Inequality

The IFS Deaton Review

Education inequalities

Christine Farquharson
Sandra McNally
Imran Tahir

An IFS initiative funded by the Nuffield Foundation

IFS Institute for Fiscal Studies

Nuffield Foundation

CPP ESRC CENTRE FOR THE MICROECONOMIC ANALYSIS OF PUBLIC POLICY

Education inequalities

Christine Farquharson (Institute for Fiscal Studies), Sandra McNally (University of Surrey; Centre for Economic Performance, LSE) and Imran Tahir (Institute for Fiscal Studies)[1]

Executive summary

Changes in education over time

Education levels have risen over time, in the UK and internationally. The share of students achieving at least five good GCSEs or equivalent increased from under 40% in the early 1990s to a high of 82% in 2012, while the share of the working-age population with a degree has more than doubled since 2000 – from just under 20% in 2000 to just over 40% in 2020.

Despite rising qualifications, England stands out internationally for nearly non-existent improvements in skills when making comparisons across generations. In virtually all OECD countries, literacy and numeracy skills are substantially higher among young people aged 16–24 than among the older generation (aged 55–65). England is the exception to the rule: while its 55- to 65-year-olds perform relatively well, especially in literacy, young people in England have not improved on these skills at all. That has left England ranked 25th out of 32 countries in terms of the literacy skills of its young people.

Despite spending increases in the last few years, education spending as a share of national income is no higher than in the early 2000s. Taking into account the likely taxpayer cost of non-repaid student loans, UK education spending in 2020–21 was worth 4.8% of national income. A decade earlier, following years of real-terms growth, education spending had peaked at over 5.6% of national income.

Today's education inequalities are tomorrow's income inequalities

Higher levels of qualification are strongly associated with better prospects in the labour market. Around nine in ten graduates are in employment between their mid 20s and early 50s. Employment rates of people educated to GCSE level or below are far lower: among those in their 30s, for example, two in five women and one in five men are not in work. Graduates also enjoy higher earnings, with the median 40-year-old graduate earning twice as much as someone qualified to GCSE level or below. Despite a huge increase in the share of graduates, this 'wage premium' has barely budged in the last five decades, at least for men. There is good evidence that at least some of this wage premium is due to the causal impact of education improving people's outcomes, rather than just selecting and sorting people of differing ability.

[1] The authors are grateful to Anna Vignoles, Paul Johnson, Robert Joyce and the Deaton Review panel for many helpful contributions and suggestions, which have greatly improved the chapter.

People with lower levels of qualifications are also more exposed to slow earnings growth over their lives, with less opportunity for pay progression throughout their careers. Strikingly, the most common annual salary for low-educated 45- to 50-year-olds (i.e. those with qualifications at or below GCSE or equivalent) is between £15,000 and £20,000 – the same as for 25- to 30-year-olds with those qualifications.

The impact that education has on earnings depends on what and where people study, not just their level of qualifications. After accounting for a detailed set of characteristics, including prior attainment, women who study medicine or economics see an earnings boost of over 60% compared with similar peers who do not earn a degree. For women studying creative arts or agriculture, the average earnings premium is only around 10%. For men, graduates in some subjects have lower earnings than similar non-graduates. There are also major subject differences in the financial rewards to completing vocational education, with the highest returns in areas such as engineering, business or construction.

The financial rewards to education also depend on a young person's own characteristics, which can perpetuate inequalities in the labour market. Young people from better-off families – and especially those who attended private school – enjoy much higher financial rewards from completing a degree than their peers from disadvantaged backgrounds, even holding constant attainment during school and at university as well as subject and institution.

Unequal access to, and success in, the education system

Despite decades of policy attention, there has been virtually no change in the 'disadvantage gap' in GCSE attainment over the past 20 years. While GCSE attainment has been increasing over time, 16-year-olds who are eligible for free school meals are still around 27 percentage points less likely to earn good GCSEs than less disadvantaged peers. Children from disadvantaged backgrounds also make slower progress through secondary school: in the 2019 GCSE cohort, just 40% of disadvantaged children who achieved the expected level at age 11 went on to earn good GCSEs in English and maths, compared with 60% of their non-disadvantaged peers. And while virtually all (95%) of non-disadvantaged pupils who achieved above the expected level at age 11 went on to earn good GCSEs, one in six of primary school high achievers from disadvantaged backgrounds missed out on the GCSE benchmark.

These gaps are even wider when looking at more rigorous benchmarks for attainment. Pupils who were not eligible for free school meals are around three times as likely as their more disadvantaged peers to achieve above the expected level at age 11 and at GCSE. They were also three times more likely to attend one of the most selective higher education institutions.

But the role of family background is not limited to the poorest – household income is a strong predictor of attainment for better-off families too. While around 40% of young people who just miss out on free school meals achieve good GCSEs, that rises to 70% of 16-year-olds in the richest third of families. Even within this better-off group, family income is an important predictor of higher levels of attainment: children in the 10% richest families are more than twice as likely as those in the seventh decile to earn at least one A or A* grade at GCSE. And while 71% of private school students had earned a degree by age 26, just 17% of those from the poorest fifth of families had reached that milestone. More than half of the latter group had not progressed beyond GCSE level.

The COVID-19 pandemic has significantly worsened overall outcomes as well as widening inequalities. The share of pupils leaving primary school meeting literacy and numeracy benchmarks fell from 65% in 2018–19 to 59% in 2021–22. (The government's levelling up agenda aims to see this reach 90% by 2030.) Children from more disadvantaged backgrounds may have fallen twice as far behind as the average child, in part due to worse experiences with home learning. Disadvantaged children had less access to resources to learn at home. They were less likely to receive resources such as online classes during the first lockdown, and more likely to be absent more frequently and for longer than their better-off peers.

While girls consistently and substantially outperform boys in the education system, their educational success has not translated into gains in the labour market. Girls are around 10 percentage points more likely than boys to reach attainment benchmarks at various stages of the education system. This gap is long-standing: it has been clear in GCSE performance for over three decades now, and the number of women completing degrees has exceeded the number of men doing so since the 1990s. But while women are more likely to progress to higher education, they are less likely to select subjects such as computer science, engineering or maths. And women's outperformance in the education system has not led to outperformance in the labour market – rather, somewhat lower wages early in women's careers are then held back further relative to men once they have children.

Educational inequalities by ethnicity are nuanced – children from ethnic minority backgrounds typically start out behind white peers, but make much faster progress. By age 19, all major ethnic groups are more likely than white pupils to have earned A levels or equivalent qualifications. And by age 26, white British pupils are the least likely to hold a degree and the most likely to have stopped their education at GCSE or below. Despite the educational success of some ethnic minorities, however, young people from non-white backgrounds continue to face disadvantage in apprenticeships and in the labour market.

Educational attainment in London outstrips that in much of the rest of England. London benefits from both better performance and lower inequality than other parts of the country. All local authorities in London perform above the national average in the share of 11-year-olds meeting expectations in reading, writing and maths. The disadvantage gap in GCSE performance in Inner London is less than half as wide as that in the rest of the country.

Despite this, the biggest predictors of educational disadvantage relate to people, not places. Attainment gaps between the government's new 'Education Investment Areas' and the rest of the country are only around a quarter as large as the gaps by eligibility for free school meals. A 16-year-old's family income is more than four times as strong a predictor of GCSE attainment as their local authority of residence.

The development of educational inequalities during the school years

Differences in educational attainment emerge early in childhood and develop throughout an individual's lifetime. Even prior to beginning school, there are differences in children's cognitive and socio-emotional skills. During the school years, these educational inequalities crystallise; only 8% of young people who were not meeting expectations in reading, writing and maths at the end of primary school went on to achieve pass grades in GCSE English and maths.

Education spending in England has become less progressive over time. In 2000, primary school pupils in the most disadvantaged fifth of schools attracted around 20% more funding than those in the most affluent fifth. This premium rose to 35% by 2010, but the past decade has seen all of this increase in progressivity disappear due to both the shifting demographics of disadvantage and explicit policy choices in the school funding formula.

By contrast, the gap between private and state schools in per-pupil resources has doubled since 2010. In 2009–10, the average state school pupil attracted £8,000 a year of total funding (both day-to-day and investment spending). On average, private school fees (less bursaries) were around £3,100 higher. By 2020–21, state school spending had slipped slightly while private school fees increased in real terms, leaving the gap at £6,500.

Significant reductions in class sizes can have a significant effect on learning outcomes, but achieving big reductions in class size is expensive. To cut primary school class sizes from the current average of 27 pupils to 17 pupils would mean creating around 60% more classes, which would cost £6 billion in teacher salaries alone (assuming these additional teachers could be found).

Ensuring that all schools hire and retain effective teachers is key to mitigating educational inequalities. An excellent teacher at the front of the classroom is crucial, and having a good rather than an average teacher carries lifelong benefits for earnings as well as behavioural skills. But among the 10% most disadvantaged schools in England, nearly a quarter were assessed by Ofsted to have teaching that 'requires improvement' or is 'inadequate'. In the 10% least disadvantaged schools, by contrast, virtually all teaching was rated 'good' or 'outstanding'.

The current way of allocating pupils to schools disadvantages children from lower-income backgrounds and those in rural areas. The school choice system gives substantial weight to distance in deciding which pupils can access what schools. This pushes up house prices near the most in-demand schools, pricing out those on lower incomes. Meanwhile, children in rural areas have fewer schools to choose from in the first place.

Education inequalities beyond the school years

GCSE attainment is a crucial indicator of a young person's eventual level of qualification. The better someone scores at GCSE, the more likely they are to hold advanced qualifications. It is extremely unlikely for someone in the bottom fifth of GCSE scores to earn a degree by their mid 20s. On the other hand, nearly 80% of young people in the top 10% of the GCSE distribution have a degree a decade later.

While there is some catch-up, a sizeable share of the population does not progress beyond (or even to) basic levels of qualifications. Nearly half of pupils who have not achieved at least five good GCSEs or equivalent by age 16 still have not obtained them by the age of 19. Only a third of those who have not reached this benchmark by age 19 achieve it by their mid 20s.

Between 2010–11 and 2020–21 there was a significant decline in the number of adult learners. The number of learners studying basic skills qualifications (at Level 2 or below) has nearly halved in the past decade.

Adults in the UK were a quarter as likely to start an advanced vocational qualification as adults in the US. Among OECD countries, the UK has one of the lowest rates of adults taking advanced vocational qualifications (Level 4 or Level 5) with only 1.5 adults per 1,000 population starting such a qualification in 2019.

Since the early 2000s, there have been large falls in spending on adult education. Spending in 2019–20 was nearly two-thirds lower in real terms than in 2003–04 and about 50% lower than in 2009–10. This fall was mainly driven by the removal of public funding from some courses, which has made it more difficult for adult learners to access funding for courses at lower levels.

Building a more equal education system

We set out seven 'guiding principles' for policymakers to support a more equal education system:

Look at the education system as a whole. Educational inequalities start early in life, but every stage of the system plays a role in shaping – and reducing – inequality. Reforms to the education system should consider the entire system, including how different stages interact. Targets that focus only on one stage of education can store up problems elsewhere in the system.

Early intervention is important – but it must be followed up. Intervening in the early years can be an effective and efficient way of supporting a more equal education system: preventing inequalities from opening up in the first place is often cheaper than trying to close gaps later on. But early interventions work best when they are followed up by investments at subsequent stages of education.

Creating opportunities for everyone. Academic education is better catered for (and better resourced) in the post-compulsory system than vocational education – even though over half of young people do not go on to A levels after completing their GCSEs. The education system must offer high-quality options to young people who pursue vocational options, especially to ensure that they develop the general skills needed to be resilient and adaptable to a changing labour market.

Invest in education. While delivering high-quality education is a complex process, adequate funding is a necessary starting point. Government spending on education has fallen significantly over the last decade, especially on further education, and funding for the COVID recovery package in England is likely to fall short of the scale of the challenge. There is increasingly clear evidence that spending really does matter for pupil achievement – though, of course, resources need to be used well to be most effective.

Ensure people are making informed decisions. The education system is full of choices – which school to attend, what subjects to study, which post-compulsory route to take, whether to return for adult education later in life. There are many factors that go into decision-making that cannot be directly influenced by education policy and there is not just one route to success. But we should ensure that people have clear, easy-to-access information about the routes available to them, so that they can make the best decisions for their own circumstances.

Education is not just about test scores. In our view, the overall role of an education system is to support children, young people and adults to develop their own talents and to reach their full potential. Imparting knowledge and skills is a fundamental part of this. But other outcomes from the education system matter too – children's broader 'soft skills', their mental health and resilience, their physical health, their social and emotional development, and their ability to successfully navigate the challenges they will face in the workforce and in their lives are all important and deserve to be considered alongside knowledge and skills when making major decisions about the education system.

Educational inequalities cannot be solved by the education system alone. Family background has an extraordinarily strong influence on educational attainment. Educational inequalities are a consequence as well as a cause of wider economic inequality. In an economy where the financial returns to 'making it' in education are so high, there will always be pressure on parents to invest in helping their children to succeed. And in a society where the resources parents have to invest are so different, the education system will never be able to fully compensate for the vastly different experiences children have outside the school gates.

1. Introduction

Education is one of the most important predictors of people's life chances. Better-educated people are more likely to be in work and tend to earn more, and the influence of education does not stop there. Education shapes a range of other outcomes, including health, wealth and even happiness.

Explaining differences in education is therefore essential to understanding lifetime inequalities. In this chapter, we draw on an extensive body of evidence to further our understanding of education inequalities in today's world. The focus of our chapter is education inequalities in the United Kingdom (UK), and predominantly in England. But the lessons we draw will carry implications for settings across the world.

What do we mean by education inequalities?

Before continuing, it is important to be clear on precisely what we mean by education inequalities. In this chapter, we focus on three forms of inequalities:

1. Inequalities **by** education in life outcomes: How do long-term outcomes such as earnings or well-being differ between those with more and less education?

2. Inequalities **in** education between groups: How do patterns of educational attainment differ between groups? Does educational attainment reinforce existing patterns of disadvantage, or act as an engine of social mobility?

3. Inequalities **of** education: How do the resources and opportunities that the education system offers differ across children, young people and adults?

Distinguishing between the first two types of education inequalities is essential for clearly defining what we want to measure. In some contexts, it makes sense to consider education as an outcome in its own right – and so we will care quite a bit about how attainment varies between groups. In other cases, we can think about education as a stepping stone to facilitate many other outcomes. Here we might think more about the role that education plays in driving inequalities in the labour market, in health or in well-being.

The third type of educational inequality can be an important driver of inequalities by and, especially, in educational attainment. Throughout the second part of this chapter, we therefore examine how the structure of the education system and the resources that are allocated through it affect attainment, and therefore how they contribute to mitigating or exacerbating other sorts of inequalities.

How do we measure education?

Discussion of educational inequalities ideally centres on inequalities in skills, abilities and training. If we want to close the gap between different groups, it is not particularly useful to simply fiddle with grading systems to ensure more 'equal' outcomes – we want to 'level up' people's actual skills and abilities.

Despite their importance, measuring skills – as opposed to qualifications – can be difficult. In this chapter, we use data from a range of sources. Some of these do have good measures of skills, but by and large we measure education using qualifications. These are an imperfect proxy, but they are nevertheless informative about underlying skills and the differences in attainment between

groups. And qualifications can also be important per se: since observing skills in the real world is often difficult, society and individuals, such as employers, often rely upon qualifications as a measure of education.

What do we investigate?

In this study of education inequalities, we consider a variety of different issues and topics. However, we have in mind three principal questions which correspond to the three different types of educational inequalities we set out above:

1. Why do education inequalities matter? – We provide evidence on inequalities **by** education in life outcomes.

2. What inequalities does the existing education system produce? – We show the inequalities **in** education by gender, socio-economic status, ethnicity and place.

3. What causes education inequalities? – We consider inequalities **of** education during the schooling years and post-school.

The structure of this chapter

We begin our study, in Section 2, by introducing the UK education system and documenting broad trends in education both over time and compared with other countries. The remainder of the chapter is based around providing evidence to answer the three questions listed above. In Part I, we show that different education routes lead to different levels of earnings and other life outcomes. There are sizeable inequalities by education in life outcomes, which is why education inequalities are important.

Having established the importance of differences in education, in Part II we analyse the education inequalities produced by the existing education system. We document how educational attainment varies by socio-economic status, gender, ethnicity and region. We provide evidence that there are pervasive gaps in education between different groups of individuals.

In Part III, we analyse the drivers of education inequalities in the UK. We first look at factors that impact educational attainment during children's time in school, including the role of family, school and peers. We then consider whether the UK's post-compulsory education system can reduce existing educational inequalities, and how well the system is set up to allow students to get 'back on track' after falling behind.

Finally, we draw the policy implications of our analysis in Part IV and set out principles for building a more equal education system.

2. The UK education system in context

In the UK, every child is in full-time education between the ages of 5 and 16. Children generally begin primary school at age 5 and progress to secondary school at age 11. When compulsory full-time secondary education finishes at age 16, young people sit national examinations. While the four nations of the UK all broadly follow this structure (outlined in Figure 1), there are differences in the curriculum and the exams taken by pupils in each nation. In England, Northern Ireland and Wales, pupils follow a National Curriculum that is structured into phases known as Key Stages

(KSs) and are regularly tested throughout their time at school. Pupils in Scotland follow the Curriculum for Excellence and sit fewer tests during primary and secondary school.

Figure 1. Timeline of education in the UK

Box 1. Notable features of the UK's education system

While the UK has many features that are common to education systems around the world, there are several aspects of the education system that stand out when compared with other countries:

- high-stakes national exams at an early age (16), followed by a subsequent round of equally high-stakes exams for some just two years later;
- a narrow post-16 academic curriculum, which requires students to specialise in a maximum of three or four subjects and gives them the option to stop studying English and maths (provided they pass a minimum threshold in the age 16 exams);
- stark differences between academic and vocational education in terms of the structure, status and quality of options available;
- comparatively low levels of training and lifelong learning.

After completing compulsory secondary education at age 16, young people must decide what to do next. In England, pupils are legally obligated to remain in some form of education or training until the age of 18. While there is no such legal requirement in the other nations, the majority of young people choose to remain in education. For these young people, there are a range of post-16 education options available, including both academic and vocational routes.

For young people who successfully complete the requisite post-secondary education, there is the opportunity to progress to higher-level qualifications, such as advanced vocational courses and degrees. People can also pursue education later on in their life, either through workplace learning or by returning to formal education.

While Figure 1 shows a common timeline of education, it is important to note that individuals have vastly different experiences of their time in education. Even between the ages of 5 and 16, when everyone attends primary and secondary school, a child's experience of education will depend on factors such as their school, their peers and their teachers.

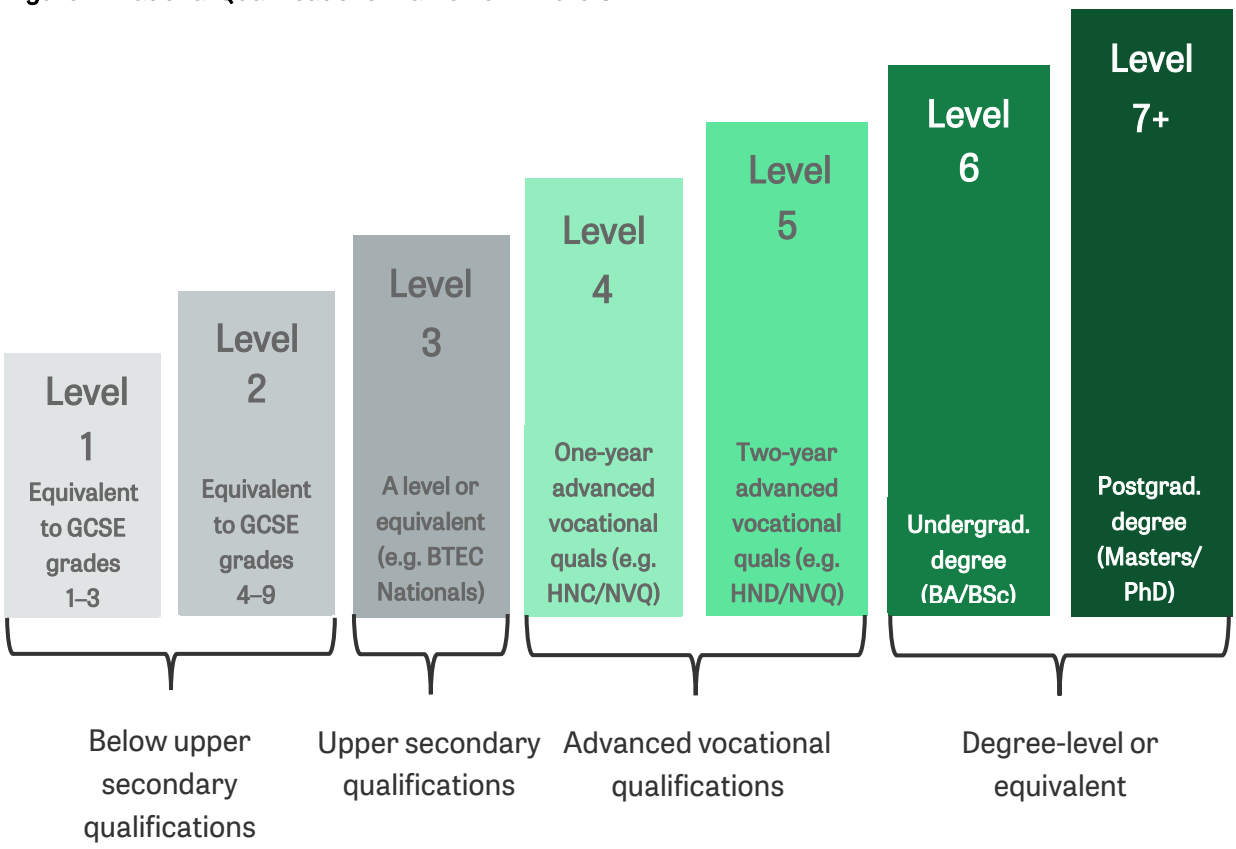
Following secondary school, education diverges depending on the choices that young people make. In the UK, there are multiple differences between the academic and vocational post-secondary educational tracks. One crucial one is that while young people taking the academic track predominantly study one set of qualifications (A levels in England, Northern Ireland and Wales; Highers in Scotland), there is a huge range of vocational routes, including both apprenticeships and classroom-based courses.

After finishing compulsory education, there are again many potential educational pathways. For those progressing to tertiary education, a range of different degrees and advanced vocational courses are available. Lastly, skill development does not conclude in the early 20s; people undergo (formal and informal) on-the-job training and can also decide to return to formal education.

Qualification levels in the UK

The different routes through the education system lead to many different types of qualifications. In order to easily compare these different qualifications, it helps to group them. The UK's National Qualification Framework (NQF) categorises each qualification into a level. In Figure 2, we illustrate the levels defined by the NQF and the types of qualifications that correspond to each level. In the remainder of this chapter, we refer to the levels defined by the NQF and also the qualification groups stated at the bottom of the schematic – Figure 2 will provide a useful reference to what we mean in each instance.

Figure 2. National Qualifications Framework in the UK



Note: The figure shows the qualifications framework used in England, Wales and Northern Ireland; Scotland employs its own qualifications framework called the Scottish Credit and Qualifications Framework (SCQF) which has 12 levels. However, we can still define the same groups of qualifications (e.g. advanced vocational and degree-level or equivalent) in Scotland.

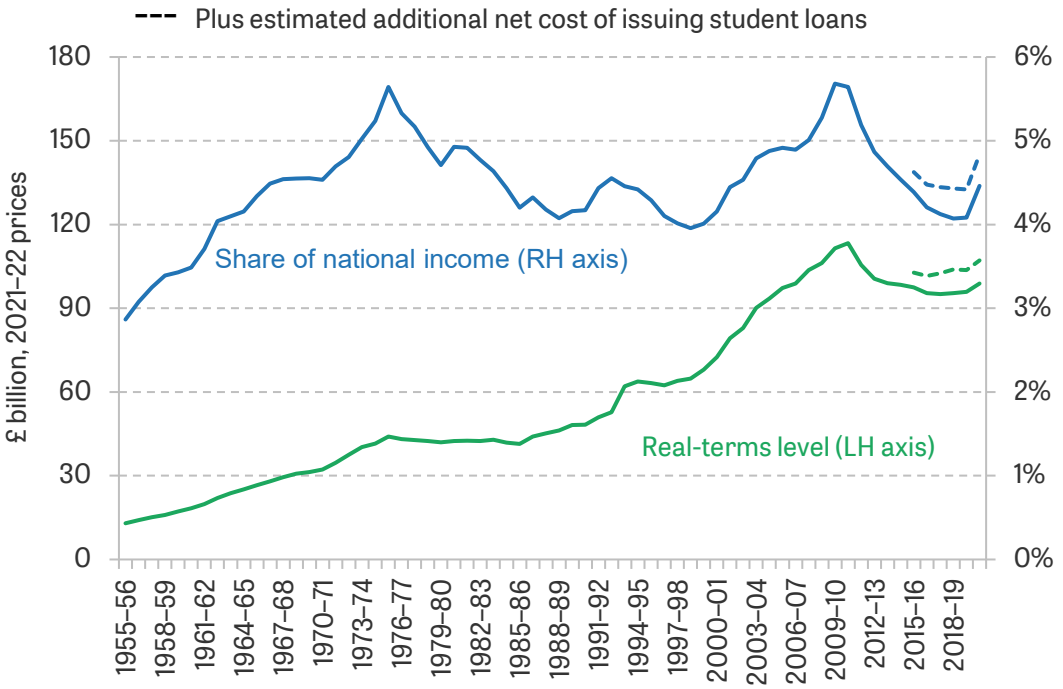
Apprenticeships can also be classified using the framework in Figure 2. There are different levels of apprenticeship: intermediate apprenticeships which are Level 2, advanced apprenticeships which are Level 3, higher apprenticeships which are at Levels 4–5 and degree apprenticeships which are at Level 6 and above.

Public spending on education in the UK

Since the 1950s, UK government spending on education has increased significantly in real terms. As a fraction of national income, though, education spending has remained between 4% and 6% since the mid 1960s. As we illustrate in Figure 3, public spending rose especially quickly from the late 1990s through to the late 2000s, with real-terms growth averaging about 5% per year between 1998–99 and 2010–11. However, education spending then fell from 2010 onwards as a result of public spending cuts. Between 2010–11 and 2019–20, spending on education declined by

over 15% in real terms, which resulted in total spending levels returning to 2005–06 levels, and the share of national income spent on education fell to levels last seen in the late 1990s.

Figure 3. UK education spending (in 2021–22 prices and as a share of national income)



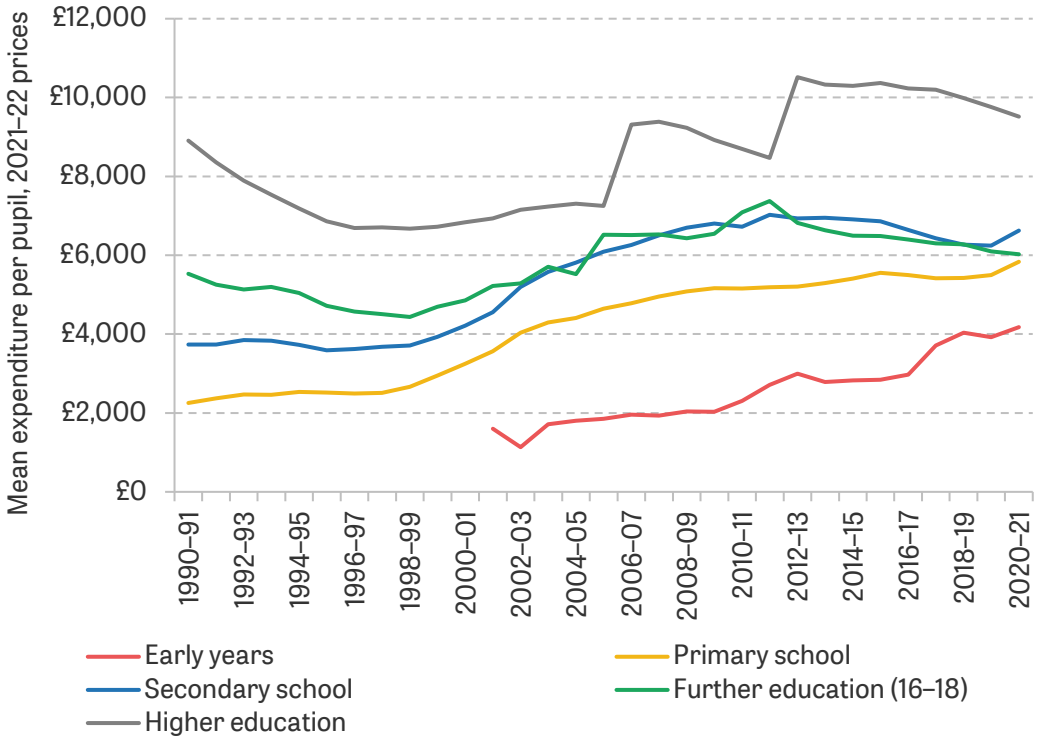
Note: Student loans figures are based on the estimated net cost to the Treasury, counting interest earned on the share of loans expected to be paid as a receipt and the share of loans expected to be written off as a cost.

Source: Figure 2.1 in Farquharson et al. (2021).

There have also been shifts in how government spending on education is allocated to different parts of the education system. Figure 4 shows spending per pupil across five different stages of education from 1990–91. In 1990–91, there was a very clear gradient across education stages: the older the pupils being taught, the higher the level of public spending (or resources) per pupil per year. Higher education spending was £8,900 per student per year, about four times the level of primary school spending per pupil. Further education spending was about £5,500 per student and nearly 2.5 times the level of primary school spending (and 1.5 times the level of secondary school spending) per pupil. Early years spending was very low (less than £100 million in total, with no centralised national programmes for early education) and is not shown on the graph as a result.

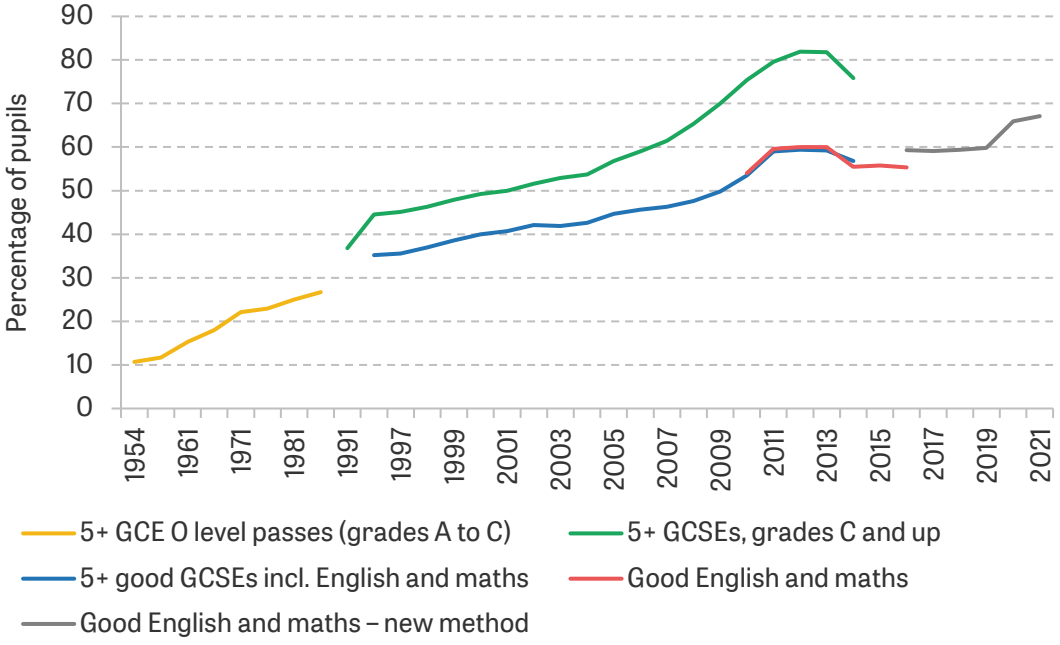
Since then, the gap in spending levels between different stages of education has narrowed. Today, higher education spending is just over one-and-a-half times the level of primary school spending per pupil, and further education spending per pupil is only slightly higher than the level of primary school spending per pupil. In addition, the level of early years spending has rapidly increased since the early 2000s. Therefore, although there still remains a spending gradient across the different stages of education, over the last three decades the relative differences have become smaller.

Figure 4. Real-terms spending per pupil or student per year at different stages of education



Source: Figure 4.1 in Farquharson et al. (2021).

Figure 5. Share of each academic cohort achieving school-leaving qualifications



Note: Covers pupils at schools in England and Wales to 1974; pupils in England thereafter. 'School-leaving qualifications' are defined as: five or more GCE O levels (grades A to C) and CSE grade 1 until 1986 (yellow); five or more GCSEs or equivalent qualifications (grades C and above) from 1991 to 2014 (green); five or more good GCSEs or equivalent qualifications, including English and maths, between 1996 and 2014 (blue); English and maths GCSEs at grade C or above from 2010 to 2016 (red); and English and maths GCSEs at grade 4 or above for 2016 onwards (grey). Results from 2020 and 2021 occurred during the COVID-19 pandemic and so are not based on externally moderated exams.

Source: Table 6 in Bolton (2012); Department for Education, 'Key stage 4 performance 2021' and predecessors.

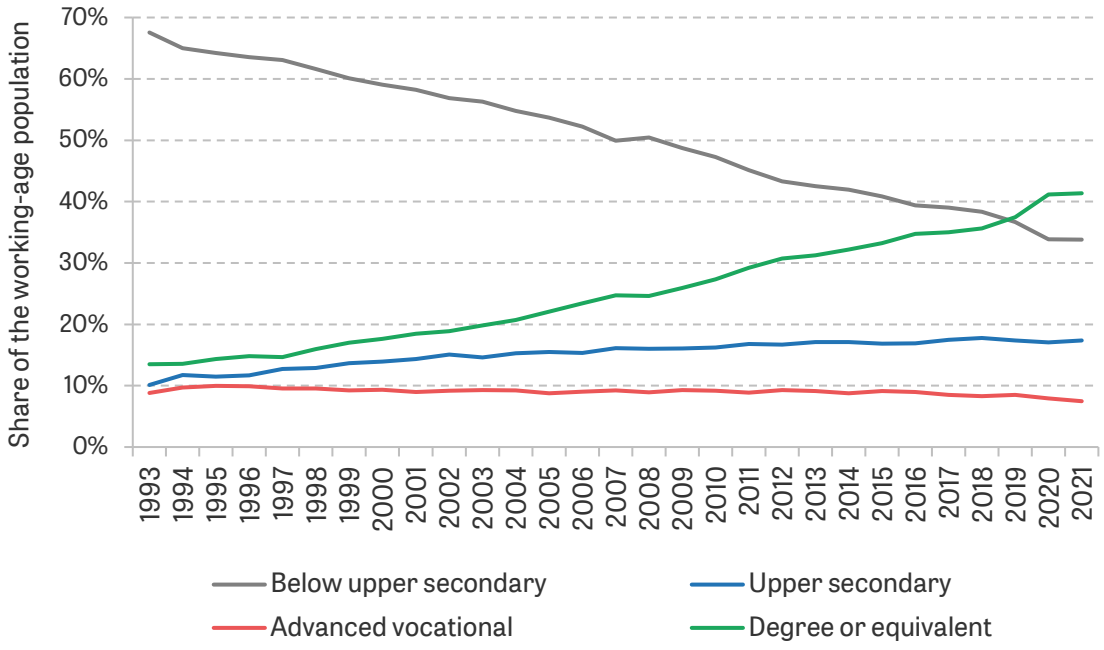
Trends in UK educational attainment

In the UK, there has been a long-run increase in the time that young people spend in education and an accompanying rise in levels of educational attainment. As we see in Figure 5, the share of young people successfully completing school-leaving qualifications has risen significantly since the 1950s, though successive changes to the definition of 'good' school-leaving qualifications have affected pass rates. In the early 1950s, just over 10% of each academic cohort were successfully achieving school-leaving qualifications – then at least five Certification of Secondary Education (CSE) qualifications at the top grade (1) or five O levels at grades A to C.

In 1988, England transitioned from the dual-track O-level and CSE system to a single system of GCSEs. Previously, CSE qualifications were designed to be accessible to a broader range of students than O levels. From 1988, all students were entered for GCSE examinations and so many more pupils were taking GCSEs than had been taking O levels. The introduction of GCSEs was also accompanied by a move away from measuring *relative* performance (how a pupil compared with their peers) to 'criterion-based assessment' (how well a pupil had mastered the learning objectives), as well as an end to the rationing of the top grades (Gibbs and Murphy, 1994).

Performance in GCSEs increased dramatically over time, with especially sharp year-on-year increases from the mid 2000s. By 2011, around 80% of the academic cohort in England and Wales successfully completed five good GCSEs or equivalent qualifications. Roughly 60% earned five good GCSEs including English and maths. Reforms to GCSEs in 2017 saw a small jump in the share of pupils achieving a (weak) pass in English and maths; the share achieving a strong pass (grade 5 or above) is considerably lower, at around 40%. Attainment jumped up in 2020 and 2021, as the COVID-19 pandemic led to the cancellation of externally assessed exams.

Figure 6. Highest qualification among the UK working-age population (aged 22–64)



Note: Among people with UK-based qualifications. Between 4% and 8% of the population had a different below-degree qualification as their highest.

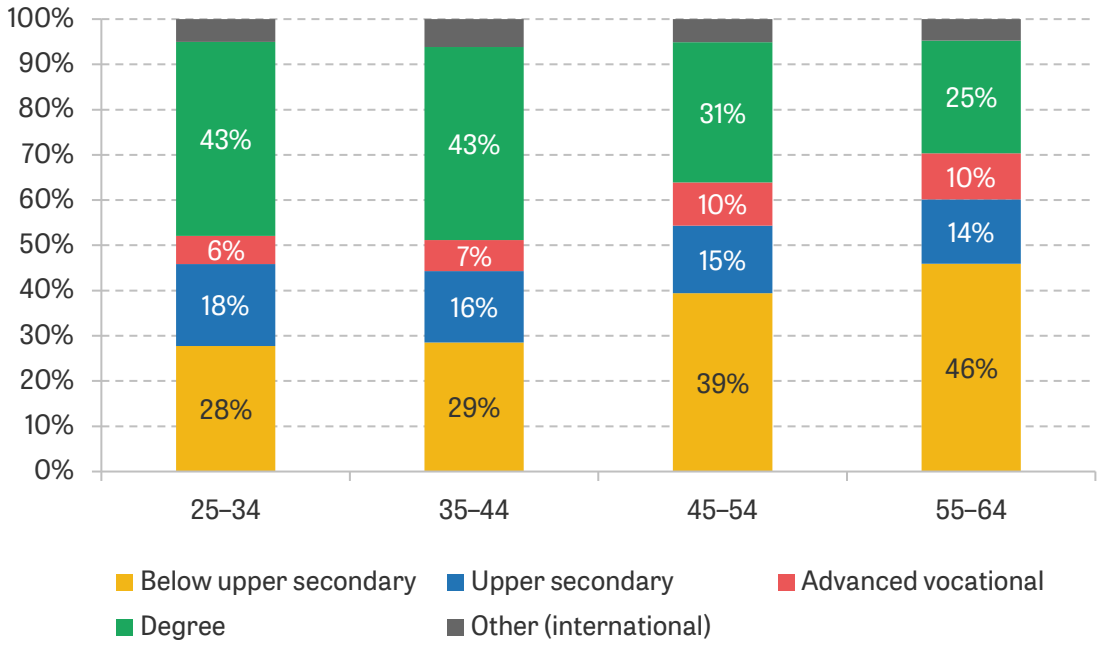
Source: Authors' calculations using the Labour Force Survey.

As well as a growing share of the population obtaining school-level qualifications, the UK has also experienced a rise in the number of people obtaining higher-level qualifications, especially degrees. In Figure 6, we show how the fraction of the working-age population (individuals aged 22–64) with a degree, as well as the share of people with other qualifications, has evolved since 1993.

In the early 1990s, more than two-thirds of the working-age population lacked upper secondary qualifications – they were educated to GCSE level at most. Less than 15% of the population held a degree or equivalent qualification. The last 30 years have seen an enormous change in the educational composition of the UK workforce. The share of workers educated to GCSE level or below has fallen dramatically, from around 65% to 34%. This has been mirrored by a huge increase in academic qualifications – a steady rise among those educated to upper secondary (A level or equivalent), and huge growth in the share with a degree. The latter group has more than trebled, meaning that more than 40% of the UK's working-age population held a degree by 2020. This reflects a long-run trend of increasing numbers of young people starting university each year (and is similar to what happened in other high-income countries). The number of applicants to universities reached a new record high in 2021 (Bolton, 2022). However, the share of the working-age population whose highest qualification level is an advanced vocational qualification has remained fairly constant throughout the period at around 10%.

The increase in time spent in education over recent decades and the rise in numbers of young people attending university have led to higher levels of educational attainment among younger generations. In Figure 7, we show levels of educational attainment across different age groups in 2019. We see that younger cohorts are more likely to have higher levels of qualifications. Over 40% of people aged between 25 and 44 have completed a degree-level or equivalent qualification, compared with roughly 25% of those aged between 55 and 64.

Figure 7. Highest qualification level among different age groups in the UK, 2019



Note: 'Other' includes people who were unable to map their highest qualification onto a UK equivalent – mostly those with international qualifications below degree level.

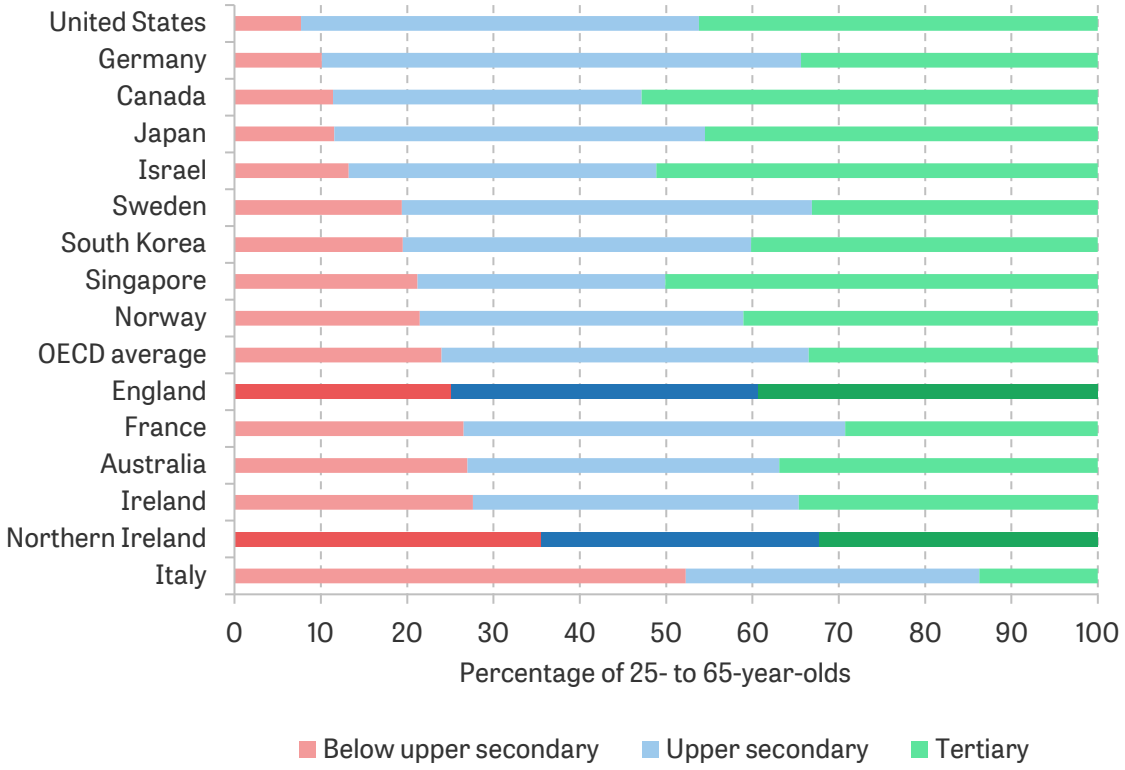
Source: Authors' calculations using the Labour Force Survey.

International comparisons in educational attainment

The UK is not the only nation to have experienced rising levels of education; education levels have risen globally over the past century (Roser and Ortiz-Ospina, 2016). To get a sense of how the UK compares with other countries, in Figure 8 we present the distribution of educational attainment in England and Northern Ireland alongside a selection of other developed countries.[2]

Figure 8 shows us that England's level of tertiary education – which includes both advanced vocational and degree-level qualifications – is above the OECD average and comparable to levels in many other developed countries. However, around a quarter of working-age adults in England are not educated to upper-secondary level. Northern Ireland fares even worse on this measure, with more than a third of adults not having progressed to upper-secondary qualifications.

Figure 8. Highest qualification level among the working-age population in selected OECD countries, 2019

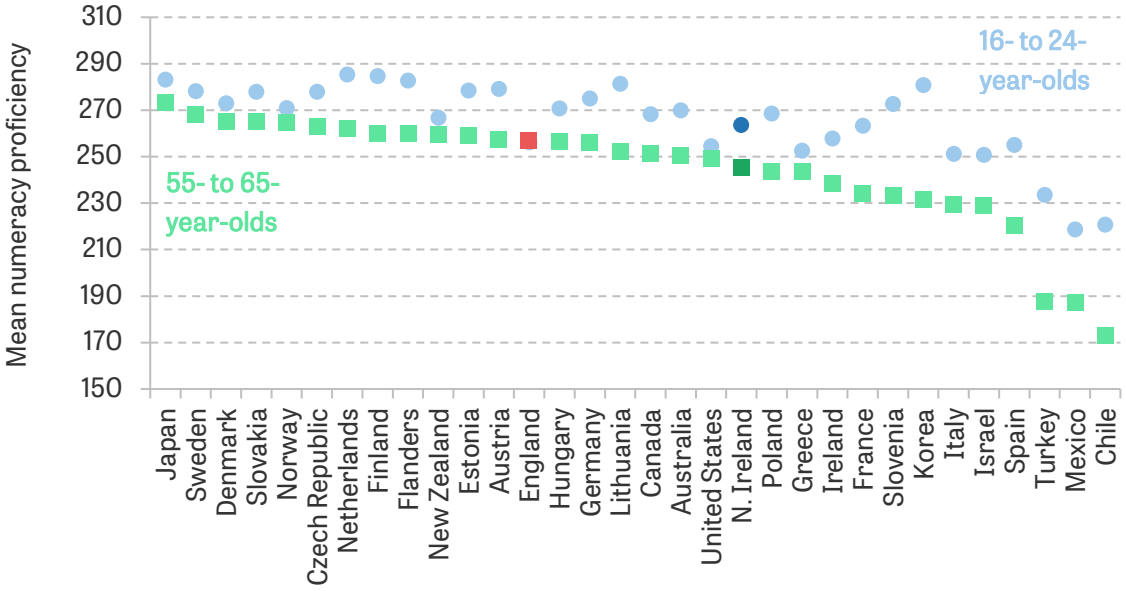


Note: The OECD classifies qualifications using the International Standard Classification of Education (ISCED) framework. In the graph, below upper secondary corresponds to ISCED 1, 2 and 3C short; upper secondary counts ISCED 3A, 3B, 3C long and 4; and tertiary includes ISCED 5A, 5B and 6. For more details, see UNESCO Institute for Statistics (2012).

