



Bulletin 14

Skills shortages in the UK economy

Spring 2024

Key Highlights from the Bulletin

Our fourteenth *Skills Shortage Bulletin* restates what is now a concerningly predictable mantra (as we highlighted in our [Skills Shortage Bulletin summary document 2024](#)): that skills shortages continue to proliferate, and public and private investment is in decline. It remains important to continue to refine this understanding, and develop and share analysis on which interventions to address skill shortages might act.

- We have featured the Department for Education (DfE) and NFER's work on predicting labour market outcomes to 2035 in bulletins [12](#) and [13](#). In this volume, the Korean Employment Information Service make an illuminating comparison with their modelling for Korea. While there are differences in proportions of the workforce in key industries, with Korea's larger manufacturing base and the UK's more developed service sectors such as finance, both share common concerns for the future, including increasing requirements in care-related occupations as a result of an aging population, and around the role of immigrant labour.
- In the present bulletin, we hear from IFFR on their findings for the [DfE's 2022 UK Employer Skills Survey \(ESS\)](#), published in December 2023. This comprehensive evaluation of the state of the UK labour market indicates that the 'extraordinary set of challenges' since last UK-wide ESS in 2017 have raised nearly every metric to worrying levels. The 1.5 million vacancies reported by employers was the highest reported since the ESS began in 2011, with employers more acutely impacted than in previous years. We get a view of this inside one sector from Space Skills Alliance, reporting on their recent findings from the government's [Space Sector Skills Survey 2023](#). Of their sample of 35% of the space workforce, 95% said they were experiencing some kind of skill-related challenge, a significant increase from 67% in 2020. Despite similar challenges across other industry sectors, the ESS found there was decreased investment in and provision of training nationally. Findings from Learning and Work Institute tell a similar story: adult participation in essential skills learning has declined by over 60% in the past decade. They also add nuance to our picture by highlighting how the disparities *within* local areas in essential skills needs exceeds the difference *between* local authorities.
- The disruptive consequences of the introduction of Artificial Intelligence (AI) continues to feature prominently in discussions around future skills needs and shortages. We review a selection of recent research on how AI might shape the workplace of the future. Evidence indicates its impact is being felt across the global economy. Broad uptake of AI both increases work quality by reducing tedious and dangerous tasks whilst exposing workers to more intense working environments and heightening their sense of insecurity. Pearson's new Skills Map of England shows that while 2 million jobs across England may be lost to 2027 due to AI, AI will also create 2.4 million jobs. The challenge is, therefore, to bridge the gap between the roles disappearing and the estimated 390,000 new roles. Pearson suggest that immediate support and devolution of skills funding is needed to enhance responsiveness of local labour market conditions, together with enhanced data.

- What practical steps might be taken to help coordinate stakeholders to facilitate coordinated responses to address skills gaps? IfATE, sharing an update on their SkillsCompass initiative, explore how AI and other data tools are being used to detect emerging skills and inform rapid response provision of training. The British Chambers of Commerce (BCC) report on their experiences leading 32 of the 38 Local Skills Improvement Plans (LSIPs). They explore how LSIPs had led to improved communication and interpretability between employers and training providers, but warn that long-term political commitment is required to enable the fruits of such labours to flourish. A similar theme emerges from our own forthcoming research reviewing stakeholder experiences of Degree Apprenticeships. We found that good employer-provider relationships were essential to the delivery of courses where theoretical and practical learning had strong relevance to employer needs, but resources and stability were not always available to facilitate such relationships.





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The Employer Skills Survey 2022

IFF Research

The 2022 UK Employer Skills Survey (ESS), published by the Department for Education and conducted by IFF Research, represents a watershed in the wider survey series.

Since the last UK-wide ESS was undertaken in 2017, employers have contended with an extraordinary set of challenges including the impacts of the COVID-19 pandemic, which has drastically changed the way people work; the subsequent and sustained tightening of the UK labour market; navigating the post-Brexit economic landscape; and more recently, the far-reaching implications of a sustained period of high-inflation and the rapid growth of AI. In this context it is more important than ever that the UK Government understands the skills challenges faced by employers and the steps they take to ensure they have a proficient and productive workforce. ESS continues to be a vital source of intelligence in understanding these issues.

Skills challenges when recruiting

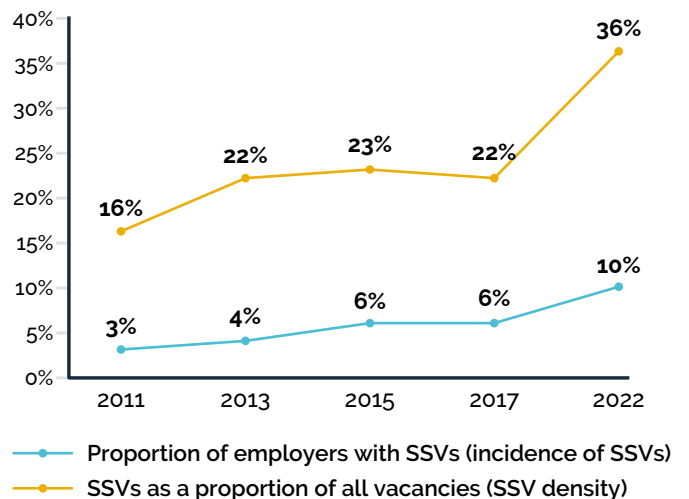
Reflecting the tight labour market of the last few years, the 1.5 million vacancies reported by employers was the highest reported since the ESS series began in 2011; in comparison there were around 1 million vacancies in 2017. The proportion of employers with vacancies and vacancy density (i.e. vacancies as a proportion of employment) were also at all-time highs for ESS (23% and 5% respectively).

Vacancies that prove hard to fill due to shortages of applicants with the required skills, qualifications, or experience (skill-shortage vacancies, or 'SSVs') were also on the rise – there were around 530,000 of these, almost double the previous high of around 230,000 in 2017. The proportion of employers with SSVs also increased (10%, up from 6% in the 2015 and 2017 waves).

Perhaps of most concern, employers were more acutely affected by SSVs than ever before in the series, with a far higher proportion of all vacancies reported as SSVs (36%, up from 22% in 2017). There was a particularly large

increase in SSV density among the largest employers with 250 or more employees, from 16% in 2019 to 35% in 2022.

Figure 1.



The most common skills found to be lacking among applicants were specialist skills or knowledge needed for the role (contributing to 63% of SSVs) and the ability to manage time and prioritise tasks (48%). SSVs have a detrimental impact on business operations, most commonly increasing workloads among existing staff (85%), while half mentioned difficulties meeting customer service objectives (50%) and seeing their operating costs increase (48%).

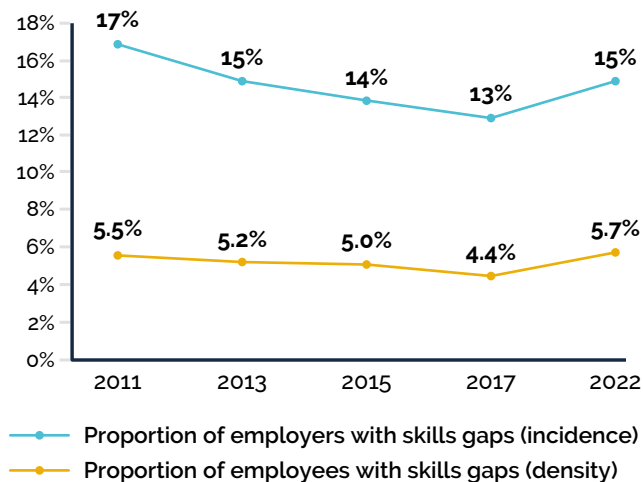
The internal skills challenge

Employers with at least one member of staff not considered to be fully proficient in their role are defined as having skills gaps. Between the start of the ESS in 2011 and the last UK-wide survey in 2017, there were gradual declines in both the incidence and density of



skills gaps. The proportion of employers reporting skills gaps (incidence) fell from 17% in 2011 to 13% in 2017, and the proportion of the workforce with skills gaps (density) fell from 5.5% in 2011 to 4.4% in 2017. The 2022 survey bucked these trends, with incidence of skills gaps increasing to 15% and density to 5.7%. The overall number of skills gaps increased from an ESS-series low of 1.3 million skills gaps employees in 2017 to a series high of 1.7 million in 2022.

Figure 2.



The specific skills lacking among the existing workforce were similar to those mentioned for SSVs, though in contrast to SSVs, the ability of staff to manage their own time and prioritise tasks (contributing to 60% of skills gaps) superseded specialist skills or knowledge for the role (54%) as the most common skill lacking among staff with skills gaps.

Around two-thirds of employers (65%) said skills gaps affected their performance (15% said this was a major impact). Like with SSVs, the standout impact of skills gaps was increasing staff workloads (53% of those that had skills gaps), followed by higher operating costs (27%) and difficulties meeting quality standards (25%).

What are employers doing in response to these skills challenges?

Training and workforce development are important means of tackling skills issues within the workforce, particularly at a time of short labour supply. However, despite the challenges discussed earlier, there has been a reduction in the proportion of employers that have provided training for staff, from fairly consistent levels of 65% to 66% between 2011 and 2017, down to 60% in 2022. This reduction also played out in terms of the proportion of staff trained, falling from 62% in 2017 to 60% in 2022.

Even in cases where training was being provided, it was happening less often and with less investment from employers; the average number of training days per trainee per year was 6.0 days, compared with 6.4 days in 2017), and the £53.6 billion spent on training in the previous 12 months represented a real terms reduction of 7.7% from 2017 (though for England, Northern Ireland and Wales, where 2019 ESS data is available, the 2022 results represent slight increases on 2019 levels).

Employers were also less engaged with the wider skills system and opportunities to nurture talent than they were previously, with a fall in the proportion of employers offering work experience in the last 12 months (30% vs. 38% in 2016) and lower levels of interest in offering T-levels (33% of employers in England, down from 36% in 2019). Provision of apprenticeships, in terms of currently employing apprentices, or actively offering them (19%) was at similar levels to 2016.

There is clearly more work to do to promote the value to employers of investing in skills, particularly in light of fast-paced changes to the economic landscape, with the emergence of AI and the transition to net zero. Failure to meet employer skill needs will likely continue to hamper productivity and leave the UK lagging behind its international competitors.

The Department for Education and IFF Research are currently in the design phases of the 2024 survey, results from the 2022 survey can be found here: [Employer skills survey 2022 - GOV.UK](https://www.gov.uk/government/statistics/employer-skills-survey-2022) (www.gov.uk).



