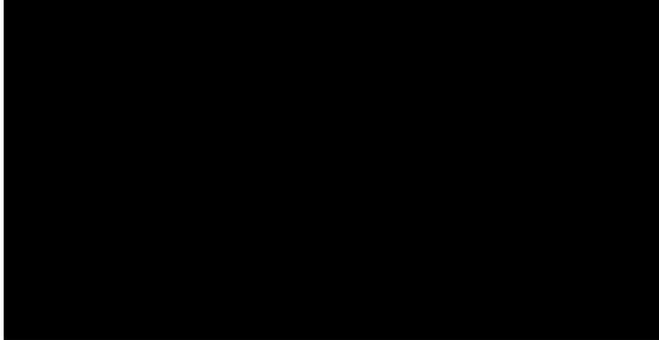


Upskilling and retraining the adult workforce

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This POSTnote provides an overview of adult upskilling and retraining in the UK. It outlines the national context of adult education, including issues around supply and demand of skills as well as funding and participation rates. It also discusses the key impacts of adult learning. This briefing focuses on 19+ adult learning and excludes university education.

While there are a range of competing frameworks that define 'skills',¹⁻⁴ the UK Government's Employer Skills Survey (ESS), which in 2019 was undertaken by 81,000 employers in the UK (excluding Scotland),⁵ grouped skills into 'technical and practical skills' and 'people and personal skills'.^{6,7} Technical and practical skills include specific knowledge needed to perform a role, while people and personal skills include time management, task prioritisation and teamworking.^{6,7} Upskilling refers to the improvement of an individual's skillset while retraining refers to developing skills to enable a change in an individual's role.⁸

Imbalance between the skills available in the labour market and those sought by employers creates 'skills mismatches'.⁹⁻¹³ When the skills or qualifications of workers exceed employer demand it can lead to 'skills surpluses'. However, when the type or level of skills that employers need is lacking amongst individuals, it can create 'skills gaps' and 'skills shortages'.⁹ Skills gaps occur when workers within an organisation lack the necessary level of skills to fulfil their roles. Skills shortages occur when vacancies cannot be filled due to a lack of skilled individuals in the workforce, although unfilled vacancies can also reflect a failure to attract candidates due to undesirable working conditions.⁹

Some mismatches are present in any economy, however, there

Overview

- The UK faces a range of challenges that will require workers to upskill or retrain.
- There are mismatches between supply and demand of skills in the UK workforce.
- The Government and the devolved administrations are pursuing a range of policies to strengthen the UK's skills base.
- Participation in adult education (AE) in England has fallen from 4.4m in 2003/04 to 1.5m in 2019/20. In the same period, funding for AE fell by nearly two thirds.
- Participation in AE is less likely for adults who are older, lower skilled or experience educational disadvantages.
- Adult learning is associated with a range of positive economic and wellbeing outcomes.

are currently significant skills challenges within the UK. The 2019 ESS reported that 24% of job vacancies were caused by skills shortages and that 13% of employers thought that some employees were under-skilled for their role.^{6,14} Productivity levels in the UK have remained weak since 2008,^{15,16} and the coronavirus pandemic has disrupted the labour market.¹⁷ Trends such as automation, migration and an extended work life are also likely to influence the type of jobs available in the future. There are 32.5m workers aged 16+ in the workforce,¹⁸ and, according to the Confederation of British Industry, 25.5m will require upskilling and 5m will require retraining by 2030.⁸

The UK Government and devolved administrations are pursuing policies to help boost the UK's skills base (Box 1). In May 2021 the UK Government introduced the [Skills and Post-16 Education Bill](#) to Parliament, which provides legislation for reforms to post-16 education and training in England outlined in the [Skills for Jobs White Paper](#).¹⁹ This includes a Lifelong Loan Entitlement equivalent to four years of post-18 full-time or modular study at higher technical and degree levels, the detail and scope of which will be consulted upon.²⁰ Research shows that co-production of training between providers and employers can help create effective training programmes,^{21,22} and the Bill envisages more employer input through the development of Local Skills Improvement Plans in conjunction with providers.²³

Box 1: UK and devolved Governments' skills policies

- **England:** [Funding for adult education and training](#) includes the Adult Education Budget (£1.34bn in 2020/21) and the National Skills Fund (NSF) (£2.5bn from April 2021). A consultation on the creation of a single Skills Fund closed in October 2021.²⁴ Through the NSF, adults are entitled to a funded Level 3 (equivalent to A Level) qualification if they do not already have one or, from April 2022, if they earn below the National Living Wage or are unemployed.²⁵ The NSF supports Skills Bootcamps that offer courses of up to 16 weeks for people aged 19+ in areas such as construction, engineering and digital.^{26,27}
- **Scotland:** The 2019 Future Skills: Action Plan sets out Scotland's plan for boosting skills:²⁸ supporting retraining opportunities from the energy sector into green jobs; publication of a careers strategy;²⁹ improving access in the rural economy; and supporting Community Education.
- **Northern Ireland:** The 2021 Skills for a 10x Economy strategy aims to increase the numbers of workers with qualifications (at a range of levels) and the proportion of graduates leaving higher education with degrees in STEM subjects (such as computer sciences and engineering).³⁰
- **Wales:** The Young Person's Guarantee offers training or employment support to under-25s,³¹ while Personal Learning Accounts allow individuals aged 19+ from lower income households to gain skills.³² The Flexible Skills Programme helps businesses upskill their staff in creative, manufacturing and digital skills.^{33,34} Targets for 75% of working-age adults to be qualified to Level 3+ and <5% to have no qualifications by 2050 are being considered.³⁵

Factors affecting employment and skills

There are several interrelated factors that are influencing the nature of employment and skills in the UK.³⁶ These include:

