Skills Builder PARTNERSHIP

ESSENTIAL SKILLS TRACKER 2022

Will Seymour, Robert Craig

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Foreword

There have long been calls for a greater emphasis on essential skills: those highly transferable skills that everyone needs to do almost any job. Since 1989, the CBI have regularly called for skills including teamwork, speaking and listening, and problem solving to be a normal outcome of a good education, and then further nurtured by employers.

The events of the last couple of years have only increased the demand for these skills. An increased emphasis on caring professions has highlighted the critical importance of skills like listening and problem solving. Conversely, social distancing has increased automation of those skills which do not need that human dimension.

The Skills Builder Partnership exists to ensure that one day, everyone builds the essential skills to succeed. Since 2018, our approach has been a collective one: bringing together educators, employers and impact organisations around that shared mission as well as a common language and outcomes for essential skills provided by the Skills Builder Universal Framework.

That Partnership is now more than 800 organisations strong, and the growing impact of the Framework has been seen across education, training and employment. In the last year, the Partnership delivered 1.46 million opportunities for individuals to boost their essential skills. These opportunities increasingly span the length of individuals' lives – from primary school through secondary school, college, university or apprenticeships, and on through careers to retirement.

However, whilst there have long been calls for greater emphasis on these skills, whether from business organisations or from educators, evidence on essential skill levels across the UK is limited.

That has been due to the absence of a shared language or the means with which to quantify those skills. The Skills Builder Universal Framework addresses that gap, and for the first time we have been able to build a full picture of how individuals in the UK build and deploy their essential skills across their adult lives.

Through the excellent analysis of this report's authors, Robert Craig and Will Seymour, we now have a benchmark to understand some of the challenges and the opportunities for essential skills in the UK. As we commit to making this an annual view of essential skills across the country, our hope is that this helps to galvanise and direct our efforts as a Partnership and everyone who has a stake in the development of essential skills.

Together, this will help us to ensure that one day, everyone builds the essential skills to succeed.

Tom Ravenscroft
Founder & CEO, Skills Builder Partnership

Skills Builder PARTNERSHIP

Summary

Context for the research

There is now significant interest in how essential skills – those highly transferable skills required for practically any job – can contribute to social mobility, productivity and prepare the workforce for automation. At the same time, there is growing momentum for taking a robust and consistent approach to measuring and building these skills.

The pandemic is broadly seen to have accelerated long term trends in the world of work: increasing levels of automation and growth in sectors including healthcare, social care and personal care, education, professional services and digital and creative industries. These are sectors that lean particularly on essential skills including interpersonal, communication, creative and self-management skills. In contrast, volumes of jobs in industries that rely less on essential skills are in decline, including manufacturing, agriculture and administrative services.

Despite valuable pieces of isolated research,[1] to date we have never had a clear picture of the levels of these skills across our country and how they impact life outcomes. Considering how comprehensive the data available on literacy and numeracy rates as well as academic performance in the United Kingdom are, and how valuable these are as policy and research instruments, it is evident that there is a profound gap when it comes to understanding essential skills.

The purpose of this research is to take the first step in filling that gap by providing a view of skill levels across our country and how they relate to important outcomes like wellbeing, employment and income. By repeating this research annually, we will build a baseline for essential skill levels across the country as well as a nuanced picture of the factors both impacting and impacted by them.

[1] Angus, Millard, Joshua, Baars & Bowen-Viner (2020). *How do essential skills influence life outcomes?*

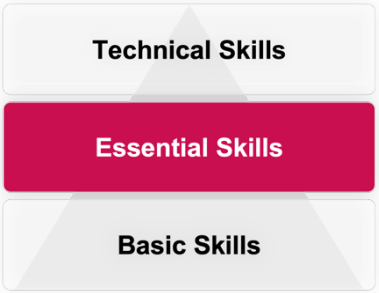
This paper therefore sets out to answer the following questions:

1. What is the relationship between essential skills and life outcomes such as employment and wellbeing?
2. To what extent do the UK public believe essential skills are important for their lives?
3. How are essential skills and the opportunities to build them distributed across our society?
4. What is the relationship between opportunities to build skills, skill levels and other outcomes?

Findings

- This research shows that essential skills are correlated with life outcomes, from increased wellbeing and higher earnings to lower probability of being out of work or education.
- However, essential skills – and the opportunities to build them – are not distributed equitably in the UK.
- It is therefore no surprise that the UK public both highly values these skills and wants more opportunities to build them.
- Despite this, opportunities to build essential skills are limited.
- As well as a 'skills gap', this paper shows there is in effect a 'skills trap'. Disadvantage and a lack of early opportunity to build essential skills leads to a lack of value placed on them, limited future opportunities, lower skill score, lower income and lower life satisfaction.
- The paper further validates findings from decades of work on the ground that high-quality opportunities to build essential skills improve individuals' skill levels.
- To both bridge the gap and escape the trap, the UK needs to scale the volume of high quality opportunities to build essential skills in education, through impact interventions and in employment.

What are essential skills?



Essential skills are those highly transferable skills that everyone needs to do almost any job, which make specific knowledge and technical skills fully productive.[2] These are therefore distinct from basic skills (literacy, numeracy and digital skills) and technical skills (specific to a particular sector or role, sometimes drawing off a particular body of knowledge).

They are:

- **Listening:** receiving, retaining and processing of information or ideas
- **Speaking:** oral transmission of information or ideas
- **Problem Solving:** ability to find a solution to a situation or challenge
- **Creativity:** use of imagination and the generation of new ideas
- **Staying Positive:** ability to use tactics and strategies to overcome setbacks and achieve goals
- **Aiming High:** ability to set clear, tangible goals and devise a robust route to achieving them
- **Leadership:** supporting, encouraging and developing others to achieve a shared goal
- **Teamwork:** working cooperatively with others towards achieving a shared goal

The research is the first of its kind to use the Skills Builder Universal Framework for Essential Skills. The importance of these skills seems to be talked about endlessly in employer surveys, reviews of educational priorities, and more speculative forward-looking reports.[3] But the absence of shared language and measurable outcomes has to date prevented tangible and consistent research into who benefits from these skills and the impact of having them. The Skills Builder Universal Framework addresses this gap.

[2] UK Commission for Employment and Skills (UKCES) (2009). *The Employability Challenge*.
[3] CBI (2018). *Educating for the Modern World: CBI / Pearson Education and Skills Annual Report 2018.* CBI; Institute of Student Employers (ISE) (2018). *ISE 2018 Development Survey: Trends, benchmarks and insights.*

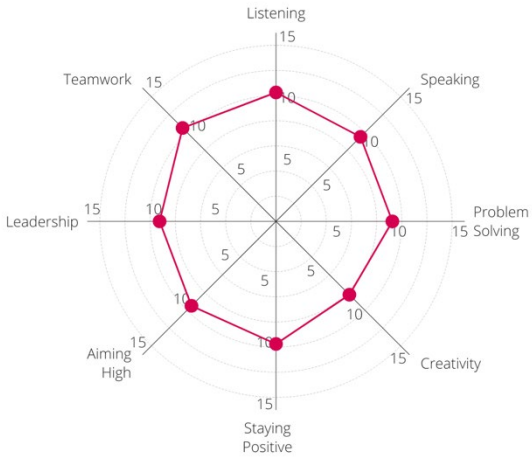


Figure 0.1 - Illustrative chart showing skill scores for an an individual with an average skill score of 9.4 across all skills

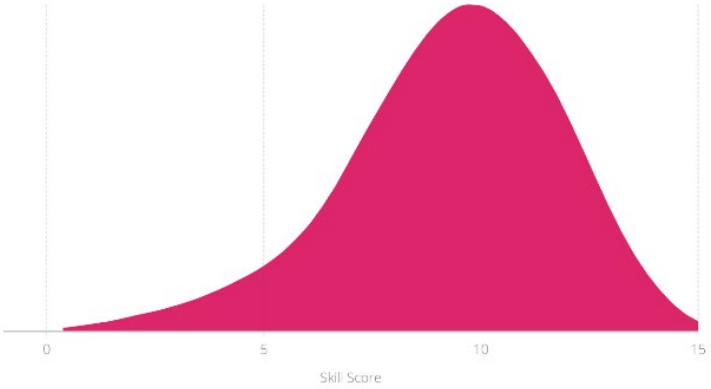


Figure 0.2 - Distribution of average skill scores for the sample population

The Framework was developed in collaboration with organisations including the CBI, CIPD and Gatsby Foundation as well as leading businesses, educators and academics with two-way validation to ensure it is both relevant and comprehensive. It breaks down the eight essential skills into 16 measurable, teachable, learnable components, from Step 0 to Step 15. Individuals indicate their ability against a likert scale for each step, which produces a "skill score" from -1 to 15 for each of the eight essential skills.

In this report we look both at the skill score for each of the eight skills (e.g. Problem Solving) but also use an average of all eight skills for each individual to give an average skill score. This average skill score enables us to undertake analysis and make effective comparisons across the population. Unless otherwise specified, when we talk about "skill score" in this paper, we are referring to an average skill score across the sample population, which in turn is an average of scores for each of the eight skills.

By using the Framework in this research, we can now measure skill levels as rigorously as technical skills or as we grade learning in education.

Essential skills impact life outcomes

Higher levels of essential skills are strongly related to improved employment and wellbeing outcomes.

Higher levels of essential skills drive higher income:

- Analysis finds a wage premium of between 12% and 18% associated with an increase in skill score from the lower quartile to the upper quartile (i.e. an increase in an average skill score from 8.2 to 11.3).
- For the average worker, this increase from 8.2 to 11.3 translates into an essential skills wage premium of between £3,900 and £5,900.
- Iteratively controlling for education level, age, and other demographic factors shows that individuals who are similar in these respects but not in skill score are very likely to have incomes that differ in proportion to their level of essential skills, which is indicative of a causal relationship between essential skills and income.

Higher levels of essential skills are related to higher life satisfaction:

- There is a clear link between higher skill scores and greater life satisfaction, significant at the 0.01 level. Without controlling for other variables, 5% of the variance in life satisfaction is accounted for by skill score.
- Moving from the lower quartile skill score to the upper quartile skill score is associated with an increase in life satisfaction from 6.5/10 to 7/10, when controlling for age, income, and other demographic factors.

Building essential skills can reduce the probability of being out of work or education:

- The relationship between skill score and the likelihood of an individual being in work or education is clear, and significant at the 0.01 level.
- An increase in skill score from the lower quartile to the upper quartile is associated with a reduction in the likelihood of being out of work or education from 11% to 7%, when controlling for age, gender, demographics, and social advantage.
- An individual with a skill score 3 steps higher than an otherwise similar individual is on average 52% less likely to be out of work or education.

Essential skills are valued

This research adds to the body of literature showing that essential skills are highly valued in the UK across several domains:

- An overwhelming 89% of individuals believe essential skills to be important for employment, career progression or success in a recruitment process.
- Of these outcomes, individuals believe the skills to be particularly important for overcoming adversity and difficulty in life (86%).
- 71% of individuals also believe essential skills are important for academic performance.

Essential skills and opportunities to build them are not distributed equitably

The median skill score of adults in the United Kingdom is 9.4 out of 15. As we repeat this research each year, we will look at trends in this top line number. Unfortunately, in how this average breaks down, essential skills are not distributed equitably in the UK:

- There is a long tail of adults with much lower abilities in essential skills: 10% of adults have a skill score lower than 5.
- There is a strong case for “levelling up” essential skills across the country, with the North and East of England reporting lower skill levels than London, the South and Midlands.
- Skill score increases as people age from 18 to 44 years old but then drops again from 45 to 66, indicating both the importance of starting to build skills young, but also to keep going through lifelong learning.
- Those from more advantaged backgrounds and those who attended independent or selective schools have meaningfully higher levels of essential skills.

Individuals in the lowest quartile of skill score are:

- 30% more likely to be aged 55-64
- 109% more likely to have no formal qualifications
- 8% more likely to have attended a non-selective state school
- 11% more likely to live in the North of England
- 23% less likely to have had a parent attend university
- 22% less likely to have had parents that were engaged with their education.

The opportunities to build essential skills are also inequitably distributed:

- Only 14% of workers had ever been given the opportunity by their employer to develop essential skills through structured learning.
- Most lower income workers and individuals in low-skilled occupations do not have opportunities to build essential skills. This contrasts starkly with those in higher income, “white collar” jobs, who get more opportunities to build these skills, even though higher skill levels drive higher income across all types of work.
- Those who attended independent schools were more likely to report that they had opportunities to build essential skills at school than their peers who attended non-selective state schools.
- It is the most disadvantaged individuals that are least likely to benefit from having opportunities at school to build the essential skills that lead to improved life outcomes.
- Those who lack the opportunity to build skills in school are less likely to have the opportunity to build skills in employment.

Opportunities to build essential skills pose a solution

Given both the real impact on income and life satisfaction, as well as the pervasive perception that essential skills are important across life, it is logical that demand for more opportunities to build essential skills is very high:

- 83% of workers would like more opportunities to build essential skills, while 92% believe that they should form part of professional development.
- Those who desire more opportunities to build skills also have markedly higher skill levels. 66% of those who strongly agreed they want more opportunities have above median scores; collectively this sub-population has a median score of 11.3, compared to a score of 8.3 (and only 20% above median) for those that strongly disagree they want more opportunities.
- Individuals who had good opportunities to build essential skills at school and strongly agree that they want more opportunities to build skills have some of the highest skill levels in the UK, with 81% of them achieving a skill score above the median.

Skill score increases amongst individuals who had greater opportunities at school or in employment, but who are otherwise similar:

- Skill score is higher for individuals who had multiple specific opportunities to build essential skills, compared to those who had none. For individuals who had opportunities in education skill score is 1 step higher on average, and for those who had opportunities in employment it is 1.5 steps higher.

Implications for policy makers, educators, employers and impact organisations

This research paper finds that beyond the well-documented 'skills gap' in the UK, there is also a 'skills trap':

- Those from less advantaged backgrounds – whether through parental engagement, education or the type of school they attended – have fewer opportunities to build essential skills at school.
- Having had fewer opportunities to build skills at school, their skill levels are lower. That is a primary driver of why we see such disparities in skill levels by different demographic or socio-economic characteristics.
- These individuals subsequently have less desire to build essential skills.
- They then go into lower skilled, lower paid jobs.
- Those jobs provide fewer opportunities to build essential skills and they continue on a lower earnings trajectory than their peers with higher levels of essential skills.
- They ultimately have lower levels of life-satisfaction.