The UK Employer Skills Survey continues to be a crucial evidence source for understanding the skills issues faced by employers, and the 2022 survey sheds light on the impact of recent economic challenges including the UK's exit from the EU and the COVID-19 economic recovery. It will be of concern to Government that skills gaps have increased among the workforce, and, at the same time, it has become more challenging to find suitable skills within the labour market. It is important that Government continues to work with employers and the wider skills system to ensure future skills needs can be met.

Sam Selner

Director, Learning and Skills Research, IFF Research

Divergent Projections of Two Nations Preparing for a Common Future

Comparative Analysis: Employment Trends and Future Prospects in Korea and the UK

Si-kyun, Lee (Senior Research Fellow, Office of Employment Information Analysis, KEIS),
Young-dal, Kim, (Researcher, Labor Market Analysis & Data Survey Division, KEIS)

Introducing the Korea Employment Information Service

The Korea Employment Information Service (KEIS) is an organization dedicated to collecting, processing, and analysing employment information in the labour market. If we were to look for a similar institution in Europe, it could be understood as akin to the IAB (Institut für Arbeitsmarkt- und Berufsforschung: Labor Market and Vocational Research Institute) in Germany. We operate the online job portal 'Worknet' and manage the national employment information network, enabling us to monitor the overall employment market, forecast long-term employment trends, and publish information on future occupations. Based on this, we engage in research and produce reports for employment policy formulation, as well as implement career development programs for job seekers, thus actively participating in various aspects of the employment process.

Our work in labour projection

Continuous economic growth relies not only on advancements in production technology but also on efficiently predicting and supplying the necessary workforce and distributing jobs in the labour market. To achieve this, we conduct long-term projections over the next decade, including forecasts for workforce supply, workforce demand, and discrepancies in workforce supply by education level and major. We also undertake projections based on various scenario situations. For example, scenarios may include the dominance of carbon reduction policies, rapid dissemination of information technology, or the realization of labour supply shortages due to population aging. Medium to long-term workforce supply projections will provide

answers to population, employment, and skill shortages, supporting stable economic growth over the next decade.

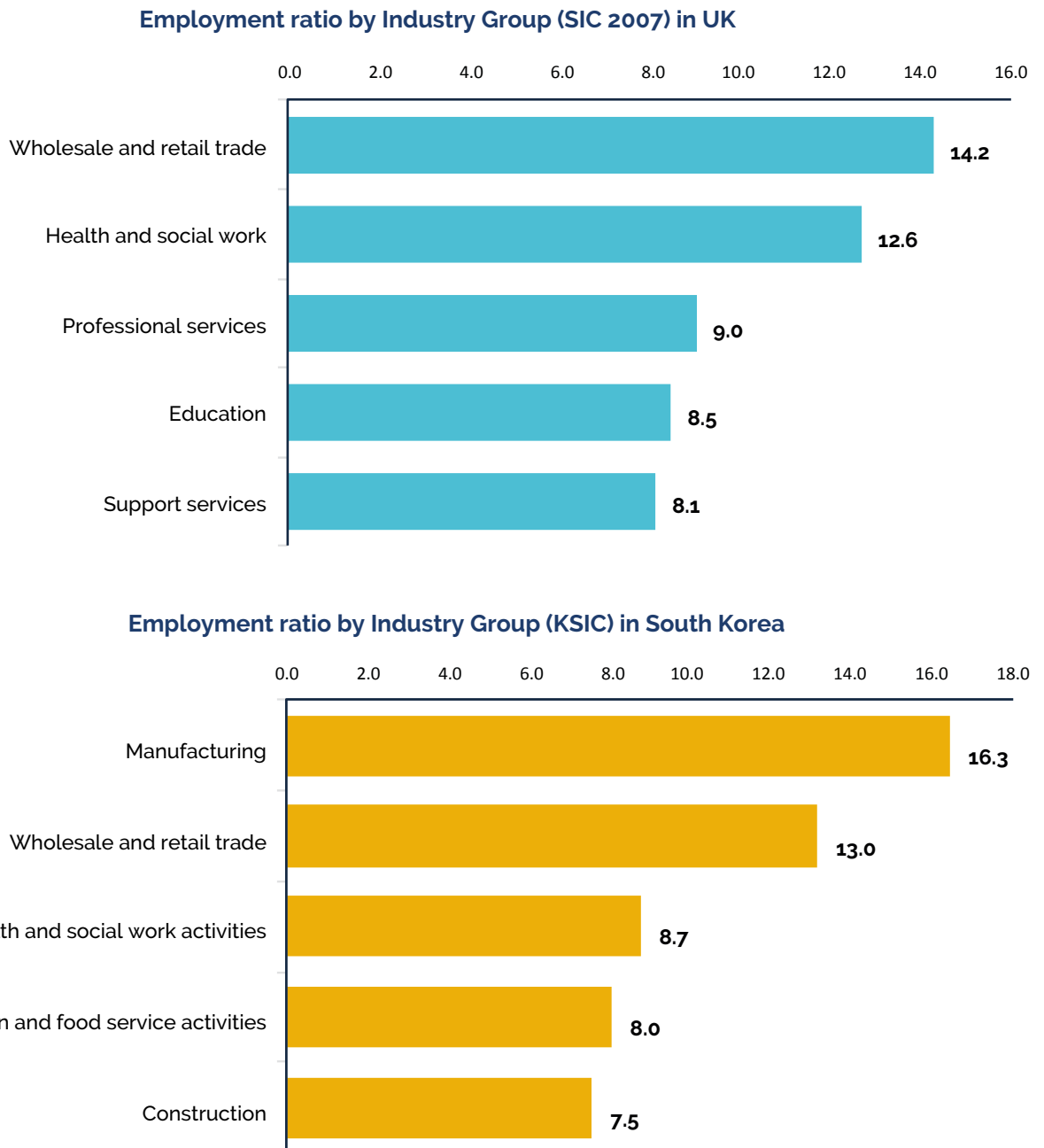
The differences and similarities between the two countries

Before introducing our research findings, we were intrigued to hear the exciting news that detailed job forecasts until 2035 have also been announced in the United Kingdom. The employment landscapes of the UK, which was the starting point of the industrial revolution, and Korea, which followed later, differ in many aspects. Consequently, the future occupations needed may also differ. However, on the other hand, we are both moving towards the same future. We must actively utilize green technology, cope with aging populations, and may need immigrant labour to address labour shortages. Comparing the employment outlook of both countries will illustrate the paths each is taking within their distinct employment environments and show how we can collaborate in the future.

Key findings

As of 2020, the industries with the highest employment proportions in the UK were Wholesale and retail trade (14.2%), Health and social work (12.6%), and Professional services (9.0%) according to the Standard Industrial Classification (SIC) 2007. During the same period, Korea's top industries were Manufacturing (16.3%), Wholesale and retail trade (13.0%), and Human health and social work activities (8.7%) according to the Korean Standard Industrial Classification (KSIC).

Figure 1. Employment by Industry Group in UK and South Korea (2020)

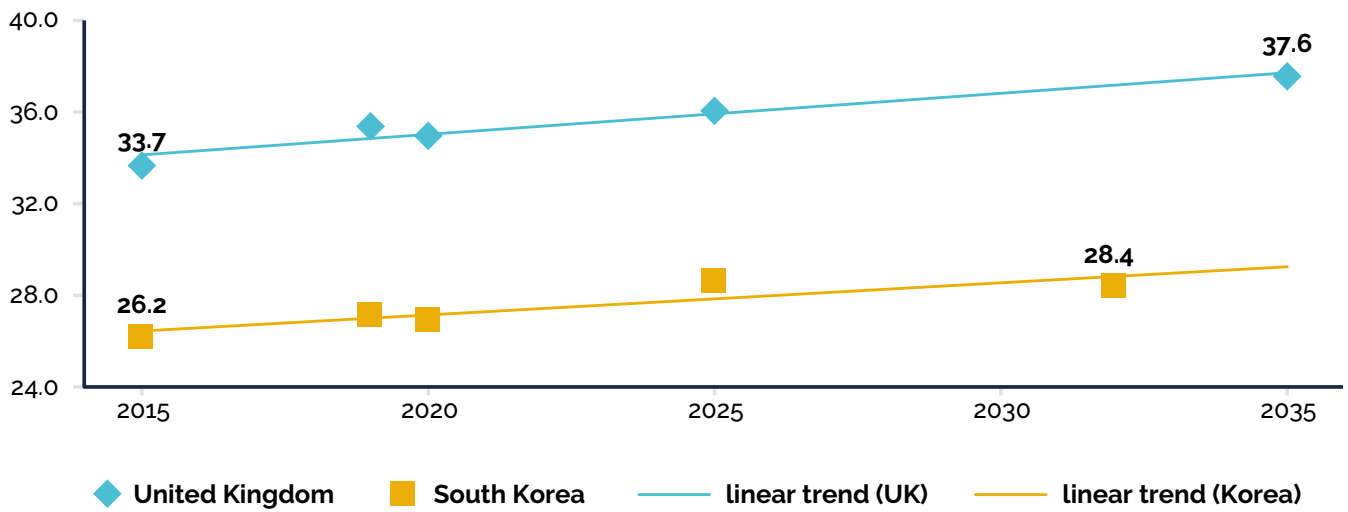


Source: Department for Education (UK) Nations Projections. Employment Projections Division (KEIS, Korea).

According to the UK Department for Education's Labour Market and Skills Projections: 2020 to 2035, the UK is projected to have 37.568 million employees by 2035, while according to the Korea Employment Information Service's medium to long-term workforce

demand projection (2022-2032), Korea's employment is forecasted to reach 28.398 million by 2032, indicating a generally similar trend in employment prospects between the two countries.

Figure 2. Employment Changes in UK (2015-2035) and South Korea (2015-2032) (millions)



Source: Department for Education (UK) Nations Projections. Employment Projections Division (KEIS, Korea).

