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Rethinking skills gaps and solutions

Working Paper 4 of The Skills Imperative 2035: Essential skills for tomorrow's workforce

Luke Bocock, Juan Manuel Del Pozo Segura and Jude Hillary,
National Foundation for Educational Research

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Published in June 2024 by
National Foundation for Educational Research
The Mere, Upton Park, Slough, Berks SL1 2DQ

www.nfer.ac.uk

Registered Charity No. 313392

ISBN 978-1-916567-08-5

How to cite this publication:
Bocock, L., Del Pozo, J. and Hillary, J. (2024). *Rethinking skills gaps and solutions. Working Paper 4 of The Skills Imperative 2035: Essential skills for tomorrow's workforce*. Slough: NFER.

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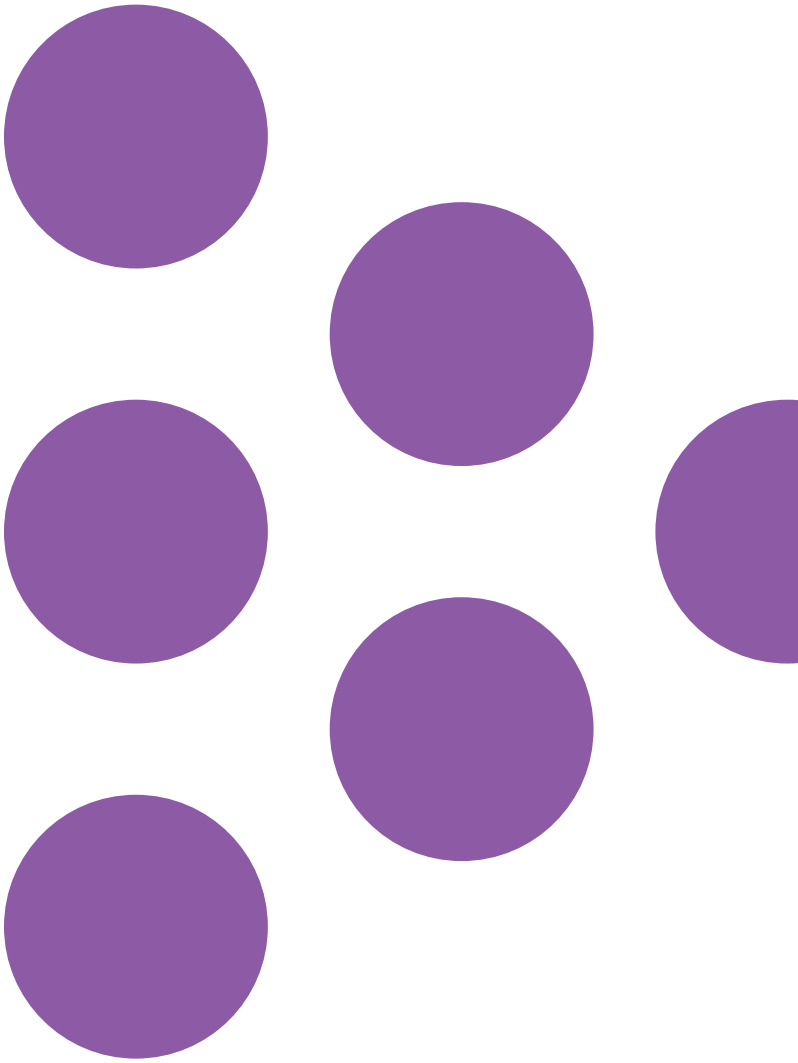


Acknowledgements

We would like to thank the Nuffield Foundation for funding this report which forms part of the wider research programme: *The Skills Imperative 2035*: Essential skills for tomorrow's workforce. We are particularly grateful to Emily Tanner from the Nuffield Foundation for reviewing the draft report and providing comments. We gratefully acknowledge the contributions of Carole Willis, Maddie Wheeler, Dr Lesley Duff, and Daniel Keel at NFER, who reviewed and commented on the report, and thank Neelam Basi for providing administrative support. Finally, we are grateful to Mary Curnock Cook CBE, Cheyrl Lloyd, Becci Newton, Tom Ravenscroft, and Professor Chris Millward, who are members of our Strategic Advisory Board and who all provided comments on the draft reports. The responsibility for the views expressed and for any errors lie with the authors. The opinions expressed in this report are those of the authors and do not necessarily reflect the views of Nuffield.

The Nuffield Foundation is an independent charitable trust with a mission to advance social well-being. It funds research that informs social policy, primarily in Education, Welfare and Justice. The Nuffield Foundation is the founder and co-funder of the Nuffield Council on Bioethics, the Ada Lovelace Institute and the Nuffield Family Justice Observatory. The Foundation has funded this project, but the views expressed are those of the authors and not necessarily the Foundation. Visit www.nuffieldfoundation.org

Foreword

Previous reports in this series have set the scene for a UK 2035 labour market changed significantly by technology and automation, demographic, and environmental factors. Many job roles and occupations are likely to reduce significantly in size while others, typically in more senior and professional occupations, are likely to grow. Our research has identified that a group of quite familiar core skills – we call them Essential Employment Skills (EES) – remain and grow in demand throughout this change period. These EES are: communication, collaboration, problem-solving, organising, planning and prioritising work, creative thinking, and information literacy.

These skills are not new; they are already most used in the labour market today, but they will be in even greater demand in future, particularly because they are most intensively utilised in the professional occupations that are expected to grow their share of UK employment in future. Further, they are the skills which will enable workers who are displaced by technology in future to transition to other parts of the labour market more easily.

For the first time, this research replaces familiar tropes and anecdotes about so-called 'soft skills' with quantitative evidence about these closely defined Essential Employment Skills. As well as quantifying just how many of our workers currently have significant deficiencies of these skills (13%), we project that this could grow to as much as 22% of the workforce by 2035. Unless action is taken, workers' skills deficiencies may hold back earnings growth and productivity as well as exacerbating skills shortages in the economy.

Using a novel survey methodology, this research has also considered skills utilisation from an employee perspective uncovering a significant minority of workers who have skills that are potentially being under-utilised and under-recognised by their employers, especially in mid- to low-level skill occupations. This is in stark contrast with the perspective of employers who think that skills gaps are most prevalent in low-skill level occupations. This mismatch of perceptions is a key finding that needs addressing by employers to unlock the latent skills potential of their existing workforce.

These findings set the stage for a deeper exploration of future skills needs and offer a roadmap for politicians, policymakers, employers and other stakeholders to prepare for the changing face of the UK's workforce in the coming decade. By fostering a proactive approach to skill development, we can build a resilient, adaptable, and thriving workforce prepared to meet the demands of tomorrow's economy.

Mary Curnock Cook CBE
Chair, Strategic Advisory Board
The Skills Imperative 2035

Glossary

Essential Employment Skills (EES)	The six skills that are anticipated to be most heavily utilised across the labour market in 2035. These are transferable skills, specifically: communication, collaboration, problem-solving, organising, planning and prioritising work, creative thinking and information literacy.
Skills Supply	The level of EES that people – specifically workers, the long-term unemployed and young people – possess across the six skill domains, derived from self-assessments of their behaviours, on a scale of 0-100.
Skills Requirements	Refers to the EES people need to do their jobs, across the six skill domains, on a 0-100 scale, according to the results of our survey. They are calculated using people's self-assessments of the *level* and *importance* of each skill required to do their job.
Skills Gaps	Refers to the skills gaps calculated based on responses to our survey, from Skills Requirements minus Skills Supply for each skill domain.
Skills deficiencies	Where a worker (or group of workers) has a Skills Gap, and the Skills Requirements for their jobs are greater than their Skills Supply, according to workers' self-assessments.
Skills under-utilisation	Where a worker (or group of workers) has a Skills Gap, and their Skills Supply is greater than the Skills Requirements of their jobs, according to workers' self-assessments.
Standard Occupational Classification (SOC)	The SOC system is the main system for classifying occupational information in the UK. Jobs are classified by their skill level and context. The UK introduced this classification system in 1990 (SOC90). It has been revised every ten years, with the latest update taking place in 2020.
Occupational hierarchy	At its highest level of classification, the SOC (2020) classifies occupations into nine 'major' groups, based on skill level and skills specialisation. Occupations in SOC1 (Directors, managers and senior officials) typically require the highest skill levels, followed by SOC2 (Professional occupations) whereas occupations in SOC9 (Elementary occupations) typically require the least.
Higher skill-level occupations	These are occupations in the first three broad occupational groups (SOC1 to SOC3) in the SOC, specifically: 1. Directors, managers and senior officials (SOC1) 2. Professional occupations (SOC2) 3. Associate professional occupations (SOC3).
Mid- and lower-skill-level occupations	These are occupations in the bottom six broad occupational groups (SOC4 to SOC9) in the Standard Occupational Classification, specifically: 4. Administrative and secretarial occupations (SOC4) 5. Skilled trades occupations (SOC5) 6. Caring, leisure and other service occupations (SOC6) 7. Sales and customer service occupations (SOC7) 8. Process, plant and machine operatives (SOC8) 9. Elementary occupations (SOC9).

Overview of The Skills Imperative 2035 programme

The global economy is changing. New technologies, coupled with major demographic and environmental changes, are anticipated to disrupt the labour market in the coming decades. Previous research for *The Skills Imperative 2035* indicates the structure of the labour market is likely to continue to change – slowly, but steadily and inexorably – impacting on the jobs that are available. Some industrial sectors, for example 'Business and other services' and 'Non-market services' (which includes public administration, health and education) are expected to grow their share of UK employment, whilst other sectors (e.g., 'Manufacturing') are likely to experience job losses. There are also set to be significant shifts in the occupational structure of employment, with job growth concentrated in 'professional' occupations, whilst most other occupational groups are set to see their share of UK employment decline.

This anticipated shift in occupational structure of employment will have implications for the skills needed to do the jobs that will be available in future. Previous research for *The Skills Imperative 2035* has identified a set of skills that are intensively utilised across the labour market today, but which will be in even greater demand in 2035. These 'Essential Employment Skills' (EES) are communication, collaboration, problem-solving and decision-making, organising, planning and prioritising work, creative thinking and information literacy. These EES skills are growing in importance across the labour market as not only will there be more jobs in future that require them, they are also most intensively utilised in the occupations that are expected to grow their share of UK employment by 2035.

Employers already indicate that deficiencies of EES are a constituent of most skills gaps. This suggests that these deficiencies are likely to have an impact on economic growth, limiting individuals' employment and earnings opportunities, as well as the performance and productivity of organisations. However, we lack a detailed data-driven understanding of the current and anticipated supply of these skills. Nor do we understand how these skills are distributed across the population, or the Skills Gaps that exist between workers' Skills Supply (i.e. the EES workers possess) and their Skills Requirements (i.e. the skills they need to do their jobs effectively). Our research seeks to address these knowledge gaps.

Calls to place more emphasis on the development of EES are growing. However, assessments of the scale and scope of skills gaps rely almost entirely on employers' perspectives. Minimal attention has been paid to the prospect that workers' assessments of their Skills Supply and Skills Requirements may differ from those of their employers. **In this stage of *The Skills Imperative 2035*, we focus on the missing worker perspective in order to better understand the current and anticipated supply of these skills and the 'gaps' between Skills Supply and Skills Requirements.**

In the next stage of the programme, we will examine the impact of anticipated changes in employment and skills requirements on the people already in the labour market. We will explore what can be done to cushion the impact of labour market changes on the groups that are most at risk of being adversely affected. Finally, we will investigate how the education system can best support skills development.

Executive Summary

Introduction

Previous stages of *The Skills Imperative 2035* research programme involved projecting what jobs will be available in the future labour market and what skills will be needed to do those jobs. Our skills projections identified a set of skills that are intensively utilised across the labour market today, but which will be in even greater demand in 2035. These EES are communication, collaboration, problem-solving, organising, planning and prioritising work, creative thinking and information literacy. These skills are growing in importance across the labour market and are also most intensively utilised in the occupations that are expected to grow their share of UK employment by 2035.

In this next stage of *The Skills Imperative 2035*, we move our focus to looking at the supply of EES. We seek to quantify what the current supply of EES skills is across the population and forecast how this may change in future. We also seek to identify the *Skills Gaps* that exist between workers' *Skills Supply* and the *Skills Requirements* of their jobs.

Skills Gaps

Skills Gaps can be measured from the perspective of both employers and employees but efforts to collect data at scale on Skills Gaps have generally relied on gathering the perspective of employers. The scale and severity of skills gaps reported by employers has been widely acknowledged, as has the fact that deficiencies of EES are a constituent of most skills gaps.

By comparison, relatively minimal attention has been paid to collecting workers' perspectives. Skills Builder has developed their Essential Skills Tracker, which measures people's levels of 'essential skills' and the returns to these skills (Seymour and Craig, 2023). We seek to build on this work by quantitatively comparing workers' *Skills Supply* to the *Skills Requirements* of their jobs. To do this, we have developed the NFER Essential Employment Skills Survey – a first-of-its-kind instrument for gathering data at scale about peoples' Skills Supply and the Skills Requirements of their jobs, which we use to estimate both current and future Skills Gaps.

The Employer perspective

Employers indicate skills challenges are severe and growing

We start by summarising the employer perspective on the skills challenges that they face. Employers report two types of related challenge: finding suitably skilled staff when recruiting (Skills Shortages) and deficiencies amongst their current workforce in skills that are needed to perform their roles effectively (Skills Gaps). The scale and severity of skills gaps reported by employers are widely acknowledged. In their responses to the biennial Employer Skills Survey – one of the largest employer surveys in the world – UK employers have indicated that skills challenges are severe and growing. In the 2022 survey, employers reported having 1.5 million vacancies, nearly 0.5 million more than in 2017, and over half of these were identified as 'hard-to-fill' (IFF Research, 2023). Employers also reported an increase in 'skills gaps' in 2022, with 5.7 per cent of UK employees identified as not being proficient in the skills required to do their role, up from 4.4 per cent in 2017.

The severity of the skills challenge is also acknowledged by Government – for example, in the Skills for Jobs Policy Paper (DfE, 2021) – as well as in independent reports, for example a report by the Industrial Strategy Council which predicted 20 per cent of the workforce may lack the necessary skills for their roles by 2030 (Industrial Strategy Council, 2019). Skills challenges have also been blamed for costing the UK economy billions every year in lost productivity, recruitment fees, temporary staffing and hiring workers at a lower level (for example, the Open University's 2019 Business Barometer put the cost of skills shortages to the UK economy at £4.4bn).

Employers indicate that skills gaps are most prevalent in the lowest skill level occupation groups

Some 9.2 per cent of workers in elementary occupations were identified by their employers as not being fully proficient in their roles, compared to 2.5 per cent of Directors, managers and senior officials (IFF Research, 2023). The causes of skills gaps cited by employers also vary by occupation. In the 2019 Employer Skills Survey, employers reported that a lack of motivation was a factor in 51 per cent of skills gaps in 'Elementary occupations', compared with 38 per cent across all occupations (Winterbotham *et al.*, 2020).

Employers report experiencing a lack of essential employment skills, as well as a lack of technical skills

Employers report experiencing a double skills challenge. Whilst gaps in technical skills are most commonly discussed, employers also report a lack of EES that are crucial as they complement technical skills. Deficiencies in EES are regularly identified by employers as a major constituent of skills gaps (e.g., Winterbotham *et al.*, 2018; Winterbotham *et al.*, 2020; IFF Research, 2023). There is no shortage of other studies internationally that have found EES play a significant role in employers' overall perceptions of skills gaps, regardless of level or industry (e.g., Wolff and Booth, 2017; McGunagle and Zizka, 2018).

Furthermore, EES are set to become even more important in the future. The projected growth in higher skill level, higher-skilled 'professional' occupations is anticipated to increase the demand for EES because these occupations utilise 'non-routine cognitive skills'[1] more intensively (Cominetti *et al.*, 2022). Our own employment projections for *The Skills Imperative 2035* research programme suggest that professional occupations are set to continue increasing their share of UK employment (Wilson *et al.*, 2022).

