

Skills for productivity growth

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Skills for productivity growth

CHAPTER SIX

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"High paid employment opportunities for graduates in poorer parts of the UK are relatively scarce, which leads to regional 'brain drain' to London and the South East."

The notion that the education and skills of the country's workforce make an important contribution to productivity growth and improved living standards is deeply engrained, long underpinning UK economic and education policy. Yet this focus on the supply of skills overlooks the importance of what kinds of skills employers are looking for on the demand side, particularly given regional differentials and technological change.

Improving productivity and living standards will therefore require a labour market that is better suited to fulfil people's aspirations at work, across all regions of the UK, and a policy architecture that is fit for the shifting economic landscape.

This preoccupation with skill supply sits uneasily with commentaries and empirical evidence that call into question the assumption that higher educational credentials and skills necessarily make for more productive workers earning higher wages.

For example, many UK employers are saying they are now hiring non-graduate apprentices to fill formerly graduate jobs, potentially shifting the balance of productivity and wage pay-offs to graduate education.¹ There are also major regional imbalances in the returns to graduate education. This is in part because high paid employment opportunities for graduates in poorer parts of the UK are relatively scarce, which leads to regional

'brain drain' to London and the South East, and means that graduates who remain in poorer regions are more likely to work in low paid and non-graduate jobs.²

New digital technologies seem to offer organisations many opportunities to raise productivity by recruiting high skill tech workers (such as developers, data scientists and digital engineers).³ However, these same technologies are also associated with radical changes in the world of work, such that increasing numbers of workers with varying levels of education and skills find themselves in precarious work, devoid of employment protection and income security.⁴

Moreover, many companies are now deploying digital technologies to construct a 'blended workforce' of in-house workers and crowd-sourced freelancers in an effort to improve productivity, which raises questions about the incentives and commitment of employers to the provision of training and career pathways for their employees.⁵

A demand-side focus

This chapter argues that the demand side of the labour market (namely the choices and actions of employers) needs to be better understood if the UK is to develop a virtuous circle between skills, productivity and living standards. This perspective will point to a broader policy architecture.

Productivity Institute research

A complete review of the vast literature on the relationship between skills and productivity is beyond our scope here.⁶ Instead, we highlight three areas of TPI research with important policy implications:

New evidence about the regional patterns of employer demand for graduates and non-graduates in England, including a focus on tech skills.

Recent Productivity Institute discoveries about why a growing number of organisations choose to access skilled workers from a global pool of digital platform freelancers, rather than hiring or training their own employees.

The shortcomings of the UK's current education policy, with long-standing problems of underinvestment, policy churn and policy coordination. Improved skills can enhance productivity and earnings in an uncertain and rapidly changing context, but it will require closer attention to be paid to employers and the shifting economic landscape.

Regional skills mismatch

The 'skills mismatch' can apply across several dimensions.⁷ TPI research is attempting to quantify this by examining the extent to which organisations' demand for specific types of skilled worker matches the supply across the different regions of England, accounting for regional mobility.

Measuring skills mismatch accurately is challenging as it requires reliable data on both the skills available in the labour force and the skills sought by employers. There are many ways to measure this, ranging from official labour market surveys to more subjective surveys of workers about how close their skills match their jobs.

Our research has initial new results from the demand side, which draw on regional job recruitment data placed on platforms by hiring organisations.⁸ For a

given region, organisations can seek to recruit residents of the region – including those already employed in another organisation, direct from educational institutions, from unemployment, or from outside the labour force. They can also try to hire from outside their region.

