' professional growth, could help foster a learning culture within an organisation.

Securing quality and relevance

When outsourcing learning to external providers, employers interviewed highlighted the importance of ensuring its quality and relevance. Establishing continuous

evaluation and feedback mechanisms to assess the effectiveness of external training providers and satisfaction among staff was also seen as important.

> "I think the challenge is maybe to find the right trainer and the right programme, because the selection is really huge and the question is what is the programme and who is the personality that would fit most with the team" *(Employer, Retail)*

Benefits of learning to the wider economy

Key findings

- Analysis of LEO data suggests a significant impact of learning on the likelihood of individuals claiming out-of-work benefits. From 11 weeks after commencement of training, learners were significantly less likely to be in receipt of benefits than the matched comparison group and this continued for the remainder of the two-and-a-half year period considered in the analysis. Participation in training also reduced the number of weeks spent on out-of-work benefits over this period by an average of 1.5 weeks.
- Little evidence on the impact of lifelong learning on receipt of benefits was identified in the evidence review. However, one UK study found that achieving entry level qualifications significantly reduced time on benefits for those aged 25 and above and achieving level 1 qualifications reduced time on benefits for those aged 19 and above.
- Analysis of LEO data shows variation in the impact of learning on benefit receipt by prior qualification levels. The findings show the greatest reduction in benefit receipt for those with lower qualification levels. This impact decreases as prior qualification levels increase, and switches to an increased level of benefit receipt for those with higher qualification levels.

This section focuses on the impact of lifelong learning on receipt of benefits as one indicator of how participation in training affects the wider economy. This should be read alongside earlier sections which considered the impact of lifelong learning on individuals and employers, given that impacts on outcomes such as employment, earnings, retention and productivity also result in benefits to the wider economy.

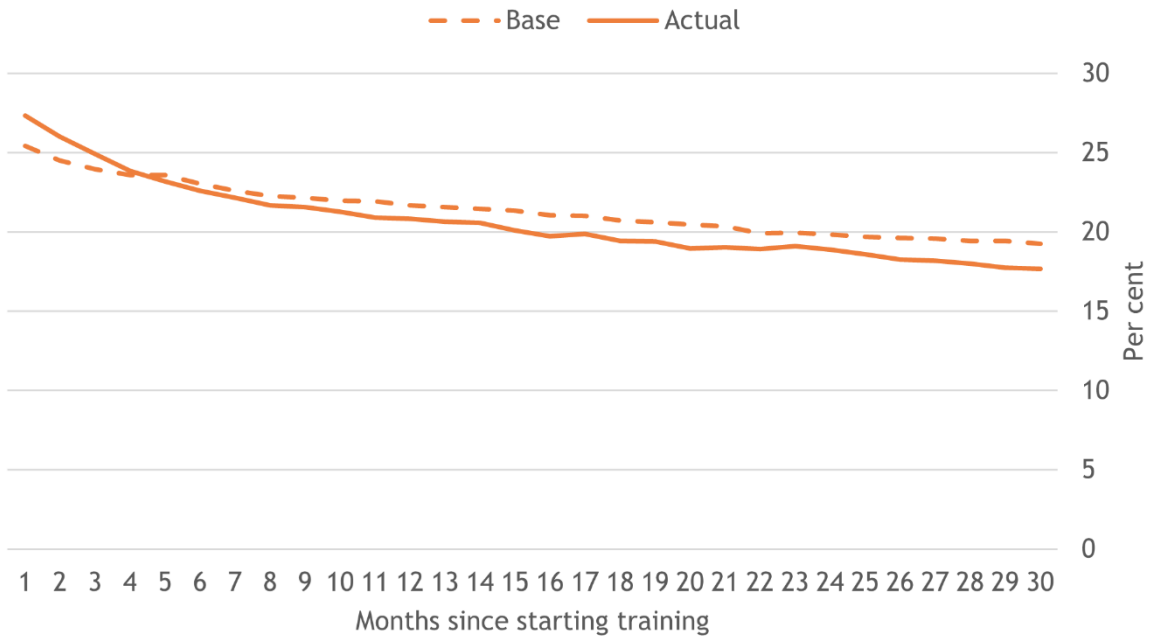
Benefit receipt

Analysis of LEO data suggested that learning had a discernible impact on individuals' likelihood of claiming out-of-work benefits. Figure 13 tracks the percentage of individuals claiming out-of-work benefits for two-and-a-half years after starting training, compared with the percentage expected to be claiming (the base) if they had not undertaken any training. Figure 14 shows the same time period, but focuses on the estimated size of the impact.

The results show that in the two months immediately after starting training, learners were more likely to be claiming out-of-work benefits than those in the matched comparison group. This may be because starting training may delay when individuals enter employment. However, this pattern gradually reversed over the months following the training start until learners appeared less likely to be on out-of-work benefits than the matched comparison group, from around five months after starting to

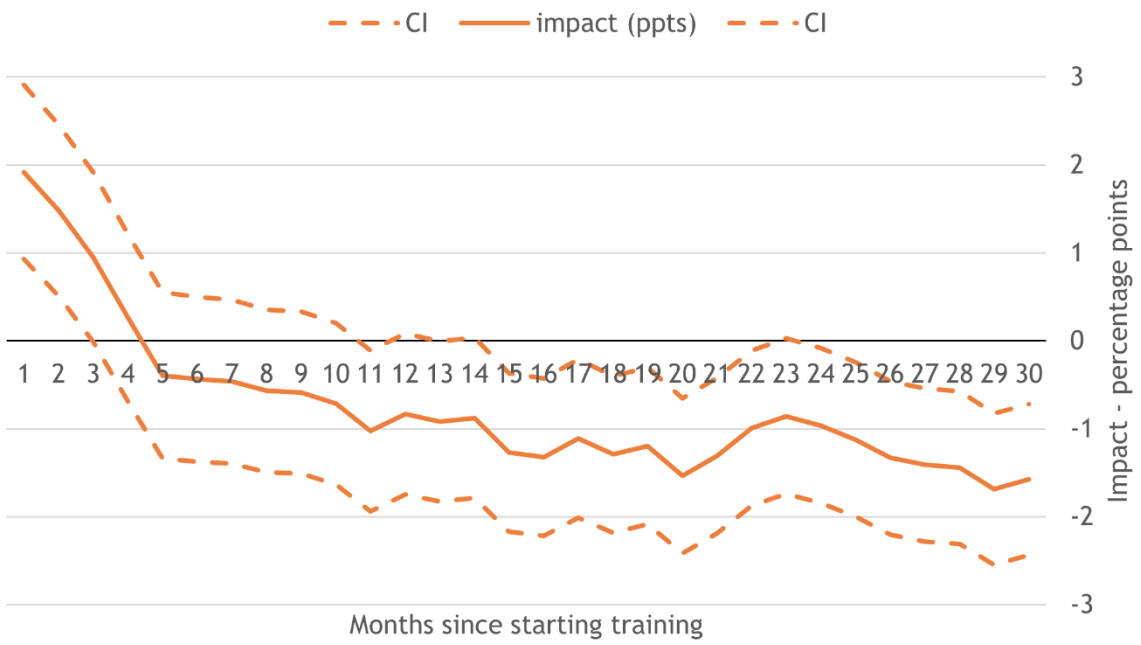
participate in training onwards. This impact continued to increase and started to become statistically significant at around the 11-month point. It then remained statistically significant for most of the remainder of the two-and-a-half year period. Participation in training also reduced the number of weeks spent on out-of-work benefits over this period by an average of 1.5 weeks.

Figure 13: Percentage of cohort claiming benefits in months following training start



Notes: Based on analysis of LEO data for 8,935 individuals in the treatment group and 44,770 individuals in the comparison group.

Figure 14: Estimated impact of training on likelihood of being on out-of-work benefits



Notes: Based on analysis of LEO data for 8,935 individuals in the treatment group and 44,770 individuals in the comparison group. CI=upper and lower bounds of 95 per cent confidence intervals.

Table 6 provides a summary of the overall impact of participation in training on the number of weeks spent on out-of-work benefits over the 2.5 years following the start of participation in training. It shows that, on average, participation in training reduced the amount of time on out-of-work benefits by 1.5 weeks over this time-period and this impact was statistically significant.

Table 6: Impact of training on benefit receipt over the 2.5 years following training start

	Treatment group	Matched comparison group	Impact (difference)	95 per cent confidence interval	
				Lower bound	Upper bound
Number of weeks on out-of-work benefits in 2.5 years following training start	25.4	26.8	**-1.5**	-2.4	-0.5

Notes: Based on analysis of LEO data for 8,935 individuals in the treatment group and 44,770 individuals in the comparison group. Where the impact estimate is shown in bold, it is statistically significant at the 5 per cent level or better.

Little evidence on the impact of lifelong learning on receipt of benefits was identified in the evidence review. One UK study that estimated the impact of achieving qualifications below level 2 in the 2005/06 academic year found that achieving entry level qualifications was associated with a statistically significant reduced time on benefits for those aged 25 or above, and achieving level 1 qualifications reduced time on benefits by around eight to 15 days for those aged 19 and above (Wiseman et al., 2013).

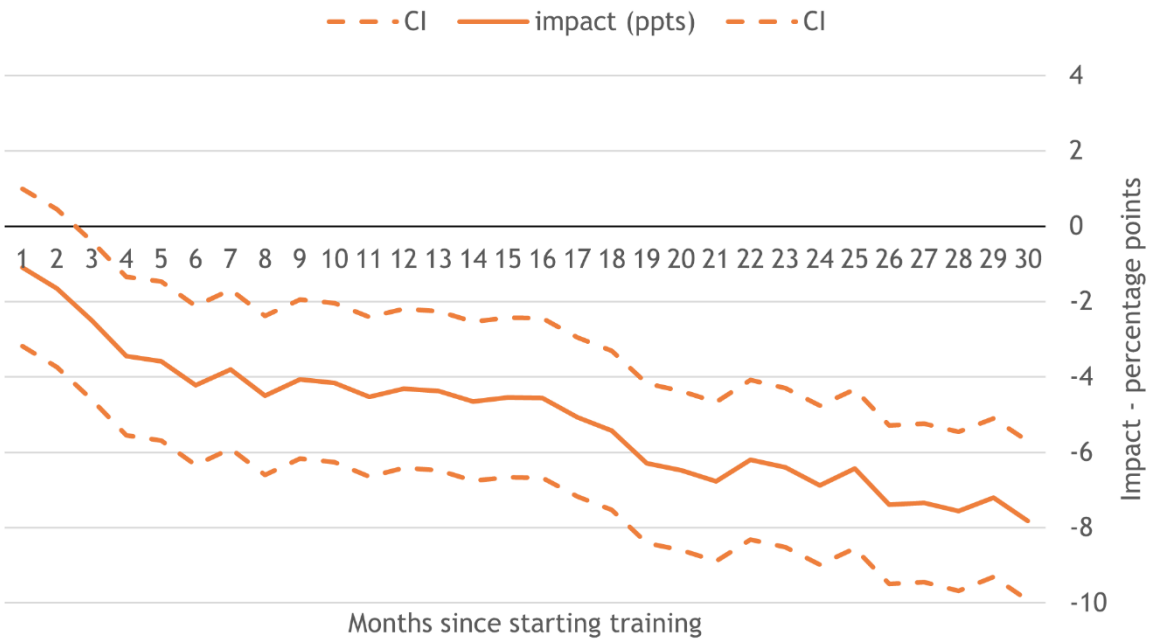
Variations in the impact of lifelong learning on benefit receipt by prior qualification level

Further analysis of LEO data suggested there was variation in the impact of learning on benefit receipt by prior qualification levels. Figures 15-19 track the estimated impact of training for two-and-a-half years after commencement, for individuals with different prior qualification levels. It should be noted that this analysis was only conducted with LEO data, as the sample size for Understanding Society was too small for sub-group analysis.