- **Automation:** [Developments in technology](#) are likely to displace certain jobs (see [POSTnote 534](#)), particularly those that involve routine tasks.³⁷ The Office for National Statistics estimates that 1.5m people in England (7.4%) are employed in jobs at high-risk of automation.³⁸ Emerging technologies will also create new jobs and change the nature and types of job roles available across a range of sectors.³⁹⁻⁴¹
- **Net zero emissions:** As part of its commitment to reach net zero emissions by 2050,⁴² the UK Government aims to support up to 440,000 jobs in net zero industries by 2030.⁴³ There is likely to be a reduction in roles in 'carbon-intense' industries and an increase in roles in 'green sectors'.⁴⁴⁻⁴⁷
- **Ageing population:** Increased life expectancy means that more 50+ year olds are in work,^{48,49} and the employment rate for 50-64 year olds has increased from 60% in 2000 to 73% in 2020.⁵⁰ Workers will need to upskill and retrain to remain in work across a prolonged work life.
- **Immigration:** The launch of the points-based system limits opportunities for migrant workers to find employment in the UK.^{51,52} Sectors like construction⁵³ and hospitality,⁵⁴ which have made disproportionate use of these workers, now have to recruit more of their staff from the domestic workforce.⁵⁵
- **COVID-19:** One in four people who were employed during the pandemic were furloughed for a period between March 2020 and June 2021.⁵⁶ Furloughed employees were most likely to be [younger \(16-24\)](#)⁵⁷ and older (50+) workers,⁵⁸⁻⁶⁰ and more likely to be in lower skilled employment.⁶¹ [Labour market recovery](#) is uneven across sectors and regions,⁶² and experiences of unemployment or furlough could have a negative impact on earnings and career progression.^{63,64}

The UK skills landscape

While no system of labour market information (LMI) can predict the future, LMI can be an important tool for identifying current skills mismatches as well as informing training provision and [careers guidance](#) to help address skills mismatches.^{65,66} There are various methods for collecting LMI for skills (Box 2).

Box 2: Labour market information (LMI) for skills

LMI covers data related to the job market such as earnings and employment rates. Skills levels are an important part of LMI and there are various ways of measuring them:

- **Employer surveys** are used to obtain information about skills needs.⁶⁷ There is a delay between data collection and publication, meaning that surveys are not always the most up-to-date reflection of current skills needs.
- **Qualifications** are a proxy for skills, but many skills do not lend themselves to formal testing. This metric can also exclude those who have skills but lack qualifications.
- **Real time data** such as online job postings reveal skills demands.⁶⁸ This metric can exclude certain skills and cater to roles more likely to be advertised online.⁶⁹ It also does not reveal the skills that employers get from recruitment.

O*NET (for the US)⁷⁰ and the European Skills/Competences and Occupations Framework⁷¹ sort LMI within a consistent framework that connects skills to occupations.⁷² There are calls for the UK to adopt a similar framework;⁷² Nesta has created a prototype Open Jobs Observatory that provides information on the skills mentioned in UK job adverts.^{73,74}

Supply of skills

If the supply of skills does not meet employer demand it can create skills shortages and gaps^{9,11} that can have negative impacts for workers, organisations and society.^{11,12} For example, when individuals have limited skills, it can restrict access to quality employment and in-work progression. Prolonged shortages and gaps are also associated with lower productivity and wages.^{75,76} While shortages and gaps vary across sectors and places,^{6,14,77-81} the 2019 ESS indicated that:

- **Technical and practical skills** contributed to 84% of skills shortage vacancies.⁶ Specialist skills or knowledge needed to perform a role was the most acute shortage (63%).⁶ There is unmet demand for intermediate technical skills in shortage sectors such as manufacturing and engineering.⁸² Uptake of higher technical education in England, between A Levels and undergraduate degrees ([Level 4-5 courses in England](#)), has been low compared to other countries and compared to Level 3 courses (such as A Levels) and degrees.⁸²⁻⁸⁵
- **People and personal skills** contributed to 66% of skill-shortage vacancies.⁶ Most prominent was management of time and prioritisation of tasks (45%).⁶ The importance of social and emotional skills such as leadership are increasingly recognised by employers (see also [POSTnote 583](#)).⁸⁶⁻⁸⁸

Basic skills (including literacy, numeracy, digital and English for speakers of other languages) are important for facilitating work, life and learning.^{89,90} According to the Organisation for Economic Cooperation and Development's (OECD) 2012 Survey of Adult Skills, 9m adults (16-65) in England had low literacy and/or numeracy (5m of whom were in work).^{90,91} From a 2021 survey of 4,000 adults, Lloyd's Bank estimated that 11m UK adults lack essential digital skills ([POSTnote 643](#)).⁹² The Multiply programme, announced in October 2021, will provide £560m to support numeracy training for UK adults from Spring 2022.⁹³

Demand for skills

The Chartered Institute of Personnel and Development found that 22 (out of 38) Local Enterprise Partnerships across England were characterised by low demand for skills and low supply of skills.⁹⁴ When employer demand is primarily for low level skills, it can create a vicious cycle where low demand for high skills disincentivises training and drives down job quality. This can create 'low skills traps', which can become dominant in a sector or place, even if pockets of high skills demand exist.^{95–98} The ESS found that 2.2m workers were believed by their employers to have skills or qualifications more advanced than needed for their job roles.¹⁴ Overqualification can limit earnings potential,^{76,99,100} while skills under-utilisation can lead to employee dissatisfaction and increase turnover rates for organisations, which may increase recruitment costs.¹⁰¹

Adult education and lifelong learning

The UK Government define adult skills and lifelong learning provision as "education, advice and training for adults (19+) who want to upskill, reskill or move into employment."¹⁰² Lifelong learning acknowledges that people at various stages of life need access to different types of learning in different contexts.^{103,104} Adult education (AE) is an essential part of this, and caters for a range of learners of varying ages, abilities, subjects and motivations.¹⁰⁵ As such, AE includes:

- **formal** learning that is structured and accredited;
- **non-formal** learning that is flexible and often unaccredited;
- **informal** learning that happens in everyday life and work.