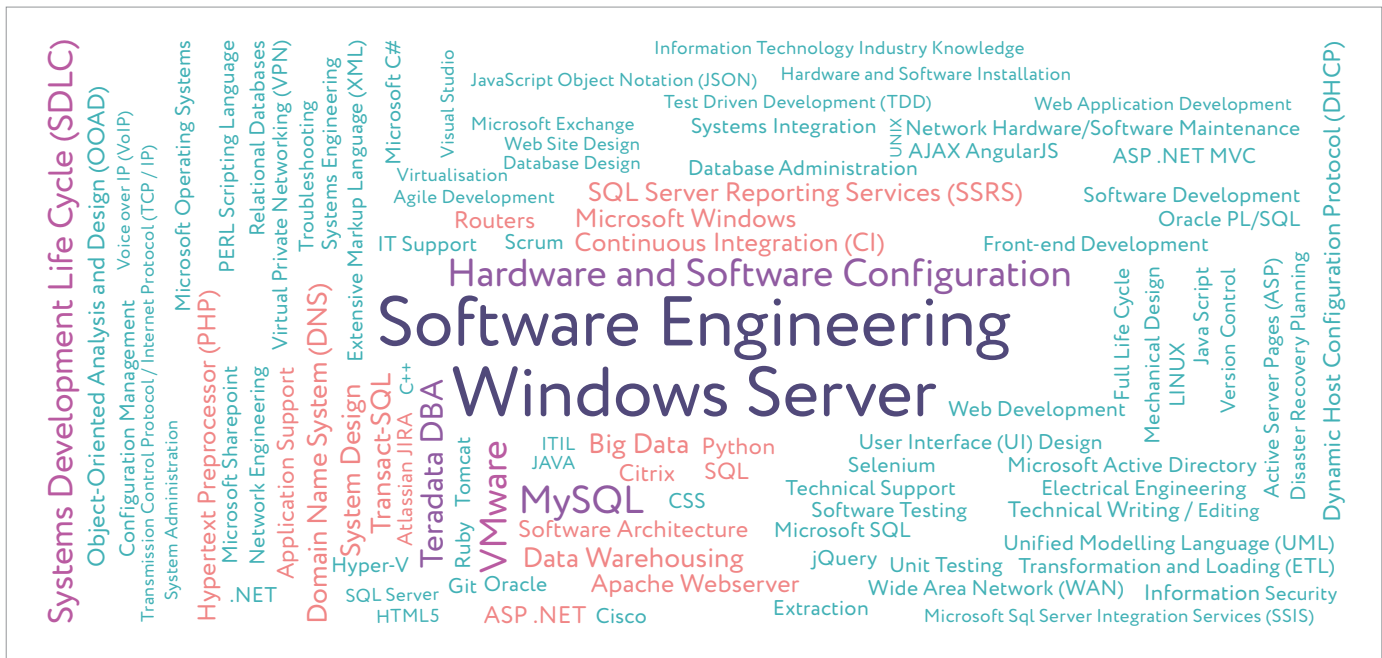
Graduates

Our descriptive analysis of job platform data first divides qualifications into graduates and non-graduates.⁹ As is well known, the demand for graduates is concentrated in a limited number of regions, especially around London but also around Birmingham and Manchester. The demand for non-graduates is more diffuse, with a few pockets of low demand mostly in more rural areas.

When we look instead at the demand for advanced technical skills a somewhat different geographic picture emerges. We divide job advertisements into those for high-tech skills versus others, based on words associated with tasks carried out by occupations that require advanced technical skills (Figure 1). On this definition, high-tech jobs represent approximately a tenth of all the job advertisements analysed.

The sample of high-tech job ads is then divided into those requiring graduate versus non-graduates. Interestingly, there is little difference between ads for graduates versus non-graduates in the frequency of words included in the high-tech word cloud.