Participating in learning reduced benefit receipt most for those with lower qualification levels prior to starting training. This impact decreased as prior qualification levels increase, and participation in training was associated with higher levels of benefit receipt for those with higher qualification levels prior to undertaking training. As set out in the Earnings section, this may be due to variation in the types of training undertaken by each group; individuals with higher prior qualifications may have undertaken longer and/or more intensive training, requiring a greater reduction in working hours or a longer time spent out of work.

For those with no prior qualifications, participation in training reduced the likelihood of individuals claiming out-of-work benefits for most of the 2.5 years following the start of learning (Figure 15). The positive impact of training in reducing the likelihood of being on out-of-work benefits increased over time for this group. The impact for this group was substantially larger than for individuals with other prior qualification levels, with an eventual drop of eight percentage points compared to around two percentage points for individuals qualified to level 1, limited change for levels 2 and 3 and an average increase of 1.5 percentage points for level 4 (see below).

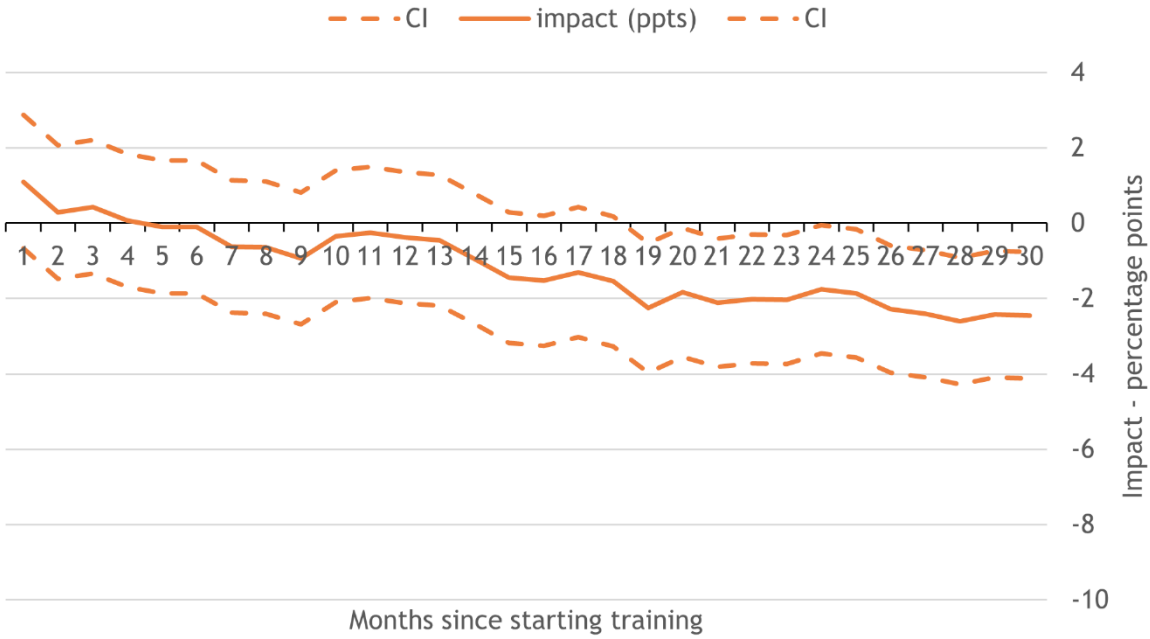
Figure 15: Percentage of those with no prior qualifications claiming benefits in months following training start



Notes: Based on analysis of LEO data for 4,630 individuals in the treatment group and 6,445 individuals in the comparison group. CI=upper and lower bounds of 95 per cent confidence intervals.

For those whose highest qualification was at level 1 before embarking on training, the positive impact of training in reducing the likelihood of being on out-of-work benefits only started to emerge 19 months after starting training (Figure). From this point onwards, participation in training reduced the likelihood of being on out-of-work benefits by around 2 percentage points.

Figure 16: Percentage of those with highest prior qualification at level 1 claiming benefits in months following training start



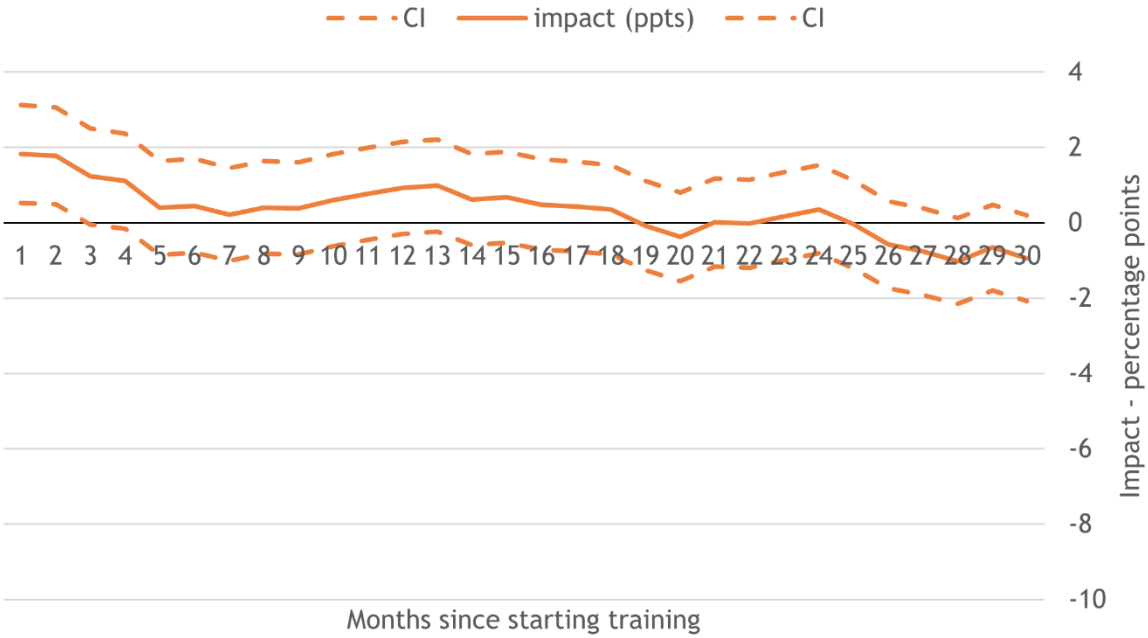
Notes: Based on analysis of LEO data for 3,760 individuals in the treatment group and 18,840 individuals in the comparison group. CI=upper and lower bounds of 95 per cent confidence intervals.

There was little evidence that participation in training impacted the likelihood of those with previous qualifications at level 2 claiming out-of-work benefits (Figure).

For those with qualifications at level 3, participation in training was associated with a greater likelihood of claiming out-of-work benefits for most of the first 14 months after starting training (Figure). However, this negative impact disappeared after this point.

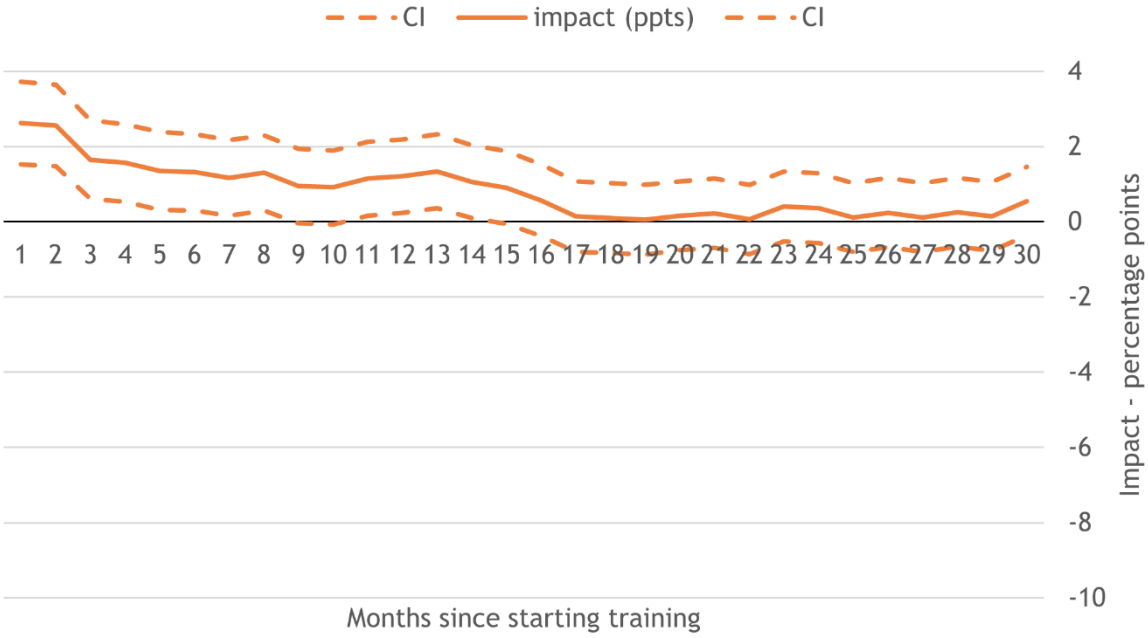
In contrast, Figure 19 shows that participation in training appeared to increase the likelihood that those qualified to level 4 or above were on out-of-work benefits for most of the 2.5 year period after starting training. This impact was statistically significant, but fairly modest, increasing the likelihood of claiming benefits by an average of 1.5 percentage points over this period.