Examining the projected increase in employment by occupation in the UK from 2020 to 2035, the greatest increase in employment is expected in Professional occupations, followed by Associate professional occupations and Caring, leisure, and other service

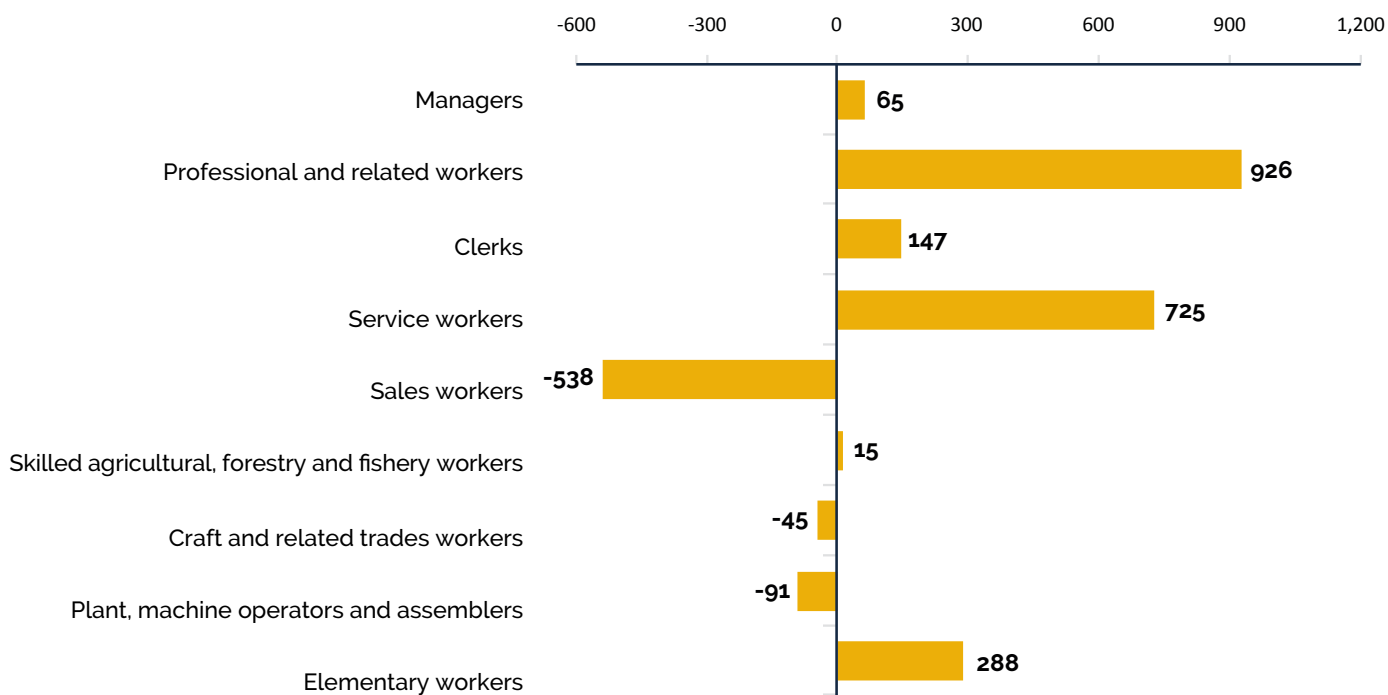
occupations. Conversely, Administrative and secretarial occupations, Skilled trades occupations, and Elementary occupations are expected to see a decrease in employment.

Figure 3. Employment Change by Occupation Group (SOC 2020) in UK (between 2020 – 2035)



Source: Department for Education (UK) Nations Projections.

Figure 4. Employment Change by occupation Groups in Korea (2020-2032).



Source: Employment Projections Division (KEIS, Korea)

In Korea, the occupations projected to see the highest increase in employment by 2032 are Professionals and related workers, Service Workers, and Elementary Workers, while a significant decrease in employment is expected among Sales Workers.

These differences in projections stem from variations in the industrial environments of the two countries that generate employment. For instance, Korea’s economy has a high proportion of value-added in manufacturing, undergoing a rapid transition to a service economy typical of late industrial societies. On the other hand, the UK possesses a developed environment with high-value-added service sectors such as finance. Additionally, Korea is experiencing a decline in the proportion of the education service sector amid severe low birth rates.

However, both countries are experiencing an increase in the proportion of Health and social work industries and anticipate growth in care-related occupations, indicating commonality amidst rising income levels and an aging population demographic.

What’s next

Due to severe low birth rates and population aging, Korea is projected to see a decline in its economically active population starting from 2028. We are currently conducting research to estimate the shortage of manpower through medium to long-term workforce demand projections.

We look forward to leveraging the expertise of the UK, which has been ahead of us in utilizing immigrant labor, and our research on employment in renewable energy and carbon reduction economy since 2020 signifies that Korea and the UK are preparing for the same future and can collaborate with each other.

If you wish to collaborate with us on our project or share your thoughts on how we can improve, we are always eager to hear from you and welcome your feedback (Contact point: Dr. Lee Si-Kyun, siju0428@keis.or.kr).



I am leading the Employment Information Analysis and Labor Projection at the Korea Employment Information Service. Our goal is to find the best responses to employment levels, future occupations, and changes in the technological landscape. We are conducting research to estimate future labour shortages due to Korea's low birth rate, and we are keen on hearing about the experiences of the United Kingdom, which has already accepted foreign workers ahead of us.

Si-Kyun Lee

Senior Research Fellow, Office of Employment Information Analysis, KEIS

References

Department for Education(UK). Labour market and skills projections: 2020 to 2035. (<https://www.gov.uk/government/publications/labour-market-and-skills-projections-2020-to-2035>)

Jinhee, Park, Sikyun, Lee, et al. (2023). "Data-Based Employment Policy Support Plan" (Unpublished : Government Policy Collaboration Report)



Tables

Table 1. Employment Change by Occupation Group in UK (SOC 2020)

	year					2020-2035	
	2015	2019	2020	2025	2035	Change	Growth rate
Managers, directors and senior officials	3,205	3,678	3,758	3,572	3,924	167	0.3
Professional occupations	6,885	7,836	8,211	8,851	9,792	1,582	1.2
Associate professional occupations	4,219	4,571	4,777	5,055	5,533	755	1.0
Administrative and secretarial occupations	3,736	3,628	3,733	3,791	3,597	-136	-0.2
Skilled trades occupations	3,489	3,434	3,025	3,049	2,958	-67	-0.1
Caring, leisure and other service occupations	3,149	3,251	3,128	3,196	3,419	291	0.6
Sales and customer service occupations	2,887	2,817	2,789	2,820	2,835	46	0.1
Process, plant and machine operatives	2,113	2,209	1,962	2,026	1,952	-10	0.0
Elementary occupations	3,972	3,941	3,592	3,660	3,558	-34	-0.1
All occupations	33,656	35,365	34,975	36,022	37,568	2,593	-

Source: Department for Education(UK) Nations Projections

Table 2. Employment Change by Occupation Group in South Korea (KSOC)

	year					2020-2032	
	2015	2019	2020	2025	2032	Change	Growth rate
Managers	358	408	395	458	461	65	1.3
Professionals and related workers	5,189	5,556	5,480	6,232	6,407	926	1.3
Clerks	4,446	4,749	4,691	4,958	4,838	147	0.3
Service Workers	2,813	3,116	3,046	3,514	3,771	725	1.8
Sales Workers	3,129	3,030	2,897	2,598	2,359	-538	-1.7
Skilled Agricultural, Forestry and Fishery Workers	1,243	1,332	1,383	1,466	1,398	15	0.1
Craft and Related Trades Workers	2,375	2,372	2,336	2,378	2,292	-45	-0.2
Plant, Machine Operators and Assemblers	3,187	3,026	2,957	2,972	2,866	-91	-0.3
Elementary Workers	3,437	3,533	3,718	4,053	4,007	288	0.6
All occupations	26,178	27,123	26,904	28,630	28,398	1,493	-

Source: Employment Projections Division(KEIS, Korea)

SkillsCompass: how IfATE is preparing the English skills system to meet labour market change

Jonathan Mitchell, IfATE



In the context of increasingly rapid labour market change and emerging technologies, it has never been more important to ensure the skills system can detect and prepare the workforce in a timely way. Advancements in artificial intelligence and data manipulation tools now promise to permit IfATE to increase the scale of data and analysis we can deliver in support of the decisions employers take in our prioritisation, creation and approval of apprenticeships and technical qualifications. Here, we outline IfATE's plans to meet this challenge.

Jonathan Mitchell
IfTAE

Regular readers of this bulletin will need no introduction to the many challenges and opportunities facing those of us – for instance at IfATE – tasked with shaping skills training for the labour force of today and tomorrow. Every day, we learn more about how industrial innovation, advances in technology, major shifts in prevailing workplace cultures, evolving national and global priorities, and many other factors are exercising transformative impact on employers' workforce demands. This affords great opportunity for businesses and individuals.

Yet often by the time those transformations make it into the public consciousness, nascent skills demand in new capabilities has already begun its transition from a potential skills shortage to an emerging skills shortage. We know of instances where change has appeared to leapfrog these stages to become an urgent skills shortage, on which economic growth is contingent, almost overnight.

Because this process is happening all of the time, the attention of employers can understandably be dominated by the skills shortages of yesterday and today, leaving little capacity for worrying about tomorrow. In consequence, the skills system reflex has sometimes tended to take the form of discrete, single-purpose responses to urgent need, stimulated into life by a wide range of individual bodies working in isolation, and adding, in their proliferation, to the complex ecosystem that users of all kinds tell us they struggle to navigate.

Research carried out by IFF Research for IfATE in 2023 showed that the most important factor affecting employers' confidence to engage with the skills system was knowledge that the training content 'is relevant and up-to-date for the needs of your sector'. 83% of employers surveyed said that this was important to them when assessing whether an apprenticeship or qualification would lead to a suitably qualified employee – more than any other factor.

Both revisions to existing products and the development of new system responses to changing labour market requirements depend on reliable detection of emerging skills need as early as possible. Up to now, IfATE has depended for the acquisition of this intelligence on what can be provided by its employer-led trailblazer groups, route panels and wider sector engagement carried out by officials.

But it would not be unreasonable for employers to expect government to curate more insight and intelligence in support of this work than we have done so far. Advancements in artificial intelligence and data manipulation tools now permit us to radically increase the scale of data and analysis we can deliver in support of the decisions employers take in our prioritisation, creation and approval of apprenticeships and technical qualifications.

In this context, IfATE has been working with Innovate UK's Workforce Foresighting Hub: its work will assist in the detection of future skills (i.e. the skills necessary to adopt and exploit innovative technologies and shape the future workforce). We are now extending our efforts into the detection of emerging skills (i.e. those already beginning to appear as requirements in the labour market, but which may not yet have become universal within specific occupations) through the development of the SkillsCompass tool.