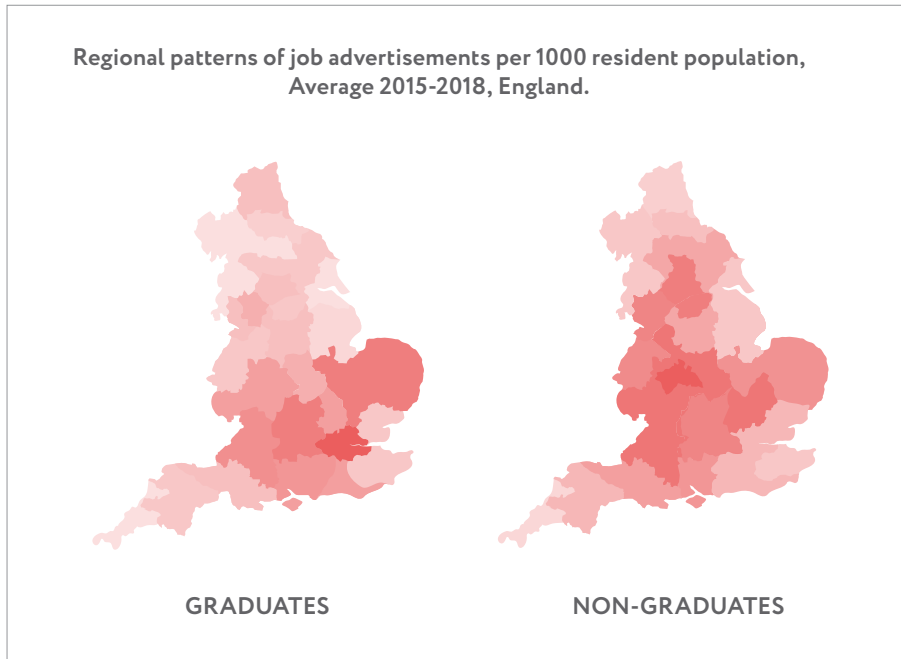
Figure 1: High tech skills Word Cloud



Source: See Andrieu and Kuczera (2023) for details on the construction of this variable.

Note: The larger the size of the word, the more frequent the keyword appears in the advertisements.

Figure 2: Demand for high technical skills: Graduates and Non-Graduates.



Source: Authors' own calculations using Lightcast data

Note: The darker the colour the greater the demand relative to population in a region.

Figure 2 shows the distribution for English regions. The demand for high-tech graduates is concentrated mostly in the golden triangle of London, East Anglia (Cambridge), the area around Oxford and extending west to Bristol. The demand for high-tech non-graduates is more dispersed, with high concentrations in the West Midlands and North West, and relatively low concentrations in London and East Anglia. There are large areas where demand for high tech skills, both graduates and non-graduates, is very low, including Essex, Lincolnshire, and Merseyside.

Interpretation

How do we interpret these results? One possible explanation is that high tech graduates migrate to the golden triangle where wages (and amenities) are higher. Organisations in other regions faced with a shortage of workers with advanced technical skills are forced to rely on non-graduates, usually from local FE colleges.

The analysis of regional mobility in de Coulon et al.¹⁰ suggests they are much less mobile than graduates across regions. A kind of 'job queue' effect is observed within each region such that individuals with non-graduate tech skills are closer to the front of the job queue in regions outside the golden triangle than their counterparts searching for employment in the golden triangle (for a given demand for high tech jobs).

An alternative explanation is that organisations outside the golden triangle are producing different kinds of goods and services, not so much in the high-tech sectors, and therefore with less need for advanced graduate-level skills while still requiring workers to have some technical knowledge because of the pervasiveness of digital technologies.

Even in the high-tech sector, ostensibly similar types of organisations across regions may deploy different levels of technical sophistication in their work and production processes, producing differences in demand for graduate versus non-graduate tech skills.

Explanations

Which of these explanations applies depends on whether technical skills of graduates and non-graduates are substitutes or complements. If they are complements, then having access to both kinds of worker is important for organisations.

This may vary by region. Some regions, such as London and East Anglia, may have an ample supply of graduates with advanced technical skills. Given evidence of over education in some research,¹¹ some organisations may be using these graduates in jobs where non-graduate technical skills would be sufficient. If this is the case, then graduates may be crowding out non-graduates in these regions. In other regions, organisations may employ some graduates but also need non-graduates with good technical skills.

Can organisations improve productivity by using digital freelance platforms?

Another lens on the supply and demand of tech skills is provided by research into digital freelance platforms. The rapid pace of innovation in digital technologies is transforming the skills required by organisations in all sectors of the UK economy and posing new productivity challenges (see Chapter Five).

Organisations are having to adapt the skillsets of their workforce to an array of new digital technologies, including robotics, machine learning and data science for example. At the same time, organisations may be able to meet their skill needs by accessing talent available globally on digital freelance platforms. This leads to a number of questions. Why do organisations use digital freelance platforms? What tasks are crowdsourced in this way? And how does this new transactional form of buying skills affect productivity?