To unlock social mobility as well as improve wellbeing and productivity in the UK, it will take a well-targeted effort not only from policy makers, but educators, impact organisations and employers.

While some demographic factors are immutable or much harder to change, providing high-quality opportunities to build essential skills falls well within the competency of employers, educators, impact organisations and policy makers. We have seen the meaningful positive impact of higher skill levels, measured against the Universal Framework, on life outcomes. Given that opportunities to build essential skills lead to higher skill levels irrespective of demographic factors, there is a clear case for rapidly scaling the number of opportunities to build essential skills in the UK in a variety of contexts.

Policy Makers

Investing in essential skills pays off. By only focusing on incremental improvements in attainment, basic and technical skills, we are missing an opportunity to rapidly and fundamentally improve social mobility.

Our employment market is facing several challenges: a lack of reskilling, older workers leaving the workforce, youth under- and unemployment, potential future displacement due to automation. This research shows that explicitly building essential skills in both today's and tomorrow's workforce is both overwhelmingly in demand and a route to addressing these issues.

In formal education, policymakers should:

- Put the Skills Builder Universal Framework on a par with the Gatsby Benchmarks of Good Career Guidance so that all schools and colleges have a clear, consistent and measurable way of developing the essential skills of their students.
- Use the Skills Builder Framework as the *de facto* impact measurement tool for essential skills in schools and colleges so there is a shared language and understanding of skills scores as individuals move through education and work settings.
- Ensure the Unit for Future Skills, to be set up by the Department for Education and announced in the recent Levelling Up white paper, works across departments and especially with BEIS and DWP. This will ensure the development of a consistent language around essential skills.

In employability, policymakers should:

- Embed essential skills training into the DWP Restart scheme with the Skills Builder Universal Framework used for measuring high quality employability provision.
- Use the Skills Builder Universal Framework in Youth Hubs as a tool in employability training to develop and measure essential skills.
- Local Skills Improvement Plans (LSIPs) should use this Tracker as a starting point for reflecting on the essential skills needs in their area, complementing technical skill needs.

Educators

84% of working age adults in the UK believe that these skills should be taught in lessons in school and college. The research shows they are right. The same benefits of early intervention extensively documented in other domains such as literacy[4] applies equally to building essential skills.[5] This paper shows that individuals who are given the opportunity to build essential skills in education go on to have higher skill levels, place more value on essential skills, seek out more skills building opportunities, are more likely to be in work or education, go into jobs with more skills building opportunities, earn more money and feel they have better career prospects.

Educators should:

- Invest in high quality essential skills development across an individual's education, from the early years through to further and higher education.
- This should include using a consistent language for essential skills across schools and colleges, as well as in special schools and alternative provision settings.
- Set expectations for how students progress in essential skills over their time in education, building off the benchmark of one step of progress per skill per year.
- Ensure that dedicated time is available in schools and colleges to build essential skills – recognising the need for direct instruction as well as practice.
- Engage businesses to bring essential skills learning to life, and make that learning relevant and connected with the world of work.

Employers

83% of workers would like more opportunities to build essential skills, while 92% believe that they should form part of professional development. At the same time, the essential skills wage premium evidences the potential productivity gain from building these skills. As employers look to not only attract but retain talent, meeting employee demand for meaningful professional development opportunities to build essential skills by embedding them into Learning & Development is a win-win.

To address the demand and need for essential skills through their Learning and Development, employers should:

[4] Fair Education Alliance (2016). *Report Card 2016*. Fair Education Alliance.
[5] Allen (2011). *Early Intervention: The Next Steps*. H.M. Government.

- Have a cohesive and comprehensive approach to building essential skills as part of professional development.
- Provide learning opportunities to employees to build their essential skills throughout their whole career. To do this really well means having managers or Learning & Development staff trained to give specific, constructive feedback as well as effective coaching.
- Promote and recognise the development of essential skills through appraisals, reviews and rewarding progression.

As an employer, you may already recruit implicitly or explicitly for essential skills. Even if it is explicit, it may well be scoring against high-level terms like "teamwork" without a clear breakdown of what this means. As compellingly set out by Kahneman et al,[6] this is likely to result in very noisy decisions. But that isn't the only reason to use a comprehensive framework for essential skills in the recruitment process.

Recruiting for essential skills in a transparent way can support employers as they try to build more diverse teams. Despite gaps that still need to be closed, essential skills are more evenly distributed across several demographic characteristics than some traditional recruiting criteria.[7] Equally, while variables like education level will be fixed at the point of interview, by being transparent and specific about the skills you are recruiting for and sign-posting to e-learning resources, you can potentially upskill candidates through the recruitment process leading to better outcomes.

Given the potential skills gain, not to mention the importance placed on essential skills through the recruitment process, employers should:

- Identify and set out which essential skills and specific skill steps are required for roles, including them in job descriptions.
- Clearly identify what essential skills and skill steps they are measuring through their recruitment processes.
- Ensure that recruitment processes are designed to correctly measure and identify the skills that they seek. Assessors should be enabled to analyse applicants' essential skills rigorously against the Skills Builder Framework.
- Promote inclusion by giving candidates a fair chance to demonstrate their skills. Be transparent with candidates as to what skills are being recruited for, support them to build those skills through the process and provide constructive feedback.

[6] Kahneman, Sibony & Sunstein (2021). *Noise: A flaw in human judgment*. Little, Brown.
[7] For example, education is a statistically significant predictor of age in our dataset, whereas skill score is not. Similarly, education is a much better predictor of social grade than skill score.

Employers seeking to improve social mobility and employability outcomes through outreach programmes should:

- Demonstrate the relevance of how specific skills are used in the workplace, promoting their importance to volunteers as well as participants.
- Ensure outreach activities, insight days, work experience and internships provide opportunities for participants to build essential skill steps, in line with the Skills Builder Framework.
- Ensure outreach activities measure progress in building participants' essential skills and use that data to optimise for impact.

Impact Organisations

This report further evidences just how vital the work is of the thousands of organisations building essential skills across the country. Individuals who have multiple specific opportunities to build essential skills are likely to have higher skill scores and in turn better outcomes.

As an organisation working toward better outcomes through building skills, you can optimise your impact by:

- Using consistent language for skills, based on the Universal Framework, so that the individuals you work with benefit from being able to focus on the same skills using the same language whether in employment, education, or on one of your programmes.
- Building in prompts, questions or reflections that effectively allow individuals to assess themselves against the Framework, quantifying it and tracking progress.
- Designing programmes that focus tightly on building specific skill steps, which accelerates progress and in turn outcomes.
- Bringing the skills to life by linking to real world outcomes – such as those evidenced in this research. This helps individuals to understand how the essential skills support success in their broader lives.

1. Essential skills impact life outcomes

Chapter Summary

- There is a strong positive relationship between skill score and income. Analysis suggests this relationship contains a causal component.
- Those with higher skill scores tend to earn significantly more.
- There is a strong positive correlation between skill score and wellbeing. Those with higher levels of essential skills tend to report higher life satisfaction.
- There is a strong negative correlation between skill score and being out of work or education. Those with higher skill scores are less likely to be out of work or education.

Higher levels of essential skills correlate with higher income

Key findings

- Analysis finds a wage premium of between 12% and 18% associated with an increase in skill score from the first quartile to the third quartile (i.e. an increase in average skill score from 8.2 to 11.3).
- For the average worker, this equates to an essential skills wage premium of between £3,900 and £5,900.
- Iteratively controlling for education level, age, and other demographic factors, shows that individuals who are similar in these respects but not in skill score are likely to have incomes that differ proportionally to their level of essential skills, which is indicative of a causal relationship.

Objectives and background

This chapter builds on *Better Prepared*, which identified a wage premium of £3,400 per year for young adults aged 18-24 in full-time work moving from the 1st percentile skill score to the median.[8] The objective of the analysis presented in this section is to more fully understand the possible income benefits of a stronger skill score amongst the whole adult UK working population.

For a full explanation of the modelling and methodology, see Appendix 1. Advisory support for the analysis was provided by Chris Percy, whom we would like to thank.

[8] Kashefpakdel, Ravenscroft & Percy (2021). *Better Prepared: Essential Skills and Employment Outcomes for Young People.*

Skill score is strongly correlated with income

Weighted interval regression reveals a very strong relationship between skill score and income (p-value 0.00). Each step increase in skill score is associated with a 6% increase in income relative to the step before. Those at the third quartile skill score earn on average 18% more than those at the first quartile skill score – or approximately £5,900 for the average worker. This result does not itself motivate a causal interpretation; what it does show is that two randomly picked full-time workers are very likely to have different incomes if their skill scores are different. Modelling the raw relationship is likely to produce an estimate of the upper bound to which skill score drives income, given that confounding factors are more likely to increase both skills score and income (such as privileged upbringings) rather than increase one while decreasing the other.

Controlling for other variables suggests a causal relationship between skill score and income

Analysis elsewhere in this report finds relationships between a number of variables and skill score, such as highest education level. Many of these variables also affect income, as is the case with education. Attempts should be made to control for such variables, in order to disaggregate the effect that they have on income directly from the effect that they have on income via essential skills (as illustrated in Figure 1.1). However, because some of these variables have two-way relationships with skills, it is challenging to control for them in a simple way in cross-sectional data in order to uncover a causal relationship. For instance, higher initial levels of skills both lay the groundwork for high skills in the future and help access higher levels of education; education in turn provides an opportunity to further improve skills.

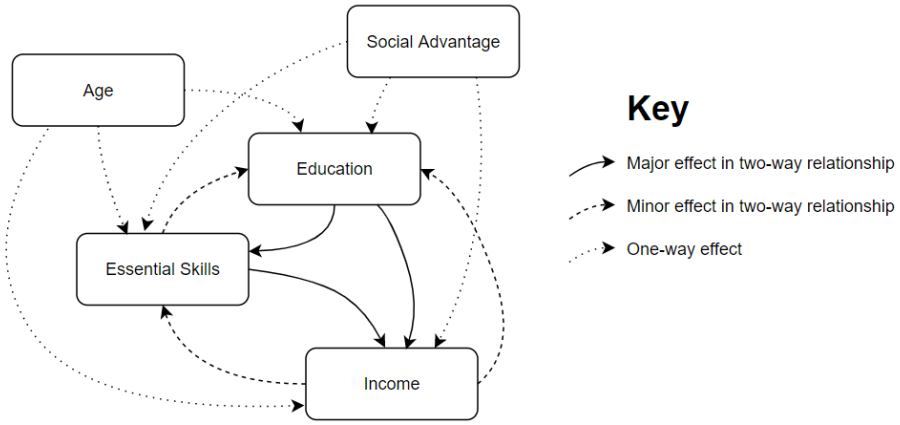


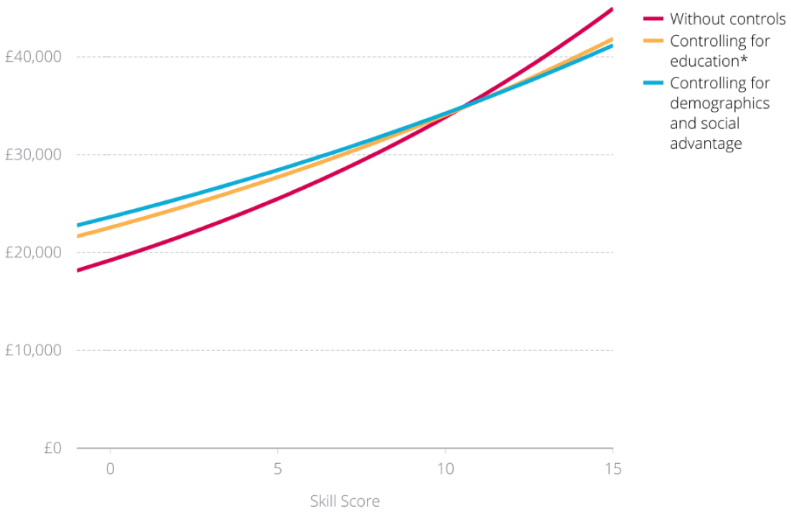
Figure 1.1 – Illustrative causal diagram of essential skills and interacting variables

Controlling for education, a difference in skill score of one step is associated with an increase in income of 4% (p-value 0.00). A full-time worker at the third quartile of skill score can be expected to earn 13% more than a full-time worker with the same education level at the first quartile of skill score. This equates to around £4,100 for the average worker.

Controlling for age as well as education, each step increase in skill score is associated with a 4% increase in income (p-value 0.00).[9] A full-time worker at the third quartile of skill score can expect to earn 12% more than a full-time worker of the same age and similar education level with a skill score at the first quartile. This equates to around £3,900 for the average worker.

Controlling for social advantage as well as age and education level, the wage premium associated with skill score remains statistically significant, and is still 4% (p-value 0.00). Moving from the first quartile to the third quartile results in an average increase of 12% in income, or around £3,900. The stability of the model to the addition of further control terms is indicative of at least a partial causal effect of skill score on income.

Income rises with skill score



*Controlling for education with and without age represented by one line

Figure 1.2 – Relationship between skill score and income in different models

[9] The square term of age is included as the relationship between skill score and age is non-linear

Higher levels of essential skills are related to higher life satisfaction

Key findings

- There is a clear link between higher skill scores and greater life satisfaction (p-value 0.000). Without controlling for other variables, 5% of the variance in life satisfaction is accounted for by skill score.
- When controlling for other factors that are likely to have a significant impact on life satisfaction, such as age and income, moving from the lower quartile skill score to the upper quartile skill score is associated with an increase in life satisfaction from 6.5/10 to 7/10.[10]

Objectives and background

Wellbeing is now – rightly – considered by many to be an outcome as valid as those more traditionally measured such as attainment or income. The relationship between essential skills and life satisfaction therefore warrants just as much attention as that between essential skills and income. Recognising the potential for reverse causality, the analysis presented in this section seeks to understand how much of an effect skill score could have on life satisfaction.