Source: Table A3.14 in OECD (2019).

[2] Unfortunately, the OECD data used to produce this graph are only available for England and Northern Ireland and not the United Kingdom as a whole. In addition, the OECD data do not disaggregate education levels into the four categories used in the previous subsection; instead, vocational qualifications and degrees are combined into tertiary education.

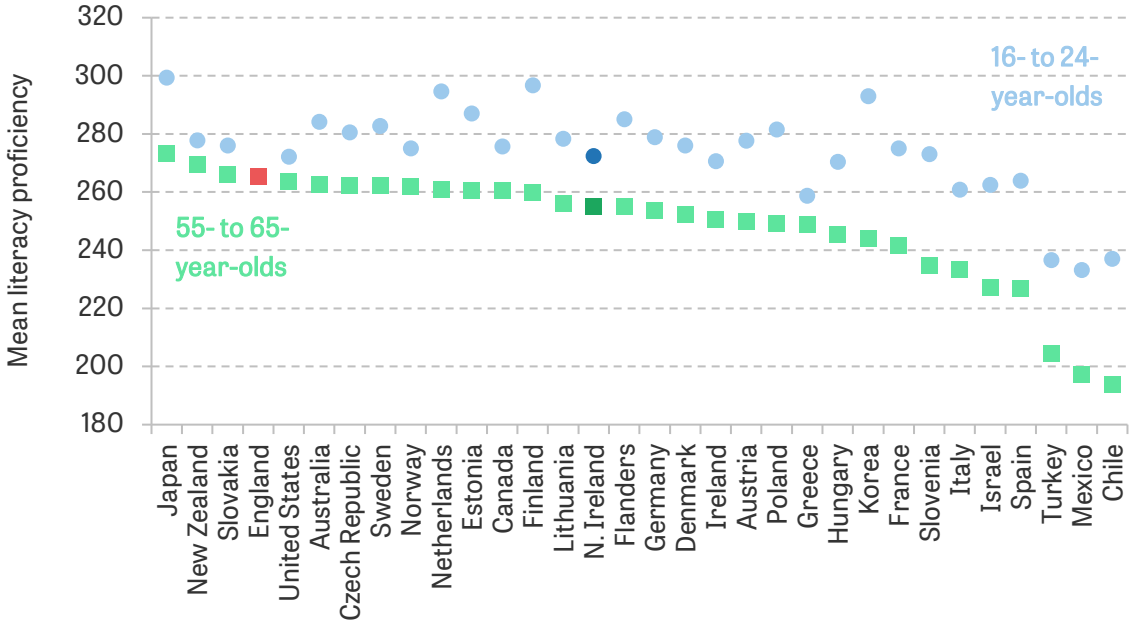
Figure 9. Mean numeracy proficiency score in selected OECD countries, 2019



Note: At this scale, the data points for 16- to 24-year-olds and 55- to 65-year-olds completely overlap in England. The numeracy proficiency score is measured on a scale from 0 to 500, with higher scores corresponding to higher levels of proficiency; one standard deviation on the numeracy scale is around 57 score points.

Source: Table A3.5(N) in OECD (2019).

Figure 10. Mean literacy proficiency score in selected OECD countries, 2019



Note: At this scale, the data points for 16- to 24-yearolds and 55- to 65-year-olds completely overlap in England. The literacy proficiency score is measured on a scale from 0 to 500, with higher scores corresponding to higher levels of proficiency; one standard deviation on the numeracy scale is around 48 score points.

Source: Table A3.5(L) in OECD (2019).

While the working-age population of England is broadly at the middle of the pack in the distribution of qualifications, England is unique in the stagnation in skills it has seen over the past decades when making comparisons across generations. Figures 9 and 10 present average numeracy and literacy proficiency scores – as measured by the OECD's Survey of Adult Skills – for younger and older age groups in a selection of countries.[3] Only in England do these overlap – meaning that, despite huge increases in the share of people achieving higher qualifications, younger generations are no more likely to be numerate or literate than those born four decades earlier.

[3] For more analysis of England's performance, see: Department for Business, Innovation and Skills (2013).

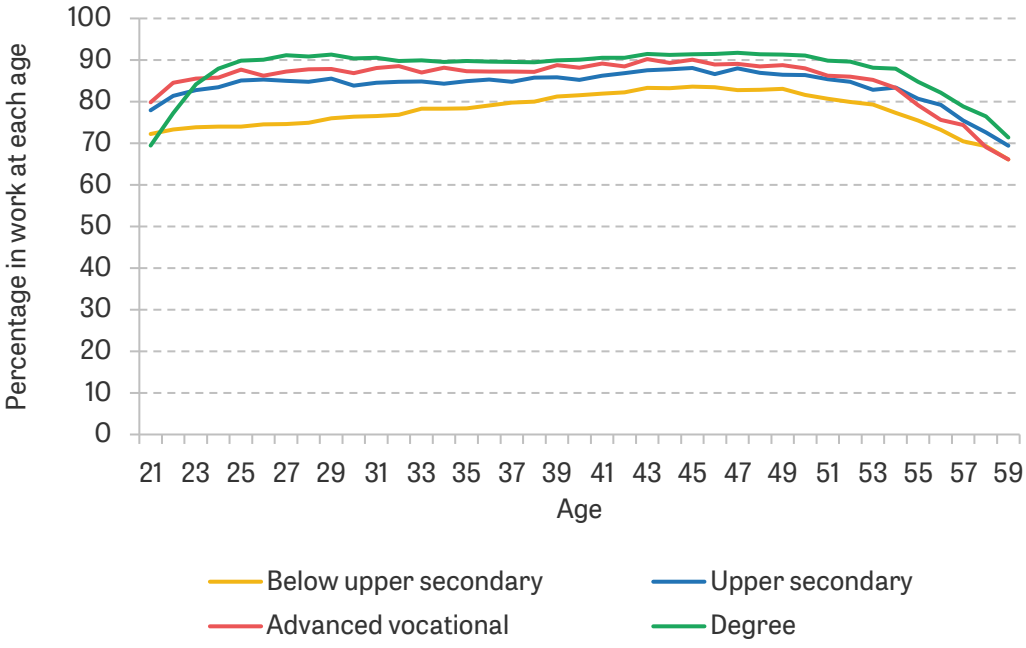
Part I. Inequalities by education

One of the reasons that educational inequalities attract substantial policy attention is the impact that education can have on later life outcomes – most obviously employment and earnings, but also outcomes such as health, happiness, marriage, crime, and civic participation. There is an enormous body of evidence showing that higher levels of education are strongly associated with better outcomes across these domains, and quite a few studies showing that there is at least some causal relationship. This means that the level of education that a person attains can dramatically shape their life chances across a range of areas. While all of these dimensions are important, in this part of the chapter we focus primarily on education's impacts on employment and earnings. These are some of the most studied relationships, and they form a crucial baseline for understanding other aspects of inequalities in the labour market (as discussed by Giupponi and Machin (2022) for this Review).

3. Associations between education and employment

We begin by considering how employment rates vary by education. In Figure 11, we present the percentage of people in employment at each age between 21 and 59 by their highest qualification level. Higher levels of education are associated with higher levels of employment for all ages (one exception is the early 20s, when many university students have not yet started to work). Between the mid 20s and early 50s, roughly 90% of graduates are in employment, which is higher than the employment rates of individuals with an advanced vocational qualification or upper-secondary education. The employment rates among those whose highest qualification level is below upper-secondary level are significantly lower. Among people in their 30s with below upper-secondary qualifications, for example, two in five women and one in five men are not in work.

Figure 11. Share of people in paid work, by age and highest qualification level



Source: Authors' calculations using the Labour Force Survey, 2019Q2–2020Q1.

Figure 12. Distribution of annualised earnings among employees educated to GCSE and to degree level, ages 25–30

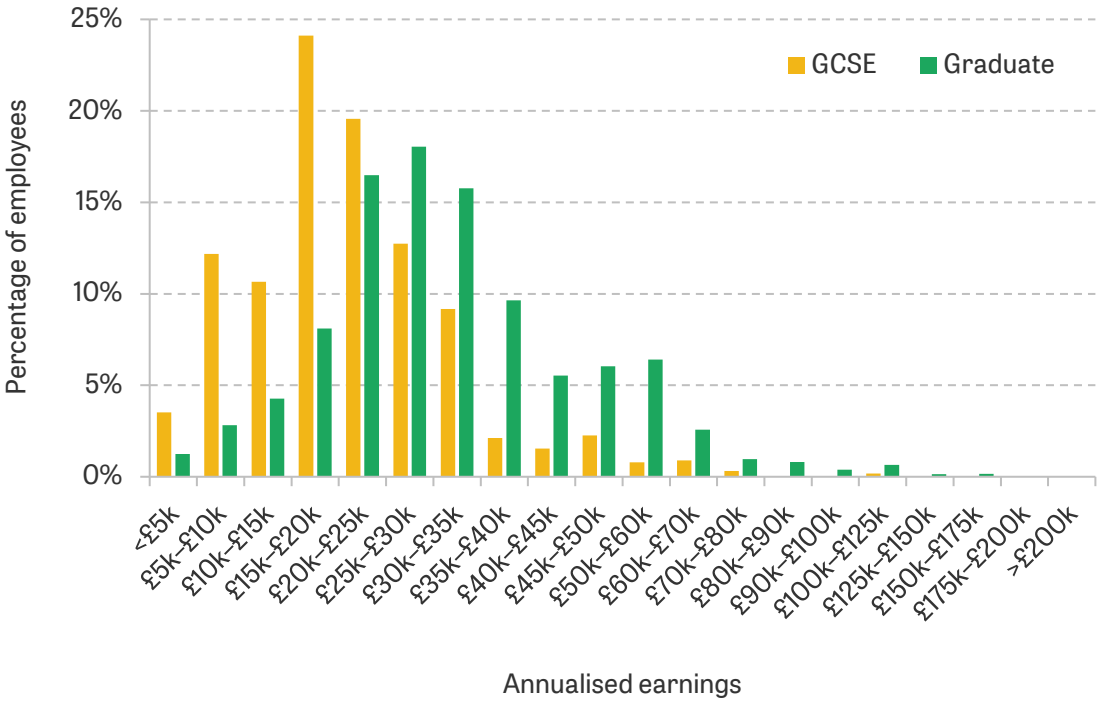
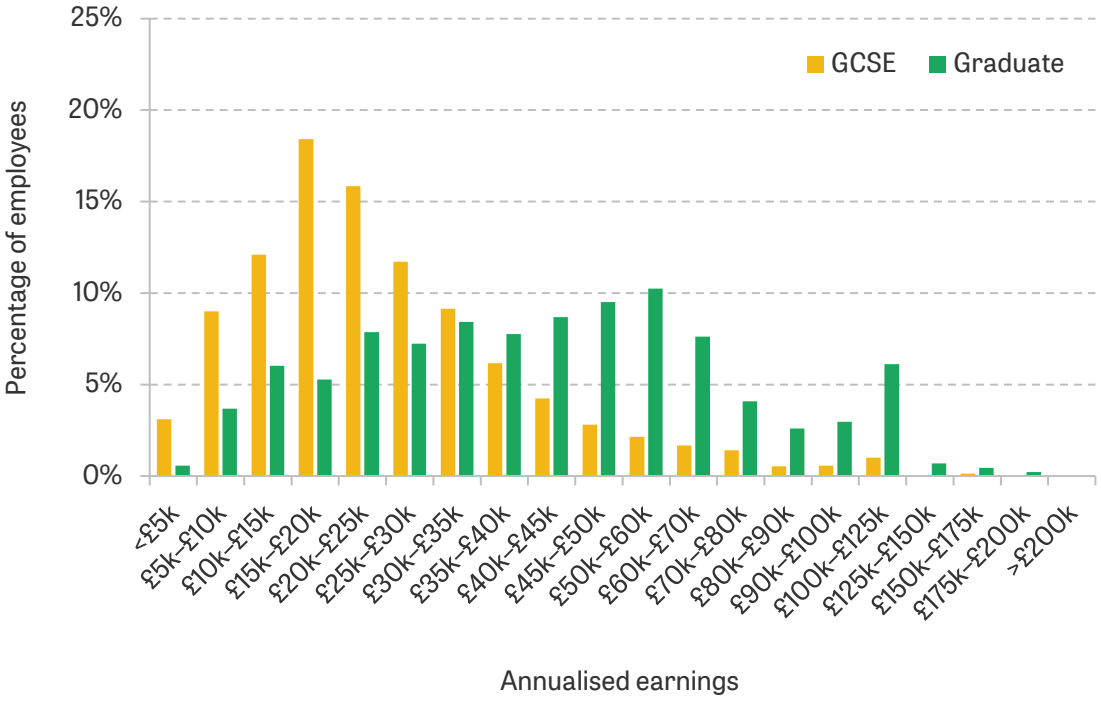


Figure 13. Distribution of annualised earnings among employees educated to GCSE and to degree level, ages 45–50



Note and source for Figures 12 and 13

Note: Annualised earnings are derived from reported weekly earnings. The sample includes all employees, regardless of hours of work (so differences in annualised earnings will reflect differences in patterns of part-time work). Not all bins are of equal width.

Source: Authors' calculations using the Labour Force Survey, 2019Q2–2020Q1.

Even among people who are in paid work, earnings vary significantly by education. Figure 12 shows the distribution of annualised earnings among employed young adults (aged 25–30) who hold degrees and their peers who are educated to GCSE level or below. The distribution of earnings for graduates and for those educated to GCSE level or below are quite different. The most common annual earnings for a GCSE-educated employee in their late 20s is between £15,000 and £20,000; for a graduate, the most common value for annual earnings is £10,000 higher. One in five young graduates earns the equivalent of £40,000 or more a year, compared with just one in twenty of their GCSE-educated peers.

These differences are even greater at older ages, as Figure 13 shows (for employees aged 45–50). The distribution of earnings among employees educated to GCSE level or below is considerably narrower than that for graduates, and concentrated at lower earnings levels. Strikingly, the most common annual salary for GCSE-educated 45- to 50-year-olds is between £15,000 and £20,000 – the same as for 25- to 30-year-olds. And, while earnings above £60,000 are exceptionally rare among the GCSE-educated, a quarter of graduates earn above this level – often comfortably above it.

The result of these earnings distributions is that high earnings overwhelmingly go to those with the highest qualifications. In 2019–20, more than 70% of those earning over £50,000 a year – and more than 80% of those on £100,000 or more – were graduates. Conversely, nearly half of employees earning less than £20,000 a year were educated to GCSE level or below.

The results in Figures 12 and 13 suggest that education affects not only the *level* of earnings someone enjoys, but also how quickly their earnings grow during their working years. In Figures 14 and 15 we therefore show how median annualised earnings change over the life cycle for employees with different levels of qualifications, separately for men and women.

Even when young people start their careers, there are already appreciable differences in earnings by qualification – the median 22-year-old male employee with a degree earns around £20,500 a year, compared with £18,000 for a male employee with less than upper-secondary qualifications. This inequality is particularly noteworthy since workers without a degree have already had a 'head start' on their careers – they have been able to build up a few years of work experience while their peers were studying for their degree.

But the differences between the more- and less-well-qualified only grow from there. The median earnings of workers with degrees increase very rapidly at first, doubling in the first decade of work. The rate of growth then slows, but these workers generally continue to see their earnings rise slowly through their 30s and 40s.

By contrast, both male and female workers educated to GCSE level or below experience far flatter earnings growth; for women, there is essentially no earnings growth after about age 30. This means that, by age 40, the median male (female) graduate earns nearly £48,000 (£33,000) a year, while wages for someone with below upper-secondary education are around £18,000 lower. Similar patterns have been extensively documented in other countries.

The relationship between education and earnings looks quite different for men and women. Graduate men enjoy very fast earnings growth for their first 15 years after graduation. Earnings growth slows during their late 30s and 40s, but it remains positive – so the earnings of employed male graduates peak in the mid 50s. Men educated at most to GCSE level also see earnings growth during the first half of their career (albeit much slower than for graduates), with earnings peaking in their late 40s before falling sharply by their early 60s.

Figure 14. Median annualised earnings among employees, by age and qualification level: men

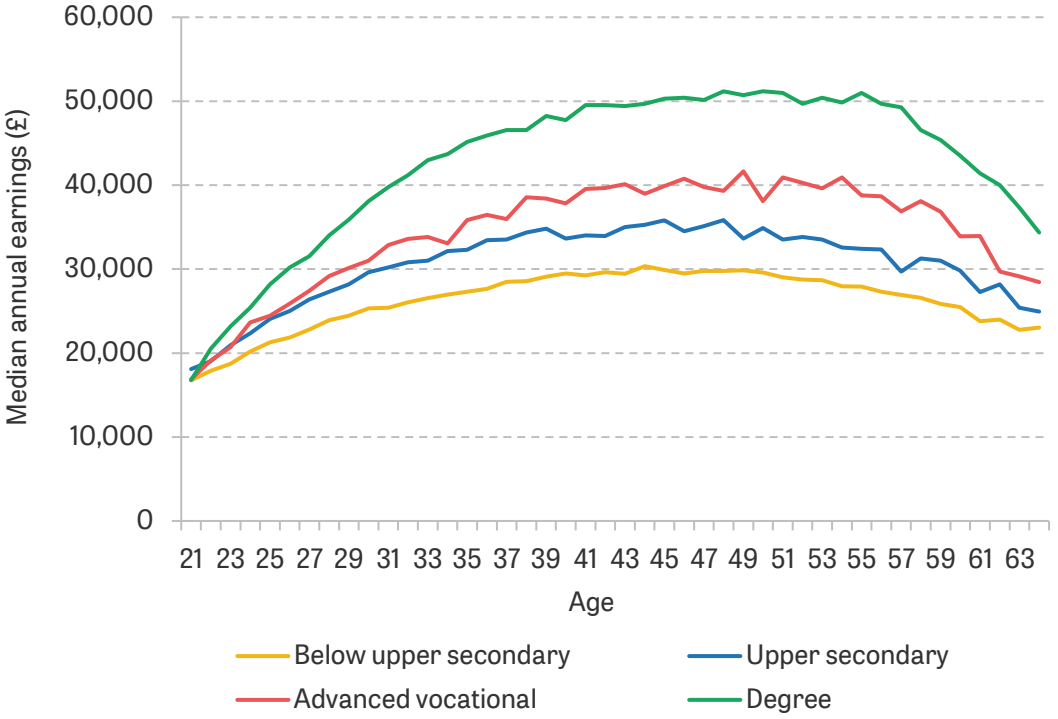
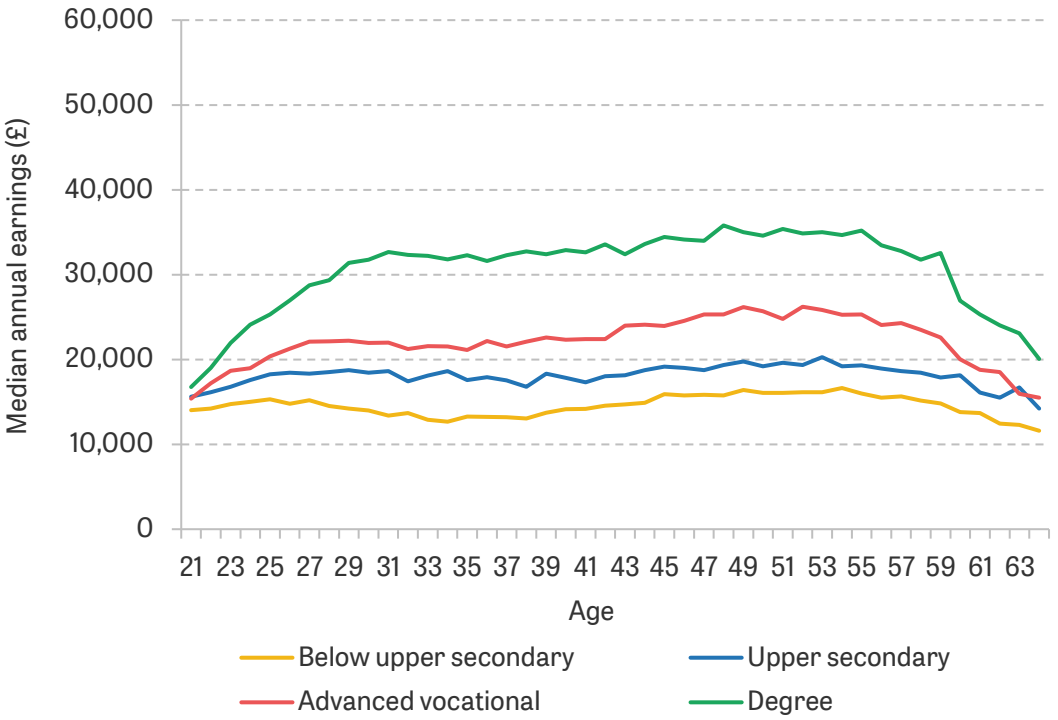


Figure 15. Median annualised earnings among employees, by age and qualification level: women



Note and source for Figures 14 and 15

Note: The Labour Force Survey reports median weekly earnings, which we have annualised to produce the graphs. Sample consists of all employees (not self-employed people), regardless of weekly hours. Drop-off in the late 50s among men, and in the 30s and 50s for women, therefore partly reflects a shift to part-time working in these age groups.

Source: Authors' calculations using the Labour Force Survey, 2019Q2–2020Q1.

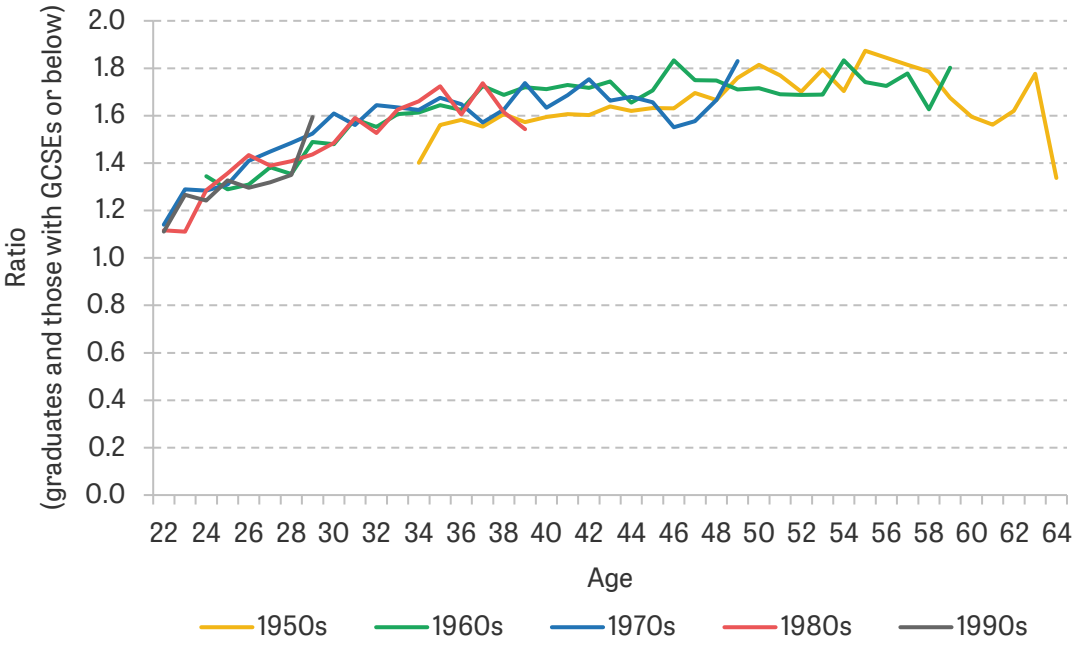
For women, the major differences between education groups come during their 20s. Employed graduate women see steep earnings growth, with their earnings doubling between age 21 and age 31. By contrast, women educated at most to GCSE level see very little growth in their earnings during this period; instead, earnings for employees in this group start to fall from their mid 20s onwards. This coincides with women starting their families and reducing their hours.

Graduate women and those with advanced vocational qualifications are largely protected against seeing their earnings fall (conditional on remaining in work), but they see essentially no earnings growth until their early 40s. This lost earnings growth in the years after childbirth is the main driver of the gender pay gap for those who remain in work (Costa Dias, Joyce and Parodi, 2020).

The graduate wage premium

The graduate wage premium measures the difference between graduate earnings and non-graduate earnings. Figures 14 and 15 imply that the graduate wage premium is positive at almost all ages (i.e. graduates earn more on average than non-graduates). To get a better sense of how much more graduates earn than non-graduates, we can consider the ratio between graduate earnings and non-graduate earnings. In Figures 16 and 17, we present the ratio of median graduate earnings among employees relative to the median earnings of employees with below upper-secondary education. We do this separately for men and women, and also by the decade in which individuals are born, to examine how the graduate wage premium has evolved. It is important to note that we do not factor in the hours people work and so the ratio of hourly wage rates may be different from the numbers displayed in Figures 16 and 17.

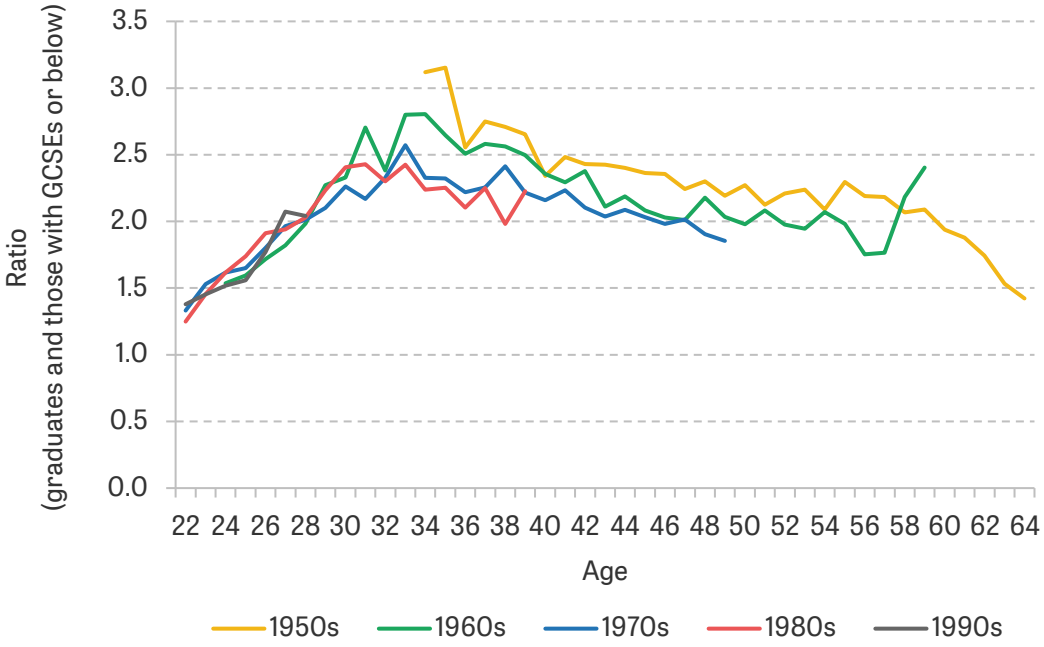
Figure 16. Ratio of median earnings among employees between male graduates and those with below upper-secondary education, by decade of birth and age



Note: Includes all male employees aged between 22 and 64. We compare median weekly pay of those with degrees and those educated to GCSE level or below.

Source: Authors' calculations using the Labour Force Survey, 2019Q2–2020Q1.

Figure 17. Ratio of median earnings among employees between female graduates and those with below upper-secondary education, by decade of birth and age



Note: Includes all female employees aged between 22 and 64. We compare median weekly pay of those with degrees and those educated to GCSE level or below.

Source: Authors' calculations using Labour Force Survey, 2019Q2–2020Q1.

The ratio between graduate and non-graduate earnings among employees is greater than 1 at all ages and across all birth cohorts for both men and women. Among men, the ratio continues to grow throughout almost their entire career – more steeply at first, as graduates enjoy greater wage progression early in their careers, and then more slowly later on. There are relatively few differences between generations, suggesting that the earnings premium for male graduates has not substantially shifted over time despite the fact that the number of graduates has increased over time. This reflects the increasing relative demand for graduate workers – partly due to changing demand for jobs that have always been done by graduates, and partly due to the spread of higher education programmes (and degree requirements) for professions that had previously required lower levels of qualification. Both of these phenomena have occurred internationally, and so are not just UK-based changes.

For women, the picture looks somewhat different. The graduate wage premium among employees is even larger than it is for men, with graduate female employees earning more than twice as much for most of their working lives as female employees with GCSE education (or below). Unlike for men, there is evidence of differences between generations: older cohorts of women enjoyed a higher graduate wage premium than their younger counterparts. This likely reflects, in part, the huge increase in the share of women being educated to degree level, which means the graduate group has become less selected over time. In addition, a growing share of women achieve GCSE qualifications even if they do not progress further, which pushes up the average level of education among the low-educated group.

4. What are the returns to different qualification levels?

The analysis so far shows us that people with more education tend to earn more, but it does *not* tell us whether higher levels of education *cause* higher earnings. There is a substantial challenge in understanding the extent to which education *causes* differences in earnings versus the extent to which people who are better positioned to succeed in the labour market simply choose to do more education. For example, graduates tend to have higher levels of underlying academic ability, which might be valuable to an employer regardless of their level of qualification. In addition, overall earnings differences might capture other inequalities in access to higher education. For example, graduates tend to come from better-off families than non-graduates, which might also benefit them in the labour market through access to better family networks.

This means that the graduate wage premium presents a good picture of overall inequalities by education level, but it does not tell us how much we would expect an individual to benefit financially from earning a degree. Similarly, an overall picture of inequalities does not give us any information about how much of the gap in earnings might close if levels of education increase. To answer these questions, what we really want to know are the *returns to education*, which are the benefits that can be directly (causally) attributed to education itself, rather than other underlying factors. The return to a given level of education will always depend on the counterfactual – what a young person would have done instead of studying for a particular qualification, and how this is valued in the labour market. This also means that the return to education will vary over time as market conditions change and in different economies.

Beginning with the classic works of Jacob Mincer (1958) and Gary Becker (1962), there is a large economic literature that aims to quantify the returns to education and skills. These studies use different methodologies to answer the question in different ways. While any individual study is unlikely to be a perfect measure of the causal impact of education, these studies do account for a range of potential confounding factors and, taken together, give a good indication of the true return to education. Interestingly, while over time the statistical tools used to estimate returns have become more sophisticated, many of the conclusions drawn about the value of education remain very similar (Card, 2001; Zimmerman, 2014).

Box 2. What factors drive the returns to education?

The concept of 'returns' to education aims to measure the impact that additional education has on its students' later outcomes, primarily in the labour market but also in other parts of their life (see Box 4). As the main text discusses, accurately measuring the returns to education means going beyond simple comparisons of the outcomes of people with more or less education.

But even if we can accurately measure the causal impact of additional education, interpreting these estimates of returns is not straightforward, since these measured returns will depend on a range of factors. The two most important are:

- **Education's impact on raising skills.** The most obvious channel through which education might raise wages is through its impact on skills. Education and training programmes increase both general skills (such as literacy, numeracy, communication or resilience) and more specific know-how (e.g. learning how to make joists in a carpentry class or to draw up a balance sheet in an accountancy programme). Greater knowledge and skills make people more productive and more valuable to their employers, which helps to increase their wages.

- **Education as a signal of skill and ability.** Gaining additional qualifications can raise wages even if the education itself does not improve skills. This happens because (potential) employers are not able to perfectly measure a candidate's skill set during the recruitment process, so they rely on proxies such as qualifications or grades to get a signal of a candidate's ability. In many cases, these signals are built into the recruitment process with minimum qualification requirements. This 'signalling' mechanism also includes employers who screen based on the educational institution that a young person has attended; for example, high returns to attending prestigious universities will partly reflect the value that employers place on these institutions as a signal of a candidate's underlying ability.

Empirically, it is very difficult to separate the influence of educational qualifications on raising skills and signalling underlying ability. In part this is because the two channels can overlap: for example, an employer who values certain skills may still screen for qualifications, since they certify that the candidate has indeed developed those abilities.

Box 3. Returns to absolute qualifications and relative skill

From the perspective of the labour market, the education system serves at least two purposes: it helps young people to acquire the skills and knowledge they will need to be effective in the workforce, and it provides a signal about their aptitudes to help employers 'match' to appropriate candidates. (Clearly, the education system serves many purposes beyond these, including providing people with a chance to explore and develop their interests; some of these wider purposes are discussed in Box 4.) This dual role means that both *absolute* and *relative* skill can matter for the labour market – though often they matter in different ways.

There is an enormous amount of evidence that increasing absolute skills and qualification levels benefits both individual young people and society as a whole. Research from England looks at the impact of raising the minimum school-leaving age (from 14 to 15 in 1947, and from 15 to 16 in 1972). This research finds that forcing those who would have otherwise dropped out to remain in education raises their chances of earning GCSEs, with benefits for wages (Harmon and Walker, 1995; Devereux and Hart, 2010; Grenet, 2013) though limited impact on wider outcomes such as health (Clark and Royer, 2013).

The returns to meeting educational benchmarks seem to be quite persistent. Despite the huge increase in the students attaining GCSE qualifications in more recent years, the returns to meeting GCSE benchmarks continue to be high (Machin, McNally and Ruiz-Valenzuela, 2020). Similarly, the graduate wage premium has held up over the past decades even as the number of graduates has more than doubled (Blundell, Green and Jin, 2022).

However, the sorting role that education plays means that *relative* performance can matter as well. As more young people achieve educational benchmarks such as good GCSEs or undergraduate degrees, there can be greater pressure to achieve higher levels of qualifications in order to stand out. This is particularly important for highly competitive university programmes or jobs – when there are many applicants for few positions, the relative educational rank of applicants may matter over and above any minimum qualification thresholds. There is some evidence that the top-paying jobs in particular value good grades and selective institutions, rather than just looking at whether or not an applicant holds a degree (Britton, Dearden et al., 2020; Britton et al., 2022).

The returns to school education (ages 5–16)

There is a broad consensus that both staying in school for longer and gaining additional qualifications at school have substantial and long-lasting benefits for students' future prospects (e.g. Harmon and Walker, 2001; Bonjour et al., 2003). Much of the evidence in England comes from examining the impact of a government reform in 1972 which raised the school-leaving age in England and Wales from 15 to 16. For example, by comparing the earnings of those young people who stayed in school for one additional year due to this reform against those of people who left school at age 15, Buscha and Dickson (2015) estimate that an additional year of education led to a 7% increase in earnings, on average, over the lifetime.

Since it is now compulsory for every child to remain in full-time education until the age of 16, there is not actually a lot of variation in the years of school education that children receive. Instead, the key educational differences between young people are the number and level of qualifications they obtain at the end of secondary education. A study by Hayward, Hunt and Lord (2014) estimates the returns to GCSE qualifications by accounting for a range of observable differences that might influence both a student's education decisions and her future earnings, such as parental education and attainment at earlier stages of school. They find that each additional qualification successfully completed boosts students' earnings. Even successfully completing a few GCSEs – one or two GCSE passes compared with none – is associated with significantly higher earnings. People who achieve five or more good GCSEs (including English and maths) as their highest qualification earn in excess of £100,000 more over their lifetime than those who do not achieve this benchmark.

Performing well in GCSEs and other exams does not only directly benefit students in terms of their future earnings, it also allows them to progress to higher levels of education. Machin, McNally and Ruiz-Valenzuela (2020) examine the impact that passing GCSE exams has on future educational outcomes by comparing pupils who *just* miss out on a C grade against those who scrape past the threshold. Since these pupils achieve almost identical point scores, the two groups likely have very similar ability and other underlying characteristics, which allows the researchers to attribute differences in their long-term outcomes to the impact of their GCSE grades. The study finds that narrowly obtaining a grade C in GCSE English increases a student's probability of remaining in education until age 18 by 4 percentage points and their chances of achieving an A-level or equivalent qualification at age 19 by around 7 percentage points.

The returns to higher levels of education

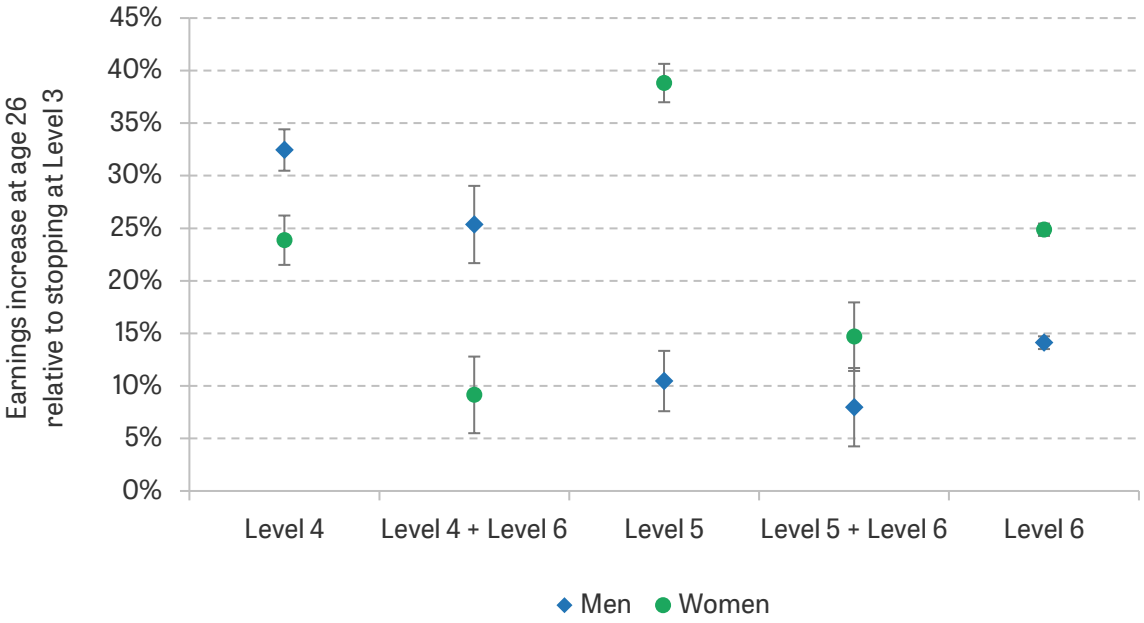
There is also clear evidence that completing higher levels of education boosts lifetime earnings. A prominent study by Blundell, Dearden and Sianesi (2005), who looked at the life outcomes of a cohort of individuals born in Great Britain in 1958, found that completing some form of higher education (i.e. an advanced vocational qualification or a degree) led to average earnings 27% higher at age 33, even after accounting for a wide range of potential underlying differences.

More recent studies support the conclusion that higher education qualifications are associated with positive returns. Belfield et al. (2018) find that, after accounting for differences in underlying observable characteristics, male graduates earn 8% more at the age of 29 than men who are educated to upper-secondary level; for female graduates, the premium is 28%. Further research shows that these benefits persist or even grow throughout a person's career (Britton, Dearden et al., 2020).

The returns to vocational qualifications have been much less thoroughly studied, but recent research suggests that here, too, higher levels of education are associated with higher wages.

One recent study by Espinoza et al. (2020) estimates the earnings differentials[4] to both advanced vocational qualifications and degrees. The authors first group individuals by their post-18 qualifications and then compare earnings across these groups at the age of 26, after accounting for a range of other factors, such as prior achievement and socio-economic background. Figure 18 presents the estimates of earnings differentials reported in the study. Specifically, it shows the percentage increase in earnings from possessing a qualification or combination of qualifications relative to only having a Level 3 qualification (i.e. an A-level or equivalent qualification) for both men and women. For example, the 32% figure for men with a Level 4 qualification means that a man with a Level 4 qualification earns 32% more on average at the age of 26 than a man with a Level 3 qualification.

Figure 18. (Conditional) increase in earnings at the age of 26 from completing different qualifications relative to finishing at Level 3



Note: All estimates show the percentage increase in earnings relative to having a Level 3 qualification (i.e. A-level or equivalent qualification) as the highest qualification level. Level 4 and Level 5 are predominantly advanced vocational qualifications, while Level 6 is an undergraduate degree or equivalent qualification. See Figure 2 on page 11 for a description of the different qualification levels.

Source: Authors' calculations using table 5 in Espinoza et al. (2020).

The estimates presented in Figure 18 are positive for each qualification and combination of qualifications, which means that on average progressing to some form of tertiary education – either an advanced vocational qualification or a degree – leads to higher earnings at the age of 26. Interestingly, certain advanced vocational qualifications appear to lead to even higher earnings than degrees (Level 6 qualifications). For men, completing a Level 4 qualification is associated with 32% higher earnings at the age of 26, while for women completing a Level 5 qualification boosts earnings by roughly 39%. Of course, these estimates do not paint a full picture of the returns to different qualifications: they consider earnings only up to age 26 but graduates with degrees tend to see significant earnings acceleration through their 30s as well. In addition, as Espinoza et al. (2020) note, the numbers taking advanced vocational qualifications

[4] It is unlikely that this study controls for all characteristics that make groups different and so estimates should not be interpreted as causal, which is why the authors refer to earnings differentials rather than returns.

are small and tend to be quite occupation-specific. For example, 70% of women with a Level 5 qualification studied a 'subject allied to medicine', mainly nursing.

There are also studies that consider returns to apprenticeships for young people in England. Cavaglia, McNally and Ventura (2020) estimate the return to starting an apprenticeship at Level 2 or 3 compared with pursuing a vocational classroom-based route at the same level. They show high average returns for individuals with an apprenticeship relative to the counterfactual, but they are much higher for men than women and this largely reflects the sector of specialisation.

One of the challenges of comparing the returns to vocational and academic education (whether at tertiary level or below) is that trajectories are very likely to change as people age. For example, using international data, Hanushek et al. (2017) find that in many countries the initial (relative) advantage of vocational education in terms of employment and income reduces with age and is eventually surpassed – potentially because more general education better equips the average worker for future training and technological change. But the existence (and extent) of this potential trade-off varies across countries.

Box 4. The non-monetary returns to education

While our focus in this section is the monetary returns to education, the benefits of education are not limited to financial returns. Education has many other impacts, which benefit not only individuals themselves but society as a whole. Some of the non-monetary returns to education in the UK[a] that studies have found include:

- **Better mental health and life satisfaction.** The prevalence of mental health conditions is higher and has been increasing at a faster rate for those with lower levels of education (Barr, Kinderman and Whitehead, 2015). Raising the minimum school-leaving age from 15 to 16 also increased life satisfaction, over and above the changes in income it drove (Oreopoulus and Salvanes, 2011).

- **Reduced criminality.** There are several channels through which education can reduce criminal behaviour, including by increasing skill levels and the ability to gain legitimate employment; by raising incomes; by improving 'soft skills' such as decision-making and patience; and through the formation of better peer groups (Feinstein, 2002). A reduction in criminal behaviour can have substantial benefits for society: Feinstein estimates that if 1% of the unqualified working-age population achieved A-level qualifications, the reduced crime savings would amount to £665 million per annum. Machin, Marie and Vujić (2011) conclude that raising the minimum school-leaving age from 15 to 16 created a net social benefit from decreased property crime worth £23–30 million over the following decade.

- **Better health outcomes.** Higher education is linked to increased life expectancy and reduced comorbidities. Education can be key in the development of health knowledge, the implementation of health behaviours, the use of preventive services (Feinstein, Duckworth and Sabates, 2004), and the avoidance of risky behaviours such as smoking (Clark and Royer, 2013). Overall, education has been found to reduce smoking and substance use, depression, obesity and poor health outcomes, while having a positive effect on regular exercise. The causal effect of education on health and health behaviours seems to be especially pronounced for men (Conti, Heckman and Urzua, 2010).

- **Higher levels of civic participation and social cohesion.** While cross-country comparisons tend to find little relationship between average education levels and social trust, at the individual level education level is a strong predictor of social and institutional trust, along with the propensity to engage in politics (Hall, 1999; Green, Preston and Sabates, 2003). By generating social capital, education can also support well-functioning democracies: it raises the benefits of civic engagement and participation in support of broad-based regimes (Glaeser, Ponzetto and Shleifer, 2007).

- **Intergenerational benefits.** Many studies (e.g. Currie and Moretti, 2003; Black, Devereux and Salvanes, 2005) have shown that mothers with higher levels of education have children with better educational performance and reduced behavioural problems. Parental education may benefit children through income effects – with parents obtaining higher-paid jobs and differences in maternal labour supply – as well as through delayed childbearing and assortative mating (Carneiro, Meghir and Parey, 2013). Parents with higher levels of education may also have better knowledge about the education system and a greater ability to support their child's learning at home.

[a] Evidence from the UK or England, unless otherwise specified.