Global market

The current trend of using digital platforms has evolved from previous strategies of IT outsourcing and offshoring,¹² yet offers easier access to digitally-enabled transactions.

There are hundreds of digital platforms for freelance labour, such as Dribbble, Fiverr, Freelancer, PeoplePerHour, Topcoder, Toptal and Upwork. They function like a marketplace for specialist services and enable organisations to access directly a global pool of workers such as translators, designers, coders, data analysts, accountants and lawyers. The number of freelancers registered with these platforms is enormous – around 18 million with Upwork and four million with Fiverr for example.¹³

The platform proposes a match between the client and a freelancer for a specific task using a digital algorithm that incorporates client reviews and ratings of each freelancer's performance. The fee is typically negotiated individually either per hour or per task. The platform collects commissions from both the client organisation and from the freelancer.¹⁴

Figure 3 shows the kinds of specialist tasks sourced from a sample of the large platforms.¹⁵ The high-skill nature of tasks is supported by data on the level of education of registered freelancers, which shows that more than four in five (83 per cent) have higher education qualifications (ILO 2021: 141).

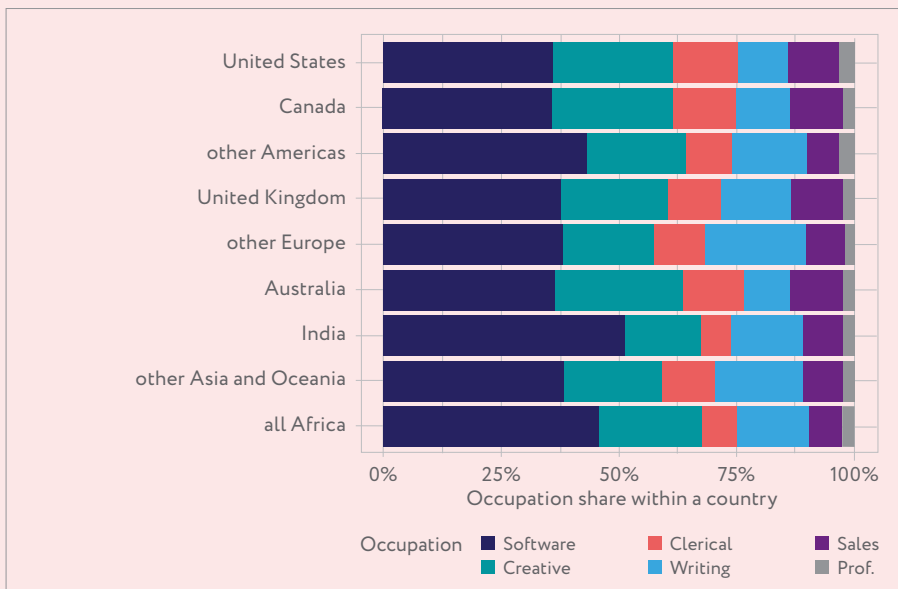


Figure 3: Share of tasks sourced from digital freelance platforms by occupation and country

Source: Kassi and Lehdonvirta (2018: figure 6).

This task-specific, transactional model of using a global pool of platform freelancers raises important issues concerning the relation between skill demand and productivity.

Organisations can potentially benefit from several productivity-related advantages:

COST REDUCTION

There is a potentially large short-term cost incentive since hiring full-time workers is more expensive (not least in terms of tax, social security and office space costs) than a series of individual transactions with freelancers.^{16 & 17} Alternative models of using a specialist outsourcing company (e.g. a payroll company or IT services company), or hiring via a temporary staffing agency, are also more expensive because such workers enjoy protected employment rights with their employing organisation. By contrast, digital freelance platforms abdicate responsibility for providing employment or social protection benefits to the registered workers, which is estimated to reduce labour costs by 20-30 per cent.¹⁸

EASE OF ACCESS TO SPECIALIST SKILLS

Digital freelance platforms typically offer management software systems that enable client organisations to track and monitor progress of tasks and budget spend. This provides an attractive business solution.¹⁹

SPEED AND FLEXIBILITY OF SOURCING SKILLS

Compared to traditional practices of hiring, redeployment or procurement, organisations report being attracted by the speed of sourcing solutions offered by digital freelance platforms in a context of tight project deadlines.^{20 & 16}

AUGMENT INCUMBENT WORKFORCE SKILLS

Faced with restrictions on headcount, organisations may also be motivated to rely on online freelancers at busy times or to bring in additional skills.