Further education providers are organisations that receive Government funding to provide formal and non-formal education to individuals aged 16+. These include further education colleges, adult community education providers and independent training providers.¹⁰⁶

Declining funding and participation rates

Funding for and participation in AE has experienced a sharp decline.^{107–109} Between 2003/04 and 2019/20 real-terms funding for AE in England fell by two thirds and participation fell from 4.4m to 1.5m.¹⁰⁸ The UK Government's figures for England show that participation in formal learning and non-formal adult community education has fallen for 2020/21.¹⁰⁷ The OECD use international surveys to show that informal learning is the most frequent form of workplace learning.¹¹⁰ However, it is difficult to gauge the knowledge gained from informal learning.^{111,112}

Employer provided training

The workplace is a key source of training,¹¹³ but the amount of training received by UK workers has declined since the early 2000s.^{113–116} The 2019 ESS shows that the proportion of staff receiving training over the previous year (60%), the number of training days per employee per year (3.6), and total investment per worker (£1,500) have been at their lowest since 2011.¹¹³

While [apprenticeships](#) (which incorporate on and off the job training) have traditionally helped younger workers enter the labour market, they have become more prevalent for adults aged 25+.^{117–120} This trend has increased since changes were made to apprenticeships in 2017 (Box 3). After the changes, there was a decline in apprenticeship starts in England and it has become more common for employers to make established employees apprentices and for apprentices to train at higher

levels.^{118,121,122} There are concerns that younger and less qualified workers are less able to access apprenticeships.^{123–126} The Gatsby Foundation suggests that allowing skilled older workers to obtain an equivalent apprenticeship qualification could help focus apprenticeships towards younger workers.¹²⁷

Box 3: Changes to apprenticeships

Since 2017, apprentices spend 20% of their time in off the job training and UK employers pay an Apprenticeship Levy (0.5% of the wage bill if it exceeds £3m per year).¹²⁸ While Levy funds are distributed to the devolved Governments as a block grant, in England, funds can be used by employers for apprenticeship training and assessment. There are concerns that some organisations are transferring existing training into apprenticeships to spend their Levy contributions.^{122,129}

Inequalities in adult learning participation

Certain demographics and characteristics are associated with disparities in participation in adult learning and education.

- **Age:** Participation in adult learning declines with age.^{107,130} Only 33% of 55–64 year olds engaged in learning according to the Learning & Work Institute's (L&W; an AE charity) 2021 participation survey of 5,000 individuals aged 17+.¹³⁰ This was the lowest rate amongst working age groups surveyed.
- **Location:** [The Government's levelling up agenda](#) aims to address regional economic disparities in the UK in part through improving skills.¹³¹ Participation in AE varies across the UK; the L&W's survey found that participation is highest in London (59%) and lowest in Wales (38%).¹³⁰ Regional participation rates disguise sharper sub-regional disparities, which reflect socioeconomic and educational disadvantages.
- **Skills level:** Individuals in lower skilled work are less likely to get training compared to those in higher level roles.^{116,132–134} Work training for lower skilled workers tends to focus on health and safety or induction, rather than broader topics.¹³⁵
- **Education:** Prior educational attainment is a predictor of participation.^{132,136} The Department for Education's (DfE) 2016 Adult Education Survey of 8,800 people found that only 53% of respondents with no qualifications reported learning in the previous year (compared to 92% with a degree).¹³⁷

Although AE can act as a vehicle for social mobility, access is unequal^{132,136,138} and appears to favour those with educational and socioeconomic capital.^{139,140} The Education Select Committee identified community education as important for adults most removed from learning¹⁴¹ and voiced concerns that the Government lacks a strategy for its provision or funding.

Barriers to participation and delivery

The L&W's 2021 survey reported that 69% of adults who had not recently engaged in learning faced barriers to AE.¹³⁰ The barriers are dispositional (where an individual's attitudes and expectations limit participation), situational (which arise from individual circumstances) and institutional (where structural and organisational factors limit access or delivery of training).¹⁴²

Dispositional

52% of respondents to the L&W's survey who had not recently participated in learning cited a dispositional barrier.¹³⁰ 29% of these stated that 'nothing' prevented participation while 18% lacked interest in learning, suggesting that AE's positive impacts may not be appreciated.^{130,142} AE can be complex and if

learners are unaware of potential pathways and outcomes it may deter engagement.¹⁴³ Poor access to advice and guidance, and poor quality of information can pose a significant barrier to participation.^{82,141,144,145} Negative experiences of prior education may also deter individuals from further engagement.¹⁴⁶

Situational

40% of respondents to the L&W's survey who had not recently engaged with learning cited situational barriers with 25% citing costs and 18% citing time pressures.¹³⁰ Direct and indirect costs associated with learning can prevent access to AE.^{137,147} This includes initial costs, caring responsibilities and earnings losses as a result of training. Flexible, blended and distance learning may reduce some situational barriers (see [POSTnote 639](#)).

Institutional

Barriers that could restrict participation or delivery include:

- **Staff:** An expansion in upskilling/retraining requires teaching staff. A 2018 survey of 9,860 Further Education staff in England found that 14% of teachers planned to leave and¹⁴⁸ a follow-up with 3,694 participants found 42% of teachers (and 38% of leaders) planned to leave within a year.^{148,149}
- **Eligibility:** In England, funding for study at Level 3 (A Level equivalent) extends to those aged 19+ who do not have a prior qualification and, from April 2022, those who are unemployed or earn below the National Living Wage.²⁵ Funding for Level 2 (GCSE equivalent) is offered to those 19+ who are unemployed or earn below the National Living Wage.¹⁵⁰ Funding is also available to those without a prior qualification aged 19–23 (for 24+ co-funding is available).¹⁵⁰
- **Level 3 reform:** Some [Level 3s \(such as some BTECs\) are due to be defunded](#) in England from 2024.^{25,151,152} The DfE envisage a 33% reduction in Level 3s available to adults affecting 17% (44,000) of funded enrolments.¹⁵³ Alongside A Levels and [T Levels](#), a range of other reformed Level 3 qualifications could be made available for adults.¹⁵³
- **Equivalent or lower qualification (ELQ) rules:** Learners studying at higher level may be ineligible for funding if their highest qualification matches (or is higher than) their desired course level.^{82,154,155} The Institute for Fiscal Studies point out that ELQ rules could restrict efforts to upskill or retrain¹⁵⁶ and many stakeholders have called for reform.^{82,144,145,157} The UK Government will consult on previous study restrictions.¹⁹

Impacts of adult learning

AE has direct and indirect impacts with individuals, employers and communities experiencing a range of benefits.¹⁵⁸