Skill score and wellbeing

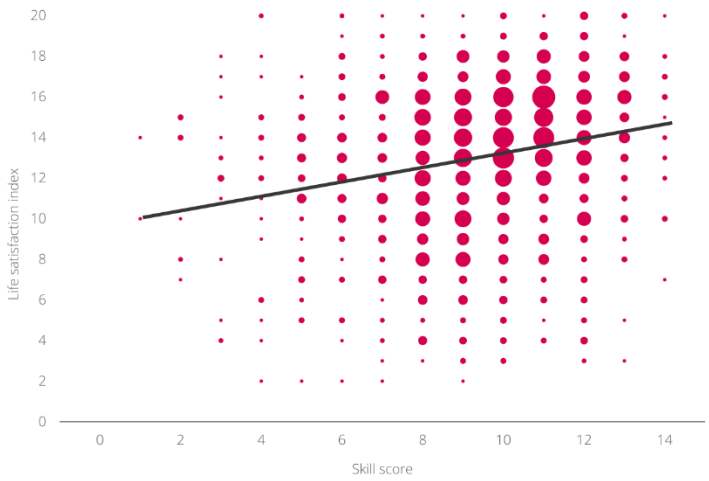


Figure 1.3 – bivariate linear regression between skill score and life satisfaction index

Life satisfaction is quantified here via an index of two survey questions, which asked "how satisfied are you with your life nowadays?", and "to what extent do you feel the things you do in your life are worthwhile?". With possible responses to each question ranging from 0 (lowest) to 10 (highest), the theoretical range of the index is from 0 to 20. As is common with such questions, the majority of responses cluster well within the extremes – in this case the interquartile range extends just six points from 11 to 17. While caution should be taken when interpreting nominal or percentage changes in data from subjective questions of this sort, higher scores overall are nonetheless indicative of higher wellbeing.

[10] For clarity, the modelled increase from 14.5 to 15.5 on a scale of 0-20 (i.e. 21 gradations) in the life satisfaction index is rebased to a more conventional scale of 1 to 10.

Skill score is correlated with life satisfaction

Weighted linear regression, without any control variables, shows that life satisfaction tends to increase as skill score increases, noting significant variation from individual to individual. Though changes in skill score account for only 5% of the variance in reported life satisfaction, the effect of skill score is statistically significant (p-value 0.00). Each step increase in skill score is associated with an increase of 0.37/20 on the life satisfaction index.

Life satisfaction increases with skill score

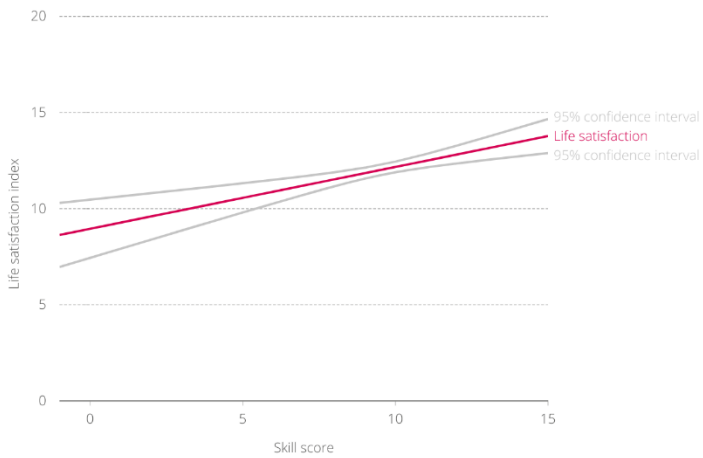


Figure 1.4 – predicted life satisfaction and confidence intervals for various skill scores, controlling for age, demographics factors, social advantage, and income

Controlling for age and other demographic factors

A number of other factors are likely to influence life satisfaction, as well as the way in which it is self-reported. Controlling for age, work status, demographic factors, and measures of social advantage increases the accuracy of the model, such that it can now account for 19% of the variance in life satisfaction. The magnitude of the effect of skill score amongst these other factors, however, remains relatively stable, and significant at the 0.001 level. Each step in skill score is still associated with an increase of around 0.35/20 on the wellbeing index.

Controlling for income

Income is likely to have a significant influence on life satisfaction. As discussed in the previous section, higher skills may support people to have higher income. Nonetheless, we are interested in whether skills appear to have a positive relationship with life satisfaction through channels outside of income. In order to control for income, a subsample of respondents in full-time work is analysed in a similar regression model. Sample size is reduced to 670, which has a detrimental effect on the accuracy of the model. However, once again, controlling for income in this smaller subsample does little to reduce the effect of skill score on life satisfaction; and its statistical significance remains unaffected.

Building essential skills can increase the probability of being in work or education

Key findings

- There is a clear relationship between skill score and the likelihood of an individual being in work or education (p-value 0.007).
- When controlling for age, gender, demographics, and social advantage, an individual with a skill score one step higher than an otherwise similar individual is 15% less likely to be out of work or education.
- An individual with a skill score 3 steps higher than an otherwise similar individual is 52% less likely to be out of work or education.

Objectives and background

- Supporting individuals into education and employment has rightly been a long-standing objective for many policymakers and practitioners.
- Previous research has shown that aiming high – in the form of career aspirations – is correlated with lower NEET ("not in education employment or training") levels in certain populations.[11]
- This report seeks to add to the information available to policy makers and practitioners by exploring the relationship between specific levels of essential skills, employment and education rates.

An increase in skill score is correlated with a reduction in likelihood of being out of work or education

Raw weighted logistic regression shows that as skill score increases, the likelihood of an individual being out of work or education decreases. On average, across the working-age UK population, an individual with a skill score 1 step higher than another is 15% less likely to be out of work or education. An individual with a skill score 3 steps higher than another is 52% less likely to be out of work or education.

Likelihood of being out of work or education decreases with higher skill scores

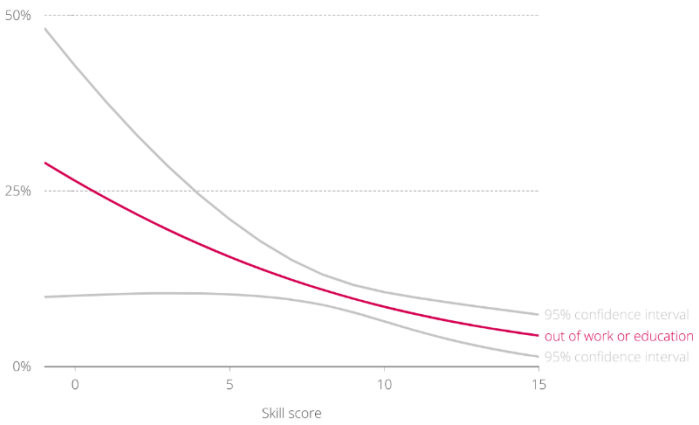


Figure 1.5 – likelihood of an individual being out of work or education at different skill scores, controlling for demographic factors and social advantage

[11] Yates (2010). Early Occupational Aspirations and Fractured Transitions: A Study of Entry into 'NEET' Status in the UK. *Journal of Social Policy, 40*(3), 513–534; Gutman & Schoon (2013). *The impact of non-cognitive skills on outcomes for young people.* Education Endowment Foundation.

Controlling for other variables

As in the relationship between skill score and income, a number of other variables are likely to have an impact on the likelihood of being employed or in education, solely or in addition to affecting skill score. Controlling for age does not significantly alter the effect of skill score on the likelihood of being in work or education. Attempts have been made to accommodate those remaining economically inactive due to childcare responsibilities by controlling for age, gender, and whether or not the household contains children, in combination with one another. In any case, whether these factors are controlled for or not makes little difference to the relationship between skill score and the likelihood of being out of employment or education – this nonetheless decreases by 14-15% per skill step.

2. Essential skills are valued

Chapter Summary

- An overwhelming 89% of individuals believe essential skills to be important for employment, career progression or success in a recruitment process.
- Of these outcomes, individuals believe the skills to be particularly important for overcoming adversity and difficulty in life (86%).
- 71% of individuals also believe essential skills are important for academic performance.

Context

With many employers currently concerned about the 'Great Resignation' but misaligned on what their employees value,[12] an avenue to explore should be essential skills. If adults in the UK believe essential skills are not only important for their employment but also their wellbeing, there would be a clear opportunity to meaningfully build on relational factors (for example employees feeling valued by their managers or having caring teammates) by systematically developing skills like teamwork, leadership and listening. Equally, having a comprehensive approach to building skills such as staying positive and aiming high could support employees in overcoming difficulties and adversities, while structurally nurturing skills like problem solving and creativity may support a sense of development and progress.

Many may value essential skills in education for the purpose of wider life outcomes or employability. However, it is equally valid to ask whether the UK public believe essential skills are important in education for the purpose of academic success.

Essential skills are considered important

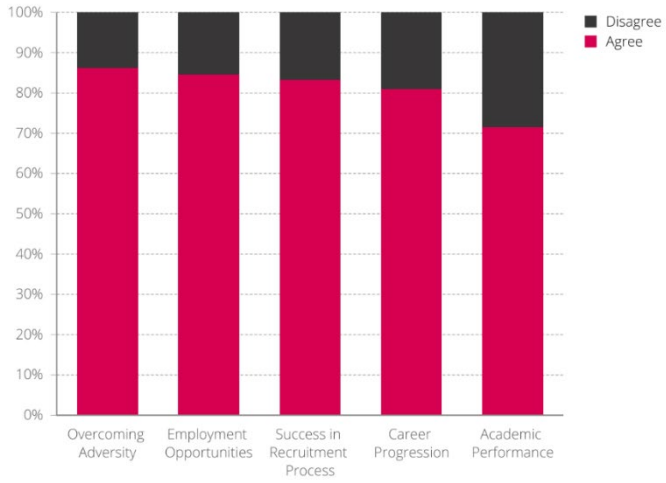


Figure 2.1 – Percentage of individuals who believe essential skills are important by different areas

[12] De Smet, Dowling, Mugayar-Baldocchi & Schaninger (2021). *'Great Attrition' or 'Great Attraction'? The choice is yours.* McKinsey.

Importance in Employment

Working age adults in the UK overwhelmingly believe that essential skills are just that: essential. This holds across the employment lifecycle, from importance placed on essential skills for securing employment opportunities (85%) and success in the recruitment process (83%) through to career progression (81%).

Those in professional or managerial jobs were most likely to respond that essential skills are important for employment opportunities (90% & 91%), while 78% of individuals in semi- or unskilled manual jobs believe this to be the case. The outlier is those who have never worked, with only 68% believing these skills to be important for employment.

Essential skills in employment

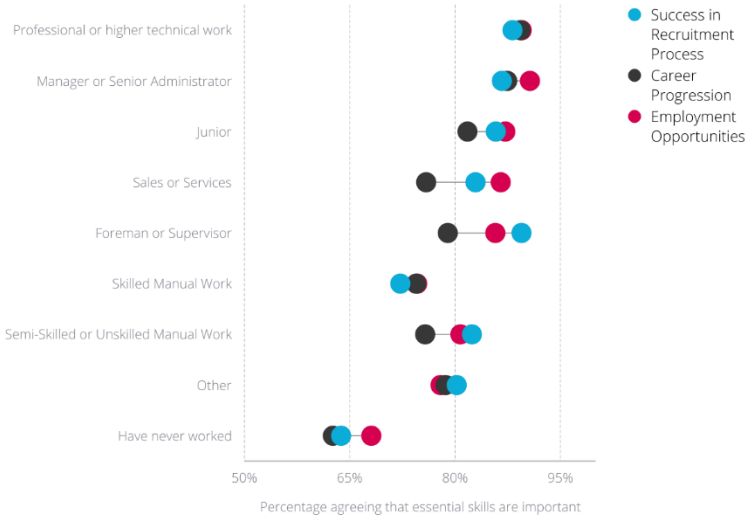


Figure 2.2 – Importance of skills in employment

A similar pattern holds for education levels: of respondents with a postgraduate or undergraduate degree, 91% and 89% respectively believe the skills are important for employment, compared to 75% for those with no formal qualifications and 78% for those with Level 1 qualifications. To some extent, this could reflect the reality of the job market. However, as we will see later in this paper, opportunities to build essential skills may be a significant contributing factor.

This finding further validates previous research by the Sutton Trust, which found that 94% of employers, 97% of teachers and 88% of young people saw these skills as being at least as important as academic grades to students' future success.[13]

[13] Cullinane & Montacute (2017). *Life Lessons: Improving essential life skills for young people.* The Sutton Trust.

Importance in Education

71% of individuals believe essential skills are important for academic performance. While this is significant, an even greater proportion – 84% – believe that these skills should be taught in lessons in school and college. This means that even most of the small majority of people who do not believe skills to be important for academic success, still believe that the skills are so vital in our wider lives that they should be taught explicitly at school.

This reinforces previous research, which found that 77% of young people aged 18-24 in the UK believe essential skills are important for their academic performance.[14]

Importance in our wider lives

The vast majority of individuals in the UK (86%) believe that essential skills are important for overcoming difficulty and adversity in life. Combined with the perceived importance in employment, this helps explain why so many are in favour of essential skills being taught explicitly in school or college.

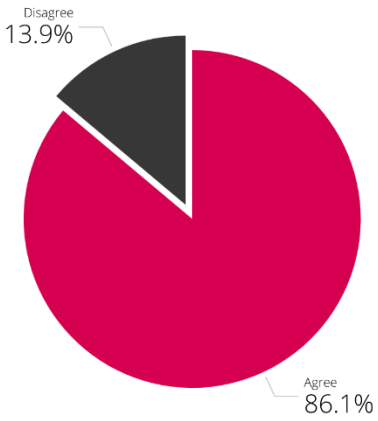


Figure 2.3 – Importance of essential skills for overcoming difficulty and adversity in different areas of life

[14] Kashefpakdel, Ravenscroft & Percy (2021). *Better Prepared: Essential Skills and Employment Outcomes for Young People.*

3. Essential skills are not distributed equitably

Chapter Summary

- The median skill score of adults in the United Kingdom is 9.4 out of 15. This is in line with Level 3 expectations.
- There is a long tail of adults with much lower abilities in essential skills: 10% of adults have a skill score less than 5.
- Individuals in the lowest quartile of skill score are: 30% more likely to be aged 55-64, 109% more likely to have no formal qualifications, 8% more likely to have attended a non-selective state school, 11% more likely to live in the North of England, 23% less likely to have had a parent attend university and 22% less likely to have had parents that were engaged with their education.
- There is a strong case for "levelling up" essential skills across the country, with the North, Midlands and East of England reporting lower skill levels than London, the South and Midlands.
- Skill score increases as people age from 18 to 44 years old but then drop again from 45 to 66, indicating both the importance of starting to build skills young, but also to keep going through lifelong learning.
- Those from more advantaged backgrounds and those who attended independent or selective schools have meaningfully higher levels of essential skills.