Productivity impact?

At first sight, this suggests that the use of digital freelance platforms contributes positively to the organisation's productivity. But there are important contingencies and unknowns, and these are being explored in ongoing research coordinated by Hsing-fen Lee at the Royal Holloway, University of London (in collaboration with the ILO and King's Business School).²¹

First, there is a strong incentive for organisations to routinise and codify the tasks outsourced to the digital platform to avoid extra time and costs required to explain and manage the work required. On the one hand, the more codifiable the task, the easier (and quicker) the process of knowledge transfer from the platform to the client organisation. On the other hand, however, there is a risk that the complexity of the original task

is purposefully diminished to suit the platform solution at the expense of what the organisation actually needs.

Second, the decision to use knowledge services from other organisations or individuals often underestimates the degree of tacit knowledge required to do a given task well.^{22 & 23} Employees in an organisation typically require tacit understanding about how their task fits with other activities. This involves firm-specific know-how and understanding of how to address ambiguities.²⁴ By contrast, once managed as a series of freelance tasks, without this internal tacit knowledge, there is a high risk that the quality of work is lower and does not integrate well with other organisational activities.

Understanding firms' motivations

TPI research is surveying UK firms to better understand their motivations for using online freelancers. In addition to revealing the importance of lower cost and ease of access to specialist skills, the research will also analyse how each task undertaken by online freelancers fits with the firm's activities, so as to evaluate the quality of knowledge sharing.

The research will seek to uncover evidence of sustained productivity effects by examining the degree of sophistication of project management, knowledge coordination and HR management within the client firm. These are likely to increase the scope for learning and assimilation of new knowledge, with positive implications for innovation and productivity.

A long-term, sustainable architecture for skills and education

This chapter has described two ways in which the interaction between skill supply and skill demand may affect productivity, each underlining the inadequacy of the policy focus on supply of education and skills alone. The skills needed, their location, and the way organisations access skills have all been changing.

These uncertainties and challenges of skill formation facing organisations in the UK are not helped by the inadequate architecture for skills policy, particularly in England, over the last two decades. The legacy of underinvestment, extreme policy churn and lack of co-ordination associated with successive governments has held back productivity and earnings growth.

So, whilst skills and vocational education and training (VET) - whether in the form of apprenticeships, new technical qualifications (such as T Levels or Higher Technical Qualifications) or new institutions (Centres of Vocational Excellence, National Skills Academies, National Colleges, Institutes of Technology) - have duly appeared in a series of successive and short-lived economic strategies, they have typically been poorly funded and not joined up with other policies and initiatives.

Short-term

Few policies have remained in place for long, and neither have the ministers or departments and agencies overseeing them. According to the Institute for Government (2017), since the early 1980s there have been 28 major pieces

of legislation related to vocational, FE and skills training, six different ministerial departments with overall responsibility for education, 48 secretaries of state with relevant responsibilities, and no organisation has survived for longer than a decade.²⁵ Gillian Keegan MP, herself a former skills minister between 2020-21, is currently the sixth Secretary of State at the Department for Education since 2019.

"As a consequence, the vocational sector is an 'alphabet soup' of providers, with acronyms that change every year. Students are horribly confused about which programmes are valued by employers, and nobody has any confidence that a qualification will lead to work or pay progression, or even exist in a few years' time. It is the worst failure of domestic British public policy since the Second World War."

(IfG report)²⁶

The instability in the sector has created a complex and ever-changing landscape for individuals and employers, as well as institutional providers.

"Essentially, what we have is a set of institutions, funding mechanisms and levels, inspection regimes, regulatory arrangements, programmes, qualifications, assessment systems, and policies that are in constant flux."