With SkillsCompass, we will gather and analyse data from a wide but manageable range of sources in support of this work. These will include the outputs of the Workforce Foresighting Hub, job vacancy data, other labour market analyses, the insights drawn from our own employer networks, LSIPs and other intelligence drawn from evolving partnerships with regional bodies possessing devolved skills budgets and powers, and data that shows the sorts of emerging skills being addressed currently through rapid response provision such as Skills Bootcamps.

We are aiming to deploy Large Language Models to cross-reference these data with our own data in employer-specified occupational standards, so that we can identify gaps, or where skills currently situated in existing occupations may need to transition into other occupations. The Standard Skills Classification being developed by Department for Education's Unit for Future Skills (UFS) with support from the Institute for Employment Research (IER) will form a critical bridge

between and within datasets that will support this. We expect to be able to detect not only changing skills demand, but also the urgency of required action, and the likely scale of demand over time.

We know that there are many other organisations developing similar approaches using the same technologies to collect this sort of insight. Rather than seeing ourselves in competition with these, we want to find ways of bringing the insight together, supporting IfATE's unique role in converting the widest possible range of insights into appropriate Skills System responses.

Particularly important to us is that this action leads to coherence and navigability in the skills system in England. Our Future-Facing Innovation Strategy and Simpler Skills System reports (both 2023) laid out the foundations of this structure, brigading response types into three types. 'Embedded' responses (involving updates or creation of occupational standards – and flowing through into IfATE's apprenticeships and technical qualifications) will happen when changing skills demand has become the norm in an occupation. But we will also need to develop 'Dynamic' responses to meet nascent demand before this has happened – most likely by stimulating awarding bodies to develop technical qualifications within the 'Additional Specialist' category in a range of technical qualifications. More urgent and agile 'Rapid' responses will also be needed, to support short-term training in changing skills. We think there is scope to explore how the Skills Bootcamp model can help address this requirement.

We are still quite near the beginning of this work, but progress is gathering pace. It is a profoundly collaborative endeavour, and we are working closely with a huge range of organisations, including the Gatsby Charitable Foundation which is supporting the project. Among others, Edge, WorldSkills UK, InnovateUK, Enginuity, West Midlands Combined Authority, IER and our friends at the Department for Education and its UFS are all contributing generous insight, guidance and challenge as we take the work forward.

The door to add to this number remains firmly wedged wide open. We want to ensure that our approach and its outputs satisfy the widest possible range of requirements, and readers of this bulletin are encouraged to reach out to IfATE where there is the potential for valuable collaboration.

Mapping Local Essential Skills Needs in England

Learning and Work Institute

Essential skills, including literacy and numeracy, are increasingly crucial for life, work and economic growth. However, in the UK, nine million adults have low literacy and/or numeracy skills. Worryingly, in England the number of adults improving these skills has reduced by more than 60% over the past decade as Government investment in skills is set to be £1 billion less in 2025 compared to 2010. As a result, on current trends, it would take over 20 years for every adult to get the help they need.

Devolution of the Adult Education Budget, a significant proportion of which is spent on adult essential skills learning, and locally commissioned programmes, such as the Multiply adult numeracy initiative and UK Shared Prosperity Fund activity, provide an opportunity for Mayoral Combined Authorities and local authorities to work with providers to ensure that provision reaches those who have the most to gain from participating. Indeed, local authorities were required to develop data-informed local investment plans for these programmes to inform delivery.

Yet data on the level of essential skills needs (as opposed to participation in essential skills learning) is hard to find. Most estimates rest on the OECD's 2013 Survey of Adult Skills (PIAAC) and the last comprehensive national survey was the 2011 Skills for Life Survey. Although a new set of OECD results is expected later this year, it won't provide the level of local granularity needed to inform delivery.

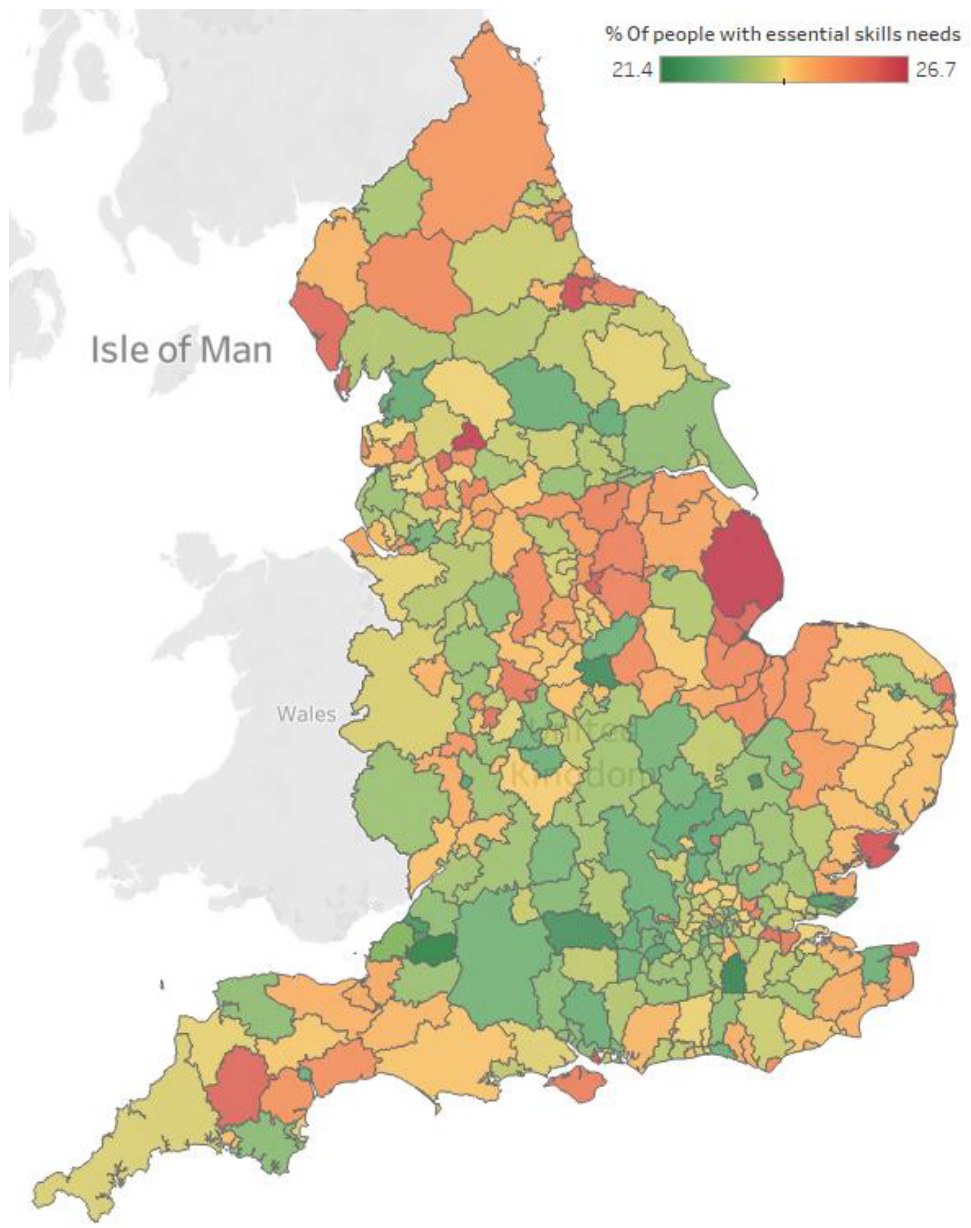
Modelling local essential skills needs

Learning and Work Institute (L&W) worked with a number of local authorities and Mayoral Combined Authorities to develop an essential skills model to fill this gap in local data, subsequently extending the model to cover the whole of England. Taking England level data from the OECD survey on the likelihood of having low essential skills by characteristics such as age,

qualifications and labour market participation, the model applies this to other data sources, including census data and the Labour Force Survey, to give more up-to-date indicative proportions and numbers of people with low essential skills, at local authority and ward level.



Figure 1. Essential Skills Needs in England by Local Authority



The modelling reveals that, while essential skills needs can be found in all parts of the country, there are disparities within local areas that far exceed the differences between local and combined authorities across the country. Pockets of high need exist in every region, with areas of lower overall need masking pockets of high need, and the reverse. For example:

➤ London has the third lowest percentage (23.2%) of people with essential skills needs among the Mayoral and combined authorities, yet it is also home to 10 of the 20 wards with the highest essential skills needs. Due to population size, it also has the highest number of people (more than 1.4m) with low essential skills.

➤ Greater Manchester Combined Authority has the third highest percentage (24.4%) of essential skills needs amongst the combined authorities but also includes 6 of the 20 wards in England with the lowest percentage of essential skills needs nationally.

L&W’s briefing [Modelling Essential Skills Needs across England](#), provides more detailed analysis and breakdowns by combined authority and local authority areas. The data can also be viewed online in an [interactive map](#).



Policy implications

This evidence highlights a need to set a high ambition for adult essential skills. In the context of further devolution of the Adult Education Budget (or from 2024/25 the Adult Skills Fund), it also reinforces the value of a national statutory entitlement to fully funded English and maths up to Level 2 for adults, to ensure that anyone who needs it can access essential skills learning anywhere.

Over the past decade, the level of investment underpinning this entitlement has fallen by over 50%.

L&W believes that the Government should develop a plan to reverse falling investment, and aim for 90% of the population to have the essential skills they need for life and for work by 2035, compared with 75% today.

Although the broad entitlement to essential skills learning is important in addressing these needs, L&W's modelling suggests achieving significant impact on essential skills levels will also require that this investment – at any level – is targeted effectively. There is a clear role for devolved adult skills commissioners and local areas, working with providers, to ensure that places with the highest needs benefit from the support available.



Adult participation in essential skills learning has declined by over 60% in the past decade, alongside huge cuts to adult skills budgets. Ultimately, greater focus at the national level, including increased investment, is needed to reverse these trends. Alongside this, understanding where need is greatest can help learning providers and local policy makers target resources such as Adult Education Budget and Multiply provision effectively, to ensure that those who stand to benefit most get the support they need.

Alex Stevenson

Head of Essential and Life Skills, Learning and Work Institute

Closing the Skills Gap

British Chambers of Commerce

In 2019, the British Chambers of Commerce (BCC) convened an independent commission to help firms unravel the age-old conundrum of the UK's skills gap and to improve investment in training. The inquiry revealed a huge disconnect between local employers and the education and skills system. It found 61% of recruiting firms were struggling to find people with the skills they needed and almost half (45%) had reduced their investment in training – a trend that had been growing throughout that decade.