1 This term borrows from Acemoglu and Autor's terminology for classifying different types of task.

Gathering the missing worker perspective

Assessments of skills gaps have tended to rely on employer perspectives, with *skills deficiencies* attributed to the lack of skills employees possess, rather than the under-utilisation of skills by employers or the withdrawal of skills by dissatisfied employees. However, employer perspectives of skills gaps only tell one side of the story. Research by Hurrell suggests employers' biases can result in them attributing the cause of skills gaps to employees, when in reality many people may possess these skills but decide to withdraw them because of disaffection with their employer (Hurrell, 2016). Other organisational biases, for example assumptions about gender, have also been shown to influence how organisations understand and respond to skills shortages (e.g., Bryant and Jaworski, 2011). It is also suggested that HR departments may manipulate the reporting of organisational skills shortages to draw attention to future skills shortages and strengthen the case for investment in training and recruitment (Watson, Webb and Johnson, 2006). It is important to acquire a more rounded understanding of skills gaps, and to acknowledge the interplay between supply-side and demand-side factors.

In this research, we seek to deepen the collective understanding of skills gaps by developing and utilising a new, first-of-its-kind instrument to measure people's Skills Supply, Skills Requirements and Skills Gaps in relation to EES. We use an instrument to collect data from nearly 12,000 people aged 15-65 in 2023 and estimate (i) individuals' Skills Supply from their self-reported behaviours, (ii) the Skills Requirements of respondents' jobs based on the level and importance of each skill they think is required to do their jobs, and (iii) workers' Skills Gaps, from the difference between Skills Requirements and Skills Supply. We combine our data with future population and employment projections, as well as projected changes in Skills Requirements by occupation, to explore how EES Skills Supply and Skills Gaps might change between 2023 and 2035. This enables us to offer fresh insights into the skills challenge. More detail on our research design, methodology and the rigorous development and validation of our survey can be found in the accompanying Technical Supplements.

It is not our intention to imply that Skills Requirements are better assessed by workers than by employers. Skills assessments are inherently subjective. Instead, our aim is to gather the missing worker perspective and compare it to the existing perspective of employers of (overall) skills gaps. This is important because research comparing the perceptions of employers and workers is severely limited, and also because the dyadic research that has been done has identified substantial perception gaps between employers and workers, with greater misalignment between low-skilled workers and their employers (e.g. McGuinness and Ortiz, 2014; Hurrell, 2016; Tsirkas, Chytiri and Bouranta, 2020). Skills gap disagreement between employers and workers has important consequences for the collective response needed to close skills gaps.

Key findings

Nearly one in five workers in higher skill level occupations have substantial skills deficiencies

Whilst workers in high skill level occupations at the top-end of the occupational hierarchy (SOC1-SOC3) have the highest levels of EES on average, our research suggests that over half the workers in these groups have skills deficiencies, meaning their self-reported behaviours suggest their Supply of EES is lower than the Skills Requirements of their jobs. This will not always be problematic – most workers with skills deficiencies have relatively *minor deficiencies* that may suggest many employees are developing in their roles. However, almost one in five people (19 per cent) currently working in high skill level occupations (SOC1-SOC3) have relatively *substantial deficiencies*[2] of EES, which may jeopardise their ability to fulfil their job requirements effectively. This equates to nearly 2.8 million workers in England in these occupational groups. By contrast, around a third of workers in mid- to low skill level occupations (SOC4-SOC9) have skills deficiencies. Of these, only six per cent have substantial deficiencies in the EES required to perform their jobs, less than a third of the proportion of workers in high skill level occupations (SOC1-SOC3). Our research suggests that the Skills Requirements of jobs decrease at a faster rate than workers' Skills Supply as we move down the occupational hierarchy, which helps explain why fewer workers in mid- and low skill level occupations have skills deficiencies.

These differences in average Skills Supply and Skills Requirements between occupations appear very similar when comparing across EES domains. However, our results indicate that workers in mid- and low skill level occupations perceive their jobs to require marginally higher levels of 'Creative thinking' than other EES, whereas they have lower levels of these skills. High skill level occupations place the greatest demands on workers' 'Information literacy' skills, whereas 'Creative thinking' is utilised least intensively of our six EES domains; this is mirrored in the differences in their skill levels by domain.

Workers in low skill level occupations tend to have the highest average levels of skills under-utilisation

In contrast to workers in high skill level occupations, the self-reported behaviours of the majority of workers in mid- and low skill level occupations (SOC4-SOC9) indicate they experience *skills under-utilisation* – that is, they possess EES that are not fully utilised when performing their jobs. Some 22 per cent of workers (3.4 million workers) in mid- to low skill level occupations have substantial EES under-utilisation compared to seven per cent for high skill level occupations. The highest average levels of skills under-utilisation are amongst workers in 'Elementary occupations'. This contrasts with the perspective of employers, who suggest that (overall) skills gaps are most prevalent in low skill level occupations and that transferable skills constitute a large component of these gaps. This potentially implies there are important perception gaps between employers and employees.

2 We categorise everyone with a skills deficiency as having either a 'minor' or 'substantial' skills deficiency by standardising the distribution of Skills Gap scores in 2023 and identifying a threshold equivalent to 1 SD from the mean. See *Research design and methodology* section for more details.

Without action, the number of workers with substantial EES skills deficiencies could nearly double by 2035, meaning up to seven million workers may lack the EES they need to do their jobs fully

Our exploratory projections of how Skills Gaps might change between 2023 and 2035 suggest that the proportion of workers in England with substantial EES skills deficiencies may grow, unless action is taken to increase workers' average skill levels. Skills deficiencies exist on a spectrum; most deficiencies are relatively minor and are unlikely to significantly jeopardise someone's ability to do their job. However, our analysis indicates that, in 2023, 13 per cent of workers have relatively substantial EES deficiencies, which is equivalent to around 3.7 million workers. Our projections indicate that this proportion could grow to 22 per cent of workers by 2035. This would mean that up to seven million workers in 2035 would lack the EES they need to do their jobs, almost double the number with substantial deficiencies in 2023. This is largely a consequence of the increased intensity with which workers across most of the labour market are expected to need to utilise EES in their jobs in the future, and partly also because of projected job growth (which would result in a higher number of workers with skills deficiencies even if the prevalence of deficiencies remained constant).

High skill level occupations are likely to have the largest skills deficiencies in 2035, but the prevalence of skills deficiencies in mid- and lower skill level occupations may also grow

Our exploratory projections of Skills Gaps in 2035 indicate that up to 26 per cent of high skill level occupations (SOC1-SOC3) in England may have substantial deficiencies in their EES in 2035, meaning they may be lacking in the EES required to do their jobs fully. This is equivalent to around 4.4 million workers in England in these occupations. This is concerning as most of the new job growth by 2035 is projected to take place at the top end of the occupational hierarchy, particularly in professional jobs. Unless action is taken, workers' skills deficiencies may hold back earnings growth and organisational productivity.

The proportion of workers with substantial EES deficiencies is also likely to grow across mid-and low skill level occupations. Up to around one in six (17 per cent) of the 15.5 million workers in England in these occupations (SOC4-SOC9) are projected to have substantial skills deficiencies in 2035, up from six per cent in 2023.

Workers in high skill level jobs tend to have higher Skills Requirements and higher Skills Supply of all six essential employment skills

Peoples' self-assessments suggest that, on average, workers at the top-end of the standard occupational classification (SOC) hierarchy – 'Managers, directors and senior officials' (SOC1) – have the highest levels of EES, whilst workers at the bottom-end of the hierarchy – 'Elementary occupations' (SOC9) – have the lowest levels of these skills. This pattern remains visible after controlling for differences in a broad range of individual characteristics, including workers' qualification levels, which influence their ability to access high-skilled occupations. This might be because workers in higher skill level, higher-paid jobs utilise EES relatively more intensively, affording them more opportunities to hone these skills over time (Dickerson *et al.*, 2023). Differences in Skills Supply by occupation look very similar when comparing across the six domains that together comprise our EES.

Levels of EES vary across the population, with 'Education and training' an important determinant of Skills Supply

Our analysis finds that average Skills Supply – the level of EES that we estimate people to possess given their self-reported behaviours – varies by demographic characteristics, employment status, education, access to training, geography, occupation and industry. Further, differences in individual's 'occupation' (their broad occupational group), 'employment' (their employment status and managerial status) and their 'education and training' (their highest qualification and participation in formal and informal training) contribute most to differences in Skills Supply.

People with higher levels of EES earn more and are more likely to be in management positions

People with higher EES have higher salaries, on average, and they are also significantly more likely to be in a management position. These relationships remain significant even after netting out the effects of differences in workers' occupation, education and training and other factors. This provides some *suggestive* evidence that people's Skills Supply may affect their ability to command higher salaries and demonstrate management potential. However, we cannot rule out the explanation that people's salaries and management status affect their skill levels rather than vice versa, or that the relationships between skill development and individuals' earnings and management status are reciprocal.

People with higher levels of EES have higher job and life satisfaction

People with a higher level of EES also experience higher job and life satisfaction, on average. These relationships remain statistically significant after netting out the effects of differences in a broad range of other individual factors, including in people's occupations, which is likely to have a strong bearing on their task profile and level of responsibility and so may also affect both their skill development and job and life satisfaction indirectly. A tenpoint increase in Skills supply corresponds with the same increase in job satisfaction as moving from the <£16k per year salary band to the £31k-£44k salary band. However, for context, a 10-point increase in Skills Supply is large; roughly equivalent to the difference between the median and the 90th percentile of the Skills Supply distribution. The association between Skills Supply and life satisfaction is weaker than the one we report between Skills Supply and job satisfaction, but still statistically significant. One explanation for our findings is that utilising EES *causes* people's job and life satisfaction to increase, but an alternative is that more satisfied individuals are better at developing their skills, and it is also possible that both skills and satisfaction are driven by other variables not measured by our survey.

Our results indicate that people with higher levels of EES earn more, are more likely to be in management positions and have higher job and life satisfaction

Recommendations

Our research insights point towards the importance of a *collective response* from across government, industry, the education system and wider society to address skills gaps in the current workforce. This is likely to also involve ensuring that young people are equipped with the skills they will need in the future labour market. The consequence of inaction may be that Skills Gaps continue to widen, limiting individuals' employment and earnings opportunities and the performance and productivity of organisations.

We make six recommendations regarding the *collective response* required from employers, education providers and government to address employee-reported skills gaps. These are:

Recommendation 1:
Employers grappling with skills gaps should consider what more they can do to align expectations and skills assessments between managers and workers across their workforce.

Recommendation 2:
Employers should consider what more they can do to support their line managers to identify and utilise the 'latent' EES of their workers, particularly the under-utilised skills of workers in mid- and low skill level occupations.

Recommendation 3:
Employers should reflect on the extent to which skills gaps in their organisation could be a consequence of 'skills withdrawal' and how they ensure that working conditions and practices promote organisation commitment, engagement and work effort.

Recommendation 4:
Government should further incentivise employer investment in the development of their workforce's EES.

Recommendation 5:
Government and institutional funders should fund more research to (i) understand the causes, scope and consequences of perception differences between employers and employees, (ii) identify the determinants of EES, and (iii) identify the most effective strategies for educators and employers to assess and develop EES.

Recommendation 6:
The Department for Education should consider what more it can do to support education and training providers to identify and adopt the best strategies for assessing and developing people's EES.

1. Introduction

The global economy faces significant shifts in the coming decades. New technologies, coupled with major demographic and environmental change, are predicted to disrupt the economy and the labour market in various ways (Wilson *et al.*, 2022). This will have a significant impact in the next ten to 15 years and beyond, both in terms of the jobs available and the skills needed to do them. Some commentators anticipate that skills such as creativity, critical thinking, teamwork, problem solving and resilience – skills which complement the new technologies and other changes taking place – will become increasingly important in the future. Significant shortages in these skills are likely to be an increasing challenge for employers in future, which may hold back economic growth and social mobility and increase the costs of disruption in the labour market.

In the first stage of this research programme, we investigated the scale of the challenge faced by the UK in the next 15 years. After laying the foundation with an initial literature review (Taylor *et al.*, 2022), the programme explored how the size and composition of the labour market might change by 2035 (Wilson *et al.*, 2022). Due to the inherent uncertainty involved with predicting the future, we produced projections for a range of scenarios. This included a baseline set of projections, which take account of existing technological trends and assume that the adoption of automation, environmental transitions, etc., will continue at a similar pace in the future. We also produced two alternative scenarios; a *Technological opportunities* scenario which assumes a faster pace of adoption of new technologies; and a *Human-centric* scenario, which also assumes a faster pace of adoption of new technologies but places more emphasis on increased demand for education and health services.

In the next stage, we examined how the demand for skills will change by 2035, based on these labour market projections, and identified which employment skills will be most needed in the future (Dickerson *et al.*, 2023). We identified a set of six 'Essential Employment Skills' (EES) that are likely to be most heavily utilised across the labour market in 2035; communication, collaboration, problem-solving, organising, planning and prioritising work, creative thinking and information literacy. The conceptual framework that underpins our measurement of these skills is shown on the next page. Job growth is anticipated to be concentrated in higher skill level occupations that utilise these skills most intensively, and continued adoption of technology is also likely to mean that workers across the labour market need higher levels of EES.

In this current stage, we move onto quantitatively assessing the current and potential future supply of EES and to exploring how current Skills Gaps relating to EES may change between 2023 and 2035. We seek to deepen the collective understanding of current and future skills gaps.

Later, we will identify the groups that are most likely to be adversely affected by projected changes in the employment landscape and skills requirements and consider the policy responses needed to enable more people in these groups to transition into growing areas of the economy. In the final stage, we will investigate the determinants of skill development during childhood, and policy responses (within and beyond the education system) that might best support the development of young people's skills.

Previous reports from *The Skills Imperative 2035: Essential skills for tomorrow's workforce* research programme can be found on the NFER website.

Conceptual framework for measuring EES

Communication

Good communication is essential for forming productive, effective relationships based on shared knowledge and meaning. The mediums and platforms through which people communicate is ever changing, but the vital importance of this skill and the core ingredients of good communication remain constant. Communication involves creating shared meaning, knowing how to provide information that your audience and collaborators need, and adapting your mode and style of delivery depending on the needs of each situation.

Thematic areas for COMM	
A	Recognition that communication involves shared meaning
B	Willingness to provide information and understanding about what this involves
C	Adaptation of mode and/or style of delivery in relation to recipient

Collaboration

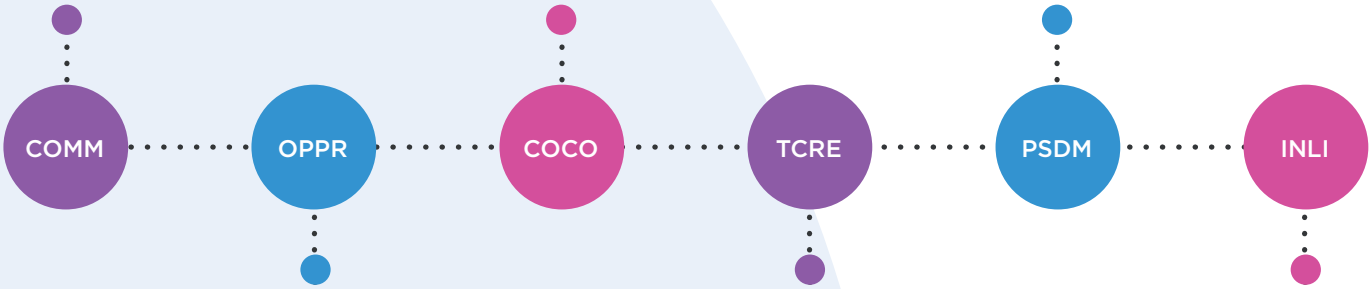
Collaboration amongst people is needed to drive projects forward. Knowing how to form, foster and maintain constructive and collaborative relationships with others, and the ability to interact effectively, will be vital skills for bringing multiple perspectives and ideas to bear on projects, and for ensuring a team's collective strengths are fully utilised.

Thematic areas for COCO	
A	Formation of and maintaining constructive/collaborative relationships with others
B	Effective interactions in collaborative situation

Problem solving and decision making

As machines get better at processing information, humans can expect to be increasingly called upon to use this information to identify, diagnose and solve problems, carefully balancing risks and rewards. Individuals need to know how to analyse and evaluate information, identify problems, weight up the risks and benefits of different solutions, and chose the most effective strategies for solving problems.

Thematic areas for PSDM	
A	Analysis of information for problem solving
B	Identification of problems and associated risks and benefits of solutions
C	Using effective strategies for identifying solutions and solving problems
D	Evaluation of information for decision making
E	Using effective strategies for choosing between options



Organising, planning and prioritising

Remote working and other post-pandemic changes to working practices place even greater emphasis on the vital importance of excellent self-management, planning and organisation skills. Individuals need to be able to prioritise, set goals and create plans to achieve these plans, sometimes working with dispersed teams of colleagues. People will need the ability to organise work activities to deliver plans effectively and achieve objectives.