(Keep et al., 2021)²⁷

Co-ordination

There have also been co-ordination problems within the Department for Education, as well as between it and other departments tasked with different aspects of improving productivity and economic performance.

In England schools, skills and universities have all been run in very different and often competing and counterproductive ways. Coffield (2007) argues that England does not have a single, coherent educational system, but instead three badly co-ordinated sectors - Schools, FE (or VET) and Higher Education (HE) - which reflect sharp divisions within the Department of Education.

"Many companies are now deploying digital technologies to construct a blended workforce of in-house workers and crowd-sourced freelancers in an effort to improve productivity."

"The mental image suggested by these structural arrangements is of three well-intentioned but dyspraxic and myopic elephants, who are constantly bumping into each other and standing on each other's feet instead of interweaving smoothly in one elegant dance."

(Coffield, 2007)²⁸

HE in England has been increasingly treated as a market, shaped and funded through individual student choice and overseen by a market regulator, the Office for Students (OFS).²⁹

Numbers in English universities are uncapped and institutional funding for teaching comes through a student loan system. FE, however, even when offering similar programmes, has strict number controls, and budgets and contracts via the Education and Skills Funding Agency (ESFA), now an in-house body at the DFE.

Apprenticeships policy is different again. It is funded through an employer levy and regulated by the Institute for Apprenticeships and Technical Education (IFATE). It is not known whether, or how often, the OFS, ESFA and IFATE meet

together to consider the supply skills in the round. In England there is no joined up tertiary education system unlike in Scotland, Wales, and other European countries such as Ireland.

Government spending

Nor has government spending on education kept pace with the claimed ambition to drive a high skill, high productivity economy.

In the late 1970s, education spending represented 12% of total public spending, making it the largest item of public spending alongside pensions. In the early 1980s, this had declined to about 10%, while from the late 1980s it increased back up to approximately 12% in the 2000s. Since 2010 it has fallen to 10.3% of public spending (2021–22) and it is now only the fourth largest area of public spending.

The FE sector suffers the most from these arrangements. Since 2010 its funding has barely risen at all in real terms and it has instead experienced several periods of significant cuts. According to the Institute for Fiscal Studies (2023), between 2010–11 and 2019–20, spending per student aged 16–18 fell by 14% in real terms in FE colleges and by 28% in sixth forms. For FE colleges this left spending per student at around the level it was in 2004–05, while spending per student in sixth forms was lower than at any point since at least 2002. FE is also where the majority of VET takes place - including adult learning and training in the workforce.

Extra funding

In the 2019 and 2021 spending reviews, the government announced extra funding for colleges and sixth forms. As a result, overall per-student spending in 16–18 education is set to rise by 9% in real terms between 2021–22 and 2024–25 (see Figure 4 overleaf). Yet college spending per pupil in 2024–25 will still be around 5% below 2010–11 levels, while school sixth form spending per pupil will be 22% below 2010–11 levels.

Higher Education pressure

HE funding in England has also been intensifying as the undergraduate tuition fee remains frozen at £9,250 per year (originally set a decade ago and updated for inflation only once in 2017) and high inflation is rapidly eroding its value. In terms of 2012 pounds, it dropped from £9,000 in 2012 to around £7,760 in 2020, a 14 per cent cut. According to Mark Corver of DataHE, in 2023 after two years of high inflation, real terms fees have now fallen to £5,600 - a massive 38 per cent cut from 2012.

There are questions about the ongoing affordability of the HE funding system overall. In a recent report the House of Lords criticised the OFS for failing to recognise the severity of the "looming crisis" facing English universities, stating that "its approach to regulation often seems arbitrary, overly controlling and unnecessarily combative", and that it has paid insufficient regard to either student interests or the financial challenges facing the sector.³⁰