The Launch of Local Skills Improvement Plans (LSIPs)

The Workplace Training and Development Commission was clear that businesses needed a stronger voice in skills planning. In mid-2021, this led to the Department for Education (DfE) asking eight Chambers to be trailblazers for Local Skills Improvement Plans (LSIPs). They were tasked with making education and training provision more responsive to employers' needs. Fast-forward to 2024, and Chambers are now designated by the DfE to lead 32 of the 38 LSIPs across England, with their Plans all now in place. The pace of change has been dizzying, with a huge amount of business engagement and learning taking place across the Chamber Network. Recently the BCC commissioned an independent expert to assess the impact of business led LSIPs to date and identify next steps to improve them.

Are LSIPs working?

This report, *Bridging The Skills Gap*, found that LSIPs are already making a positive difference for local employers and providers. For example, Business West set up a successful collaboration between GKN Aerospace and the West of England Institute of Technology to upskill redundant workers following the closure of Honda's Swindon factory. Initiatives like this should lead to more people being able to access the training they need for great jobs in their local area. More employers are now engaged, and their expectations have been raised. Providers have welcomed the granularity of data that LSIPs have provided.

However, the report points out that LSIPs are a process of change, that the level of transformation required will need more time, an employer-led approach, and a Government commitment to longer term investment.



The role of Chambers

With Chambers already deeply integrated into their local business communities, they possess first-hand insights into industry needs and dynamics. This gives them a direct and practical understanding of the skills required by businesses of all sizes, across all sectors. They have adopted a critical translation and interpretation role, helping employers to identify and articulate their skills needs and how this relates to the language of the skills system. The status of Chambers as politically neutral entities also fosters credibility, making them trustworthy intermediaries - capable of accelerating collaboration among diverse stakeholders.

Engagement

The report found that the LSIP process is encouraging more employers to collaborate and engage positively with the skills system. And it is changing attitudes and behaviour regarding their role in addressing skills shortages.

There is growing evidence of Chambers engaging employers who had not previously spoken to education and training providers. They were also found to be directly influencing employers to become actively involved in skills solutions. Chambers have reported success in bringing business and education together in meaningful discussion, allowing them to find common ground on which to build purposeful action.

Challenges

The research also uncovered some challenges for Chambers, mainly around grappling with the complexity of the landscape and its numerous, interested stakeholders. Barriers were sometimes reported due to bureaucratic complexities and overlapping jurisdictions with other agencies and institutions. Differing priorities among Chamber-led LSIPs, local authorities, and Local Enterprise Partnerships (LEPs) had also occasionally resulted in varied approaches to skills development, hindering cohesive planning.

The report also found frustrations with the limited scope the Plans have to operate in. The focus of LSIPs was originally intended, by DfE, to be on specific technical skills. But Chambers discovered that employers also want cross-sectoral 'soft' skills such as communication and team working. In response, many LSIPs have

promoted innovative collaborations with employers to help encourage and promote these skills.

Funding

The money to action LSIP priorities has been flagged as a barrier to further progression. The Local Skills Improvement Fund is limited in scale, duration and revenue spend. More time is needed to bed in the significant changes in culture and collaboration between education and employers, to make the Plans fully effective. Longer term funding is needed to stabilise the process and maintain momentum.

The Way Forward

The strength of the local approach to skills is that it allows for finely tuned LSIPs, tailored to specific local contexts. But it is also important to recognise areas of commonality, as well as hyper-local priorities. The active employer engagement, created by LSIPs, provides an opportunity to inform and drive national strategy - creating a connection that is currently missing and allowing the voice of SMEs to be truly heard at national level. The British Chambers of Commerce network can act as this conduit, fostering collaboration at the national level by taking the valuable insights and strategies developed by different Chambers, and feeding them into Government.

There is a huge potential for LSIPs to build on the employer-led system, improve strategic planning, maximise the impact of skills funding and boost employer investment. But it needs politicians to commit to the plans for the long-term, to give the scheme the stability and certainty it needs to push forward.



If we get it right, the potential of LSIPs is phenomenal. It is an ongoing process that identifies business growth ambitions, the people and skills they need to achieve that growth, and the training needed for people to benefit from these opportunities. We need the LSIPs to stay business led, and to remain a key part of the government's long-term skills strategy. Without that commitment – the hard work already achieved risks being undermined.

Jane Gratton

Deputy Director Public Policy at the British Chambers of Commerce

Automation Does Not Mean Fewer Jobs – It Means Different Jobs

Freya Thomas Monk, Pearson

Preparing for the workforce of the future: Pearson's new Skills Map of England shows that, while 2 million jobs will be impacted by automation and augmentation by 2027, 2.4 million new jobs will be created.

It's hard to avoid reports that automation and augmentation will take over numerous jobs in the coming years. Of course there is no doubt that technology will impact the workforce of the future, but you might be surprised to see that our new [Skills Map of England research](#) shows that there will be more jobs available across England in four years' time. While 2 million jobs across England may be lost owing to automation and augmentation by 2027, the same drivers are expected to create more than 2.4 million jobs, a net increase of 390,000 new roles.

With unprecedented changes in the employment landscape ahead, it's imperative that we equip ourselves with the knowledge and tools to navigate these shifts effectively. That is why we released this new research - exploring the workforce changes in each of England's nine regions between now and 2027, showing which sectors are likely to expand and which are set to shrink, based on the number of jobs available. We also looked at the current skills in demand from employers, as well as those growing in importance, finding that:

- **The IT Sector will see most growth:** The IT sector is expected to expand its workforce by the greatest number of employees (+365,000), closely followed by Transportation and Storage (+215,000)
- **The Retail Sector to shrink the most:** The Wholesale and Retail Trade sector is expected to have 170,000 fewer jobs
- **'Human Skills' are the most in demand:** The most in demand skills are currently predominantly human, transferable skills such as communication and teamwork
- **London, the North West and South East regions** will see the most jobs disrupted by technology

So how do we bridge the gap between the roles disappearing and the new ones being created? This is the challenge ahead for job seekers and decision makers - policymakers, educators or employers - as they plan for the years ahead and look to support workers to reskill or upskill into emerging available roles.

The key lies in understanding the ebb and flow of opportunity across different sectors and efficiently transitioning displaced individuals into these emerging career paths. To achieve this, local regional leaders need a tailored, localised plan that leverages regional strengths. We have three key recommendations for policymakers, as they plan for the years ahead:

1. **Further devolve skills and employment funding to combined authorities** - Local leaders are best placed to understand local labour market conditions, and to work with local employers and education providers to support the development of future skills.
2. **Act now, to help the workforce adapt** - There is an immediate need to support those in roles at risk, and to consider how these people can be upskilled or reskilled to meet the needs of the growing sectors of the economy.
3. **Use data to plan for the future** - Evidence-led policy making will deliver the most effective outcomes. Policymakers should utilise private and public sector data to ensure skills policy is forward looking, and to ensure that we are planning for the jobs of the future.

Economic success hinges on the delicate balance between the skills of the workforce and the needs of employers. Regions with a flexible and adaptable workforce that can more readily anticipate and embrace new opportunities over the next five, ten, or even fifty years, are the most likely to thrive.



Evidence-led policymaking, driven by private and public sector data, ensures that decisions are forward-looking and aligned with future workforce trends. Pearson advocates for regular data exercises in devolved areas to keep policymakers informed and empower them to make informed decisions.

In the journey toward a future-ready workforce, Pearson's Skills Map of England acts as a guiding compass. The challenges posed by technological transformations are significant, but the opportunities for growth and adaptation are equally vast.

Policymakers, educators, and employers must heed the call to action, embracing localised strategies, proactive measures, and data-driven decision-making to ensure that England's workforce not only survives but thrives in the face of change.

Freya Thomas Monk

Managing Director of Vocational Qualifications and Training, Pearson

Degree Apprenticeships in England: what can we learn from the experiences of apprentices, employers and HE providers?

Edge Foundation

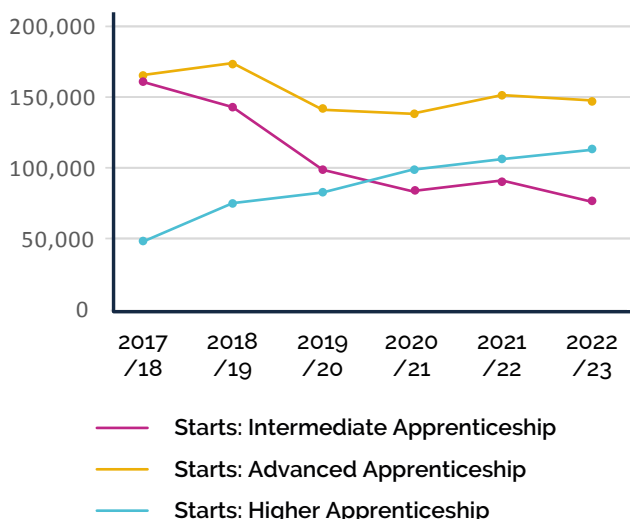
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Former Minister for Skills Robert Halfon has on multiple occasions remarked that 'Degree Apprenticeships are my two favourite words in the English language'. Degree apprenticeships (DAs), launched in 2015, offer opportunities to study at a degree level while in full-time employment, typically studying one day a week at a university and four days a week at work for 3-5 years. In forthcoming research preliminary presented here, the Edge Foundation share some early findings on our investigation into stakeholder experiences.

Degree Apprenticeships (DAs), are touted (as Halfon puts it) as combining 'the best of vocational and academic education, allowing young people to learn while they learn and remain free of student debt'. They are intended to help stimulate investment in training, enhance productivity, and address skills shortages. Apprentices benefit from immersion in a workplace environment whilst accessing degree level tuition. There are around 100 standards. The number of apprentices are growing, and higher apprenticeships of which DAs are a key part) are growing as a portion of total apprenticeship numbers. From 2017-18 to 2022-2023, level 6 apprenticeship starts (the majority of which are DAs) grew from 5,491 to 46,800. DAs are intended to be employer-led, and are funded by the Apprenticeship Levy at a rate of 0.5% of employers' payroll bill over £3 million. They are available across most sectors and are championed by prestigious employers including Visa, PwC, and Jaguar Land Rover, and delivered in partnership with roughly 100 higher education providers, including Russell Group universities. Recently launched and announced DAs include [space engineering](#) and [teaching](#). While policy and public perception of DAs seems positive, [employers have raised concerns that the levy and DAs are insufficiently](#)

[flexible](#) to support their training needs. Others worry that the increase in expensive DAs taken up by employees already in the workforce is [to the detriment of resourcing and support for apprenticeships to help young people enter the workforce](#).