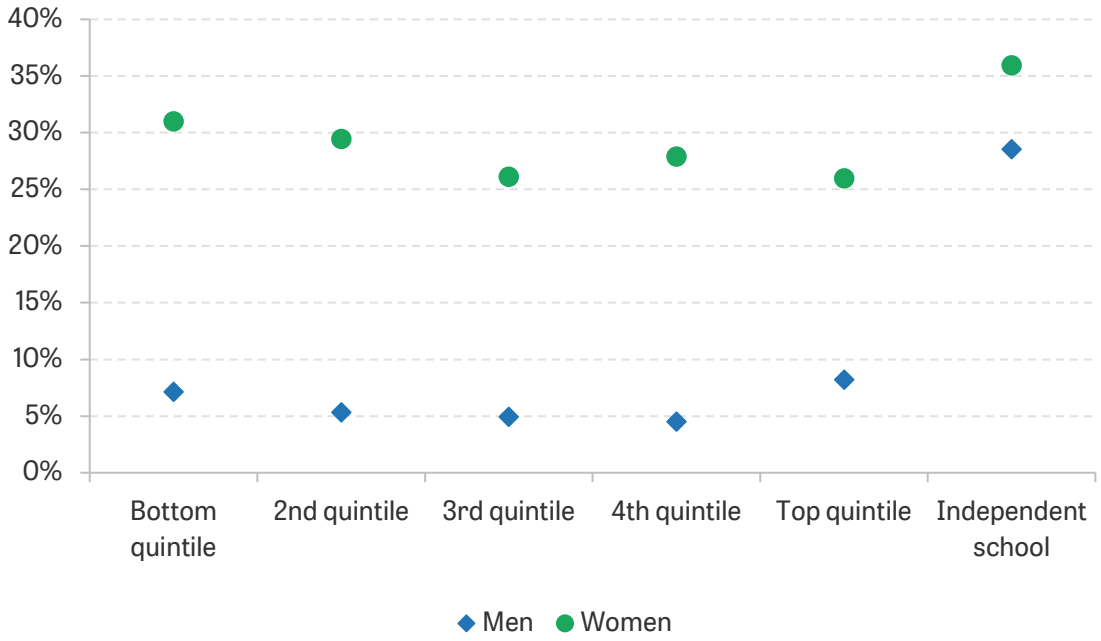
5. Are returns equal for different groups?

While education translates into higher earnings on average, there is considerable variation in the strength of this relationship. For example, the returns to a degree vary depending on a person's family background and their ethnicity. Britton, Dearden and Waltmann (2021) classify graduates who went to state schools into five groups based on their family's socio-economic background, and also separately group pupils who attended independent schools. They then investigate how the returns to earning a degree (controlling for background characteristics and prior attainment) vary for each group.

The returns to university education are especially high for privately educated graduates, at around 29% for men and 36% for women (Figure 19). Besides high returns for privately educated students, among women the returns are somewhat higher for state-educated students from the poorest 40% of families. For men, young people from the richest and poorest families enjoy somewhat higher returns. The (much) higher overall returns for women partly reflect the fact that women without degrees have especially low earnings, particularly when they come from disadvantaged backgrounds.

Britton, Dearden and Waltmann (2021) also find a considerable degree of variation in the returns to university by ethnicity (Figure 20). Women from a South Asian background do particularly well from gaining a degree, with Indian (27%), Pakistani (40%) and Bangladeshi (30%) graduates all achieving large returns. White British women are located within this cluster with returns of 28%. By contrast, the returns for black Caribbean women are particularly low at 9%. For men, there are much lower average returns, but the largest estimates by some distance are for Pakistani students at 36% while the returns for white British graduates are much lower at around 6%.

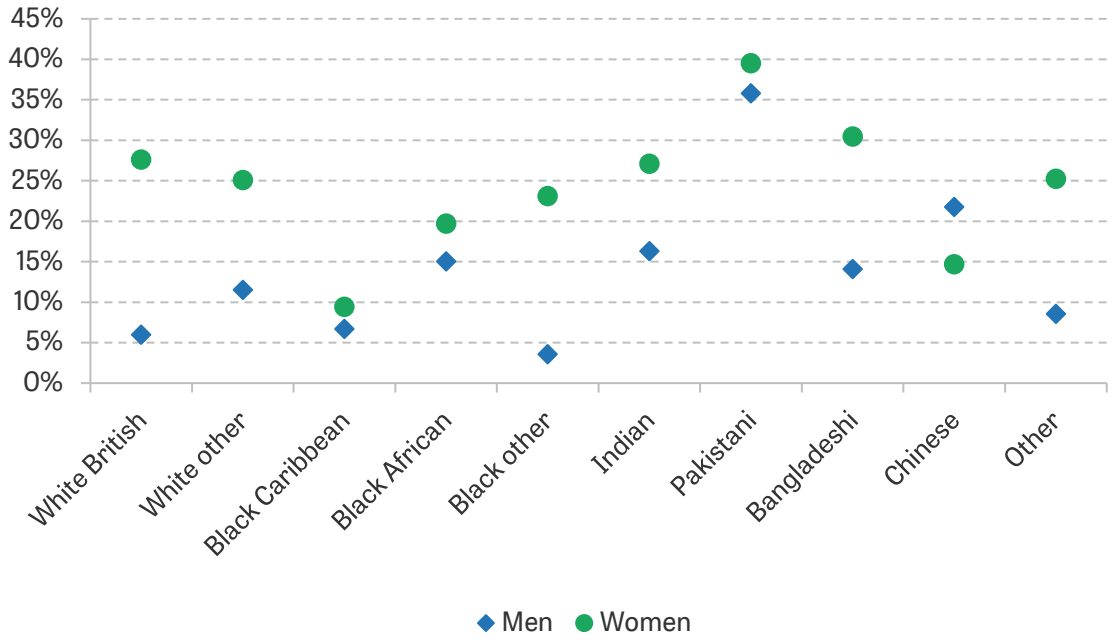
Figure 19. Estimated returns to completing a university degree at age 30 by socio-economic status



Note: All estimates show the percentage increase in earnings relative to having a Level 3 qualification (i.e. A-level or equivalent qualification) as the highest qualification level. The estimates control for background characteristics and prior attainment. See Figure 2 on page 11 for a description of the different qualification levels.

Source: Authors' calculations using table 5 in Britton, Dearden and Waltmann (2021).

Figure 20. Estimated returns to completing a university degree at age 30 by ethnicity



Note: All estimates show the percentage increase in earnings relative to having a Level 3 qualification (i.e. A-level or equivalent qualification) as the highest qualification level. The estimates control for background characteristics and prior attainment. See Figure 2 on page 11 for a description of the different qualification levels.

Source: Authors' calculations using table 6 in Britton, Dearden and Waltmann (2021).

In summary, completing a degree does not lead to the same future earnings for everyone. Privately educated individuals and those from the worst-off families seem to benefit the most from university, while certain ethnic groups also earn more from completing a degree. Much of the difference reflects differences in the counterfactual – the earnings that different groups can expect if they do not obtain a degree. The large inequalities in these earnings and in employment outcomes are explored in more detail in Giupponi and Machin (2022).

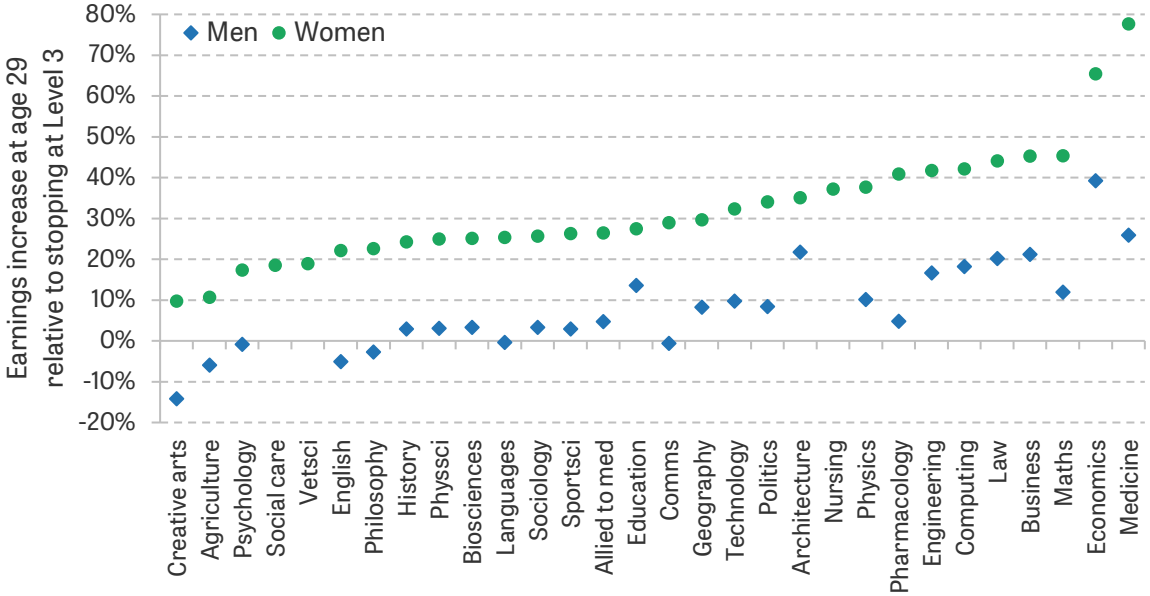
How do returns vary by the educational route taken?

Part of the variation between different groups of individuals is also explained by the specific educational route they take – the subjects they study and which university they attend. While early studies of the returns to education were limited to estimating the returns to additional years of schooling or completing a qualification, the availability of rich data has enabled researchers to consider the returns to more specific educational routes.

The importance of subject choice

For both advanced vocational qualifications and degrees, earnings differ quite a lot by the subject studied. In their study of the returns to higher education, Belfield et al. (2018) estimate the labour market returns to different degree subjects, taking into account background characteristics such as prior attainment and socio-economic status. They find that the return to a degree varies considerably depending on the subject. As Figure 21 shows, while certain subjects (e.g. medicine and economics) lead to substantial increases in earnings at age 29, subjects such as creative arts and agriculture lead to far smaller (even negative) earnings gains relative to not completing a degree.

Figure 21. Estimated returns to completing a university degree at age 29 by subject



Note: Some degree courses had so few male graduates that it was not possible to include estimates of their returns. Estimates are based on inverse probability weighting, taking into account a range of characteristics including detailed prior attainment information and socio-economic status.

Source: Appendix data tables 2a and 2b of Belfield et al. (2018).

In addition, returns differ substantially between men and women. Most strikingly, on average women benefit financially from attending university irrespective of the course they study. For men, the returns in some subjects, including creative arts and agriculture, are effectively zero or even negative. This means that on average these men would have been financially better off not attending university (although this analysis ignores other, non-financial benefits from attending university or studying a particular degree course).

In a similar study, Battiston et al. (2019) also find substantial variation in the returns to different subject areas within vocational education. While subjects such as 'engineering', 'construction' and 'business and law' lead to high returns, vocational qualifications in 'arts and media' are actually associated with negative earnings differentials when compared with finishing at upper-secondary level.

The varying returns to different qualifications by field of study are an international phenomenon and are well documented, both in university and secondary education (e.g. Webber, 2014; Dahl, Rooth and Stenberg, 2020). There is also much variation in the returns to different skills, with rising returns to interpersonal and analytical skills in the UK over time (Dickerson and Morris, 2019), as in other countries.

And, at least for some subjects, the grades that graduates earn can be an important part of their future outcomes in the labour market as well. Even after accounting for attainment at GCSE and A level, as well as other student characteristics, graduates who earned a 2:2 in a law or economics course go on to earn around 15% less than their classmates who earned a 2:1 (Britton et al., 2022). Achieving higher grades has a much larger payoff at more selective institutions – suggesting that some of the highest-paying employers value both which university a graduate attended and how well they did there.

The returns to private schools and elite universities

The type of school that individuals attend may also impact future earnings. One set of educational institutions in the UK that appear to produce particularly academically and professionally successful students are private schools. While only around 7% of English students attend private schools (Green et al., 2012), private school alumni are disproportionally well represented in a range of 'elite sectors', such as the judiciary, civil service and politics (Sutton Trust, 2019). Private school alumni generally experience a range of better life outcomes, including higher-status jobs and higher wages (Sullivan et al., 2014).

Private school students are significantly more likely to achieve higher levels of education – which we have argued leads to better labour market outcomes – but this only seems to be part of the reason that private school alumni tend to earn more. Green et al. (2015) find that even after accounting for eventual educational attainment and the fact that they have better-off parents, private school graduates – especially men – still enjoy a wage premium, meaning that attending private school confers advantages over and above boosting educational attainment. It is difficult to definitively prove what else is driving higher earnings, but it could be that attending private school enables students to develop peer networks that are useful in the labour market or private schools may develop other traits that are rewarded in the labour market.

Another educational route that leads to high returns in the labour market is attending a top university. In their study of the returns to higher education, Britton, Dearden et al. (2020) estimate the labour market returns to attending different types of university after accounting for

differences in underlying characteristics. Figures 22 and 23 display their estimates for the average returns (relative to completing upper-secondary education) for women and men at ages 30, 40, 50 and 60 from attending different groups of universities.

Figure 22. Estimated returns for women to higher education at different ages by type of university attended

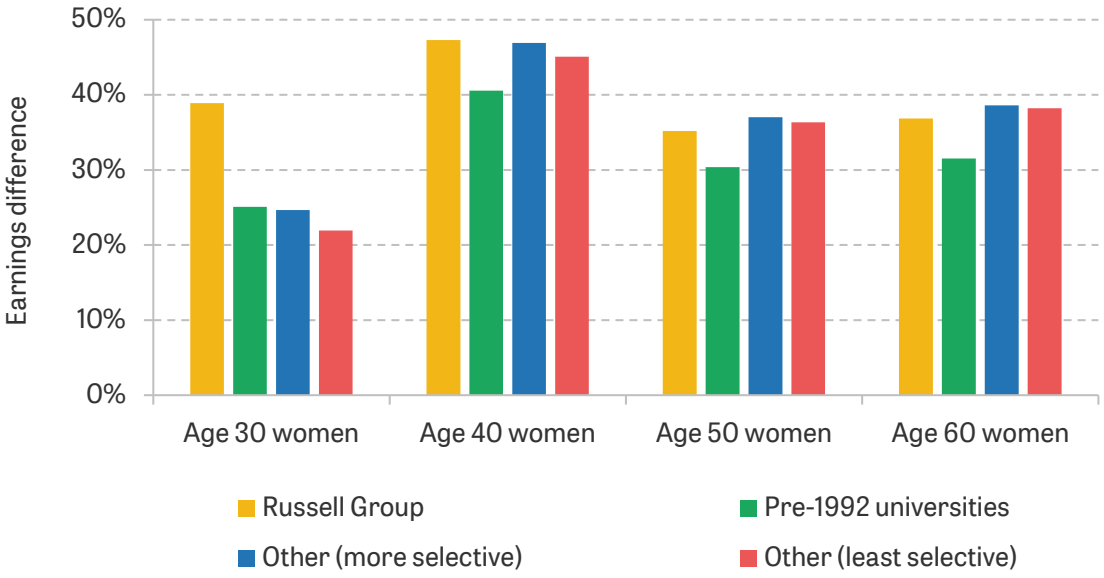
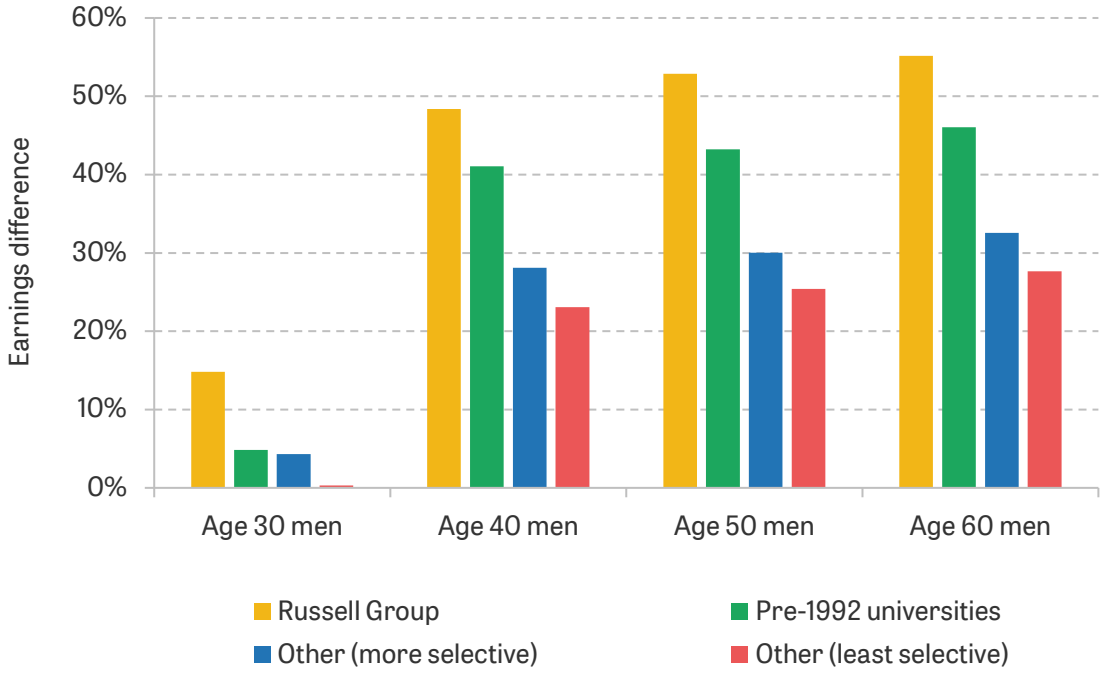


Figure 23. Estimated returns for men to higher education at different ages by type of university attended



Note and source for Figures 22 and 23

Note: Estimates are based on multiple ordinary least squares (OLS) regressions, taking into account a range of characteristics including detailed prior attainment information and socio-economic status. The impact of initial conditions is fixed at age 30, and the later-life estimates are based on simulated data.

Source: Figure 16 in Britton, Dearden et al. (2020).

Male graduates of more selective universities – the high-status 'Russell Group' universities and the pre-1992 universities[5] – earn more on average than graduates from other universities at every age. There is a particularly dramatic growth in returns between ages 30 and 40 for all university types, but even at older ages the more selective universities still lead to the highest returns. For women, the picture is more nuanced: at younger ages, more selective institutions offer higher returns. But at older ages, returns look much more even across institution type, with the exception of lower returns for non-Russell-Group pre-1992 universities.

Summary

Education is a key determinant in the distribution of many outcomes that are important to individuals and society as a whole. Although estimating the causal impact of education is difficult, there is a wide-ranging body of evidence showing that there is a causal benefit from obtaining more education. In this section, we have focused on the financial impacts of education, but we have also highlighted that higher levels of education bring a host of other benefits as well.

Although the overall returns to higher levels of education are clearly positive, there is considerable variation in the magnitude of benefits. The returns to university and other education routes depend enormously on an individual's gender, ethnicity and socio-economic status, as well as on what and where they have studied.

[5] The pre-1992 universities are non-Russell-Group universities that pre-dated the 1992 conversion of polytechnics into universities.

Part II. Inequalities in education

Education is a key determinant of individuals' life chances. In Part I, we showed that people with different levels of qualifications have, on average, very different life experiences. It is not possible or desirable to remove inequalities of outcome completely – rational and well-informed people may make different decisions about how much (or what type) of 'human capital' to invest in. Yet given the large returns to higher levels of education, it is critical to understand whether there is equal access to education, and to work to remove barriers that prevent people from reaching their full potential. This is particularly important where the education system reinforces existing inequalities – for example, by social and economic background, by gender, by ethnicity or by place.

In this part, we therefore examine which types of students are disproportionately likely to achieve each level of education in the UK. In our analysis, we present the most recent snapshot of educational attainment across these groups and also consider how inequalities in education have evolved over time.

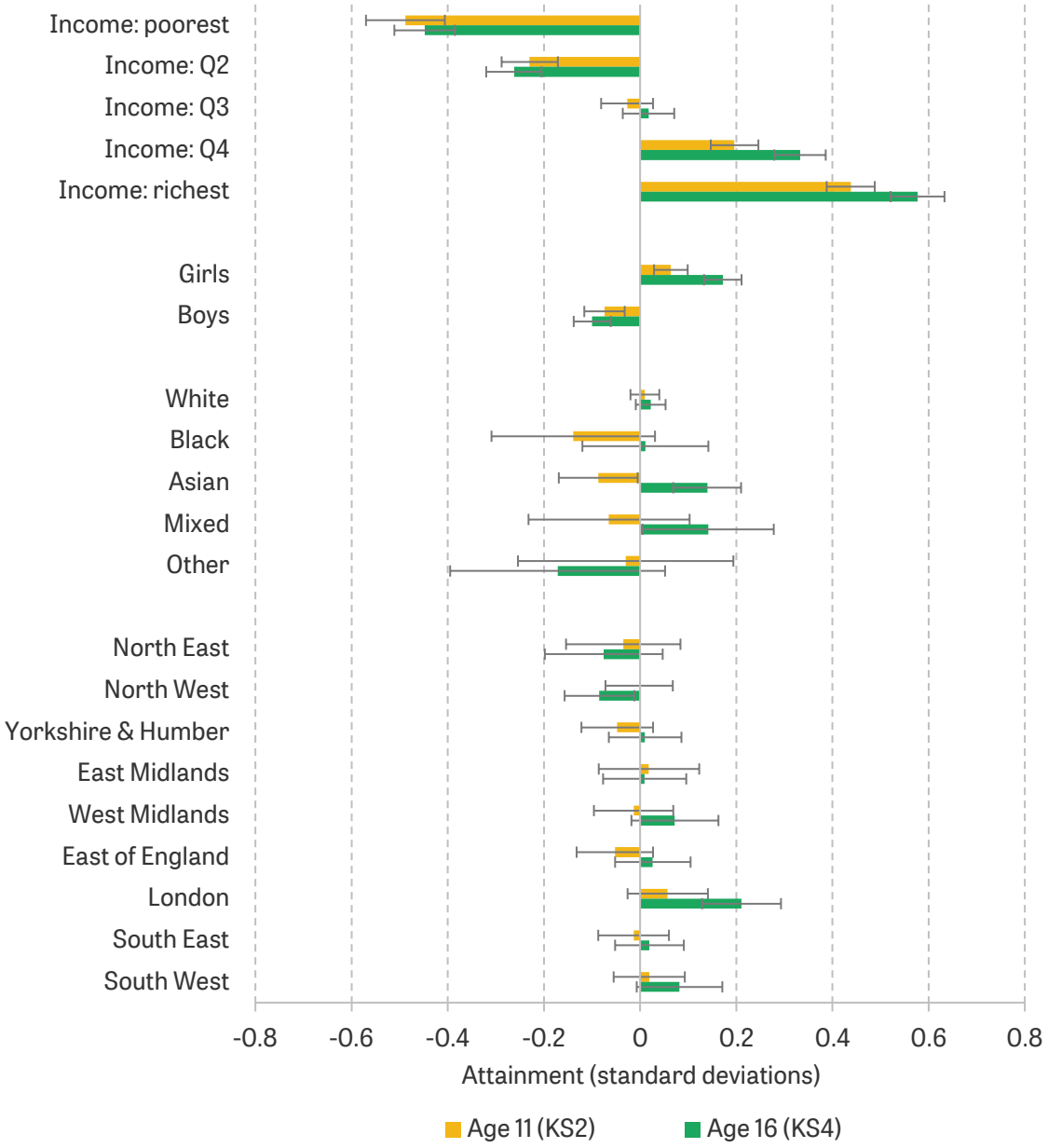
To motivate this analysis, in Figure 24 we show how educational attainment at age 11 and age 16 varies by parental income, gender, ethnicity and region. We rescale attainment so that the population has an average of zero. This means that positive numbers indicate that the group as a whole outperforms the average, while negative numbers suggest that the group has below-average attainment.

There are huge differences in attainment between children and young people from different backgrounds. The differences by family income are the most striking, but there are substantial gender differences too, with girls outperforming boys. The picture for inequalities by ethnicity is more nuanced; at age 11, all ethnic minority groups have lower average attainment than white pupils (though the differences are often not statistically significant). But by age 16, children from Asian and mixed ethnic backgrounds in particular have above-average attainment. Regional differences are considerably smaller than differences by income, and are usually not statistically significant. However, these regional gaps seem to grow over time: they are somewhat more evident at age 16 than they were at age 11. At GCSE, young people in London clearly outperform those elsewhere in the country, while those in the North West tend to lag behind.

This figure motivates our analysis in the next four sections: we consider in turn the inequalities in educational attainment by family background, by gender, by ethnicity and by place. Then in Section 10, we look at the intersections between these different dimensions of inequality.

One important group that we do not focus on is children with special educational needs or disabilities (SEND). This is a large group – around 1.5 million pupils in England alone are known to have SEND. It is also a very mixed group, covering conditions as wide-ranging as dyslexia, hearing impairments, autism, mental health problems and severe learning disabilities. Compared with the other dimensions of inequality that we focus on in this chapter, however, the limitations of using administrative data to examine inequalities by SEND are much greater. We observe only high-level indications of how much support a child is getting, but this measure will miss many of the differences between children with SEND. Moreover, even for children with the same level of need, the likelihood of SEND diagnosis and support varies between areas and over time. For these reasons, we do not focus on SEND in this section (though Box 5 presents some additional information and key resources).

Figure 24. Educational attainment at the end of primary school and at GCSE, by pupil characteristics



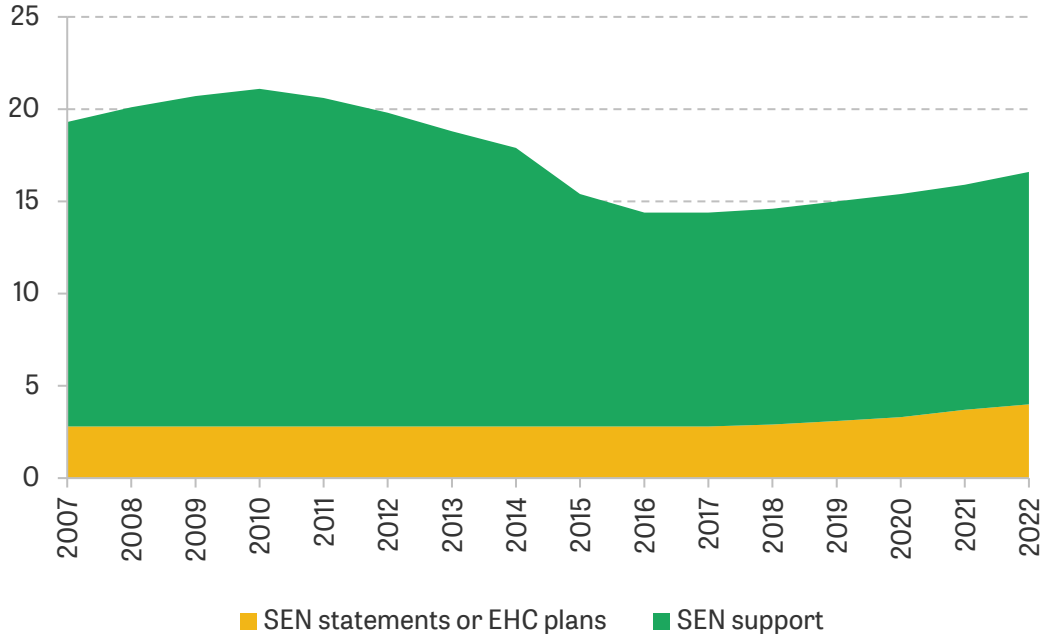
Note: The figure shows group-level averages of attainment measures at Key Stage 2 (age 11) and Key Stage 4 (age 16), which have been standardised to have a mean of 0 and a standard deviation of 1. At KS2, the underlying measure is the average fine points score on English and maths. At KS4, the underlying measure is a pupil's total points score at GCSE (which captures both how many GCSE entries they had and how well they did). Horizontal lines show 95% confidence intervals.

Source: Authors' calculations using data from the Millennium Cohort Study linked to the National Pupil Database.

Box 5. Special educational needs and disabilities

Special educational needs and disabilities are common, affecting around 1.5 million children in England. Among the 2016 GCSE cohort, one study found that almost 40% of young people had been classified as having SEND at some point during their time in school (Hutchinson, 2021). In 2022, 17% of pupils were receiving some support for SEND, including 4% of pupils receiving more intensive support through education, health and care (EHC) plans. As Figure 25 shows, the total number of pupils receiving SEND support has been increasing in recent years, but it is still well below its peak in 2010.

Figure 25. Share of pupils with special educational needs in England



Note: SEN support is a tier of additional support for children with less severe special educational needs. SEN statements and EHC plans set out a legally binding offer of support for children with more severe needs.
Source: Department for Education, 'Special educational needs in England – January 2018: national tables' and 'Pupils in all schools, by type of SEN provision'.

One challenge with analysing SEND support is that administrative data capture the support that pupils are offered, rather than the needs that they actually have. This is a significant distinction: as Figure 25 shows, SEND support rates have changed substantially over time in response to factors such as reports from the regulator or transition to a new system of support. And there is significant geographic variation in SEND diagnosis and support; Hutchinson (2021) finds that which primary school a child attends is a stronger predictor of their eventual chances of being diagnosed with SEND than their own demographics or age 5 assessment results.

Special educational needs are an important factor contributing to educational inequalities. Even with the limitations in administrative data, the patterns in attainment are stark: for example, in the 2019 GCSE cohort, 48% of pupils without identified SEND achieved good GCSEs in English and maths, compared with 17% of pupils with SEND support in place. Among pupils with more severe SEND, more than half were not entered for GCSEs and just 6% achieved good GCSEs in English and maths.

The difficulty of building measures of education that are comparable across the four nations of the UK means that most of the focus of this part is on data from England; however, many of the patterns we document and the issues we highlight are relevant more broadly.

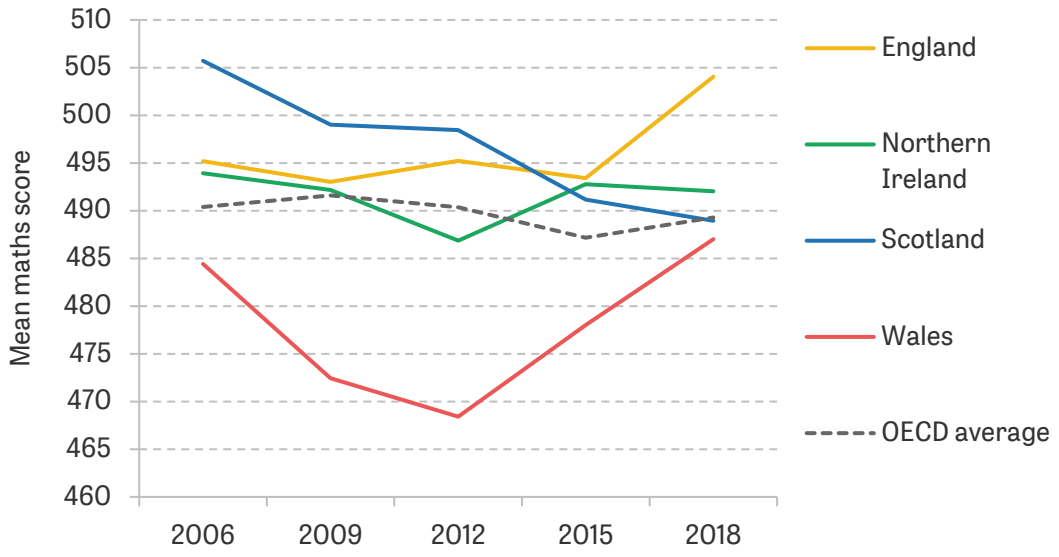
Box 6. Educational inequalities across the UK

Education in the United Kingdom is a devolved matter, meaning that the governments of Scotland, Wales and Northern Ireland have control of their own education systems. While the broad structure of the education system is quite similar across the four countries (see Figure 1 on page 9), the details differ. The four countries have taken different approaches to education funding, curriculum priorities, assessments and data collection. This means that it is difficult to compare performance on standard educational assessments across the four nations of the UK.

One way of drawing comparisons between UK nations is to use assessments designed to compare educational performance across countries. Figure 26 shows trends over time in the UK nations' performance on maths tests in the Programme for International Student Assessment (PISA) data. While England and Northern Ireland have improved relative to the OECD average, Scotland has seen its performance in maths decline (this is also true of Scotland's performance in science, but not in reading). Wales persistently performs below the OECD average, but its performance has improved in recent years. However, figures for 2018 may be biased by the large numbers of pupils who are not included in PISA data (and who are disproportionately low-achieving) (Jerrim, 2021). A recent comparison of Welsh and English administrative data also found that the disadvantage gap is considerably larger in Wales than in England, with disadvantaged Welsh students about 22–23 months behind their better-off peers (compared with an 18-month gap in England) (Cardim-Dias and Sibieta, 2022).

Another approach is to use data from surveys to compare cognitive development across the four nations. Sibieta and Fullard (2021) use data from the Millennium Cohort Study of children born in 2000–01. Children from all four nations were given cognitive tests at ages 3, 5, 7, 11 and 14, allowing researchers to see how performance differs between the four nations on a common scale. The results do not point to a consistent pattern of devolved nations out- or under-performing England; even at the same age, the ranking of the four nations depends on the specific test administered.

Figure 26. Trends in PISA maths scores across UK nations



Source: Figure 7.15 of Sizmur et al. (2019).

6. Educational inequalities by socio-economic status

One of the most stubborn inequalities in the education system is the vast difference in attainment between children from different social and economic backgrounds. In their study of social mobility in Britain, Elliot Major and Machin (2018) argue that one of the key barriers to social mobility is that children from better-off families are more likely to achieve higher levels of education, which inhibits social mobility across generations. While successive governments have made narrowing the attainment gap between disadvantaged students and their peers a policy priority, there remain socio-economic inequalities at all stages of education.

Box 7. Measuring socio-economic status

Capturing all the relevant features of a child's social and economic background is usually not possible in data sets, so researchers instead focus on measures that indicate the child's socio-economic status (SES). In this section, we make use of two measures of SES: eligibility for free school meals and a more detailed index of socio-economic status.

Eligibility for free school meals (FSM eligibility). Children in the UK are entitled to free school meals if their parents or guardians are in receipt of qualifying benefits. The proportion of children eligible for FSM changes over time, but this measure usually captures the 15–20% of children from the lowest-income families. A major advantage of using FSM eligibility is that it is available in all major education data sets in England, and so gives us a consistent measure of SES. However, FSM eligibility is only a binary indicator – it does not tell us anything about the different backgrounds of children whose parents are just over the threshold to qualify and those who come from high-income families, for example.

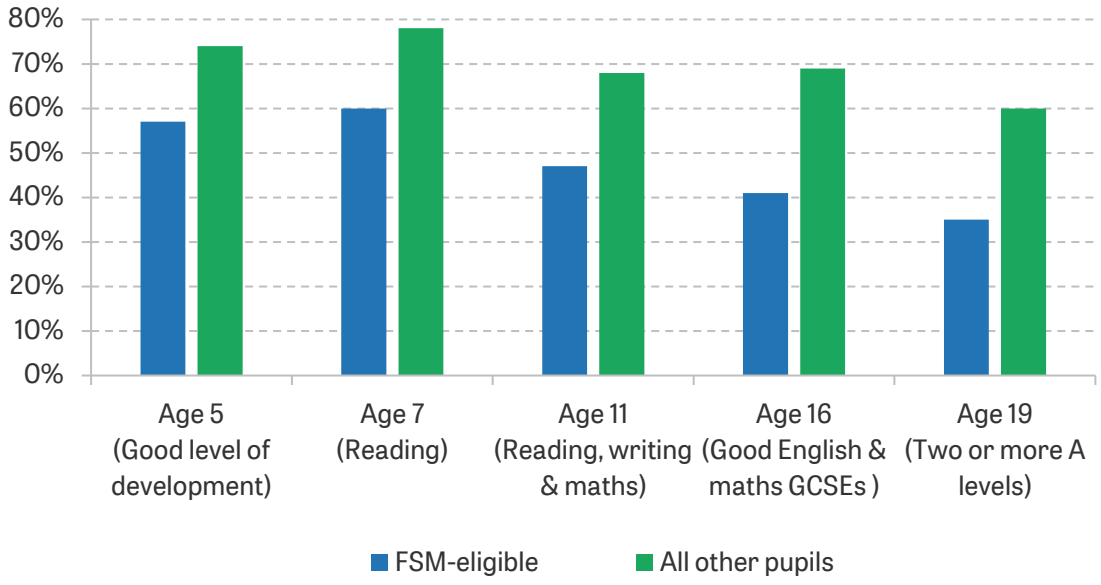
More recently, the Department for Education has adopted a new measure of disadvantage. This incorporates pupils who have ever been eligible for free school meals in the past six years as well as children being looked after by their local authority.

Socio-economic status index. In order to obtain more nuanced information about differences in background, it is sometimes possible to calculate a socio-economic status index. This is a number calculated for each individual on the basis of a range of factors that are specific to them, such as the level of deprivation in the area in which they grew up as well as their eligibility for free school meals.

Socio-economic inequalities during school

In Figure 27, we show the share of students in England achieving important educational benchmarks at various ages – age 5 (the first year of school), age 7 (the end of Key Stage 1), age 11 (the end of primary school), age 16 (GCSEs) and age 19 (Level 3 attainment) – by their eligibility for free school meals. Because of the tremendous disruption to assessment during the COVID-19 pandemic, we focus on data from 2019 (the most recent data available that are based on 'normal' assessments at all stages).

Figure 27. Attainment gaps between students eligible and not eligible for free school meals at different stages of the education system, 2019



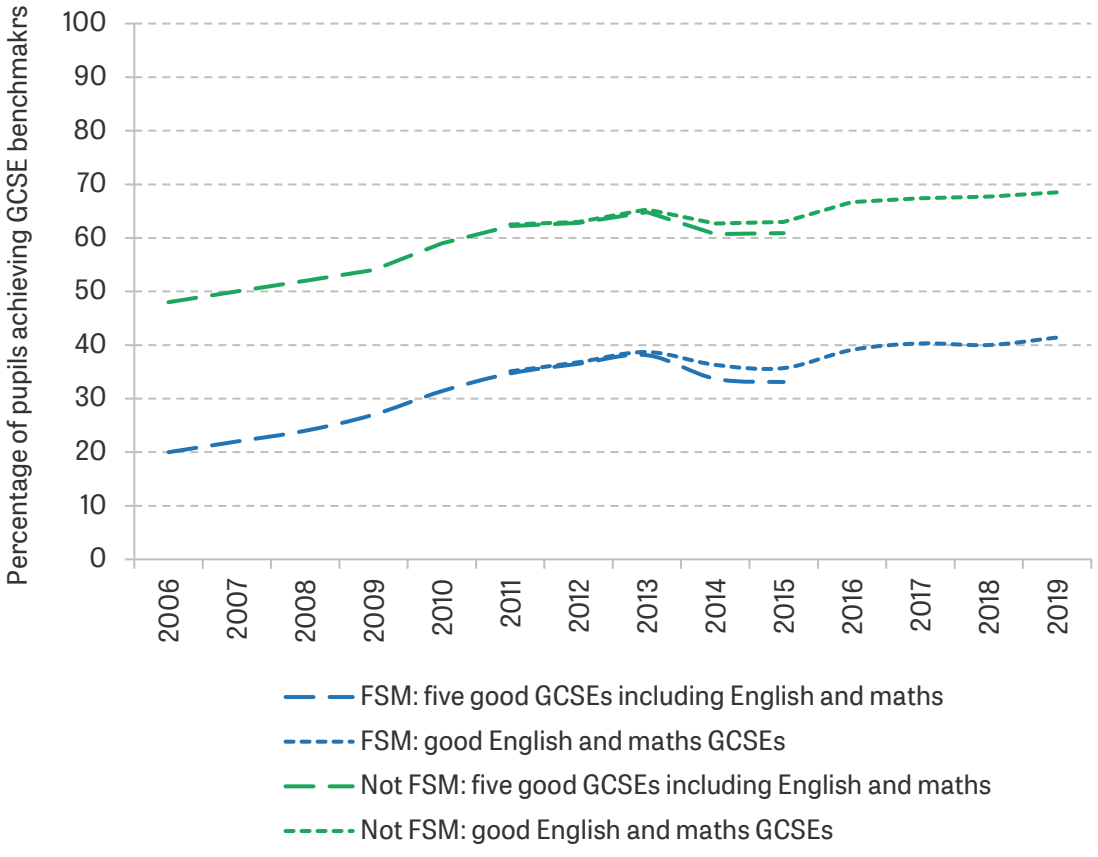
Note: Data are based on pupils recorded in mainstream state-funded schools in England. A good level of development at age 5 refers to a pupil achieving at least the expected level in the early learning goals (ELGs) within the three prime areas of learning and within literacy and numeracy. Age 7 results refer to reaching the expected level in Key Stage 1 English reading. Age 11 results refer to reaching the expected level in all of the Key Stage 2 reading and maths tests and writing teacher assessment. Age 16 results refer to pupils who achieved grades 4–9 in both English and maths GCSEs. Age 19 results refer to achieving two or more A levels (or equivalent) by the age of 19.

Source: Age 5 statistics are based on table 1 of 'Early years foundation state profile results: 2018 to 2019'. Age 7 statistics are based on table N10 of 'Phonics screening check and key stage 1 assessments: England 2019'. Age 11 statistics are based on figure 5 in Department for Education, 'National curriculum assessments: key stage 2, 2019 (revised)'. GCSE statistics are from 'Characteristics summary' table in Department for Education, 'Key stage 4 performance, 2019 (revised)'. Level 3 attainment statistics are based on table 3 in Department for Education, 'Level 2 and 3 attainment by young people aged 19 in 2019'.

Even at the beginning of the schooling years, there are already large disadvantage gaps in attainment. While only 57% of children eligible for free school meals are recorded as having a good level of development at age 5, 74% of children from better-off families meet this benchmark. The size of the gap is similar at the end of Year 2 (age 7), when 60% of disadvantaged pupils reach the expected level in reading compared with 78% of their better-off peers. The share of pupils meeting expectations falls by the end of primary school: strikingly, just 65% of pupils leaving primary school in 2019 were achieving the expected level in terms of reading, writing and mathematics. Under its new plans for 'levelling up' education, the government wishes to see this rise to 90% by 2030 (see Section 9 for more discussion of the levelling up agenda). This hugely ambitious target is motivated, in part, by the inequalities at this stage: fewer than half (47%) of pupils eligible for free school meals met the expected standard in all three areas in 2019.

There is also a clear disadvantage gap in GCSE results. While 69% of students not eligible for free school meals obtained at least a grade 4 in both English and maths GCSEs, only 41% of pupils eligible for free school meals met the same benchmark. By age 19, just 35% of individuals who were FSM-eligible at age 16 obtained Level 3 (A-level or equivalent) qualifications compared with 60% of all other pupils.

Figure 28. GCSE performance by children's eligibility for free school meals



Note: Long-dashed lines reflect the percentage of pupils earning five good GCSEs, including English and maths (available 2006 through 2015). Shorter-dashed lines show the percentage of pupils achieving good English and maths GCSEs (grades A*–C or 9–4).

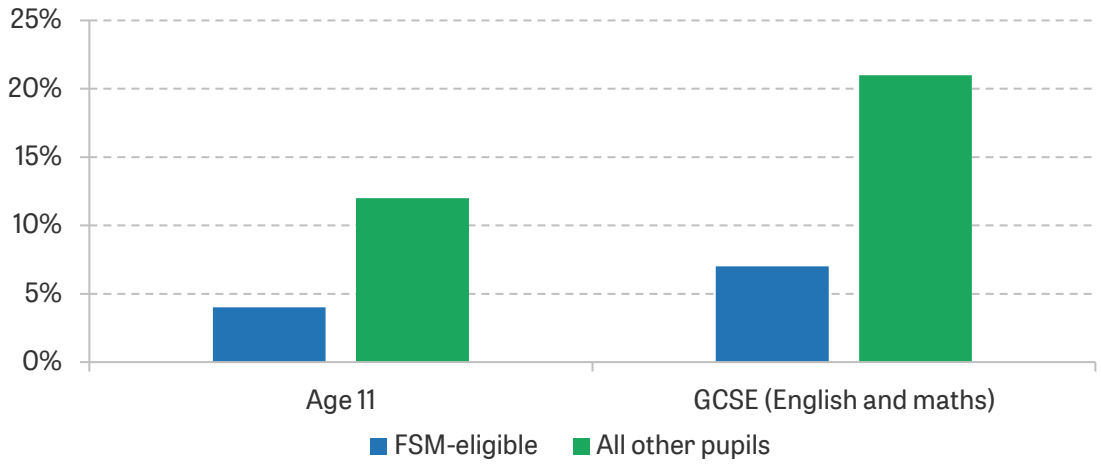
Source: Department for Education, 'GCSE and equivalent attainment by pupil characteristics' (2014 and prior years). Department for Education, 'Revised GCSE and equivalent results in England' (2017 and prior years). Department for Education, 'Key stage 4 performance 2019 (revised)'.

These gaps can also worsen as children progress through the education system. In the 2019 GCSE cohort, just 40% of disadvantaged children who achieved the expected level at age 11 went on to earn good GCSEs in English and maths.[6] Among children from non-disadvantaged backgrounds who achieved at the expected level, 60% went on to meet the GCSE benchmark. The disadvantage gap is large even among those with high attainment at the end of primary school: while virtually all (95%) of non-disadvantaged pupils who achieved above the expected level went on to earn good GCSEs, one in six high achievers from disadvantaged backgrounds missed out on the GCSE benchmark.

And, as Figure 28 shows, these gaps have been exceptionally persistent over the last 15 years. Despite substantial growth in the share of pupils reaching GCSE benchmarks, the gap in performance between pupils who are eligible for FSM and their better-off peers has remained essentially unchanged, with non-FSM pupils 27–28 percentage points more likely to meet the benchmark.

Hutchinson, Reader and Akhal (2020) construct a different measure of the 'disadvantage gap' by converting the difference in GCSE attainment between students into a measure of how many months of learning disadvantaged students are behind other students. According to this measure, there was a decline in socio-economic differences in the first half of the decade as the GCSE disadvantage gap fell by 1.6 months between 2011 and 2015. However, since 2015, progress in closing the gap seems to have stalled.[7] The persistence of the disadvantage gap – on either measure – is remarkable, given widespread agreement on the importance of equalising opportunities and sustained policy effort to support disadvantaged pupils.

Figure 29. Higher attainment gaps between students eligible and not eligible for free school meals at the end of primary school and compulsory secondary education



Note: Data are based on pupils recorded in mainstream state-funded schools in England. Age 11 results refer to achieving above the expected level in all of the Key Stage 2 reading and maths tests and writing teacher assessment. GCSE refers to pupils whose average grade across their English and maths GCSEs was above 7 (equivalent to an A grade).

Source: Age 11 statistics are based on table N5 in Department for Education, 'National curriculum assessments: key stage 2, 2019 (revised)'. GCSE statistics are from table CH5 in 'Characteristics summary' table in Department for Education, 'Key stage 4 performance, 2019 (revised)'.

[6] Based on statistics from Department for Education, 'Ready reckoners and transition matrices for key stage 4'.