The UK average

Against the Skills Builder Universal Framework, the median level of essential skills in the UK is 9.4. The mean level is 9.3, with 95% confidence intervals at 9.2 and 9.4.

Putting this in context, this means that on average, UK working age adults have intermediate to advanced levels of essential skills. Comparing this to the implied required skill levels in apprenticeship standards, it would place the average adult just above Level 3 (8.7), which is an A Level equivalent, but meaningfully below that required for a Level 5 apprenticeship (14.1).[15] However, a quarter of the working age population has a skill score below 8, which implies they would be below the Level 3 apprenticeship standard. The bottom 10% of the population has a skill score below 5 and below the implied level required for a Level 2 apprenticeship (6.6).

This helps explain why employers tend to feel that candidates and employees lack the essential skills that they require.[16]

[15] Ravenscroft & Baker (2020), *Towards a Universal Framework for Essential Skills.*
[16] Institute of Student Employers (ISE) (2018). *ISE 2018 Development Survey: Trends, benchmarks and insights;* CBI (2018). *Educating for the Modern World: CBI / Pearson Education and Skills Annual Report 2018.* CBI; UKCES (2016). *Employer Skills Survey 2015: UK Results – Evidence Report 97*; Mourshed, Patel & Suder (2014). *Education to Employment: Getting Europe's Youth to Work.* McKinsey Center for Government.

The eight essential skills

At an individual level, ability across the eight skills tends to be relatively consistent, which is to say that your score in one skill is a strong predictor of your score in another skill. At a national level, creativity is the UK's weakest skill (with a median of 8.5 as well as both lower first and third quartiles), with listening and teamwork scoring highest (medians of 10.25 and 10.5 respectively). A lower average score for creativity is driven primarily by average scores for that skill declining more rapidly than any other in older age groups.

Distribution of average skill scores across the sample population

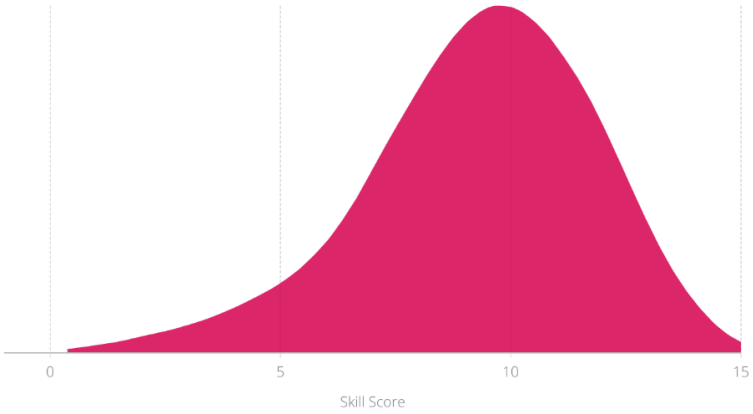


Figure 3.1 – Distribution of Skill Score

While not comparable data sets, it is interesting to contextualise these findings by looking at rich operational datasets from the Skills Builder Hub and Skills Builder Benchmark platforms, which allow educators to assess groups and individuals to assess themselves against the Universal Framework. Between them, they have data from over 13,000 groups and 19,000 individuals. As in our nationally representative sample, the highest scoring skill on both platforms is Teamwork.

Skill score by skill

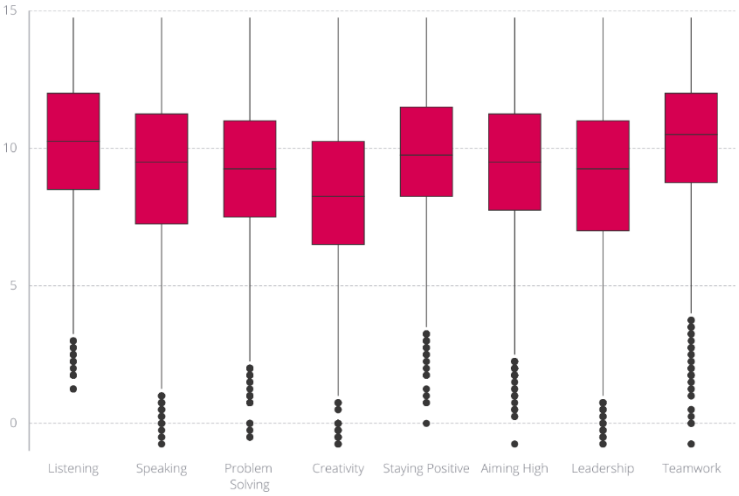


Figure 3.2 – Skill score by skill

In contrast, rather than being on average the lowest scoring skill, Creativity falls toward the middle of the pack on both platforms. The groups and individuals on the platforms – and particularly the Hub with a lot of primary school users – skew significantly toward lower age groups. This tends to support the observation from our nationally representative sample that creativity scores decline with age. While purely speculative, there are a few hypotheses as to why this might be the case. For example, it could be that creativity is nurtured and measured much more when we are younger, but declines with age. In any event, it underscores the importance of not only 'starting young' when it comes to building essential skills, but of 'keeping going' as we progress through our education and careers.

Age

There are substantial operational data that show skill score increases with age in an educational setting.[17] The Skills Builder Universal Framework for Essential Skills is designed to represent a comprehensive learning journey from early years through to employment, with logical incremental steps.[18] As individuals accrue opportunities to build essential skills over their lifetime – primarily through education and employment – we expect their skill levels to increase.

This research again confirms that skill scores can increase with age – but that this only happens to a point. There is a distinct increase in skill levels as individuals progress in their careers, with a big jump after five or so years in employment. While the median for 18-24 years olds is low, at 9.9, this increases to 10.5 and 10.8 for 25-34 and 35-44 year olds respectively.

However, the distribution of skill score widens with age. Dips in median score for those over 45 years old are driven by meaningfully lower first quartiles. Someone aged 55-64 is 30% more likely to be in the lowest skill score quartile.

The implication is that it takes a meaningful amount of time to build essential skills in the workplace, and that continuing to practice them is vital. Failing to do so could present a real barrier to reskilling and lifelong learning.

Skill score by age

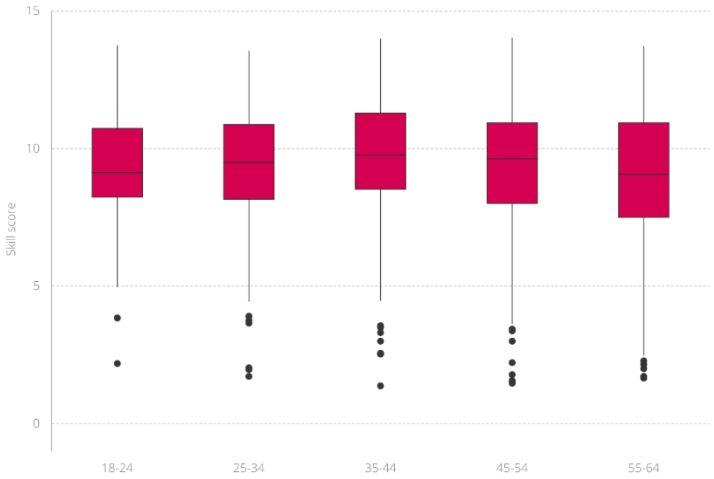


Figure 3.3 – Skill Score by Age Group

Skill score by age (in full-time work)

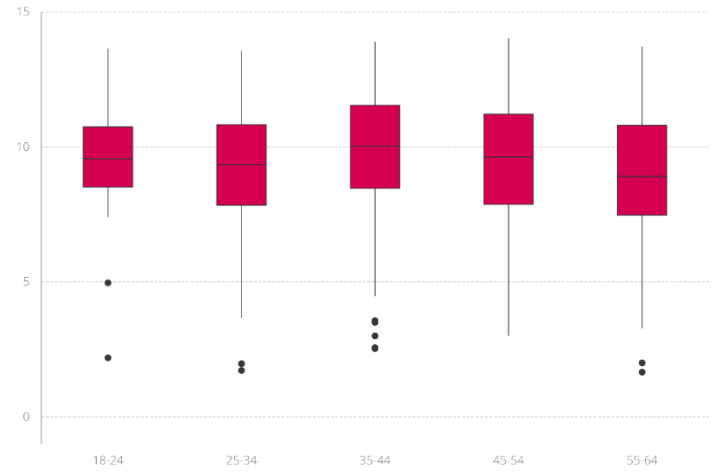


Figure 3.4 – Skill Score by Age Group for those in full time work

[17] Skills Builder Partnership (2021). *Impact Report 2021.*
[18] Ravenscroft & Baker (2020). *Towards a Universal Framework for Essential Skills.*

Education level

Educational achievement and essential skills have a symbiotic relationship. On the one hand, formal education can provide individuals with opportunities to build essential skills. This means that with more high-quality education, individuals can build their essential skills to higher levels. On the other hand, essential skills allow individuals to better access educational attainment.[19] This mutually reinforcing relationship means that individuals benefiting from opportunities to build essential skills through education have higher skill levels, which then enables them to better access more education and higher attainment.

As might therefore be expected, there is a strong positive linear relationship between level of education and essential skills. Only 32% of individuals with no formal qualifications had a skill score above the median, but this jumps to 41% for those achieving a Level 3 qualification. Individuals in the lowest quartile are 109% more likely to have no formal qualifications. Moving from no formal qualifications to a Level 3 qualification is associated with an increase in skill score of 1.4 from 7.7 to 9.1.

Someone with a Level 6 qualification is 53% more likely to be in the top quartile of skill score. Achieving a Level 6 qualification is associated with another large increase of skill score up to 10.5. This is driven by a higher lower bound (1st Quartile = 9.1 up from 8.3 for Level 4-5 qualifications) rather than an increase in the third quartile. This means that even the lowest scoring individuals – those in the first quartile – with a Level 6 qualification have the same skill levels as those median for individuals with Level 3 qualifications.

Someone with a Level 6 qualification is 53% more likely to be in the top quartile of skill score

Multivariate regression finds that those with a level 6 qualification have a skill score that is on average 2-2.5 steps higher than those with no formal qualifications, when controlling for age, gender, parental engagement, parental education, and type of school attended (p-value 0.000).

The implication is that Level 6 qualifications have the effect of ensuring a stronger minimum level of skills – or, as an alternative or complementary explanation, that in order to achieve a Level 6 qualification, a certain base level of essential skills are required. If the latter is the case, then one route to increasing diverse participation in Level 6 qualifications could be to build the essential skills of students from a young age.

[19] Ashdown & Bernard (2011). Can explicit instruction in social and emotional learning skills benefit the social-emotional development, well-being, and academic achievement of young children? *Early Childhood Education Journal, 39*(6), 397–405; Linares, Rosbruch, Stern, Edwards, Walker, Abikoff, & Alvir (2005). Developing cognitive-social- emotional competencies to enhance academic learning. *Psychology in the Schools*, (4), 405-417.

	Above median	Median skill score	Standard deviation
No formal qualifications	32.5%	7.7	3.4
Entry level	39.9%	9.2	2.6
Level 1	35.3%	8.8	2.4
Level 2	39.2%	8.8	2.5
Level 3	41.4%	9.1	2.1
Level 4-5	56.0%	9.8	2.2
Level 4-6	58.1%	9.8	2.2
Level 6	68.1%	10.5	1.7

Figure 3.5 – Skill score by education level

Educational settings

For various reasons, educational attainment in England differs by school type, with those attending independent[20] and selective[21] schools achieving higher grades. Previous research showed that this relationship holds for essential skills, with those who had attended a selective or independent school reporting both more opportunities to build skills and higher skill levels.[22]

This research reconfirms that finding, with median skill scores in selective and independent schools of 9.6 and 9.7 respectively, compared to 9.3 in comprehensive state schools. Interestingly, selective state schools had the highest proportion of individuals with scores above median (55%), relative to independent (52%) and non-selective state (49%).

The increased skill scores in selective and independent schools correlates with the increased opportunities to build those skills that were reported in these settings. This is explored further in the next chapter on opportunities.

[20] Ndaji, Little & Coe (2016). *A comparison of academic achievement in independent and state schools.* Durham University Centre for Evaluation and Monitoring.
[21] Gorard & Siddiqui (2018). Grammar schools in England: a new analysis of social segregation and academic outcomes. *British Journal of Sociology of Education, 39*(7), 909-924
[22] Kashefpakdel, Ravenscroft & Percy (2021). *Better prepared: Essential skills and employment outcomes for young people.*

Previous research showed that skill scores for individuals who attended Alternative Provision were significantly lower than in other settings (15% above median), a finding validated by this study with 27% of the sample having an above-median skill score.[23]

School type	Above median	Median skill score	Standard deviation
Non-selective state school	49.0%	9.3	2.4
Grammar/selective state school	54.5%	9.6	2.2
Independent/fee-paying	51.9%	9.7	2.0
Alternative Provision	26.6%	9.3	2.2
I went to a mixture	40.7%	9.0	2.1

Figure 3.6 – Skill score by school type

Geography

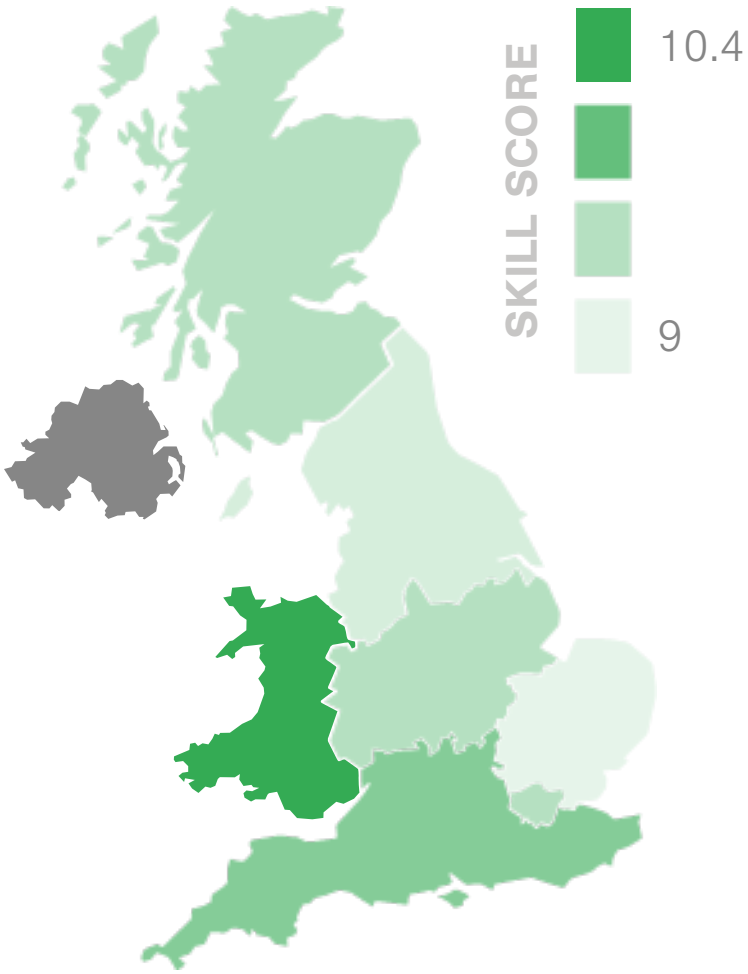
There are multiple ways in which geography can interact with skill score:

- High-skilled and high paid jobs are disproportionately located in urban areas and particularly London and the South East[24]
- The age in urban areas skews younger than in rural areas[25]
- Selective schools are disproportionately in areas of more social advantage[26]
- There is a so-called London Effect on educational outcomes,[27] which also "does exceptionally well against the Social Mobility Index"[28]

The scores for English regions therefore reflect these phenomena, with higher median scores in the South, London and Midlands. Interestingly, the higher medians are mainly explained by meaningfully higher first quartiles, at 8.2 and 8.3 for London and the South compared to 7.8 for the North and Midlands and 7.9 for the East.