Employment and earnings

AE is associated with improved employability.^{159,160} Longitudinal Educational Outcomes data, which connects official datasets to track individual outcomes,^{161,162} indicates that most qualification levels are associated with better labour market outcomes.^{163,164} For non-graduates, study at Level 3 (equivalent to A Level) to Level 5 (equivalent to a foundation degree) is associated with higher employment rates and reduced claim rates for out of work benefits than lower level study.¹⁶³ The L&W's 2021 survey reported that 34% of respondents planned to change job or career.¹³⁰ While AE can support career change,¹⁰³ a positive career move is more strongly associated with formal college or university training compared to work-related training.^{136,165}

For England, the DfE estimate that Level 2 and 3 qualifications are associated with a 9% and 16% wage boost respectively,¹⁶⁶ and technical Level 4 and 5 courses are associated with even greater earnings.⁸⁵ There are variations in returns to wages according to subject, with those related to law, construction and engineering associated with higher earnings.^{85,164} The Social Market Foundation found that employer training had only a small impact on median personal income growth over a 5 year period against those who did not participate (12.8% vs 12%).¹³⁶ Returns from non-formal and informal training are difficult to measure,¹⁶⁷ however, the OECD estimated an 11% and a 3.5% return on wages respectively.¹¹⁰ Positive returns on earning associated with AE are generally greater for younger learners who are able to reap the benefits for a longer period.

Further learning

Participation in AE is associated with an increased likelihood of continued learning.^{160,168} One year after completing a Skills for Life course (an initiative launched in 2001 to improve literacy and numeracy) 50% of English and 48% of Maths learners had attended a subsequent course (with 35% and 29% respectively attributing participation in further learning to the initiative).¹⁶⁹

Community participation and active citizenship

The OECD have found associations between higher literacy, numeracy and digital skill levels and positive social outcomes such as participation in volunteering¹⁷⁰ and civic engagement.¹⁷¹ Populations in locations with higher levels of AE also reported less loneliness during the pandemic.¹⁷² A trial of English for speakers of other languages provision resulted in improved social participation and integration for its 527 participants.¹⁷³

Health and wellbeing

There is an association between adult learning and health and wellbeing benefits^{174,175} such as smoking cessation, exercise and nutrition.¹⁷⁶ In a DfE commissioned study, participation in adult community education reduced clinically significant symptoms of anxiety and/or depression for 52% of learners.¹⁷⁷

Priorities for public policy

Key areas for policymakers to consider in relation to adult education, upskilling and retraining include:

- **Funding for delivery of upskilling and retraining:** The Institute for Fiscal Studies note that UK Government funding for AE remains below 2010 levels,¹⁵⁶ and there has been a coinciding fall in participation.^{82,108,132,141,178} Employer funding for training has also decreased and the Education Select Committee,¹⁴¹ with other stakeholders,^{8,179} call for schemes to incentivise investment such as skills tax credits.^{180–182}
- **Addressing demand for skills as well as supply of skills:** There have been calls for a learning strategy that focuses on progression routes for lower skilled and lower paid workers.^{132,183,184} Academic stakeholders stress that boosting skills supply in areas with low demand for skills can have low impact and that issues around demand for skills should factor into local development strategies.^{185,96,97,186,187}
- **Accessible upskilling and retraining opportunities for adults:** There are concerns that funding restrictions around Level 2 and 3 (equivalent to GCSE and A Level), ELQ rules and a removal of some qualifications (such as BTECs) could create barriers to adult education.^{82,141,144,154,156,188–190}