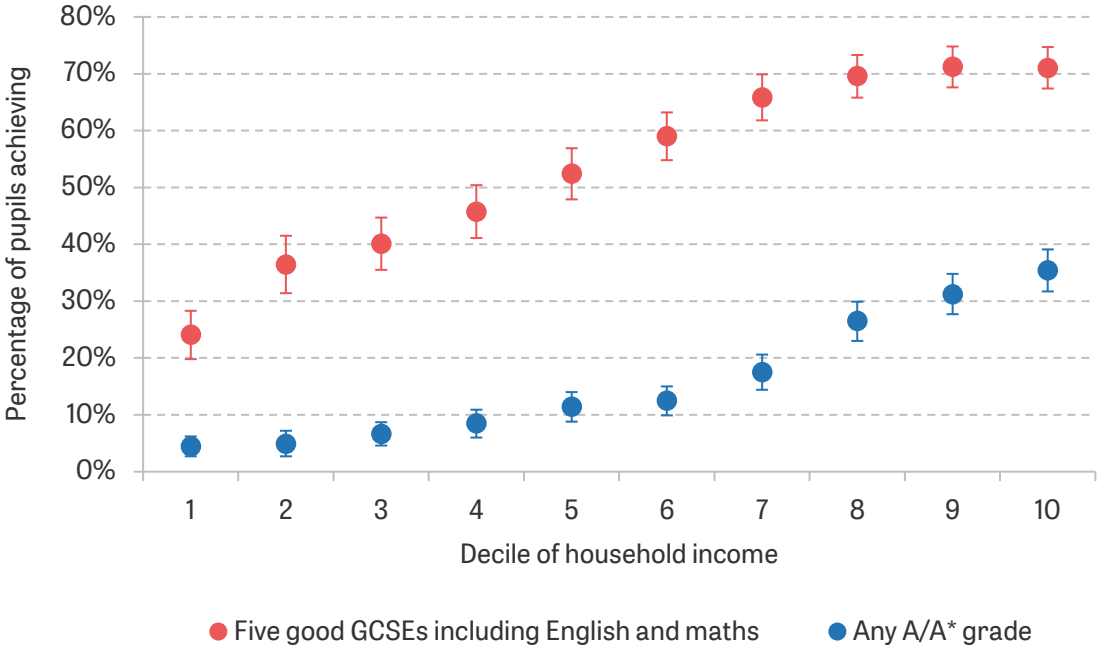
[7] This may partly be due to reforms to GCSE exams, but Burgess and Thomson (2019) find that these reforms do not completely explain the lack of progress in closing the gap.

Even more striking than the socio-economic gap in achieving educational benchmarks is the inequality in children who excel academically. Figure 29 shows that, at the end of primary school and at GCSE level, pupils not eligible for free school meals were around three times as likely to achieve very strong results as their FSM-eligible peers.

Moving beyond eligibility for free school meals

So far, we have measured socio-economic status by eligibility for free school meals. As discussed in Box 7, this is a useful way of identifying the most economically disadvantaged families. However, these measures do not tell us anything about how socio-economic background influences attainment among other groups. While administrative education data in England do not contain information about parents' income or other characteristics, we can use data from the Millennium Cohort Study (MCS) linked to pupils' educational records to see how different family characteristics relate to attainment in this cohort of children (who were born in 2000 and 2001).

Figure 30. GCSE attainment by decile of household income at age 14



Note: Pupils are split into ten equally-sized groups based on their age 14 equivalised household income. This is the last set of income data collected in the MCS before pupils sat their GCSEs at age 16. Vertical lines show the 95% confidence intervals for each estimate.

Source: Authors' calculations using data from the Millennium Cohort Study linked to the National Pupil Database.

Figure 30 shows the percentage of young people obtaining five good GCSEs including English and maths (in red) and the share earning at least one A or A* grade at GCSE (in blue), by decile of their family's income when they were 14. There are enormous differences by family income in both measures. More than seven in ten of the young people from the 10% richest families earn five good GCSEs, compared with fewer than three in ten young people in the poorest families. A child whose parents are in the top third of the income distribution has a higher chance of earning As and A*s than a child from the poorest families does of getting five good GCSEs.

Figure 30 also shows the limits of relying solely on FSM eligibility to measure socio-economic inequalities in education. FSM eligibility captures broadly the bottom two household income groups. There are big differences within this – young people in the second decile are around 50%

more likely than those in the poorest 10% of families to earn five good GCSEs. And there are differences in the non-FSM group as well; young people in the third decile (who are not eligible for FSM) achieve similarly to those in the second decile (who mostly are), but they look very different from those at the top of the income distribution.

It is also interesting to compare the relationship between income and achievement towards the top of the income distribution. While the relationship between income and earning five good GCSEs is close to non-existent for the top four income groups, there are huge differences in the probability that these children excel academically. Children in the 10% richest families are more than twice as likely as those in the seventh decile to earn at least one A or A* grade.

What has been the impact of COVID-19 school closures on learning and educational inequalities?[8]

The COVID-19 pandemic has deeply affected every stage of education, widening the already-large inequalities between different socio-economic groups and between different regions. In England, schools were fully shut to all but the most vulnerable pupils for 17 weeks across two national lockdowns. Many pupils have spent far longer out of the classroom due to local lockdowns, self-isolation, or the staggered return to in-person schooling in Summer 2020. Of course, education did not stop happening while schools were out – but the shift to online learning was neither equally delivered nor equally accessible. Instead, it has highlighted some pre-existing inequalities and created new ones.

Curriculum delivery. The initial (March 2020) period of school closures in England was sudden and largely unanticipated. Schools were given a weekend's notice to shift to fully online delivery, and there was little guidance available about what provision ought to look like. In general, schools with more affluent student bodies were more likely to offer a more intensive curriculum during the first period of school closures. Nearly three-quarters of private school pupils had full school days – almost twice the share of state school pupils (Elliot Major, Eyles and Machin, 2020). Even within the state sector, there were substantial differences of approach: while nearly 60% of state secondary school parents in the richest fifth of families reported that their child's school was providing online classes, this fell to 40% of parents in the poorest fifth of families (Andrew et al., 2020c).

During the second period of school closures (January–March 2021), schools' provision of learning evened out somewhat (Cattan et al., 2021a). This improvement highlights the important role that policy can play in guiding school policy: clear guidance on the expected offer from schools, coupled with creation of online learning resources such as Oak National Academy, helped schools to deliver a more intensive and uniform approach to home learning.

The digital divide. The move to online learning meant that access to reliable internet and home computers became vital for children to access their school's lessons. But these factors were not equally distributed before the pandemic – and, despite the departmental aim to provide laptops to some disadvantaged secondary school pupils, it remained the case that pupils in disadvantaged families were substantially less likely to have access to suitable technology to learn online. In January 2021, around 80% of teachers in the most affluent quarter of schools – and 95% of those in private schools – reported that nearly all of their pupils had access to a device for learning. In the most disadvantaged schools, this fell to around 40% of teachers (Sutton Trust, 2021).

[8] There has been an enormous amount of research into the educational impacts of the pandemic. Excellent summaries include Royal Society DELVE Initiative (2020) and Education Endowment Foundation (2021).

Home environment and resources. The shift to home learning also made a wide range of other home resources more important. The inequalities in access to desks and quiet study spaces were larger than inequalities in access to technology; they were also much more difficult for policymakers to address, and so largely persisted throughout both rounds of school closures.

Parents were another important resource for children being asked to learn at home. Families differed in the amount of time that parents had available to support their child, and in the knowledge and skills they had to provide practical help with mastering new or challenging concepts.

Pupil engagement in home learning. Given these inequalities in home and school resources, it is perhaps unsurprising that disadvantaged pupils were, on average, much less engaged in home learning (Nelson and Sharp, 2020). Disadvantaged pupils also spent less time on home learning activities than their better-off peers (Williams et al., 2020; Green, 2020). At primary school, the largest inequalities were in time spent on online classes; at secondary school, however, inequalities in time on other educational activities such as paid tuition or self-study were even more pronounced (Andrew et al., 2020b).

The return to school. The enormous inequalities that home learning opened up meant that access to in-person schooling during 2020 and 2021 will be an important factor in children's learning. However, even here a combination of policy decisions and families' choices may have further exacerbated educational gaps. During the optional return to school in Summer 2020, pupils at the 10th percentile of the pre-COVID family earnings distribution were 21 percentage points less likely to return to school than their peers at the 90th percentile, even after accounting for a wide range of school and family characteristics (Cattan et al., 2021b).

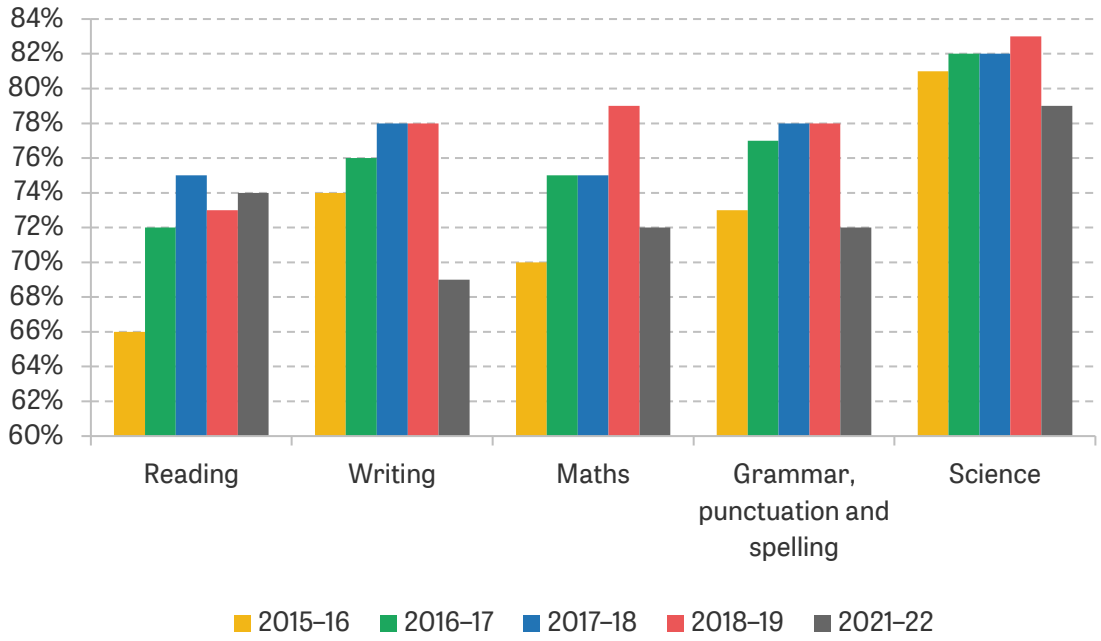
The pandemic's impact on attainment and inequalities in lost learning

There is a growing body of evidence aiming to quantify the impacts of the COVID-19 period on children's learning. Most studies find that the first period of school closures in England cost children on average 1–2 months of expected progress, with larger impacts in maths (Rose et al., 2021; Renaissance Learning and Education Policy Institute, 2021; Blainey and Hannay, 2021). While there is less evidence for secondary school pupils, some studies suggest that the scale of learning loss was similar or somewhat larger (Renaissance Learning and Education Policy Institute, 2021). The restrictions on in-person learning in 2021 also had an impact, costing primary school pupils around a month of expected progress (Renaissance Learning and Education Policy Institute, 2021).

The most recent data from the Department for Education (Key stage 2 attainment: National headlines) bear out the huge loss of learning that has occurred. Overall, 59% of pupils met the expected level in reading, writing and maths in 2021–22, down from 65% in 2018–19 (assessments were cancelled during the two years in between). The government's levelling up agenda wants to see that number rise to 90% by 2030, so this represents a significant setback on a measure that is already well below that goal.

Figure 31 looks at performance on specific Key Stage 2 subjects. Performance in writing and maths in particular had been improving quickly pre-pandemic, with the share of pupils meeting the standard in maths growing by nearly 10 percentage points. However, the pandemic significantly knocked back these scores: in 2021–22, just 72% of children achieved the expected level in maths. Writing scores fell even more steeply, from a high of 78% to just 69%.

Figure 31. Share of pupils meeting the expected level at the end of Key Stage 2 (England)



Note: Changes in the writing assessment in 2017–18 mean writing attainment is not directly comparable to earlier years. Data analysing attainment among different groups of pupils (e.g. disadvantaged and not) will be available in December 2022 in a revised statistical release.

Source: Department for Education, 'Key stage 2 attainment: National headlines'.

Interestingly, performance in reading held up better than in other subject areas. This might partly reflect how schools prioritised home learning content during the pandemic, but it could also reflect the greater confidence that parents had in supporting children with reading at home. This latter channel provides an additional argument for the importance of improving skills in the adult population: it might benefit children, through enriching their home environments, as well as the adults themselves.

While data for post-pandemic attainment in different groups are not yet available, numerous studies conducted using other data sources (such as in-class assessments) make it clear that these impacts are far from equally distributed. Unequal access to school resources, unequal technology and study space at home, unequal engagement in home learning and an unequal return to school mean that disadvantaged students, on average, have fallen much further behind than their better-off peers. Precise estimates of this gap are still uncertain, but one study found that the gap between Year 6 Pupil Premium students and their peers had widened from around five months' expected progress to nearly seven months (Blainey and Hannay, 2021). Put another way, many of the available studies suggest that disadvantaged pupils suffered around twice as much learning loss as the average during the pandemic. The enormous scale of this challenge – both the overall worsening of results, and the widening inequalities between groups – should define much of education policymaking in the coming years.

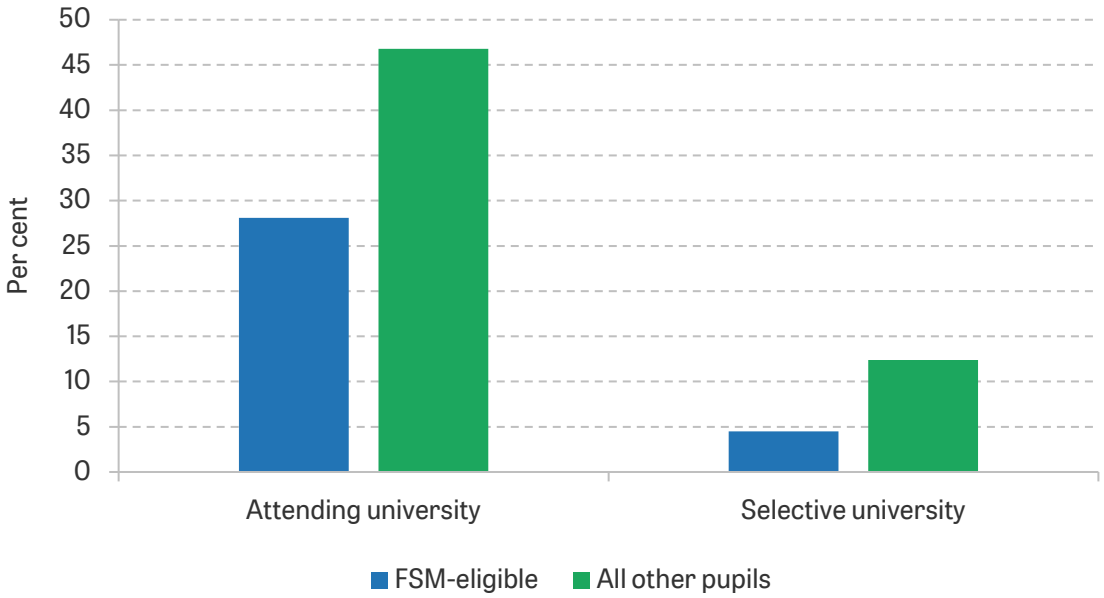
Socio-economic inequalities in higher education

The attainment gaps during school are mirrored by gaps in the rate of progression to higher education as a whole as well as progression to the most selective higher education institutions. Figure 32 shows the percentage of pupils who have started studying for a degree by age 19. Just over a quarter (28%) of pupils who were eligible for free school meals had progressed to higher

education by 19, compared with almost 47% of their non-FSM-eligible peers. While this gap had closed slowly between the mid 2000s and 2015, it has since opened back up again – the gap in 2021, at 19 percentage points, was the same as it was in 2007.

And, as we saw earlier in this section, the proportional inequalities look even bigger when we consider higher academic benchmarks; pupils who were not eligible for FSM were nearly three times more likely to attend one of the most selective higher education institutions than their peers from more disadvantaged backgrounds. We showed in Part I that attending university significantly raises lifetime earnings – and this is especially true for disadvantaged pupils, and for those attending selective universities. The results in Figure 32 suggest that there is considerably more scope to support pupils from these groups to access university (though such support would need to start early and be reflected in school-level achievement (Chowdry et al., 2012)).

Figure 32. Progression to higher education and the top-third most selective higher education institutions at age 19, by eligibility for free school meals at age 15 (2021)



Note: The Department for Education ranks higher education providers into three categories (low-, medium- and high-tariff providers) based on the normalised mean tariff score of their intake; we refer to the high-tariff providers as the top-third most selective higher education institutions.

Source: 'Widening participation in higher education 2019'.

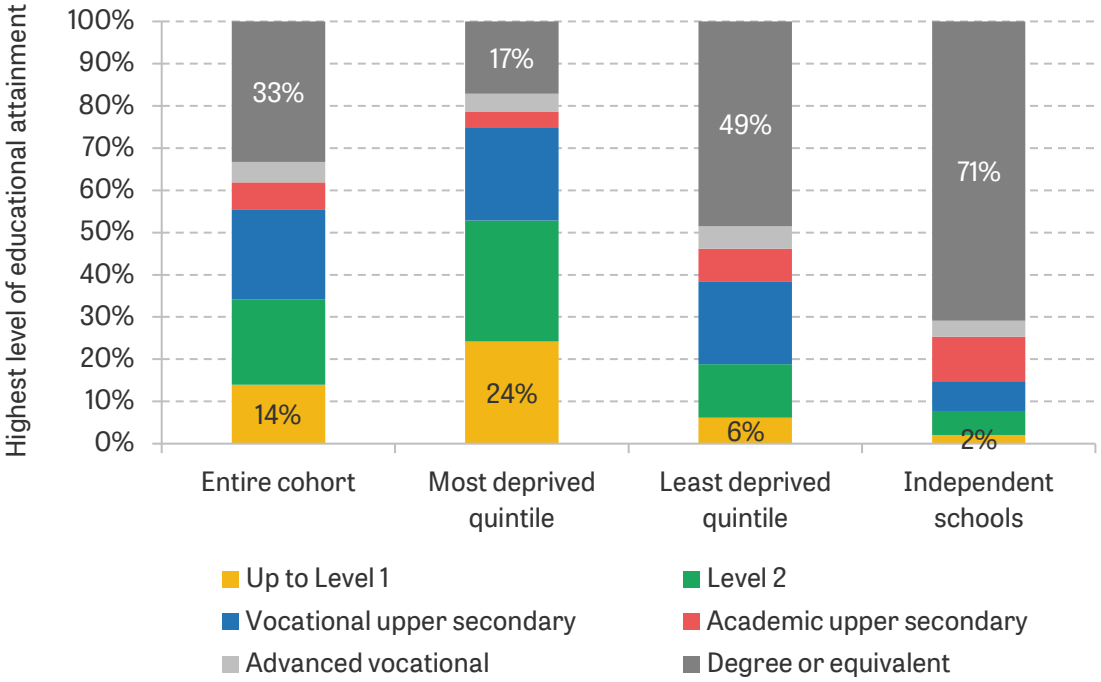
Socio-economic inequalities carry over into adulthood

These differences in educational experiences during school and early adulthood lead to huge differences in the types of qualifications that young adults from different socio-economic backgrounds hold. In Figure 33, we look at the distribution of educational attainment 10 years after the end of full-time compulsory schooling (i.e. at the time of GCSE exams). Specifically, we look at the distribution of educational attainment at age 26 for the entire cohort of students in England who completed their GCSEs in 2006. The graph shows the distribution of educational attainment for the entire cohort as well as for three socio-economic groups – the most deprived quintile and least deprived quintile as identified by ranking everyone based on a socio-economic

status index, and those who attended a private school for their secondary education (who are included as a distinct socio-economic group).[9]

Ten years after GCSEs, roughly a third of young adults had gone on to complete a degree. Another third had not progressed to upper secondary education, while the rest had qualifications in between. But these outcomes vary enormously based on the young adult's background. More than half of young adults from the most disadvantaged families were only qualified to GCSE level or below. Over 90% of young people who attended private school had progressed past this level. The strong relationship between background and qualifications is also obvious when looking at degrees; over 70% of private school alumni held a degree, compared with fewer than 20% of those in the poorest fifth of families. These large inequalities in progression to higher education explain a large share (though far from all) of the earnings gaps by age 30 between those who had been eligible for free school meals, those who had not been, and those who had attended independent schools (Office for National Statistics, 2022).

Figure 33. Distribution of highest educational attainment among 26-year-olds in England by socio-economic status, 2016



Note: Espinoza et al. (2020) calculate a socio-economic status index for each individual based on a combination of variables, including indicators that measure the deprivation of the local area in which they grew up (e.g. the percentage of people in managerial and professional occupations in the area and the share of people who own their homes) and whether the person was eligible for free school meals during their time at school. They rank everyone into quintiles based on this socio-economic score and report the levels of education among the most deprived and least deprived quintiles.

Source: Authors' calculations using table A1.4 in Espinoza et al. (2020).

[9] It is not possible to calculate socio-economic scores for private school students and instead they are treated as a separate socio-economic group in their own right. In particular, this means that the quintile labelled as least deprived does not include any private school students.

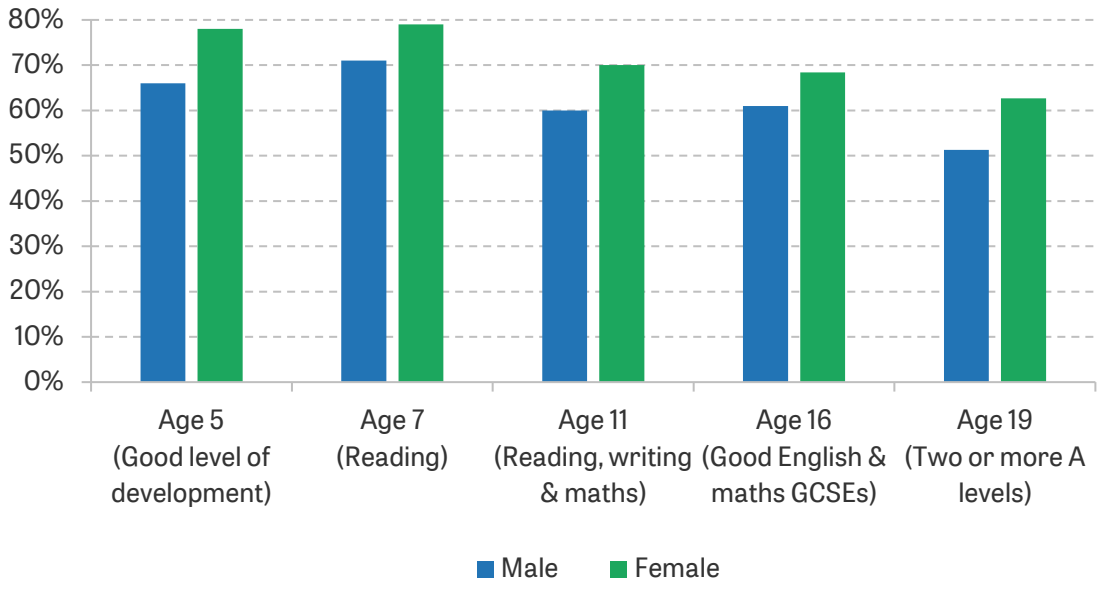
Summary

Educational inequalities by family background are substantial, pervasive and stubbornly persistent. At all stages of education, children and young people from disadvantaged backgrounds are far less likely to achieve educational benchmarks. These gaps are even larger, in proportional terms, when we consider higher levels of attainment.

7. Educational inequalities by gender

In many areas, as Andrew et al. (2021) highlight, women and girls have worse outcomes than men and boys. This is not the case in the education system: for quite some time, women have outperformed men in terms of both their grades and their educational attainment. In Figure 34, we show attainment gaps by gender at age 5 (the first year of school), age 7 (the end of Key Stage 1), age 11 (the end of primary school), age 16 (GCSEs) and age 19 (Level 3 attainment).

Figure 34. Attainment gaps at different stages of the education system by gender, 2019



Note: Data are based on pupils recorded in mainstream state-funded schools in England. A good level of development at age 5 refers to a pupil achieving at least the expected level in the early learning goals (ELGs) within the three prime areas of learning and within literacy and numeracy. Age 7 results refer to reaching the expected level in Key Stage 1 English reading. Age 11 results refer to reaching the expected level in all of the Key Stage 2 reading and maths tests and writing teacher assessment. GCSE refers to pupils who achieved grades 4–9 in both English and maths GCSEs. Level 3 attainment at age 19 refers to achieving two or more A levels (or equivalent) by the age of 19.

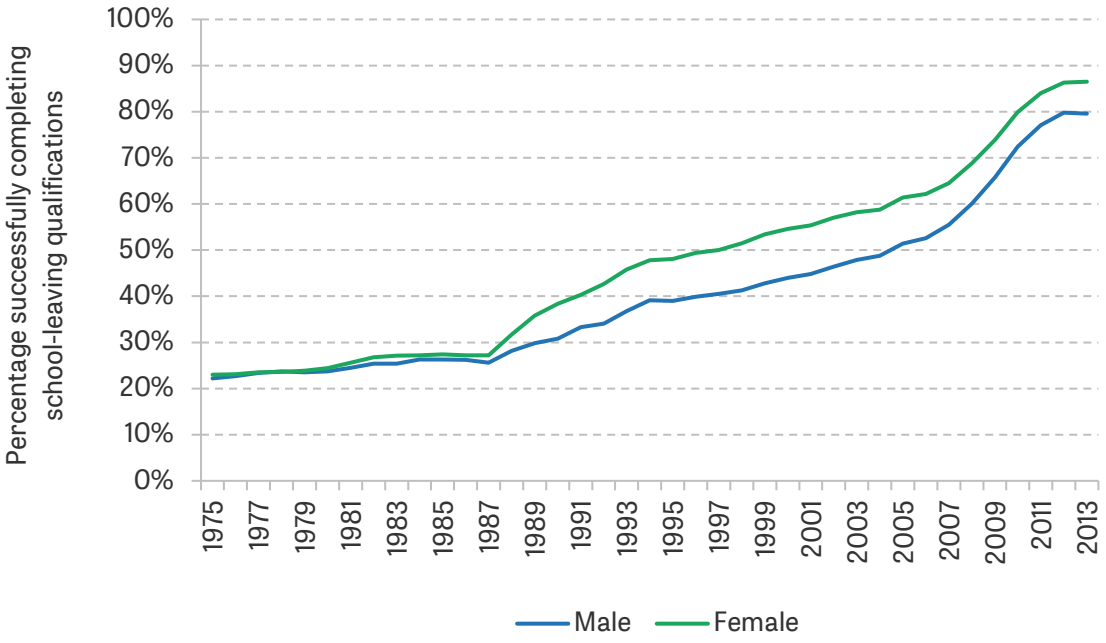
Source: Age 5 statistics are based on table 1 of 'Early years foundation state profile results: 2018 to 2019'. Age 7 statistics are based on table N7 of 'Phonics screening check and key stage 1 assessments: England 2019'. Age 11 statistics are based on figure 5 in Department for Education, 'National curriculum assessments: key stage 2, 2019 (revised)'. GCSE statistics are from 'Characteristics summary' table in Department for Education, 'Key stage 4 performance, 2019 (revised)'. Level 3 attainment statistics are based on table 3 in Department for Education, 'Level 2 and 3 attainment in England: Attainment by age 19 in 2019'.

At the start of primary school, girls are more likely than boys to be classified as having a good level of development, and when they are assessed at the end of Key Stage 1 (at age 7) almost 80% of girls reach at least the expected standard in reading compared with 71% of boys. (The gender gap is larger – 13 percentage points – for English writing, and just 3 percentage points in maths.) By the end of primary school, 60% of boys reach the expected level in reading, writing and maths,

while 70% of girls meet the threshold. There is also a clear gender gap in GCSE results; the share of girls achieving at least a grade 4 in both English and maths GCSEs is 7 percentage points higher. Moreover, while 51% of young men achieve Level 3 (A-level or equivalent) qualifications by the age of 19, 63% of young women do so.

The gender gap in education is not a recent phenomenon. Figure 35 shows the long-run trend in the share of young people successfully completing school-leaving qualifications (i.e. achieving at least five O-level passes or five GCSEs at grade C and above). A gap in GCSE performance between boys and girls first emerged in the 1980s, around the time that O levels were replaced by GCSEs in England, Wales and Northern Ireland in 1988. The introduction of GCSEs brought a move towards more continuous assessment, which seems to have benefited girls.

Figure 35. Share of men and women in each academic cohort in England and Wales achieving school-leaving qualifications (at least five O-level passes or five GCSEs at grade C and above)



Note: From the 2013–14 academic year, there were changes to the way in which the number of pupils achieving five GCSEs at grade C or above was measured, which means it is not possible to make comparisons using this measure for more recent years.

Source: Historical statistical releases of GCSE results published by Department for Education.

The gender gap grew quickly in the years after the introduction of GCSEs, peaking at 11 percentage points between 1999 and 2002. It then fell slowly to around 7 percentage points in the early 2010s as boys caught up with girls. More recent measures, though not directly comparable to the historical data in Figure 35, show a similarly-sized gender gap.

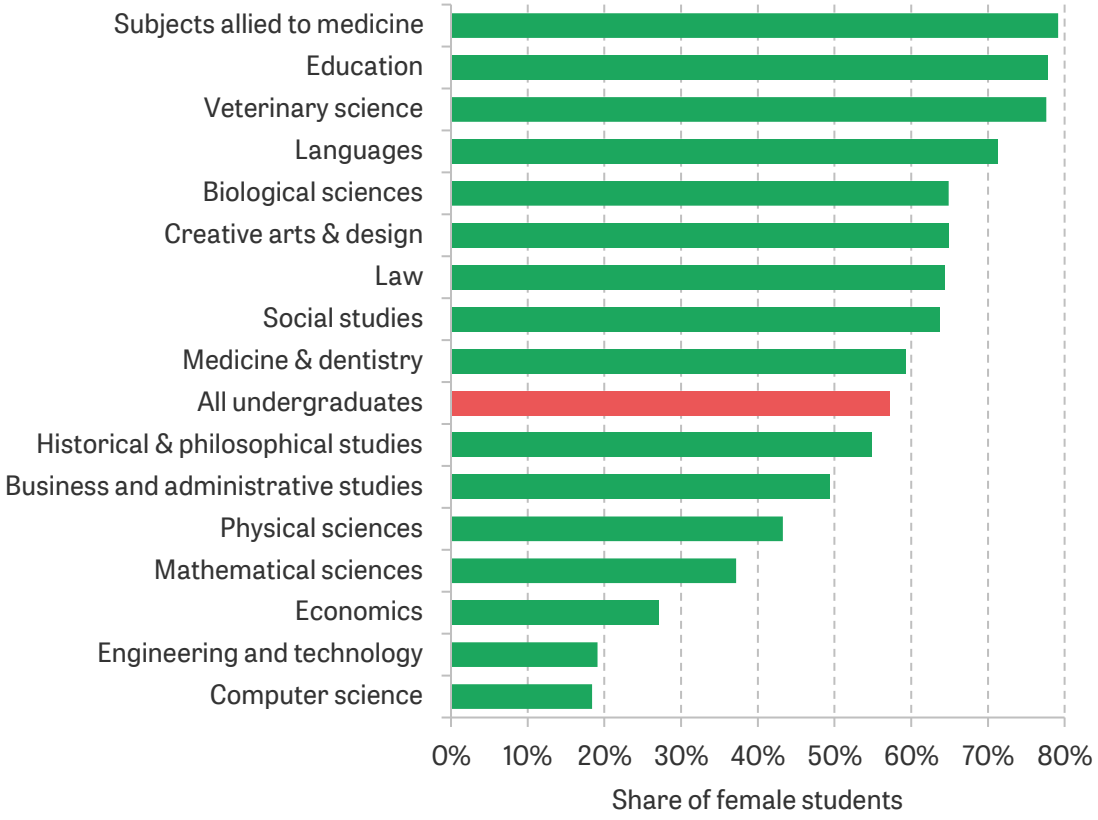
Gender gaps in progression to higher education

For much of the 20th century, men were more likely than women to complete a degree. However, the number of women completing degrees overtook the number of men doing so in the 1990s (Bolton, 2012). The gap between the number of men and women studying for degrees has increased each year since then, such that in 2020–21 57% of pupils in higher education were female (Higher Education Statistics Agency, 2022). This trend of increasing numbers of women studying at university has been witnessed in many other developed countries.

The gender gap in higher education participation among the most selective universities is nearly as large (in proportional terms). In 2019–20, 12% of young women attended a selective university, compared with 10% of young men ('Widening participation in higher education 2019'). These gender gaps have grown slightly over the last decade, even as higher education participation has increased for both men and women.

We established in Part I that attending university is associated with higher earnings but crucially the subject studied also matters for future earnings. Women tend to study different subjects from men at university. This is highlighted by Figure 36, which shows the share of students enrolled in different university subject areas who are female.

Figure 36. Share of female students in different degree subject areas, 2018–19



Source: Authors' calculations using HESA statistics from 'Figure 13 – HE student enrolments by subject area and sex'.

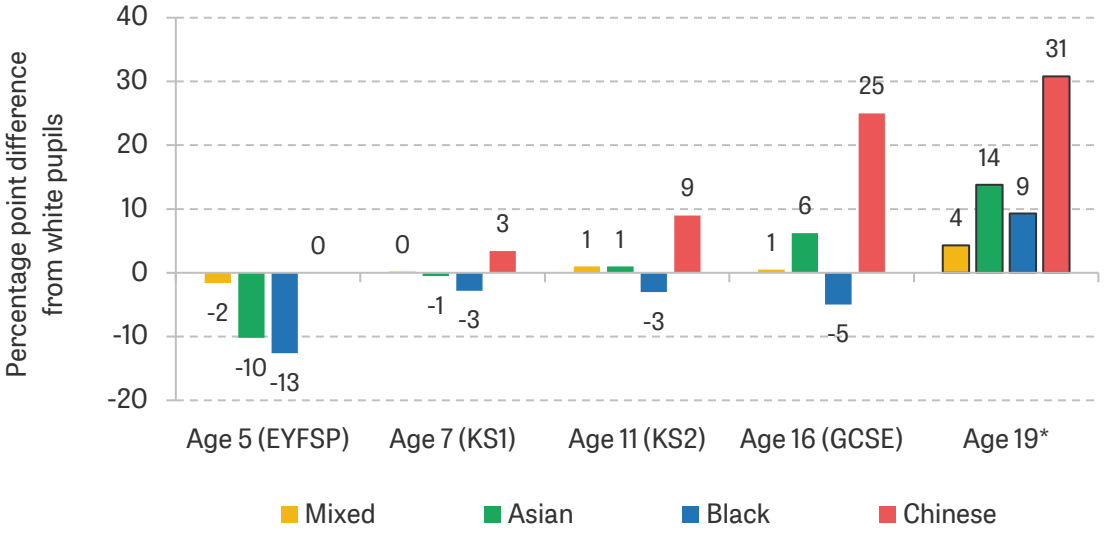
There are significant differences in the subjects studied by men and women in higher education. Among those taking science-related degrees, women are over-represented in subjects allied to medicine (e.g. nursing), veterinary science, biological sciences and medicine & dentistry even compared with their share of the overall university population. Yet fewer than half of the students studying other STEM subjects are female. Women are particularly under-represented in engineering & technology and computer science courses, where they make up less than one-fifth of the student body. In a study of gender gaps in education, Cavaglia et al. (2020) find that even after accounting for other differences between men and women, such as their prior educational attainment, women in England are 16.5 percentage points less likely than men to study STEM subjects at university.

Across the non-science degrees, women are over-represented in most subject areas. There are particularly high levels of women studying education (78%) and languages (71%) at university. In contrast, less than half of people studying business and administrative degrees and only 27% of those taking economics degrees are women. This gender difference in subject-taking is important because some of the courses where women are under-represented have some of the highest returns – meaning that subject of study contributes to the gender pay gap shortly after graduation (Puhani and Machin, 2003; Advani et al., 2021).

8. Educational inequalities by ethnicity

In the UK, as Mirza and Warwick (forthcoming) document for this Review, there is a vast amount of evidence suggesting that people from many ethnic minority backgrounds have worse outcomes across a range of areas. For example, ethnic minorities tend to earn less on average and are more likely to be unemployed.

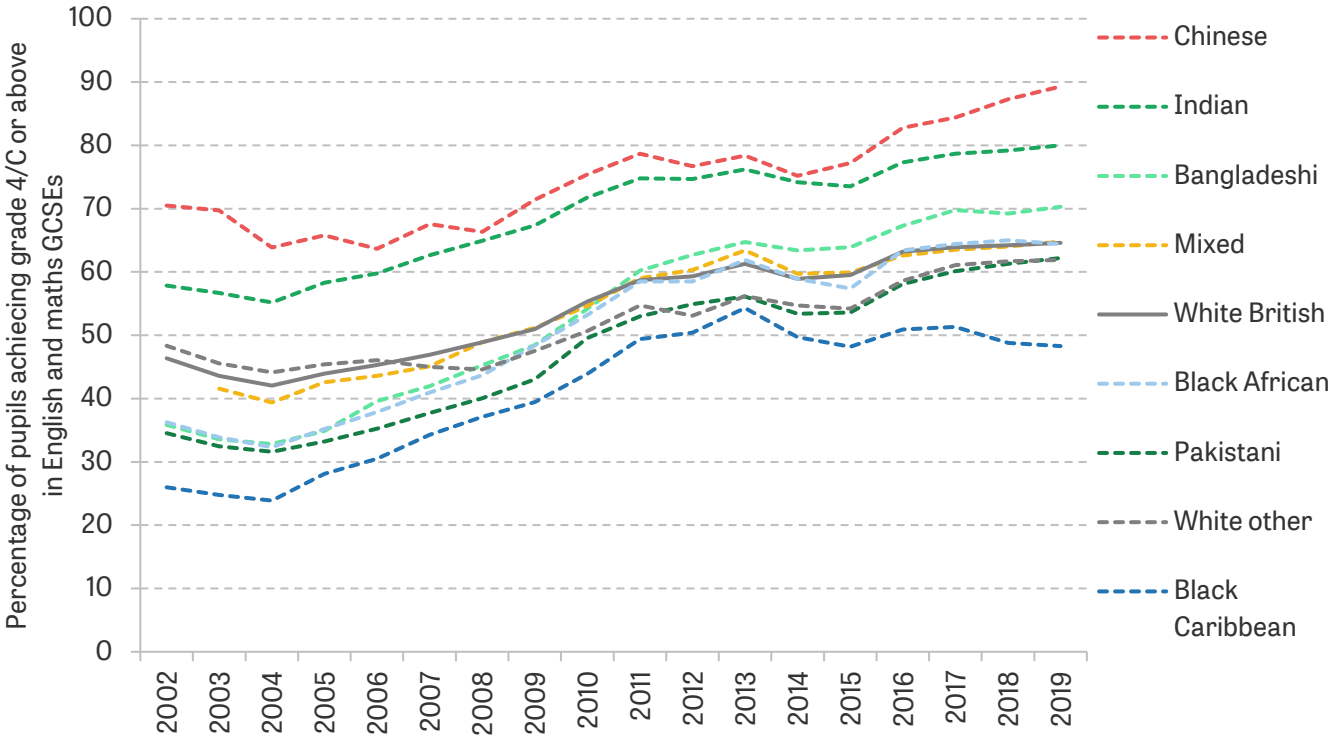
Figure 37. Attainment gaps between ethnic minority pupils and white pupils at different stages of education, 2019 GCSE cohort*



Note: Data are based on pupils recorded in mainstream state-funded schools in England. Each bar reflects the percentage point difference in the share of pupils achieving the expected level between the ethnic minority group and white pupils. At age 5, we record the share of pupils reaching a good level of development on their Early Years Foundation Stage Profile (EYFSP) assessments (in 2007–08). Age 7 refers to the share of pupils reaching the expected level of reading at Key Stage 1 (in 2009–10). Age 11 results refer to reaching the expected level in reading, writing and maths at the end of primary school (in 2013–14; note that the scale of these results is not comparable to more recent years of data). GCSE refers to pupils who achieved grades 4–9 in both English and maths GCSEs (2018–19). Results at age 19 refer to earning a Level 3 qualification (A-level equivalent) by age 19.
* Due to the pandemic's impact on attainment measures, we use data from a different cohort (the 2016 GCSE cohort) to assess Level 3 qualifications by age 19 in 2018–19.

Source: Department for Education, 'Early years foundation stage profile results: 2009 to 2010' (using historical data), 'Attainment by pupil characteristics at key stage 1: 2010', 'National curriculum assessments: key stage 2, 2014 (revised)', 'Key stage 4 performance 2019 (revised)' and 'Level 2 and 3 attainment age 16 to 25' (using age 19).

Figure 38. Share of pupils achieving good English and maths GCSEs, by ethnicity



Source: Results for 2011 to 2019 are from National Pupil Database and 'Characteristics summary' table in Department for Education, 'Key stage 4 performance, 2019 (revised)'. Earlier results from historical statistical releases of GCSE results published by Department for Education.

The education system stands out as one area where inequalities by ethnicity are more nuanced. These inequalities have changed over time, as young people from some ethnic minority backgrounds have made faster progress than white British pupils. Educational inequalities by ethnicity also change over the life cycle. Children from ethnic minority backgrounds start out with far worse outcomes than their white British peers; at age 3, for example, just 6% of children from Pakistani and Bangladeshi families scored in the top fifth of the cognitive ability distribution, compared with 21% of children from white backgrounds (Cattan et al., 2022). These ethnic inequalities persist to age 5, as Figure 37 shows: compared with white children, children from Asian and black ethnic backgrounds were considerably less likely to reach a good level of development during Reception.

But despite these early disadvantages, children from ethnic minority backgrounds seem to make much faster progress through the education system. During primary school, ethnic differences in the share of pupils reaching the expected level of development are generally small. By GCSE, the share of Asian pupils receiving good English and maths scores was around 6 percentage points higher than the share for white pupils, though pupils from black backgrounds were less likely to meet this benchmark. But pupils from all ethnic minority backgrounds were substantially more likely to have earned a Level 3 qualification by age 19 than young people from white backgrounds.

While Figure 37 shows how overall differences by ethnic background change over the life cycle, these broad ethnic categories obscure important differences between different ethnicities within each group. Figure 38 focuses on GCSE attainment to show how performance within these more granular ethnic groups has changed over time. In the early 2000s, there were five clear categories of performance. At the top end, 70% of pupils from Chinese backgrounds achieved

passing grades in English and maths. This fell to just under 60% of pupils of Indian heritage, and below 50% of white pupils (white British and white other). Pupils from Pakistani, Bangladeshi and black African backgrounds were in the next group, with around 35% of pupils achieving good GCSEs. Pupils from black Caribbean backgrounds had the worst results on average, with only around 25% passing their English and maths GCSEs.

By the late 2000s, many of these ethnic inequalities had narrowed. At the top end, Indian and Chinese pupils performed more similarly. And differences between other ethnic groups had declined as well, with the attainment gap between black Caribbean and white British pupils falling to around 10 percentage points in the early 2010s.

Since then, though, much of this progress has reversed. While some groups – most notably Bangladeshi students – continued to improve, the share of black Caribbean pupils achieving good English and maths GCSEs has fallen from 54% in 2013 to 48% in 2019. While the gap between Chinese and black Caribbean pupils had narrowed from 45 percentage points in 2003 to 24 percentage points in 2013, by 2019 nearly all of this progress had disappeared, as the gap rose to 41 percentage points.

One group that fares particularly poorly in the education system is children from Gypsy, Roma or Irish Traveller backgrounds. This is a relatively small group – fewer than 1,500 pupils in this group sat GCSE exams in 2019, compared with a total cohort of around 540,000.[10] But among those who did sit GCSEs, attainment rates were far below those of other ethnic groups; just 28% of Irish Traveller pupils sitting GCSEs, and 14% of Gypsy and Roma pupils, achieved good GCSEs in English and maths. Given the small numbers sitting these exams, the share of the whole 16-year-old Gypsy, Roma and Traveller cohort attaining these qualifications will be even lower.

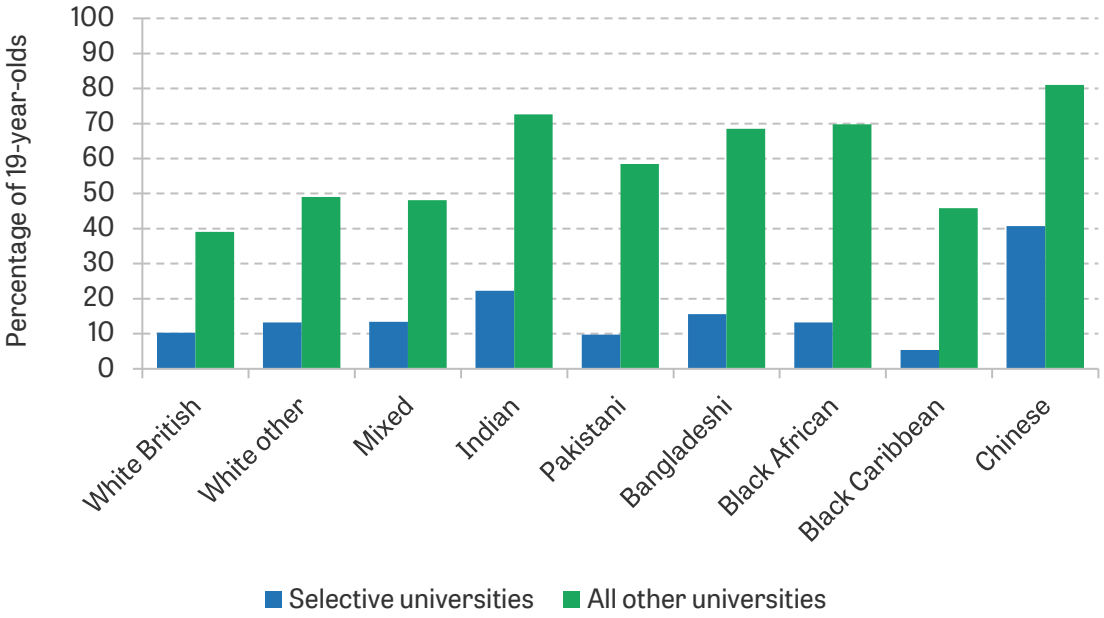
Gypsy, Roma and Traveller children face exceptionally high levels of disadvantage; one study finds that five in six children from these backgrounds are disadvantaged in housing, household economic activity, education and/or health, compared with two in six children from other backgrounds (Burchardt et al., 2018). In addition, children and young people from Gypsy, Roma and Traveller backgrounds face challenges including frequent transitions between schools, employment and/or domestic responsibilities, a lack of cultural understanding, language barriers, racism and bullying (Wilkin, Derrington and Foster, 2009).