Figure 1. Apprenticeship starts by level



Source: ONS Apprenticeships, Academic year 2023/24.

With such interest in DAs as they approach their 10th anniversary, the Edge Foundation with partners from the Universities of Bath, Oxford, Huddersfield, and Birmingham, has conducted an investigation into the experiences of stakeholders around DAs. Our team conducted interviews with nearly 100 stakeholders, including large employers, SME employers, Education and Training Providers (ETPs), apprentices, and policymakers. Together, we have considered their motivations for engaging with DAs, what challenges they perceive, and their hopes for future of DAs. Hitherto, much research around DAs has been quantitative, or limited to small case studies at small numbers of ETPs and employers. Our data provides a rich, illustrative portrait across employment sectors.

Here, we outline two key themes from the research. Firstly, stakeholders had a diverse appreciation of specific workplace-focused content versus theoretical content. Secondly, DAs depend on not just employer leadership but a multiplicity of mutually collaborative relationships which can be challenging to foster and manage.

Proximity of learning to workplace

One of DAs' defining features is their aim to make classroom-based learning relevant to the world of work. When we spoke to apprentices and employers, they reported variable experiences as to how studies and employment aligned. This differed even within

employment sectors and within courses. There were tensions in how far tutors and taught course content could stay at 'the sharp end' (SME Employer 02) of employer realities, given how rapidly industries and technology were changing, particularly around health, allied health, and digital DAs. One interviewee recalled how:

'We had one person for instance ... delivering a mental health module. And they were teaching ... and [my colleague] ran out, she's like, please can you stop this lecturer! He is teaching them stuff that has not been delivered in mental health for 15 plus years, literally had to go in and stop him!' (ETP & Employer 03)

One nursing degree apprentice, generally positive about the applicability of their formal learning, felt that broader modules such as 'sustainable public health' were 'wishy washy' (Apprentice 13). Another apprentice, studying chemistry, appreciated the 'generic' science provision despite that this was 'not always totally relevant to exact work' (Apprentice 14).

While the utility of some learning was not always immediately evident to apprentices, apprentices reported that it often became relevant over time. One level 7 MBA degree apprentice reflected on their initially combative encounter with academic theorising of a practical area they considered themselves already an expert in ('why do I need to learn all this rubbish?



Why can't I just get on with it?'). However, while still sceptical, they described how they came round to the idea of developing a dialogue with the material using it to inform and evaluate their practice (Apprentice 18). Other apprentices similarly reported through their apprenticeship they had come to appreciate using academic knowledge as 'theoretical tools' (Apprentice 21) to justify and inform their practice. As one SME apprentice described, they were otherwise 'making things up as we go along', and that it was helpful to 'justify some of the reasons why we're doing something' (Apprentice 04).

Employers also recognised these benefits. As one employer put it: 'this is one of the reasons why I love apprenticeships, is that ability to merge that theory into exactly what they're doing' (Large Employer 09). Off-work learning raised novel perspectives employers and apprentices may not have realised were relevant and brought them back to their employers. As one technology SME put it, learning on-the-job was 'good for practical problem solving', but in excess this would mould them into:

specialists with only the stuff that we do right now. What I actually want from them is to be a broad-based developer, which means that they actually have to understand the breadth of computer science. So the fact that that isn't directly applicable, doesn't bother me, I actually like that! (SME 12).

This style of learning, 'the opportunity to learn the theory, apply it, evaluate it, ask questions, come back to it, practice it, develop skills' was further endorsed by providers. It aligns with 'theories of learning' and resulted in 'quicker' learning (ETP & Employer 01).

Collaboration

This sort of integration was, we found, contingent on effective relationships between employers and providers which were not always easy to foster or maintain. Some employers we spoke to felt providers were not always flexible enough in recruitment or design. In a number of ways, providers struggled with the delivery of DAs, particularly around resource, compliance (e.g. Ofsted or ESFA funding rules) and were insufficiently able to adapt their operations to delivery of DAs. We heard from employers that providers were 'bolting on' apprenticeship requirements to existing degree courses.



ETPs we spoke to increasingly recognised that effective DAs required separate development from their existing undergraduate offer. To help with this, where ETPs had good relationships with employers or were delivering learning through employers, they could draw on employer materials and resources to help align learning with workplace conditions. Sharing experience and knowledge to co-deliver learning meant, as one university put it, 'I can truly say, from the heart, this is for the first time, we are truly, truly kind of employer-driven' (ETP 01). Another SME described how in their relationship with their provider, 'we don't see them as a supplier, we see them as a partner' (SME Employer 08).

These sorts of relationships were difficult to develop. As one provider described:

'stakeholder relationships are really important, and challenging and rewarding all at the same time. But they're very time consuming. And that isn't always factored into the university programme. Well, it's not factored in' (ETP 17)

Specific initiatives also faced issues. For example, one way to integrate work and learning is to hire tutors with extensive industry experience. However, such tutors, one ETP described, were 'hard to work with', 'very expensive', lacked teaching expertise, and were risky as they were often not contractually obliged to teach for any fixed term (ETP 18).

Some particularly large employers, in sectors such as health and engineering, had taken on most of the responsibilities in delivery of learning to the extent that they became the 'main provider of apprenticeships ... we have our kind of validating university, so they rubber stamp the certificate, but otherwise we do all the delivery' (ETP & Employer 03). In health in particular this mirrors older modes of delivery such as nursing training programmes. But the migration of teaching within employers was only plausible for large employers and was not without its own problems. Placements were still often limited by availability, and ETP partners reported taking on new roles in coordinating between employers to ensure apprentices obtained a range of experiences (ETP 03). Employers involved in delivery meanwhile still experienced misalignments between 'what's nationally stipulated and evidence based on what actually



happens in practice' in areas with strong professional requirements (ETP & Employer 02). Across the spectrum of DAs, while collaboration was recognised as important and often more than transactional, levels and patterns of collaboration varied widely as a consequence of limited resources.

Conclusions

Throughout the findings, there was a strong sense of the diversity of DAs in their development, design, and delivery, derived from the differences between the coalition of interests between policymakers, employers, and ETPs which sustain them. Consequently, we identified variability in terms of quality of experience for apprentices. But given the relative recency of DAs, we found much good practice and a number of clear directions of travel for the delivery of DAs. Good multidirectional collaboration between ETPs, employers, and apprentices, was critical for improved outcomes for employers and authenticity of learning for apprentices. But forming such relationships was still hard, and our evidence indicated that such efforts may be challenging to sustain. In the current political climate, interviewees were anxious as to future changes to funding arrangements which could affect DAs. Following the previous 10 years DAs have had to develop, further stability would continue to support positive developments in ETP-employer relationships, and help deliver programmes that are responsive to national and employer needs.



Andrea Laczik
Director of Research

Degree Apprenticeships represent a brilliant forum for employers and providers to come together and develop high quality experiences for apprentices. The testimonies we have explored in this research evidence in concrete ways how the mode of study DAs offer enables new and productive intersections between degree-level learning and workplace requirements. As we consider the future of DAs ahead of the next general election, we remain concerned that stable support is available to help support these good relationships and provide opportunities for young people to gain such valuable experiences.

Overview: Gen AI: Sculpting the workplace of the future

Kat Emms, Edge Foundation

Artificial Intelligence (AI) has emerged as a transformative force across various sectors, revolutionising the way we work, communicate and live. While AI promises unprecedented efficiencies and advancements, its integration into the labour market raises significant questions about the future of work and the skills required to thrive in this evolving environment.

Employers expect AI to be a significant labour market disruptor, along with technologies including agriculture technologies, digital platforms and apps, e-commerce and digital trade. World Economic Forum's (WEF) Future of Jobs Report 2023 predicts that 23% of global jobs will change in the next five years due to industry transformation, including through artificial intelligence and other text, image and voice processing technologies.

The launch of ChatGPT in November 2022, with similar AI systems closely following, was a turning point in terms of the access of large language models (LLMs) easily and openly available to the public. These LLMs are easy to access and can automatically perform a wide range of prompted tasks, from writing to producing graphics to computer programming. Like never before, this has given individual employees the capacity to allow AI into their work lives and job roles, with a click of the button handing tasks over to a machine. At the same time, it has handed over power to employers to decide which jobs are rendered necessary, and which not, in the face of Gen AI. Making, therefore, the loss of jobs a real threat in the presence of these technologies.

Adoption and shifting job tasks

WEF's Future of Jobs (2023) survey of 803 companies – collectively employing more than 11.3 million workers across 45 countries - looked at which technologies companies were most likely to adopt by 2027. Approximately 74.9% of companies are looking to adopt AI technologies in the next five years. Yet predictions by employers may pan out a slower pace than initially

anticipated, as suggested by the previous WEF survey in 2020, which predicted that almost half (47%) of business tasks would be automated in the following five years. However, in the 2023 survey, employers revised down their expectations for future automation to predict that 42% of business tasks will be automated by 2027. Meanwhile a 2023 study by Eloundou et al. reveals that around 80% of the U.S. workforce could have at least 10% of their work tasks affected by the introduction of LLMs, while approximately 19% of workers may see at least 50% of their tasks impacted. The projected effects span all wage levels, with higher-income jobs potentially facing greater exposure to LLM capabilities and LLM-powered software.

While automation poses challenges for workers whose roles are rendered obsolete, Gen AI also has the potential to improve workers job roles through increased productivity, allowing machines to do tasks that workers find repetitive and time-consuming. Brynjolfsson et al. (2023) provide an example of such productivity gains in the real-world workplace at a micro level. They studied the adoption of a Generative AI tool that provides conversational guidance for customer support agents. Their research finds that access to AI assistance increases the productivity of agents by 14%, as measured by the number of customer issues they are able to resolve per hour. Furthermore, these gains accrue disproportionately to less-experienced and lower-skill workers. They conclude that this is because Gen AI systems work by capturing and disseminating the patterns of behaviour that characterise the most productive agents.