Thematic areas for OPPR	
A	Development of a goal/plan to prioritise something
B	Development of a goal/plan to organise something
C	Development of a goal/plan to complete objectives

Creative thinking

In a rapidly changing world of work, the ability to come up with new and creative solutions to tackle both entrenched and emerging problems will be highly prized. This involves taking a fresh perspective on issues and challenges, developing new and different ideas and the ability to create something novel.

Thematic areas for TCRE	
A	Development of new/different ideas
B	Creation of something new/ different
C	Application of a fresh perspective to an issue or challenge
D	Application of thought in a new/ different way

Information literacy

In an increasingly complex world, the ability to find, gather, distil and use information from a diverse range of sources will be essential for understanding the 'bigger picture' and making high-quality, research-informed choices. This will require the ability to gather and evaluate the credibility and reliability of information, weight up the strengths and weaknesses of arguments and use logic and reasoning to make the right choices.

Thematic areas for INLI	
A	Determining appropriate actions using logic and reasoning
B	Identification of strengths and weaknesses through reasoning
C	Evaluation of credibility and reliability of information

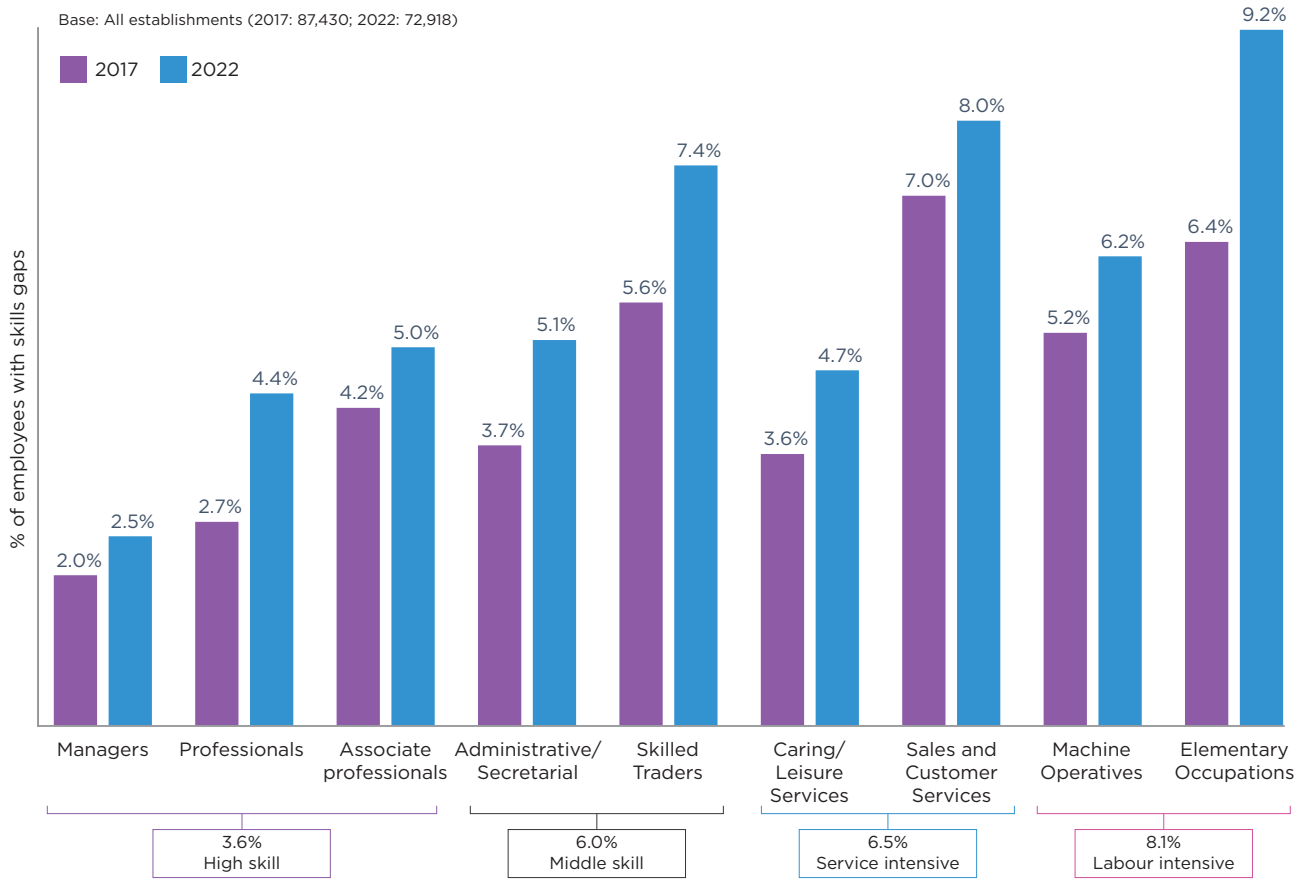
The employer perspective

Employers report two inter-related challenges; finding suitably skilled staff when recruiting ('skills shortages') and deficiencies amongst their current workforce in skills that are needed to perform their roles effectively ('skills gaps'). In their responses to the biennial Employer Skills Survey – the principal source of intelligence on skills shortages and skills gaps and one of the largest employer surveys in the world – employers have indicated that skills challenges are severe and growing. In 2022, employers reported having 1.5 million vacancies, an increase of nearly 0.5 million vacancies on the 2017 level. Of these, 0.85 million vacancies were 'skill-shortage vacancies', meaning employers struggled to fill them due to a lack of skills, qualifications or experience among applicants, more than double the 0.34 million reported in 2017 (IFF Research, 2023). Employers also reported an increase in skills gaps in 2022, with 5.7 per cent of UK employees identified as not being proficient in the skills required in their role, up from 4.4 per cent in 2017. This means that 1.72 million employees were judged by employers to have a skills gap, nearly half a million more than in 2017 (1.27 million). Of these two related skills challenges, 'skills gaps' represent the bigger knowledge gap and are the focus of this research.

Skills gaps affect employers and individuals. Around two-thirds of employers (66 per cent) in the 2019 Employer Skills Survey indicate that these skills gaps are already impacting their institutional performance, for example by increasing workload for other staff, higher operating costs and difficulties meeting quality standards. If skills gaps grow, this is likely to increase the costs to employers. EES shortages may also amplify the disruption that results from projected changes in the structure of the labour market, which will most adversely affect workers in declining occupations. To move out of these occupations into growing areas of the labour market, they will need to demonstrate proficiency in the EES, which are more intensively utilised in growing, higher-skilled occupations (e.g., Laker and Powell, 2011).

A common explanation for skills gaps is that employers are forced to hire people with skills deficits and they are subsequently unable or reluctant to develop these workers' skills.

Figure 1: Proportion of workers in each broad occupational group (SOC major group) that were identified by employers as having 'skills gaps', in 2017 and 2022



Source: Reprinted from Employer Skills Survey report, 2022.

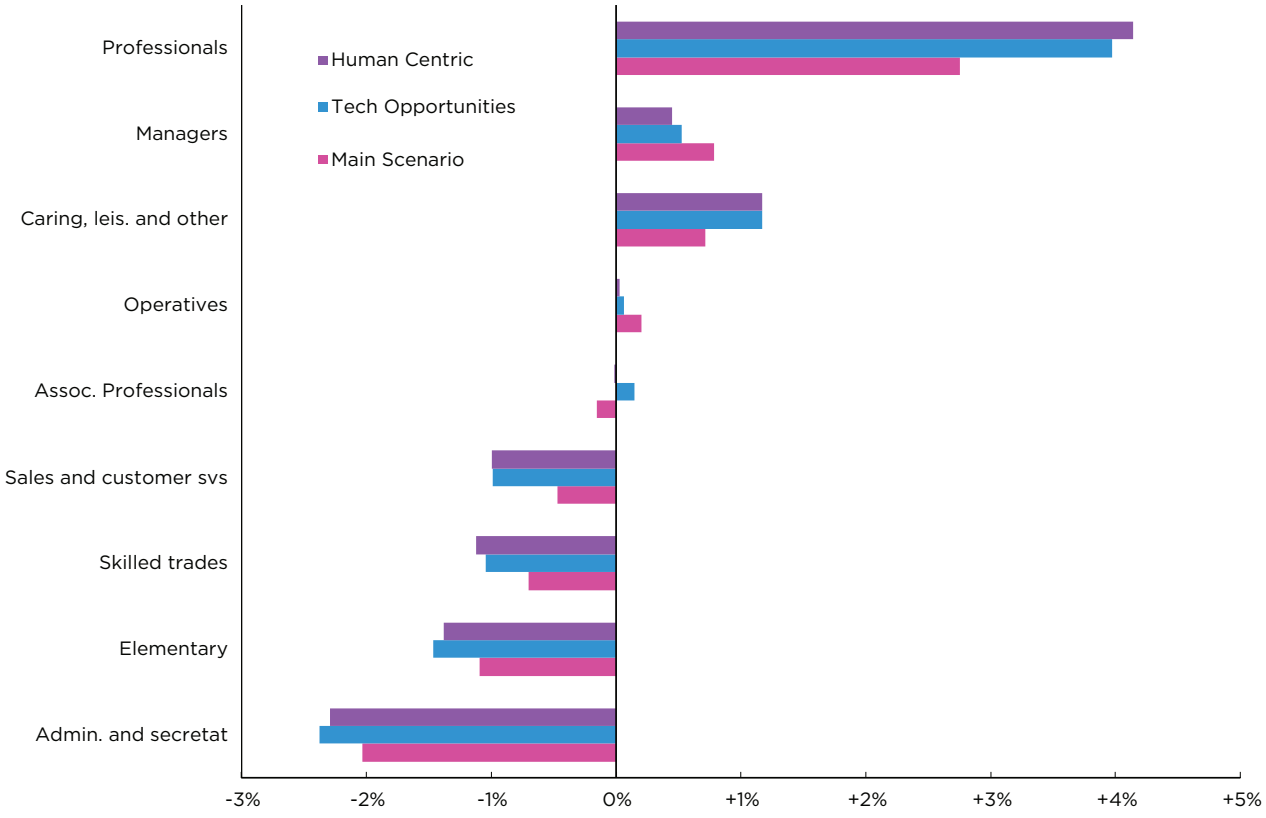
Deficiencies in transferable EES are regularly identified as a major constituent of these skills gaps (e.g., Winterbotham *et al.*, 2018; Winterbotham *et al.*, 2020; IFF Research, 2023). For example, an inability among staff to manage their own time or prioritise tasks (which aligns closely with 'organising, planning and prioritising work'; one of our EES) was identified in 60 per cent of all skills gaps in 2022. An inability to manage their feelings and the feelings of others was also identified in 47 per cent of skills gaps by respondents to the 2022 Employer Skills Survey (IFF Research, 2023).

Employers indicate that skills gaps are most prevalent in the lowest skill level occupation groups. As shown in Figure 1, 9.2 per cent of workers in elementary occupations in 2022 were identified by their employers as not being fully proficient in their roles, compared to 2.5 per cent of Directors, managers and senior officials (IFF Research, 2023).

There are reasons to believe that skills gaps in relation to EES might grow more prevalent. Technology changes have reduced the demand for workers to perform routine tasks and increased the demand for non-routine cognitive tasks that augment the role of technology (Acemoglu and Restrepo, 2022). Furthermore, these skills are set to become even more important in the future. The projected growth in higher skill level, higher-skilled 'professional' occupations is anticipated to increase the demand for EES because these occupations utilise non-routine cognitive skills more intensively (Cominetti *et al.*, 2022). Our own employment projections for *The Skills Imperative 2035* suggest that professional occupations are set to continue increasing their share of UK employment, as shown in Figure 2 (Wilson *et al.*, 2022). This is the case in both the 'Main scenario' and two alternative scenarios which model the effects of a more rapid uptake of automation-related technologies (the 'Technological Opportunities Scenario' and a 'Human Centric Scenario' in Figure 2).[3]

Consequently, demand for EES is expected to continue rising across most of the labour market (e.g., Deming, 2017; Schanzenbach *et al.*, 2016). Unless the supply of these skills also rises in response to increased demand, employers are likely to report deepening skills gaps between 2023 and 2035.

Figure 2 Percentage growth in employment share across the UK, 2020-35



Source: The Skills Imperative 2035 labour market projections (see Working Paper 2)

3 More detail on these employment projections is available in the *Occupational Outlook* reports published on *The Skills Imperative 2035* webpages.

Gathering the missing worker perspective

Assessments of skills gaps have tended to rely on employer perspectives, with skills deficiencies attributed to the supply-side (i.e. the lack of skills employees possess) rather than the demand-side (i.e., under-utilisation of skills by employers, or withdrawal of skills by employees that are disaffected with their employer). Assessments of skills gaps that rely on employer perspectives do little to deepen our understanding of how skills are distributed across the population, which is a vital prerequisite for identifying the most effective solutions to skills challenges, particularly in occupations with high skills gaps. Minimal attention has also been paid to the possibility that there may be a perception gap between workers and employers, or to the interplay between supply-side and demand-side factors. Comparing the perceptions of workers and employers has the potential to deepen our understanding of the nature, causes and potential solutions to skills shortages and skills gaps. Existing research comparing employers' perceptions of skills gaps with those of employees is severely limited, but the dyadic research that has been done indicates significant perception gaps between employers and workers (McGuinness and Ortiz, 2014; Hurrell, 2016; Tsirkas, Chytiri and Bouranta, 2020). The causes and consequences of these perception gaps have important implications for how skills gaps are addressed. Therefore, we supplement this existing knowledge base by developing and utilising a novel, first-of-its-kind instrument to gather the missing worker perspective on *Skills Supply*, Skills Requirements and Skills Gaps.

It is not our intention to imply that Skills Requirements are better assessed by workers than employers. Assessments of EES are, arguably, inherently inter-subjective. Instead, our aim is to deepen the current understanding of Skills Gaps by comparing data from workers' self-assessments with the perspectives of employers. We rely on people's self-assessment of their behaviours (rather than asking them directly about their skill levels) and the Skills Requirements of their jobs. This has the advantage of enabling us to gather data, at scale, on individual's *Skills Supply* and the Skills Requirements of their jobs, although we acknowledge the known limitations of using self-report data (see **Research design and methodology** section), which are elaborated upon in the accompanying Technical Supplements.

Perception gaps between employers and workers

Gathering the missing worker perspective also enables us to make broad comparisons between the EES Skills Gaps calculated from workers' self-assessments and employers' perspectives of (overall) skills gaps. This is important because research comparing the perceptions of employers and workers is severely limited, and also because the dyadic research that has been done has identified substantial perception gaps between employers and workers, with greater misalignment between low-skilled workers and their employers (e.g. McGuinness and Ortiz, 2014; Hurrell, 2016; Tsirkas, Chytiri and Bouranta, 2020). There is also some evidence of perception gaps between employers, students and Higher Education Institutions (e.g. Pereira, 2013; Wesley, Jackson and Lee, 2017; Wickramasinghe and Perera, 2010; Wolff and Booth, 2017; Matsouka and Mihail, 2016). The scale, distribution and causes of perception gaps between employers and workers have important consequences for the collective response needed to close skills gaps.

Accompanying Technical Supplements

In addition to this Working Paper 4 Report, we have produced two Technical Supplements:

Technical Supplement Part A. An analysis of the availability of Essential Employment Skills and the gaps between workers' skills and the skills their jobs require: This describes all of the analysis we have undertaken of Skills Supply, Skills Requirements and Skills Gaps using the results of the NFER Essential Employment Skills Survey.

Technical Supplement Part B. Developing, piloting and validating a new instrument for the measurement of Essential Employment Skills: This details the development and validation of our survey instrument, and the sampling, fieldwork and survey weighting that was undertaken to gather and prepare our survey data for analysis.

2. Research design and methodology

The NFER Essential Employment Skills Survey: A new source of evidence

The NFER Essential Employment Skills Survey is the first of its kind; the first instrument to estimate both the EES that people possess ('Skills Supply') and the 'Skills requirements' of their jobs, and to compare the two in order to quantify Skills Gaps across the workforce.