Ethnic inequalities in higher education

While the average GCSE results of white British children are rather middle-of-the-pack, these students stand out for being far less likely than students from most ethnic minority backgrounds to attend university (Figure 39). This is especially striking since many of these ethnic minority students have other characteristics that are associated with a lower chance of earning a degree; for example, while 14.5% of white British students were eligible for free school meals in 2019, 22.1% of students of black African heritage and 20.6% of students of Bangladeshi heritage were eligible (Department for Education's analysis of the January 2019 school census). This means that ethnic minorities outperform white British students by an even larger margin once these characteristics are taken into account (Crawford and Greaves, 2015).

[10] These very small numbers suggest that this group is not well captured in administrative data, since many young people will not be sitting exams at 16. Further, the small cohort size makes it more difficult to accurately assess trends over time. We have therefore excluded Gypsy, Roma and Traveller pupils from the figures in this chapter.

Figure 39. Progression to higher education by age 19 by ethnicity, 2021



Note: The Department for Education ranks higher education providers into three categories (low-, medium- and high-tariff providers) based on the normalised mean tariff score of their intake; we refer to the high-tariff providers as the top-third most selective higher education institutions.

Source: 'Widening participation in higher education 2019'.

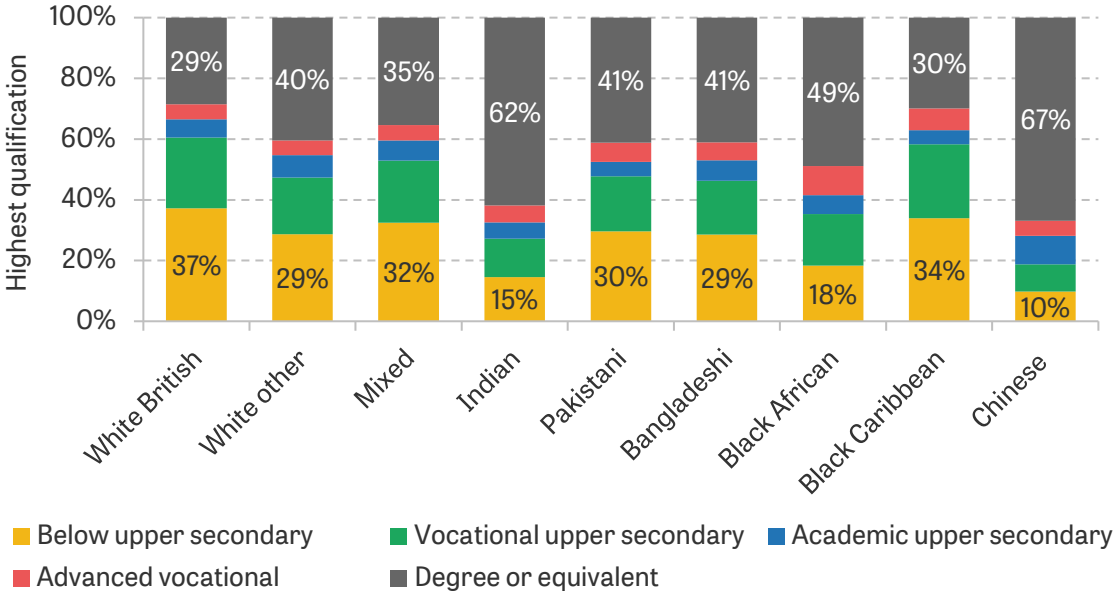
Ethnic inequalities in qualification levels

There are sharp differences in levels of education across different ethnic groups. In Figure 40, we show education levels at age 26 for the 2006 GCSE cohort by ethnicity. At one end of the spectrum, more than six in ten students of Indian or Chinese heritage have earned a degree by the age of 26, and nearly all of the rest progress to at least upper-secondary education.

Perhaps less well known is the fact that the next most successful ethnic group (in terms of the share of 26-year-olds with degrees) is black African students. Almost half of students of black African heritage have received a degree by age 26. These students are also much more likely than any other group to earn advanced vocational qualifications.

Other groups, such as students of black Caribbean heritage, have a distribution of qualifications that is much more similar to that of white British students. Strikingly, of all the ethnic groups, it is white British students who have the lowest rates of degree-level qualifications and the highest share not progressing to at least upper-secondary education.

Figure 40. Distribution of highest qualifications among 26-year-olds in England by ethnicity, 2016



Note: The educational categories are the same as those depicted in Figure 2 on page 11.

Source: Authors' calculations using table A1.5 in Espinoza et al. (2020).

Summary

Educational inequalities by ethnicity are nuanced, depending on what measures are being considered, which ethnicities are being compared, and when the outcomes are measured. In early life, white British children significantly outperform those from ethnic minority backgrounds. These differences mostly disappear during primary school, and by age 19 young people from minority backgrounds are significantly more likely to have A-level or equivalent qualifications than their white peers. The one exception to this is in apprenticeships; young people are more likely to start an apprenticeship if they are white British, either compared with the cohort as a whole or compared with those undertaking vocational education at the same level.[11]

There are significant differences in inequalities within broad ethnic groups. Young adults from black Caribbean backgrounds, for example, are almost twice as likely as those from black African backgrounds to not achieve upper-secondary qualifications by age 26. These groups have also faced very different changes to attainment over time; while black African pupils' GCSE performance has caught up with that of their white British peers, performance among black Caribbean pupils has stagnated since 2013, leading inequalities to widen once again.

While the results in this section point to a need for nuance in analysing ethnic inequalities in the education system, they do not mean that there is no cause for concern. Rather, the strong educational performance of pupils from some ethnic minority backgrounds makes explaining the very poor outcomes these groups have in the labour market even more difficult. Young adults from minority backgrounds do not enjoy the same financial returns to their qualifications as their white British peers, and people from minority backgrounds are far more likely to be unemployed or working in temporary jobs. These issues are discussed in greater depth by Mirza and Warwick (forthcoming).

[11] In the UK, apprenticeships are not primarily geared to young people. For example, data for 2018–19 in England show the share of starts by age category: 21.5% under 19; 35.4% aged 19–24; 43.1% aged 25+ (https://explore-education-statistics.service.gov.uk/data-catalogue/apprenticeships-and-traineeships/2021-22).

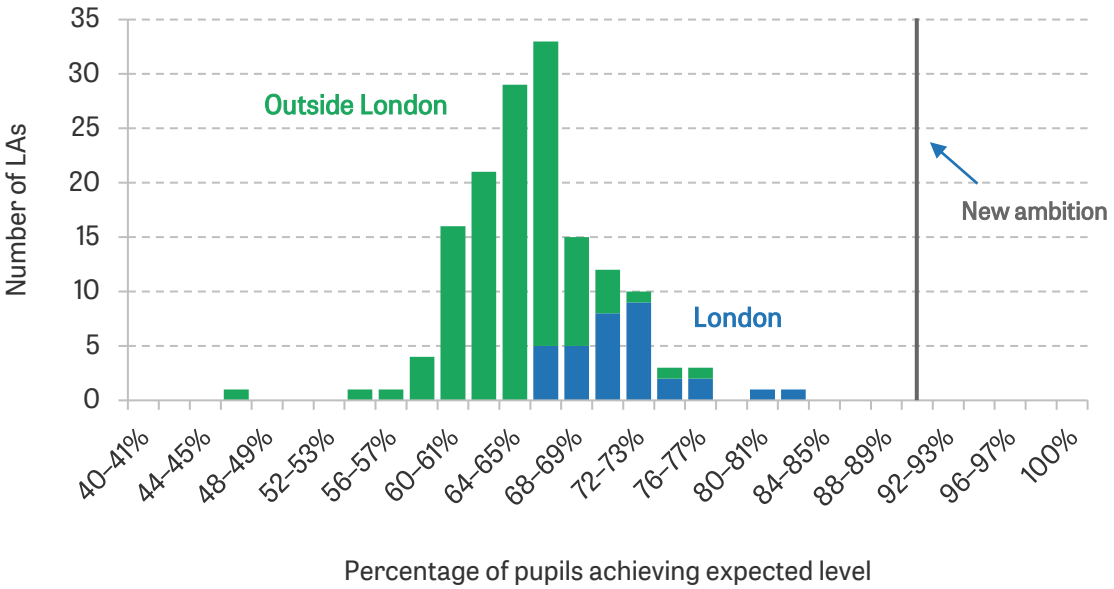
9. Educational inequalities by geography

So far, we have focused on inequalities in educational attainment based on the characteristics of pupils themselves – their socio-economic background, their gender and their ethnicity. More recently, however, the debate on educational inequalities has shifted to focus on the 'levelling up agenda'. Broadly put, this approach argues that geographic inequalities in education are profound and that place has a role in shaping both individual outcomes and the inequalities between them. In this section, we therefore analyse the extent of geographic variation in educational attainment.

Geographic inequalities during primary school

Substantial inequalities in educational attainment across local authorities are already in place by the end of primary school. Figure 41 shows the distribution of 151 local authorities (LAs) in England based on the share of their pupils who reach the expected level in reading, writing and mathematics by the end of primary school. Nationally, only 65% of pupils met this benchmark in 2019 (post-pandemic, in 2022, the share had fallen to 59%). However, as the figure shows, this national average masks substantial variation.

Figure 41. Distribution of local authorities based on the share of primary school leavers meeting the expected level in reading, writing and maths, 2019



Note: The figure shows the distribution of local authorities in England by the share of their Key Stage 2 pupils achieving the expected level in reading, writing and maths.

Source: Authors' calculations using table L1 in Department for Education, 'National curriculum assessments: key stage 2, 2019 (revised)'.

In the seven worst-performing LAs, fewer than 60% of pupils met the standard; in the six top LAs, 75% or more reached this benchmark. Notably, five of those six top-performing LAs are located in London (the exception is Trafford, in Greater Manchester). Even the worst-performing London LAs are still above the national average. While London LAs make up just over a fifth of councils in England, more than two-fifths of LAs with above-average results are located in London. More than three-quarters of LAs where at least 70% of pupils meet this benchmark are in London.

While this particular benchmark is just one measure of educational attainment, it has taken on new significance with the publication of the government's Levelling Up White Paper (Department for Levelling Up, Housing and Communities, 2022). The White Paper includes a target for 90% of primary school pupils nationwide to be meeting this benchmark by 2030. As Figure 41 shows, achieving this target would indeed 'level up' education in the sense of requiring greater progress from low-performing areas. However, this hugely ambitious national target will require all local authorities to significantly improve their performance.

Box 8. Education and the 'levelling up' agenda

The government's 2022 Levelling Up White Paper (Department for Levelling Up, Housing and Communities, 2022) explored the substantial and persistent geographic inequalities in the UK.

Educational 'missions'. Two of its 12 'missions' for 2030 pertain to education: the ambition to have 90% of 11-year-olds in England meeting expectations in reading, writing and maths (see Figure 41), and the mission to have an additional 200,000 people completing high-quality skills training annually in England.

Education Investment Areas. The White Paper branded 55 of the English local authorities with the worst results as 'Education Investment Areas'. Schools in these areas will receive more encouragement (and, in some cases, be mandated) to join multi-academy trusts. These areas will also be prioritised for new free schools for 16- to 19-year-olds and for some targeted central government spending – though details about how much funding this represents have not yet been confirmed.

Employer involvement. The White Paper commits to rolling out Local Skills Improvement Plans, which give employers a greater role in developing local technical education programmes. The government is also establishing 'Pathfinder areas' in Blackpool, Walsall, and Barking and Dagenham to bolster connections between education and training providers, employers and Jobcentre Plus.

Education provision. The White Paper also proposes to increase access to post-compulsory education by opening new 16–19 free schools in targeted areas, supporting new Institutes of Technology, making it easier for new higher education providers to enter the sector, and expanding the programme of Skills Bootcamps to provide more access to short-term, intensive training courses.

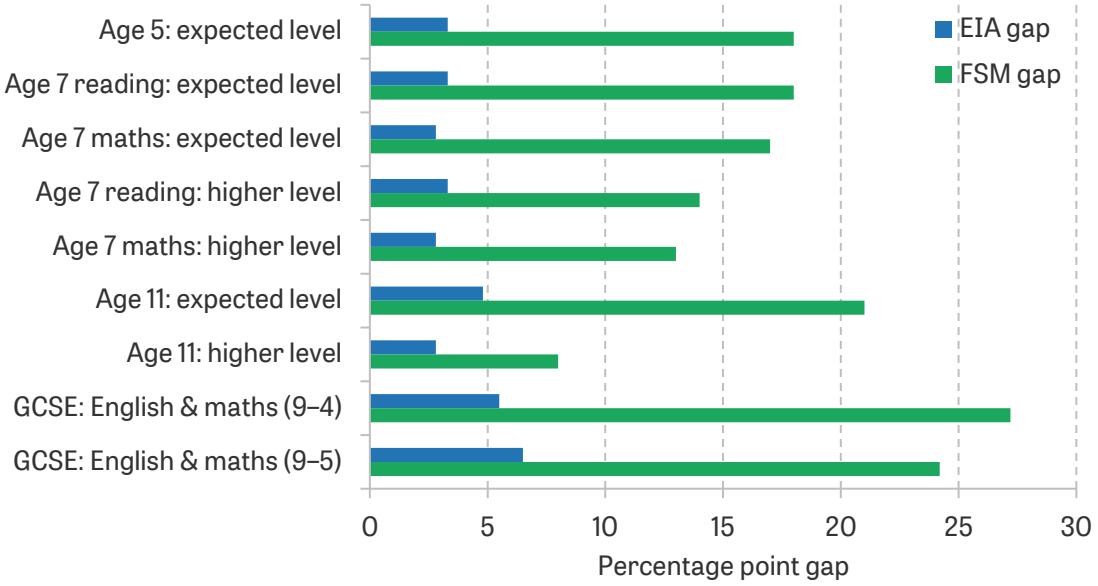
While the levelling up target represents an opportunity to marshal cross-governmental resources to raise standards and reduce inequalities, it does not come without risk. By the time children are 5 years old, the proportion of children reaching a good level of development is already at or above the national average in all London local authorities. The cohort of children who will leave primary school in 2030, when the government's levelling up target is due to be met, was already 3 years old when the policy was announced. This means that there is limited scope to address some of the root causes of inequalities in the earliest years of life, which in turn means that schools will need to do nearly all of the heavy lifting if the government's target is to be met (without simply making the tests easier to inflate pass rates).

A narrow focus on an incredibly ambitious target at the end of primary school will certainly focus attention. The risk is that, without the tools or the time to reach this target in wide-reaching, sustainable ways, the focus that the target attracts will skew incentives to such an extent that other important parts of the education system are neglected.[12] For example, there is little incentive under this goal to push children who are already on track to meet the expected level to reach higher levels of development. Nor is there much call to focus on children who are unlikely to meet these targets by the end of primary school even with significant intervention.

Education Investment Areas

An open question for the levelling up agenda will be how effectively policymakers can marshal resources to improve attainment, and how much of a role geography will play in determining who and where receives additional support. The government has already indicated that it will designate 55 local authorities in England (around a third of the total) as 'Education Investment Areas' (EIAs), with preferential access to some programmes of support (see Box 8). These areas have mainly been selected on the basis of their Key Stage 2 (age 11) performance. As Figure 42 shows, they certainly have worse attainment than other local authorities. At age 11, for example, 62% of pupils in EIAs reach the expected level in reading, writing and maths, compared with 67% in the rest of the country. The figure shows the 5 percentage point gap between the two groups in blue.

Figure 42. Percentage point gap in attainment between Education Investment Areas and other local authorities, and between pupils eligible and not eligible for free school meals



Note: The figure shows the percentage point gap between 2019 attainment in Education Investment Areas and other local authorities (EIA gap), and between pupils eligible for free school meals and other pupils (FSM gap). Age 5 results are for achieving the expected level in all domains of the EYFSP. Age 7 results reflect performance on reading and maths assessments separately; age 11 results combine reading, writing and maths.

Source: Age 5: 'Early years foundation stage profile results: 2018 to 2019'. Age 7: 'Phonics screening check and key stage 1 assessments, England 2019'. Age 11: 'National curriculum assessments: key stage 2, 2019 (revised)'. GCSE: 'Key stage 4 performance, 2019 (revised)'.

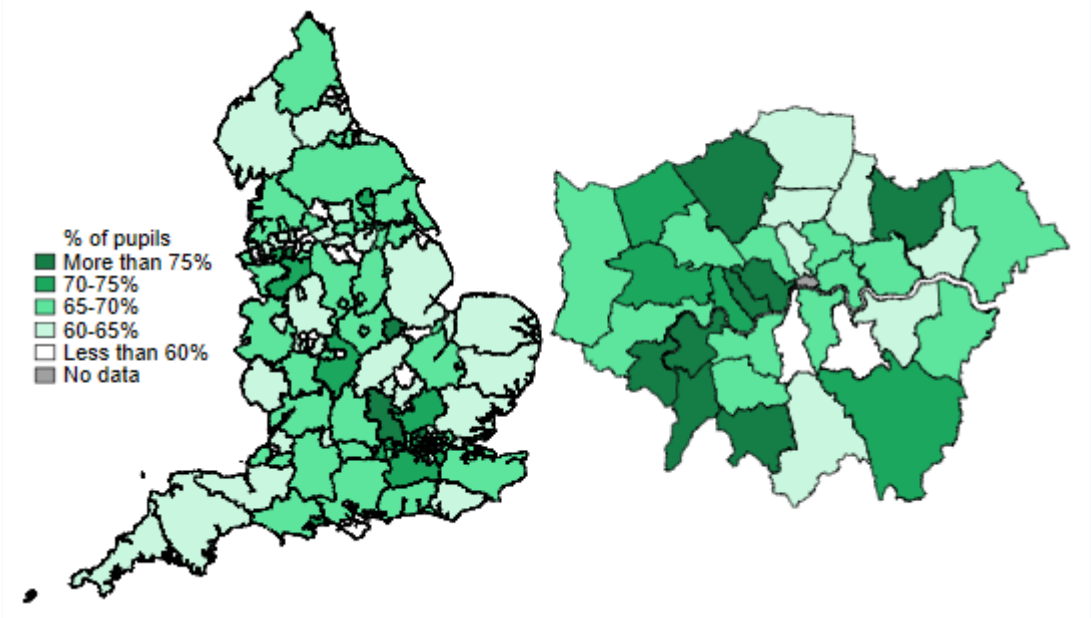
[12] While the government does include other 'supporting' measures in a technical appendix to the White Paper, it has not committed to achieve any specific level on these measures – or even to make progress at all.

The government's levelling up agenda argues that these 'left behind' areas should receive additional targeted funding and support to help erase the inequalities between them and other parts of the country. This represents a change from the previous approach of targeting additional funding at disadvantaged or under-achieving pupils, rather than at particular places. To put the gaps between EIAs and other parts of the country in context, Figure 42 therefore also shows the gap in results by free school meals eligibility (in green). These inequalities dwarf the gaps between EIAs and other places, strongly suggesting that targeting support based on geography captures only a small part of the educational disadvantage faced by some of the worst-off in the country.

Geographic inequalities at GCSE and beyond

The relatively small differences in GCSE performance between Education Investment Areas and the rest of England understate the differences in attainment between different local authorities. In Figure 43, we illustrate the share of pupils achieving pass marks (grade 4/C) in GCSE English and maths in each local authority. The share ranges from just over 40% in Knowsley to 80% in Trafford. Overall, though, GCSE performance tends to be higher in the south of England, typically outside of city centres. The worst-performing places are found in the north of the country as well as in inner-city areas.

Figure 43. Share of pupils obtaining good English and maths GCSEs (2018–19 GCSE cohort)



Note: Students achieving grades 4–9 in both English and maths GCSEs. London is shown enlarged on the right.

Source: Department for Education, 'Key stage 4 performance, 2019 (revised)'.

GCSE performance in London is quite mixed. While attainment in the suburbs and in Westminster and Kensington is among the best in the country, fewer than 60% of pupils in inner-city boroughs such as Lewisham and Lambeth achieve good results in English and maths.

However, for a given level of GCSE performance, pupils in London are much more likely to advance on to higher education than those living in other parts of the country. In Figure 44, we plot the relationship between GCSE attainment at age 16 and degree completion by age 26 for the 151 local authorities in England. For each LA, we focus on the outcomes of the cohort which took

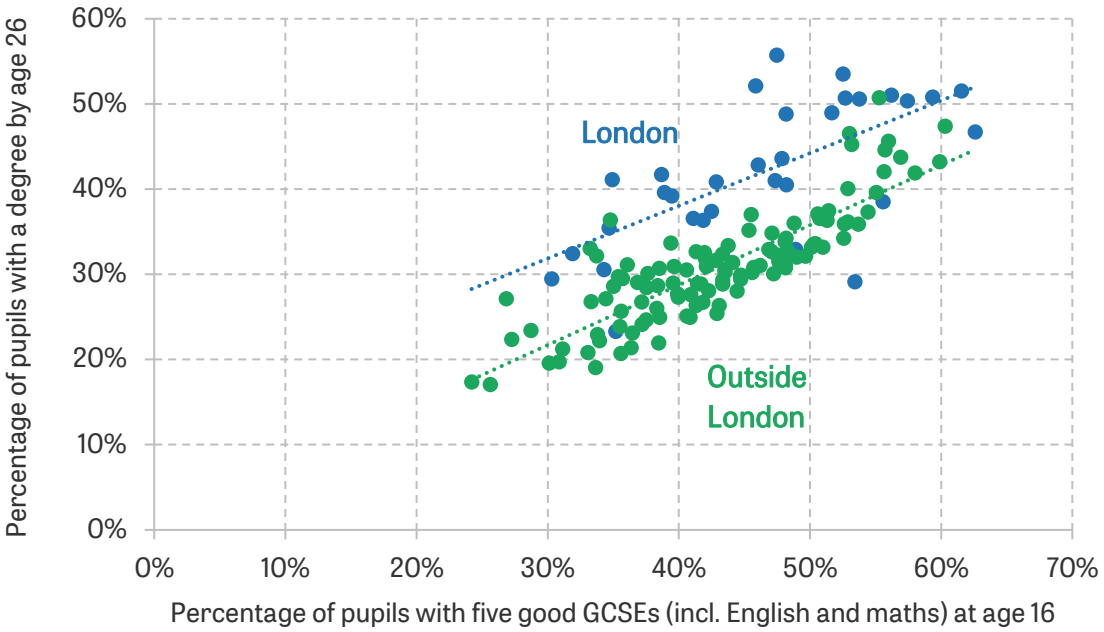
its GCSEs in 2006 – so we look at the degree completion rates of young people who grew up in different parts of England.

Overall, as we would expect, local authorities where a greater share of 16-year-olds achieved good GCSEs also had a greater share of their young adults go on to earn degrees by age 26. This is quite a strong relationship; overall, a 10 percentage point increase in the share of a cohort earning five good GCSEs is associated with a 7.5 percentage point increase in the share of young adults who go on to earn a degree.

However, Figure 44 also shows that young people who went to school in London are much more likely to go on to earn degrees than their GCSEs alone would predict. For London boroughs, the share of young people who go on to earn a degree is about 9 percentage points higher than would be predicted by GCSE results.

It is important to note that these results are based on the cohort of young people who completed secondary school in each local authority – put another way, they show how later qualifications differ based on where a young person grew up. If we instead look at the share of students with a degree by where they live at age 26, the London effect is even stronger: there is a clear pattern of degree-educated students concentrating in London and other urban areas (Britton, Waltmann and Xu, 2021). As a result of this migration, within cohorts there is an intensification in regional inequalities in educational attainment after graduation.

Figure 44. GCSE attainment (age 16) and degree completion (age 26) for local authorities in England, 2005–06 GCSE cohort



Note: Rates of degree completion are based on the local authority where a pupil completed their secondary school (not where they completed their degree or where they live at age 26), so the figure shows access to higher education among those growing up in different parts of England. Dashed lines show the (linear) line of best fit, which gives an indication of the average relationship between a local authority's GCSE attainment and its degree completion rates within and outside London.

Source: Authors' calculations using table A1.7 in Espinoza et al. (2020).

10. Intersections between educational inequalities

We have established that educational attainment varies by socio-economic status, gender, ethnicity and across place. Yet we have looked at each of these characteristics separately. In practice, there are important intersections between these different dimensions of inequality. In part, these reflect the relationships between the different dimensions of disadvantage. For example, eligibility for free school meals is geographically concentrated in some parts of England, meaning that part of the disadvantage penalty in education likely reflects broader differences between regions. Similarly, children from some ethnic groups are far more likely to be FSM-eligible; nearly 30% of pupils with black Caribbean ethnicity were eligible for FSM in 2019, compared with 5% of students from Indian ethnic backgrounds.[13]

But the interactions between different dimensions of inequality also reflect the multiple disadvantages that some pupils face: for example, a white British boy in receipt of free school meals who is taking GCSEs in a rural or coastal area is likely to face a very different set of challenges from a white British girl from an affluent family in suburban London.

Documenting intersections between inequalities

We first consider how these different characteristics interact by looking at inequalities in educational attainment across a combination of them. To this end, in Figure 45 we present the percentage of pupils achieving at least a grade 4 in both English and maths GCSEs by a combination of their eligibility for free school meals, their gender and their ethnicity. Failing to achieve these basic GCSE benchmarks can have significant long-term consequences for young people's later educational options and their earnings, so understanding how inequalities by ethnicity, gender and background intersect is vital for analysing which groups are at most risk of being left behind.

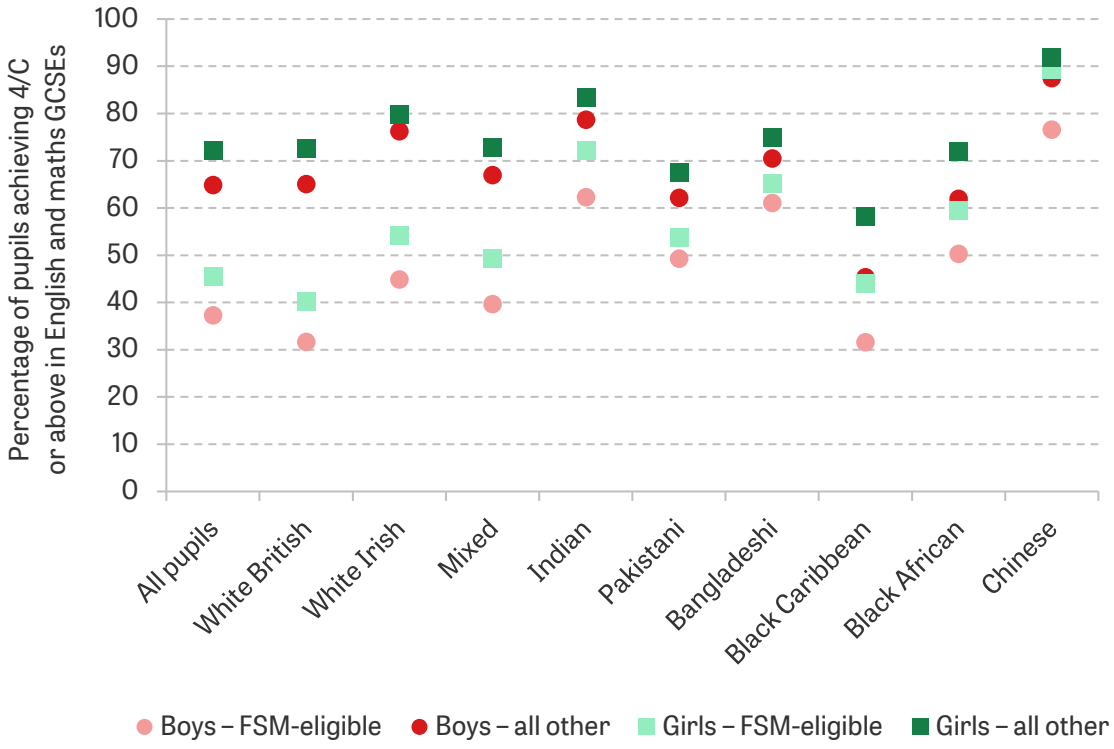
Disadvantaged boys from a white British background or a black Caribbean background have the lowest levels of GCSE attainment. This is in some sense unsurprising: being a boy, being eligible for free school meals and being from white British or black Caribbean background are each associated with lower levels of attainment at GCSE. However, Figure 45 underlines just how much worse these students fare. In 2019, 65% of all students achieved pass marks (grade 4/C) in GCSE English and maths. Fewer than half as many – 32% – of disadvantaged boys from white British or black Caribbean backgrounds achieved this important educational benchmark.

From our earlier analysis, we know that, on average, disadvantaged pupils perform worse in their GCSEs than more advantaged pupils. Figure 45 confirms that this disadvantage gap is present within each ethnic group, but importantly the size of the gap varies by ethnicity. The FSM attainment gap is largest among white British boys (33 percentage points), White Irish boys (31 percentage points) and boys from a mixed background (27 percentage points). There are also disadvantage gaps for the other ethnicities, but they are much smaller.

In each ethnic group, girls also perform better than boys, but there tends to be less variation in the size of the gender attainment gap between ethnicities. The largest gender gap in attainment is amongst black Caribbean pupils, where girls are 13 percentage points more likely than boys to achieve good GCSE results (regardless of their eligibility for free school meals).

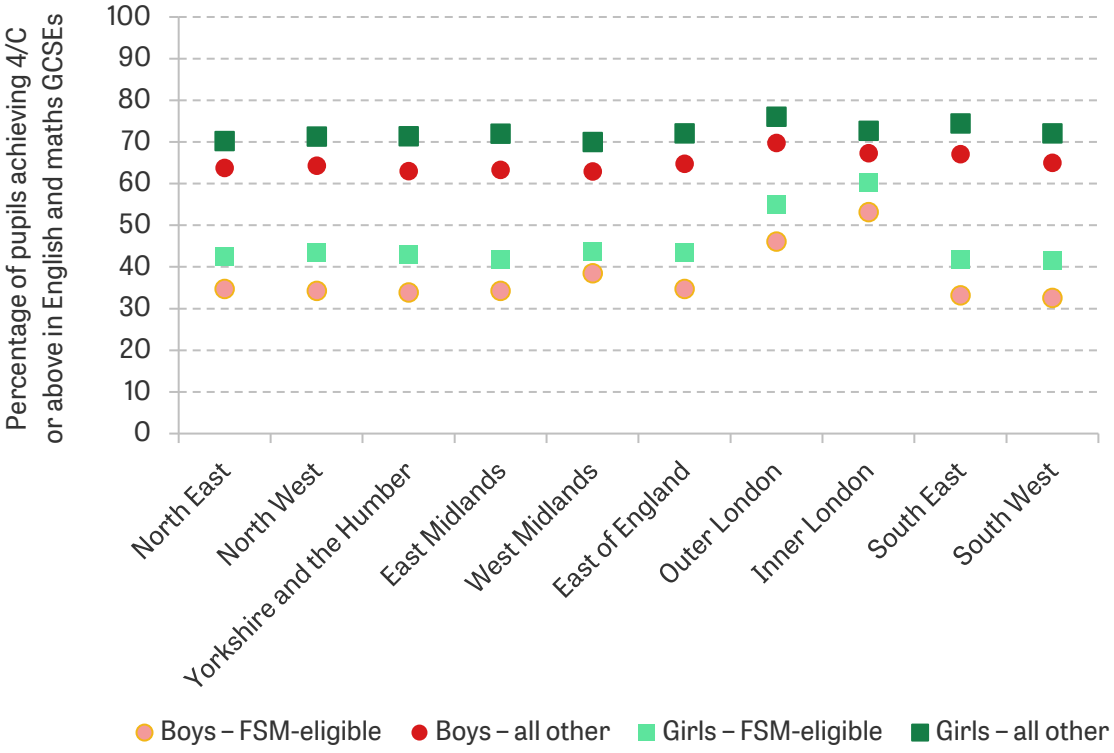
[13] The highest rates of FSM eligibility are found among pupils from Irish Traveller backgrounds (57%) and those from Gypsy/Roma backgrounds (33%). All figures taken from the Department for Education's analysis of the January 2019 school census.

Figure 45. GCSE performance by eligibility for free school meals, gender and ethnicity in 2019



Source: 'Characteristics summary' table in Department for Education, 'Key stage 4 performance, 2019 (revised)'.

Figure 46. GCSE performance by eligibility for free school meals, gender and region in 2019



Source: 'Characteristics summary' table in Department for Education, 'Key stage 4 performance, 2019 (revised)'.

Figure 46 presents analogous results, this time focusing on how inequalities by gender and disadvantage vary across the regions of England. What stands out here is how similar most regions look. Across most of the country, the differences across regions are dwarfed by the impact of disadvantage – particularly socio-economic disadvantage – within region.

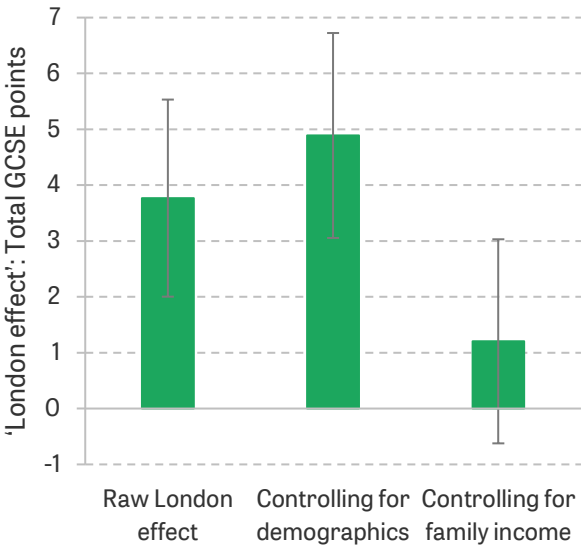
The notable exception is London, especially Inner London. In most regions, the gap in GCSE performance by FSM eligibility is between 25 and 30 percentage points. In Outer London, this falls to 21 percentage points for girls; in Inner London, the gap is 12 percentage points for girls and 14 percentage points for boys. This means that inequalities by socio-economic background only have around half as much impact on young people's GCSE results within London schools as in the rest of the country. Importantly, this is entirely driven by better performance among disadvantaged pupils, meaning that lower educational inequality in the capital is a result of 'levelling up' rather than levelling down.

Understanding the 'London effect'

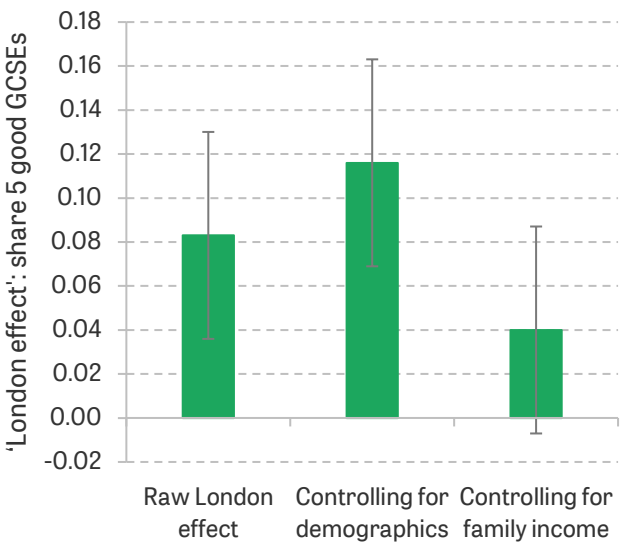
To explore further the drivers of this 'London effect', Figure 47 shows how the scale of the gap between the capital and the rest of England changes when we account for information about pupils' backgrounds.[14] We use data from the Millennium Cohort Study (MCS), which captures a subset of the 2016–17 GCSE cohort and contains detailed information about their family circumstances.

Figure 47. The 'London effect' in age 16 attainment (MCS cohort)

Panel A. Total GCSE points



Panel B. Five good GCSEs, including English & maths



Note: Graphs show the coefficient on a 'London' dummy from regressions of total GCSE points (Panel A) and whether the pupil achieved five good GCSEs including English and maths (Panel B). All regressions control for gender. The second specification in each figure also controls for FSM eligibility, ethnicity (white, black, Asian, and mixed or other), English as an Additional Language, and Special Educational Needs support. The final specification adds in a control for equivalised family income, measured at age 14. Vertical black bars show the 95% confidence interval on each estimate.

Source: Authors' calculations using data from the Millennium Cohort Study linked to the National Pupil Database.

[14] More precisely, the graph plots the coefficients on a 'London' indicator from several different regression specifications.

The first point in each panel of Figure 47 shows the size of the attainment gap between pupils in London and those in the rest of the country, adjusting only for any differences in the share of female pupils. London pupils have an average total GCSE point score around 3.8 points higher, and they are around 8 percentage points more likely to earn five good GCSEs including English and maths.

In the second set of points, we adjust for some of the demographic differences between London and the rest of the country that are captured in the National Pupil Database (NPD). Specifically, we control for differences in ethnic composition and the share of students who are eligible for free school meals (FSM eligibility), the share of students for whom English is an additional language, and the share of students receiving Special Educational Needs support. After this adjustment, the London effect grows even larger, which suggests that schools in London are outperforming those in other parts of the country despite having a greater share of disadvantaged pupils.

However, the demographic information captured in the NPD is coarse, which means it does not capture all of the underlying differences between pupils in London and those in the rest of the country; we have already seen (in Figures 29 and 30) that eligibility for free school meals captures only a portion of the relationship between family income and attainment. One particularly important difference is that FSM-eligible children in London tend to come from somewhat better-off families: the median equivalised income of FSM-eligible pupils' families is around £25 per week higher in London than it is in the rest of the country.

In the third specification in Figure 47, we use the richer information available in the MCS to control for family income alongside the demographic information from the previous specification. While London-based young people continue to do somewhat better than those in the rest of the country, these effects are much smaller and no longer statistically different from zero. This suggests that a large part of the 'London effect' might relate to differences in pupils' backgrounds that are not easily observed in administrative data sets such as the NPD.

Yet while the 'London effect' may be small on average after accounting for family income, it could still be important for certain groups. Breaking the results down further into white and non-white pupils, and those eligible and not eligible for free school meals, we find that the 'London effect' is smallest for white pupils not eligible for free school meals (after controlling for family income as well as other demographics). Ethnic minority pupils benefit from a substantial London effect, especially for meeting the five good GCSEs benchmark. Unfortunately, the survey we use is too small to allow us to distinguish between the experiences of different ethnic minority groups – which could be an important factor behind the 'London premium' we find for ethnic minorities.

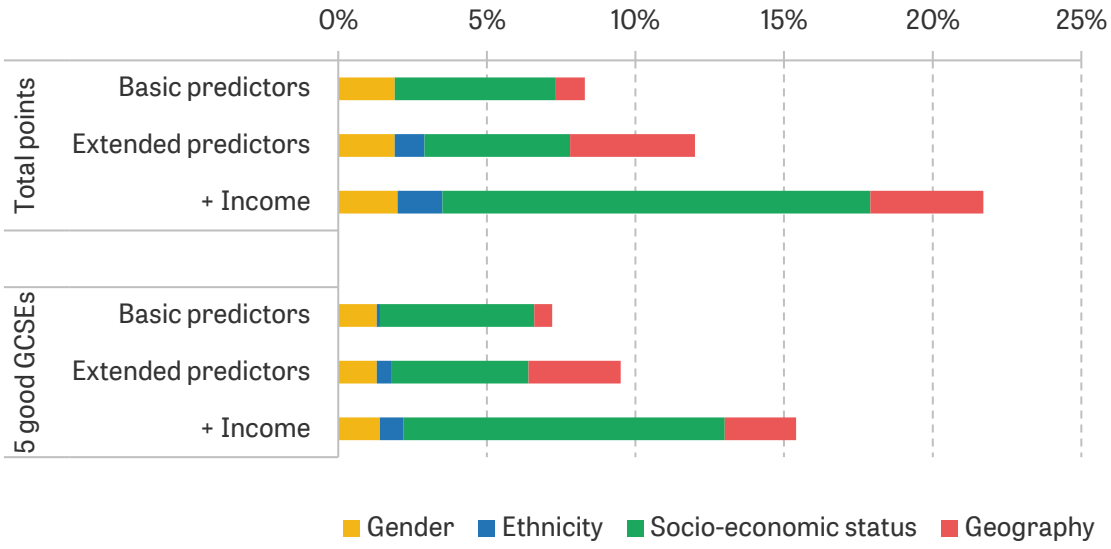
This positive 'London effect' has not always existed. As documented by Blanden et al. (2015), from the mid 1980s through to the mid 1990s, disadvantaged pupils performed at about the same level or worse in London compared with disadvantaged pupils elsewhere in England. While the causes behind London's relative improvement continue to be debated, changes in the ethnic mix of pupils in London and improvements in 'school quality' both play a role (see Blanden et al. (2015) for a discussion).

Which inequalities in education are largest?

This section has focused on documenting the important – sometimes large, sometimes stubborn – relationships between educational attainment and different dimensions of disadvantage. But these different dimensions are not independent: for example, children from some ethnic minority backgrounds are more likely to be eligible for free school meals or to live in London. It is therefore essential to consider the intersections between these different dimensions of inequality when looking at wider educational outcomes.

One way of doing this is to explore how strongly each dimension of inequality is related to educational attainment, accounting for all the other dimensions. To do this, we employ a statistical analysis[15] to calculate how much of the variation in GCSE results can be 'explained' by differences in each of these dimensions.

Figure 48. Contribution of different demographic factors to inequalities in educational attainment



Note: The figure shows the percentage of the variance in GCSE outcomes (adjusted R^2) explained by different groups of predictors, as attributed using a Shapley–Shorrocks decomposition. 'Basic predictors' include gender, eligibility for free school meals, major ethnic group, and region. 'Extended predictors' include gender, FSM eligibility, minor ethnic group (rather than major), and local authority district (rather than region). The final specification adds equivalised household income at age 14 to the set of extended predictors.

Source: Authors' calculations using data from the Millennium Cohort Study linked to the National Pupil Database.

We show the results of this decomposition in Figure 48. The first row for each outcome is based on a specification that includes broad definitions of gender, socio-economic status, ethnicity and geography.[16] Overall, we are able to explain 7–8% of the variation in GCSE attainment with these demographic variables. Of that, well over half of the variation in GCSE outcomes is accounted for

[15] Specifically, we use regression analysis to estimate how much young people's GCSE attainment depends on a range of characteristics related to their family's socio-economic status, their gender, their ethnicity and their local area. We then use a Shapley–Shorrocks decomposition to calculate how much of the variation in GCSE results can be 'explained' by differences in each of these dimensions.

[16] We include indicators for whether the young person is female, whether they are eligible for free school meals, their major ethnic group and their region.

by differences in socio-economic status (as measured by FSM eligibility). Gender accounts for around a fifth of the variation we explain, or around 2% of the variation in GCSE attainment overall.

In the second row, we continue to account for gender and eligibility for free school meals, but we also consider a wider range of demographics from the National Pupil Database (NPD). This includes more detailed measures of ethnicity (e.g. distinguishing between children from Indian, Pakistani and Bangladeshi backgrounds instead of simply analysing 'Asian' backgrounds as a whole) and more localised indicators of geography (local authority district instead of region). The final row adds in equivalised household income from the Millennium Cohort Study (MCS).

This final row clearly shows the importance of considering family income: the share of variation in GCSE attainment that we can (statistically) explain jumps from 12% to 22% for GCSE points score, and from 10% to 15% when considering whether pupils meet the benchmark of achieving five good GCSEs including English and maths. Socio-economic status is by far the strongest predictor in these decompositions. However, across the different specifications, the proportion of variation explained by other factors does not change very much, which suggests that these factors (such as the location of a pupil's school) have their own relationship to GCSE attainment over and above proxying for socio-economic disadvantage.

Overall, the results of this decomposition – and the wider results presented in this part of the chapter – highlight the crucial role that a young person's family background continues to play in his or her educational prospects. This is particularly evident in stubborn disadvantage gaps, which remain large and will have widened further during the pandemic. But as the analysis in Figure 30 and in this section makes clear, the impact of socio-economic status extends far beyond whether a pupil is eligible for free school meals: at every point of the income distribution, pupils from somewhat better-off families do better in the education system than their peers from slightly poorer backgrounds.

The importance of socio-economic status in generating inequalities in education does not mean that other characteristics are unimportant: indeed, as we show in this section, inequalities by characteristics such as geography remain deeply rooted.

In other cases, the story of education inequalities is much more nuanced, and different from what a singular focus on labour market inequalities would suggest. While women have significantly worse outcomes in the labour market, particularly after having children, girls have long outperformed boys in the education system and that gap has widened over time. This disconnect between the education system and the labour market is even more evident when considering inequalities by ethnicity. Children from ethnic minority backgrounds start out behind, but make much faster progress than white peers and so are much more likely to leave education with A levels or a degree.

The analysis in this section suggests that inequalities in education are not immutable: the patterns of inequality can look quite different at different stages of education, and some inequalities have changed significantly over time. This points to the importance of understanding how inequalities develop through the schooling years and how the education system can promote better outcomes for children; we explore these questions in the next section.

Part III. The development of inequalities

11. Education inequalities during the school years

Unlike other stages of education, nearly every child in the UK attends school between the ages of 5 and 16. This means that the school years are the stage of education where children get the most similar set of experiences. But, as we show in this section, these similarities are far from total: there are still substantial differences in the quality of children's school experiences, not to mention the differences in what happens outside the classroom. In this section, we document how equal – or unequal – children's experiences during the school years are, and examine when the differences in educational attainment that we showed in Part II emerge.

The development of education inequalities during the school years

Differences in skills, such as cognitive and socio-emotional skills, emerge at an extremely young age. Cattan et al. (2022) show that even in the first few years of life there are important differences in skills between children. And, because later skills are built on the foundation of earlier cognitive and socio-emotional development, these early skills can have a lasting or even a growing impact on how a child's skills develop.