1. Clarke, L. *et al.* (2006). A European Skills Framework?—But What are Skills? Anglo-Saxon Versus German Concepts. *Journal of Education and Work*, Vol 19, 255–269.
2. Weldon, P. (2020). [Defining Skills for the Future: What's in a Name?](#) *Australian Council for Educational Research - ACER*.
3. OECD (2018). [The Future of Education and Skills: Education 2030](#). OECD.
4. Kashefpakdel, E. *et al.* (2021). [Better Prepared: Essential Skills and Employment Outcomes for Young People](#).
5. Cabinet Secretary for Education and Skills (2021). [Scottish Employer Skills Survey 2020](#). Cabinet Secretary for Education and Skills.
6. Winterbotham, M. *et al.* (2020). [Employer Skills Survey 2019: Skills Needs](#). Department for Education.
7. Winterbotham, M. *et al.* (2020). [Employer Skills Survey 2019: Research Report](#). Department for Education.
8. Confederation of British Industry (2020). [Learning for Life: Funding a World-Class Adult Education System](#). Confederation of British Industry.
9. McGuinness, S. *et al.* (2018). Skills Mismatch: Concepts, Measurement and Policy Approaches. *Journal of Economic Surveys*, Vol 32, 985–1015.
10. Green, F. (2016). [Skills Demand, Training and Skills Mismatch: A Review of Key Concepts, Theory and Evidence](#). Government Office for Science.
11. Brunello, G. *et al.* (2019). [Skill Shortages and Skill Mismatch in Europe: A Review of the Literature](#). IZA Institute of Labor Economics.
12. Consearo, L. (2021). [Economic Substantiality: Skills in the UK Labour Market](#). in *The Sustainability Debate*. (eds. Topić, M. *et al.*) 35–56. improving work capacity.
13. McGuinness, S. *et al.* (2017). [How Useful Is the Concept of Skills Mismatch?](#) International Labour Organization.
14. Winterbotham *et al.* (2020). [Employer Skills Survey 2019: Developing the Skills Pipeline](#). Department for Education.
15. Office for National Statistics [Productivity Measurement – How to Understand the Data Around the UK's Biggest Economic Issue](#). *Office for National Statistics*.
16. Ilzetzki, E. (2020). [Explaining the UK's Productivity Slowdown: Views of Leading Economists](#). *VoxEU.org*.
17. Eyles, A. (2021). [How Has COVID-19 Disrupted the UK Labour Market, and How Can Better Adult Training and Job Placement Aid the Recovery?](#) *IPPO*.
18. Office for National Statistics (2021). [Employment in the UK: November 2021](#). *Office for National Statistics*.
19. Department for Education (2021). [Skills for Jobs: Lifelong Learning for Opportunity and Growth](#). Department for Education.
20. HM Government (2021). [A Plan for an Adult Skills and Lifelong Learning Revolution: Government Response to the Committee's Third Report](#). HM Government.
21. Fuller, A. *et al.* (2019). [Improving Workplace Capacity as the Prerequisite for Effective Work-Based Learning: A Co-Production Approach](#). in *Work-Based Learning as a Pathway to Competence-Based Education*. UNEVOC Network Contribution.
22. Fuller, A. *et al.* (2021). [Expanding Skills and Workplace Capacity: A Relational Approach To Industrial Strategy](#). in *In: The Political Economy of Industrial Strategy in the UK*. Agenda Publishing.
23. Department for Education (2021). [Skills Accelerator: Local Skills Improvement Plan Trailblazers and Strategic Development Fund Pilots](#). *GOV.UK*.
24. Department for Education (2021). [Skills for Jobs: A New Further Education Funding and Accountability System](#). Department for Education.
25. Department for Education (2021). [National Skills Fund](#). *GOV.UK*.
26. Department for Education (2021). [The National Skills Fund Consultation](#). Department for Education.
27. Department for Education (2021). [List of Skills Bootcamps](#). *GOV.UK*.
28. Cabinet Secretary for Education and Skills (2021). [Future Skills: Action Plan](#).
29. Scottish Government (2020). [Scotland's Careers Strategy: Moving Forward](#). Scottish Government.
30. Department for the Economy (2021). [A Skills Strategy for Northern Ireland - Skills for a 10x Economy](#). Department for the Economy.
31. Working Wales [Young Person's Guarantee](#). *Working Wales*.
32. Business Wales (2021). [Personal Learning Account](#). *Business Wales Skills Gateway*.
33. Business Wales [Flexible Skills Programme](#). *Business Wales Skills Gateway*.
34. CIPD (2021). [Helping Employers Navigate the Skills Landscape in Wales](#). CIPD.
35. Welsh Government (2021). [Shaping Wales' Future: Using National Indicators and Milestones to Measure Our Nation's Progress](#). Welsh Government.
36. Bell, T. *et al.* (2021). The Launch Report for The Economy 2021 Inquiry.
37. Office for National Statistics (2019). [Which Occupations are at Highest Risk of Being Automated?](#) *Office for National Statistics*.
38. Office for National Statistics (2019). [The Probability of Automation in England: 2011 and 2017](#). *Office for National Statistics*.
39. PricewaterhouseCoopers (2018). [Will Robots Really Steal Our Jobs: An International Analysis of the Potential Long Term Impact of Automation](#).
40. Willcocks, L. (2020). Robo-Apocalypse Cancelled? Reframing the Automation and Future of Work Debate. *Journal of Information Technology*, Vol 35, 286–302. SAGE Publications Ltd.
41. Badet, J. (2021). AI, Automation and New Jobs. *OJBM*, Vol 09, 2452–2463.
42. (2008). [Climate Change Act](#).
43. Department for Business, Energy & Industrial Strategy (2021). [Net Zero Strategy: Build Back Greener](#). Department for Business, Energy & Industrial Strategy.
44. Department for Business, Energy & Industrial Strategy (2021). [Green Jobs Taskforce Report](#). Department for Business, Energy & Industrial Strategy.
45. National Grid Group (2020). [Building the Net Zero Energy Workforce](#). National Grid Group.
46. Robins, N. *et al.* (2019). [Investing in a Just Transition in the UK: How Investors can Integrate Social Impact and Place-Based Financing into Climate Strategies](#). Grantham Research Institute on Climate Change and the Environment.
47. Valero, A. *et al.* (2021). [Are 'Green' Jobs Good Jobs? How Lessons from the Experience To-Date Can Inform Labour Market Transitions of the Future](#). Centre for Economic Performance, LSE.
48. Office for National Statistics (2021). [Births in England and Wales: 2020](#). *Office for National Statistics*.
49. Office for National Statistics (2021). [National Life Tables – Life Expectancy in the UK](#). *Office for National Statistics*.
50. Centre for Ageing Better (2020). [The State of Ageing in 2020](#). Centre for Ageing Better.
51. Walsh, P. (2021). [Policy Primer: The UK's 2021 Points-Based Immigration System](#). *The Migration Observatory*.
52. Home Office (2021). [The UK's Points-Based Immigration System: Policy Statement](#). *GOV.UK*.
53. Construction Industry Training Board (2021). [Migration in the UK Construction and Built Environment Sector](#). Construction Industry Training Board.