Prior to this research, minimal attention has been paid to the possibility that there may be a perception gap between workers and employers, or to the interplay between supply-side and demand-side factors. There have been almost no attempts to quantify the supply of EES or skills gaps from workers self-reported behaviours or efficacy beliefs, a notable exception being Skills Builder's annual Essential Skills Tracker (e.g. Seymour and Craig, 2023), which measures people's levels of 'essential skills' and the returns to these skills. However, this has not stretched as far as gathering data on people's 'Skills Requirements' or measuring workers' 'Skills Gaps', or projecting how these EES Skills Gaps may change in the future.

We estimate people's skills by collecting data on the behaviours individuals are able to exhibit in response to their environments when their situation demands it. Our survey asks people to self-report their behaviours, focusing on those that are reflective of different levels of EES, as opposed to asking people to self-report their ability level in relation to each skill directly. We also ask respondents to self-assess the Skills Requirements of their jobs. Our measurement scales for each EES domain utilise both newly developed items and a range of existing self-report measures that have previously been piloted and validated. We rigorously validated our measurement scales through a large-scale pilot (see accompanying Technical Report for more details). Subsequently, in 2023, we gathered and analysed self-assessment data from nearly 12,000 people aged 15-65 on their Skills Supply, Skills Requirements and Skills Gaps.

The development of our instrument was underpinned by a conceptual framework that drew on relevant descriptions of skills from established skills frameworks, our earlier literature review for *The Skills Imperative 2035* and the skills descriptors from O*NET. O*NET is the primary database of occupational information in the United States and was used in the last stage of *The Skills Imperative 2035* to project Skills Requirements across the labour market in 2035 and identify our six EES.

Self-assessment methods have the advantage of enabling us to gather quantitative data at scale on the Skills Requirements of individuals' jobs and on their behaviours, which are used to approximate their skill levels. Respondents' survey responses are transformed into meaningful measures of their skills using Rasch measurement theory, which enables us to account for differences in the difficulty of agreeing with each behavioural statement in our survey. This enables us to compare Skills Supply across domains and between groups. It also enables us to equate and compare workers' Skills Supply with their Skills Requirements, which means we can quantify Skills Gaps and analyse their distribution across the labour market.

Of course, there are known shortcomings to self-assessment methods. Self-reported behaviours may not completely correspond with how participants would react, or feel, in reality. Participants' responses often depend on context, such as question order and mode of delivery, and measures may be prone to a range of biases, for example reference bias (Lira *et al.*, 2022), which relates to differences in the implicit standards held by individuals. Self-report measures are also vulnerable to social desirability bias as people may try to increase their 'moral worth' or show they are 'doing the right thing' (Sayer, 2007). In our instrument, we try to minimise the effects of bias, for example by using scale anchors that provide respondents with common reference points when rating their Skills Requirements. More importantly, our intention is not to suggest that workers' perspectives of Skills gaps are more valid than employers' perspectives. Instead, we seek to deepen existing understanding of Skills Gaps by gathering the missing worker perspective (and advocate for dyadic approaches in the future that best enable comparison of workers' and employers' perspectives).

To examine the distribution of skills across the population we collect information from respondents on their background and the jobs they work in. Specifically, we gather data on individuals' demographic characteristics, industry, occupation, qualifications, employment status, socio-economic status, health status and training participation. We also collect data on individuals' salary, managerial status, and job and life satisfaction in order to explore how people's Skills Supply relates to these factors.

Our 2035 projections suggest that:

up to **22%**
of workers could have a 'substantial' EES skills deficiency by 2035, compared with **13%** in 2023.

This would be equivalent to

7 million

workers in England lacking the skills they need to do their jobs fully in 2035, **3.3 million** more than in 2023.

Finally, we explore how Skills Gaps might change between 2023 and 2035. While no one can be certain about the future, quantitative projections provide a foundation for thinking about how Skills Gaps may change over time and the collective response that may be required to close them. To project future Skills Gaps, we first re-weight our survey data to account for projected changes in the population and in the composition of employment. We use the Baseline employment projections produced earlier in *The Skills Imperative 2035*. We then also adjust workers' Skills Requirements to account for projected changes in EES utilisation within each occupational group[4]. We do this without adjusting workers' Skills Supply, which may, in reality, increase as a consequence of increased utilisation of these skills. Consequently, our projections may over-estimate Skills Gaps. The Skills Requirement scores of workers in the same broad occupational group are adjusted by the same amount, based on the proportionate change in EES Skills Requirements within that occupation that we have projected between 2023 and 2035.

We categorise everyone with a projected skills deficiency in 2023 and 2035 as having either a 'minor' or a 'substantial' skills deficiency by standardising the distribution of Skills Gap scores in 2023 and identifying a threshold equivalent to one standard deviation from the mean. We use this same threshold (from the distribution of 2023 Skills Gap scores) to categorise individuals as having either a 'minor' or 'substantial' skills deficiency in 2035 and explore the extent to which skills deficiencies change between 2023 and 2035. We apply this same methodology to categorise workers as having either a 'minor' or a 'substantial' level of skills under-utilisation. Our projections of potential Skills Gaps in 2035 should be treated as exploratory, and comparisons between Skills Gaps today and potential Skills Gaps in 2035 should be interpreted cautiously.

More detail on the research design and methodology, as well as the development, testing and validation of the instrument assessing Skills Supply can be found in the accompanying Technical Supplement Part B.

4 Our earlier 2035 skills projections calculate a 'skills utilisation' for each domain for each occupation by multiplying the 'Level' of skill required in each occupation by the 'Importance' of each skill required. Both Level and Importance are measured on ordinal scales, but to project potential Skills Gaps in 2035 we treat skills utilisation scores as continuous data.

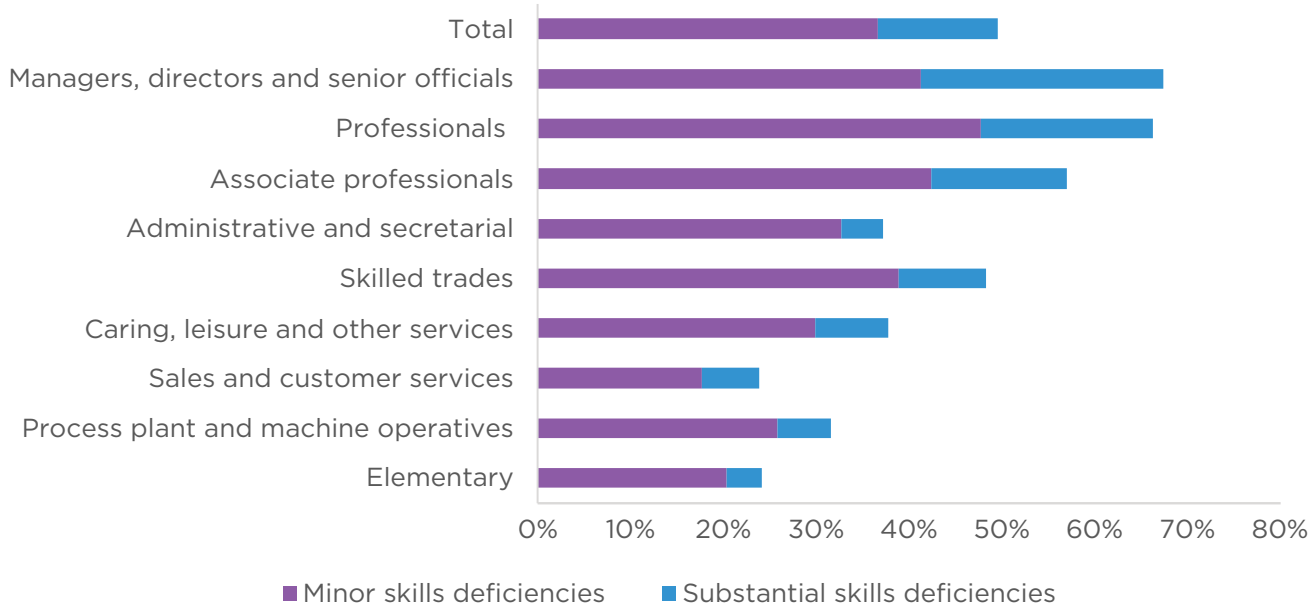
3. Key findings from our research

Nearly one in five workers in higher skill level occupations have substantial *skills deficiencies*

Our research suggests that *skills deficiencies* – skills that people require to do their jobs but which they do not possess – vary markedly across the occupational hierarchy, as shown in Figure 3 below. Over half of the workers in higher skill level occupations (SOC1-SOC3) have EES skills deficiencies whereas, by comparison, only a third of workers in mid-to lower skill level occupations (SOC4-SOC9) have skills deficiencies. This is largely because workers' Skills Requirements decrease at a faster rate than their Skills Supply as we move down the occupational hierarchy, which results in fewer workers in mid- and low skill level occupations having skills deficiencies despite their EES Skills Supply being lower.

Having a skills deficiency may not always be problematic – most workers with skills deficiencies have relatively *minor deficiencies* that may suggest they are developing in their roles. We distinguish between workers who have relatively minor skills deficiencies and those that have more substantial deficiencies, which may have more impact on their job performance[5]. We find that substantial skills deficiencies are more common in higher skill level occupations. Almost one in five people (19 per cent) currently working in high skill level jobs (SOC1-SOC3) have substantial deficiencies in the EES skills required to fulfil their job requirements. This is equivalent to nearly 2.8 million workers in these occupational groups. This compares to only six per cent of workers in mid-to low skill level occupations (SOC4-SOC9) who have substantial EES deficiencies.

Figure 3: Proportion of 'Workers'[6] in 2023 with EES *deficiencies* by broad occupational group (SOC major group), broken down into 'minor' / 'substantial' skills deficiencies



Source: Analysis of NFER's EES survey dataset

5 More detail on how Skills Gaps are calculated and how skills deficiencies were classified can be found in the *Research design and methodology* section.

6 Workers (sample size (N) = 8,569) are defined as 'Adults aged 19-65 who are either currently in paid work or who have been in work at any point in the previous five years, and young people aged 16-18 who are in work-based training or employment 20+ hours per week'.

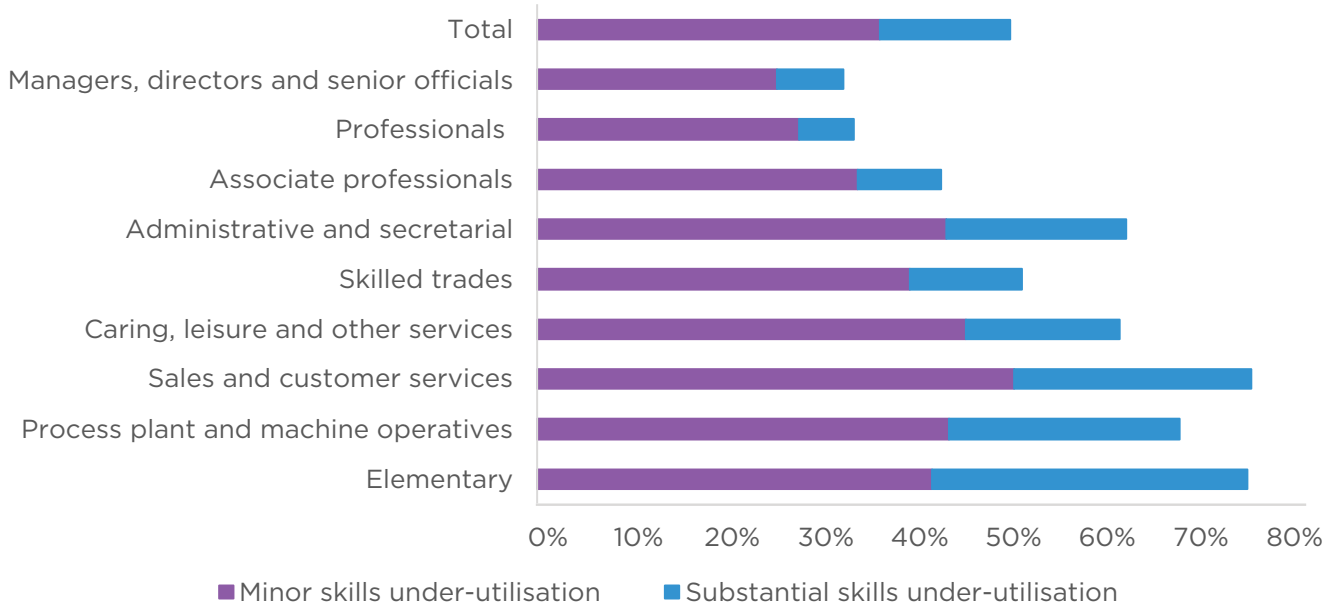
Workers in low skill level occupations tend to have the highest average levels of skills under-utilisation

Positive Skills Gaps indicate skills deficiencies whereas negative Skills Gaps indicate *skills under-utilisation* – in other words, the skills workers possess are higher than those required to do their jobs. There are a number of possible reasons why this might happen. For example, these surplus EES could have been developed in a previous job which required a higher level of these skills than is required in their current role. Or a worker may have developed them through some activity they do outside of work.

We find from respondents' self-assessments that around half of workers report having under-utilised EES in 2023. However, these workers are not equally distributed across the occupational hierarchy. Our analysis shows that while people in high skill level occupations (SOC1-SOC3) are more likely to experience *skills deficiencies*, as shown above in Figure 3, those in mid- and low skill level occupations (SOC4-SOC9) are more likely to have *under-utilised* EES (see Figure 4).

As with skills deficiencies, we split workers with under-utilised EES into those who have relatively 'minor' skills under-utilisation and those that have more 'substantial' skills under-utilisation.[7] This latter group should be of interest to employers, especially those grappling with skills gaps. Figure 4 shows that most workers with *under-utilised* EES have relatively minor under-utilised EES. However, around one in seven workers (14 per cent) in 2023 have substantial EES under-utilisation. This is equivalent to 4.4 million workers in England. We also find that workers with substantial EES under-utilisation are more common in mid- to low skill level occupations (SOC4-SOC9) than in high skill level occupations (SOC1-SOC3). Some 22 per cent of workers in mid- to low skill level occupations in England – 3.4 million workers – have substantial EES under-utilisation compared to seven per cent for high skill level occupations.

Figure 4: Proportion of 'Workers' in 2023 with EES *Skills under-utilisation* by broad occupational group (SOC major group), broken down into 'minor' / 'substantial' EES under-utilisation



Source: Analysis of NFER's EES survey dataset

7 See Section 2 (Research design and methodology) for more details on how workers were categorised as having either a 'minor' or 'substantial' skills under-utilisation.

This picture contrasts with that reported by employers in the Employer Skills Surveys, which suggests that (overall) skills gaps are more prevalent as we move down the occupational hierarchy, with transferable skills constituting a large component of skills gaps. This may be because our survey measures EES Skills Gaps specifically whereas the Employer Skills Survey asks employers to report the proportion of workers that are not fully proficient across *all* the skills required to perform their job. However, these employers identify EES as a contributing factor in the majority of skills gaps, with 'self-management' (which is closely related to 'Planning, organising and prioritising' in our survey) particularly commonly cited.

Another explanation is that skills deficiencies and skills under-utilisation co-exist at the group-level, with some individuals in low skill level occupations having large Skills deficiencies whilst other individuals in the same occupational groups have high levels of Skills under-utilisation. This might be the case if, for example, lower skill level occupations constitute a relatively diverse workforce, including over-qualified people doing casual work or stuck in low skill level jobs alongside other people with lower qualification levels and lower job prospects. However, were this the case, we would expect workers with lower-level qualifications in these occupations to have lower levels of skills under-utilisation than their more qualified peers, but this is not the case. A more likely explanation, therefore, is that employers and workers have perception gaps, and that this misalignment is greatest between employers and workers in low skill level occupations.