Figure 17: Percentage of those with highest prior qualification at level 2 claiming benefits in months following training start



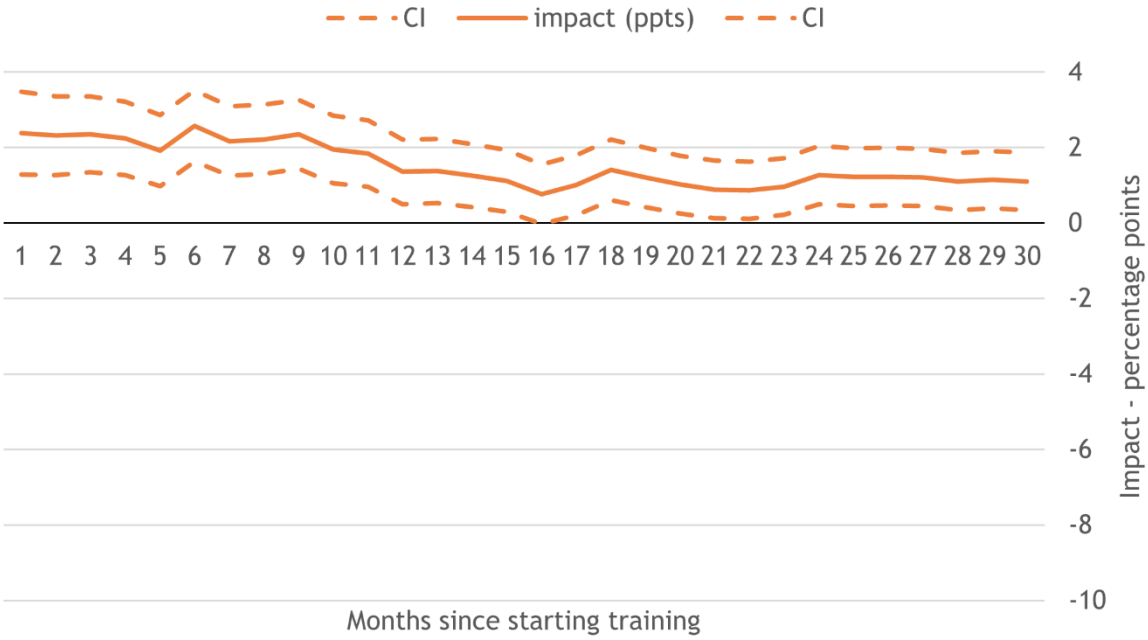
Notes: Based on analysis of LEO data for 5,505 individuals in the treatment group and 27,645 individuals in the comparison group. CI=upper and lower bounds of 95 per cent confidence intervals.

Figure 18: Percentage of those with highest prior qualification at level 3 claiming benefits in months following training start



Notes: Based on analysis of LEO data for 4,975 individuals in the treatment group and 25,110 individuals in the comparison group. CI=upper and lower bounds of 95 per cent confidence intervals.

Figure 19: Percentage of those with highest prior qualification at level 4 or above claiming benefits in months following training start



Notes: Based on analysis of LEO data for 3,010 individuals in the treatment group and 15,625 individuals in the comparison group. CI=upper and lower bounds of 95 per cent confidence intervals.

The differential impact by prior qualification level is also apparent in the impact on time spent on out-of-work benefits (Table 7). The positive impact of participation in training was most apparent for those with no prior qualifications. This group spent nearly eight weeks less on out-of-work benefits in the two-and-a-half years following the start of learning than would have been expected if they had not participated in training. For those with level 1 qualifications, participation in learning reduced the total time spent on out-of-work benefits by 2.1 weeks.

Overall, participation in training did not have a statistically significant impact on the number of weeks spent on out-of-work benefits by those who had level 2 or level 3 qualifications prior to starting training. Those qualified to level 4 or above spent an additional 1.8 weeks on out-of-work benefits over the 2.5 years after starting training, compared with an expected average of 4.7 weeks on out-of-work benefits for this group in the absence of training.

Table 7: Estimated impact of training on number of weeks on out-of-work benefits in the 2.5 years following training start, by prior qualification level

	Treatment group	Matched comparison group	Impact (difference)	95% confidence interval	
				Lower bound	Upper bound
No prior qualifications	65.4	73.3	**-7.9**	-10.3	-5.6
Highest prior qualification at level 1	48.2	50.3	**-2.1**	-4.0	-0.2
Highest prior qualification at level 2	28.2	28.4	-0.1	-1.4	1.2
Highest prior qualification at level 3	14.5	13.8	0.8	-0.2	1.8
Highest prior qualification at level 4 or above	6.5	4.7	**1.8**	1.0	2.6

Notes: Analysis for those with no prior attainment based on 4,630 individuals in the treatment group and 6,445 individuals in the comparison group, with 35 treated individuals off support. Analysis for those with highest prior qualification at level 1 based on 3,760 individuals in the treatment group and 18,840 individuals in the comparison group, with 5 treated individuals off support. Analysis for those with highest prior qualification at level 2 based on 5,505 individuals in the treatment group and 27,645 individuals in the comparison group, with 25 treated individuals off support. Analysis for those with highest prior qualification at level 3 based on 4,975 individuals in the treatment group and 25,110 individuals in the comparison group, with 45 treated individuals off support. Analysis for those with highest prior qualification at level 4 or above based on 3,010 individuals in the treatment group and 15,625 individuals in the comparison group, with 115 treated individuals off support. Differences statistically significant at the 5 per cent level or better highlighted in bold. Note that HESA Statistical Disclosure Control rules have been applied, so all counts are rounded to the nearest multiple of 5.

Although there is little robust published evidence, our findings suggest a clear link between lifelong learning and reduction in benefit receipt, particularly for those with no, or only level 1 qualifications prior to undertaking learning. Any negative impacts for those with higher levels of prior qualifications tended to reduce over time or be fairly small. Despite a relatively modest average impact on benefit receipt at any given point, the findings suggest that the cumulative savings on benefit payments over time would be substantial.

Summary and implications of findings

Research findings show that lifelong learning has a range of employment-related impacts, benefiting individuals, employers and the wider economy.

Employment

Analysis of both Understanding Society and LEO data identified a positive impact from lifelong learning on employment. Results from Understanding Society showed that participation in learning increased the likelihood of being in employment by 4.5 percentage points two years after participating in training and 4.2 percentage points after three years. Results from LEO were similar, showing that participation in learning increased the likelihood of being employed over the two-and-a-half years after starting training, with an impact of four percentage points after two years and an average of an additional 3.6 weeks spent in employment over this time period. Other studies identified in the evidence review found that participation in lifelong learning had a positive impact on the probability of being in employment for those in technical occupations, increased the likelihood of returning to employment after a break and was associated with higher rates of employee retention, as well as productivity.

The LEO analysis found substantial variation in the impact of lifelong learning by prior qualification level. Lifelong learning was found to have a positive impact on employment for individuals with all prior qualification levels, except those qualified at level 4 and above – where no impact was identified. Participation in training increased the number of weeks spent in employment in the two-and-a-half years after starting training by an average of 7.1 weeks for individuals with no qualifications, compared with 4.7 weeks for those with level 1 qualifications, 3.0 weeks for those with level 2 qualifications and 1.5 weeks for those with level 3 qualifications. Whereas participation in training increased the likelihood that those with no qualifications or level 1 qualifications were in employment for most of the 2.5 year period after starting training, the positive effect of participation in training on employment emerged later for those with level 2 and level 3 qualifications.

Earnings

There were contradictory findings in relation to the impact of lifelong learning on earnings. The analysis of Understanding Society found that learners experienced a statistically significant increase in annual net earnings from employment and self-employment of £1,389 two years after participation in training, rising to £1,629 three years after training.

In contrast, results from LEO showed a significant negative impact on individuals' total taxable pay from employment of around £1,600 in each of the two tax years after starting a training course. The Understanding Society analysis also found that individuals who participated in training were less likely to report that they were 'living

comfortably' or 'doing alright' financially one year after starting training than the matched comparison group, although this negative impact on household finances disappeared two and three years after participating in training. This would be consistent with participation in learning having a stronger negative impact on total taxable pay from employment initially, but the positive effects of training on net labour income two and three years after starting training then offsetting any negative impact on household finances over the longer term.

Although the aggregate impact of lifelong learning on earnings was found to be negative in the LEO analysis, there was no discernible effect on earnings for those who had no, or only level 1, qualifications at the time they started training. However, earnings were reduced by participation in learning for those with higher level qualifications prior to training and the magnitude of the negative effect of training on earnings increased with the level of prior qualifications. In the first tax year after training, earnings appeared to be reduced by £1,000 for those with prior qualifications at level 2, £2,150 for those with qualifications at level 3 and £4,800 for those qualified to level 4 or above. For those who had level 2 qualifications at the time they embarked on training, the negative earnings effect was slightly lower in the second tax year following the year that they started training, suggesting that this reduction in earnings might fall over time, but this was not the case for those with prior qualifications at level 3, or level 4 or above.

However, most studies examined in the evidence review found a positive impact of lifelong learning on wages. The evidence review identified a small number of studies that suggested variable impact of lifelong learning on earnings for different demographic groups. For example, evidence suggested that the impact may be more pronounced for younger workers. There was conflicting evidence on the relationship between lifelong learning, earnings and gender.

Considering the findings from our analysis alongside those from the evidence review, lifelong learning appears to have a positive impact on earnings in the longer term. However, our analysis suggests this may be preceded by a short-term drop in earnings during training and in the years immediately after its completion. This may be due to learners reducing their working hours in order to complete training, or while they become established in a new career.[26]

Wider economy

Analysis of LEO data found that although participation in learning increased the likelihood that individuals claimed out-of-work benefits in the two months immediately after starting training, this pattern gradually reversed over time. From 11 weeks after

[26] A recent L&W report on retraining and career change found people changing sector or occupation experienced an average pay penalty of £3,731 a year, but subsequent pay growth which was nearly three times faster than if they had stayed in the same job.

the commencement of training, learners were significantly less likely to be in receipt of benefits than the matched comparison group and this continued for the remainder of the two-and-a-half year period considered in the analysis. Participation in training also reduced the number of weeks spent on out-of-work benefits over this period by an average of 1.5 weeks.

The positive impact of lifelong learning on reducing receipt of out-of-work benefits was most apparent for those with no prior qualifications. This group spent nearly eight weeks less on out-of-work benefits in the 2.5 years following the start of training than would have been expected if they had not participated in training. For those with level 1 qualifications, participation in training reduced the total time spent on out-of-work benefits by 2.1 weeks. Overall, participation in training did not have a statistically significant impact on the number of weeks spent on out-of-work benefits by those who had level 2 or level 3 qualifications prior to starting training. Those qualified to level 4 or above spent an additional 1.8 weeks on out-of-work benefits over the 2.5 years after starting training, compared with an expected average of 4.7 weeks on out-of-work benefits for this group in the absence of training.

Analysis of Understanding Society data found that participation in lifelong learning did not affect health in the three years after taking part in training. There was also little evidence that it affected life satisfaction, except those who took part in training were slightly less likely to report being completely or mostly satisfied with their life overall 2 years after starting training. However, studies identified in the evidence review found robust evidence that participation in lifelong learning benefited the wider economy by increasing employee retention and productivity.

Employer perspective

For employers, the benefits associated with workplace learning include helping to support employee retention, contributing to career progression and increased earnings, and boosting staff confidence and performance. As well as having value for employees, offering workplace learning was seen to have benefits for organisations themselves in that they may be seen as more attractive to potential job candidates, and because engaging with learning is linked to increased workforce productivity.