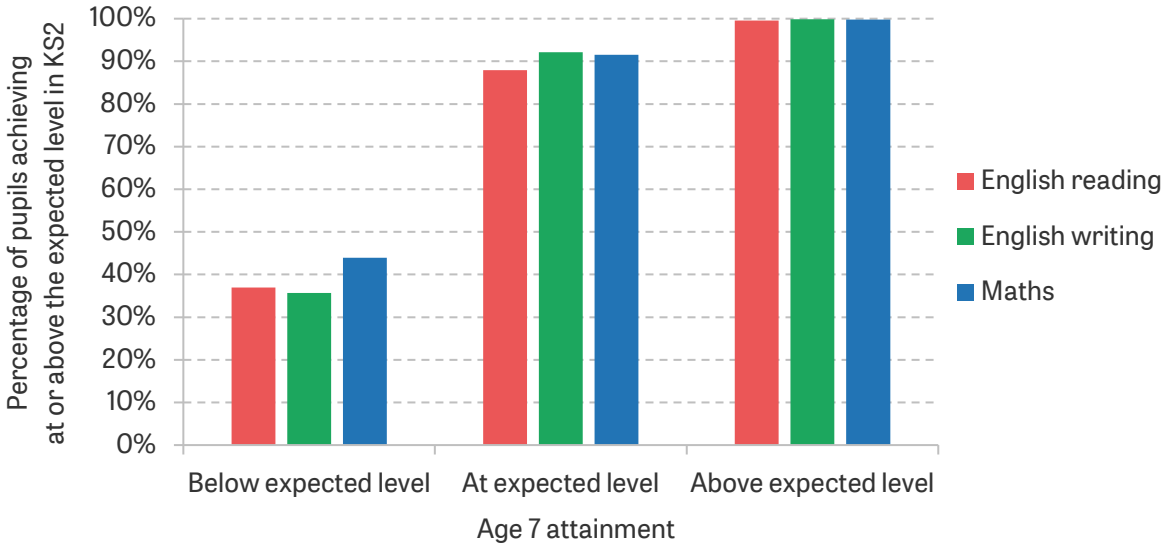
While initial differences in skills are important, educational inequalities crystallise during the school years, and particularly during secondary school. In Figures 49 and 50, we show how pupils' performance at one stage of education relates to their attainment in the next stage. Perhaps unsurprisingly, we can see that there is substantial persistence in how well pupils perform from one stage to the next. In primary school, virtually all pupils who exceed the expected level at age 7 go on to reach at least the expected level at age 11. Among those who exceed the expected level at age 11, more than 90% go on to achieve good GCSEs in English and maths at age 16.

However, the primary and secondary school years look somewhat different in terms of the prospects for less-well-performing pupils catching up to their classmates. During primary school, around 40% of pupils who fell short of the expected standard at age 7 go on to reach the expected level by age 11. In secondary school, though, this catch-up is much rarer: only 8% of young people who did not meet the expected level at age 11 achieve pass grades in GCSE English and maths.

In the remainder of this section, we give an overview of some of the most important 'inputs' into education during the schooling years, summarising some of the evidence for how each input affects attainment and how policymakers, head teachers and teachers can influence these inputs to reduce inequalities. We also document how unequally distributed these inputs are at the moment.

We start with the big picture: the role that overall school resources play in shaping attainment, and the shrinking spending premium enjoyed by more disadvantaged pupils. We next discuss some of the key decisions schools make about how to allocate these resources – in particular, the role that excellent teachers play in shaping pupils' outcomes, and the considerably smaller impact of plausible reductions in class size.

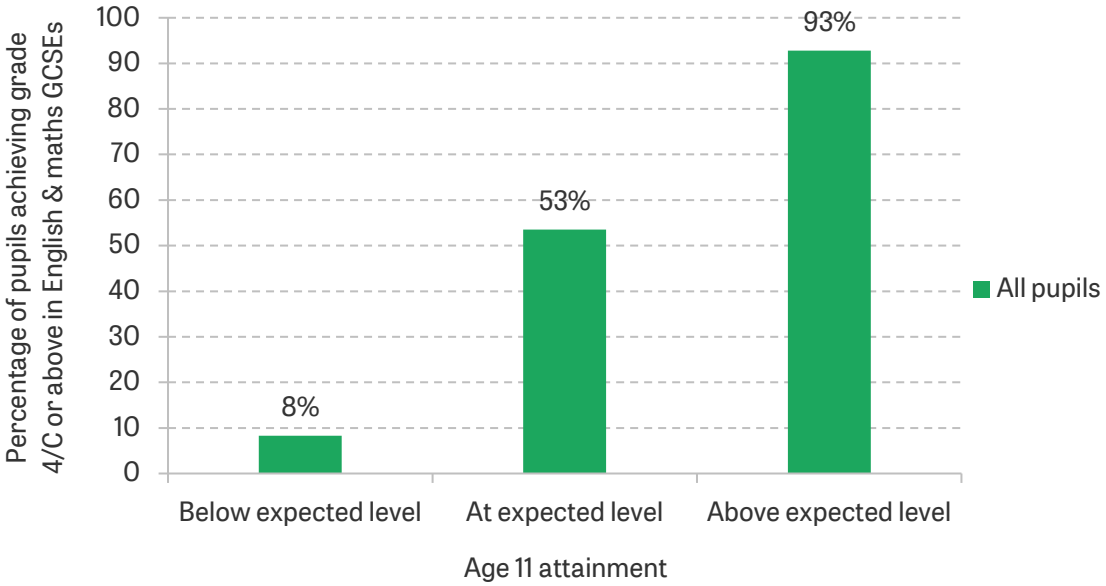
Figure 49. Attainment at the end of primary school (age 11) by level of attainment at the age of 7, 2019



Note: Age 7 attainment is measured by teacher assessment outcomes in English reading, English writing and mathematics. For this cohort, 7–8% perform below the expected level in each subject, 77–78% perform at the expected level and 15% perform above the expected level. We exclude pupils who are performing below the national curriculum levels (i.e. on P-scales) from our analysis. Attainment at the end of primary school is measured by national achievement tests taken by children at the end of Key Stage 2. Performance in these exams is measured in terms of levels (from level 1 to level 5). The figure shows the percentage of pupils performing at or above the expected level, which corresponds to attainment at or above level 4.

Source: Authors' calculations using 'Key stage 1 to 2 transition matrices 2019 (revised)'.

Figure 50. GCSE performance by attainment at the end of primary school, 2019



Note: Attainment at the end of primary school is measured by national achievement tests taken by children at the end of Key Stage 2. For this cohort, 12% of children achieved below the expected level, 45% achieved at the expected level and 44% achieved above the expected level (subsequent reforms to the assessments mean that these are not comparable to current KS2 attainment data). We exclude pupils who are performing below the national curriculum levels (i.e. on P-scales) from our analysis. Performance in these exams is measured in terms of levels (from level 1 to level 5). In the figure, 'Below expected level' corresponds to attainment at KS2 level 3 or below, 'At the expected level' refers to attainment at level 4 and 'Above expected level' is attainment at level 5. GCSE performance is measured by the percentage of pupils achieving grade 4/C or above in both GCSE English and maths.

Source: Authors' calculations using 'Key stage 2 to 4 transition matrices 2019 (revised)'.

We then look at the role that a child's peers play in his or her learning, and what that means for academic selection, both within school (setting and streaming) and across different tracks. Finally, we examine how parents choose between different schools and the implications that the current system has for inequalities, as well as the wider role that families and the home environment play in children's development through the schooling years.

Total school resources

School funding is one of the most immediate levers that governments can pull to try to change educational attainment. Many early studies found no or even a negative relationship between school resources and academic attainment. But more recent evidence – based on better data and methodologies – generally finds that higher school spending on average drives better test scores, graduation rates and continuation in post-compulsory education.[17] One study in England, for example, found that an extra £1,000 per primary pupil per year (roughly a 15% uplift on current funding) raised average attainment by around a third of a standard deviation over four years, which equates to about 4–5 months of additional educational progress in age 11 tests beyond what these students would have otherwise achieved (Gibbons, McNally and Viarengo, 2018).

However, additional spending is not equally impactful for all schools. It delivers the largest benefits for schools that were previously less well funded (Johnson and Jackson, 2019) and those that have a more disadvantaged student body (e.g. Jackson, Johnson and Persico, 2016). In other words, the marginal impact of additional resources is greater on the educational achievement of more disadvantaged students. This means that targeting increases in school spending at disadvantaged schools and pupils not only reduces inequalities; it is also a more efficient way of raising overall attainment than increasing spending by the same amount for all schools.

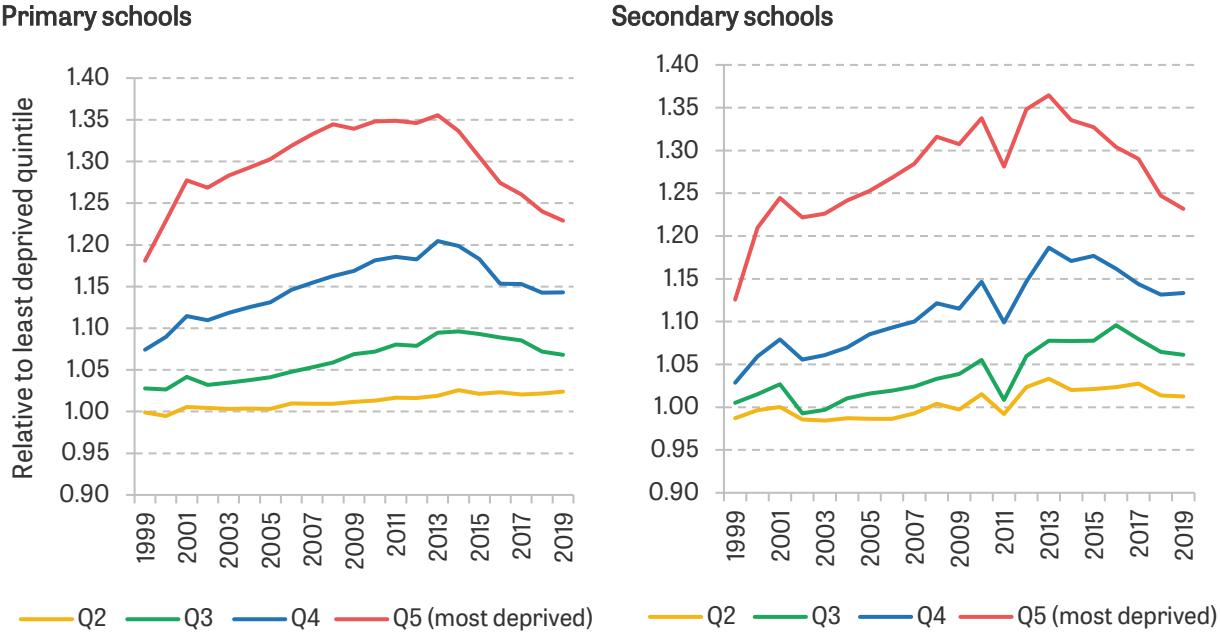
School funding in England

This points to an important role for school funding systems in determining both the level of total resources in the system and the distribution of funding across schools and pupils. In England, school funding is intended to be progressive: the pupil premium provides schools with an extra £1,385 for every primary school pupil who has claimed free school meals in the last six years (£985 per secondary school pupil up to age 16). These funds are meant to be used specifically for initiatives to support disadvantaged children. Schools in disadvantaged areas also receive additional funding via the school funding formula.

Figure 51 shows that the funding system became substantially more progressive over the 2000s. In 2000, primary school pupils in the most disadvantaged fifth of schools attracted around 20% more funding than those in the most affluent fifth (Britton, Farquharson et al., 2020). A decade later, the funding premium had risen to around 35% (and total budgets had increased too – so this was a larger share of a bigger pot).

[17] Hanushek (2006), Gibbons and McNally (2013) and Jackson (2020) are all excellent summaries of the literature on total funding and pupil attainment.

Figure 51. Spending per pupil by quintile of eligibility for free school meals, relative to least deprived quintile



Note: Schools are allocated to five equally-sized groups based on the share of pupils eligible for free school meals in each year. Spending includes sixth-form funding but excludes spending done by local authorities on behalf of schools.

Source: Figure 3.1 in Sibieta (2021a).

However, these patterns have reversed since 2013, and the effective funding premium for disadvantaged schools has fallen to less than 25% – about the same level it was at in 2000. Secondary schools have undergone a similar shift.

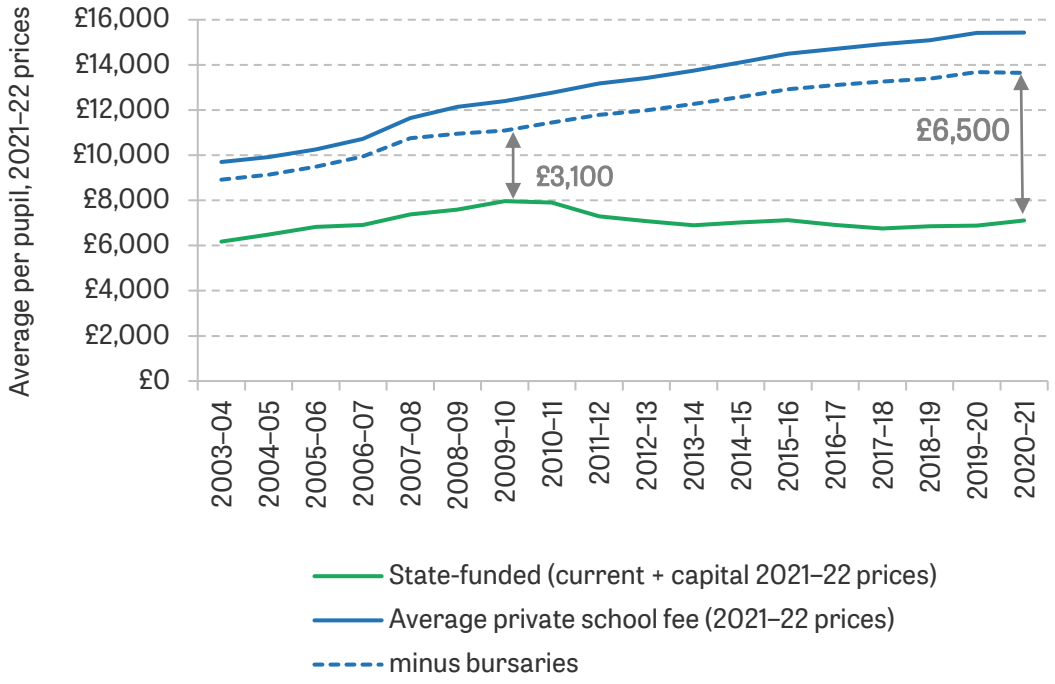
Much of this erosion of progressivity is due to the changing demographics of disadvantage (Britton, Farquharson et al., 2020). The overall share of pupils eligible for free school meals fell during this period, meaning funding targeted at disadvantage made up a smaller share of the overall pot. This was compounded by the shifting geography of disadvantage: FSM eligibility fell particularly sharply in London and, in later years, London schools were less likely to be in the most disadvantaged fifth nationally. Since London schools receive higher per-pupil funding to reflect higher costs, this compositional change reduced the overall amount of spending targeted at the most disadvantaged schools.

But more explicit policy choices have also played a role. A cash-terms freeze in the pupil premium has left it smaller as a share of overall funding. And while the government claims that rising minimum funding floors in the National Funding Formula are part of its 'levelling up' agenda, in practice these tend to benefit more affluent areas, further reducing the progressivity of the system (Sibieta, 2021a).

Box 9. Resources in the private school sector

While the progressivity of funding in the state sector has declined in recent years, it is still the case that the system remains progressive: it targets more resources to schools with more disadvantaged pupils. By contrast, private and independent schools – which on average cater to pupils from more affluent families – have substantially higher resources than the rest of the state sector. As Figure 52 shows, this inequality has grown quickly: resource gaps between the average private and state school more than doubled between 2009–10 and 2019–20 (Sibieta, 2021b).

Figure 52. Comparing state school spending per pupil and average private school fees over time (2021–22 prices)



Note: State-funded school spending includes both current and capital spending. Private school fees represent the average termly day fee at day schools multiplied by three. Level of bursaries calculated using total spending by schools on bursaries and scholarships divided by the total number of pupils at Independent School Council (ISC) schools.
Source: Figure 1 in Sibieta (2021b).

This reflects not just the squeeze on school finances over this period, but also 23% real-terms growth in private school fees (net of boarding costs). Some top-tier private schools charge considerably more, around triple the average. This rapid growth in fees meant that, in 2019–20, resources per pupil were twice as high in the private sector as in the state sector (Sibieta, 2021b).

Class sizes

While there is an increasingly solid evidence base showing that overall school resources increase attainment on average, it is also very clear that it matters where that money is spent. One of the most popular uses of extra funding is in reducing class sizes; a 2019 poll of English teachers, for example, found that this was the top priority for around a third of teachers (National Education Union, 2019), and this issue regularly polls at or near the top of parents' priorities for education.[18]

Making classes *much* smaller can have substantial benefits: for example, one American study found that children in very small classes (with 13–17 pupils) had test scores around 4 percentage points higher than those in classes with 22–25 pupils (Krueger, 1999). Other work finds longer-term benefits for university attendance (Chetty et al., 2011).[19]

But research that looks at smaller changes in class size – which are arguably more realistic in a policy context where teacher recruitment is a perennial challenge – tends to find much smaller benefits from smaller classes, if any impact at all (Hoxby, 2000; Rivkin, Hanushek and Kain, 2005; Cho, Glewwe and Whitler, 2012). These studies are also able to rule out even small effects on achievement from moderate changes in class size.

Class sizes in England

After falling from a long-term high of around 28 pupils per class in 1998 to roughly 26 pupils in the 2000s (Department for Education, 2011), average class sizes in primary schools have risen to 27 pupils per class in more recent years.[20] At this level, changes in class size likely had only very small impacts on attainment, if any.

Delivering large reductions in class sizes would be very expensive. For example, cutting primary school class sizes to 17 pupils – as in the Krueger (1999) study discussed above – would mean creating around 60% more classes. With 4.7 million primary school pupils in England, that equates to around 100,000 new teachers and a salary cost of close to £6 billion[21] – before factoring in costs such as teacher training, additional classrooms or teaching assistants.

This suggests that, despite the popularity of smaller classes, plausible reductions in class sizes are unlikely to offer the best value for money when trying to improve children's outcomes. While substantial reductions can deliver moderate benefits for education, they are hugely expensive. More realistic changes are unlikely to make much difference to children's attainment.

[18] See, for example, https://www.telegraph.co.uk/education/educationnews/11535469/Small-class-sizes-top-priority-for-2-in-5-parents.html.

[19] https://explore-education-statistics.service.gov.uk/data-tables/fast-track/93d322d5-4763-4708-9b07-771e5e8f2ebf. Other studies find that splitting a class in half increases test scores in primary school substantially (e.g. Angrist and Lavy, 1999; Frederiksson, Ockert and Oosterbeek, 2013).

[20] While average class sizes vary around the country, there is no strong relationship between an area's level of disadvantage and its average class size. Indeed, at Key Stage 2, local authorities with a higher proportion of pupils receiving free school meals tend to have *smaller* class sizes than more affluent areas.

[21] Based on average classroom teacher pay reported in the 2021–22 School Workforce Census (about £39,000), adjusted for a 5% pay increase and adding 37.5% on-costs for pensions, employer National Insurance contributions, etc.

Teacher effectiveness

While plausible changes in the number of pupils in a classroom are likely to have modest impacts on attainment, improving the effectiveness of the teacher at the front of the room can be transformative. Studies from around the world consistently find that teachers differ in their average 'effectiveness' (the average amount of academic progress that their students make). For example, in England, Slater, Davies and Burgess (2012) find that having a teacher at the 75th rather than 25th percentile of effectiveness adds almost half of a GCSE point per subject for any given student.

The benefits of having a good teacher last in the longer term: Chetty, Friedman and Rockoff (2014) estimate a lifetime earnings gain of $250,000 per classroom over a teacher's career from replacing a teacher in the bottom 5% of value added with an average teacher. These long-run outcomes reflect not just teachers' influence on children's academic attainment, but also their impact on other outcomes such as behaviour and other non-cognitive skills (Jackson, 2016).

There is good evidence that differences in teacher 'effectiveness' persist over time, and past effectiveness is a good guide to a teacher's performance with future classes (Kane and Staiger, 2008; Bacher-Hicks et al., 2019). That means that, year after year, the most effective teachers see the pupils in their classes make faster-than-average progress, and these pupils are likely to go on to enjoy higher lifetime earnings.

Because teachers play a vital role, good management and feedback to help them develop is essential to effective education. In one experiment, for example, school principals who were given management training and encouraged to give frequent detailed feedback to teachers saw test scores in their schools rise by around 30% of a standard deviation (Fryer, 2017). A number of other studies also highlight the importance of good management practices for attainment (Bloom et al., 2015; Muñoz and Prem, 2022). This is also important for students in further education colleges (McNally, Schmidt and Valero, 2022).

Box 10. Identifying, recruiting, and training effective teachers

Teacher hiring. Because teachers are so important for pupils' outcomes, identifying and recruiting highly effective teachers is essential to a successful education system. Unfortunately, identifying strong teachers at the hiring stage is challenging: characteristics such as a candidate's educational record or teacher training are often poor predictors of teacher effectiveness.[a] A teacher's level of experience can be a better guide, at least in the earliest years of teaching: effectiveness continues to increase as teachers gain more experience. On the other hand, there is some evidence that the most qualified teachers (with higher scores on licensing tests) tend to leave the profession more quickly, which acts to push down the average quality of more experienced teachers (Wiswall, 2013; Hendricks, 2016).

Once teachers are in the classroom, head teachers and policymakers have more tools available to identify the most successful teachers among a school's existing staff, including statistical value added measures and direct classroom observations (Kane et al., 2011). Since predicting effectiveness during the hiring process is so challenging, more rigorous probation periods may be helpful in giving head teachers the chance to properly assess their staff and how they work on the job.[b]

Teacher training and professional development. Teaching can also be improved among the existing pool of teachers. The most reliable evidence supports programmes of peer-to-peer evaluation among teachers. For example, Burgess, Rawal and Taylor (2021) find that assigning teachers to observe and rate two or three of a colleague's lessons substantially improved teacher effectiveness – both among the teachers receiving peer feedback and among those giving it.

Teachers can also be trained in specific approaches to teaching. For example, Machin and McNally (2008) and Machin, McNally and Viarengo (2018) show that training teachers to adopt more effective teaching strategies for literacy delivered long-lasting benefits among boys and pupils from disadvantaged backgrounds.

[a] Most studies find that higher levels of education do not systematically predict more effective teachers (Burgess, 2019), and the evidence for one type of teacher training being better than others is mixed (Clotfelter, Ladd and Vigdor, 2010; Allen et al., 2016; Allen and Allnutt, 2017).
[b] This was one of the recommendations of the LSE Growth Commission (Aghion et al., 2013).

Inequalities in teacher effectiveness in England

Since teacher effectiveness plays such an important role in improving pupils' outcomes, having a highly effective teacher can play an important role in mitigating inequalities – or exacerbating them. Unfortunately, it is difficult to predict teacher effectiveness based on measurable criteria (as discussed in Box 10).

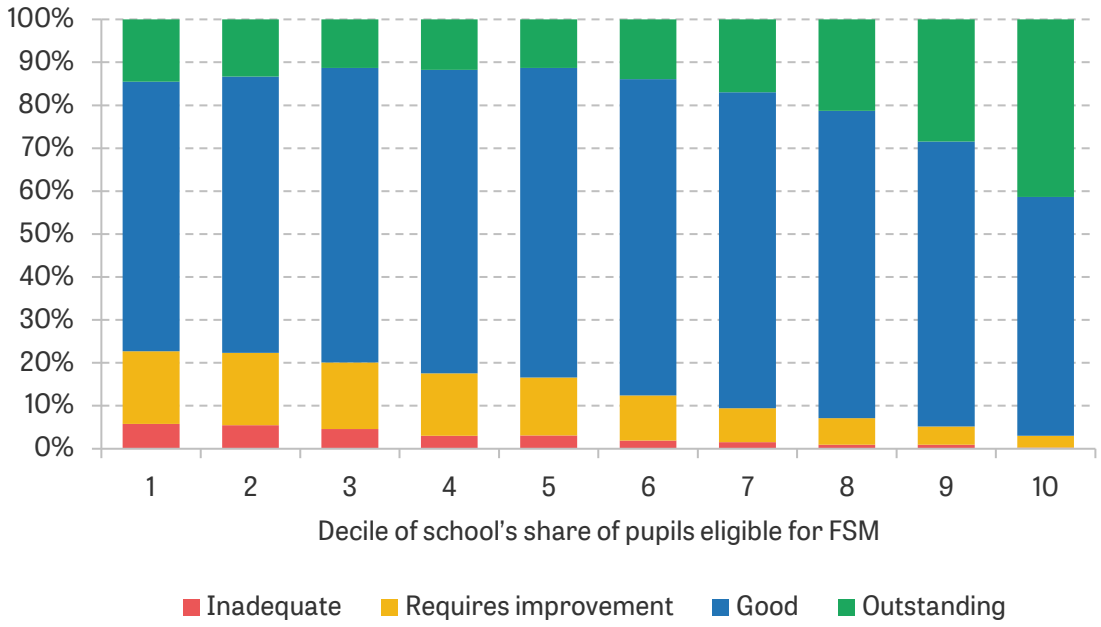
So far, relatively little is known about how and where the teachers with the highest effectiveness (as measured by statistical methods) are distributed across England. But other proxies for teacher effectiveness suggest that the distribution of teachers in England may be worsening the gaps between disadvantaged students and their better-off peers.

First, a substantial share of teachers in England do not hold degrees relevant to the subject they teach. Sibieta (2018) finds that, while around 80% of Key Stage 4 teachers of music, art, biology and general science have relevant degrees, this falls to around 50% of teachers of modern languages, drama, maths and physics. And these teachers are not evenly distributed across schools; more disadvantaged schools are less likely to have KS4 teachers with relevant degrees, especially if they are outside London.

One way of measuring teacher effectiveness is by using the reports of the schools regulator, Ofsted. Figure 53 summarises how Ofsted's assessment of the quality of teaching varies by the level of disadvantage of the school (based on the share of its pupils eligible for free school meals). In the most disadvantaged tenth of schools on the far left of the figure – where an average of 49% of pupils are eligible for free school meals – nearly a quarter of schools fail to meet the standard for 'good' teaching. In the least disadvantaged tenth, with just 2% of pupils eligible for free school meals on average, over 95% of schools meet the standard (and more than four in ten have 'outstanding' teaching).[22]

[22] One limitation of using more subjective measures of teacher quality (such as Ofsted ratings) is the risk of conflating difficult teaching circumstances with poor teacher quality. While Ofsted inspectors try to take school circumstances into account in their assessments, it is of course possible that teachers in better-off schools find it easier to demonstrate the kinds of behaviours that Ofsted is looking for. On the other hand, since pupils will be affected by the teaching quality they actually experience rather than the potential best-case-scenario effectiveness of their teachers,

Figure 53. Ofsted ratings for quality of teaching, learning and assessment in state-funded schools in England



Note: The categories on the horizontal axis split schools into 10 groups based on the share of their pupils eligible for means-tested free school meals in 2020. Schools on the left of the graph have a greater share of pupils eligible for FSM. Ratings are the latest available for each school as of 31 August 2019 (after which the inspection framework changed to remove this 'quality of teaching' category).

Source: Authors' calculations using data from State-funded schools inspections and outcomes as at 31 August 2019 and Get information about schools.

And these studies only explore the inequalities in access to effective teaching in the state school sector. It is much harder to assess the effectiveness of state and private school teachers within the same study, since independent schools are generally not observed in administrative data on pupil outcomes and teacher characteristics.

Peer effects[23]

In addition to the teacher at the front of the room, children's outcomes during the schooling years are also shaped by their classmates. Isolating the impact of a child's peers is challenging, and estimates of peer effects vary widely.[24] In general, though, there are a few lessons that consistently emerge from summaries of the evidence base on peer effects.

First, **there can be sizeable negative effects from 'bad' peers**, such as children who behave disruptively in class. These effects are long-lasting: one study finds that exposure to a disruptive peer (experiencing domestic violence at home) during elementary school reduces earnings at

these measures still tell an important story about the inequalities experienced in classrooms with different levels of disadvantage.

23 See Sacerdote (2011) and Burgess (2016) for excellent summaries of this literature.

24 In general, the more precisely a researcher is able to define a child's peer group (e.g. friend group or classroom rather than school year) and the more reliably they are able to measure their characteristics, the higher their estimates of the peer effects on a pupil's own achievement.

ages 24–28 by 3% (Carrell, Hoekstra and Kuka, 2018). But even in a less extreme context in England, studies find significant and sizeable negative effects arising from 'bad' peers at the bottom of the ability distribution (Lavy, Silva and Weinhardt, 2012).

A second lesson is that having high-achieving peers is not necessarily always good; there is some evidence that **pupils benefit from peers who are at a similar academic level** (Hoxby and Weingarth, 2005). Having a peer group at a similar level might help teachers to target their lessons more effectively. There is also some evidence that a pupil's ability r*elative to their classmates* is important for their longer-term attainment: students who are more highly ranked in their primary school classroom go on to have higher confidence and better test scores at secondary school than peers with a similar level of ability but who were in a higher-achieving primary classroom (Murphy and Weinhardt, 2020).

Policy implications: setting and streaming

Evidence that pupils benefit from having children of similar abilities in their class implies that academic tracking or setting might help to improve student outcomes. To the extent that pupils benefit from having peers at a similar level (rather than just benefiting from having high-achieving peers), tracking offers a chance to improve the attainment of high-ability *and* low-ability pupils at the same time. Indeed, while the evidence base is fairly mixed, around half of studies find that tracking benefits overall attainment (most other studies find no effect) (Sacerdote, 2011).[25]

But an effective tracking system relies on accurately identifying which pupils belong in which groups. In school systems that incorporate an element of tracking, schools typically use a combination of prior attainment (test scores and/or coursework grades), teacher recommendations and the family's own preferences. There are risks for inequality in all of these: prior attainment measures will disadvantage those who start out behind but make fast progress, including many ethnic minority groups (as we show in Part II). Teacher recommendations may similarly introduce bias: for example, high-attaining disadvantaged students are more likely to have their grades under-predicted than their more affluent peers (Murphy and Wyness, 2020). And family preferences favour parents who are more informed and ambitious and children who are more confident.

And crucially, the impacts of within-school tracking or setting might be very different from the effects of between-school streaming (where pupils attend different types of schools, such as academic or vocational). Creating separate schooling 'streams' comes with the risk that policymakers (implicitly or explicitly) impose a hierarchy that in turn sees the schools that cater to 'better' pupils attracting better resources. Splitting up pupils into different schools also raises the costs of switching track later on. Box 11 discusses the role of grammar schools in the English system and how they affect both individual attainment and overall social mobility.

[25] An evidence review by the Education Endowment Foundation, by contrast, found that tracking had no impact on pupil attainment. Most of the studies covered in this review were relatively old (from the 1960s and 1970s) and did not use contemporary methods to identify the causal effect of tracking.

Box 11. Grammar schools and academic selection

For the latter half of the 20th century, education in England largely followed a two-track system. Pupils who performed well on the '11-plus' exam at the end of primary school were eligible to attend academically selective grammar schools; those who did not make the grade instead attended secondary moderns. Concerns about unequal access, unnecessary division and under-provision for pupils who did not pass the 11-plus saw the grammar school system significantly curtailed in 1998 (though legislative quirks mean that selective schooling persists in some areas of England).

Since then, the merits of a two-track system – both for grammar school pupils and for children attending surrounding non-grammar schools – have been hotly debated.

Some view grammar schools as giving uniquely good opportunities to bright children (including those from disadvantaged backgrounds) who otherwise might not be challenged to reach their potential. Obtaining good-quality evidence for this assertion is challenging: it requires unpicking the *causal* impact of grammar schools from the role played by their *selection* of academically talented pupils. But a small number of studies credibly suggest that grammar schools do improve their own pupils' outcomes. For example, one study exploits strict rules for who was offered a grammar school place to compare children born in Aberdeen in the 1950s who just got in with those who just missed out. The researchers find that attending a grammar school at that time substantially increased women's likelihood of earning A levels and men's probability of receiving a degree, though they had little long-term effect on men's income or employment (Clark and Del Bono, 2016).[a] Similar work in England finds that, controlling for age 11 attainment, grammar school pupils were more likely to earn a good degree than those who just missed out on a place (though, when compared with pupils who went on to earn similar GCSEs, grammar pupils fared somewhat worse at university) (Burgess, Crawford and Macmillan, 2017). Grammar schools do not seem to have much impact on non-academic outcomes such as pupils' self-confidence or aspirations (Jerrim and Sims, 2018).

While grammar schools may have some benefit for their own pupils, this could come at the cost of overall levels of attainment by worsening outcomes for those who just miss out on a place. Evidence from countries that have weakened selectivity have found higher levels of average achievement. For example, the abolition of a two-track system in Finland slightly increased verbal skills, with stronger effects on children of less-educated parents (Kerr, Pekkarinen and Uusitalo, 2013). And the improvement in average levels of attainment that comes with 'comprehensivisation' comes alongside lower levels of inequality. For example, Burgess et al. (2020) find that – accounting for a range of individual characteristics – the wage distribution of people who grew up in selective schooling areas is significantly more unequal than that of people who went to school in comprehensive systems.

Grammar schools are also not very efficient in promoting social mobility. Children from the most disadvantaged backgrounds are substantially less likely to attend grammar schools: even in selective areas, only around 6% of children from the poorest tenth of families attend a grammar, compared with 51% of those at the 90th percentile (Burgess, Crawford and Macmillan, 2017).

[a] These results are based on a cohort of children educated in Aberdeen in the 1960s, so the scale of these impacts reflects the barriers (financial and not) that prevented talented children who did not attend grammar schools from going on to further education. As the authors note, grammar schools' impacts in today's system are likely substantially smaller. Indeed, one study employing a matching design finds that pupils who narrowly made it to grammar school have better university outcomes conditional on their age 11 attainment, but somewhat worse outcomes conditional on their GCSE performance (Burgess, Crawford and Macmillan, 2017). Importantly, holding constant pupils' GCSE attainment means that benefits for later attainment that are already evident at age 16 will not be considered.

School choice and the role of geography

There are important differences between schools which can influence children's academic attainment. Better-funded schools and those with better teachers tend to lead to better exam results; smaller classes have a more modest effect, but the mix of pupils within them can matter quite a bit. Taken together, this suggests that a child's eventual results will depend, in part, on which school she or he attends.

In England, parents have some influence over this process. Even within the state sector in areas without selective schooling, parents are able to rank preferred schools in their local authority. These preferences are then taken into account in an algorithm that matches pupils to schools.

From the parent side, the school choice process looks fairly similar for those from disadvantaged backgrounds and those from more affluent families. Across the socio-economic spectrum, parents typically value a school's academic quality,[26] closeness to their home, and how similar (in terms of socio-economic status) the other pupils are to their own child (Burgess et al., 2015). And more disadvantaged families are just as likely to engage in the school choice process (ranking more than one school) as more affluent parents (Burgess, Greaves and Vignoles, 2019).

There are, however, important regional differences: families in rural areas are substantially more likely to list only one school than those based in cities (Burgess, Greaves and Vignoles, 2019). Since this limited set of rankings is correlated with pupils ending up in a less-high-performing school, this suggests that issues of access to good schools in rural areas are holding some pupils back. Programmes to help encourage a meaningful amount of school choice in rural areas – for example, assisting with transport to and from school – could help to 'level up' families' experiences of the school choice system.

The challenges facing rural families are one acute symptom of a wider problem with the role that distance plays in the school choice system. Distance shapes families' preferences – parents typically strongly prefer a school that is closer to their home.

But distance is also used in the school choice system itself to allocate places when a popular school is oversubscribed. In practice, this has meant that the most popular schools end up with de facto catchment areas. Since these are broadly stable over time, being near to a good school ends up being part of families' decisions over where to live – which in turn pushes up housing prices near the school, as more affluent families are more able to pay the housing premium. The

[26] This is one reason why institutions to ensure school accountability – such as league tables of school results – can be an important part of spurring schools to perform well. For example, Burgess, Wilson and Worth (2013) link the Welsh Government's decision to end school performance tables to a large and immediate fall in attainment, with bigger effects on low-achieving pupils.

premium can be significant; research in 2013 found that a one standard deviation increase in either a school's quality or the prior attainment of its intake pushed up local house prices by 3% (Gibbons, Machin and Silva, 2013).

Box 12. School type and the push for academisation

In its recent Schools White Paper (Department for Education, 2022), the government set out its plans to encourage all schools to join multi-academy trusts by 2030. The academy model for schools offers state-funded schools independence from their local education authority, with greater freedom over their curriculum and management. Multi-academy trusts are groups of academies run by private or charitable organisations.

Academies were first introduced in 2002 as a way to offer a 'fresh start' to poorly performing schools in disadvantaged areas. It was a highly targeted policy and pupils in these schools benefited from academisation, with higher test scores several years later (Eyles, Hupkau and Machin, 2016; Eyles and Machin, 2019). However, when academisation was broadened out to most secondary schools in the early 2010s and a proportion of primary schools, the impacts were ambiguous (Andrews et al., 2017). Also, there was zero effect on achievement in primary schools (Eyles, Machin and McNally, 2017).

The role of families and the home environment

School choice is one major way in which families influence their child's educational development and attainment. But the home environment is also a crucial determinant of educational inequalities and social mobility; indeed, families may play a bigger role in explaining the variation in educational attainment than either schools or peers.

In part, this reflects the critical role that families play in children's development before they start school. But the home environment also shapes children's development during the schooling years: the time parents spend with their children, and the investments parents make into other resources such as tutoring or extracurricular activities, can have huge impacts on children's performance at school.

Better-off families have more resources at their disposal, and so may be more able to provide inputs such as private tutoring (Jerrim and Sims, 2018), access to technology or a quiet study space. For example, primary school children in the richest third of families were nearly 20 percentage points more likely to have a dedicated study space at home during the pandemic than their peers in the poorest third (Andrew et al., 2020a).

Parents also differ in how much time they spend with their children. On average, more educated parents tend to spend more time with their children, despite also being more likely to be in work and to work longer hours (Guryan et al., 2008). These parents spend more time not just on educational activities, but also on recreational activities such as playing sports or going on family outings.

Taken together, these results suggest that unequal experiences at home tend to reinforce existing inequalities. This was one reason that the COVID-19 pandemic was so damaging to

educational inequalities – by raising the importance of the home environment through long periods of remote learning, the pandemic meant that children's family backgrounds played a larger-than-usual role in their education.

Summary

While inequalities in skills and development are evident even before children start school, the schooling years see these inequalities widen. Especially during secondary school, it becomes more difficult for individual pupils to 'catch up' if they fall below the expected standard of learning. This means that the school years are critical both for addressing inequalities and for ensuring that children develop at least the basic standard of skills to support their future aspirations.

The development of inequalities during the schooling years is not just about what happens in schools. The resources that children have access to at home vary considerably. Inequalities in income (and the resources it can buy) and in parental time, confidence and engagement all play a role in shaping children's trajectories during the schooling years.

But the environments that children are exposed to in school are also key drivers of their attainment and wider development. For instance, it is increasingly clear that school resources matter for supporting children's academic development. Overall resources are also, in some ways, the easiest lever for central government to pull: dedicating additional funding to schools, or changing the way it is allocated to bring it in line with the current distribution of need, is administratively relatively straightforward (if financially costly). Despite this, the past 15 years have seen an effective freeze on total school spending and a rapid fall in the progressivity with which funding is allocated. At the same time, private school resources have raced away from the state school sector, further widening the gaps between the privileged few who attend independent schools and those in the state sector.

Even within a context of slow overall growth in spending, though, there is still scope for schools to choose how to allocate their resources. While smaller classes are perennially popular with parents, achieving even modest benefits for attainment may require dramatic changes in class sizes – and correspondingly large increases in spending.

Instead, schools should focus more on the quality and effectiveness of their teachers. Identifying excellent teachers at the hiring stage is difficult, but low-cost programmes of peer observation and feedback between teachers can substantially raise their effectiveness once they are in the classroom. These kinds of initiatives might be particularly effective in more disadvantaged schools, which are far less likely to have excellent teaching.

Children are also influenced by the peers in their class. These peer effects can be highly non-linear: having a very disruptive peer in elementary school can have a small but measurable impact on earnings through the late 20s. The academic ability of peers also matters, but in sometimes-nuanced ways: while there are usually benefits from having higher-ability peers, low-achieving students often do better when grouped with classmates in a broadly similar ability range.

Parents weigh up all these factors, and more, when deciding which schools to rank at the top of their list. But while parents across the socio-economic spectrum largely favour similar attributes in a school – academic quality, a short commute, and similar peers – there are significant

differences in how able they are to access their preferred schools. Families in rural areas are more likely to see themselves as having only one viable school choice. And across the country, the use of distance as a tiebreaker means that housing prices rise near the most popular schools, pricing out those on lower incomes.

12. Education inequalities beyond the school years

After finishing compulsory education, young people make pivotal educational choices. They decide whether to continue education, what form of education to pursue (academic or vocational or a mixture) and which subjects to study. And education is not restricted to the young: adults of all ages participate in education and training, either in the classroom or at work.

Earlier in this chapter, we established that these educational choices matter as differences in education translate into unequal distributions of earnings and other important outcomes. We also showed that there are systematic differences in the attainment of and the educational routes selected by different groups of people; individuals from more affluent backgrounds, women, and many but not all minority ethnic groups are significantly more likely to go on to earn higher levels of qualifications.

We now turn to analysing the features of the post-compulsory education system that contribute to education inequalities. We first look at how levels of educational attainment evolve after the school years and document how participation in education and training by adults has changed over the past decade. We then highlight the role that three specific factors play in the development of education inequalities beyond the school years: individual decision-making, the structure of the UK's post-16 education system and the funding of adult education.

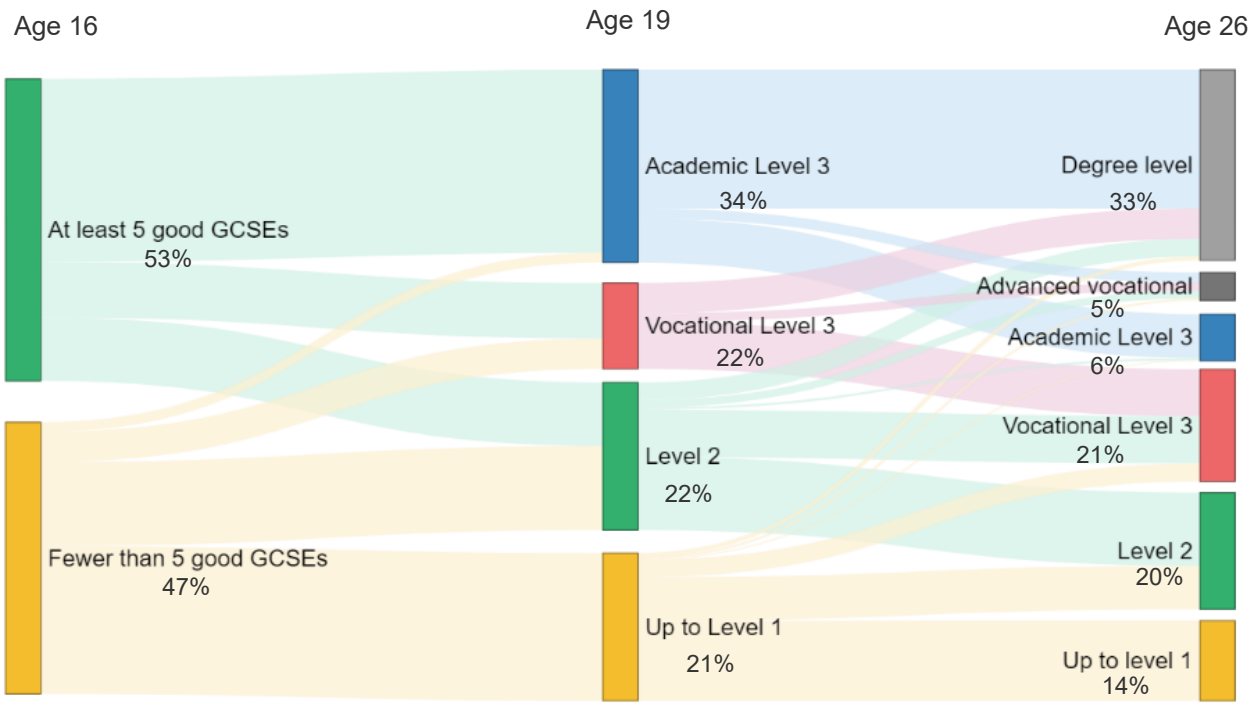
The development of education inequalities after GCSEs

We begin our analysis by looking at the educational outcomes and trajectories of a specific academic cohort – the 2006 GCSE cohort – to illustrate how educational inequalities develop after the school years. At the age of 16, just over half of the 2006 GCSE cohort held at least five good GCSEs; 47% had not met this benchmark. In Figure 54, we track how these groups progressed through the education system for the first decade after their GCSEs.

Figure 54 underlines the fact that GCSE attainment is a crucial indicator of a young person's eventual level of qualification. Less than 15% of those with fewer than five good GCSEs at age 16 had gone on to achieve Level 3 (A-level or equivalent) qualifications by age 19. By contrast, the vast majority of pupils who met the GCSE benchmark subsequently went on to achieve Level 3 qualifications. Around half of pupils who had not earned good GCSEs by age 16 had achieved the qualification by age 19 and almost 70% had earned their GCSEs by age 26, but they were very unlikely to go on to reach higher levels of qualifications. By contrast, over 70% of young people with academic Level 3 qualifications at age 19 have completed a degree by age 26.

Clearly, we would expect young people with better levels of prior attainment to reach higher levels of education, but part of the reason that there are large educational inequalities in the UK is that a sizeable share of the population does not progress beyond (or even to) basic levels of qualifications. Strikingly, 14% of the entire cohort had not even reached GCSE-level qualifications by age 26.

Figure 54. The evolution of educational attainment for the 2006 GCSE cohort between the ages of 16 and 26



Note: The percentages may not sum to 100 at each age due to rounding. Attainment at Level 2 and below corresponds to below upper-secondary level; this can be separated into up to Level 1, which is the same level as GCSEs below C grade (or below a grade 4), and Level 2 which is equivalent to GCSEs at C grade or above (or above a grade 3). Level 3 relates to upper-secondary level (i.e. A level or equivalent); Level 3 is divided into 'academic', which refers to qualifications such as A levels or International Baccalaureates, and 'vocational' which corresponds to more practically-oriented qualifications such as BTECs. Advanced vocational and degree-level qualifications are beyond upper-secondary level.

Source: Authors' calculations using tables A1.8 and A1.10 in Espinoza et al. (2020).