While the benefits of Gen AI may be felt disproportionately across those of different skill levels, Calvino and Fontanelli's (2023) research for the OECD also found differing levels of usage of AI across different types of organisations. The analysis of firm-level surveys from 11 countries (Belgium, Denmark, France, Germany, Ireland, Israel, Italy, Japan, Korea, Portugal and Switzerland) found that the use of AI is prevalent in ICT and Professional Services and more widespread across large – and to some extent across young – firms. They also concluded that AI users tend to be more productive, especially the largest firms. The analyses also discovered there to be several complementary assets that are significantly linked to AI usage. These notably include intangibles, such as ICT skills and training, firm-level digital capabilities, as well as digital infrastructure.

Changing technological skills and growing 'human' skills

Further benefits to the integration of AI tools have been explored in OECD's Employment Outlook 2023, which looked at experiences of early adopters of tools like computer vision and natural language processing. In 2022, they surveyed over 2000 employers and 5300

workers in the manufacturing and finance sectors of seven countries, as well as speaking directly to stakeholders in these sectors. According to employers, not only has AI increased the importance of specialised AI skills but it has increased the importance of human skills to an even greater extent. Similarly, WEF (2023) highlight that employers estimate that 44% of workers' skills will be disrupted in the next five years. Cognitive skills are reported to be growing in importance most quickly, reflecting the increasing importance of complex problem-solving in the workplace. Analytical thinking and creative thinking remain the most important skills for workers in 2023, with creative thinking to be growing in importance slightly more rapidly than analytical thinking (ibid.).

Technology literacy is the third-fastest growing core skill amongst employers (WEF, 2023). And while AI and big data proficiencies specifically rank only 15th as a core skill for mass employment today, it is a top three priority in company training strategies between now and 2027, and number one priority for companies with more than 50,000 employees. Companies report that they will invest an estimated 9% of their reskilling efforts in this area – a greater proportion than the more highly-ranked creative thinking. Though generative AI has the potential



to displace jobs, the focus placed on training workforces to exploit AI and big data indicates the opportunities for new roles which harness its potential to help achieve organisational goals. Furthermore, two out of five employers consider that the lack of adequate AI-related skills is a barrier to using AI at work (OECD, 2023). The National Audit Office (2024) recently observed that many government departments were exploring opportunities to use new AI technology, however 70% of government bodies responding to their survey reported that a lack of skills were a barrier to AI adoption. Such adoption of new technologies would ultimately bring huge benefits to public services. While some companies, particularly early adopters, may provide some training for AI, formal education and employer training will need to play a significant role more broadly to overcome this major barrier to adoption.

Job satisfaction and well-being

Beyond changing skills needs of employees, AI also has potential to impact job satisfaction and well-being of individuals. The biggest impact highlighted by the literature so far has been on job quality. Workers and employers report that AI can reduce tedious and dangerous tasks, leading to greater worker engagement and physical safety. Nearly two-thirds (63%) of workers reported that AI had improved their enjoyment at work by automating dangerous or tedious tasks, allowing them to focus on more complex and interesting ones (OECD, 2023). Conversely a recent study by IFOW (2024) found that although quality of life positively correlated with frequency of interaction with ICT such as laptops, tablets, smartphones and real-time messaging tools, a negative correlation was observed between quality of life and the frequency of interaction with newer workplace technologies (e.g. wearables, robotics, AI and ML software). There could be several reasons for this. There are reported cases of AI automating simple tasks and leaving workers with a more intense, higher-paced work environment. AI can also change the way work is monitored or managed, which may increase perceived fairness, but also poses risks to workers' privacy and autonomy on execute tasks (OECD, 2023).

Notwithstanding the potential benefits of AI adoption, anxieties associated with jobs being entirely replaced by new technologies is a major source of stress for employees. OECD (2023) found that three in five workers are worried about losing their jobs entirely to AI in the next ten years, particularly those who actually work with AI. Numerous other studies have

found that this heightened prospect of automation is linked to job insecurity, feelings of purposelessness and a spectrum of health issues including anxiety, depression, burnout and poorer overall health outcomes (Abeliansky & Beulmann, 2019; Hinks, 2021; Nazareno & Schiff, 2021; Schwabe & Castellacci, 2020; Turja et al., 2022; Xu et al., 2023).

Job losses

These anxieties are not entirely misplaced. Daugherty et al.'s (2023) analyses from O*NET and the United States Bureau of Labor Statistics reveals that tasks with the highest potential for automation by LLMs tend to be routine and repetitive. Therefore, their analyses found that the jobs ranking highest for potential automation are Credit Authorizers, Checkers and Clerks (81% of work time could be automated); Management Analysts (70%); Telemarketers (68%); Statistical Assistants (61%); and Tellers (60%). WEF (2023) also estimates that the largest losses are expected in administrative roles and in traditional security, factory and commerce roles. Surveyed organisations furthermore predict 26 million fewer jobs by 2027 in Record-Keeping and Administrative roles, including Cashiers and Ticket Clerks; Data Entry, Accounting, Bookkeeping and Payroll Clerks; and Administrative and Executive Secretaries, driven mainly by digitalisation and automation.

Evidence from the effects of more recent AI developments, such as the introduction of ChatGPT paint a slightly different picture, with evidence showing that higher-skilled workers being disproportionately affected by the release of generative AI tools. Hui et al.'s (2023) investigated the short-term effects of the introduction of ChatGPT in November 2022 on freelance





workers, focusing on writing-related services as the main affected occupations. They found ChatGPT has a substantial adverse effect on workers' employment outcomes. Freelancers in more affected occupations experienced a decrease of 2% in the number of monthly jobs and a decrease of 5.2% in monthly earnings on the job-matching platform, following the release of ChatGPT, compared to freelancers in less-affected occupations. They conclude from these findings that generative AI models act as a substitute for knowledge workers of all quality types, at least in the short term, effectively reducing their employment and earnings.

Job growth

Despite growing risks for both lower and middle skilled employees, as well as knowledge workers, there is some evidence that recent technological adoption will lead to the creation of new jobs within the economy. Daugherty et al.'s (2023) analysis finds that the adoption of LLMs is likely to create new roles within the categories of AI Developers, Interface and Interaction Designers, AI Content Creators, Data Curators, and AI Ethics and Governance Specialists. WEF's (2023) estimates that the demand for AI and Machine Learning Specialists is expected to grow by 40%, or 1 million jobs, over the next five years, as the usage of AI and machine learning drives continued industry transformation.

Conclusion

The most recent iterations and widening usage of Gen AI, such as ChatGPT amongst others, appear to be having the most immediate effect on job tasks rather

than fully replacing job roles in the short term, allowing some workers to be more productive. The distinctive difference we have seen with these most recent tools is the disruption to knowledge-based, higher skilled and creative job roles such as through image generation and writing-related tasks, as well as AI affecting routine and repetitive tasks. As has long been predicted, demand for certain jobs will continue to fall such as administrative and secretarial roles. At the same time jobs relating to AI will be increasingly widespread, such as AI developers and ethics and governance specialists.

Beyond these specific roles, jobs more broadly will increasingly require higher competence in human skills such as analytical thinking and creative thinking. Likewise companies are expecting their employees to have a certain level of AI literacy in order to effectively exploit its benefits. This requires government, educational institutions and employers to provide sufficient education and training that prepare workers for the jobs that will grow, as well as the digital literacy to confidently use AI in any workplace setting.

Although impact so far has been limited as adoption is slower than perhaps expected, it is clear the potential for substitution of tasks and whole roles will not be insignificant. The pace of change in these technologies is unwavering, and although we can in no way truly know what changes are afoot, the change is ultimately unfathomable. We must therefore prepare the current and future workforce with the digital skills to navigate the workplace and the human skills that currently distinguish us from AI.

The Transformative Role of AI in the Careers Advisers' Workplace

In the fast-evolving landscape of careers education, information, advice and guidance (CIAG), artificial intelligence (AI) is playing an increasingly pivotal role, revolutionising how careers advisers operate and interact with clients. From streamlining administrative tasks to providing 24:7 personalised CIAG (including the inbuilt option of speaking to a human adviser) AI technologies are reshaping the way professionals in this field design and deliver their services.

There are at least five advantages of AI in this context namely:

- (i) **scalability** – AI-driven CIAG can reach a broader audience, connecting to professionally trained careers advisers when needed;
- (ii) **personalisation** – AI can offer personalised recommendations based on interests, skills and occupational preferences;
- (iii) **data-driven insights** – AI can easily leverage big datasets and provide real time access to job vacancies and labour market trends, supporting well-informed choices;
- (iv) **cost-effective** – AI can quickly respond to frequently asked questions and make more in-depth guidance referrals to human advisers, if needed, thereby saving time and money within organisations; and
- (v) **empowerment** – AI-driven careers information and advice equips career guidance professionals to 'stay ahead of the curve' in keeping up to date with labour market trends, learning more about their clients/customers career exploration in advance of a 1:1 or group meeting, and analysing data trends to feed into local, regional and national education, skills and economic growth strategies.

There is an ongoing debate about the potential depersonalisation of the career guidance experience and the importance of preserving the human touch in guiding individuals to make meaningful career choices and decisions. The moral struggle lies in finding the right balance between the efficiency gains of AI and the empathic guidance that human careers advisers provide.



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Skills gaps in space: findings from the Space Sector Skills Survey 2023

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Space is one of the fastest growing sectors of the UK economy. In the past year we've seen the first launch from UK soil, the creation of the Astra Carta, an initiative led by the King to put sustainability at the core of space activity, and an investment by the UK Space Agency of almost £50m for space research, manufacturing and testing facilities in regional space clusters.

But space, like many other STEM sectors, is facing skills gaps. Last year we ran the second [Space Sector Skills Survey](#) on behalf of the UK Space Agency and the Department for Science, Innovation and Technology (DSIT). Just over 200 organisations responded, representing about 12,000 workers or 35% of the space workforce.

95% of respondents said they were experiencing some kind of skills-related challenge to do with their current workforce, recruitment, or retention. This was a big increase from 67% in 2020, and represents a major barrier to the growth of the sector.

Skills gaps

- 52% of organisations reported skills gaps in their current workforce.
- Of those reporting a skills gap in their current workforce, 72% have a gap in software & data skills, significantly higher than any other technical area. This is partly driven by a need for skills in AI & machine learning (41%) and data analysis & modelling (36%).
- These gaps are a result of struggling to hire new staff (48%), new staff not having the right skills (45%), and existing staff leaving (34%).