[23] Kashefpakdel, Ravenscroft & Percy (2021). *Better prepared: Essential skills and employment outcomes for young people.*
[24] Office for National Statistics (2020). *Employee earnings in the UK: 2020,*
[25] Department for Environment, Food & Rural Affairs (2021). *Statistical Digest of Rural England Population*.
[26] Gorard & Siddiqui (2018). Grammar schools in England: a new analysis of social segregation and academic outcomes. *British Journal of Sociology of Education, 39*(7), 909-924.
[27] Department for Education (2020). *Examining the London advantage in attainment: evidence from LSYPE*.
[28] Social Mobility & Child Poverty Commission (2016). *The Social Mobility Index.*

While there appears to be limited or mixed variation in academic attainment across the four nations,[29] this research shows that the two nations that have well-established, explicit skills strategies for schools[30] also have higher levels of essential skills. The median skill score in England is 9.4, while it is meaningfully higher in Scotland and Wales at 9.5 and 10.4 respectively. Unfortunately, our sample size for Northern Ireland was too small – with meaningfully higher standard deviation – to report robust findings from.



Social Advantage

Accepting that there is no perfect measure of social advantage, this research used several common proxies: school type (covered above), parental university attendance and parental engagement with education.

Individuals who had one or both parents attend university tend to have higher skill scores (53% and 54% above median respectively) than their peers who don't know or for whom neither attended university (40% and 49% above median). Those in the top quartile of skill score were 30% more likely to have had both parents attend university.

Parents attended university	Above median	Median skill score	Standard deviation
Both parents	53.7%	9.7	1.9
One parent	52.8%	9.7	2.3
Neither	49.2%	9.4	2.4
Don't know	41.0%	8.2	2.9

Figure 3.7 – Skill score by parental education

[29] Machin, McNally & Wyness (2013). Educational attainment across the UK nations: performance, inequality and evidence. *Educational Research*, *55*(2), 139-164.
[30] The Scottish Government, Edinburgh (2007). *Skills for Scotland: A Lifelong Skills Strategy;* The Welsh Government (2008). *Skills Framework for 3 to 19 year olds in Wales*.

However, the differences were even more pronounced for parental engagement. Individuals with a top quartile skill score were 39% more likely to have had parents who were very engaged in their education. 61% of respondents who reported that their main parent(s)/ guardian(s) were 'very engaged' with their education whilst they were at school had a skill score above the median. This compares with 52% for those whose parents were 'fairly engaged' and only 39% whose parents were 'not very engaged'. Interestingly, while still lower than for those with engaged parents, 51% of those who responded 'not at all engaged' had scores above the median. We will look to replicate this nonlinear outlier in future.

	Above median	Median skill score	Standard deviation
Very engaged	60.9%	10.1	2.0
Fairly engaged	52.0%	9.6	2.2
Not very engaged	38.9%	8.8	2.5
Not at all engaged	50.8%	9.6	2.6
Don't know	28.1%	8.6	2.4

Figure 3.8 – Skill score by parental engagement

Other demographic and socio-economic variables

Our survey gathered data on other variables that research shows can play a role in outcome levels, such as special educational needs & disability (SEND), ethnicity and gender. Unfortunately, we have not been unable to report on these variables as the findings were not significant. For ethnicity in particular, sample sizes for any particular group were too small to derive any robust conclusions from.

In future, we will look to explore how we can either increase sample sizes to significant levels in a nationally representative sample, draw conclusions from smaller sample sizes or better measure these important characteristics.

4. Opportunities to build essential skills are not distributed equitably

Chapter Summary

- Only 14% of workers report having ever been given the opportunity by their employer to develop essential skills through structured learning.
- The inequalities in skill levels are reflected – and as we will see in the next chapter probably caused – by an inequitable distribution of opportunities to build essential skills.
- Most lower income workers and individuals in low-skilled occupations do not have opportunities to build essential skills. This contrasts starkly with those in higher income, "white collar" jobs, who get more opportunities to build these skills, even though higher skill levels drive higher income across all types of work.
- Those who attended independent schools were more likely to report that they had opportunities to build essential skills at school than their peers who attended non-selective state schools.
- It is the most disadvantaged individuals that are least likely to benefit from having opportunities at school to build the essential skills that lead to improved life outcomes.
- Those who lack the opportunity to build skills in school are less likely to have the opportunity to build skills in employment.
- We therefore start to see an emergent picture of a skills trap, where on average: those from less advantaged backgrounds have fewer opportunities to build essential skills at school; these individuals subsequently have less desire to build essential skills; they then go into lower skilled, lower paid jobs; and those jobs provide fewer opportunities to build essential skills; they ultimately have lower levels of life-satisfaction.

Context

In the same way that levels of essential skills are not distributed equitably in the UK, what limited opportunities there are to build them are not distributed equitably.

Educators believe that there is a lack of opportunity to develop essential skills in schools: 72% of teachers feel that their school should increase their focus on these skills.[31] From an employer perspective, there is a shortfall between the skills that they require and those of candidates and employees.[32] The case for providing high-quality opportunities to build these skills in employment as well as education and through interventions is therefore incredibly compelling. This chapter reveals who does – and does not – benefit from opportunities to build essential skills.

[31] Cullinane& Montacute(2017). *Life Lessons: Improving essential life skills for young people*. The Sutton Trust.
[32] Institute of Student Employers (ISE) (2018). ISE 2018 *Development Survey: Trends, benchmarks and insights;* CBI (2018). *Educating for the Modern World: CBI / Pearson Education and Skills Annual Report 2018*. CBI; UKCES (2016). *Employer Skills Survey 2015: UK Results – Evidence Report 97.* UKCES; Mourshed, Patel & Suder (2014). *Education to Employment: Getting Europe's Youth to Work*. McKinsey Center for Government.

Opportunity in employment is limited, unevenly distributed and accrues to those who already have higher skill levels

There is a strong relationship between the type of work that people do, their income and whether they have recently had opportunities to build skills in the workplace. The majority of lower earners – those earning less than £25,000 per year – did not have an opportunity to explicitly build essential skills within the last year. This compares starkly to the fact that the majority of individuals in every income bracket above £25,000 reported having had an opportunity to build their essential skills in the last year.

Types of opportunity in work

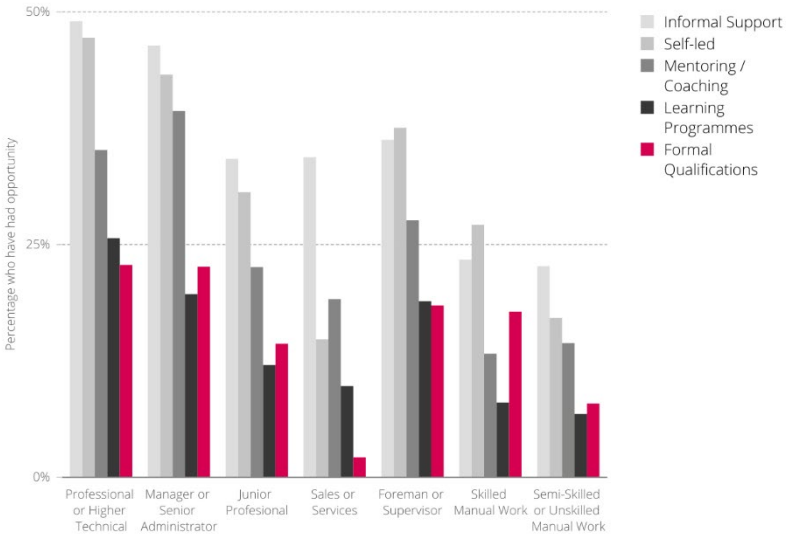


Figure 4.1 – Type of skill building opportunity at work by work

This two-tiered structure of skills building opportunities corresponds to skilled employment, with the majority of what might traditionally be called "white collar" workers having the opportunity to build essential skills, compared to their peers in "blue collar" jobs who do not get to benefit.

It is also disproportionately younger workers who have the opportunity to build essential skills, with a majority of individuals under 44 years old having these opportunities compared to a minority of those older than 44.

However, the broad perception of opportunity to build skills does not correspond neatly to the explicit opportunities to build skills. Of those in full-time employment who agreed they have had access to plenty of opportunities through their employer, only 36% were able to identify an actual type of opportunity they had had.

Only 14% of workers had ever had the opportunity to develop essential skills through structured learning, with roughly a quarter (26%) having had mentoring or coaching to build them. Even the proportion of workers having ever had other informal support was low (35%).

Only 14% of workers had ever had the opportunity to develop essential skills through structured learning

Advantage and opportunity

Roughly 7% more respondents who attended independent schools (41%) than non-selective state schools (34%) agreed or strongly agreed that they had sufficient opportunities to build essential skills at school.

This increased opportunity to build essential skills in independent schools corresponds with higher levels of skills for those that attended them. This pattern does not hold for selective state schools, whose attendees had higher skill scores than those who attended non-selective state schools, but who marginally felt they had fewer opportunities to build the skills than peers in non-selective state schools.

Far fewer individuals who felt that their parents were not at all engaged in their education reported having had opportunities at school (23%), compared to those who felt their parents had been very engaged (46%). This could be explained by a general disengagement from education. Previous studies from both the Sutton Trust and the Social Mobility Commission have highlighted that independent schools and wealthier parents seem to put more emphasis on building the essential skills of their children.[33] So an alternative – and more troubling – hypothesis is that those individuals who may have been more generally disadvantaged also lacked opportunities to build essential skills. That is to pose the question: is it the most disadvantaged that have the fewest opportunities at school to build the skills that lead to better outcomes?

Those with less engaged parents are less likely to have had opportunities to build skills at school

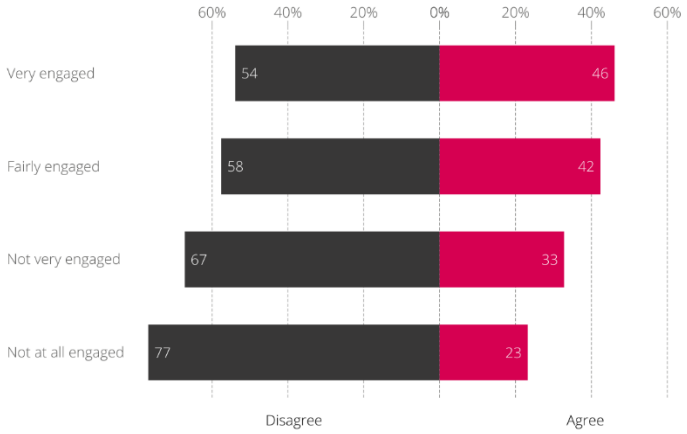


Figure 4.2 – Opportunities at school by parental engagement

Those with parents who went to university are more likely to have had opportunities to build skills at school

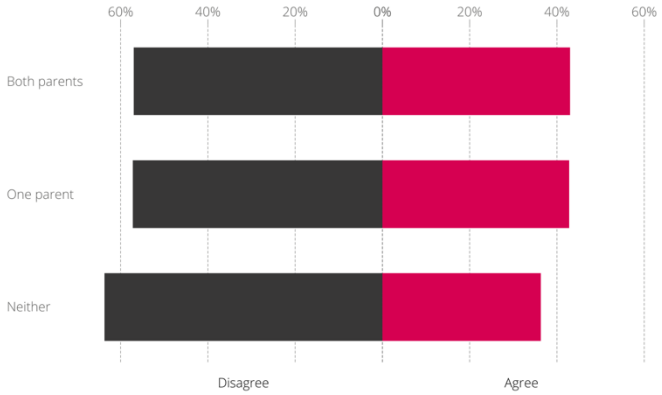


Figure 4.3 – Opportunities at school by parental education

This research finds that unfortunately that is probably the case. Using another proxy for advantage, those that had both (43%) or one parent (42.8%) attend university were much more likely to have had opportunities to build essential skills at school than those for whom neither parent attended university (36.3%).

[33] Whitty, Power & Sims (2013). *Lasting benefits: The long-term legacy of the Assisted Places scheme for Assisted Place holders.* The Sutton Trust.

For reasons explained in the next chapter, the relationship between parental education, parental engagement and opportunities to build essential skills persists into employment. Individuals who had both or one parent attend university were much more likely to have had specific opportunities to build essential skills in employment (76% and 69% respectively) than those for whom neither parent attended university (61%). Those with parents who were very engaged in their education were much more likely to have had specific opportunities to build skills in employment than those reporting their parents were not at all engaged (70% compared to 54%).