54. Office for National Statistics (2021). [Business Insights and Impact on the UK Economy: 9 September 2021.](#)
55. CIPD (2021). [Addressing Skills and Labour Shortages Post-Brexit.](#) CIPD.
56. Office for National Statistics (2021). [An Overview of Workers Who Were Furloughed in the UK: October 2021.](#) Office for National Statistics.
57. Office for National Statistics (2021). [Coronavirus and Changing Young People's Labour Market Outcomes in the UK.](#) Office for National Statistics.
58. Wilson, T. *et al.* (2021). [An Unequal Crisis: The Impact of the Pandemic on the Youth Labour Market.](#) Institute for Employment Studies.
59. Office for National Statistics (2021). [Characteristics of People Who Have Been Furloughed in the UK.](#) Office for National Statistics.
60. Brewer, M. *et al.* (2021). [Post-Furlough Blues: What Happened to Furloughed Workers After the End of the Job Retention Scheme?](#) The Resolution Foundation.
61. Elliot Major, L. *et al.* (2021). [Unequal Learning and Labour Market Losses in the Crisis: Consequences for Social Mobility.](#) Centre for Economic Performance, LSE.
62. Nabarro, B. (2021). [UK Economic Outlook: The Future Isn't What It Used To Be.](#) in *IFS Green Budget*. Institute for Fiscal Studies.
63. Henehan, K. *et al.* (2021). [An Intergenerational Audit for the UK.](#) The Resolution Foundation.
64. Crossley, T. *et al.* [A Year of COVID: The Evolution of Labour Market and Financial Inequalities Through the Crisis.](#) Understanding Society.
65. Řihová, H. (2016). [Using Labour Market Information: Guide to Anticipating and Matching Skills and Jobs. Volume 1.](#) Publications Office.
66. Bimrose, J. (2021). [Labour Market Information for Career Development: Pivotal or Peripheral?](#) in *The Oxford Handbook of Career Development*. (eds. Robertson, P. J. *et al.*) 282–296. Oxford University Press.
67. Office for National Statistics (2020). [Comparison of Labour Market Data Sources.](#) Office for National Statistics.
68. Vassilev, G. *et al.* (2021). [What's in a Job? Measuring Skills from Online Job Adverts.](#)
69. Garasto, S. *et al.* (2021). [Boosting Labour Market Intelligence for Local Decision-Makers.](#) *nesta*.
70. US Department of Labor [O*NET OnLine.](#)
71. European Commission (2020). [European Skills/Competences, Qualifications and Occupations \(ESCO\).](#)
72. Sleeman, C. *et al.* (2021). [The UK Needs a Skills Framework.](#) *nesta*.
73. Sleeman, C. (2021). [The Open Jobs Observatory.](#) *nesta*.
74. Sleeman, C. *et al.* (2021). [Open Jobs Observatory: Extracting skills from Online Job Adverts.](#) *nesta*.
75. McGowan, M. A. *et al.* (2015). [Labour Market Mismatch and Labour Productivity: Evidence from PIAAC Data.](#) OECD.
76. Guvenen, F. *et al.* (2020). Multidimensional Skill Mismatch. *American Economic Journal: Macroeconomics*, Vol 12, 210–244.
77. Industrial Strategy Council (2019). [UK Skills Mismatch in 2030.](#) Industrial Strategy Council.
78. The Edge Foundation (2021). [Skills Shortages Bulletin: Summary.](#) The Edge Foundation.
79. Wilson, R. *et al.* (2020). [Working Futures, 2017-2027: Long-Run Labour Market and Skills Projections for the UK.](#) Institute for Employment Research Warwick; Cambridge Econometrics.
80. CBI *et al.* (2021). [Skills for an Inclusive Economy: CBI/Birkbeck Education and Skills Survey 2021.](#) CBI; Birkbeck.
81. The Open University (2021). [The Open University Business Barometer.](#) The Open University.
82. Augar, P. (2019). [Post-18 Review of Education and Funding: Independent Panel Report.](#) Post-18 Education and Funding Review Panel.
83. Field, S. (2018). [The Missing Middle: Higher Technical Education in England.](#) The Gatsby Foundation.
84. Mason, G. (2020). Higher Education, Initial Vocational Education and Training and Continuing Education and Training: Where Should the Balance Lie? *Journal of Education and Work*, Vol 33, 468–490. Routledge.
85. Britton, J. *et al.* (2020). [Post-18 Education - Who is Taking the Different Routes and How Much Do They Earn?](#) Centre for Vocational Education Research.
86. Billing, F. *et al.* (2021). [Building Workforce Skills at Scale to Thrive During—and After—the COVID-19 Crisis.](#) *McKinsey&Company*.
87. Deming, D. J. (2017). The Growing Importance of Social Skills in the Labor Market. *The Quarterly Journal of Economics*, Vol 132, 1593–1640.
88. Dickerson, A. *et al.* (2019). [The Changing Demand for Skills in the UK.](#) Centre for Vocational Education Research.
89. Learning and Work Institute (2021). [Getting the Basics Right: The Case for Action on Adult Basic Skills.](#) Learning and Work Institute.
90. OECD (2020). [Raising the Basic Skills of Workers in England, United Kingdom.](#) Organisation for Economic Co-operation and Development.
91. Pensiero, N. *et al.* (2018). The Effects of Post-Compulsory Education and Training Systems on Literacy and Numeracy Skills: A Comparative Analysis Using PISA 2000 and the 2011 Survey of Adult Skills. *European Journal of Education*, Vol 53, 238–253.
92. Lloyds Bank (2021). [2021 Essential Digital Skills Report.](#) Lloyds Bank.
93. HM Treasury (2021). [Autumn Budget and Spending Review 2021.](#) HM Treasury.
94. CIPD (2019). [Productivity and Place: The Role of LEPs.](#) CIPD.
95. Government Office for Science (2017). [Future of Skills and Lifelong Learning.](#) Government Office for Science.
96. Sissons, P. (2021). The Local Low Skills Equilibrium: Moving from Concept to Policy Utility. *Urban Studies*, Vol 58, 1543–1560.
97. Green, A. E. *et al.* (2021). Public Policy for Addressing the Low-Skills Low-Wage Trap: Insights from Business Case Studies in the Birmingham City Region, UK. *Regional Studies*, Vol 55, 333–344. Routledge.
98. Government Office for Science (2021). [Low Skill Traps in Sectors and Geographies: Underlying Factors and Means of Escape.](#) Government Office for Science.
99. Office for National Statistics (2019). [Overeducation and Hourly Wages in the UK Labour Market; 2006 to 2017.](#) Office for National Statistics.
100. CIPD (2018). [Over-Skilled and Underused: Investigating the Untapped Potential of UK Skills.](#) CIPD.
101. Keep, E. (2016). [Improving Skills Utilisation in the UK - Some Reflections on What, Who and How?](#) SKOPE.
102. Department for Education (2020). [A Plan for an Adult Skills and Lifelong Learning Revolution.](#) House of Commons Education Committee.
103. Barnes, S.-A. *et al.* (2016). [Education as the Underpinning System: Understanding the Propensity for Learning Across the Lifetime.](#) Government Office for Science.
104. OECD (2021). [OECD Skills Outlook 2021: Learning for Life.](#) OECD.
105. Kantar Public (Firm) *et al.* (2018). [Decisions of Adult Learners.](#) Department for Education.
106. Education and Training Foundation (2020). [So What is the FE Sector? A Guide to the Further Education System in England.](#) Education and Training Foundation.