Some 22 per cent of workers in mid- to low skill level occupations in England – 3.4 million workers – have substantial EES under-utilisation compared to seven per cent for high skill level occupations

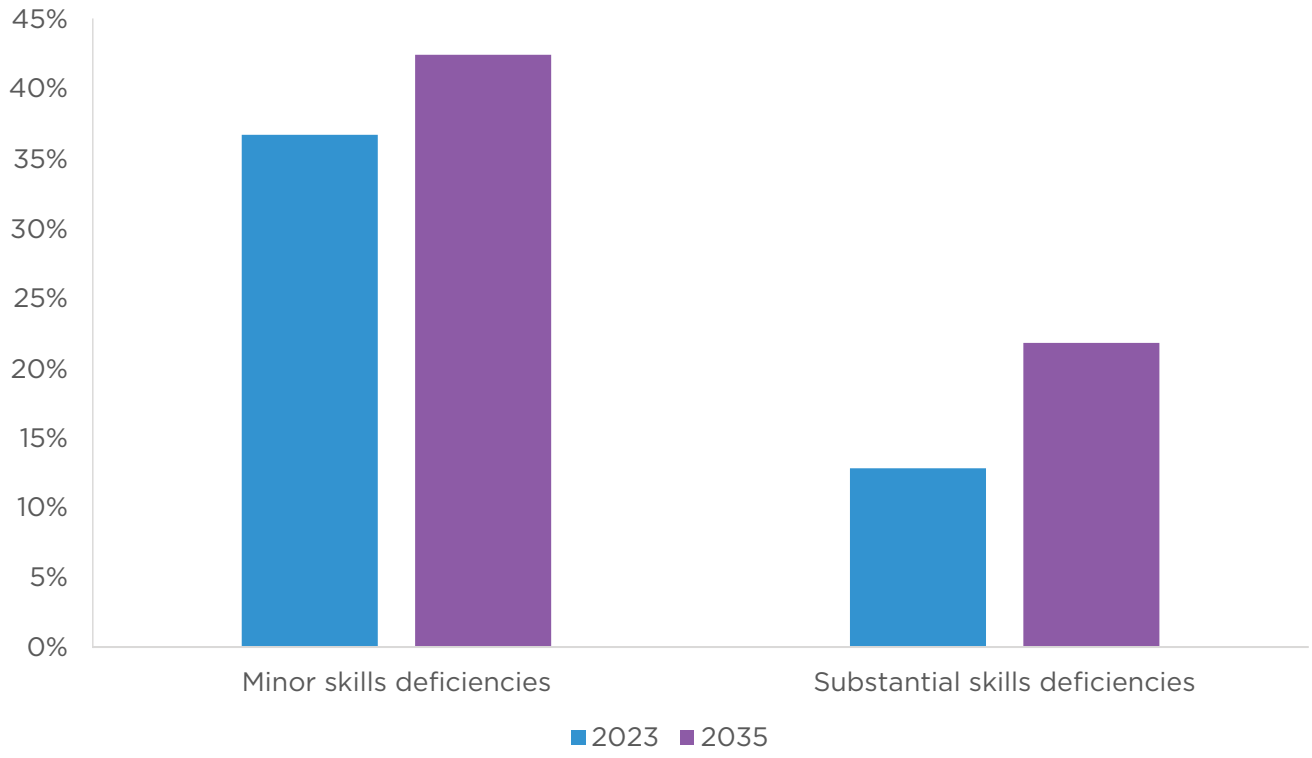
Without action, the number of workers with substantial EES skills deficiencies could nearly double by 2035, meaning up to seven million workers may lack the EES they need to do their jobs fully

Our exploratory analysis into how Skills Gaps might change between 2023 and 2035 suggests that the proportion of workers with substantial EES skills deficiencies may grow. Our research suggests that up to around two-thirds of workers may experience EES-related skills deficiencies in 2035, compared to around a half today. Most of these workers will experience a 'minor' deficiency, but a significant minority may have a 'substantial' deficiency.

As shown in Figure 5, our analysis suggests that 13 per cent of workers already have a substantial EES skills deficiency in 2023, meaning that their self-reported behaviours suggest they may not possess the skills required to fulfil their job requirements.[8] This is equivalent to around 3.7 million workers in 2023. However, our projections of how Skills Gaps may change between 2023 and 2035 indicate that the proportion of workers in England with substantial skills deficiencies has the potential to rise as high as 22 per cent by 2035. This would be equivalent to up to seven million workers lacking the EES they need to do their jobs fully in 2035, almost double the number of workers with substantial skills deficiencies in 2023.

This growth is primarily a consequence of increases in the intensity with which workers across the labour market, particularly professionals, will need to utilise EES in their jobs and partly also because of the overall job growth anticipated in the labour market (which would result in a higher number of workers with skills deficiencies even if the prevalence of Skills Gaps remained constant).

Figure 5: Proportion of 'Workers' with *Skills deficiencies in 2035 compared to 2023*, broken down by 'minor' and 'substantial' skills deficiencies



Source: Analysis of NFER's EES survey dataset

8 See Section 2 (Research design and methodology) for more details on how workers were categorised as having either a 'minor' or 'substantial' skills deficiency.

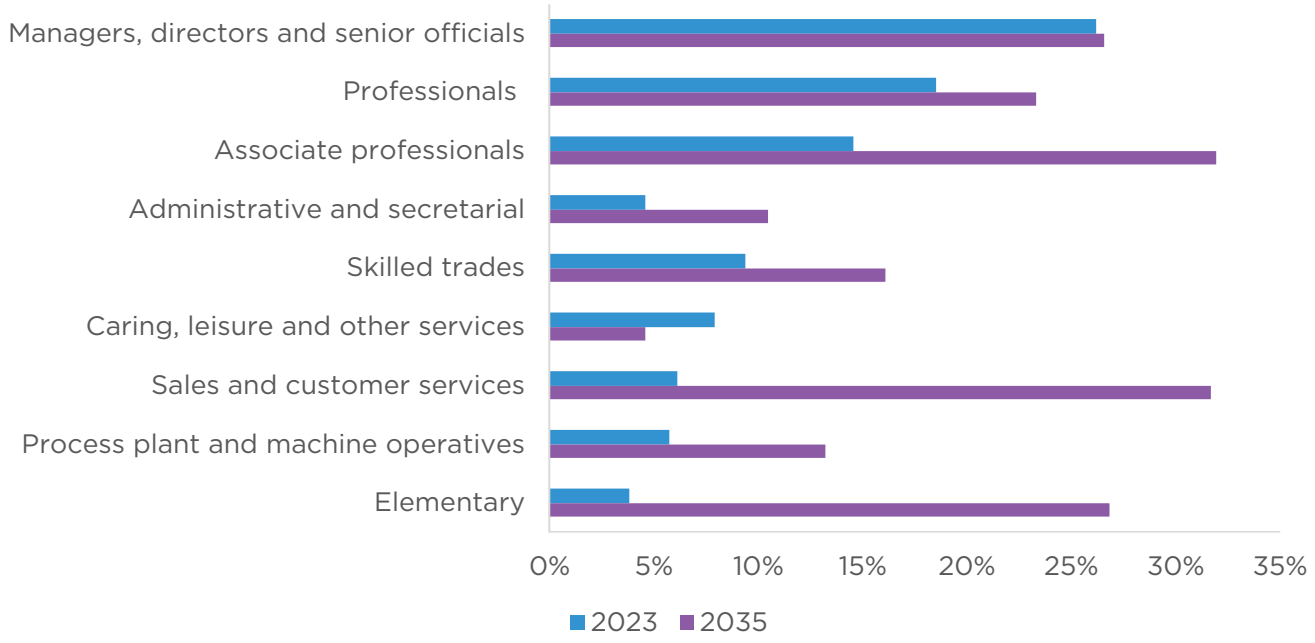
High skill level occupations are likely to have the largest skills deficiencies in 2035, but the prevalence of skills deficiencies in mid- and lower skill level occupations may also grow

Our analysis of how Skills Gaps might change between 2023 and 2035 suggests that the proportion of workers in higher skill level occupations (SOC1-SOC3) with substantial skills deficiencies in England has the potential to increase from 19 per cent of workers in these groups in 2023 to 26 per cent in 2035, as shown by Figure 6 below.

Our projections also indicate that the proportion of workers with substantial skills deficiencies may increase more rapidly in most mid- and low skill level occupations compared to high skill level occupations, albeit from a lower base[9]. This is largely because workers in mid- and low skill level occupations are expected to experience a larger increase, relative to workers in higher skill level occupations, in the requirements for them to utilise EES in their jobs.

This underlines the importance of the education and training system in effectively developing young people's EES before they enter the workforce, and of employers and employees appreciating the importance of investing in developing these skills in their workforce. The consequence of inaction may be that substantial skills deficiencies become ever more prevalent across the labour market.

Figure 6: Proportion of 'Workers' with substantial EES *deficiencies* by broad occupational group (SOC major group), in 2035 compared to 2023



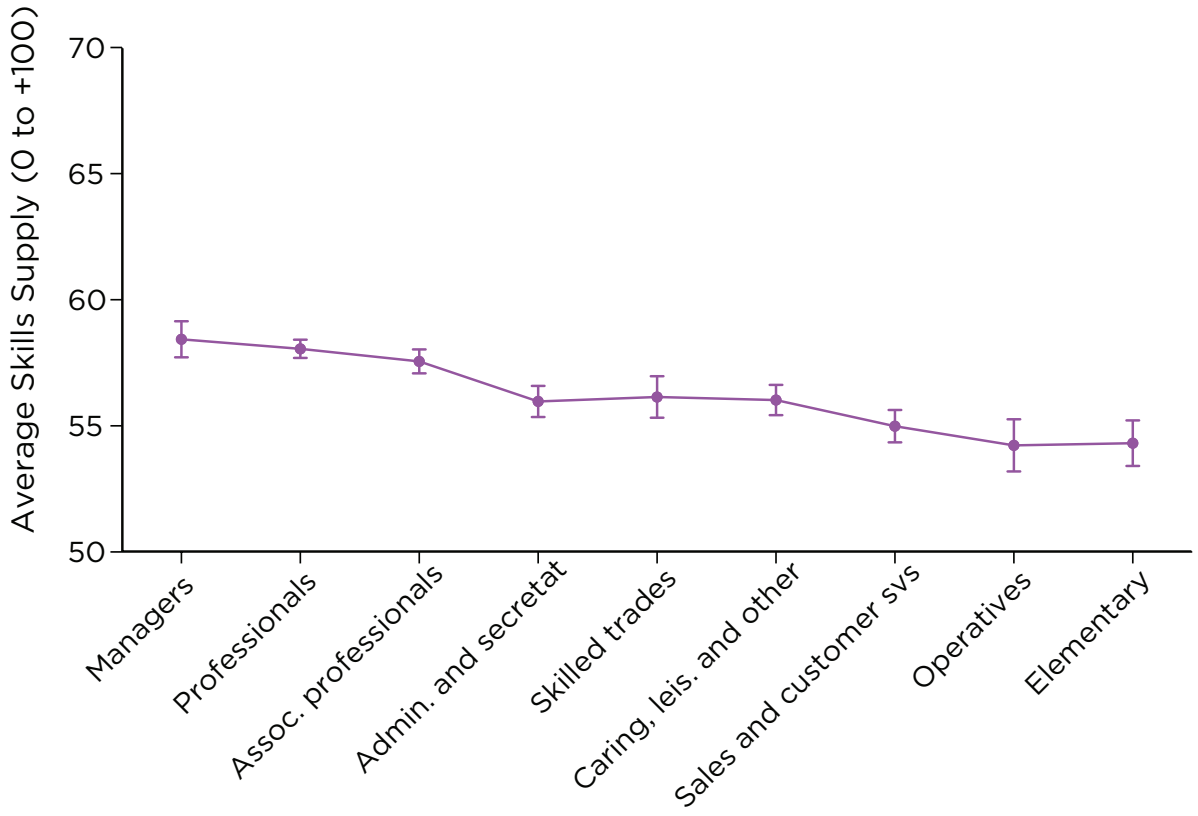
Source: Analysis of NFER's EES survey dataset

9 The only exception to this is 'Caring, leisure and other services', in which substantial EES skills deficiencies are projected to decline slightly between 2023 and 2035. This is because EES Skills Requirements in this occupational group are projected to decline slightly, from a high base level.

Workers with high skill level jobs tend to have higher Skills Requirements and higher Skills Supply of all six essential employment skills

On average, workers' levels of EES, based on their self-reported behaviours, decrease as we move down the occupational hierarchy from 'Managers, directors and senior officials' at the top-end to 'Elementary occupations' at the bottom-end, as shown in Figure 7.

Figure 7: Average EES Skills Supply in the overall population, broken down by occupation (SOC major group).



Source: Analysis of NFER's EES survey dataset

Note: Individuals' Skills Supply is calculated from their self-reported behaviours and put on a scale from 0-100, where larger numbers indicate higher skill levels.

Part of the relationship between occupation and Skills Supply is attributable to other differences between occupations in the composition of workers in each group. For example, workers in higher skill level occupations tend to require higher qualification levels and receive more training, factors which are associated with higher levels of EES, accounting for part of the relationship between occupation and Skills Supply. This *could* be because education and training have a direct causal effect on individual's EES.

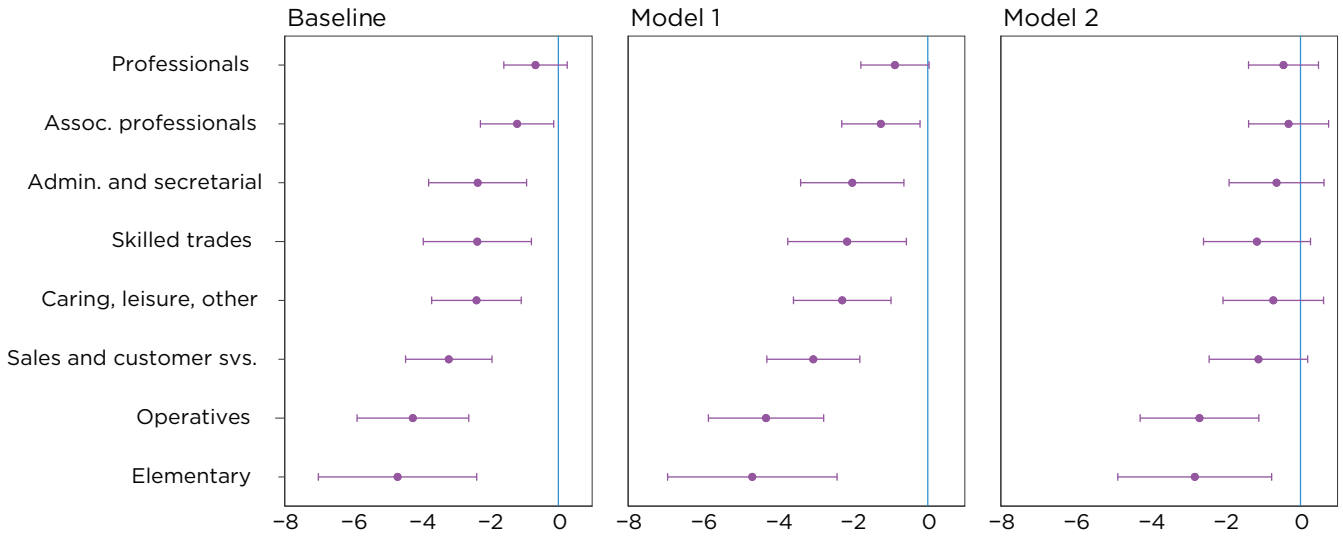
However, our statistical analysis suggests that, broadly speaking, Skills Supply declines as we move down the occupational hierarchy even after netting out the effects of differences in a broad range of other individual characteristics, including people's education and training. This is shown in Figure 8 below, which shows the change in average skill level (EES) for each major occupational group relative to the average skill level of 'Managers, directors and senior officials'. 'Model 1' controls for workers' differences in demographic characteristics and health status, and 'Model 2' controls for differences in a

broader range of individual characteristics, including workers' employment and managerial status, geography, education and training and industry. One potential explanation for this is that workers in higher skill level jobs utilise EES relatively more intensively, affording them more opportunities to hone these skills over time (Dickerson *et al.*, 2023).

Differences in Skills Supply and Skills Requirements between occupations do not vary substantially by EES domain, as shown in Figure 9 (Skills Supply by domain) and Figure 10 (Skills Requirements). However, our results indicate that workers in mid- and low skill level occupations perceive their jobs to require marginally higher levels of 'Creative thinking' than other EES, whereas they have lower levels of these skills. High skill level occupations place the highest demands on workers' 'Information literacy' skills whereas 'Creative thinking' is utilised relatively less intensively; these differences are mirrored in the skills workers possess.