Those who had more opportunities at school have more opportunities at work

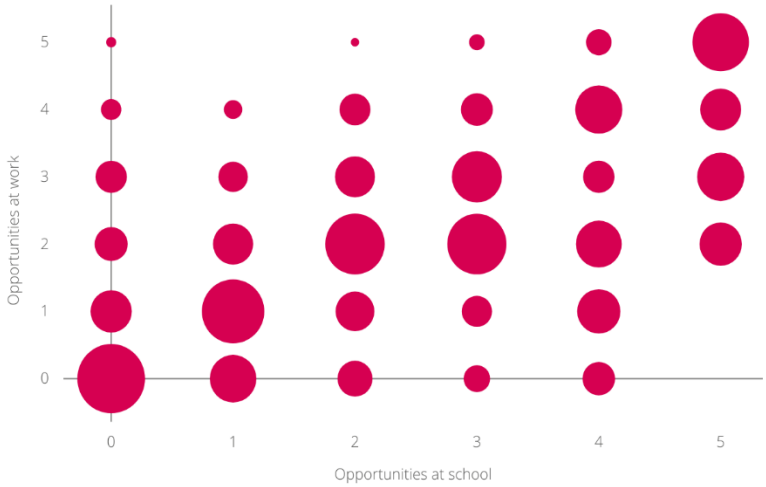


Figure 4.4 – Opportunities at school and opportunities in employment

There is a strong relationship between having had opportunities to build essential skills in education, and going on to desire more opportunities to build those skills. 86% of individuals who strongly agree they had opportunities at school now desire more opportunities to build essential skills, compared to 66% who strongly disagreed they had these opportunities.

There is also a strong relationship between having opportunities to build essential skills in education and going on to have those opportunities later in life through employment. 55% of those that strongly agreed they had opportunities at school went on to have specific opportunities to build essential skills in employment, compared to only 32% who strongly disagreed they had opportunities at school.

From the findings in this chapter we start to see an emergent picture of a skills trap:

- Those from less advantaged backgrounds – whether through parental engagement, education or the type of school they attended – have fewer opportunities to build essential skills at school.
- Skill levels are also lower on average for those from less advantaged backgrounds.
- These individuals subsequently tend to have less desire to build essential skills.
- They are then likely to go into lower skilled, lower paid jobs.
- Those jobs provide fewer opportunities to build essential skills.
- They are ultimately likely to have lower levels of life-satisfaction.

5. Opportunities to build skills present a solution

Chapter Summary

- Given both the real impact on income and life satisfaction, as well as the pervasive perception that essential skills are important across life, it is unsurprising that demand for more opportunities to build essential skills is very high.
- 79% of working age adults want more opportunities to build essential skills.
- Those who desire more opportunities to build skills also have markedly higher skill levels. 66% of those who strongly agreed they wanted more opportunities have above median scores and a median skill score of 10.34 for that sub-population, compared to a score of 7.28 (and only 20% above median) for those that strongly disagree they want more opportunities.
- Individuals who had good opportunities to build essential skills at school and strongly agree that they want more opportunities to build skills, have some of the highest skill levels in the UK, with 81% of them achieving a skill score above the median.
- Individuals in the top quartile of skill score were 85% more likely to strongly agree that they had opportunities to build essential skills at school.
- Skill score increases amongst individuals who had greater opportunities at school or in employment, but who are otherwise similar. Skill score is on average 1 and 1.5 steps higher for individuals who had multiple specific opportunities to build essential skills in education and employment respectively, compared to those who had none.
- We can now see the full extent of the population-level skills trap: those from less advantaged backgrounds have fewer opportunities to build essential skills at school; having had fewer opportunities to build skills at school, their skill levels are lower; that is a primary driver of why we see such disparities in skill levels; these individuals subsequently have less desire to build essential skills; they then go into lower skilled, lower paid jobs; those jobs provide fewer opportunities to build essential skills and they continue on a lower earnings trajectory; and they ultimately have lower levels of life-satisfaction.

Demand for more opportunities

Given the impact of essential skills on life outcomes, the fact that high-quality opportunities to build essential skills improve individuals' skill levels[34] and the inequitable distribution of those skills and opportunities to build them, it is no surprise that the UK public both highly value these skills and want more opportunities to build them.

79% of those with an opinion either strongly agreed or tended to agree that they would like more opportunities to build the eight essential skills, with only 4% of UK working age adults strongly disagreeing.

[34] Angus, Millard, Joshua, Baars & Bowen-Viner (2020). *How do essential skills influence life outcomes?*

There is also a clear linear relationship between skill levels and demand for more opportunities. 66% of those who strongly agreed they wanted more opportunities had skill scores above the median, compared to only 31% and 20% for those who tended to disagree or strongly disagreed. Those who strongly disagreed were 135% more likely to have a skill score in the bottom quartile.

Those who strongly disagreed were 135% more likely to have a skill score in the bottom quartile

Most people would like more opportunities to build essential skills

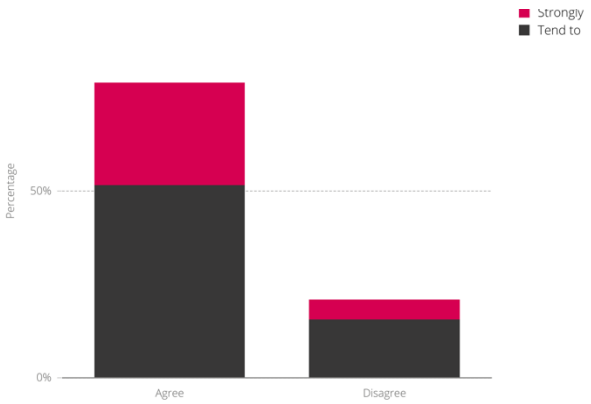


Figure 5.1 – UK public demand for more opportunities to build essential skills

Those with a desire for more opportunities to build skills have a higher skill score

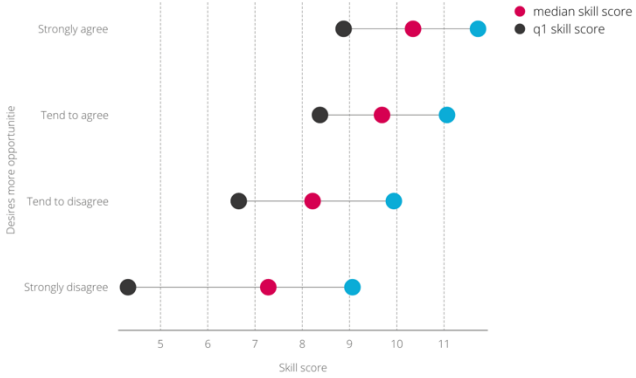


Figure 5.2 – Demand for more skills building opportunities

More opportunities to build essential skills improves skill levels

Key findings

- Skill score increases amongst individuals who had greater opportunities at school, but who are otherwise similar.
- Skill score increases amongst individuals who have had greater opportunities at work, but who are otherwise similar.

Objectives and background

Analysis has already shown that a number of demographic factors and specific interventions correlate with a higher skill score. In this section, efforts are taken to work towards a causal interpretation of some of these interventions by measuring their effect on skill score, both in isolation and when controlling for demographic factors.

While some demographic factors are immutable or much harder to change, providing high-quality opportunities to build essential skills falls well within the competency of employers, educators, impact organisations and policy makers. We have seen already the meaningful positive impact of higher skill levels, measured against the Universal Framework, on life outcomes. If opportunities to build essential skills lead to higher skill levels irrespective of demographic factors, then there is a clear case for rapidly scaling the number of opportunities to build essential skills in the UK in a variety of contexts.

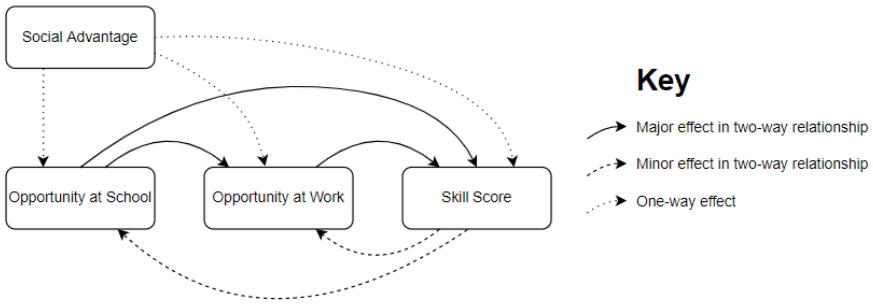


Figure 5.3 – Illustrative diagram of effects between skill score, opportunities and social advantage

Exploratory regression analysis finds that combining the responses to two questions related to opportunities at school into an index leads to stronger correlations with skill score. The index comprises how strongly a respondent agreed that they have had "access to plenty of opportunities at school to grow the skills they selected" in addition to the number of specific opportunities in school they selected. 0 represents the least opportunity at school, with a maximum possible score of 8.

An analogous process is used to calculate an opportunities at work index, from how strongly a respondent agreed that they have "had access to plenty of opportunities through my employers to grow the skills I selected" in addition to the number of specific in-work opportunities they selected. The scale of this index is also 0 to 8.

Opportunities lead to a higher skill score

All else being equal, an individual who scores 4 in the opportunities at school index (i.e. in the top 75-90%) has a skill score 1 step higher than an individual who scores 0. Individuals in the top quartile of skill score were 85% more likely to strongly agree that they had opportunities to build essential skills at school.

All else being equal, an individual who scores 4 in the opportunities at work

Opportunities at schools

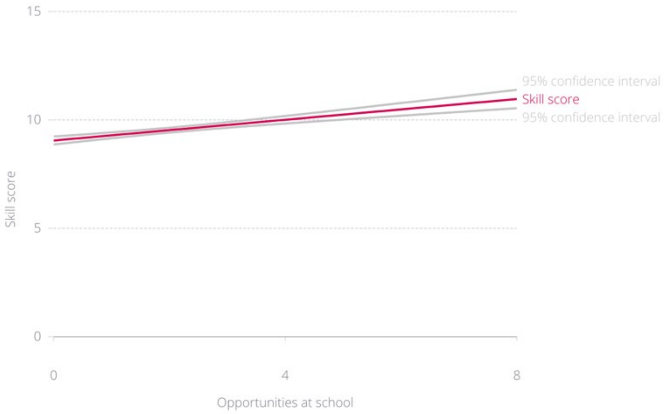


Fig 5.4 – Effect of opportunities at school on skill score, when controlling for relevant factors

index (ie in the top 75%) has a skill score 1.5 steps higher than an individual who scores 0. People who agreed that they have had plenty of opportunities to build essential skills at work were 30% more likely to have a top quartile skill score. Conversely, those who disagreed that they had had such opportunities were 37% more likely to be in the bottom quartile.

There is a body of literature showing that with explicit training, people can improve their essential skills.[35] These findings further validate that research and yet again show that with explicit opportunities to build essential skills, individuals can upskill – with a meaningful impact on their life outcomes.

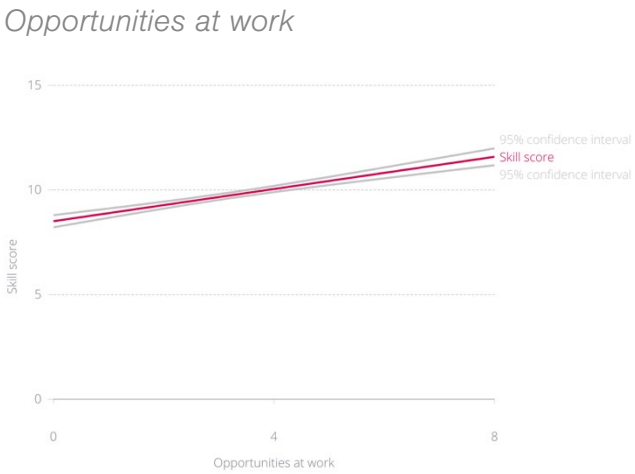


Fig 5.5 – Effect of opportunities at work on skill score, when controlling for relevant factors

We can now see the full extent of the skills trap:

- Those from less advantaged backgrounds – whether through parental engagement, education or the type of school they attended – have fewer opportunities to build essential skills at school.
- Having had fewer opportunities to build skills at school, their average skill levels are lower. That is a primary driver of why we see such disparities in skill levels by different demographic or socio-economic characteristics.
- These individuals subsequently tend to have less desire to build essential skills.
- They are then likely to go into lower skilled, lower paid jobs.
- Those jobs provide fewer opportunities to build essential skills and continue on a lower earnings trajectory than their peers with higher levels of essential skills.
- They are ultimately likely to have lower levels of life-satisfaction.

However, the research also shows that providing more opportunities to build essential skills is likely to improve individuals' skill levels irrespective of their job, what school they went to, where they live or their relative advantage. In turn, those higher skill levels can unlock better employment and life outcomes across the UK.

[35] Angus, Millard, Joshua, Baars & Bowen-Viner (2020). *How do essential skills influence life outcomes?*

Skills Builder
PARTNERSHIP

Appendix 1: Methodology

Chapter Summary

- The research is based on a nationally representative survey of 2,262 working age adults in the United Kingdom.
- Participants self-assessed themselves against the Skills Builder Universal Framework for Essential Skills. This cross-validated approach to skill measurement breaks down essential skills – those highly transferable skills that are required for almost any job – into 16 steps. The eight essential skills are: teamwork, leadership, listening, speaking, problem solving, creativity, aiming high, and staying positive.
- The questionnaire recorded respondents' employment details such as income and the type of work they do, along with perceptions of their careers and opportunities.
- Opportunities that respondents had to build essential skills were also captured, whether through education, employment or self-directed learning.
- In addition to the demographic data held by YouGov on survey respondents to allow weighting, the survey also recorded more detailed demographic data including several measures of advantage.

YouGov random probability sample

This research analyses the responses of 2,262 respondents to a survey designed by Skills Builder Partnership and administered by YouGov as part of their 'UK Omnibus' in November 2021. Respondents were from across the United Kingdom and aged between 18 and 66. YouGov weighted responses by age, gender, social class, region, and level of education and this weighting is used in the analysis to ensure that the sample is representative.

This paper follows a similar design to that of *Better Prepared: Essential Skills and Employment Outcomes for Young People* (Kashefpakdel, Ravenscroft, Percy: 2021) and in turn Mann and Percy (2014).