107. Department for Education (2021). [Further Education and Skills: Academic Year 2020/21](#). GOV.UK.
108. Britton, J. *et al.* (2020). [2020 Annual Report on Education Spending in England](#). The Institute for Fiscal Studies.
109. Department for Education (2019). [Community Learning: Statistical Data Set](#). GOV.UK.
110. OECD (2019). [Returns to Different Forms of Job Related Training: Factoring in Informal Learning](#). Vol 231, OECD.
111. Taylor, A. *et al.* (2021). How Well Equipped are National Surveys to Capture New Approaches to Training? *Journal of Education and Work*, Vol 34, 676–690.
112. Field, J. *et al.* (2016). [Skills and Lifelong Learning: Informal Learning in the Family and Community](#). Government Office for Science.
113. Winterbotham, M. *et al.* (2020). [Employer Skills Survey 2019: Training and Workforce Development](#). Department for Education.
114. Green, F. *et al.* (2019). [Training Trends in Britain](#). Unionlearn.
115. Jiaqi Li *et al.* (2020). [Trends in Job-Related Training and Policies for Building Future Skills into the Recovery](#). Centre for Vocational Education Research.
116. Clayton, N. *et al.* (2021). [Learning at Work: Employer Investment in Skills](#). Learning and Work Institute.
117. Department for the Economy (2021). [ApprenticeshipsNI Statistics from August 2013 to April 2021](#). Department for the Economy.
118. Department for Education (2021). [Apprenticeships and Traineeships, Academic Year 2020/21](#).
119. Welsh Government (2021). [Apprenticeship Learning Programmes Started: Interactive Dashboard](#). GOV.WALES.
120. Skills Development Scotland (2021). [Modern Apprenticeships](#). Skills Development Scotland.
121. Conlon, G. *et al.* (2021). [The Impact of the Apprenticeship Levy on Apprenticeships and Other Training Outcomes](#). Centre for Vocational Education Research.
122. Dickinson, P. *et al.* (2021). [The Benefits of Hindsight: Assessing the Impact of Apprenticeship Reforms on Employer Behaviour](#). Warwick Institute for Employment Research.
123. Evans, S. *et al.* (2019). [Bridging the Gap: Next Steps for the Apprenticeship Levy](#). Learning and Work Institute.
124. Newton, O. *et al.* (2017). [Our Plan For Apprenticeships](#). The Edge Foundation.
125. McIntosh, S. *et al.* (2018). [Labour Market Outcomes of Older Versus Younger Apprentices: A Comparison of Earnings Differentials](#). Centre for Vocational Education Research.
126. Henehan, K. (2019). [Trading Up or Trading Off?: Understanding Recent Changes to England's Apprenticeship System](#). The Resolution Foundation.
127. Field, S. (2018). [Taking Training Seriously: Lessons From an International Comparison of Off-the-Job Training for Apprenticeships in England](#). The Gatsby Foundation.
128. Education and Skills Funding Agency (2021). [Apprenticeship Funding Rules](#). GOV.UK.
129. Richmond, T. (2020). [Runaway Train: Why the Apprenticeship Levy Is Broken and How to Fix It](#). EDSK.
130. Hall, S. *et al.* (2021). [Adult Participation in Learning Survey 2021](#). Learning and Work Institute.
131. Johnson, B. (2021). [The Prime Minister's Levelling Up speech: 15 July 2021](#). GOV.UK.
132. Luchinskaya, D. *et al.* (2019). [The Adult Skills Gap: Is Falling Investment in UK Adults Stalling Social Mobility?](#) Social Mobility Commission.
133. Jenkins, A. (2021). Patterns of Participation and Non-Participation in Learning in Mid-Life and Their Determinants. *International Journal of Lifelong Education*, Vol 40, 215–228. Routledge.
134. OECD (2019). [Getting Skills Right: Future-Ready Adult Learning Systems](#). OECD.
135. Luchinskaya, D. *et al.* (2019). 'Virtuous' and 'Vicious' Circles? Adults' Participation in Different Types of Training in the UK and Its Association with Wages. *Social Inclusion*, Vol 7, 177–201.
136. Bhattacharya, A. *et al.* (2020). [\(Adult\) Education, Education, Education: How Adult Education Can Improve the Life Chances of Those on Low Incomes](#). Social Market Foundation.
137. Department for Education (2018). [Adult Education Survey 2016: Research Report](#). Department for Education.
138. Lisauskaitė *et al.* [Going Further: Further Education, Disadvantage and Social Mobility](#). The Sutton Trust.
139. Kosyakova, Y. *et al.* (2021). [Formal Adult Education and Socioeconomic Inequality: Second Chances or Matthew Effects?](#) *Sociology Compass*, Vol 15,
140. Janmaat, J. G. *et al.* (2013). Skills Inequality, Adult Learning and Social Cohesion In The United Kingdom. *British Journal of Educational Studies*, Vol 61, 7–24.
141. House of Commons Education Committee (2020). [A Plan for an Adult Skills and Lifelong Learning Revolution](#). House of Commons Education Committee.
142. Pennacchia, J. *et al.* (2018). [Barriers to Learning for Disadvantaged Adults](#). Department for Education.
143. Hupkau, C. *et al.* (2017). Post-Compulsory Education in England: Choices and Implications. *National Institute Economic Review*, Vol 240, 42–57. SAGE Publications Ltd.
144. House of Commons Environmental Audit Committee (2021). [House of Commons Environmental Audit Committee: Green Jobs](#). House of Commons Environmental Audit Committee.
145. Hector, M. (2021). [Transition to Ambition: Navigating the Careers Maze](#). Policy Connect.
146. Tuckett, A. *et al.* (2016). [Factors and Motivations Affecting Attitudes Towards and Propensity to Learn Through the Life Course](#). Government Office for Science.
147. Averill, P. *et al.* (2019). [Post-18 Choice of Part-Time Study](#). Department for Education.
148. Thornton, A. *et al.* (2018). [College Staff Survey 2018: Main Report](#). Department for Education.
149. Thornton, A. *et al.* (2020). [College Staff Survey 2019 Follow-Up: Research Report](#). Department for Education.
150. Education and Skills Funding Agency (2021). [ESFA Funded Adult Education Budget \(AEB\): Funding and Performance Management Rules 2021 to 2022](#). Education and Skills Funding Agency.
151. Department for Education (2021). [Reforms to Post-16 Qualifications at Level 3 in England: Policy Statement](#).
152. Zahawi, N. *et al.* (2021). [Nadhim Zahawi Addresses Association of Colleges Conference](#). GOV.UK.
153. Department for Education (2021). [Review of Post-16 Qualifications at Level 3 in England: Impact Assessment](#). Department for Education.
154. Walker, T. *et al.* (2020). [Learning to Level Up: The Role of Skills in Tackling Job Insecurity Through Brexit and Covid-19](#). Work Foundation.
155. Office for Students (2021). [Guide to Funding 2021-22](#). Office for Students.
156. Waltmann, B. *et al.* (2021). [Big Changes Ahead For Adult Education Funding? Definitely Maybe](#).
157. Whieldon, F. (2021). [Calls for ELQ Rule Reform Ahead of Lifelong Loan Entitlement](#). FE Week.
158. Schuller, T. (2017). [Skills and Lifelong Learning: The Benefits of Adult Learning](#). Government Office for Science.
159. Midtsundstad, T. (2019). A Review of the Research Literature on Adult Learning and Employability. *European Journal of Education*, Vol 54, 13–29.