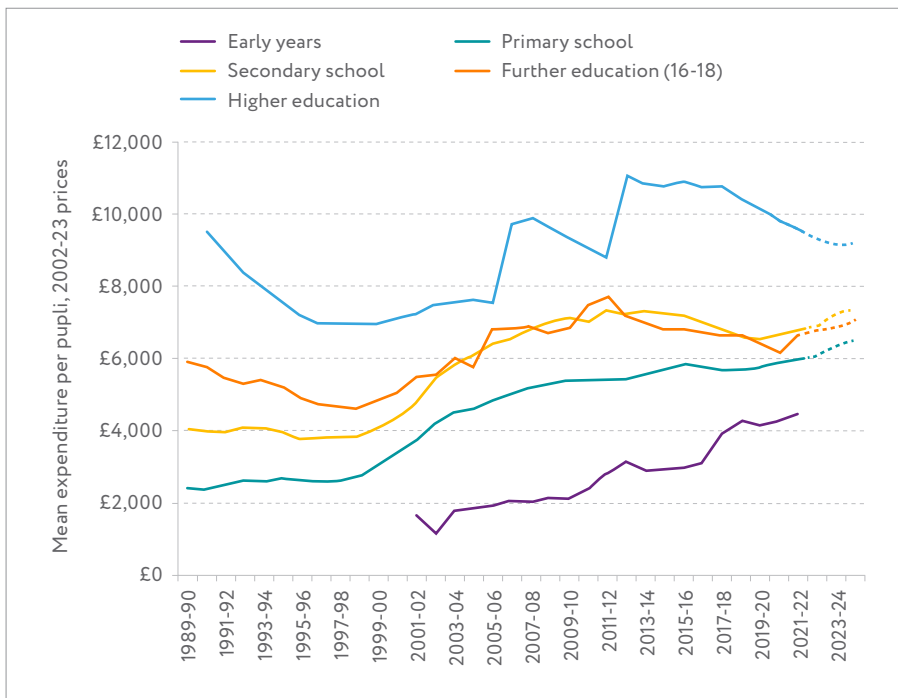


Figure 4: Spending per pupil/student per year at different stages of education (2022/23 prices)

Note and source: Early years figures are spending per child for 3- and 4-year-olds taking up a place. Secondary school spending per pupil includes spending on school sixth forms. Further education figures represent spending per student aged 16-18 in further education and sixth-form colleges. Higher education figures are cohort-based numbers divided by 3 - an approximate course length. HM Treasury, GDP deflators, November 2022 (<https://www.gov.co.uk/government/statistics/gdp-deflators-at-market-prices-and-money-gdp-november-2022-autumn-statement>).

Lack of co-ordination

An equally significant problem alongside policy churn and inadequate funding is the lack of co-ordination between education and skill policies, and innovation and spatial policy. As the UK commits to increased spending on R&D, including the welcome re-entry to the EU's Horizon Programme, it is particularly important that the skills system is able to absorb and deploy new innovations, knowledge and technologies in the workplace.

This requires closer alignment between education and R&D policies so that there is sufficient 'absorptive capacity'³¹ in firms in all regions. Without appropriate skills there can be no exploiting and implementing of scientific and technological discoveries, yet there appears to be very little practical co-ordination between skills and R&D policies. This can only exacerbate the mismatches described above.

Regional impact

Given the very high levels of spatial inequality in evidence within England and the UK, this is a particular challenge for efforts to improve productivity and economic growth throughout the country. Education policy in England - for schools, FE and HE - has largely operated on a 'place blind' basis.³²

However, the devolution and levelling up agendas, and the creation of Mayoral Combined Authorities (MCAs) with strong economic agendas and powers - including over skills - have begun to change this. For instance, mayors in England now have complete responsibility for their adult education budgets. Moreover, in the recently agreed deeper devolution deals in Greater Manchester and the West Midlands, joint governance boards have been established so that these two authorities and the DFE will jointly run FE for 16-19 year-olds.

This is a move in the right direction. However, this still leaves a number of major challenges if education and skills are to play a role in improving UK productivity performance. Adequate funding will require sustained, long-term reform, and extreme policy churn needs to end.

While England grapples with these challenges, the education systems across the rest of the UK are also diverging rapidly from free higher education in Scotland for Scottish students to ambitious tertiary and curriculum reform in Wales, leading to a fragmented approach to skill formation, particularly VET and HE. There are few signs that the different regimes are keen to learn from each other.