Recruitment

- 62% of organisations had recruited in the past 12 months, down from 70% in 2020.
- Of those, 80% had faced recruitment difficulties, significantly higher than the 2020 survey's result of 61%.
- The two most commonly cited reasons for recruitment difficulties were that applicants lacked the required specialist skills, knowledge, or qualifications (76%), or that there simply were not enough applicants in the first place (67%).
- The approximately 200 organisations completing the survey recruited for a total of around 1,500 roles over 12 months.
- About two thirds (72%) of roles were difficult or very difficult to recruit for, and only 10% were easy or very easy. The average role took a median of 10 weeks to hire for.
- Software & data and systems engineering have the most vacancies, together making up half (49%) of all vacancies.
- The most difficult roles to recruit for are electronics, systems engineering, and spacecraft operations. Of these, systems engineering is the most challenging area, where demand is high and it is also very difficult to recruit.
- More senior roles are harder to recruit for and take longer to fill.

Figure 1. Space lacks software & data skills



Areas where organisations report skills gaps in their current space workforce (n=103)

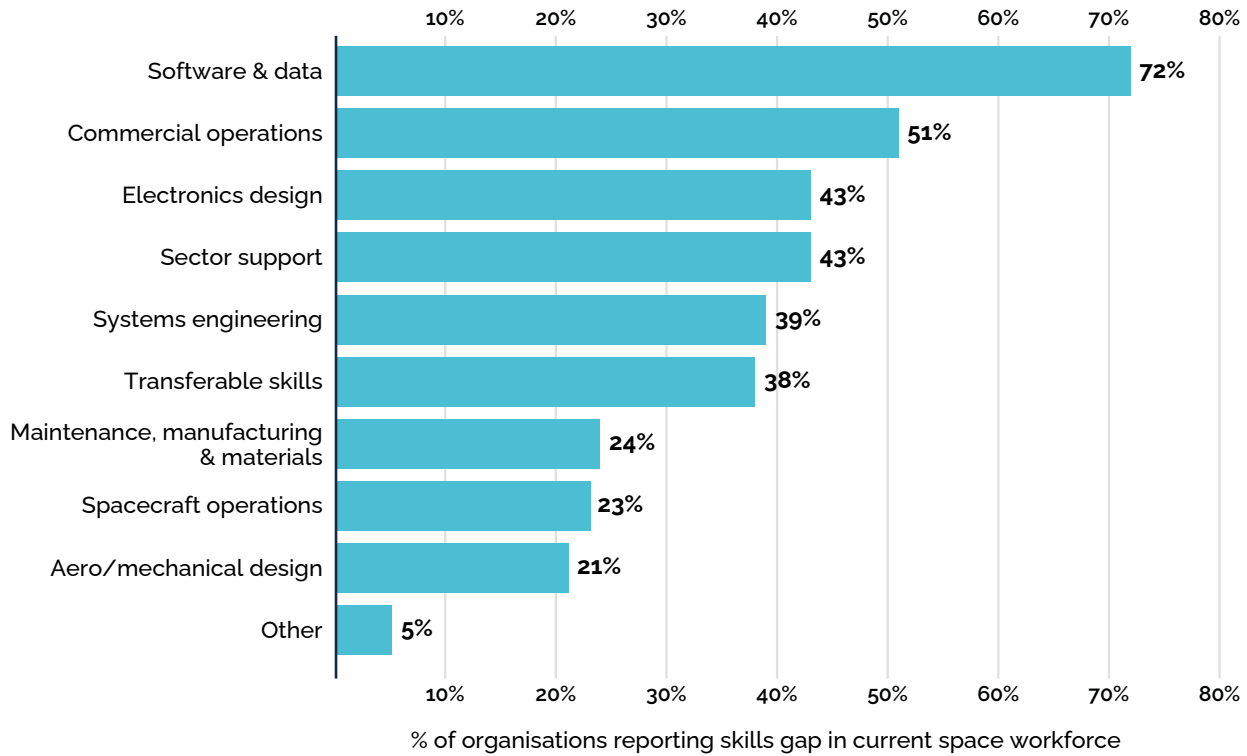
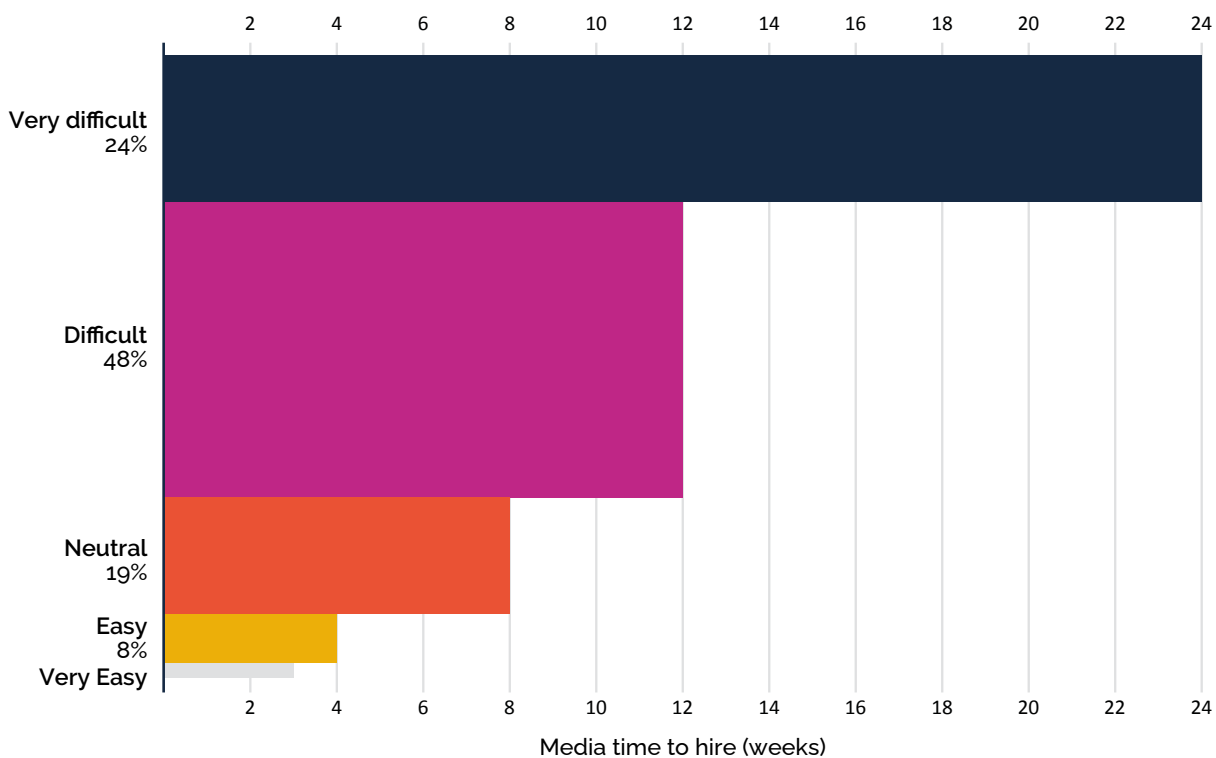


Figure 2. A quarter of space jobs take more that 5 months to hire for



Volume of vacancies at each difficulty level, and time taken to hire (n=834)



What can be done to address the space skills gap?

There is no silver bullet to solve the skills gap, but using data from the Space Sector Skill Survey and other sources we have created a [Space Skills Problem Map](#) and have a much better understanding of where the biggest problems are, and what targeted interventions might best address them.

This work requires a concerted and coordinated effort by industry, training providers, and policymakers. To encourage this, we have [set out five recommendations](#):

1. Create a space competencies framework
2. Adopt best practices for recruitment
3. Create more opportunities for young people to get experience
4. Make it easy for career changers to join the space sector
5. Make training more responsive and accessible

We believe these five mutually reinforcing actions will help expand the space sector's talent pool, increase the number of experienced people, and make it easier to adapt to changing skills needs. Since we made these recommendations in 2022, good progress has been made on several of them:

Space competencies framework: We have created [SpaceCRAFT](#), a competencies framework designed specifically for the UK space sector and based on analysis of space job adverts and the input of regional space clusters. The framework is supported by the UK Space Agency, and we are working with employers and training providers to further develop over the coming year. It was also used as the basis for the categories in the skills survey.

Best practices for recruitment: We have created the [Space Recruitment Toolkit](#), a collection of articles on recruitment best-practices tailored for space, and many space organisations have adopted them. The Satellite Applications Catapult now uses a recruitment platform designed specifically to minimise bias in recruitment, and has seen big improvements in the diversity of candidates for their Space Placements in Industry (SPIN) programme.



Opportunities for young people: Several organisations, including UKSEDS, the national student space society, run student competitions, and these have expanded in recent years and gained more industry support. The SPIN programme coordinated by the Satellite Applications Catapult and funded by the UK Space Agency has expanded to provide 150 of internships this year, double the number available in 2023.

Responsive and accessible training and opportunities for career changers: The Government's Space Industrial Plan, published in March, outlined goals for 2030 that included "increase access to high-quality, accessible, space training that is responsive to the changing needs of the sector and individuals within it, ensuring everyone (inside and outside of the space sector) can upskill or retrain throughout their career". The UK Space Agency has announced a new £1.7 million Training Programmes Fund for development of training to specifically address the issues identified in the Space Sector Skills Survey. In particular it aims to address the acute mid-career skills gap and to develop training that will enable career changers to move into the space industry from elsewhere. These programmes will be developed and delivered over the next year.

The UK Space Agency has also funded us to further develop our [Space Training Catalogue](#), a directory of more than 400 training opportunities for the UK and European space sectors that anyone can add to. This makes training more accessible, and makes it easier for employers and training providers to identify and address gaps.



Space skills gaps hold back the sector's growth and ability to innovate. Space employers struggle to recruit, facing fierce competition from other STEM sectors that pay more, especially for software and data skills that are in very high demand. In particular, hiring for senior roles is a challenge due to a lack of availability of experienced professionals and a bottleneck in upskilling junior and mid-level workers. When employers do hire successfully, their new staff do not have all the skills required, and training is required. Once trained, these staff are often poached by other space companies and the cycle repeats.

There are clear actions that the sector can take to address these problems, and good progress is already being made, but space is closely intertwined with other sectors, particularly technology and we cannot solve our problems alone. We are keen to share our knowledge, learn from other sectors and work together to address shared challenges, so please get in touch if you'd like to collaborate.

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