While it is clear that workplace learning brings many benefits, it is not without its challenges. Employers identified some of the main barriers as being the time, resources and financial implications of offering workplace learning, as well as difficulties ensuring that training is high quality and relevant to employees.

A further challenge concerned motivating employees to engage with training, particularly those who are in the later stages of their career. Fostering a culture of learning, and working to understanding employees' motivations for learning, were considered important to driving engagement. On a more practical note, creating an

accessible learning environment (whether that be online, in-person or a mixture of both), and responding to the diverse learning styles and requirements of employees, were also seen as important considerations.

Conclusion

The findings demonstrate the clear benefits of lifelong learning to individuals, employers and the wider economy, albeit with effects varying between different groups of learners. In particular, the benefits of participation in learning are greatest for those who are least qualified initially. Our analysis of LEO data showed that those who were already qualified to level 4 or above experienced less of an uplift from further skills acquisition than less-qualified groups, at least in the first two-and-a-half years after starting training.

The reason for variations in the impact of lifelong learning by prior qualification level may be partly due to differences in the type of training undertaken by each group. A large proportion of those with no prior qualifications were claiming out-of-work benefits at the time they started training, whereas those with higher-level qualifications were more likely to be in employment. If those with no, or only level 1 qualifications, were doing shorter courses focused on increasing their likelihood of entering work compared with those who already held higher-level qualifications, this might explain why those with lower prior qualification levels were more likely to experience positive impacts from training over the time period considered in the analysis.

This highlights the particular importance of learning for individuals with lower qualification levels, who are likely to experience more immediate benefits at a greater scale. It is vital that this group is supported to gain access to learning so that they can realise these benefits from participating in lifelong learning for their own personal benefit, the benefit of employers and the wider economy.

By contrast, if those with higher-level prior qualifications were doing more intensive or longer courses, this might necessitate reducing their working hours (and thus experiencing a reduction in earnings) for a period of time in order to complete training. Given that this group were less likely to be on out-of-work benefits and more likely to be in employment immediately prior to starting training than those who were less highly qualified, it is probable that the training was undertaken to enhance the prospects for long-term progression, rather than with the aim of entering work. However, even after finishing training, it might take time to find employment which allowed them to make use of any new qualifications or to progress into higher-paying work. This is particularly likely for those with higher-level qualifications initially, given that they were more likely than those with lower-level qualifications to be in higher-paid work before embarking on training.

For those with higher level qualifications initially, it is possible that the benefits of participating in training accrue over a longer period of time than it was possible to observe in the analysis. Indeed, the evidence review identified another study where positive earnings effects took four years to emerge for women, and six years for men (Blanden et al., 2012). Therefore, it is possible that the negative effects of participation in learning on earnings for those with higher level qualifications in particular may reverse over the longer-term. However, it is important to ensure that individuals are prepared for this short-term hit to earnings, but that the potential longer-term benefits are clearly communicated.

Workplace learning is an important component of lifelong learning, and the findings demonstrate the wide range of benefits employers associate with it. However, employers identified a number of challenges to its successful implementation. **This highlights the need for guidance and support for employers to maximise lifelong learning opportunities.**

Finally, there is a need for further research on the impact of lifelong learning. Our research has provided robust, causal evidence on the impact of lifelong learning on employment, earnings and the receipt of benefits. Analysis of LEO data also included impact estimates by the level of prior qualification – which has provided an insight into the relationship between lifelong learning and employment outcomes. **Further subgroup analysis, to increase understanding of any differences in the impact of learning for different groups of learners, would be beneficial**. Findings from the evidence review suggest that this should include analysis by the level of qualification attained, the sector of work, gender, age and socioeconomic background. In addition, **further analysis could examine the longer-term impacts of lifelong learning** – particularly in relation to earnings – since our findings suggest that some positive impacts may take longer to occur, especially for learning at higher levels. As future iterations of LEO become available – which will allow the tracking of the cohort used in the current analysis as they age – this could include comparisons of estimated longer-term impacts across age groups and eventually **analysis of the impact of learning for individuals in the second half of their working lives** (i.e. aged 40 and above). Further research should also explore the **mechanisms by which learning at level 2 and below is linked to the positive outcomes identified in this research**, including the types of learning associated with positive employment outcomes, and their relationship with progression to higher level learning. In addition, given the context of an ageing population and the increased likelihood that people will need to change career throughout their working lives, **research should consider how learning can be tailored to be truly lifelong** and accessible to all age groups.

Recommendations

1. Our research highlights the benefits of lifelong learning to individuals, employers and the wider economy. However, there have been sharp declines in participation, and employer and public investment, in learning since 2010, with large inequalities in access to learning. As recommended in our 2024 Annual Participation in Learning Survey report, **local and national governments should set a clear goal to promote a lifelong learning culture and work with employers, trades unions, community groups and others to reduce inequalities in access to lifelong learning .** This requires a substantial and sustained increase in investment in learning, efforts to inspire people into learning and promote employer investment in skills, and the incorporation of lifelong learning into wider policy plans such as the delivery of clean energy and the expansion of housebuilding. It should also be included as a key focus in the Government's upcoming Post-16 Education and Skills Strategy White Paper.

2. **Local and national governments, employer representative bodies and trades unions should ensure that the benefits to employers of investment in workplace learning are clearly communicated.** This should highlight benefits in relation to employee retention and attractiveness to job candidates, increased staff confidence and performance, and increased workforce productivity**.** In order to gain these benefits, **employers should seek to engage employees in workplace learning.** This should include fostering a culture of learning, with employers promoting the benefits of learning to staff, taking time to understand their reasons and motivations for participating in learning, encouraging them to engage with union learning opportunities and actively promoting increased training within their supply chain. Line managers should engage in constructive conversations about learning with their direct reports, and support staff to view learning opportunities positively. Employers should also create an accessible and inclusive learning environment, ensuring training is available in a mix of formats (e.g. online and face-to-face) and considering the different learning styles of staff in different roles and at different stages of their careers.

3. Our analysis shows that the positive employment-related impacts of lifelong learning are greater for individuals with no, or low, prior qualifications, at least in the short-term. However, individuals with lower qualification levels are substantially less likely to access learning than their more highly qualified peers, and public and employer investment is increasingly targeted at more highly qualified people. **Local and national governments should aim to increase the proportion of individuals qualified at or below level 2 who are participating in lifelong learning, given the evidence that this is effective in raising the likelihood of this group being in employment** and the potential benefits to local labour markets, workforce skills and to the exchequer in increasing employment**.** There are several ways to achieve this:

a. Our recent research on digital skills training and social mobility identified a range of options to increase participation in learning by those with lower prior qualifications, including targeted incentives (e.g. differential funding rates for people with different qualification levels) and adjustments to commissioning structures (e.g. quotas by prior attainment for specific qualifications). Individuals should also be supported to access resources from Phoenix Insight's Careers can change campaign.
b. L&W has also called for an expansion in the Lifelong Learning Entitlement in England to provide more help and support for learners with the greatest need.
c. Employment support programmes should ensure that individuals with low qualification levels are offered, and encouraged to access, learning opportunities prior to, or alongside, entering employment. Learning offers should be tailored to the specific needs of each individual.

4. To encourage greater employer investment in training, the Government should consider **replacing the current Corporation Tax deduction for training spend and introduce a new Skills Tax Credit** – as proposed in our recent report on career change. This could be modelled on the R&D tax credit and allow employers to deduct 230% of the cost of accredited training and apprenticeships from their tax liabilities. There should also be consideration as to whether the Growth and Skills Levy should require a certain proportion to be spent on training for individuals with lower prior qualification levels.

5. As recommended in our recent digital skills training and social mobility report, **local growth plans, such as City Region and Growth Deals in Scotland and Local Growth Plans, Local Skills Improvement Plans and Local Get Britain Working Plans in England, should also consider how to increase access to lifelong learning for those with low qualification levels** to encourage local growth and employment. This should include alignment with different sources of funding, such as the Adult Skills Fund, the UK Shared Prosperity Fund and Investment Zone Funding, to ensure people with low prior qualifications are able to benefit from opportunities.

6. Our findings show a short-term negative impact of lifelong learning on earnings for individuals with prior qualifications at level 2 and above. This may be due to reductions in working hours to facilitate learning, or an initial drop in earnings following a change in career. Although the evidence review suggests that these effects may reverse over the longer term, it is important that individuals are prepared for this. **Training providers should ensure learners are aware of the potential long-term benefits of learning.** The same applies to the National Jobs and Careers Service in its role offering careers advice, as well as advice on training opportunities, as highlighted in a recent Phoenix Insights report. In addition, **local and national government and employers should take action to mitigate any negative short-term impact on earnings from participation in**

training for people in employment (e.g. programmes to support career change). This could include:

a. Findings from our career change pilots suggest that support with living costs for individuals undertaking courses that require reduced working hours could raise participation.
b. Extending Train and Progress rules within Universal Credit to allow full-time training of up to a year without loss of benefit.
c. Strengthening the right to request time off to train so that individuals can remain employed while retraining during a one-year unpaid career break.
d. Increased numbers of apprenticeships offered by employers (helping people combine earning and learning) for career changers and supporting employees with the costs of learning.
e. Employers, training providers, the National Jobs and Careers Service, employment support providers and others promoting the use of the Financing your career change toolkit, which has been developed by Phoenix Insights and Careershifters to provide guidance on financing career change.

7. To encourage increased participation in learning, the Department for Education and Skills England should prioritise supporting lifelong learning of all kinds and at all levels. We set out a series of recommendations on the role of Skills England in increasing participation in learning in a separate briefing paper, which includes a suggestion that **Skills England should have a statutory duty or strategic priority to promote lifelong learning at all levels** on the lines of Medr (the new post-16 learning and skills body) in Wales.

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Appendix A - Analysis of Understanding Society

Table 8 lists the variables used to estimate the propensity score and reports the percentage of survey respondents in the treatment and comparison group with each characteristic after matching (except where other units are specified).[27] Differences in the characteristics of the two groups which remain statistically significant after matching are indicated by asterisks. These differences are measured by the mean standardized bias (MSB).[28] Given the large sample of individuals in the treatment and comparison groups, small differences in the MSB may be statistically significant and so the size of the MSB is also important. The threshold used to identify biases which are a greater cause for concern is 5 per cent. The only characteristic where the MSB exceeds 5 per cent is monthly total household net income, where this was higher for the matched comparison group than the treatment group after matching. In all other cases the MSB is below 5 per cent, suggesting that the treatment and matched comparison groups are very similar across a wide range of characteristics.

The table reports the number of individuals in the treatment group for whom no close comparators were found (the number off support). This indicates whether the findings of the analysis are likely to be representative of those for the full range of participants. Rubin's B[29] and R[30] give an indication of the balance on covariates. The treatment and matched comparison group samples are considered balanced if B is less than 25 and R is between 0.5 and 2.