Policy implications

OUR RECOMMENDATIONS ARE TO:

The UK faces significant challenges in building a more effective framework of policy and employer practice to raise productivity and living standards, and in ensuring that economic opportunities are fit for people's aspirations at work.

The TPI research described here focuses purposefully on the role of the employer as a key architect in constructing labour market demand – decisions about where to locate graduate jobs and high-tech jobs, as well as whether to hire from an online pool of freelancers instead of recruiting traditional employees.

With employer needs changing, and varying across the UK, TPI research also demonstrates that the UK's policy architecture is inadequate for a high productivity, high skill growth model, beset by skill mismatches, regional disparities, underinvestment, policy churn and policy fragmentation.

Integrate the tertiary system across higher education, further education and work-based learning (e.g. apprenticeships and other programmes) in England, linking also to schools and building on the current Local Skills Improvement Plans. To some extent this already exists, or is planned, in other UK nations, so this ought to be a realistic option.

Establish new incentives and investment rules for employers and individuals (e.g. tax credits or similar) for greater investment in human capital. This can help spur innovation and technology investment.³³ Counting some education spending as investment in the government's fiscal rules could also be considered to address the funding shortfall described above and enhance people's economic opportunities.

Strengthen the coordination between policies for tertiary education, skills, R&D and innovation. This should target 'absorptive capacity' in firms and places where R&D strengths and/or investment exist (See Chapter Three). It should also align with, and be an essential component of, policy objectives to achieve net zero (Chapter Seven), and to develop advanced manufacturing and high-tech, knowledge intensive services sectors. It should also include a focus on strengthening non-graduate technical skills.

Extend labour rights and social protections to digital platform workers (locational and online platforms) so that the rising demand for platform labour fully reflects its social and economic costs as well as private benefits. This should include health and safety protections (as in Australia for example), ensure decent pay (including procedures for dispute resolution) and give platform workers the right to access data related to their activities (following ILO recommendations).³⁴

"An alternative explanation is that organisations outside the golden triangle are producing different kinds of goods and services, not so much in the high-tech sectors, and therefore with less need for advanced graduate-level skills."

Key takeaways

With employer needs changing, the UK's policy architecture is inadequate for a high productivity, high skill growth model, beset by skill mismatches, regional disparities, underinvestment, policy churn and policy fragmentation.

Adequate skills funding will require sustained, long-term reform, and extreme policy churn needs to end.

Labour rights and social protection for platform workers will ensure employers pay the full costs of using such workers.

Giving English regional mayors more powers over skills is a step in the right direction.



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- 8 These are advertisements by firms usually through job hiring platforms such as indeed.com but also include advertisements through firms' own website. These data are compiled and adjusted to remove duplicates by Lightcast data services.
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- 14 According to platform data collected by the ILO, the commission collected from freelancers is significantly higher than from the client (ILO 2021: table 2.1).
- 15 Figure 3 is reproduced from the work of academics at the Oxford Internet Institute. It refers to completed tasks on five of the largest digital freelance platforms – Freelancer, Guru, Mturk, PeoplePerHour and Upwork.
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- 30 House of Lords Industry and Regulators Committee (2023): 'Must Do Better: the Office for Students and the looming crisis facing higher education.' 2nd Report of Session 2022-23 - published 13 September 2023 - HL Paper 246 <https://publications.parliament.uk/pa/ld5803/ldselect/ldindreg/246/24602.htm>
- 31 <https://royalsociety.org/-/media/policy/Publications/2022/absorptive-capacity-report.pdf>
- 32 For example, the Higher Education and Research Act in 2017 made very little mention of geography or spatial inequalities – nor do its provisions for the operation and responsibilities of the Office for Students.
- 33 For an international review, see Jones, B. and Grimshaw, D. (2016) The impact of skill formation policies on innovation. In J. Edler et al. (eds) *Handbook of Innovation Policy Impact*. Cheltenham: Edward Elgar.
- 34 ILO (2021) The Role of Digital Labour Platforms in Transforming the World of Work, Geneva: ILO.

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