The age 26 distribution of qualifications in Figure 54 also shows us which qualifications serve as stepping stones along the educational pathway, and which are more like final destinations. While 34% of the cohort held an academic Level 3 qualification at age 19 (almost all A levels), by age 26 only 6% of people held this as their highest qualification, i.e. people use academic Level 3 qualifications as a stepping stone to higher education. By contrast, vocational Level 3 qualifications (such as BTECs) are far less likely to lead to later qualifications; fewer than half of 19-year-olds with a Level 3 vocational qualification had earned a higher qualification by age 26. Across the entire cohort, only 5% of people's highest level of educational attainment at age 26 is an advanced vocational qualification, compared with 33% of the population holding a degree. This is despite the fact that – as we showed in Part I – completing an advanced vocational qualification boosts earnings relative to stopping at Level 3.

The change in participation in adult education over the last decade

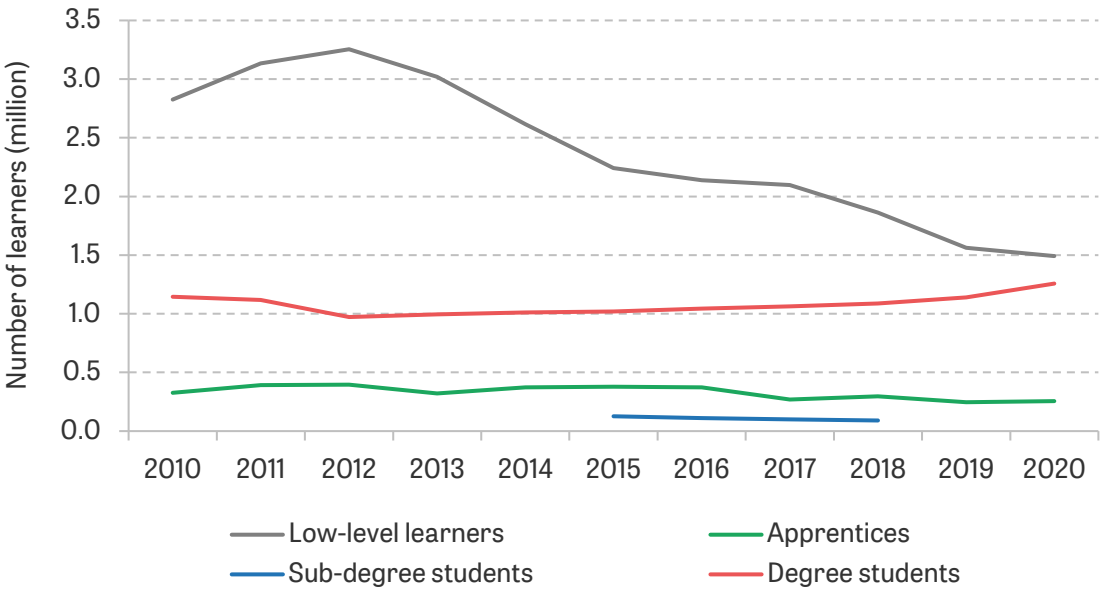
In the UK, as in most other countries, there is a wide range of routes through which adults can gain skills and qualifications. Formal education and training are one of the most important routes, since these qualifications tend to be portable (between firms or even industries) and to have stronger regulation than in-house on-the-job training. Over the last decade, the numbers and composition of adult learners in the UK have changed. In Figure 55, we show the total number of

adults (aged 19+) starting qualifications at different levels in each year between 2010–11 and 2020–21.

At the beginning of the decade, there was a large gap between the number of low-level learners and adults starting higher levels of qualifications each year. Yet since 2010 there has been a large decline in the number of adults taking these low-level qualifications from around 2.8 million in 2010 to around 1.5 million in 2020 – a decline of roughly 47%. Despite a large policy focus, the number of adult apprentices also decreased by around 21%. Not all forms of education have declined – there was an almost 10% increase in the number of learners beginning degrees each year. Overall, this means that there were 30% fewer adults starting qualifications in 2020 than in 2010, largely driven by the fall in the number of learners taking low-level qualifications.

While the change in the total number of adult learners is interesting, the key shift in the past decade has been in the type of courses studied. This is demonstrated by Figure 56, which shows how the percentages of adult learners studying at different levels have changed between 2010–11 and 2020–21. The percentage beside each qualification on the vertical axis is the share of adult learners who were studying for this qualification in 2010–11[27] (e.g. 26% of adult learners in 2010–11 were studying below Level 2 qualifications).

Figure 55. Total number of adult learners in England between 2010–11 and 2020–21

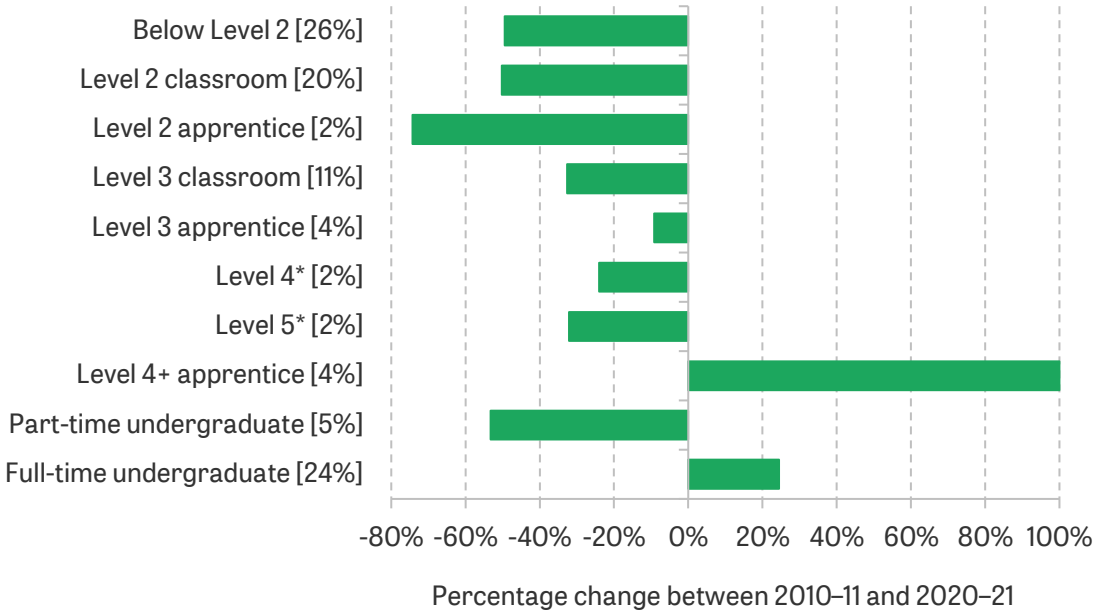


Note: The figure is for adults aged 19 and over. 'Low-level learners' refers to all classroom-based (i.e. non-apprenticeship) qualifications at Level 3 or below. 'Apprentices' encompasses all adult apprentices (at intermediate, advanced and higher level). 'Sub-degree students' is the total number of Level 4 and Level 5 entrants (data on Level 4 and Level 5 learners is only available between academic years 2015–16 and 2018–19). 'Degree students' is the total number of part-time and full-time undergraduate and postgraduate students.

Source: Figure 2.1 from Sibieta, Tahir and Waltmann (2022).

[27] This is important because whilst there were sharp increases in certain qualifications, such as Level 4+ apprenticeships, the fact there was initially a low base means that there is a relatively small increase in the absolute number of learners.

Figure 56. Percentage change in the number of adult learners taking different courses between 2010–11 and 2020–21



* For Level 4 and Level 5 qualifications, the percentage change is calculated between the academic years 2015–16 and 2018–19.

Source: Figure 2.2 from Sibieta, Tahir and Waltmann (2022).

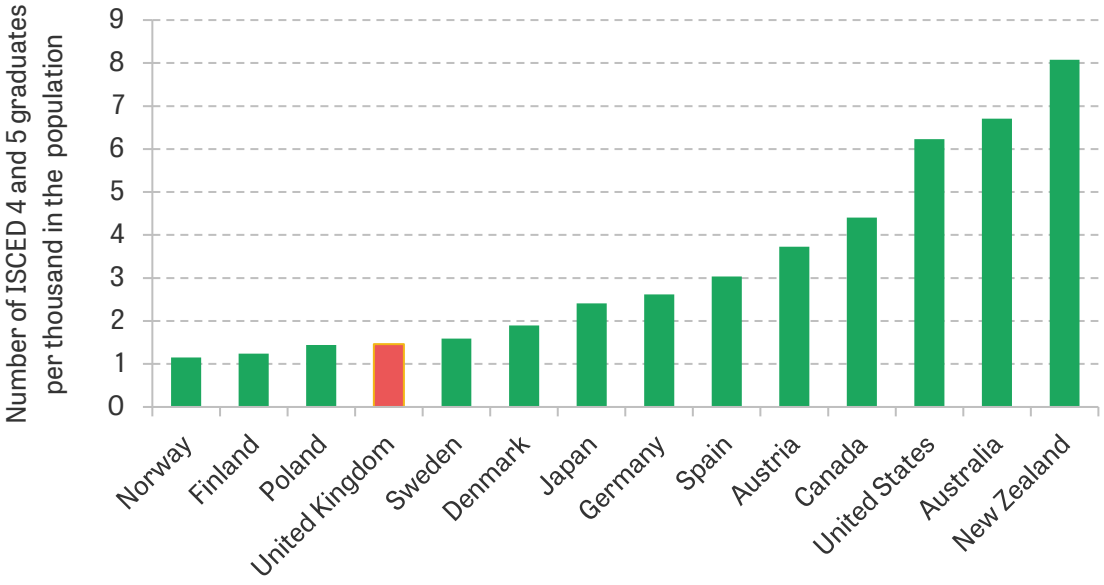
Between 2010–11 and 2020–21, the numbers of adult learners studying classroom-based courses at each level below Level 6 declined. The sharpest falls were among those studying at the lowest levels: the number of basic skill qualifications studied below Level 2 fell by almost 50%, while the number of classroom-based qualifications at Level 2 declined by half. There was also a 74% decline in the number of adults starting the most basic apprenticeships (intermediate apprenticeships). On the other hand, the number of adults studying advanced and higher apprenticeships and full-time degrees has significantly increased, although, in the case of advanced and higher-level apprenticeships, from a very low base.

The decline in the number of learners studying at Level 4 or Level 5 is also noteworthy. Earlier in this chapter, we showed that one of the notable features of the UK's distribution of educational attainment is how polarised it is: the population is split into two large groups, one with relatively low levels of education and one with high levels of education, with little in between. This 'missing middle' is due in part to a low share of individuals taking advanced vocational (or technical) courses, i.e. Level 4 and Level 5 courses. As Figure 57 illustrates, the UK has a low share of people completing these advanced vocational qualifications relative to other developed countries, and this has declined in the last decade.

In addition to formal education, there are many different forms of on-the-job or employer-provided training. On-the-job training can enhance workers' productivity and may also help to close pre-existing skill gaps, especially if it is targeted at workers with lower levels of skills and qualifications. In practice, though, Figure 58 shows that it is higher-skilled workers who are far more likely to receive on-the-job training. While over 30% of degree-holders reported receiving training in the last three months, less than 10% of workers with no qualifications benefited from employer-provided training (Luchinskaya and Dickinson, 2019).

Figure 58 also shows that training has become far less common over time; training rates for those with high levels of qualification fell by around 10% between 2010 and 2017, and there is a much longer-term trend of declining access to employer-provided training (Li, Valero and Ventura, 2020).

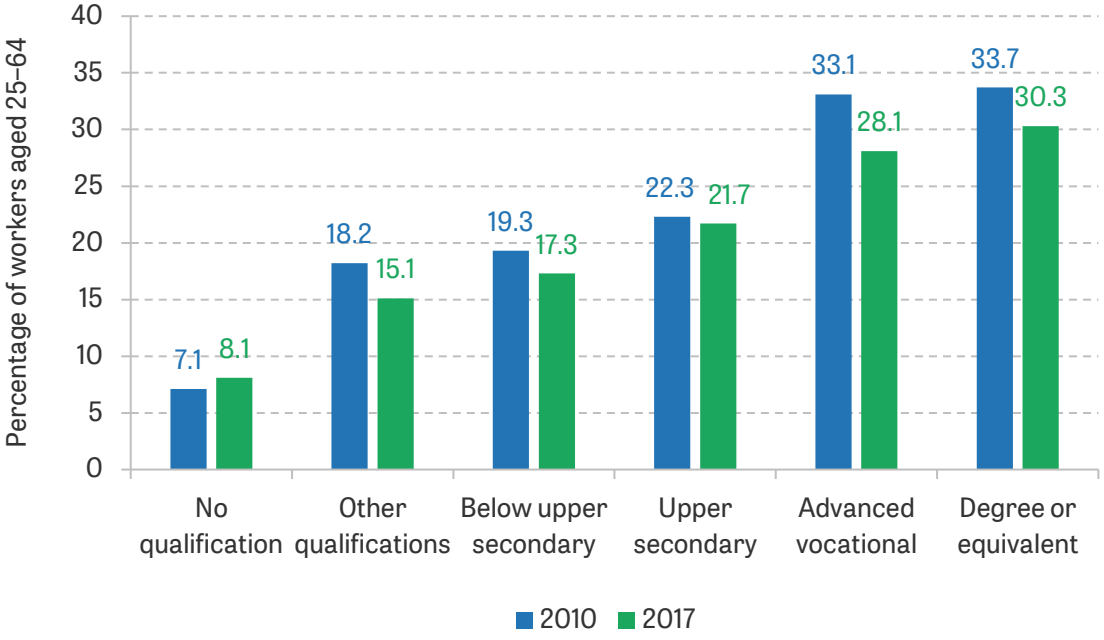
Figure 57. Number of first-time graduates from ISCED Level 4 and 5 programmes per thousand in the population, 2019



Note: This figure is an updated version of figure 4 in Field (2018). The OECD classifies qualifications using the International Standard Classification of Education (ISCED) framework. For more details, see UNESCO Institute for Statistics (2012).

Source: Authors' calculations using OECD education database.

Figure 58. Percentage of workers receiving employer-provided training in the last three months, by highest qualification level



Source: Figure 15 in Luchinskaya and Dickinson (2019).

Taken together, these statistics suggest that there has been a shift in the landscape of adult education in England over the last decade. Low-level qualifications – which sometimes offer little value to learners – have fallen substantially.[28] There has been some growth in the number of people taking higher-level qualifications, but this is from a low base. Overall, then, both the adult education system and on-the-job training have contracted over the past decade. For adults with low levels of education, these trends have made it more difficult to access opportunities to upskill through formal education or through training – meaning that existing educational gaps among adults may not be closed and may even be widening.

In the remainder of this section, we turn to analysing factors that affect educational inequalities in the post-compulsory years. There are no simple answers here: just as with the schooling-age inequalities, educational inequalities in the post-compulsory years have many causes. We begin by looking at the role that individual-specific factors, such as prior attainment and preferences, play in explaining differences in educational decisions. Later in this section, we will consider how wider characteristics of the post-compulsory education system and the funding system shape inequalities.

Options and choices during post-compulsory education

The importance of prior attainment

In the UK, there are countless potential routes through the post-compulsory education system. In reality, though, not all of these routes are available to everyone. The most important factor that determines an individual's set of educational options is their prior attainment. At the age of 16, academic qualifications such as A levels are only available to young people with the requisite GCSE grades. After upper-secondary education, whether individuals can progress to study advanced vocational qualifications or degrees depends on their earlier attainment.

In Figure 59, we return to the 2006 GCSE cohort to highlight the huge role that prior attainment plays in determining the eventual distribution of qualifications. Specifically, pupils in this cohort are placed into one of 10 equally-sized groups based on their attainment at GCSE (we use their total point score, which takes into account both how many GCSEs they sat and how well they did in each); we then plot the distribution of qualifications at age 26 within each group.

GCSE attainment is a key predictor for later educational attainment – the better someone scores at GCSE, the more likely they are to hold advanced qualifications at age 26. It is extremely unlikely for someone in the bottom fifth of GCSE scores to earn a degree by 26. On the other hand, nearly 80% of young people in the top 10% of the GCSE distribution have a degree a decade later.

In part, the importance of prior attainment reflects the unsurprising fact that those who perform well in exams are likely to be more academically able and so more likely to pursue education at advanced levels. But GCSEs also function as a 'gatekeeper' in the education system. Comparing young people who *just* miss out on a C grade with those who *just* scrape a pass, Machin, McNally and Ruiz-Valenzuela (2020) show that young people who miss out on a good English GCSE at 16 are significantly less likely to complete an A level or equivalent qualification than individuals who just manage to achieve the GCSE. Anderson (2022) shows an effect of missing out on a different

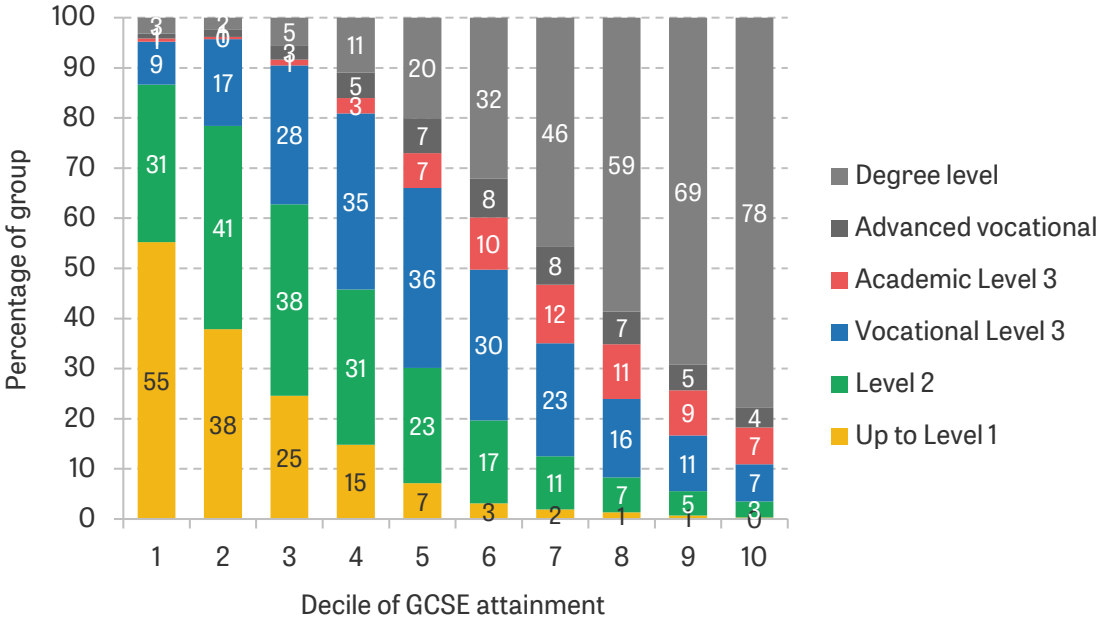
[28] It should be noted that not all low-level qualifications are 'low return' and they may also be a stepping stone to higher levels of qualification. In some contexts, training in interpersonal skills leads to higher returns than training in technical skills (Barrera-Osorio, Kugler and Silliman, 2020). 'Soft skills' are particularly relevant for people in low-skilled occupations and can yield relatively high rewards (Aghion et al., 2020).

threshold (achieving five or more good grades at GCSE) and finds that women passing this threshold earn about 3% more in their early career, though no relationship is found for men. The huge potential differences in life outcomes that result from small differences in actual GCSE scores suggest that earning a good GCSE is important for a young person's future, over and above what it says about their academic ability.

Although GCSE performance is the major predictor of later attainment, Figure 59 shows us that prior attainment does not fully determine an individual's final level of education. Particularly for those with middling GCSE results (in the middle few bars of Figure 59), young people with similar GCSE performance can end up with very different levels of qualifications. For example, 23% of young people in the fifth decile never progress beyond Level 2 qualifications, but 20% go on to earn a degree.

So, while prior attainment is a major determinant of the educational routes taken by individuals, it is far from the only factor in play. Young people with similar academic records can end up making very different choices. Moreover, these choices can be connected with other dimensions of inequality (such as socio-economic background or gender). We therefore provide a brief summary of evidence on some of the most important additional factors that influence educational decisions.

Figure 59. Distribution of educational attainment at age 26 by GCSE attainment



Note: Individuals in the 2006 GCSE cohort are split into 10 groups based on their age 16 attainment. Each individual's GCSE grades are converted into a point score and then everyone is ranked based on this score. In the figure, individuals are categorised into deciles based on their GSCE attainment, with group 1 having the lowest attainment and attainment increasing as we move to the right across the figure and higher deciles.
Level 2 attainment is achieving the equivalent of at least five GCSEs at grade C or above (or above a grade 3), and anything below this is classified as up to Level 1. It is possible, although unlikely, that students achieve a high GCSE point score without getting beyond Level 1 (i.e. obtaining high grades in four GCSEs but below C in their remaining GCSEs), which is why there is a non-zero number of pupils with up to Level 1 at the top deciles of GCSE attainment. Level 3 relates to upper-secondary level (i.e. A level or equivalent); Level 3 is divided into 'academic', which refers to qualifications such as A levels or International Baccalaureates, and 'vocational' which corresponds to more practically-oriented qualifications such as BTECs. Advanced vocational and degree-level qualifications are beyond upper-secondary level.

Source: Authors' calculations using table A1.9 in Espinoza et al. (2020).

Preferences

Even though GCSE attainment strongly influences the set of options a young person has open to them, the choices they make within that set depend on a range of additional factors. One of the major determinants of choices is preferences, for different types of qualifications and for different subjects (Archer et al., 2021; Zafar, 2013).

There is substantial evidence that men and women have different educational preferences.[29] Kahn and Ginther (2017) find that gender differences emerge early on, with boys and girls displaying differences in their preferences for STEM subjects at a young age. Even among young people with good results in GCSE maths and physics – who have shown both some interest in and some aptitude for STEM subjects – girls are less likely to continue to study these subjects at A level and university (Cassidy et al., 2018; Cavaglia et al., 2020). This is a common issue across many countries (McNally, 2020). Importantly, these preferences are not fixed – they are affected by social norms and role models as well as factors such as comparative advantage and information.

Comparative advantage and perceptions of ability

Gender differences in educational choices may be influenced by pupils' *comparative* advantages and different perceptions of their abilities. OECD PISA scores show that girls perform as well as or better than boys on reading, maths and science tests at age 15; however, their *relative* performance is stronger on reading tests.

Pupils build up a perception of their own abilities and their unique strengths in part based on these and other tests. However, these perceptions can also be influenced by their social environment or discrimination. Even though there is often little or no gender gap in maths-intensive subjects, many studies find that girls have relatively low self-efficacy in maths at all stages of education (Cheryan et al., 2017). This can be accentuated by teachers' gender stereotypes, which have been found to affect gender differences in measured performance in maths and science and in STEM-related choices within high school and beyond (Lavy and Sand, 2018; Lavy and Megalokonomou, 2019; Terrier, 2020).

Information

Educational decisions rely not only on the information a pupil has about their own (perceived) strengths and preferences, but also on information about the set of available options (Dillon and Smith, 2017). The English system offers a relatively clear and well-signposted academic path (earn good GCSEs, study A levels, attend university). But the vocational system is much less clearly defined, with many options and little centralised information about possible courses or their benefits. Educational inequalities are worsened further because this sort of information and guidance is often less available for young people from disadvantaged backgrounds (Archer et al., 2021). These young people will instead often turn to family and peers for information (Dickerson, Maragkou and McIntosh, 2018). The lack of systematic guidance leads to young people making subject and qualifications choices based on limited information, which may not ultimately lead to the best outcome.

Expectations

A lack of solid information is particularly problematic because educational decisions are inherently forward-looking: young people choosing what to study need to consider not just the present, but also how this decision will impact their future. Various studies (e.g. Zafar, 2013;

[29] For a more detailed summary of the literature on gender differences in educational decisions, see McNally (2020).

Osikominu and Pfeifer, 2018) find that men are more likely to care about the financial rewards from education than women (though this may not have a strong direct influence on subject choice). In the UK, male post-16 vocational students are more likely to select subjects associated with high returns, such as engineering and IT (Archer et al., 2021).

Young people from poorer backgrounds, on the other hand, are less likely to select more lucrative educational routes than their peers with similar prior attainment but from richer families. At age 16, even after accounting for prior attainment, young people from disadvantaged backgrounds are more likely to select non-A-level routes, attend college (Crawford, Meschi and Vignoles, 2011) and study lower-level vocational courses (Archer et al., 2021). They are also less likely to attend the most selective universities (Hoxby and Avery, 2012).

Although there is less evidence on ethnic differences in choices, Britton, Dearden and Waltmann (2021) find that students from an ethnic minority background are more likely than white British students to study degrees with a strong focus on particular jobs or industries, which suggests that they may put more weight on having an easily identifiable career path resulting from their education.

Local availability of courses

Lastly, in the UK, the availability of courses varies across the country and so educational choices may be constrained by what is offered in one's local area. Indeed, Archer et al. (2021) note that transport costs and geographical availability often represent significant barriers for disadvantaged learners, which means their choices are often governed by what is available to them locally. For example, disadvantaged young people in London – where there is the widest availability of school sixth forms – are much more likely to take higher-earning courses than disadvantaged young people in the north-west and north-east of England – where there is the lowest availability of school sixth forms. In fact, learners' choices in further education tend to be very localised with most (70%) travelling less than 10km from their home and half travelling less than 6km (Snelson and Deyes, 2016).

These local factors can be important; one study estimates that around a third of the variation in the academic selectivity of GCSEs chosen by students can be statistically explained by differences across schools (Anders et al., 2018). This provides another channel for 'peer effects', meaning that young people from disadvantaged backgrounds are more likely to study selective subjects if they have more affluent peers.

The structure of the post-16 education system

Thus far, we have focused on factors that affect how individual students make educational choices, but these decisions are also shaped by wider factors, such as the structure of the post-16 education system. In the UK, it can be particularly difficult for low GCSE attainers to progress to higher levels of attainment and generally for young people to navigate the post-16 education system.

Options for low GCSE attainers

Every year, around two-fifths of 16-year-olds in England do not pass both their English and maths GCSEs. The educational opportunities available to these young people can be limited. Effectively, the GCSE exam system sorts people into different levels of education as well as tracks. Despite the possibility of repeating the exam in later years, many students do not recover from low GCSE

attainment: less than half of students pursuing a Level 2 qualification at age 17 achieve a good upper-secondary education (Level 3 or above) by age 20 (Hupkau et al., 2017). If a student only narrowly misses a grade C/4 in GCSE English, this reduces the probability of achieving a good upper-secondary education by about 9 percentage points (Machin, McNally and Ruiz-Valenzuela, 2020).

The educational opportunities for this group of students could become even more limited in the future. The government is consulting on the introduction of a minimum academic threshold to access tuition fees and maintenance loans, which may require students to achieve at least two grade E passes at A level (or equivalent) or a minimum of grade 4 at GCSE in English and maths. This will make it even more difficult for young people who may not have performed well in these subjects to access higher education, with a particular impact on disadvantaged students. Among the 2011 and 2012 GCSE cohorts, for example, nearly a quarter of university students who had been eligible for free school meals would have been shut out of the student loan system by the proposed eligibility rules (Drayton and van der Erve, 2022). While failing to earn good English and maths GCSEs is correlated with worse performance at university, 40% of these pupils who made it to university still went on to earn a first or a 2:1 in their degree.

The underlying concern is not so much the existence of an important exam at age 16 as the longer-term implications of being unable to progress immediately to upper-secondary education, whether vocational or academic. Lupton et al. (2021) document a variety of reasons for these learners' lack of progression, including a lack of information and geographic variation in the availability of courses, which we have already discussed. They also contend that learners are unnecessarily blocked from studying many courses and apprenticeships that are suitable for them by the requirement to have English and maths GCSE at grade 4 or above.

Complex pathways through post-16 education

A major difference between academic and vocational post-16 education is that it tends to be far simpler to navigate a way through academic education. For most of the young people who begin higher education by the age of 19, there is a well-trodden path from completing GCSEs to taking A levels and then starting university. However, the majority of young people do not follow this 'academic track', and so face a far more complicated landscape of qualifications. They also need to transition to a different institution at age 16 (usually their local further education college), whereas many people pursuing the 'academic track' can do so in the same school they have attended throughout their secondary education.

There are many options available to students within vocational education but, unlike on the 'academic track', there is no obvious pathway from vocational qualifications at one level to the next, whether this be from a low level or from an upper-secondary level to an advanced vocational level. This is not helped by a proliferation of qualifications, often designed by different awarding bodies. Vocational qualifications can also be quite narrowly defined, although policy has tried to address this through the provision of 'study programmes' (Department for Education, 2012). The introduction of T levels is an attempt to address some of these problems, though it does nothing to address the narrowness of the post-16 curriculum that seems intentionally geared towards students choosing either three academic subjects (A levels) or occupationally focused vocational study (T levels). This all relies on people knowing a great deal about their talents and potential careers as young teenagers.

A related concern about the post-16 curriculum (academic and vocational) is that people can steer away from important skill areas, such as any form of maths or numeracy, provided they

pass a threshold at age 16. For example, those who take A levels typically choose only three subjects and everyone who passes thresholds in English and maths at GCSE is able to stop studying these subjects. The narrow breadth of the post-16 curriculum is an unusual aspect of the English system, and the opportunity to specialise to a very high extent after age 16 may itself be a source of inequality in the acquisition of important general skills.

Adult education funding in England

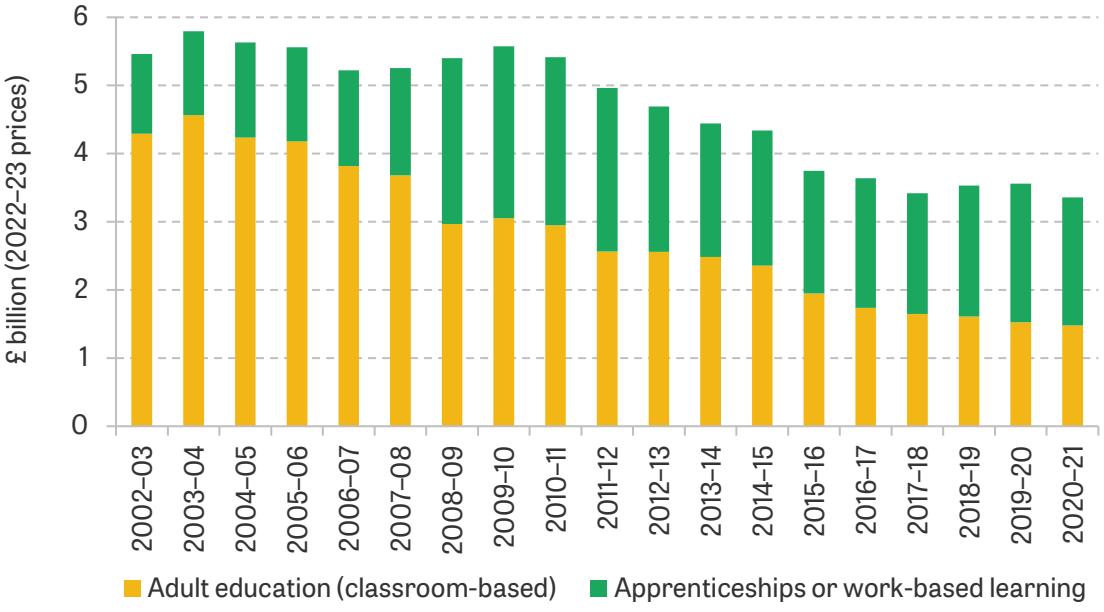
Adult education and training are funded through a variety of different sources: both private actors (including individuals and firms) and the government contribute towards the provision of adult education. In England, most low-level qualifications (Level 3 and below) are publicly funded via the Adult Education Budget, while learners wishing to study advanced courses (at Level 4 or above) typically access student loans to cover the costs of their studies. And, since 2017, apprenticeships have been funded through an apprenticeship levy on large employers. The changes in participation in adult education in the last decade are partly attributable to changes in government policy that have impacted these funding mechanisms.

Funding for adult education

First, there has been a long-term decline in total public spending on adult education in England, which is likely to have driven and been shaped by the participation trends we documented earlier in this section. This is illustrated by Figure 60, which shows the total level of adult education spending between 2002–03 and 2020–21, broken down into spending on classroom-based adult education and spending on apprenticeships or work-based learning.

As can be seen, total funding for adult education and apprenticeships was around £5–6 billion between 2002–03 and 2010–11. Funding for classroom-based adult education then dropped, which partly reflects restrictions in funding for lower-level courses introduced following the Leitch Review in 2006. However, this was made up for by increases in funding for work-based learning, particularly the creation of the 'Train to Gain' programme in the late 2000s.

Figure 60. Total spending on adult education and apprenticeships



Source: Figure 3.1 from Sibieta, Tahir and Waltmann (2022).

From 2010–11, total spending continued to fall. Classroom-based adult education spending fell from just over £2.9 billion in 2010–11 to just below £1.5 billion in 2020–21 (all in 2022–23 prices), a real-terms decrease of about 50% over the decade. This partly reflects cash-terms freezes in funding rates for most of the decade, which have been eroded in real terms by inflation, but also cuts in eligibility for public funding for qualifications at Level 3 and below.

Total spending on work-based learning and apprenticeships fell by about £500 million between 2010–11 and 2014–15 as the 'Train to Gain' programme was unwound and participants moved over to apprenticeships. Since then, spending on apprenticeships (across all ages) has remained close to about £2 billion per year in today's prices, despite the introduction of the apprenticeship levy on firms in April 2017 and the associated change in the funding regime. There was a drop of £150 million, or 8%, in 2020–21, but this likely reflects the temporary effects of the pandemic on demand and supply.

Combining these trends, total spending on adult education and apprenticeships fell from £5.4 billion in 2010–11 to about £3.4 billion in 2020–11, a drop of about 38% in real terms. There has also been a big shift in composition, with about 55–60% of spending being on apprenticeships, compared with about 45% in 2010–11 (or up from 28% if we exclude 'Train to Gain' in 2010–11). Public spending on adult education is a key driver of the decline in participation in low levels of education that we have witnessed in recent years.

Incentives in the adult education funding system[30]

For higher-level adult education, funding through the Adult Education Budget is usually not available. Instead, these adult learners access government-backed loans to finance their studies. The type of loans available to adult learners depends on the course of study: students taking higher education courses can access student loans to cover both their tuition fees and maintenance. Students taking further education courses, by contrast, are typically funded by Advanced Learner Loans (ALLs), which do not cover maintenance. Since advanced vocational qualifications are often classified as further education courses, students pursuing Level 4 or 5 qualifications may miss out on the more generous support offered to those studying for a degree at university.

In some cases, students are not able to access any public support to help finance their studies. The 'Equivalent or Lower Qualification' rule means that learners typically cannot access loans for qualifications at an equivalent or lower level to the qualifications they have already obtained. For example, someone who has studied a degree cannot access student loan funding for an advanced vocational qualification. Similarly, someone who has completed a Level 5 qualification in one field will not be able to access support for a new Level 5 qualification if they wish to change industry. This presents a significant barrier to the take-up of advanced vocational qualifications.

The current design of financial support for adult learners means that many adults are not able to access the education and training they require to upskill or reskill. Partly in recognition of these drawbacks, the government is in the process of overhauling the existing student loan system and replacing it with a new 'lifelong learning entitlement'. This will create a unified funding system for both advanced vocational courses and degree courses, which should remove funding disparities. Moreover, as part of the reforms, the government will consult on relaxing the existing rules restricting support for equivalent or lower-level qualifications. However, it is too early to know

[30] The nature of the post-18 funding system and its issues are tackled in some detail in the Augar Review of Post-18 Education and Funding (Augar, 2019).

whether these reforms will address all of the issues that exist with the financing of advanced vocational and university education.

Summary

After the school years, young people and adults make decisions about the routes they want to take through post-compulsory education. Young people's choices are often constrained by their performance in exams, but prior academic achievement does not explain everything: people with similar levels of achievement make very different educational choices. There are a variety of factors that influence educational choices, such as preferences, information and even the availability of courses in the local area.

As well as these individual-specific factors, the UK post-compulsory education system is hampered by an overall landscape that makes options for studying vocational qualifications, and particularly advanced vocational qualifications, difficult to navigate. Over the past decade, there has also been a significant decline in public spending on basic adult education and training, while for learners wishing to study more advanced vocational qualifications it is often a struggle to access funding. This combination of factors leads to a dearth of 'second chances' and lifelong learning opportunities in the UK's education system, which limits the scope for existing educational gaps to be closed.

Part IV. Building a more equal education system

Inequalities in education lead to differences in life chances. That is why the pervasive educational differences that we highlighted earlier in this chapter are so concerning, and why education remains central to both political and policy debates.

Policymaking in education cannot be purely technocratic. Questions of where, what and how we teach children – and adults – are central to society as a whole. Making education policy work is always a question of balance: between central oversight and local freedom, between depth of knowledge and breadth of exposure, between different groups of pupils, parents, teachers and schools. There is no one 'best' solution to these questions – they are complicated, and they will continue to be revisited.

Nevertheless, the analysis in the rest of this chapter has drawn on some of the best research to try to inform the debates we have about the trade-offs we have to make. We therefore now turn to the actions that education policymakers can take to build towards a more equal education system. While there are many relevant issues beyond the direct influence of education policy, our focus in this section is on the levers that policymakers can pull. We begin by outlining broad guiding principles for the education system as a whole and then make specific policy recommendations to address education inequalities during the school years and post-compulsory education. Lastly, we reflect on the impact that the coronavirus pandemic has had on efforts to mitigate existing education inequalities.

Guiding principles

There are many considerations for policymakers when deciding how to tackle education inequalities. Each individual policy decision will carry its own considerations, but there are some broad principles that should guide policymakers in developing, evaluating and implementing reforms to the education system.

Look at the education system as a whole

Education and the accumulation of skills is a continuous process that starts from birth. In this chapter, we have noted that skill inequalities exist before children begin school and we have shown how they develop through the school years. While early inequalities are important, every stage of education contributes to the eventual distribution of skills and education in the population. During the school years, many young people fall behind, and by the end of compulsory education there are large gaps in educational attainment. These education inequalities are then reinforced by the choices made and routes taken through the post-compulsory education system and limited opportunities to retrain as an adult. Therefore, when deciding how to reform the education system to tackle inequalities, it is essential that policymakers view the education system as a whole. Each stage of education needs to be given appropriate attention and there has to be a consideration of how different parts of the education system interact.

Early intervention is important – but it must be followed up

There is a wealth of evidence showing that early intervention can have enormous benefits later in life. In some cases, these early intervention programmes have proven to be more than cost-neutral – that is, the financial benefits that they deliver (e.g. in terms of higher wages, lower crime

or better health) exceed the initial spending on the programme. There is also a strong equity argument for early intervention: if we can intervene early on to prevent problems from emerging and inequalities from opening up, we can deliver a more equal education system at all ages and prevent some children from needing to catch up after we let them fall behind.

But as persuasive as the case for early intervention may be, it is only one piece of the puzzle. Investments in early intervention must be followed up at later stages of the education system.

Create opportunities for everyone

During the school years and post-compulsory education, individuals fall behind, and once they have fallen behind they do not tend to catch up. And after GCSEs, those who have not performed well or have just missed out on important thresholds often do not ever progress to higher levels of education.

This leads to a population with a high proportion of individuals with low levels of skills and qualifications, in comparison with other countries. Hence, it is essential that the education system offers chances and viable alternatives to those who fall behind during their time at school. We must recognise that academic education is better catered for (and better resourced) than vocational education in the post-compulsory system – even though over half of young people do not go on to A levels after completing their GCSEs. The education system must offer high-quality options to young people who pursue vocational options. In particular, it is critical to ensure that everyone obtains the general skills needed to be resilient and adaptable in the face of expected technological changes.

Invest in education

Educational attainment during the school years and post-compulsory education depends on the quality of education that is offered to students. While we have shown that a variety of different inputs determine the quality of education, ultimately schools and other providers of education need to have sufficient funding in order to produce high-quality education. In the UK, there are geographical discrepancies in funding levels. Moreover, in the last decade, government spending on education has fallen significantly, especially on further education. It is critical we ensure that investment in education is sufficient for everyone to have access to the best possible quality of education. There is increasingly clear evidence that spending really does matter for pupil achievement – though, of course, resources need to be used well to be most effective.

Ensure people are making informed decisions

At various points, parents and young people must make important educational decisions. Parents decide which school to send their children to and also make other choices that influence the type of education they receive. Young people decide what to study and which educational route to take. Later in life, adults may decide to return to formal education or to take alternative training opportunities. As we have shown in this chapter, all of these choices matter, because they can lead to very different future outcomes. Therefore, it is vital to ensure that people make the best choices. Of course, there are many factors that go into decision-making that cannot be directly influenced by education policy and there is not just one route to success, but we can ensure that people are making informed decisions. The opportunities and likely benefits of education must be clearly communicated in order to help people make the best decision for them.

Education is not just about test scores

In our view, the overall role of an education system is to support children, young people and adults to develop their own talents and to reach their full potential. Imparting knowledge and

skills is certainly a fundamental part of what the system needs to do to get closer to this aim. And, as we have shown, robust accountability systems can help ensure that the system works as efficiently as possible towards this aim.

But there is always a danger that head teachers judged on league table results, policymakers sensitive to pupil performance, and researchers relying on administrative data on test scores end up focusing on test scores to the exclusion of all else. Other outcomes from the education system matter too – children's broader 'soft skills', their mental health and resilience, their physical health, their social and emotional development, and their ability to successfully navigate the challenges they will face in the workforce and in their lives are all important outcomes too. And while some of these are not entirely or even primarily the responsibility of the education system, the role that education plays in influencing these wider outcomes should not be neglected.

Educational inequalities cannot be solved by the education system alone

The evidence in this chapter clearly shows that family background has an extraordinarily strong influence on educational attainment. Educational inequalities are a consequence as well as a cause of wider economic inequality. In an economy where the financial returns to 'making it' in education are so high, there will always be pressure on parents to invest in helping their children to succeed. And in a society where the resources parents have to invest are so different, the education system will never be able to fully compensate for the vastly different experiences children have outside the school gates.

Education funding

Compulsory education spending in England rose dramatically during the 2000s. Since then, it has been protected relative to most other areas of spending (and most other stages of education) during the general squeeze on public spending in the 2010s. Even so, real-terms school spending per pupil fell by 9% between 2009–10 and 2019–20.

A recent injection of funding has reversed this long-lasting spending squeeze for schools. But rising cost pressures – including recent increases in starting teacher salaries and pensions, cost pressures during the pandemic and the huge challenge of tackling learning loss – mean that schools may not have the resources they need to meet ambitious 'levelling up' targets.

Meanwhile, further education institutions have been put under enormous financial strain. They are slower to see their budgets rise during 'good times', and quicker to see cuts when the education budget as a whole falls. And, while pupils studying at further education colleges are disproportionately from disadvantaged backgrounds, there is no 'pupil premium' in the further education funding system. In the light of labour market changes, further education is more important now than it was in the past (as reflected in a higher number of people who stay on in education). There is a need for significant investment.

In the longer term, policymakers need to be clear on what they are asking schools and further education institutions to do and whether they are funding them adequately. At a minimum, this means that budgets need to account for additional responsibilities. Much of the cut to school spending through the 2010s was carried out through the back door, as local authority responsibilities were pushed down onto schools without a corresponding increase in school funding. More money will not always be the answer – but substantially more responsibilities without more money is likely to cause problems elsewhere in the system.

The education workforce

Excellent educators are essential to an effective, and equitable, education system. In most cases, a student will be better served in a larger class headed by an excellent teacher than in a smaller setting with a less-skilled teacher. The teaching profession – both in schools and in the post-compulsory education system – needs to be respected and valued in accordance with the enormous influence they have on the outcomes of young people. At the moment, schools with more disadvantaged intakes (and especially those outside London) struggle more to recruit teachers with relevant degrees and to deliver excellent teaching. This acts against the 'levelling up' agenda.

While the existing evidence base is patchy, there are worrying signs that problems with teacher retention are hurting the effectiveness of the profession. Some of the newest evidence on teacher effectiveness suggests that, among more experienced teachers, the more effective are more likely to leave the profession.

Since teacher working conditions and workload are one of the main factors driving people out of teaching, policymakers should explicitly consider how reforms and policies will affect teachers' working conditions. There is a particular risk that policymakers refuse to provide adequate resources for post-pandemic catch-up, instead expecting (or even requiring) the same teaching workforce to pick up ever more hours of teaching, marking and supervising.

The recent attention paid to teacher salaries is one important tool for recruiting talented teachers. The government should also consider not just the amount paid to teachers but also their 'effective salary' – the salaries that potential teachers could earn in a different job will vary by their location and their field of study, with strong impacts on recruiting excellent STEM teachers especially (Britton, Buscha et al., 2020).

Identifying excellent teachers at the hiring stage is difficult. This means that what happens after teachers are hired is vital. There is a role for professional development to help teachers to adopt best practices in pedagogy. And, since teachers improve most when they are in supportive professional environments, ensuring that newer teachers have access to excellent mentorship and opportunities for training is important.

Given the importance of excellent teachers, educational institutions and the government should be conscious of how teachers are allocated. For example, at a national level, this could involve incentivising stronger or more experienced teachers to teach in more disadvantaged institutions, perhaps offering a bonus or additional preparation time.

The structure of the education system

The UK's school system is distinguished by high-stakes exams which have an enormous influence on young people's access to education and on their life outcomes. For many pupils, one set of high-stakes testing at age 16 is swiftly followed by another round two years later. The choices young people need to make within post-16 education – whether they follow an academic or vocational track – can be stark, narrow and lead to choices that limit later options (e.g. not pursuing maths of any kind post-16) rather than keep doors open.

Some form of assessment that indicates what young people know and helps to sort them into appropriate further educational opportunities is an inevitable and important part of any education system. Relative to other forms of assessment such as purely teacher-assessed grades, standardised exams have an important role to play in setting and enforcing national standards and in preventing unconscious teacher bias from influencing results. The advantages of exams over teacher assessment have been highlighted during the pandemic.

However, the inevitable downside of using assessments to sort pupils into appropriate education routes is that some young people will be screened out of education pathways that they could have succeeded in. Building an equitable education system with high-stakes exams at its heart therefore means thinking carefully about designing alternative education pathways that are attractive in their own right, as well as offering second chances.

As it stands, however, vocational education can be confusing for the range of options on offer and uncertainty as to where they lead. Educational pathways need to be clear and well connected to tertiary education. There should be no cul-de-sac pathways. Careers information and guidance need to be provided early and often. It should be possible for students to transfer pathways and to combine academic and vocational options.