Given the limited evidence of bias on individual characteristics and the fact that the measures of overall balance on covariates (Rubin's B and R) were within acceptable ranges, it seems likely that the impact estimates will provide a credible estimate of impact. The low percentage of individuals in the treatment group without close comparators (4.5 per cent) also suggests that the findings are likely to be representative of those for the full range of individuals who participated in training.

Table 8: Balance between treatment and matched comparison group

Characteristic at baseline	Treatment group	Matched comparison group	Mean standardised bias (per cent)

[27] The matching is based on the sample of survey respondents rather than being population weighted. Therefore, the table reflects the characteristics of survey respondents from the matched treatment and comparison groups, rather than the characteristics of the wider population in either group. Table 8 shows the characteristics of the matched treatment group after applying population weights.
[28] The MSB is calculated by dividing the difference in means between the treatment and matched comparison groups by the square root of the mean sample variance and is expressed as a percentage.
[29] The absolute standardized difference of the means of the linear index of the propensity score in the treated and matched comparison groups.
[30] The ratio of treated to matched comparison group variances of the propensity score index.

Female	56.3	56.7	-0.8
Age (years)	42.3	42.3	-0.7
Age squared	1,894.5	1898.6	-0.5
Responsible for child under 16	25.8	26.2	-0.9
Cares for adult in household	4.6	4.3	1.3
In paid employment	86.3	87.5	-2.9*
Long-standing health problem	28.1	27.0	2.4
Monthly total household net income (£)	3,512.17	3,650.99	-5.9***
Urban area	78.2	78.6	-0.8
Married or living as couple	73.2	73.6	-1.1
Owner occupier	77.9	78.6	-1.5
Up to date with household bills	95.3	95.7	-1.8
Highest qualification cf. degree			
Higher degree	14.8	14.9	-0.3
A-level	20.3	20.6	-0.9
GCSE	17.5	18.6	-2.8
No qualifications	2.0	2.0	-0.2
Other	5.2	5.0	0.5
Ethnicity cf. white			
Mixed ethnicity	1.6	1.8	-2.3
Asian	7.2	7.8	-2.0
Black	3.2	3.2	-0.3
Other ethnicity	0.6	0.4	2.0
Region cf. London			
North East	4.7	4.3	1.8
North West	10.7	10.1	2.0
Yorkshire and the Humber	8.0	7.5	1.8
East Midlands	8.7	8.2	1.5
West Midlands	8.2	7.8	1.6
East of England	10.3	10.1	0.6

South East	14.5	14.4	0.3
South West	9.8	8.8	3.7*
Wales	3.5	3.3	0.9
Scotland	6.5	7.0	-1.7
Northern Ireland	3.1	3.8	-3.8**
Wave of training start/pseudo-start	3.5	3.6	-1.2
Comparison group	2,026		
Treatment group			
Off support	231		
On support	5,151		
Percentage off support	4.5%		
Rubin's B	14.0		
Rubin's R	0.9		

Notes: Based on analysis of Understanding Society data. ***=statistically significant at the 1 per cent level; **=statistically significant at the 5 per cent level; *=statistically significant at the 10 per cent level. Results highlighted in bold and underlined where the MSB is greater than 5 per cent.

Appendix B – Analysis of LEO data

Data

The analysis focuses on learners who turned 16 in the 2001/2002 academic year (referred to as the 2002 cohort). The cohort was born between September 1985 and August 1986. These individuals were around the age of 35 at the latest timepoint observed in the data (5 April 2021).

Participation in education and training before the age of 25

For the 2002 cohort, data from the School Census from the 2001/2002 academic year was used to identify the following baseline characteristics:

- Sex, coded to 1 if the student was recorded as female and zero if they were recorded as male;
- Whether the student was eligible for free school meals, coded to 1 if they were and zero otherwise;
- Whether English was the student's first language, coded to 1 "English" 2 "Not known but believed to be English" 3 "Other than English" 4 "Not known but believed to be other than English" 5 "Refused" 6 "Information not obtained" or .a "Not recorded";
- Whether the student had Special Educational Needs (SEN), coded to zero for those without any SEN, 1 for those with SEN, but without a statement and 2 for those with an EHC Plan or SEN statement;
- Ethnicity, coded to 1 for those recorded as White British and zero otherwise;
- Birth month and year;
- Income Deprivation Affecting Children Indices (IDACI) score derived from the pupil's postcode;
- National Statistics Postcode Directory Lower Layer Super Output Area (LLSOA) derived from the pupil's postcode (based on 2001 Census).

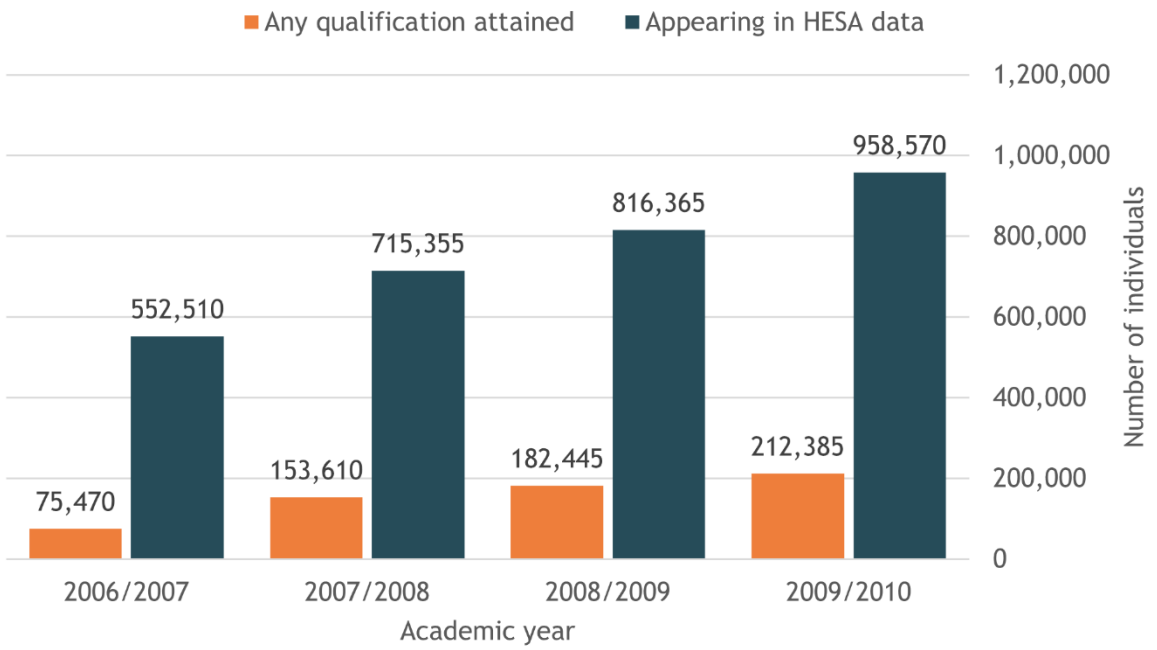
In addition to these baseline characteristics, the distance to the nearest school and the current school was recorded.

A small number of students appeared twice on the School Census. In these cases, the most complete record was chosen in preference to a record with missing data. Where both records had no, or the same number of, missing data items the records were sorted in a consistent order and the first record retained. In total there were 522,354 individuals in the 2002 cohort.

The data from the School Census were combined with information on educational attainment at Key Stage 4 between the 2001/2002 academic year and the academic year when the learner turned 24 (2009/2010) as well as Key Stage 5 data on attainment between the 2002/2003 and 2009/2010 academic years. The Individualised Learner Record (ILR) was used to identify the highest level of educational qualification held prior to starting any further education recorded on the ILR between 2002/2003 and 2009/2010. This was combined with data on qualifications attained in further education (from ILR records) between 2002/2003 and 2009/2010.

Finally, information from the Higher Education Statistics Agency (HESA) on qualifications attained whilst in Higher Education between the 2006/2007 (when the 2002 cohort turned 21) and 2009/2010 academic years was added to the dataset to identify the highest level of educational attainment recorded before the age of 25. The HESA data are only available for students who are found in the NPD or ILR data extracts. Figure 20 shows that the numbers of individuals appearing in the HESA data and attaining a qualification in each academic year has increased markedly over time. This is likely to be due to the match between the HESA data and NPD and ILR records improving over time. As a result, there may be under-reporting of the numbers of individuals in the 2002 cohort attaining qualifications at level 4 or above.

Figure 20: Number of individuals appearing in the HESA data and attaining a qualification in each academic year[31]



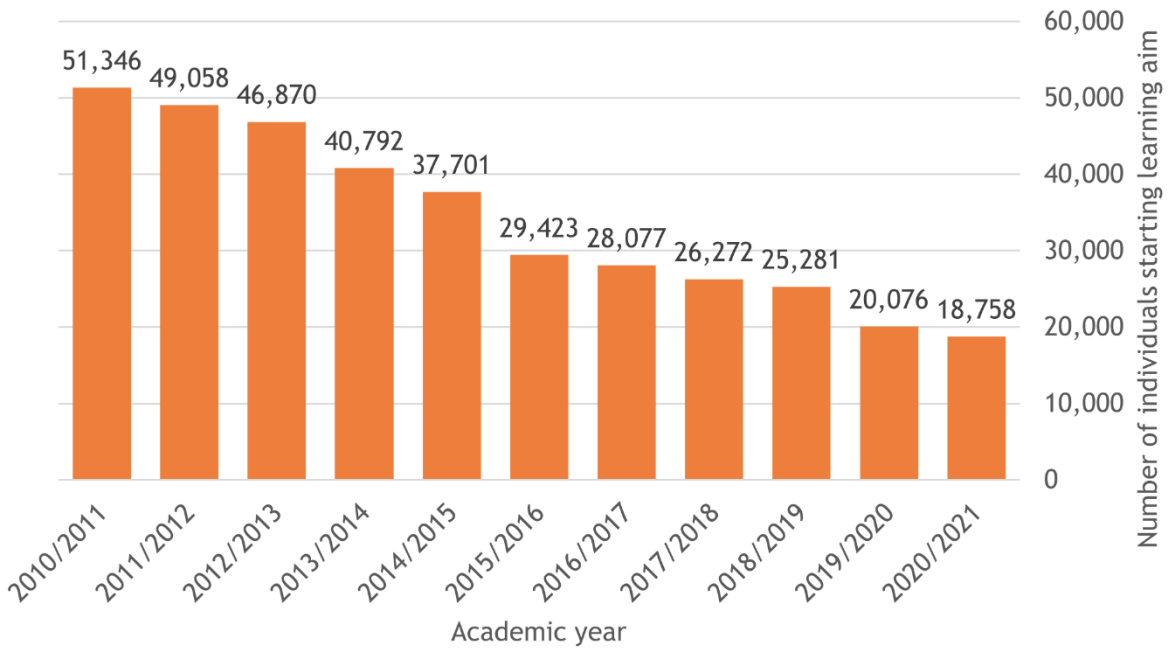
[31] Note that in some cases the level of the qualification attained according to HESA records was below level 4.