Workers in mid- and low skill level occupations perceive their jobs to require marginally higher levels of 'Creative thinking' than other EES, whereas they have lower levels of these skills

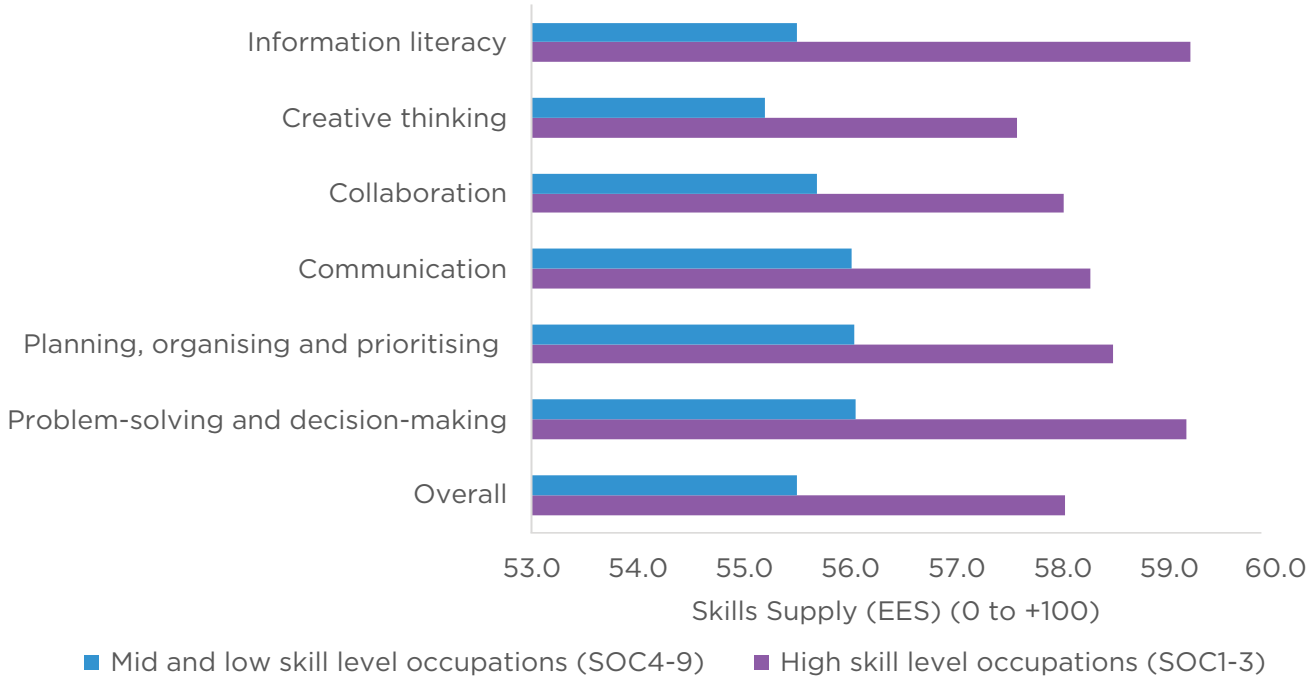
Figure 8: The partial effects on Skills Supply among 'Workers' of occupation group (SOC major group) relative to Managers, before and after netting out the effects of other individual characteristics



Source: Analysis of NFER's EES survey dataset

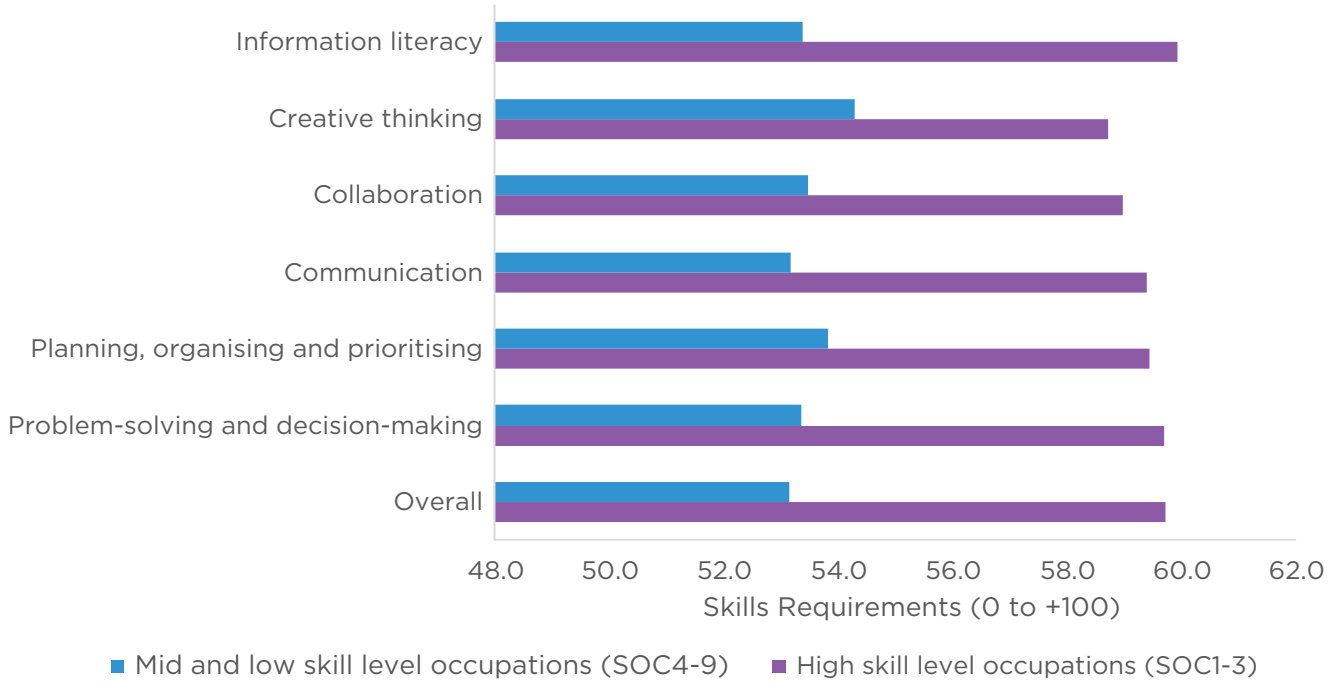
Note: 'Model 1' controls for gender, age, ethnicity, country of birth, and health status. 'Model 2' extends this list of controls to also control for employment status, managerial status, region, local area deprivation (IDACI), highest qualification level, participation in off-the-job and on-the-job training, and industry.

Figure 9: Variation in Skills Supply (0 to +100) by skill domain, broken down by high and mid- to low skill level occupations



Source: Analysis of NFER's EES survey dataset

Figure 10: Variation in Skills Requirements (0 to +100) by skill domain, broken down by high and mid- to low skill level occupations



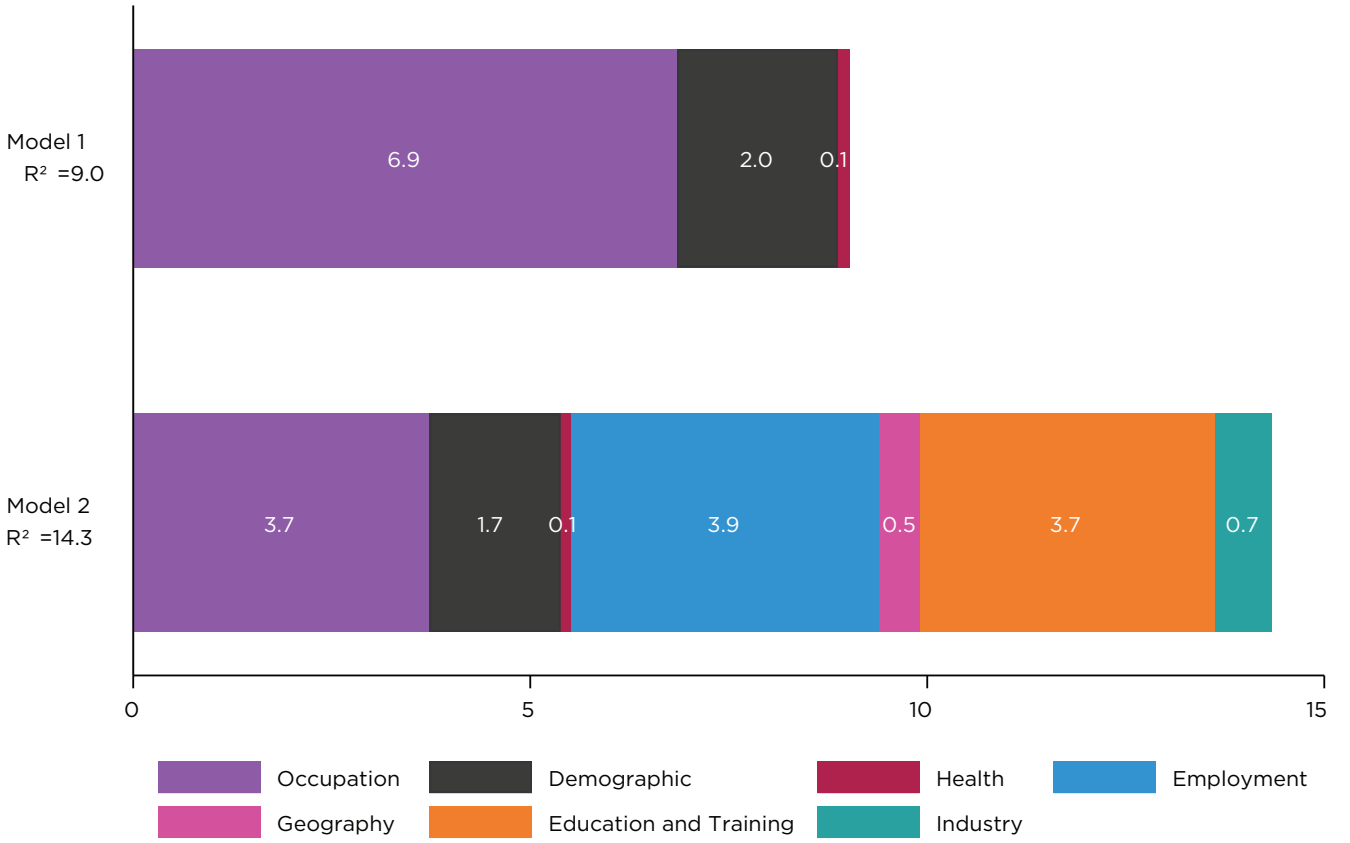
Source: Analysis of NFER's EES survey dataset

Levels of EES vary across the population, with 'Education and training' an important determinant of Skills Supply

Average levels of EES vary significantly across the population, depending on people's demographic characteristics and the occupation they work in. 'Model 1' in Figure 11 'below indicates that nine per cent of the variance in workers' EES Skills Supply is explained by differences in people's demographic characteristics and occupation. However, 'Model 2' of Figure 11 – which partitions the variance in Skills Supply into the effects of a broader range of factors than 'Model 1' – shows that almost half of the variance in Skills Supply initially attributed to differences in occupation is explained by differences between occupations in people's employment status, education and access to training (and to a lesser extent also differences in their geography and industry).

Of these factors, differences in individuals' 'occupation' (their broad occupational group), 'employment' (their employment status and managerial status) and 'education and training' (their highest qualification and participation in formal and informal training) each account for almost four per cent of the variance in Skills Supply; more than any of the other factors measured by our survey. This potentially indicates that increases in the

Figure 11: Shorrocks-Shapley decomposition of the share of variance (%) in EES Skills Supply among 'Workers' that is attributable to seven different sets of related variables



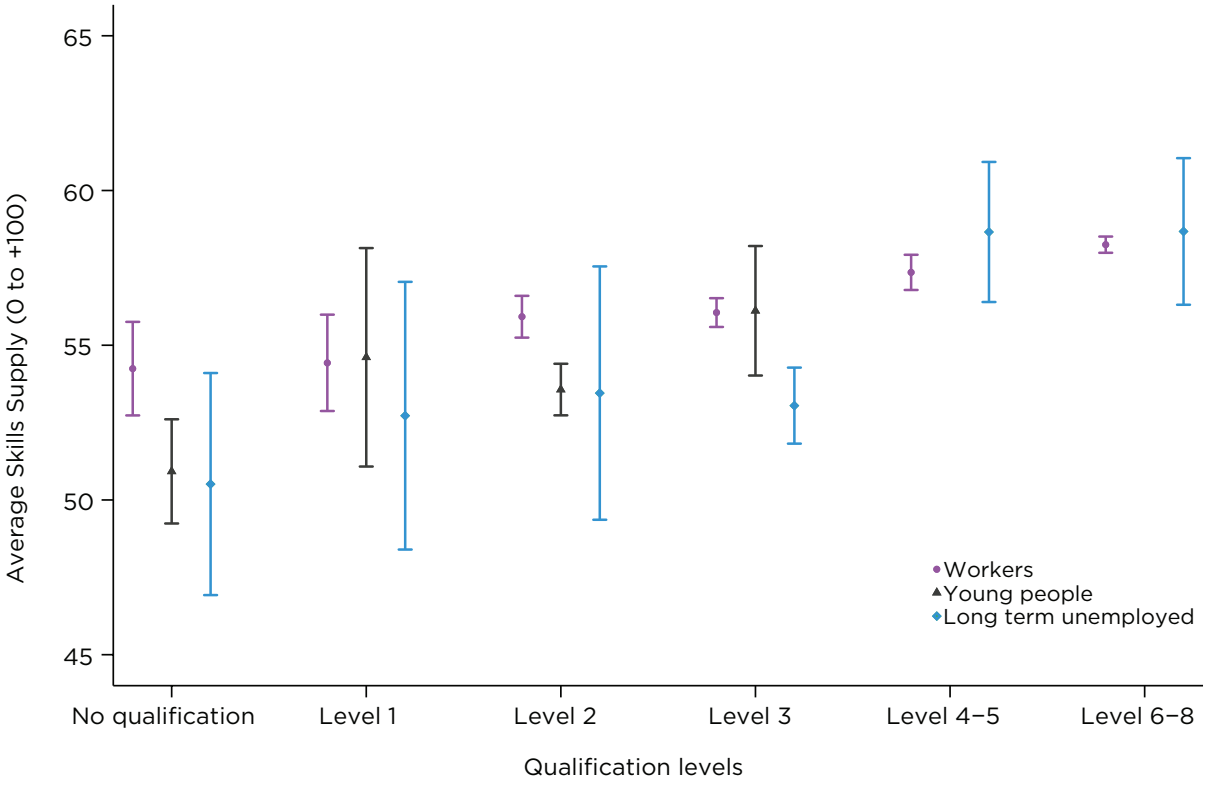
Note: The R^2 in Figure 11 above represents the proportion of the overall variance in Skills Supply that is attributable to the seven sets of independent variables in the Model. Model 1 suggests that nine per cent of the variance in Skills Supply is attributable to 'occupation', 'demographic' characteristics and 'health' variables. Model 2 suggests that seven sets of variables, listed below, account for 14.3 per cent of the variance in Skills Supply across Workers. These seven sets of variables are:

- Occupation: Broad occupational sector (SOC major group)
- Demographic: Gender, ethnicity, country of birth
- Geography: Region, local area deprivation
- Education and Training: Highest qualification achieved, participation in on- and off-the job training
- Health: Health status
- Industry: Broad industrial sector
- Employment: Employment status and managerial status.

average qualification and training levels of the population might increase the stock of EES and consequently also reduce employer-reported skills deficiencies. Conversely substantial declines in workplace training (IFF Research, 2023) and publicly-funded qualifications started by adults (Sibieta, Tahir and Waltmann, 2022) may have reduced the stock of EES across the population and exacerbated Skills deficiencies. That being said, we cannot rule out the possibility that higher Skills Supply influences people's propensity to pursue qualifications and training in the first place, and/or that both Skills Supply and qualifications and training are driven by other factors not captured in our survey.

Figure 12 below shows how average EES Supply increases as workers' qualification levels increase. One potential explanation for this relationship is that qualifications directly develop people's EES, whilst another explanation is that people with higher Skills Supply are more likely to pursue a higher qualification in the first place. Our research suggests that workers who participate in more on-the-job and/or off-the-job training (the majority of which does not lead to a qualification) also have higher levels of EES on average. This might be because participating in training develops workers' EES, although we cannot rule out the possibility that the relationship is driven by workers with higher levels of EES being more proficient in identifying and accessing appropriate training. Either way, large increases in training participation only correspond with modest increases in EES Skills Supply.