There is scope to expand sub-degree qualifications (i.e. at Levels 4 and 5), but this needs to be well integrated with higher education more generally where it makes sense to do so. Sub-degree and degree-level education are not mutually exclusive. It is also important that the system of student finance treats different tertiary qualifications on a level playing field (in contrast to current practice) and that credit transfer between levels of study and institutions is properly facilitated.

School choices and independent schools

Family resources help to determine which schools a child has access to. In England, access to highly sought-after state schools often comes down to distance; this disadvantages families who do not have the means to pay for the more expensive properties closer to the most popular schools. Even in local authorities that still operate a grammar school system, lower-income families may not have the resources (financial or informational) to prepare their children for academically selective (grammar) schools – this is borne out by the very small numbers of grammar school pupils coming from disadvantaged backgrounds. And there is clearly an enormous relationship between a family's resources and their ability to opt out of state education altogether to enter the independent sector.

This means that giving parents 'school choice' does not eradicate education inequalities. 'School choice' sets out to provide parents with a set of choices of where to send their child; this should foster competition among schools, driving up average quality and providing parents – irrespective of their finances – the chance to send their children to the best school for them. But, as long as big differences in school quality remain, there will be a strong incentive to try to place children in the 'best' schools. And, as long as that incentive remains, better-off families will be better placed to take advantage of the system – whether by tutoring their children through entrance exams or purchasing expensive houses close to the most popular schools.

Similarly, high-income families often turn to the independent sector to give their children a leg up: children who attend private schools enjoy much greater resources while at school, and go on to have higher earnings than their peers with equivalent school and university results who attended

state schools. However, the available evidence suggests that the *educational* benefits of attending a private school are modest to moderate – much smaller than the eventual differences in income (Green, 2022). This suggests that much of the value of independent schools comes indirectly – for example, through the networks they give access to or the social norms they impart.

Many of the 'silver bullet' solutions for reducing educational inequalities are therefore likely to be rather less successful than hoped. In the meantime, measures to make access fairer might include consideration of policies such as (ability) banding or lotteries to allocate places at over-subscribed state schools; meaningful partnerships between independent and state schools; increased access to independent schools for pupils from disadvantaged backgrounds (through provision of bursaries for a certain proportion); and potentially removing charitable tax status and tax relief from independent schools, though this would need to be carefully managed.

A system for lifelong learning

Education up to age 18 needs to prepare students for a lifetime in the labour market, during which there may be unpredictable changes (e.g. due to the transition to net zero or an unforeseen technological change). It is not enough to prepare students for the current labour market: they also need to have the general, transferable skills which will support them in changing career later on. All students should leave their education with good skills in literacy, numeracy, soft skills and digital skills (regardless of their post-16 direction of travel). The entire curriculum (including post-16) needs to be considered with this in mind.

But adapting to an ever-changing labour market also requires an ongoing investment in training. Public policy plays an important role here: there are strong externalities in training people, meaning that individual firms and employees will tend to under-invest in training relative to what is socially optimal. The decline of on-the-job training over past decades means policymakers should consider options to incentivise training – for example, a tax credit for firms offering training, analogous to the R&D tax credit. Furthermore, there is no reason for apprenticeships to be the exclusive model through which this is achieved when, in many cases, shorter-term and more flexible training models may be more appropriate.

A quickly changing economy means that the need for training will be felt across much of the workforce, not just those with lower levels of qualifications. Even a good Level 3 qualification might be outdated or too narrow to support someone changing industry. There is a case for public support of adult education and training, even if this is notionally at the same qualification level. There is a strong argument for public policy to facilitate retraining for all adults by removing the cost – at least when the aim is to retrain for sectors known to be in high demand such as those relating to green technology and health and social care.

Relationships between different levels of policymakers

In England, there has been a long-term shift towards bifurcating power: concentrating funding and regulatory powers in the Department for Education, increasing the scope of schools' responsibilities, but sidelining local authorities. The most recent evidence of this is the target that all schools should be academies by 2030. This could have advantages in cutting out 'middle layers' of management and simplifying the current hybrid system of school governance.

However, there is no evidence that this is likely to significantly improve attainment, as evaluations of post-2010 academies have shown quite mixed results.

The COVID-19 crisis has exacerbated tensions between all the levels of the education system. The Department for Education issued frequently changing guidance, usually with limited or no consultation, often with only days or sometimes even hours for it to be implemented. Schools and head teachers had little support in responding to these directives. And local authorities that pressed for a different approach – for example, in light of escalating local case rates – were often ignored by central government.

Repairing these relationships should be a priority for policymakers at all levels, but especially in central government. While it is difficult to measure trust and the quality of relationships, they are essential commodities for a system that will be tasked with a massive programme of catch-up and learning recovery over the next few years. Experience from similar crises in other countries shows that recovery is certainly possible – but only when different actors in the education system work together in good faith to come up with innovative solutions (Pischke, 2007; Ham et al., 2012; Beaglehole et al., 2017).

Conclusion

Education is of central importance to debates about inequality. Educational inequalities are both a cause and a consequence of the wider gaps we see in society – whether in income, in health or in happiness. But there is overwhelming evidence that the education system in England leaves too many young people behind. Despite decades of policy attention, there has been little if any shift in the gaps in educational attainment between children from different backgrounds. There is no straightforward, attractive route for young people who perform poorly at GCSE. And the adult education system has suffered from complicated funding rules and a shrinking pot of spending.

These challenges are set to become more acute. The COVID-19 pandemic put the education system under enormous strain, with significant learning loss overall and a huge increase in educational inequalities. Perhaps even more damaging in the longer term will be the social, emotional and behavioural impacts of missing out on classroom learning and formative experiences during the lockdowns. And the changes to the labour market – from technological advances, adapting to new ways of working post-pandemic or the push towards net zero – mean that the education system will have a vital role in supporting workers of all ages to train and retrain for new jobs and industries.

Meeting these challenges will be essential for both tackling inequality and improving economic efficiency. As past decades have shown, progress is often challenging and can be slow. But developing an education system that supports all children to reach their full potential is an enormous prize, and one that should motivate all of us.

Data citations

We use a wide range of published government statistics in this analysis; these have been cited throughout the chapter. In addition, we analyse several data sets, cited below. We are grateful to the data owners for their work in making these resources available; responsibility for all analysis, and any errors, rests with the authors.

Department for Education (2022), 'Longitudinal Education Outcomes (LEO) dataset'. [data collection].

Office for National Statistics. (2019). *Quarterly Labour Force Survey Household Dataset, April - June, 2019*. [data collection]. UK Data Service. SN: 8514, DOI: 10.5255/UKDA-SN-8514-1

Office for National Statistics, Northern Ireland Statistics and Research Agency. (2019). *Quarterly Labour Force Survey Household Dataset, July - September, 2019*. [data collection]. UK Data Service. SN: 8592, DOI: 10.5255/UKDA-SN-8592-1

Office for National Statistics, Northern Ireland Statistics and Research Agency, Office for National Statistics. (2020). *Quarterly Labour Force Survey Household Dataset, October - December, 2019*. [data collection]. UK Data Service. SN: 8616, DOI: 10.5255/UKDA-SN-8616-1

Office for National Statistics. (2021). *Quarterly Labour Force Survey Household Dataset, January - March, 2020*. [data collection]. *3rd Edition.* UK Data Service. SN: 8645, DOI: 10.5255/UKDA-SN-8645-3

University of London, Institute of Education, Centre for Longitudinal Studies. (2022). *Millennium Cohort Study: Third Survey, 2006*. [data collection]. *9th Edition.* UK Data Service. SN: 5795, DOI: 10.5255/UKDA-SN-5795-6

University of London, Institute of Education, Centre for Longitudinal Studies. (2020). *Millennium Cohort Study: Fourth Survey, 2008*. [data collection]. *8th Edition.* UK Data Service. SN: 6411, DOI: 10.5255/UKDA-SN-6411-8

University of London, Institute of Education, Centre for Longitudinal Studies. (2020). *Millennium Cohort Study: Fifth Survey, 2012*. [data collection]. *5th Edition*. UK Data Service. SN: 7464, DOI: 10.5255/UKDA-SN-7464-5

University of London, Institute of Education, Centre for Longitudinal Studies. (2020). *Millennium Cohort Study: Sixth Survey, 2015*. [data collection]. *7th Edition*. UK Data Service. SN: 8156, DOI: 10.5255/UKDA-SN-8156-7

University of London. Institute of Education. Centre for Longitudinal Studies. (2017). *Millennium Cohort Study: Geographical Identifiers, Sixth Survey, 2001 Census Boundaries: Secure Access*. [data collection]. UK Data Service. SN: 8231, DOI: 10.5255/UKDA-SN-8231-1

University College London, UCL Institute of Education, Centre for Longitudinal Studies, Department for Education. (2021). *Millennium Cohort Study: Linked Education Administrative Datasets (National Pupil Database), England: Secure Access*. [data collection]. *2nd Edition*. UK Data Service. SN: 8481, DOI: 10.5255/UKDA-SN-8481-2

References

Advani, A., Smith, S., Waltmann, B., and Xu, X. (2021), 'Gender Differences in Subject Choice Leads to Gender Pay Gap Immediately after Graduation', Institute for Fiscal Studies (IFS), Observation, https://ifs.org.uk/publications/15657.

Aghion, P., Bergeaud, A., Blundell, R., and Griffith, R. (2020), 'The Innovation Premium to Soft Skills in Low-Skilled Occupations', VOX article, https://voxeu.org/article/innovation-premium-soft-skills-low-skilled-occupations.

Aghion, P., Besley, T., Browne, J., Caselli, F., Lambert, R., Lomax, R., Pissarides, C., Stern, N., and Van Reenen, J. (2013), 'Investing for Prosperity: Skills, Infrastructure and Innovation', LSE Growth Commission, https://cep.lse.ac.uk/LSE-Growth-Commission/publications.asp.

Allen, R., and Allnutt, J. (2017), 'The Impact of Teach First on Pupil Attainment at Age 16', *British Educational Research Journal*, 43(4), 627–46. Accessed online: https://bera-journals.onlinelibrary.wiley.com/doi/abs/10.1002/berj.3288.

Allen, R., Belfield, C., Greaves, E., Sharp, C., and Walker, M. (2016), 'The Longer-Term Costs and Benefits of Different Initial Teacher Training Routes', Institute for Fiscal Studies (IFS), Report 118, https://ifs.org.uk/publications/8368.

Anders, J., Henderson, M., Moulton, V., and Sullivan, A. (2018), 'The Role of Schools in Explaining Individuals' Subject Choices at Age 14', *Oxford Review of Education*, 44(1), 75–93.

Anderson, O. (2022), 'Walking the Line: Does Crossing a High Stakes Exam Threshold Matter for Labour Market Outcomes?', UCL Centre for Education Policy and Equalising Opportunities, Working Paper 22-05.

Andrew, A., Bandiera, O., Costa-Dias, M., and Landais, C. (2021), 'Women and Men at Work', IFS Deaton Review of Inequalities.

Andrew, A., Cattan, S., Costa Dias, M., Farquharson, C., Kraftman, L., Krutikova, S., Phimister, A., and Sevilla, A. (2020a), 'Family Time Use and Home Learning during the COVID-19 Lockdown', Institute for Fiscal Studies (IFS), Report 178.

Andrew, A., Cattan, S., Costa Dias, M., Farquharson, C., Kraftman, L., Krutikova, S., Phimister, A., and Sevilla, A. (2020b), 'Inequalities in Children's Experiences of Home Learning during the COVID-19 Lockdown in England', *Fiscal Studies*, 41(3), 653–83.

Andrew, A., Cattan, S., Costa Dias, M., Farquharson, C., Kraftman, L., Krutikova, S., Phimister, A., and Sevilla, A. (2020c), 'Learning during the Lockdown: Real-Time Data on Children's Experiences during Home Learning', Institute for Fiscal Studies (IFS), Briefing Note 288.

Andrews, J., Perera, N., Eyles, A., Heller Sahlgren, G., Machin, S., Sandi, M., and Silva, O. (2017), 'The Impact of Academies on Educational Outcomes', Education Policy Institute, https://epi.org.uk/wp-content/uploads/2017/07/EPI_-Impact_of_Academies_Consolidated_Report-.pdf.

Angrist, J., and Lavy, V. (1999), 'Using Maimonides' Rule to Estimate the Effect of Class Size on Scholastic Achievement', *Quarterly Journal of Economics*, 114(2), 533–75. Accessed online: https://academic.oup.com/qje/article-abstract/114/2/533/1844228?redirectedFrom=fulltext.

Archer, A., Higton, J., Sibieta, L., and Tahir, I. (2021), 'The Road Not Taken: The Drivers of Course Selection', Social Mobility Commission, https://www.gov.uk/government/publications/the-road-not-taken-drivers-of-course-selection.

Augar, P. (2019), *Review of Post-18 Education and Funding*, CP117.

Bacher-Hicks, A., Chin, M. J., Kane, T. J., and Staiger, D. O. (2019), 'An Experimental Evaluation of Three Teacher Quality Measures: Value-Added, Classroom Observations, and Student Surveys', *Economics of Education Review*, 73. Accessed online: https://www.sciencedirect.com/science/article/abs/pii/S0272775719302717?via%3Dihub.

Barr, B., Kinderman, P., and Whitehead, M. (2015), 'Trends in Mental Health Inequalities in England during a Period of Recession, Austerity and Welfare Reform 2004 to 2013', *Social Science & Medicine*, 147, 324–31.

Barrera-Osorio, F., Kugler, A., and Silliman, M. (2020), 'Hard and Soft Skills in Vocational Training: Experimental Evidence from Colombia', VOX article, https://voxeu.org/article/hard-and-soft-skills-vocational-training.

Battiston, A., Patrignani, P., Hedges, S., and Conlon, G. (2019), 'Labour Market Outcomes Disaggregated by Subject Area using the Longitudinal Education Outcomes (LEO) Data', Centre for Vocational Education Research (CVER), Discussion Paper 021.

Beaglehole, B., Bell, C., Frampton, C., and Moor, S. (2017), 'The Impact of the Canterbury Earthquakes on Successful School Leaving for Adolescents', *Australian and New Zealand Journal of Public Health*, 41(1), 70–3. Accessed online: https://onlinelibrary.wiley.com/doi/full/10.1111/1753-6405.12625.

Becker, G. S. (1962), 'Investment in Human Capital: A Theoretical Analysis', *Journal of Political Economy*, 70(5, Part 2), 9–49.

Belfield, C., Britton, J., Buscha, F., Dearden, L., Dickson, M., van der Erve, L., Sibieta, L., Vignoles, A., Walker, I., and Zhu, Y. (2018), 'The Impact of Undergraduate Degrees on Early-Career Earnings', Department for Education, Research Report.

Black, S. E., Devereux, P. J., and Salvanes, K. G. (2005), 'Why the Apple Doesn't Fall Far: Understanding Intergenerational Transmission of Human Capital', *American Economic Review*, 95(1), 437–49.

Blainey, K., and Hannay, T. (2021), 'The Effects of Educational Disruption on Primary School Attainment in Summer 2021', RS Assessment from Hodder Education.

Blanden, J., Greaves, E., Gregg, P., Macmillan, L., and Sibieta, L. (2015), 'Understanding the Improved Performance of Disadvantaged Pupils in London', Social Policy in a Cold Climate, Working Paper 21.

Bloom, N., Lemos, R., Sadun, R., and Van Reenen, J. (2015), 'Does Management Matter in Schools?', *Economic Journal*, 125(584), 647–74.

Blundell, R., Dearden, L., and Sianesi, B. (2005), 'Evaluating the Effect of Education on Earnings: Models, Methods and Results from the National Child Development Survey', *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, 168(3), 473–512.

Blundell, R., Green, D. A., and Jin, W. (2022), 'The UK as a Technological Follower: Higher Education Expansion and the College Wage Premium', *Review of Economic Studies*, 89(1), 142–80.

Bolton, P. (2012), 'Education: Historical Statistics', House of Commons Library, Standard Note SN/SG/4252.

Bolton, P. (2022), 'Higher Education Student Numbers', House of Commons Library, Research Briefing 7857.

Bonjour, D., Cherkas, L. F., Haskel, J. E., Hawkes, D. D., and Spector, T. D. (2003), 'Returns to Education: Evidence from UK Twins', *American Economic Review*, 93(5), 1799–812.

Britton, J., Buscha, F., Dickson, M., van der Erve, L., Vignoles, A., Walker, I., Waltmann, B., and Zhu, Y. (2020), 'The Earnings Returns to Postgraduate Degrees in the UK', Department for Education Research Report, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/917851/PG_LEO_report_FINAL.pdf.

Britton, J., Dearden, L., van der Erve, L., and Waltmann, B. (2020), 'The Impact of Undergraduate Degrees on Lifetime Earnings', Department for Education, Research Report.

Britton, J., Dearden, L., and Waltmann, B. (2021), 'The Returns to Undergraduate Degrees by Socio-Economic Group and Ethnicity', Department for Education, Research Report.

Britton, J., Farquharson, C., Sibieta, L., Tahir, I., and Waltmann, B. (2020), '2020 Annual Report on Education Spending in England', Institute for Fiscal Studies (IFS), Report 183, https://www.ifs.org.uk/publications/15150.

Britton, J., Walker, I., Waltmann, B., and Zhu, Y. (2022), 'How Much Does It Pay to Get Good Grades at University?', Department for Education, Research Report.

Britton, J., Waltmann, B., and Xu, X. (2021), 'London Calling? Higher Education, Geographical Mobility and Early-Career Earnings', Department for Education, Research Report.

Burchardt, T., Obolenskaya, P., Vizard, P., and Battaglini, M. (2018), 'Experience of Multiple Disadvantage among Roma, Gypsy and Traveller Children in England and Wales', Centre for the Analysis of Social Exclusion (CASE), Paper 208.

Burgess, S. (2016), 'Human Capital and Education: The State of the Art in the Economics of Education', IZA, Working Paper 9885, https://www.iza.org/publications/dp/9885/human-capital-and-education-the-state-of-the-art-in-the-economics-of-education.

Burgess, S. (2019), 'Understanding Teacher Effectiveness to Raise Pupil Attainment', *IZA World of Labor*, article 465, https://wol.iza.org/articles/understanding-teacher-effectiveness-to-raise-pupil-attainment/long.

Burgess, S., Crawford, C., and Macmillan, L. (2017), 'Assessing the Role of Grammar Schools in Promoting Social Mobility', UCL, Department of Quantitative Social Science, Working Paper 17-09.

Burgess, S., Dickson, M., and Macmillan, L. (2020), 'Do Selective Schooling Systems Increase Inequality?', *Oxford Economic Papers*, 72(1), 1–24.

Burgess, S., Greaves, E., and Vignoles, A. (2019), 'School Choice in England: Evidence from National Administrative Data', *Oxford Review of Education*, 45(5), 690–710.

Burgess, S., Greaves, E., Vignoles, A., and Wilson, D. (2015), 'What Parents Want: School Preferences and School Choice', *Economic Journal*, 125(587), 1262–89.

Burgess, S., Rawal, S., and Taylor, E. S. (2021), 'Teacher Peer Observation and Student Test Scores: Evidence from a Field Experiment in English Secondary Schools', *Journal of Labor Economics*, 39(4), 1155–86.

Burgess, S., and Thomson, D. (2019), 'Making the Grade: The Impact of GCSE Reforms on the Attainment Gap between Disadvantaged Pupils and Their Peers', Sutton Trust.

Burgess, S., Wilson, D., and Worth, J. (2013), 'A Natural Experiment in School Accountability: The Impact of School Performance Information on Pupil Progress', *Journal of Public Economics*, 106, 57–67. Accessed online: https://www.sciencedirect.com/science/article/abs/pii/S0047272713001291?via%3Dihub.

Buscha, F., and Dickson, M. (2015), 'The Wage Returns to Education over the Life-Cycle: Heterogeneity and the Role of Experience', IZA Discussion Paper 9596.

Card, D. (2001), 'Estimating the Returns to Schooling: Progress on Some Persistent Econometric Problems', *Econometrica*, 69(5), 1127–60. Accessed online: https://davidcard.berkeley.edu/papers/return-to-schooling.pdf.

Cardim-Dias, J., and Sibieta, L. (2022), 'Inequalities in GCSE Results across England and Wales', Education Policy Institute report, https://epi.org.uk/publications-and-research/inequalities-in-gcse-results-across-england-and-wales/.

Carneiro, P., Meghir, C., and Parey, M. (2013), 'Maternal Education, Home Environments, and the Development of Children and Adolescents', *Journal of the European Economic Association*, 11(suppl_1), 123–60.

Carrell, S., Hoekstra, M., and Kuka, E. (2018), 'The Long-Run Effects of Disruptive Peers', *American Economic Review*, 108(11), 3377–415. Accessed online: https://www.aeaweb.org/articles?id=10.1257/aer.20160763.

Cassidy, R., Cattan, S., Crawford, C., and Dytham, S. (2018), 'How Can We Increase Girls' Uptake of Maths and Physics A-Level?' Institute for Fiscal Studies (IFS), Report 149.

Cattan, S., Farquharson, C., Krutikova, S., Phimister, A., Salisbury, A., and Sevilla, A. (2021a), 'Home Learning Experiences through the COVID-19 Pandemic', Institute for Fiscal Studies (IFS), Report 195.

Cattan, S., Farquharson, C., Krutikova, S., Phimister, A., Salisbury, A., and Sevilla, A. (2021b), 'Inequalities in Responses to School Closures over the Course of the First COVID-19 Lockdown', Institute for Fiscal Studies (IFS), Working Paper W21/4.

Cattan, S., Fitzsimons, E., Goodman, A., Phimister, A., Ploubidis, G. B., and Wertz, J. (2022), 'Early Childhood and Inequalities', IFS Deaton Review of Inequalities.

Cavaglia, C., Machin, S., McNally, S., and Ruiz-Valenzuela, J. (2020), 'Gender, Achievement, and Subject Choice in English Education', *Oxford Review of Economic Policy*, 36(4), 816–35.

Cavaglia, C., McNally, S., and Ventura, G. (2020), 'Do Apprenticeships Pay? Evidence for England', *Oxford Bulletin of Economics and Statistics*, 82(5), 1094–134.

Cheryan, S., Ziegler, S. A., Montoya, A. K., and Jiang, L. (2017), 'Why Are Some STEM Fields More Gender Balanced than Others?', *Psychological Bulletin*, 143(1), 1–35.

Chetty, R., Friedman, J. N., Hilger, N., Saez, E., Schanzenbach, D. W., and Yagan, D. (2011), 'How Does Your Kindergarten Classroom Affect Your Earnings? Evidence from Project STAR', *Quarterly Journal of Economics*, 126(4), 1593–660. Accessed online: https://academic.oup.com/qje/article-abstract/126/4/1593/1923939?redirectedFrom=fulltext.

Chetty, R., Friedman, J. N., and Rockoff, J. E. (2014), 'Measuring the Impacts of Teachers II: Teacher Value Added and Student Outcomes in Adulthood', *American Economic Review*, 104(9), 2633–79. Accessed online: https://www.aeaweb.org/articles?id=10.1257/aer.104.9.2633.

Cho, H., Glewwe, P., and Whitler, M. (2012), 'Do Reductions in Class Size Raise Students' Test Scores? Evidence from Population Variation in Minnesota's Elementary Schools', *Economics of Education Review*, 31(3), 77–95. Accessed online: https://www.sciencedirect.com/science/article/abs/pii/S0272775712000180.

Chowdry, H., Dearden, L., Goodman, A., and Jin, W. (2012), 'The Distributional Impact of the 2012–13 Higher Education Funding Reforms in England', *Fiscal Studies*, 33(2), 211–36.

Clark, D., and Del Bono, E. (2016), 'The Long-Run Effects of Attending an Elite School: Evidence from the United Kingdom', *American Economic Journal: Applied Economics*, 8(1), 150–76.

Clark, D., and Royer, H. (2013), 'The Effect of Education on Adult Mortality and Health: Evidence from Britain', *American Economic Review*, 103(6), 2087–120.

Clotfelter, C. T., Ladd, H. F., and Vigdor, J. L. (2010), 'Teacher Credentials and Student Achievement in High School: A Cross-Subject Analysis with Student Fixed Effects', *Journal of Human Resources*, 45(3), 655–81. Accessed online: http://jhr.uwpress.org/content/45/3/655.refs.

Conti, G., Heckman, J., and Urzua, S. (2010), 'The Education-Health Gradient', *American Economic Review*, 100(2), 234–8.

Costa Dias, M., Joyce, R., and Parodi, F. (2020), 'The Gender Pay Gap in the UK: Children and Experience in Work', *Oxford Review of Economic Policy*, 36(4), 855–81.

Crawford, C., and Greaves, E. (2015), 'Socio-Economic, Ethnic and Gender Differences in HE Participation', Department for Business, Innovation and Skills, Research Paper.

Crawford, C., Meschi, E., and Vignoles, A. (2011), 'Post-16 Educational Choices and Institutional Value Added at Key Stage 5', Centre for the Economics of Education (CEE), Discussion Paper 124.

Currie, J., and Moretti, E. (2003), 'Mother's Education and the Intergenerational Transmission of Human Capital: Evidence from College Openings', *Quarterly Journal of Economics*, 118(4), 1495–532.

Dahl, G., Rooth, D. O., and Stenberg, A. (2020), 'Long-Run Returns to Field of Study in Secondary School', National Bureau of Economic Research (NBER), Working Paper 27524.

Department for Business, Innovation and Skills (2013), 'The International Survey of Adult Skills 2012: Adult Literacy, Numeracy and Problem-Solving Skills in England'.

Department for Education (2011), 'Class Size and Education in England Evidence Report', Research Report DFE-RR169, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/183364/DFE-RR169.pdf.

Department for Education (2012), 'Study Programmes for 16- to 19-Year-Olds: Government Response to Consultation and Plans for Implementation', https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/305742/Government_response_to_consultation_on_study_programmes_for_16-_to_19.pdf.

Department for Education (2022), 'Opportunity for All: Strong Schools with Great Teachers for Your Child', https://www.gov.uk/government/publications/opportunity-for-all-strong-schools-with-great-teachers-for-your-child.

Department for Levelling Up, Housing and Communities (2022), 'Levelling Up the United Kingdom'.

Devereux, P. J., and Hart, R. A. (2010), 'Forced to Be Rich? Returns to Compulsory Schooling in Britain', *Economic Journal*, 120(549), 1345–64.

Dickerson, A., Maragkou, K., and McIntosh, S. (2018), 'The Causal Effect of Secondary School Peers on Educational Aspirations', Centre for Vocational Education Research (CVER), Discussion Paper 017.

Dickerson, A., and Morris, D. (2019), 'The Changing Demand for Skills in the UK', Centre for Vocational Education Research (CVER), Discussion Paper 019.

Dillon, E. W., and Smith, J. A. (2017), 'Determinants of the Match between Student Ability and College Quality', *Journal of Labor Economics*, 35(1), 45–66.

Drayton, E., and van der Erve, L. (2022), 'The Impact of Student Loan Minimum Eligibility Requirements', Institute for Fiscal Studies (IFS), Briefing Note 343, https://ifs.org.uk/publications/16039.

Education Endowment Foundation (2021), 'The Impact of COVID-19 on Learning: A Review of the Evidence'.

Elliot Major, L., Eyles, A., and Machin, S. (2020), 'Generation COVID: Emerging Work and Education Inequalities', Centre for Economic Performance (CEP), COVID-19 Analysis, Paper 011.

Elliot Major, L., and Machin, S. (2018), *Social Mobility: And Its Enemies*, Penguin UK.

Espinoza, H., Speckesser, S., Tahir, I., Britton, J., McNally, S., and Vignoles, A. (2020), 'Post-18 Education – Who Is Taking Different Routes and How Much Do They Earn?', Centre for Vocational Education Research (CVER), Briefing Note 013.

Eyles, A., Hupkau, C., and Machin, S. (2016), 'School Reforms and Pupil Performance', *Labour Economics*, 41, 9–19. Accessed online: https://www.sciencedirect.com/science/article/abs/pii/S092753711630015X?via%3Dihub.

Eyles, A., and Machin, S. (2019), 'The Introduction of Academy Schools to England's Education', *Journal of the European Economic Association*, 17(4), 1107–46.

Eyles, A., Machin, S., and McNally, S. (2017), 'Unexpected School Reform: Academisation of Primary Schools in England', *Journal of Public Economics*, 155, 108–21.

Farquharson, C., Sibieta, L., Tahir, I., and Waltmann, B. (2021), '2021 Annual Report on Education Spending in England', Institute for Fiscal Studies.

Feinstein, L. (2002), 'Quantitative Estimates of the Social Benefits of Learning, 1: Crime', Centre for Research on the Wider Benefits of Learning, Research Report 5.

Feinstein, L., Duckworth, K., and Sabates, R. (2004), 'A Model of the Inter-Generational Transmission of Educational Success', Centre for Research on the Wider Benefits of Learning, Research Report 10.

Field, S. (2018), 'The Missing Middle: Higher Technical Education in England', Gatsby Foundation.

Frederiksson, P., Öckert, B., and Oosterbeek, H. (2013), 'Long-Term Effects of Class Size', *Quarterly Journal of Economics*, 128(1), 249–85. Accessed online: https://academic.oup.com/qje/article-abstract/128/1/249/1839904?redirectedFrom=fulltext.

Fryer, R. G. (2017), 'Management and Student Achievement: Evidence from a Randomized Field Experiment', National Bureau of Economic Research (NBER), Working Paper 23437, https://www.nber.org/papers/w23437.

Gibbons, S., Machin, S., and Silva, O. (2013), 'Valuing School Quality Using Boundary Discontinuities', *Journal of Urban Economics*, 75, 15–28.

Gibbons, S., and McNally, S. (2013), 'The Effects of Resources across School Phases: A Summary of Recent Evidence', Centre for Economic Performance (CEP), Working Paper 1226, http://eprints.lse.ac.uk/51567/.

Gibbons, S., McNally, S., and Viarengo, M. (2018), 'Does Additional Spending Help Urban Schools? An Evaluation Using Boundary Discontinuities', *Journal of the European Economic Association*, 16(5), 1618–68. Accessed online: http://eprints.lse.ac.uk/84213/7/Additional_spending.pdf.

Gibbs, C., and Murphy, P. (1994), *A Fair Test? Assessment, Achievement and Equity*, Open University Press.

Giupponi, G., and Machin, S. (2022), 'Labour Market Inequality', IFS Deaton Review of Inequalities.

Glaeser, E. L., Ponzetto, G. A., and Shleifer, A. (2007), 'Why Does Democracy Need Education?', *Journal of Economic Growth*, 12(2), 77–99.

Green, A., Preston, J., and Sabates, R. (2003), 'Education, Equity and Social Cohesion: A Distributional Model', Centre for Research on the Wider Benefits of Learning, Research Report.

Green, F. (2020), 'Schoolwork in Lockdown: New Evidence on the Epidemic of Educational Poverty', LLAKES Research Paper 67.

Green, F. (2022), 'Private Schools and Inequality', IFS Deaton Review of Inequalities.

Green, F., Machin, S., Murphy, R., and Zhu, Y. (2012), 'The Changing Economic Advantage from Private Schools', *Economica*, 79(316), 658–79.

Green, F., Parsons, S., Sullivan, A., and Wiggins, R. (2015), 'Dreaming Big: Self-Evaluations, Aspirations, High-Valued Social Networks, and the Private-School Earnings Premium', LLAKES Research Paper 55.

Grenet, J. (2013), 'Is Extending Compulsory Schooling Alone Enough to Raise Earnings? Evidence from French and British Compulsory Schooling Laws', *Scandinavian Journal of Economics*, 115(1), 176–210.

Guryan, J., Hurst, E., and Kearney, M. (2008), 'Parental Education and Parental Time with Children', *Journal of Economic Perspectives*, 22(3), 23–46.

Hall, P. A. (1999), 'Social Capital in Britain', *British Journal of Political Science*, 29(3), 417–61.

Ham, V., Cathro, G., Winter, M., and Winter, J. (2012), 'Evaluative Study of Co-Located Schools Established following the Christchurch Earthquake', New Zealand Ministry of Education, http://www.educationcounts.govt.nz/publications/schooling/115174.

Hanushek, E. A. (2006), 'Chapter 14: School Resources', in E. Hanushek and F. Welch (eds), *Handbook of the Economics of Education*, volume 2, https://www.sciencedirect.com/science/article/pii/S1574069206020149.

Hanushek, E. A., Schwert, G., Woessmann, L., and Zhang, L. (2017), 'General Education, Vocational Education, and Labor-Market Outcomes over the Life-Cycle', *Journal of Human Resources*, 52(1), 49–88.

Harmon, C., and Walker, I. (1995), 'Estimates of the Economic Return to Schooling for the United Kingdom', *American Economic Review*, 85(5), 1278–86.

Harmon, C., and Walker, I. (2001), 'The Returns to Education: A Review of Evidence, Issues and Deficiencies in the Literature', Department for Education and Employment, Research Report.

Hayward, H., Hunt, E., and Lord, A. (2014), 'The Economic Value of Key Intermediate Qualifications: Estimating the Returns and Lifetime Productivity Gains to GCSEs, A Levels and Apprenticeships', Department for Education, Research Report.

Hendricks, M. (2016), 'Differential Teacher Attrition: Do High-Ability Teachers Exit at Higher Rates?'. Available at SSRN 2824586.

Higher Education Statistics Agency (2022), https://www.hesa.ac.uk/data-and-analysis/students/chart-3.

Hoxby, C. (2000), 'The Effects of Class Size on Student Achievement: New Evidence from Population Variation', *Quarterly Journal of Economics*, 115(4), 1239–85. Accessed online: https://academic.oup.com/qje/article-abstract/115/4/1239/1820394?redirectedFrom=fulltext.

Hoxby, C., and Avery, C. (2012), 'The Missing "One-Offs": The Hidden Supply of High-Achieving, Low Income Students', National Bureau of Economic Research (NBER), Working Paper 18586.

Hoxby, C., and Weingarth, G. (2005), 'Taking Race out of the Equation: School Reassignment and the Structure of Peer Effects', mimeo, http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.75.4661.

Hupkau, C., McNally, S., Ruiz-Valenzuela, J., and Ventura, G. (2017), 'Post-Compulsory Education in England: Choices and Implications', *National Institute Economic Review*, 240(1), R42–57.

Hutchinson, J. (2021), 'Identifying Pupils with Special Educational Needs and Disabilities', Education Policy Institute report, https://epi.org.uk/publications-and-research/identifying-send/.

Hutchinson, J., Reader, M., and Akhal, A. (2020), 'Education in England: Annual Report 2020', Education Policy Institute.

Jackson, C. K. (2016), 'What Do Test Scores Miss? The Importance of Teacher Effects on Non-Test Score Outcomes', National Bureau of Economic Research (NBER), Working Paper 22226.

Jackson, C. K. (2020), 'Does School Spending Matter? The New Literature on an Old Question', conference paper, https://cpb-us-e1.wpmucdn.com/sites.northwestern.edu/dist/b/3664/files/2020/11/Cornell_overview_post_stamped.pdf.

Jackson, C. K., Johnson, R. C. and Persico, C. (2016), 'The Effects of School Spending on Educational and Economic Outcomes: Evidence from School Finance Reforms', *Quarterly Journal of Economics*, 131(1), 157–218. Accessed online: https://academic.oup.com/qje/article-abstract/131/1/157/2461148?redirectedFrom=fulltext.

Jerrim, J. (2021), 'PISA 2018 in England, Northern Ireland, Scotland and Wales: Is the Data Really Representative of All Four Corners of the UK?', *Review of Education*, 9(3), e3270.

Jerrim, J., and Sims, S. (2018), 'The Association between Attending a Grammar School and Children's Socio-Emotional Outcomes: New Evidence from the Millennium Cohort Study', mimeo, https://johnjerrim.files.wordpress.com/2018/05/grammar_draft_21_05_2018.pdf.

Johnson, R. C., and Jackson, C. K. (2019), 'Reducing Inequality through Dynamic Complementarity: Evidence from Head Start and Public School Spending', *American Economic Journal: Economic Policy*, 11(4), 310–49.

Kahn, S., and Ginther, D. (2017), 'Women and STEM', National Bureau of Economic Research (NBER), Working Paper 23525.

Kane, T. J., and Staiger, D. O. (2008), 'Estimating Teacher Impacts on Student Achievement: An Experimental Evaluation', National Bureau of Economic Research (NBER), Working Paper 14607.

Kane, T. J., Taylor, E. S., Tyler, J. H., and Wooten, A. L. (2011), 'Identifying Effective Classroom Practices Using Student Achievement Data', *Journal of Human Resources*, 46(3), 587–613. Accessed online: http://jhr.uwpress.org/content/46/3/587.refs.

Kerr, S., Pekkarinen, T., and Uusitalo, R. (2013), 'School Tracking and Development of Cognitive Skills', *Journal of Labor Economics*, 31(3), 577–602.

Krueger, A. B. (1999), 'Experimental Estimates of Education Production Functions', *Quarterly Journal of Economics*, 114(2), 497–532. Accessed online: https://academic.oup.com/qje/article-abstract/114/2/497/1844226.

Lavy, V., and Megalokonomou, R. (2019), 'Persistency in Teachers' Grading Bias and Effects on Longer-Term Outcomes: University Admissions Exams and Choice of Field of Study', National Bureau of Economic Research (NBER), Working Paper 26021.

Lavy, V., and Sand, E. (2018), 'On the Origins of Gender Gaps in Human Capital: Short- and Long-Term Consequences of Teachers' Biases', *Journal of Public Economics*, 167, 263–79.

Lavy, V., Silva, O., and Weinhardt, F. (2012), 'The Good, the Bad and the Average: Evidence on Ability Peer Effects in Schools', *Journal of Labor Economics*, 30(2), 367–414.

Li, J., Valero, A., and Ventura, G. (2020), 'Trends in Job-Related Training and Policies for Building Future Skills into the Recovery', Centre for Vocational Education Research (CVER), Discussion Paper 033.

Luchinskaya, D., and Dickinson, P. (2019), 'The Adult Skills Gap: Is Falling Investment in UK Adults Stalling Social Mobility?', Social Mobility Commission.

Lupton, R., Thomson, S., Velthuis, S., and Unwin, L. (2021), 'Moving on from Initial GCSE "Failure": Post-16 Transitions for "Lower Attainers" and Why the English Education System Must Do Better', Nuffield Foundation, https://mk0nuffieldfounpg9ee.kinstacdn.com/wp-content/uploads/2021/02/Post16-transitions-for-lower-attainers-Final-report.pdf.

Machin, S., Marie, O., and Vujić, S. (2011), 'The Crime Reducing Effect of Education', *Economic Journal*, 121(552), 463–84.

Machin, S., and McNally, S. (2008), 'The Literacy Hour', *Journal of Public Economics*, 92, 1441–62.

Machin, S., McNally, S., and Ruiz-Valenzuela, J. (2020), 'Entry through the Narrow Door: The Costs of Just Failing High Stakes Exams', *Journal of Public Economics*, 190, 104224.

Machin, S., McNally, S., and Viarengo, M. (2018), 'Changing How Literacy Is Taught: Evidence on Synthetic Phonics', *American Economic Journal: Economic Policy*, 10(2), 217–41.

McNally, S. (2020), 'Gender Differences in Tertiary Education: What Explains STEM Participation?', Centre for Economic Performance (CEP), Discussion Paper 1721.

McNally, S., Schmidt, L., and Valero, A. (2022), 'Do Management Practices Matter in Further Education?', Centre for Vocational Education Research (CVER), Discussion Paper 036.

Mincer, J. (1958), 'Investment in Human Capital and Personal Income Distribution', *Journal of Political Economy*, 66(4), 281–302.

Mirza, H., and Warwick, R. (forthcoming), 'Race and Ethnicity', IFS Deaton Review of Inequalities.

Muñoz, P., and Prem, M. (2022), 'Managers' Productivity and Recruitment in the Public Sector: The Case of School Principals', Working Paper, https://osf.io/preprints/socarxiv/7zn2b/.

Murphy, R., and Weinhardt, F. (2020), 'Top of the Class: The Importance of Ordinal Rank', *Review of Economic Studies*, 87(6), 2777–826. Accessed online: https://academic.oup.com/restud/article/87/6/2777/5831842.

Murphy, R., and Wyness, G. (2020), 'Minority Report: The Impact of Predicted Grades on University Admissions of Disadvantaged Groups', *Education Economics*, 28(4), 333–50. Accessed online: https://www.tandfonline.com/doi/abs/10.1080/09645292.2020.1761945?journalCode=cede20.

National Education Union (2019), 'NEU class size Analysis Shows a Rise in 474 England Constituencies since 2010', press release, 14 November, https://neu.org.uk/press-releases/class-sizes.

Nelson, J., and Sharp, C. (2020), 'Schools' Responses to COVID-19: Key Findings from the Wave 1 Survey', National Foundation for Educational Research.

OECD (2019), 'Skills Matter: Additional Results from the Survey of Adult Skills'.

Office for National Statistics (2022), 'Why Free School Meal Recipients Earn Less than Their Peers', 4 August, https://www.ons.gov.uk/peoplepopulationandcommunity/educationandchildcare/articles/whyfreeschoolmealrecipientsearnlessthantheirpeers/2022-08-04.

Oreopoulos, P., and Salvanes, K. G. (2011), 'Priceless: The Nonpecuniary Benefits of Schooling', *Journal of Economic Perspectives*, 25(1), 159–84.

Osikominu, A., and Pfeifer, G. (2018), 'Perceived Wages and the Gender Gap in STEM Fields', IZA, Discussion Paper 11321.

Pischke, J-S. (2007), 'The Impact of Length of the School Year on Student Performance and Earnings: Evidence from the German Short School Years', *Economic Journal*, 117(523), 1216–42. Accessed online: https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1468-0297.2007.02080.x.

Puhani, P. A., and Machin, S. J. (2003), 'Subject of Degree and the Gender Wage Differential: Evidence from the UK and Germany', *Economics Letters*, 79(3), 393–400.

Renaissance Learning & Education Policy Institute (2021), 'Understanding Progress in the 2020/21 Academic Year: Findings from the Summer Term and Summary of All Previous Findings'.

Rivkin, S. G., Hanushek, E. A., and Kain, J. F. (2005), 'Teachers, Schools and Academic Achievement', *Econometrica*, 73(2), 417–58. Accessed online: https://onlinelibrary.wiley.com/doi/10.1111/j.1468-0262.2005.00584.x.

Rose, S., Twist, L., Lord, P., Rutt, S., Badr, K., Hope, C., and Styles, B. (2021), 'Impact of School Closures and Subsequent Support Strategies on Attainment and Socio-Emotional Wellbeing in Key Stage 1', National Foundation for Educational Research, Interim Paper 1.

Roser, M., and Ortiz-Ospina, E. (2016), 'Literacy', Our World in Data.

Royal Society DELVE Initiative (2020), 'Balancing the Risks of Pupils Returning to Schools'.

Sacerdote, B. (2011), 'Chapter 4: Peer Effects in Education: How Might They Work, How Big Are They and How Much Do We Know Thus Far?', in E. Hanushek, S. Machin and L. Woessmann (eds), *Handbook of the Economics of Education*, volume 3, https://www.sciencedirect.com/science/article/pii/B9780444534293000041.

Sibieta, L. (2018), 'The Teacher Labour Market in England: Shortages, Subject Expertise and Incentives', Education Policy Institute, https://epi.org.uk/wp-content/uploads/2018/08/EPI-Teacher-Labour-Market_2018.pdf.

Sibieta, L. (2021a), 'School Spending in England: Trends over Time and Future Outlook', Institute for Fiscal Studies (IFS), Briefing Note 334, https://ifs.org.uk/publications/15588.

Sibieta, L. (2021b), 'The Growing Gap between State School and Private School Spending', Institute for Fiscal Studies (IFS), Observation, https://ifs.org.uk/publications/15672.

Sibieta, L., and Fullard, J. (2021), 'The Evolution of Cognitive Skills during Childhood across the UK', Education Policy Institute Report.

Sibieta, L., Tahir, I., and Waltmann, B. (2022), 'Adult Education: The Past, Present and Future', Institute for Fiscal Studies (IFS), Briefing Note 344, https://ifs.org.uk/publications/16081

Sizmur, J., Ager, R., Bradshaw, J., Classick, R., Galvis, M., Packer, J., Thomas, D., and Wheater, R. (2019), 'Achievement of 15-Year-Olds in England: PISA 2018 Results', Department for Education, Research Report.

Slater, H., Davies, N. M., and Burgess, S. (2012), 'Do Teachers Matter? Measuring the Variation in Teacher Effectiveness in England', *Oxford Bulletin of Economics and Statistics*, 74(5), 629–45. Accessed online: https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1468-0084.2011.00666.x.

Snelson, S., and Deyes, K. (2016), 'Understanding the Further Education Market in England', Department for Business, Innovation and Skills, Research Paper 296.

Sullivan, A., Parsons, S., Wiggins, R., Heath, A., and Green, F. (2014), 'Social Origins, School Type and Higher Education Destinations', *Oxford Review of Education*, 40(6), 739–63.

Sutton Trust (2019), 'Elitist Britain 2019'.

Sutton Trust (2021), 'Remote Learning: The Digital Divide'.

Terrier, C. (2020), 'Boys Lag Behind: How Teachers' Gender Biases Affect Student Achievement', *Economics of Education Review*, 77, 101981.

UNESCO Institute for Statistics (2012), 'International Standard Classification of Education: ISCED 2011'.

Webber, D. (2014), 'Is the Return to Education the Same for Everybody?', *IZA World of Labor*.

Wilkin, A., Derrington, C., and Foster, B. (2009), 'Improving the Outcomes for Gypsy, Roma and Traveller Pupils: Literature Review', Department for Children, Schools and Families, Research Report DCSF-RR077.

Williams, T., Mayhew, M., Lagou, M., and Welsby, M. (2020), 'Coronavirus and Homeschooling in Great Britain: April to June 2020', Office for National Statistics.

Wiswall, M. (2013), 'The Dynamics of Teacher Quality', *Journal of Public Economics*, 100, 61–78. Accessed online: https://www.sciencedirect.com/science/article/abs/pii/S0047272713000194.

Zafar, B. (2013), 'College Major Choice and the Gender Gap', *Journal of Human Resources*, 48(3), 545–95.

Zimmerman, S. D. (2014), 'The Returns to College Admission for Academically Marginal Students', *Journal of Labor Economics*, 32(4), 711–54.