Notes: HESA Statistical Disclosure Control rules have been applied, so all counts are rounded to the nearest multiple of 5.

Having identified the highest level of qualification attained by individuals in the 2002 cohort before the age of 25, ILR data on learning aims was used to establish whether individuals had undertaken any further learning from the 2010/11 academic year to the 2020/2021 academic year. It was possible for an individual to start multiple learning aims within a single academic year, and so the highest level of aim with the earliest start date within the academic year was chosen as the focus.[32]

Figure shows the number of individuals from the 2002 cohort who started a learning aim in successive years from 2010/2011 onwards. Individuals could start learning aims in different academic years, so a total of 200,554 individuals (or 38.4 per cent of the cohort) started a learning aim at some point between the 2010/2011 and 2020/2021 academic years.

Figure 21: Number of individuals in 2002 cohort starting a learning aim, by academic year



Base: 522,354 individuals in the 2002 cohort.

It is apparent that the numbers of individuals starting a learning aim declined over time. Around one-in-10 individuals in the 2002 cohort (9.8 per cent) started a learning aim in the 2010/2011 academic year, and this fell to around 1 in 28 by the 2020/2021

[32] The data were sorted first to identify the highest level of aim undertaken within the academic year and then in order of start date. If the learner undertook multiple aims at the highest level identified within the same academic year, the one with the earliest start date was the focus.

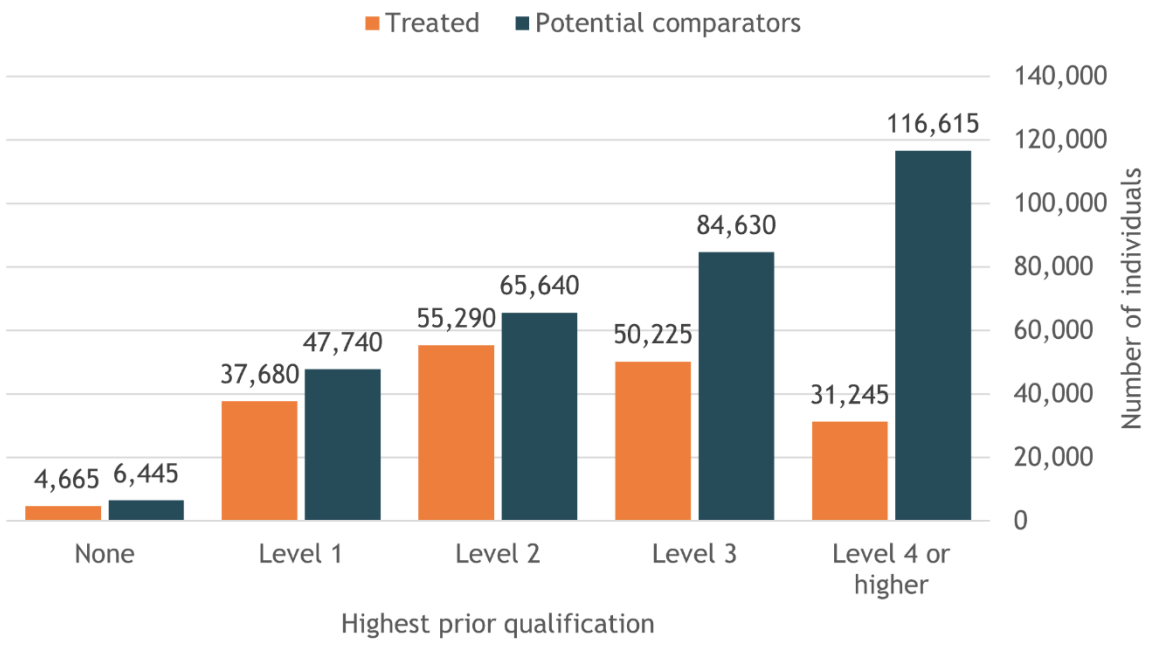
academic year. This gradual decline in the likelihood of participating in training over time is likely to reflect the cohort being more likely to undertake training on entry to the labour market and in early career rather than when they have gained more work experience.

Identifying the treatment and potential comparison groups

Each successive year of ILR data was combined with the other data on the 2002 cohort to identify the earliest year, from the 2010/11 academic year onwards, when individuals participated in training. Those who did some training between the 2010/11 academic year and the 2017/18 academic year were considered to have been treated, while those who did not do any training at all between 2010/11 and 2020/2021 were selected as potential comparators. Individuals who did not start any training between the 2010/11 and 2017/18 academic years, but did start training at some point between the 2018/19 and 2020/21 academic years were excluded from the analysis.

The final analysis sample consisted of 500,170 individuals. Figure 22 shows the breakdown of prior qualifications for the treatment and potential comparison groups. It demonstrates that the number of potential comparators exceeded the number of treated individuals across all levels of prior attainment.

Figure 22: Numbers of individuals in treatment and potential comparison groups by highest prior qualification



Base: 179,100 treated individuals and 321,070 potential comparators. Note that HESA Statistical Disclosure Control rules have been applied, so all counts are rounded to the nearest multiple of 5.

Receipt of out-of-work benefits, employment and earnings

Information on the 2002 cohort's participation in education and training was combined with data from DWP on receipt of out-of-work benefits and HMRC on employment and earnings, up to 5 April 2021. The earnings measure captured total taxable pay, summed across all earnings from employment within a given tax year. This includes basic salary and any additional payments such as overtime, or allowances for being on call. Pension contributions and any other employer benefits taxable at source would be removed from the earnings figure.

As the earnings data were only available on a tax year basis, the tax year in which the individual started training was identified and then earnings in successive tax years following the start of training were used as the outcome measures. For example, if a learner started training on 1 September 2010, earnings in the first year after starting training would be based on earnings in the 2011/12 tax year. If they started training on 6 April 2011, earnings in the first year after starting training would be based on earnings in the 2012/13 tax year. This illustrates the fact that the gap between starting training and the earnings observation could vary depending on when within the tax year the individual started training.

Earnings were set to zero where they were negative for the tax year, or if individuals had no recorded earnings in the tax year. As earnings could be observed in any tax year between 2011/12 and 2020/21 depending on when the individual started training, they were adjusted for inflation so that figures for individual tax years would be more comparable over time. This was done by using annual figures for CPIH[33] to reweight earnings for earlier tax years to prices in the 2020/21 tax year.

Data on earnings from self-employment are only available from the 2014/15 tax years onwards. The percentages of the treatment and potential comparison groups who were self-employed at some point between the 2014/15 and the 2020/21 tax years were 15 per cent and 17 per cent respectively. As including earnings from self-employment would mean restricting the focus of the analysis to outcomes observed from the 2014/15 tax year onwards, it was decided to consider earnings from employment only. Given that a similar proportion of the treatment and comparison groups were self-employed at some point, this was thought preferable to only considering training undertaken, and outcomes experienced, over a shorter period of time.

Methods

Assumptions

For PSM to provide a robust estimate of impact it is necessary to observe all characteristics which influence both participation in training and the outcomes

[33] These were averaged for individual months to calculate annual average CPIH on a tax year basis.

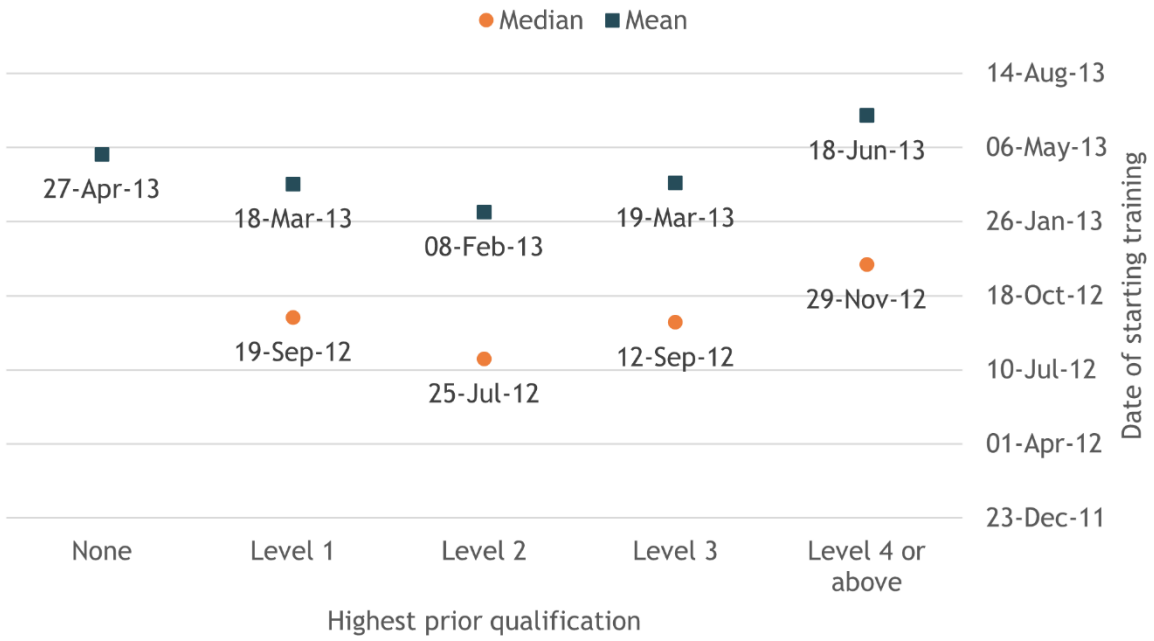
experienced as a result. As the LEO data include rich information on individuals from the time of leaving school, through any further and higher education undertaken up to the age of 24 and into labour market participation, it is considered likely that most important factors which determine participation in training and the outcomes experienced as a result are taken into account. However, as participation in training is voluntary, it is likely that less-motivated individuals will choose not to participate. This may result in the analysis overestimating the impact of participation in learning as differences in the motivation of the treatment and comparison groups could be likely to affect both the decision to undertake learning and the outcomes experienced as a result.

A further assumption underpinning the credibility of the impact estimates produced by PSM is that the potential comparison group includes individuals with similar propensity scores to those in the treatment group (known as common support). If some treated individuals cannot be matched to comparators with similar propensity scores, the impact estimates will not be representative of the impact of training across all participants – only the subset of individuals for whom suitable comparators can be found. The number of individuals in the treatment group who cannot be matched to suitable comparators are referred to as the number '***off support***'.