Figure 12: Average EES Skills Supply by highest qualification achieved, broken down by sub-population[10]



Source: Analysis of NFER's EES survey dataset

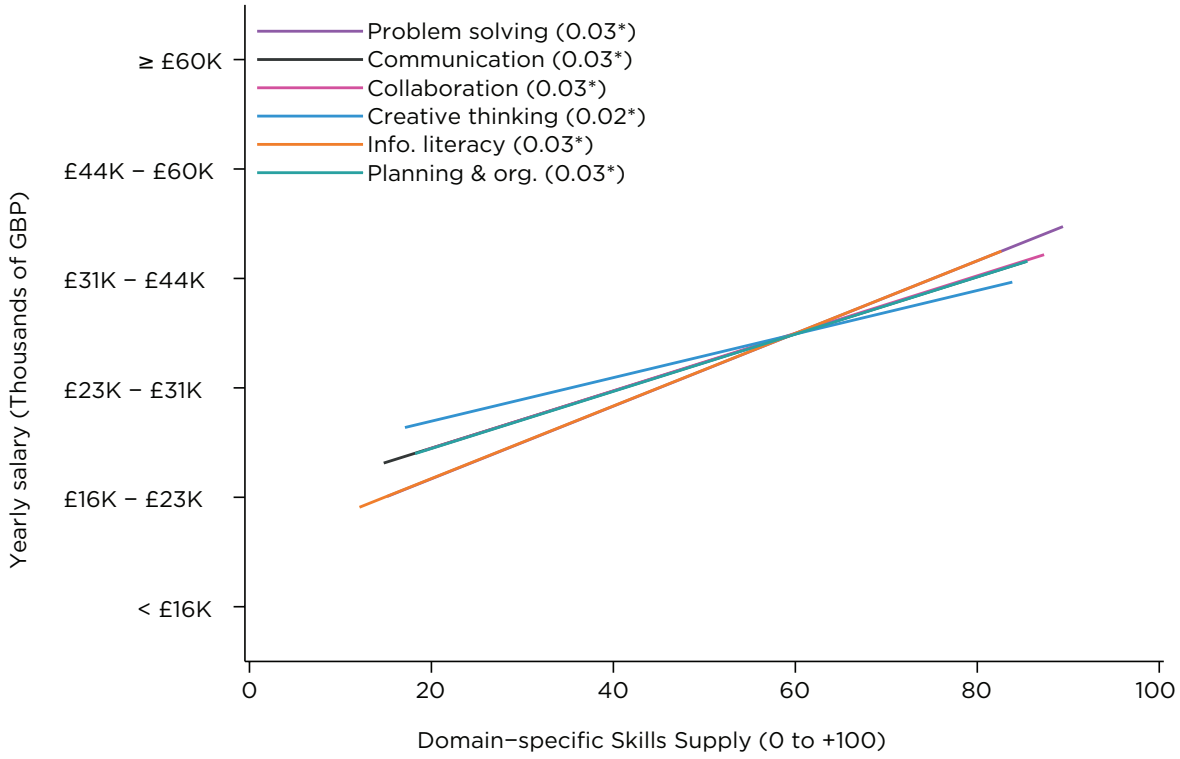
Note: Qualifications are classified using the Regulated Qualifications Framework (RQF) – No qualification: Entry level qualifications below level 1; Level 1: Low grade GCSE (grade 3 and under) and equivalent; Level 2: High grade GCSE (grade 4 and above); Level 3: A level and equivalent; Level 4-6: Degree at undergraduate level and equivalent; Level 7-8: Postgraduate degree level and equivalent. Average Skills Supply amongst young people with Level 4+ qualifications is not displayed above because very few young people aged under the age of 19 have yet achieved qualifications at these levels.

10 Readers are referred to the Technical Supplement Part A for a definition of the three sub-populations displayed.

People with higher levels of essential employment skills earn more and are more likely to be in management positions.

We find people with higher EES earn higher salaries, on average, as shown in Figure 13 below. Whilst a substantial share of the wage premium associated with higher levels of EES is attributable to other differences in individual characteristics – particularly in workers' occupation and working hours – our analysis suggests that the wage benefits associated with higher skill levels remain significant after netting out the effects of a broad range of other factors, as shown in Figure 14 below. This might suggest people with higher EES can command higher salaries in the labour market, although we cannot rule out the alternative explanation that higher salaries may be symptomatic of greater responsibilities that afford people more opportunities to subsequently develop their EES.

Figure 13: Average relationship between EES Skills Supply and salary among 'Workers', by skill domain

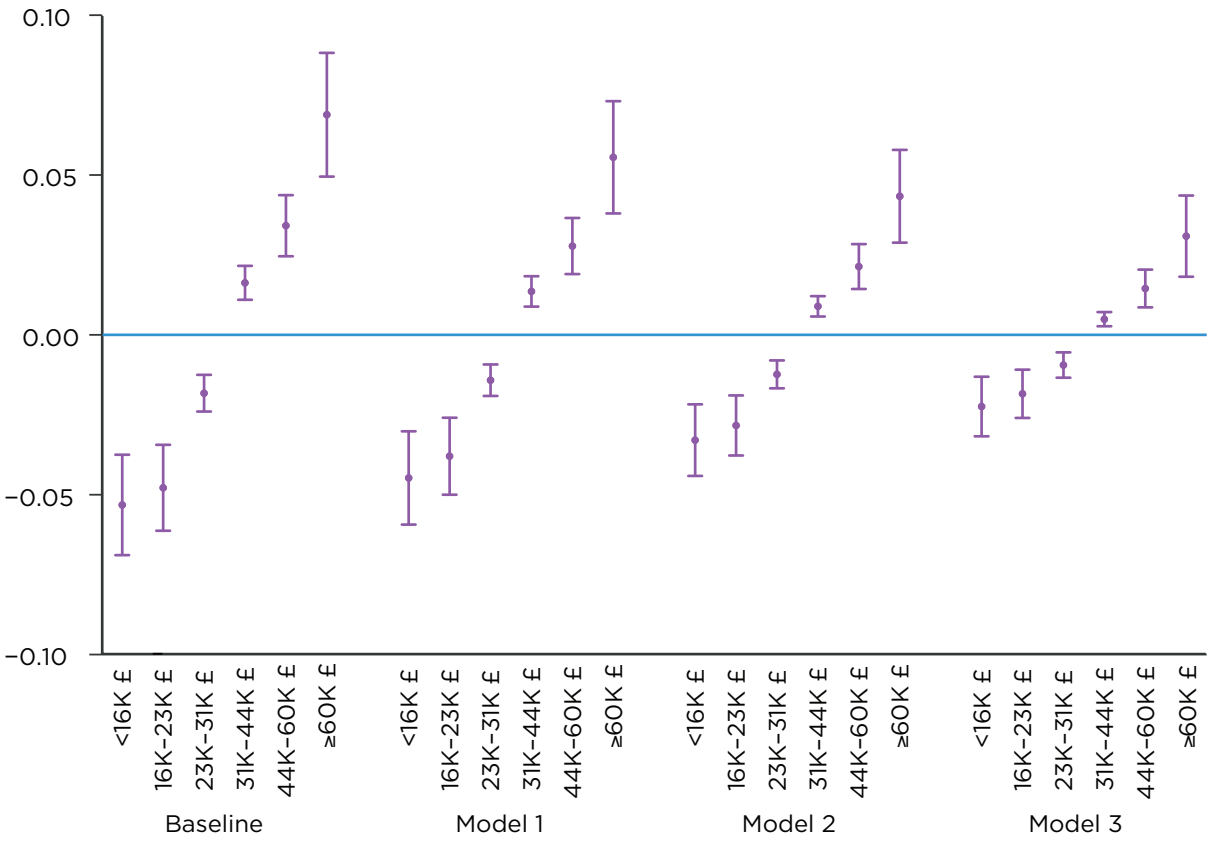


Source: Analysis of NFER's EES survey dataset

Similarly, we find people with higher levels of EES are more likely to be in a management position, on average. A ten-point increase in Skills Supply (on a scale of 0-100) is associated with an increased probability of being in management of over ten percentage points, after netting out the effects of differences in a broad range of other individual characteristics.

However, for context, a ten-point increase in Skills Supply is large; roughly equivalent to the difference between the median and the 90th percentile of the Skills Supply distribution. One potential explanation for this relationship is that EES are seen to contribute to greater leadership effectiveness in management (Riggio *et al.*, 2003).

Figure 14: Partial effect of a ten-point increase in Skills Supply on the probability of 'Workers' being in each salary category, before and after netting out the effects of other individual characteristics, where Model 3 controls for the largest number of individual characteristics



Source: Analysis of NFER's EES survey dataset

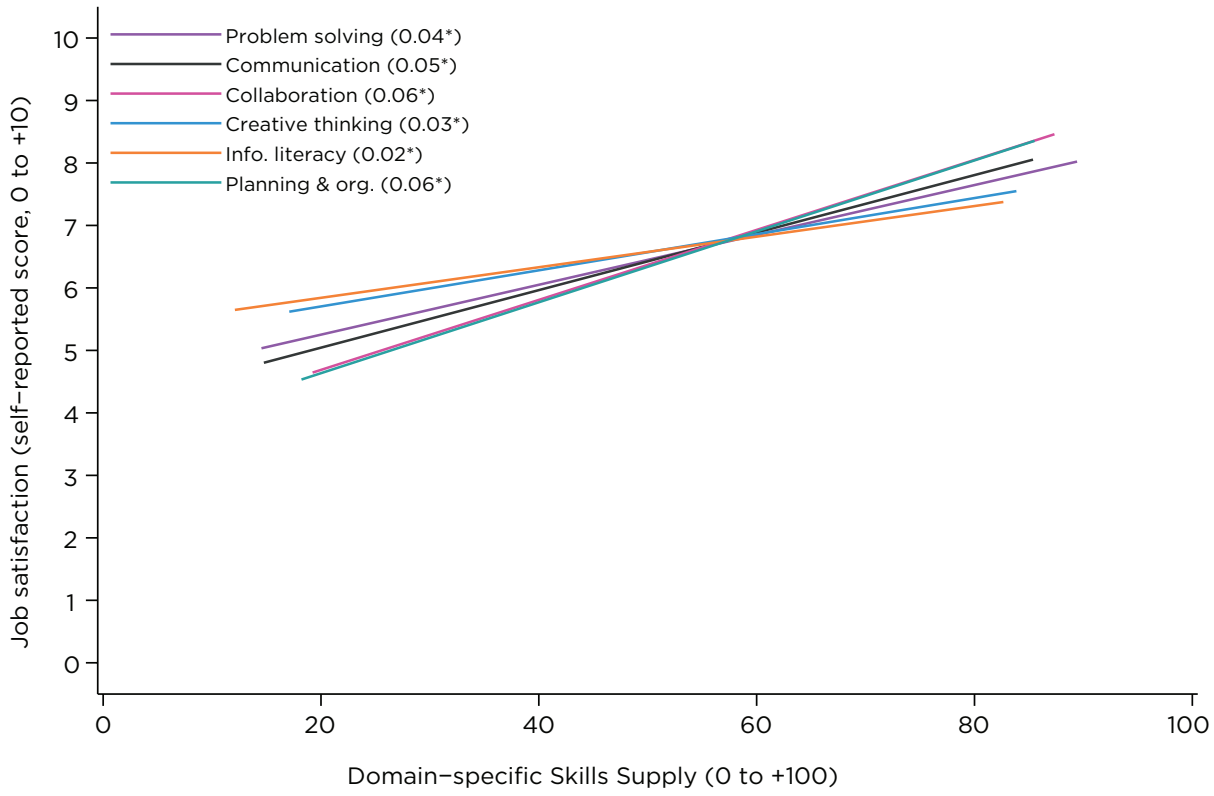
Note: 'Model 1' controls for gender, age, ethnicity, country of birth and health status. 'Model 2' adds controls for employment status, managerial status, region, local area deprivation (IDACI), highest qualification level, participation in off-the-job and on-the-job training. 'Model 3' adds further controls for the occupation and industry people work in.

This might suggest people with higher EES can command higher salaries in the labour market

Higher levels of essential employment skills are associated with higher job and life satisfaction.

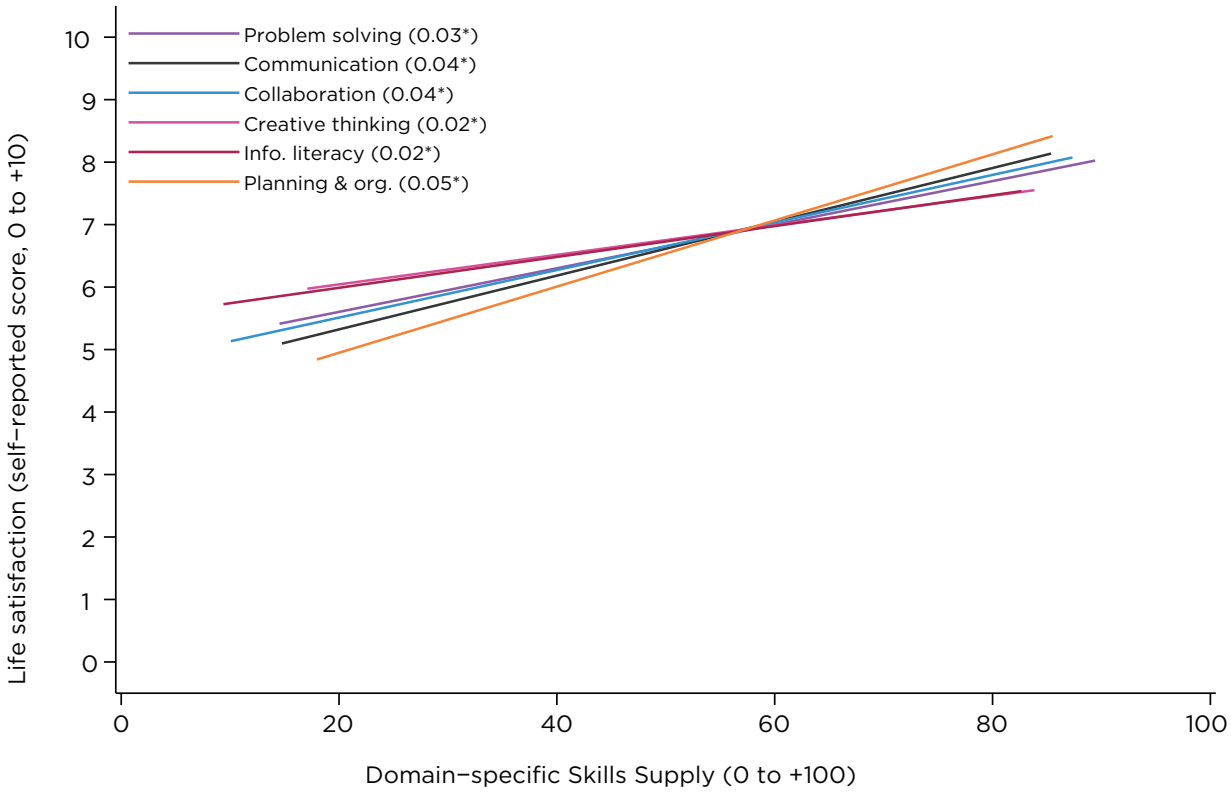
Our research suggests that higher levels of EES are associated with higher job and life satisfaction, as well as higher earning potential, as shown in Figure 15 (job satisfaction) and Figure 16 (life satisfaction) below. Although the relationship between Skills Supply and life satisfaction is weaker than the one between skills and job satisfaction, higher EES are still associated with higher life satisfaction on average. People's Skills Supply may affect their job and life satisfaction, or vice versa.