160. Department for Education (2021). [Further education: outcome-based success measures, Academic Year 2018/19.](#) GOV.UK.
161. Department for Education [Graduate Outcomes \(LEO\), Methodology.](#)
162. Conlon, G. *et al.* (2018). [Understanding the Limitations of Graduate Outcome Measures in Higher Education.](#) London Economics.
163. Anderson, O. *et al.* (2021). [Post-16 Education and Labour Market Activities, Pathways and Outcomes \(LEO\).](#) Department for Education.
164. Battiston, A. *et al.* (2019). [Labour Market Outcomes Disaggregated by Subject Area Using the Longitudinal Education Outcomes \(LEO\) Data.](#) Centre for Vocational Education Research.
165. Henehan, K. (2020). [Can Training Help Workers Change Their Stripes?](#) The Resolution Foundation.
166. Department for Education (2021). [Measuring the Net Present Value of Further Education in England 2018 to 2019.](#) Department for Education.
167. Bhutoria (2016). [Skills and Lifelong Learning: Economic Returns to Education.](#) Government Office for Science.
168. Cara, O. *et al.* (2012). [The Relationship Between Adult Learning and Wellbeing: Evidence from the 1958 National Child Development Study.](#) Department for Business, Innovation and Skills.
169. Panayitou, S. *et al.* (2018). [Quantitative Programme of Research for Adult English and Maths: Longitudinal Survey of Adult Learners Final Research Report.](#) Department for Education.
170. Rüber, I. E. *et al.* (2021). Does Participation in Adult Education Increase Volunteering? An Analysis of British Longitudinal Data. *Adult Education Quarterly*, Vol 71, 55–72.
171. OECD (2013). [OECD Skills Outlook 2013: First Results from the Survey of Adult Skills.](#) OECD.
172. Office for National Statistics (2021). [Mapping Loneliness During the Coronavirus Pandemic.](#) Office for National Statistics.
173. Ministry of Housing, Communities & Local Government (2018). [Measuring the Impact of Community-Based English Language Provision: Findings from a Randomised Controlled Trial.](#) Ministry of Housing, Communities & Local Government.
174. Field, J. (2012). [Is Lifelong Learning Making a Difference? Research-Based Evidence on the Impact of Adult Learning.](#) in *Second International Handbook of Lifelong Learning*. (eds. Aspin, D. N. *et al.*) 887–897. Springer Netherlands.
175. Field, J. (2011). Adult Learning, Health and Well-Being – Changing Lives. *Adult Learner 2011: The Irish Journal of Adult and Community Education*, 13–25.
176. Feinstein, L. *et al.* (2004). The Contribution of Adult Learning to Health and Social Capital. *Oxford Review of Education*, Vol 30, 199–221.
177. IPSOS MORI *et al.* (2018). [Community Learning Mental Health Research Project.](#) Department for Education.
178. Pember, S. (2021). [Levelling Up Adult Community Education: What Does the Data Tell Us?](#) Hoxby; FETL.
179. The Centenary Commission on Adult Education (2019). [The Centenary Commission on Adult Education – Adult Education and Lifelong Learning for 21st Century Britain.](#) The Centenary Commission.
180. The Centre for Social Justice (2020). [The Long Game: How to Reboot Skills Training for Disadvantaged Adults.](#) The Centre for Social Justice.
181. Costa, R. *et al.* (2018). *Investing in People: The Case for Human Capital Tax Credits.* Centre for Vocational Education Research.
182. McNally, S. *et al.* (2021). [Retraining: Which are the Best Policies for Getting People Back to Work?](#) *Economics Observatory.*
183. In-Work Progression Commission (2021). [Supporting Progression Out of Low Pay: A Call to Action.](#) In-Work Progression Commission.
184. Learning and Work Institute *et al.* (2020). [Learning Ladders: The Role of Adult Training in Supporting Progression from Low Pay.](#) Social Mobility Commission.
185. Sissons, P. *et al.* (2016). Local Industrial Strategy and Skills Policy in England: Assessing the Linkages and Limitations – A Case Study of the Sheffield City Deal. *Local Economy*, Vol 31, 857–872. SAGE Publications Ltd.
186. Payne, J. (2018). LE(a)P in the Dark? Devolution, Local Skills Strategies and Inclusive Growth in England. *Journal of Education and Work*, Vol 31, 489–502.
187. Gambin, L. *et al.* (2016). [The UK Skills System: How Well Does Policy Help Meet Evolving Demand?](#) Government Office for Science.
188. Aldridge, F. *et al.* (2020). [When Furlough Has to Stop: Next Steps to Avert Long-Term Unemployment.](#) Learning and Work Institute; Reform.
189. Hughes, D. (2021). [To Really Level Up, Government Needs to Slow Down Its Defunding of Qualifications.](#) *Association of Colleges.*
190. Protect Student Choice Campaign (2021). [Protect Student Choice - Don't Scrap BTECS.](#) *Protect Student Choice.*