Identifying the reference date for observing history and outcomes

For the treatment group, the date of starting the earliest learning aim in the period from the 2010/11 academic year through to the 2017/18 academic year was used as the reference date when assessing employment and benefits history and outcomes following the start of participation in training. Those in the potential comparison group were assigned a reference date at random from the distribution of the earliest training start dates observed for the treatment group, stratifying by the level of prior attainment. Figure 23 shows the mean and median start dates for individuals by the highest level of prior attainment before the age of 25. This indicates that the timing of starting training varied depending on the level of prior qualifications. Those with existing qualifications at level 2 had the earliest mean and median start dates for subsequent training, while those with existing qualifications at level 4 or above and those with no prior qualifications at all, tended to embark on further training at a later point in time than those whose highest prior qualifications were between levels 1 and 3. Given that the date of starting subsequent training varied with the level of attainment before the age of 25, the comparison group were randomly assigned start dates which mirrored the distribution of start dates for those in the treatment group with the same level of prior attainment. As a result, the distribution of reference dates for the potential comparison group reflected those for the treatment group.

Figure 23: Mean and median reference dates by highest prior qualification



Base: 179,100 treated individuals. Median suppressed for those with no prior qualifications due to low cell count (less than 10 observations). Note that HESA Statistical Disclosure Control rules have been applied, so the base count is rounded to the nearest multiple of 5.

Benefits and employment history and outcomes

Having identified a reference date for all individuals in the treatment and potential comparison groups, variables were constructed recording the individual's history of claiming out-of-work benefits and being in employment in the three years prior to this reference date. The variables recorded whether the individual was on out-of-work benefits or employed at any point in each quarter over this period.

The outcome measures recorded whether the individual was claiming out-of-work benefits or employed at any point in each month following the reference date over the 2.5 years following the reference date. For those who participated in training at some point, this would indicate whether they were on out-of-work benefits or in employment in successive months over the 2.5 years after starting the earliest training spell. Two further variables were constructed which recorded the total number of weeks that the individual spent on out-of-work benefits or in employment in the 2.5 years following the reference date, up to a maximum of 130 weeks.

Employment start and end dates were recorded as uncertain in some cases. However, similar proportions of the treatment and potential comparison groups had uncertain start and end dates - 59 per cent of both groups had at least one uncertain employment start date and 45 per cent of both groups had at least one uncertain employment end date. Dot plots suggested that the uncertain employment start and

end dates followed a similar pattern to the known start and end dates and so any error in recording for these dates is unlikely to affect the overall conclusions from the analysis.

Matching variables

Early analysis suggested that the likelihood of doing training varied by the level of prior qualification, so it was decided to hard match on the highest level of prior attainment at the age of 24. This means that the comparison group could only be selected from individuals who had achieved a similar level of educational attainment as the treatment group by this age.

The variables used to estimate propensity scores were as follows:

- Sex, coded to 1 if the student was recorded as female and zero if they were recorded as male;
- Ethnicity, coded to 1 for those recorded as White British and zero otherwise;
- Whether the student had Special Educational Needs (SEN), coded to zero for those without any SEN and 1 for those with SEN, but without a statement or those with an EHC Plan or SEN statement;
- Whether the student was eligible for free school meals, coded to 1 if they were and zero otherwise;
- Whether English was the student's first language, coded to 1 if the student's first language was believed or known to be other than English and zero otherwise;
- The month and year of starting training or the pseudo-start date;
- Whether the individual was on out-of-work benefits at any point in the quarter prior to starting training or 12 quarters before starting training and the number of weeks they were on benefits in the three years prior to starting training;
- Whether the individual was employment in the quarter prior to starting training, or 12 quarters before starting training and the number of weeks they were employed in the three years prior to starting training.

As the cohort was restricted to those who were born between 1 Sep 1985 and 31 Aug 1986, individuals in the treatment and comparison groups with the same reference date would be a similar age on that date. For this reason, age was not included as a matching variable.[34]

[34] As the LEO data only included month and year of birth, even if age in years at the reference date was derived, it would be imprecise.

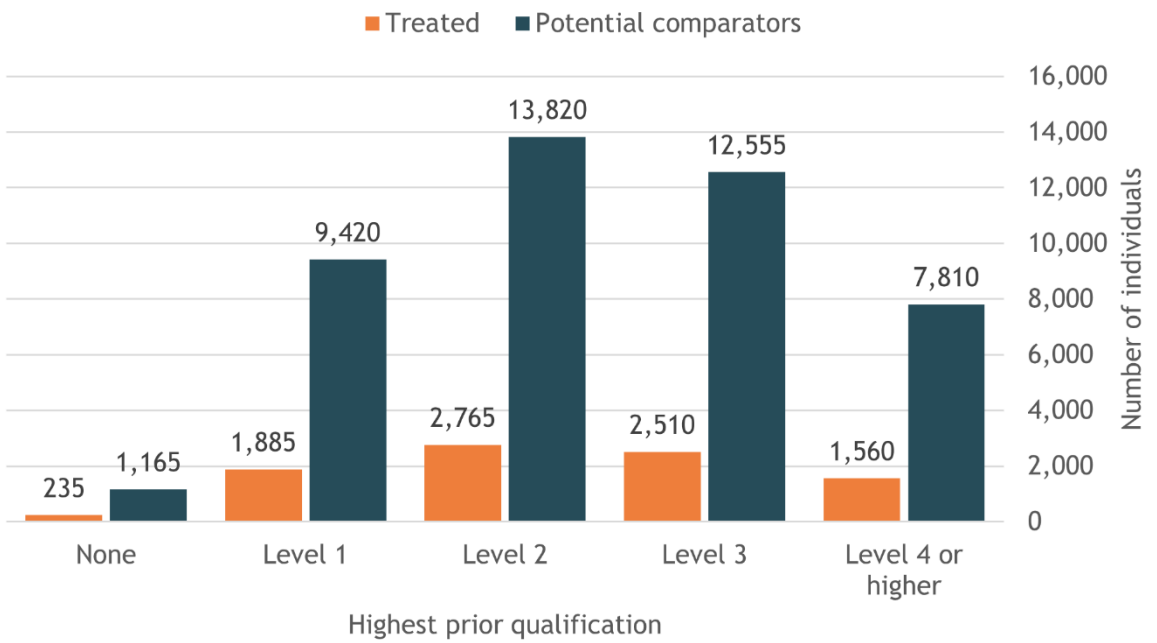
Sample selection

Given the size of the treatment and potential comparison groups and the computational demands of propensity score matching, it was decided to base the analysis on a random sample of 5 per cent of the treatment group. The sample was stratified by the level of the highest prior qualification to ensure that the resulting sample was representative of the full 2002 cohort in terms of prior qualifications.[35]

Having selected a random sample of treated individuals, a sample from the potential comparison group was also chosen at random. The number of individuals sampled from the comparison group was constrained to be five times the number of treated individuals. Figure 24 shows the number of individuals in the treatment and potential comparison groups after sampling by the highest prior qualification. It demonstrates that the number of potential comparators is five times the number of treated individuals across all prior qualification levels. It is also apparent that the number of treated individuals with no prior qualifications is relatively small. However, as less than 3 per cent of the 2002 cohort had no qualifications, this reflects the underlying distribution of qualifications. Oversampling those with lower qualification levels would mean that the findings of the analysis were not representative of the average impact of training across the whole 2002 cohort.

[35] This is likely to be the case even without stratification when drawing a random sample, but given the evidence that participation in training was related to prior qualification level, it was decided to stratify when drawing the sample to ensure it was representative of the wider cohort on this particular characteristic.

Figure 24: Numbers of individuals in the treatment and potential comparison group after random sampling



Base: 8,955 individuals in the treatment group and 44,770 individuals in the potential comparison group. Note that HESA Statistical Disclosure Control rules have been applied, so all counts are rounded to the nearest multiple of 5.

Testing whether the assumptions were met

This section considers whether the characteristics of the comparison group appeared similar to the treatment group after matching, known as the balance. If statistically significant differences between the two groups remain at this point, the impact estimates could be biased.

Table 9 reports the percentage of the treatment and comparison groups with a particular characteristic after matching, except where the variable description notes that another unit has been used. Differences in the characteristics of the two groups which remain statistically significant after matching are indicated by asterisks. These differences are measured by the mean standardized bias (MSB).[36] Given the large sample of individuals in the treatment and comparison groups, small differences in the MSB may be statistically significant and so the size of the MSB is also important. The threshold used to identify biases which are a greater cause for concern is 5 per cent, but in all cases the MSB is below this level.

[36] The MSB is calculated by dividing the difference in means between the treatment and matched comparison groups by the square root of the mean sample variance and is expressed as a percentage.

The table reports the number of individuals in the treatment group for whom no close comparators were found (the number off support). This indicates whether the findings of the analysis are likely to be representative of those for the full range of participants. Rubin's B[37] and R[38] give an indication of the balance on covariates. The treatment and matched comparison group samples are considered balanced if B is less than 25 and R is between 0.5 and 2.

Table 9: Characteristics of treatment and comparison groups after matching

	Treatment group percentage unless otherwise specified	Matched comparison group percentage unless otherwise specified
Female	52*	54*
White	82	82
Special educational needs	22	22
Free school meals	18	19
Mother tongue other than English	7	7
No qualifications by age 25	3**	3**
Highest prior qualification level 1	21	21
Highest prior qualification level 2	31	30
Highest prior qualification level 3	28	28
Highest prior qualification level 4 or above	17	18
Reference date (number of months since January 1960)	638	638
On out-of-work benefits in quarter prior to reference date	30	30
On out-of-work benefits in quarter 3 years prior to reference date	24	24
Number of quarters on out-of-work benefits in 3 years prior to reference date	3	3
Employed in quarter prior to reference date	73	72

[37] The absolute standardized difference of the means of the linear index of the propensity score in the treated and matched comparison groups.

[38] The ratio of treated to matched comparison group variances of the propensity score index.

Employed in quarter 3 years prior to reference date	70	70
Number of quarters employed in 3 years prior to reference date	9	9
Base	8,935	44,770
Number off support	20	
Rubin's B	5.3	
Rubin's R	1.0	

Notes: ***=statistically significant at the 1 per cent level; **=statistically significant at the 5 per cent level; *=statistically significant at the 10 per cent level. Results highlighted in bold and underlined where the MSB is greater than 5 per cent. Note that HESA Statistical Disclosure Control rules have been applied, so all counts are rounded to the nearest multiple of 5.

It is apparent from Table 99 that the characteristics of the matched comparison group were very similar to those of the treatment group. There were no differences between the two groups where the MSB exceeded 5 per cent. While there was a statistically significant difference between the treatment and comparison groups in the percentage that had no qualifications by the age of 25, the MSB was below the 5 per cent threshold and the absolute difference was less than 1 percentage point. Given the limited evidence of bias on individual characteristics and the fact that the measures of overall balance on covariates (Rubin's B and R) were within acceptable ranges, it seems likely that the impact estimates will provide a credible estimate of impact. The low number of individuals in the treatment group without close comparators (20) also suggests that the findings are likely to be representative of those for the full range of individuals who participated in training.