Measurement of essential skills

Respondents received a question for each of the eight essential skills in the Skills Builder Universal Framework (see Appendix 2). Each question presented all 16 steps within the Framework as statements, without any indication of step number. For each question, respondents were asked how often, if at all, they are able to do each of the skill steps when required. Response options were on a validated likert scale of: Almost Always, Often, Sometimes, Rarely, Almost Never.

In our analysis, we created a "skill score" by attributing the following weighting to each response:

- Almost Always = 1
- Often = 0.75
- Sometimes = 0.5
- Rarely = 0.25
- Almost Never = 0

To reflect the fact that the framework runs from Step 0 to Step 15, our standard approach is to deduct one point from the total, so that the total reflects the average step in the framework. This was averaged across the 8 skills. The minimum skill score that a respondent could therefore achieve was minus 1, and the maximum was 15. For example, if a respondent answered "sometimes" to every step, their score would be 7 (0.5 * 16 - 1).

Sample Distributions

	Percentiles		Smallest			
1%	2.46875		1.375			
5%	4.90625		1.46875			
10%	6.09375		1.5625		Obs	1,606
25%	8		1.65625		Sum of wgt.	1,606
50%	9.53125				Mean	9.302888
			Largest		Std. dev.	2.350016
75%	11		13.90625			
90%	12.125		13.96875		Variance	5.522577
95%	12.65625		14		Skewness	-0.672043
99%	13.5625		14.03125		Kurtosis	3.414683

Figure A.1 – summary statistics for average skill score

Estimation methods

The research applied a number of quantitative methods for exploratory analysis in order to reject certain pre-specified null hypotheses including:

- There is no relationship between skill score and earnings
- There is no relationship between between skill score and opportunities to build essential skills
- There is no relationship between skill score and measures of social advantage

We used python packages such as pandas, statsmodels and sklearn in order to explore, wrangle and clean the data. Stata was then used to run multivariate linear regression, interval regression, and logistic regression models, all incorporating sampling weights, as well as to conduct statistical tests.

Analysing the distribution of responses on a per step, per skill basis revealed that the distribution contained four spikes spaced evenly throughout, where respondents had selected the same answer for every question. Such respondents were detected by calculating the standard deviation of each respondent's responses for each skill. A standard deviation of 0 indicated that the respondent had selected the same responses for every question, regardless of which response in the scale this was. This approach had the advantage of removing bad data at responses where it was much less visible than at either extreme of the scale. Excluded respondents who answered any skill survey in this way reduces the sample from 2,261 to 1,606. The compromise made in surveying respondents on the whole framework, which meant answering 128 individual questions, and the choice not to include a "Don't know" option, inevitably increased the proportion of non-credible or low-credibility responses. Analysis of non-credible responses will inform survey design in the future.

Additional statistical checks were subsequently performed in order to uncover any additional forms of bad data, and to explore the data set. Examining distributions at particularly common skill scores satisfied us that there were no concerning patterns. Correlations of scores between skills were as positive and fairly tight, as expected, with no obvious patterns.

Our final check on whether or not respondents had answered in good faith involved fitting a gradient and intercept for each respondent's responses in each skill. The distribution of the gradients (normal, and centred slightly below zero) suggested that there were likely no more forms of bad data abundant in the skill scores. With a significant minority of respondents' skill scores showing a positive gradient, however, we did learn that the increase in difficulty of the framework in each skill from step 0 to step 15 did not steer all respondents' responses downwards. This in itself is not a problem, as long as the skill score data remains representative of the individual's ability.

Modelling skill score and income

In this section, the process through which the relationship between skill score and income was modelled is elaborated in greater detail, and the results discussed at greater length. The parameters of each iteration of the model are presented in table A.5.

The possible relationship between skill score and income can be formulated in a number of ways. One hypothesis is that an intervention that leads to a higher skill score could result in an increase in earnings potential that would, at some point in the future, materialise to a greater or lesser extent in the form of increased earnings. Since it is likely that factors such as skill score, education, and income have causal effects on one another in complex and non-immediate ways, we seek to iteratively control for each potentially confounding factor in the relationship between skill score and income in order to better understand the true relationship between these variables, and ultimately to produce indicative boundary estimates on the possible causal impact of skill score on income.

What we are seeking to test in the first instance is whether individuals might expect higher income during their working life if the formal education and additional training they have experienced in the past has essential skills more strongly embedded in them (eg. curriculum, standards, assessments, teaching time, etc.)

We then proceed to explore the potential short-term impact that an essential skills-boosting intervention for a working-age individual has on their earning power. We acknowledge that in this scenario, any increase in earning power remains a notional figure while it goes unrealised by the earner – though the theoretical gains in productivity it represents should be realised more immediately by the earner's employer, and in the wider economy.

Sample selection

We focus on full-time workers only for two reasons. Firstly, full-time salaries are comparable, whereas part time salaries without hours worked are not. Secondly, full-time workers are more likely to translate their earning potential, to which we hypothesise that essential skills contribute, as fully as possible into income. For those not in full-time work, it is much more difficult to measure earning potential via income – we know what other choices have been made to optimise labour for other factors, such as flexibility around childcare.

Excluding those not in full-time work reduces the sample size from 2,261 to 1,235.

Since income is in this analysis the dependent variable, only those reporting credibly on income are included. Removing those that did not disclose their earnings reduces the sample size from 1,235 to 1,080. Those reporting earnings not typically legally possible within full-time work in the UK are also excluded – i.e. those earning less than £15,000 – which reduces the sample size from 1,080 to 1,012.

Only credible skill score responses were included, using the same methodology as elsewhere in this report. Excluding non-credible skill score responses reduces the sample size from 1,012 to 743.

Modelling the raw relationship between skill score and income

Interval regression is used to establish the raw relationship between skill score and income. Interval regression means that income brackets can be modelled without reverting each response to the mean of their bracket, and without imposing an imaginary upper limit on the right-censored upper income bracket (which has no upper limit). Here, and and in each version of the regression that follows, skill score is regressed onto the natural logarithm of income, as is common practice for income variables, and which in this instance indeed produces significantly more normally-distributed residuals. Testing indicates that including the squared term of skill score does not improve the performance of the model, so the squared term is excluded.

Modelling the impact of confounding variables

Analysis elsewhere in this report finds relationships between a number of variables and skill score, such as highest education level. Many of these variables also affect income, as is the case with education. Modelling the relationship between skill score and income in the manner above attributes any effect of additional variables that are somewhat correlated with skill score solely to skill score. For instance, skill score increases with education level; if income also increases with education level, then a model without control variables assumes that the entire effect of education level on income is a consequence of a higher skill score.

This may to some extent be true. Those with a higher level of essential skills in school may achieve higher qualifications. The corollary, however, is also justifiable – a higher education level also means that someone will have spent more time in education and therefore had more opportunities in those settings to build essential skills (assuming these opportunities are greater than in employment).

Education

Highest education level[36] is included as a controlling factor variable, which ensures that no assumptions are made about the linearity of the effect of education on income. Excluding responses missing education level data reduces the sample size from 743 to 723. The statistical significance on the variable of interest, skill score, remains very high (p-value 0.000).

Controlling for education, a difference in skill score of one step is associated with an increase in income of 4%. A full-time worker at the third quartile of skill score can be expected to earn 13% more than a full-time worker with the same education level at the first quartile of skill score. This equates to around £4,100 for the average worker.

[36] Options include: No formal qualifications; Entry Level (e.g. entry level award/ certificate/ diploma etc.); Level 1 GCSEs grades D – G (1-3) / vocational qualification at level 1 (e.g. BTEC, OCR, C&G, other); Level 2 GCSE A-C (7-9) / vocational qualification at level 2 (e.g. BTEC, OCR, C&G, other); Scottish ordinary/ lower certificate; Level 3 A Level / International Baccalaureate/ vocational qualification at level 3 e.g. (BTEC, OCR, C&G, other); Scottish Higher certificate; Level 4-5 Higher National Certificate/Diploma; Level 4-6 Higher education undergraduate degree (including a Bachelor's degree, Foundation degree, Higher Education Diploma); Level 6 and above Post-graduate qualification

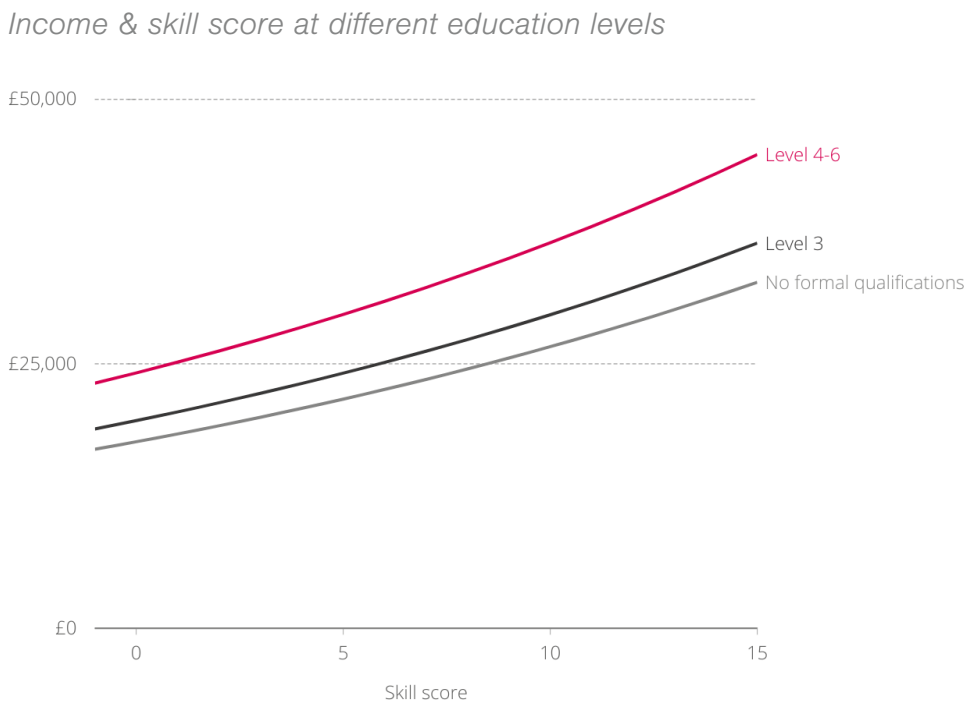


Figure A.2 – Effect of increased skill score for those with no formal qualifications, level 3 qualifications (A Levels / International Baccalaureate / BTEC, OCR, C&G, undergraduate degree

Age

Age is likely to be another confounding variable, in that it affects both income and skill score, as well as education level.

- Age to income: those who have worked for longer typically earn more on average, up until a certain point where earning power no longer increases with age, and possibly decreases.
- Age to skill score: those who have lived longer have had more time to access essential skill building opportunities; but they may also have experienced a different amount of essential skill development in school and in the workplace, and have had longer to forget what they were taught. If, as the data indicate, those in higher income jobs have more opportunities to develop their essential skills, then it should be expected that skill score also increases with age as a function of earnings.
- Age to education: those who left school at different points throughout the last 45 years did so during periods when different qualifications were available, and had different availability. Age should also affect skill score indirectly via education, as the younger a respondent is, the more likely it is that they have spent longer in formal education.

Age is included in the model as a continuous variable. The square term of age is included, since age does not have a linear relationship with income. Both age, and the square of age, have statistically significant relationships with income; including age does not diminish the statistical significance of the relationship between skill score and income.

Controlling for education level and age, each step increase in skill score is associated with a 3.7% increase in income. A full-time worker at the third quartile of skill score can expect to earn 11.5% more than a full-time worker of the same age and similar education level with a skill score at the first quartile. This equates to around £3,900 for the average worker. The average effect of moving from the first quartile to the third quartile in skill score can now be shown for individuals of similar education level at different ages.

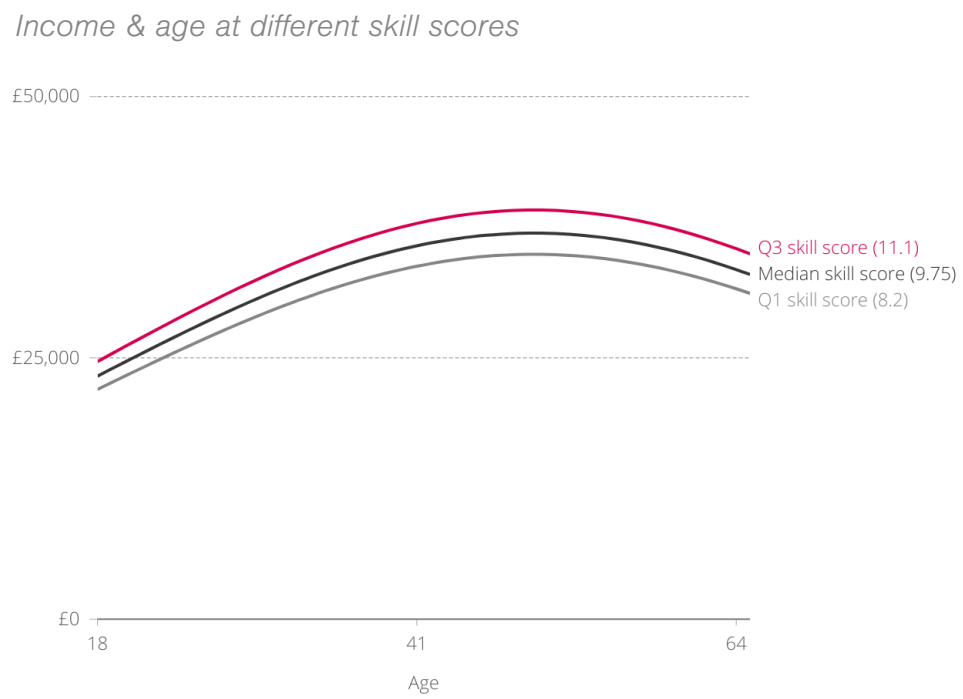


Figure A.3 – skill score and income controlling for age

Gender, ethnicity, parent's Higher Education status, and type of school attended

Social advantage, in its various forms, is likely to have a confounding impact on essential skills, education, and income, due to inequitable access to opportunities, as well as differences in self-reporting. If these are not accounted for, it could be the case that the model attributes increases in income to skill score because skill score is correlated to measures of social advantage, which can influence income in a range of direct and indirect ways.