Figure 15: Average relationship between EES Skills Supply and job satisfaction among 'Workers', by skill domain



Source: Analysis of NFER's EES survey dataset

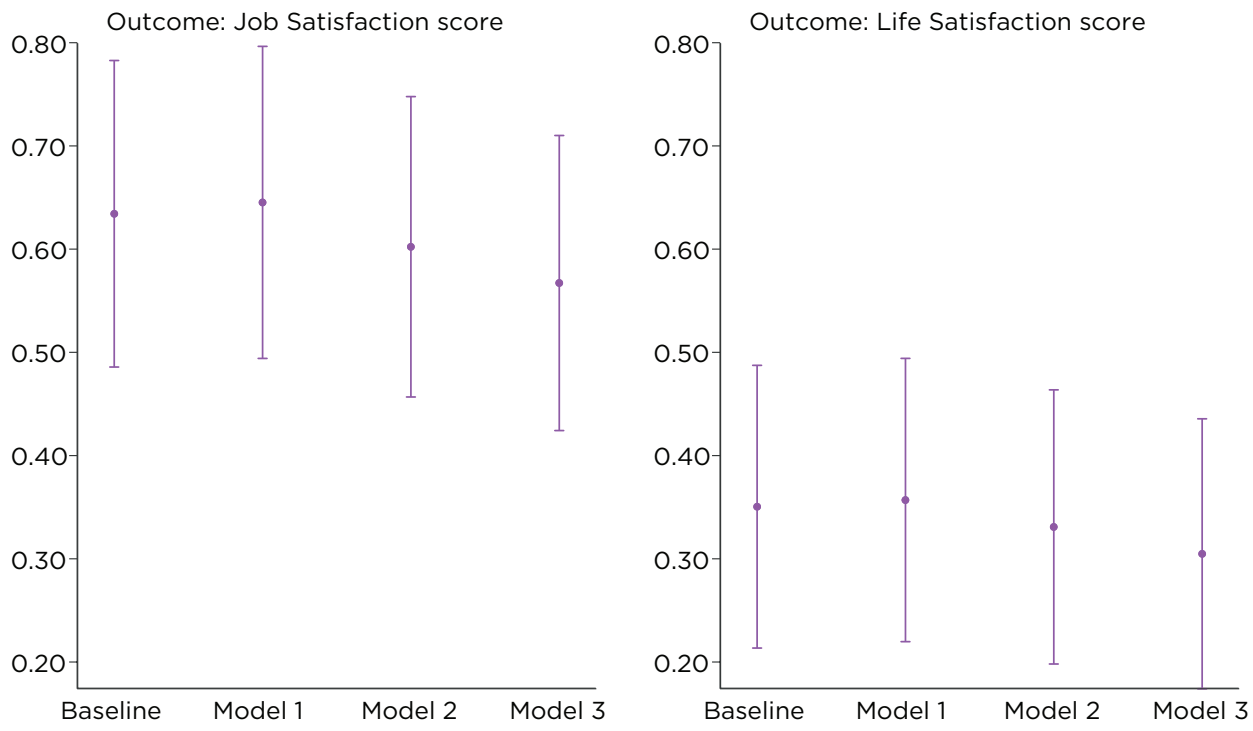
Figure 16: Average relationship between Skills Supply and life satisfaction amongst the overall population, by skill domain



Source: Analysis of NFER's EES survey dataset

Our analysis suggests that part of the relationship between skills and satisfaction is attributable to differences in other individual factors, such as the occupation people work in. However, even after netting out the effects of a broad range of other factors that may affect workers' job satisfaction, a ten-point increase in Skills Supply (EES) is associated with an increase in job satisfaction score of around 0.6 points on a ten-point scale, as shown in Figure 17 below. Comparing the relationship between people's EES and job satisfaction with that of salary and job satisfaction, we find that a ten-point increase in someone's EES corresponds with a similar increase in job satisfaction as moving from the <£16k per year salary band to the £31k-£44k salary band. However, for context, a ten-point increase in Skills Supply is large; roughly equivalent to the difference between the median and the 90th percentile of the Skills Supply distribution. Although the relationship between Skills Supply and life satisfaction is weaker than the one between skills and job satisfaction, it remains significant even after controlling for a broad range of other individual characteristics, as shown in Figure 17 below. A ten-point increase in Skills Supply (EES) is associated with an increase in life satisfaction score of around 0.3 points on a ten-point scale.

Figure 17: Partial effects of a ten-point increase in Skills Supply on job satisfaction among 'Workers' and life satisfaction amongst the overall population, before and after netting out the effects of other individual characteristics, where Model 3 controls for the largest number of individual characteristics



Source: Analysis of NFER's EES survey dataset

Note: For the job satisfaction outcome, 'Model 1' controls for age, gender, ethnicity, country of birth and health status. 'Model 2' adds controls for employment status, region, local area deprivation (IDACI), highest qualification level and participation in training. 'Model 3' also controls for occupation and industry. For the life satisfaction outcome, 'Model 1' controls for age, gender, ethnicity, country of birth and health status. 'Model 2' also controls for employment status, region, local area deprivation (IDACI), highest qualification level and participation in training. 'Model 3' adds occupation (SOC major group) and industry.

Conclusions and recommendations

Our Essential Employment Skills Survey gathers the missing worker perspective, at scale, to quantify Skills Supply, Skills Requirements and Skills Gaps in relation to EES. By estimating people's Skills Supply from their self-reported behaviours and their Skills Requirements from their self-assessments of the level and importance of each skill needed to perform their jobs, we are able to quantify Skills Gaps in relation to EES for the first time. This enables us to offer fresh insights into the supply of EES across the population, and the gaps that exist between the skills people possess and the skills requirements of their jobs.

This is important because individuals with higher levels of EES earn more, are more likely to progress into management, and have higher job and life satisfaction. However, our analysis shows that 13 per cent of workers have a substantial EES skills deficiency in 2023, which may jeopardise their ability to fulfil their job requirements effectively, and our 2035 projections indicate these skills deficiencies have the potential to get worse.

By contrast, 14 per cent of workers report having substantial EES under-utilisation – that is, where the skills they possess are higher than those required to do their jobs. Our analysis shows that skills under-utilisation is more widespread among mid- to low skills level occupations (SOC4-SOC9), with 22 per cent of workers in these occupation groups having substantial EES under-utilisation compared to seven per cent of workers in high skill level occupations. Tapping into these latent skills is going to be increasingly important for employers, individuals and the economy, especially given the crucial role that EES will play across the workforce in 2035.

Our research insights point towards the importance of a *collective response* from across government, industry, the education system and wider society to addressing skills gaps in the current workforce and ensuring young people enter the labour market with the EES that employers require. The consequence of inaction is likely to be that these Skills Gaps continue to widen, limiting individuals' employment and earnings opportunities and the performance and productivity of organisations.

Recommendation 1: Employers grappling with skills gaps should consider what more they can do to align expectations and skills assessments between managers and workers across their workforce.

According to our research, most workers in mid- and low skill level occupations self-report behaviours that indicate they have under-utilised EES, and a significant minority have substantial under-utilised EES, whereas employers indicate that (overall) skills deficiencies are most prevalent in low skill level occupations. This contradiction may reflect differences of view between employers and workers about the skills required to undertake these occupations effectively or may result from different assessments between employers and employees about the level of skills employees have to offer. Fostering better alignment between employers and employees about the skills required to perform their roles effectively, and the skills that employees possess, may be a pre-requisite for alleviating employer-reported Skills Gaps.

Employers should reflect on their HR and management practices and consider what more they can do to address these inconsistencies. This may include undertaking regular reviews of job requirements in consultation with employees, providing greater clarity on skill requirements in job specifications, actively deploying 360 degree feedback and supporting line managers and staff to develop a shared understanding of employees' current skill levels and how they could be better used and developed.

A more accurate assessment of skills gaps would also enable employers to engage more effectively with local education providers and support them to link their education, training and careers advice and guidance to future labour market needs, including the growing demand for EES.

Recommendation 2: Employers should consider what more they can do to support their line managers to identify and utilise the 'latent' EES of their workers, particularly the under-utilised skills of workers in mid- and low skill level occupations.

Our research suggests that many workers in mid- and low skill level occupations typically have under-utilised EES and a significant minority have substantial under-utilised EES, which employers may not be fully aware of. Workers in lower skill level occupations may be relatively more likely to have 'latent' EES when they are typically required by their employers to perform routine manual or cognitive tasks, but their previous roles or personal life require them to exercise a greater degree of interdependency, team working, planning, organising and problem solving. The same may be true of people whose jobs have been de-skilled as a result of the introduction of automation-related technologies. Employers may not always be aware of their workers' 'latent skills'. This asymmetry of information may be greatest between workers in low-skilled jobs and their employers. Employers should consider what more they can do to unlock pockets of latent skills in their workforce, for example by encouraging and supporting line managers to identify and fully utilise the EES that their workers possess, particularly workers in mid- and low skill level occupations. This may require changes in management behaviours, as well as changes in policies and practices.

Recommendation 3: Employers should reflect on the extent to which skills gaps in their organisation could be a consequence of 'skills withdrawal' and how they ensure that working conditions and practices promote organisation commitment, engagement and work effort.

Employers' practices can contribute to Skills Gaps. These may materialise over time as a consequence of negative reactions to poor job quality (Hurrell, 2016). Poor quality employment may cause job dissatisfaction, resulting in reduced engagement, lower organisational commitment and reduced work effort, leading workers to withdraw skills and employers to identify skills gaps. Socio-emotional skills – for example communication and collaboration – may be especially prone to withdrawal because they rely more on people's emotions and dispositions (Hurrell, 2016). Withdrawal behaviour may also be particularly common in contexts where workers have experienced increased workload and emotional demands and reductions in their autonomy, which in turn affects their dedication and organisational cynicism (van Ruysseveldt *et al.*, 2023).

England has seen an increase in poor quality jobs characterised by low hourly pay and insecurity over working hours (Resolution Foundation, Centre for Economic Performance, and LSE, 2023). Low earners are four times as likely as high earners to experience volatility in their hours or pay, or to be working fewer hours than they would like. Half of shift workers in Britain receive less than a week's notice of their working schedules, which perhaps helps explain why job satisfaction has been falling among low-earners year on year since the 90s (Resolution Foundation, Centre for Economic Performance, and LSE, 2023). Lower skill level occupations have also been subject to declining real-terms pay, growing job insecurity, increases in the intensity of effort and hours required to do their jobs, reduced autonomy and reduced utilisation of their skills.

Raising the floor on standards and offering lower-paid workers greater security, flexibility and control may be vital pre-requisites for reducing withdrawal behaviour and alleviating Skills Gaps in the current workforce. Employers should consider what more they can do to promote organisation commitment, engagement and work effort amongst their workforce, particularly amongst workers in mid- and low skill level occupations.

Recommendation 4: Government should further incentivise employer investment in the development of their workforce's EES.

Whilst the UK's training participation rate is around the average for European countries, the UK stands apart in having seen a relatively pronounced decline in training (Tahir, 2023). Between 2011 and 2022, there was a 19 per cent decline in the average number of training days received by employees in England, a decline which was also reflected in employers' training expenditure – between 2011 and 2022 the average training investment fell by 19 per cent per employee in real-terms (Employer Skills Surveys, 2011-2022).

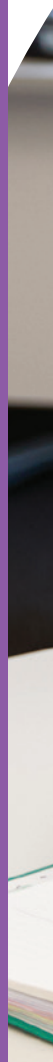
Government plays a key role in incentivising employers and employees to invest more of their own time and resources in skills development and should consider what more it could do to further incentivise employer investment in workforce skills development, for example through the tax system.

Recommendation 5: Government and institutional funders should fund more research to i) understand the causes, scope and consequences of perception differences between employers and employees, ii) identify the determinants of EES, and iii) identify the most effective strategies for educators and employers to assess and develop EES.

Prior research comparing employers' perceptions of skills gaps with those of employees are severely limited. However, the dyadic research that has been done has identified perception gaps between employers and workers, with greater misalignment between low-skilled workers and their employers (McGuinness and Ortiz, 2014; Hurrell, 2016; Tsirkas, Chytiri and Bouranta, 2020). Our research builds on this prior knowledge, again highlighting apparent perceptions gaps between employers and employees. Further dyadic research is required to understand the scale, distribution, causes and consequences of these perception gaps between employers and workers, given these have important implications for the collective response required to close skills gaps.

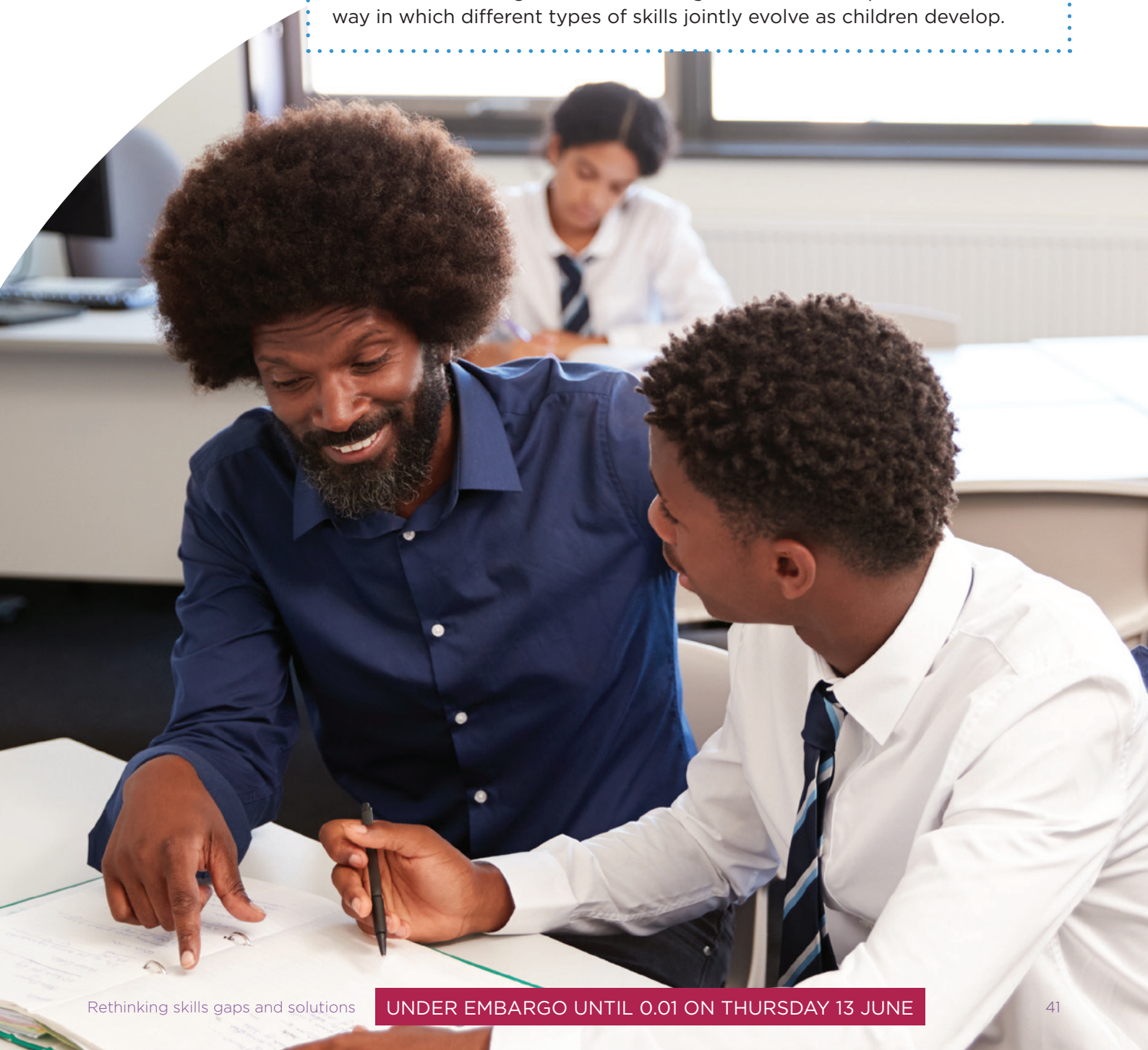
Differences in people's demographic characteristics, health status, employment status, education, participation in training, geography, occupation and industry only explain a small share of the variance in Skills Supply across the population. Further research is needed to identify other factors associated with the development of EES throughout childhood and adulthood. Later in *The Skills imperative 2035*, we will contribute to this by exploring how people's education choices and prior attainment relate to their levels of EES in adulthood. We also examine the relative importance of factors related to young people's home and school environment to their skills development throughout childhood.

We also advocate for complementing these efforts by researching the most effective strategies for assessing and developing EES, and understanding how these approaches should vary by domain, age and context, complementing research already underway in this area, including by the Skills Builder Partnership and The Careers and Enterprise Company.



Recommendation 6: The Department for Education (DfE) should consider what more it can do to support education and training providers to adopt the best strategies for assessing and developing people's EES.

EES are inherently more difficult to pin down and measure than subject-specific knowledge and skills, and therefore potentially more vulnerable to inconsistencies in the way they are assessed and developed. The Department for Education has a role to play in supporting education and training providers to identify strategies for developing and assessing young people's EES, utilising the findings from recommendation 5 above, and complementing the work of organisations already promoting tools to build and assess Essential Employment Skills, most notably the Skills Builder Partnership. Later in *The Skills Imperative 2035* we will return to the theme of skill development in childhood and offer fresh insights on the determinants of cognitive and non-cognitive skill development and the way in which different types of skills jointly evolve as children develop.



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ISBN: 978-1-916567-00-9

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