Estimating the impact of training by level of prior attainment

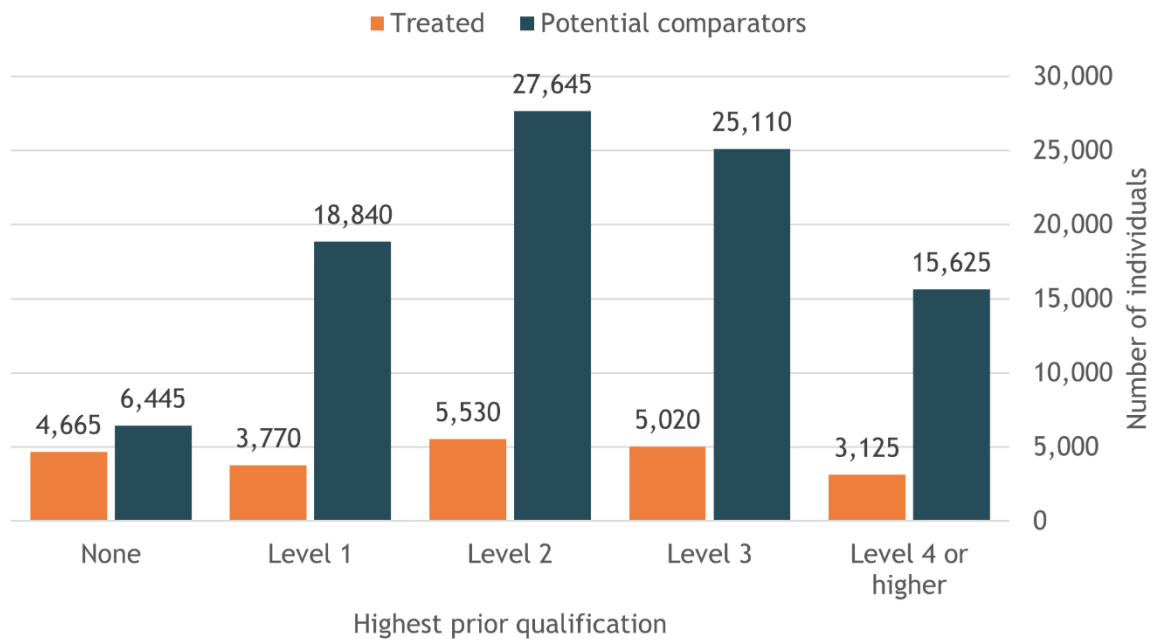
As the analysis presented in the previous section focused on estimating average effects across all those who undertook training in the period considered, participants include those with very different levels of prior qualifications. This means that the results are representative of the average impact of training across the 2002 cohort. However, the average effects might mask more pronounced impacts for participants who were less, or more, highly qualified prior to undertaking training. This section explores whether this is the case by estimating the impact of training for participants with different levels of prior qualifications.

Sample selection

As the aim was to estimate impacts which were representative of those for all individuals with a given level of prior attainment, a different method of randomly selecting individuals to include in the analysis was used. All individuals with no previous qualifications were included in the analysis to maximise the sample size and the likelihood of detecting any impacts. One-in-10 of those in the treatment group at

higher levels of qualifications were selected at random and then within each attainment group, five times as many potential comparators were chosen at random to form the analysis sample. Figure shows the numbers of individuals in the treatment and potential comparison groups after sampling.

Figure 25: Numbers of individuals in the treatment and potential comparison group after sampling, stratified by prior attainment level



Base: 22,110 individuals in the treatment group and 93,665 individuals in the potential comparison group. Note that HESA Statistical Disclosure Control rules have been applied, so all counts are rounded to the nearest multiple of 5.

Testing the match between the treatment and comparison groups

The matching was carried out for each prior attainment group in the same way as it was when estimating average effects for the 2002 cohort. This included using the same set of matching variables, with the exception of prior attainment, since the treatment and comparison groups were hard-matched on this characteristic.

As would be expected, the match (or balance) between the treatment and comparison groups on individual matching variables differed for each prior attainment group. For example,

Table 1010 to 14 illustrate the higher qualification levels of women compared with men, with women making up a lower proportion of those with no prior attainment and a higher proportion of those with level 4 qualifications and above compared with men. This pattern was apparent across both the treatment group and the matched comparison group. It is also apparent that there was a negative association between having special educational needs or being eligible for free school meals and prior attainment level. Those with prior qualifications at level 4 or above who did participate in training started this at a later point in time than those with lower levels of prior qualifications (based on the reference date).

The likelihood of claiming out-of-work benefits immediately before starting training and the number of quarters claiming out-of-work benefits over the three years prior to the reference date was lower for those with higher levels of prior qualifications. There was also a positive association between higher qualification levels and the amount of time spent in employment and the likelihood of being employed immediately prior to starting training.

Across all attainment levels the characteristics of the matched comparison group were similar to those of the treatment group after matching. Tables 10 to

Table 1414 show that none of the differences in characteristics between treatment and matched comparison groups which remained after matching were statistically significant at the 5 per cent level or greater and the mean standardised bias for individual characteristics was below 5 per cent in all cases. The values of Rubin's B and R were within acceptable ranges for all the models and the numbers of individuals in the treatment group for whom no close matches were found were small relative to the size of the group (less than 5 per cent for all attainment levels), suggesting that the resulting impact estimates would be likely to be representative of the findings for the vast majority of those with a given attainment level who took part in training.

Table 10: Characteristics of treatment and comparison groups after matching – no prior attainment

Matching variables	Treatment group (per cent unless otherwise specified)	Matched comparison group (per cent unless otherwise specified)
Female	41	42
White	84	84
Special educational needs	62	61
Free school meals	37	37
Mother tongue other than English	5	5
Reference date	639	639
On out-of-work benefits in quarter prior to reference date	68	68
On out-of-work benefits in quarter 3 years prior to reference date	60	62
Number of quarters on out-of-work benefits in 3 years prior to reference date	7	8
Employed in quarter prior to reference date	36	36
Employed in quarter 3 years prior to reference date	35	35
Number of quarters employed in 3 years prior to reference date	4	4
Base (on support)	4,630	6,445
Number off support	35	
Rubin's B	6.5	
Rubin's R	1.3	

Notes: ***=statistically significant at the 1 per cent level; **=statistically significant at the 5 per cent level; *=statistically significant at the 10 per cent level. Results highlighted in bold and underlined where the MSB is greater than 5 per cent. Note that HESA Statistical Disclosure Control rules have been applied, so all counts are rounded to the nearest multiple of 5.

Table 11: Characteristics of treatment and comparison groups after matching – level 1 prior attainment

Matching variables	Treatment group (per cent unless otherwise specified)	Matched comparison group (per cent unless otherwise specified)
Female	42	42
White	82	82
Special educational needs	43	43
Free school meals	28	29
Mother tongue other than English	8	8
Reference date	638	638
On out-of-work benefits in quarter prior to reference date	53	53
On out-of-work benefits in quarter 3 years prior to reference date	45	45
Number of quarters on out-of-work benefits in 3 years prior to reference date	6	6
Employed in quarter prior to reference date	53	52
Employed in quarter 3 years prior to reference date	53	53
Number of quarters employed in 3 years prior to reference date	6	6
Base (on support)	3,760	18,840
Number off support	5	
Rubin's B	3.6	
Rubin's R	1.1	

Notes: ***=statistically significant at the 1 per cent level; **=statistically significant at the 5 per cent level; *=statistically significant at the 10 per cent level. Results highlighted in bold and underlined where the MSB is greater than 5 per cent. Note that HESA Statistical Disclosure Control rules have been applied, so all counts are rounded to the nearest multiple of 5.

Table 12: Characteristics of treatment and comparison groups after matching – level 2 prior attainment

Matching variables	Treatment group (per cent unless otherwise specified)	Matched comparison group (per cent unless otherwise specified)
Female	50	51
White	83	83
Special educational needs	26	26
Free school meals	21	21
Mother tongue other than English	5	6
Reference date	637	637
On out-of-work benefits in quarter prior to reference date	33	33
On out-of-work benefits in quarter 3 years prior to reference date	26	26
Number of quarters on out-of-work benefits in 3 years prior to reference date	3	3
Employed in quarter prior to reference date	70	70
Employed in quarter 3 years prior to reference date	70	71
Number of quarters employed in 3 years prior to reference date	8	8
Base (on support)	5,505	27,645
Number off support	25	
Rubin's B	3.1	
Rubin's R	1.0	

Notes: ***=statistically significant at the 1 per cent level; **=statistically significant at the 5 per cent level; *=statistically significant at the 10 per cent level. Results highlighted in bold and underlined where the MSB is greater than 5 per cent. Note that HESA Statistical Disclosure Control rules have been applied, so all counts are rounded to the nearest multiple of 5.

Table 13: Characteristics of treatment and comparison groups after matching – level 3 prior attainment

Matching variables	Treatment group (per cent unless otherwise specified)	Matched comparison group (per cent unless otherwise specified)
Female	57	58
White	83	83
Special educational needs	13	13
Free school meals	14	14
Mother tongue other than English	7	7
Reference date	637	637
On out-of-work benefits in quarter prior to reference date	19	18
On out-of-work benefits in quarter 3 years prior to reference date	13	13
Number of quarters on out-of-work benefits in 3 years prior to reference date	2	2
Employed in quarter prior to reference date	81	82
Employed in quarter 3 years prior to reference date	80	79
Number of quarters employed in 3 years prior to reference date	10	10
Base (on support)	4,975	25,110
Number off support	45	
Rubin's B	5.5	
Rubin's R	1.0	

Notes: ***=statistically significant at the 1 per cent level; **=statistically significant at the 5 per cent level; *=statistically significant at the 10 per cent level. Results highlighted in bold and underlined where the MSB is greater than 5 per cent. Note that HESA Statistical Disclosure Control rules have been applied, so all counts are rounded to the nearest multiple of 5.

Table 14: Characteristics of treatment and comparison groups after matching – level 4 or higher prior attainment

Matching variables	Treatment group (per cent unless otherwise specified)	Matched comparison group (per cent unless otherwise specified)
Female	61	61
White	78	79
Special educational needs	6	7
Free school meals	8	8
Mother tongue other than English	11	11
Reference date	642	642
On out-of-work benefits in quarter prior to reference date	11	11
On out-of-work benefits in quarter 3 years prior to reference date	7	7
Number of quarters on out-of-work benefits in 3 years prior to reference date	1	1
Employed in quarter prior to reference date	87	88
Employed in quarter 3 years prior to reference date	82	82
Number of quarters employed in 3 years prior to reference date	10	10
Base (on support)	3,010	15,625
Number off support	115	
Rubin's B	2.7	
Rubin's R	1.1	

Notes: ***=statistically significant at the 1 per cent level; **=statistically significant at the 5 per cent level; *=statistically significant at the 10 per cent level. Results highlighted in bold and underlined where the MSB is greater than 5 per cent. Note that HESA Statistical Disclosure Control rules have been applied, so all counts are rounded to the nearest multiple of 5.