With gender, ethnicity, parental education, and type of school included, and excluding individuals with no data on those features, the sample size drops from 723 to 650.

Controlling for age, education level, and social advantage, the wage premium of skill score remains statistically significant, and is still 3.7%. Moving from the first quartile to the third quartile results in an average increase of 11.6% in income, or around £3,900.

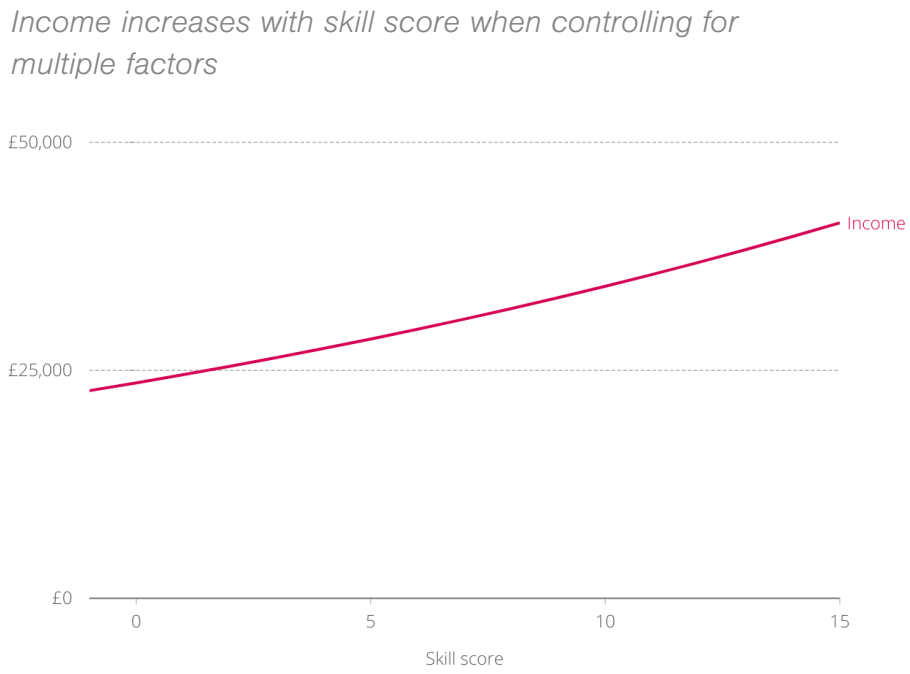


Figure A.4 – Skill score and income, when controlling for age, education level, and social advantage

Additional control variables: modelling momentary intervention

Additional collected data relevant to respondents' economic outcomes includes region, job type, industry sector, and contract type. Although a relationship between these factors and income can be expected, they have so far not been used to control for the relationship between skill score and income because they are subject to change as a result of an individual's earning power. For instance, an increase in skill score will result in greater earning power, which could result in an individual seeking a job in a higher-paying sector, or relocating to a region with more well-paying jobs. In order to understand the relationship between essential skills and potential life outcomes over the mid- to long-term, these factors have been excluded.

Controlling for factors such as job type has the effect of controlling for much of the increase in income that we are trying to measure. However, in order to understand the effect of a short-term intervention, such as an employee enrolling on a training programme over a number of months, these factors can be used as controls to compare the short-term effect on like-for-like workers. Whereas the first model presented in this analysis results in a potential upper bound of the causal effect of an increased skill score on income (of 6% per skill step), this model represents a potential lower bound.

Controlling for education level, age, social advantage, and career progression thus far, the wage premium of each step increase in skill score is significant at the 0.01 level, though it is reduced to 1.8%. The wage premium of moving from the first quartile to the third quartile is 5.6%, or around £1,900 on average.

In reality, over the longer term, it should be expected that higher skill scores, and therefore higher earning power, should result in these factors *not* remaining constant. In the short term reality, however, individuals who have upskilled do not immediately change job title, move to higher paying organisations, or relocate to regions with higher salaries. Instead, they are likely to work at an increased productivity in their current job, and receive commensurate rewards from their current employer.

	Model 1	Model 2	Model 3	Model 4	Model 5
Average skill score	0.057***	0.041***	0.037***	0.037***	0.018**
No formal qualification		0.000	0.000	0.000	0.000
Entry Level qualification		0.032	0.023	-0.032	-0.257
Level 1 qualification		0.122	0.111	0.104	0.077
Level 2 qualification		0.044	0.053	0.054	-0.009
Scottish ordinary/ lower certificate		0.101	0.089	0.026	0.073
Level 3 qualification		0.107	0.157	0.167	0.049
Scottish Higher certificate		-0.152	-0.143	-0.110	-0.081
Level 4-5 qualification		0.180	0.228	0.228	0.109
Level 4-6 qualification		0.314**	0.372***	0.344**	0.107
Level 6 and above qualification		0.418***	0.482***	0.493***	0.147
age			0.046***	0.049***	0.038***
age # age			-0.000***	-0.000***	-0.000***
male				0.000	0.000
female				-0.207***	-0.194***
not white british				0.000	0.000
white british				-0.127*	-0.100*
Both parents attended university				0.000	0.000
One parent attended university				-0.106	-0.052
Neither parent attended university				-0.140*	-0.093*
Non-selective state school				0.000	0.000
Grammar / selective state school				0.028	0.033

Independent / fee-paying school				0.003	-0.036
Alternative Provision				0.132	0.032
Professional or Higher Technical					0.000
Manager or Senior Administrator					-0.140**
Junior Profesional					-0.453***
Sales or Services					-0.623***
Foreman or Supervisor					-0.406***
Skilled Manual Work					-0.410***
Semi-Skilled or Unskilled Manual Work					-0.562***
Other work type					-0.511***
Have never worked					-0.538***
Lives in London					0.000
Dos not live in London					0.132**
N	743.000	723.000	723.000	650.000	650.000
* p<0.05, ** p<0.01, *** p<0.001					

Table A.5 – Income regression summary results

Modelling skill score and life satisfaction

Sample selection

The responses to two survey questions were added together in order to form a life satisfaction index. Respondents were asked 'how satisfied, if at all, are you with your life nowadays?' and 'to what extent do you feel that the things you do in your life are worthwhile?'. In both questions, respondents were given a range of 0 to 10, from lowest to highest. Responses to the lowest option in both questions were significantly more numerous than the distribution curve across all responses would suggest they should be. In order to simplify analysis, these outliers were removed from the sample. Of the 1,606 respondents who gave credible skill score responses, 94 were excluded on this basis, leaving 1,510.

Skill score and "how satisfied, if at all, are you with your life nowadays?"

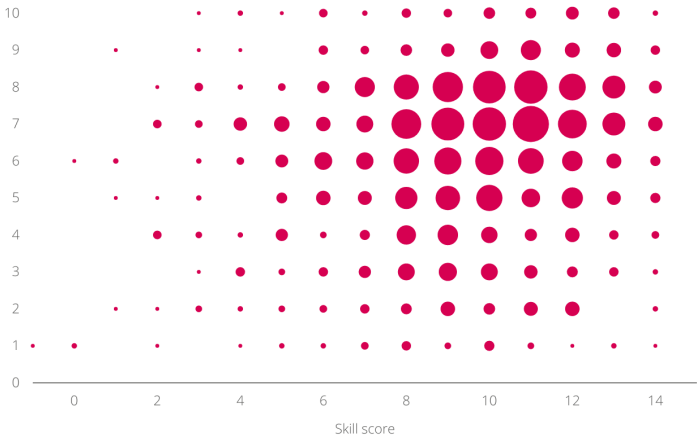


Figure A.6 – skill score and responses to "how satisfied, if at all, are you with your life nowadays?"

Skill score and "to what extent do you feel that the things you do in your life are worthwhile?"

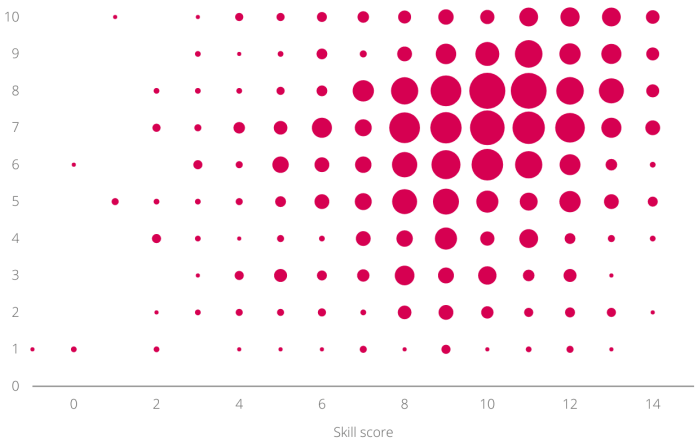


Figure A.7 – skill score and responses to "to what extent do you feel that the things you do in your life are worthwhile?"

Model parameters

Diagnostic tests reveal outliers exerting excessive influence on the relationships modelling in this section. For each of the models presented here, OLS regression is used to identify the top 5% of outliers by Cook's distance, which are then excluded from the weighted model. This has the effect of significantly reducing each model's root mean square error.

Many factors are likely to influence life satisfaction non-linearly

A number of the variables included in the model have interesting relationships to life satisfaction, as it is measured here. Including age and income in this model, with square terms, allows us to highlight the relationship between skill score and life satisfaction while another variable changes.

Age, for instance, has a well-documented, nonlinear relationship with life satisfaction. Controlling for age in our life satisfaction model, we can show the relative strength of these relationships. On average, a 35 year old with a skill score in the upper quartile will report roughly the same life satisfaction as a 55 year old with a skill score in the lower quartile.

Life satisfaction & age, at different skill scores

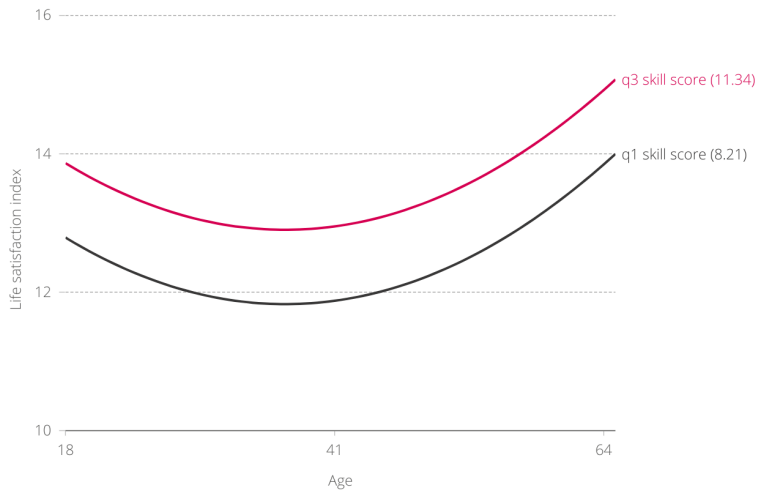


Figure A.8 – life satisfaction and age, shown at q1 and q3 skill score

Income also has a strong, non-linear relationship with life satisfaction. Sub-sampling just full-time workers, the relative strength of the relationships between skill score and life satisfaction, and income and life satisfaction, can be shown.

Figure A.9 – life satisfaction and income, shown at q1 and q3 skill score

	Model 1	Model 2	Model 3
Average skill score	0.374***	0.343***	0.322***
age		-0.201***	-0.144
age2		0.003***	0.002
Working full time (30 or more hours per week)		0.000	
Working part time (8-29 hours a week)		0.090	
Working part time (Less than 8 hours a week)		0.657	
Full time student		-2.094***	
Retired		-0.276	
Unemployed		-3.222***	
Not working		-2.774***	
Other		-2.437***	
Male		0.000	0.000
Female		0.339	0.177
White british		0.000	0.000
Not white british		0.464	0.547
No formal qualifications		0.000	0.000
Entry Level qualification		-1.719	-1.831*
Level 1 qualification		-2.214***	-1.500
Level 2 qualification		-2.619***	-1.688*
Scottish ordinary/ lower certificate		-0.715	-0.880

Level 3 qualification		-2.782***	-2.579**
Scottish Higher certificate		-1.614*	
Level 4-5 qualification		-2.342***	-1.964*
Level 4-6 qualification		-2.776***	-2.576**
Level 6 and above qualification		-2.404***	-2.412**
Both parents attended university		0.000	0.000
One parent attended university		-0.200	0.027
Neither parent attended university		-0.816*	-0.398
Non-selective state school		0.000	0.000
Grammar / selective state school		0.309	0.204
Independent / fee-paying school		0.424	0.591
Alternative Provision		-1.901**	-2.011*
Income			0.000**
Income2			-0.000*
N	1436.000	1236.000	625.000
r2	0.052	0.185	0.103
rmse	3.360	3.224	3.304
* p<0.05, ** p<0.01, *** p<0.001			

Table A.10 – life satisfaction regression model summary results

Modelling skill score and being out of work or education

Sample selection

The work status of respondents was used to identify those that were out of work or education, without being retired (or "other"). Of the 1,606 respondents who gave a credible skill score, 56% were in full-time employment, with 4.4% "not working".

Model parameters

A similar process to that used in previous models was used to understand the raw relationship between skill score and work status, before iteratively including additional control variables. In this case, the magnitude of the relationship between skill score and the dependent variable is remarkably stable across numerous models (see table A.11). Many factors affect an individual's likelihood of being in work or education, and not all of these can be controlled for. One version of the model presented here includes a three-way interaction term between gender, age, and whether or not the respondent's household contains children, in order to accommodate those who have voluntarily left work in order to care for children. Although the inclusion of these terms has no effect on skill score's coefficient, far more data would be needed in order to more effectively control for such circumstances.

	Model 1	Model 2	Model 3	Model 4	Model 5
Skill score total	-0.154***	-0.146***	-0.098*	-0.143**	-0.145**
age		-0.080	-0.070	-0.027	-0.010
age2		0.001	0.001	0.000	-0.000
Male			0.000	0.000	0.000
Female			0.221	0.092	-1.332
No formal qualifications			0.000	0.000	0.000
Entry Level qualification			-1.152	0.000	0.000
Level 1 qualification			-0.581	-0.601	-0.484
Level 2 qualification			-0.700	-0.866	-0.776
Scottish ordinary/ lower certificate			-1.679	-1.565	-1.614
Level 3 qualification			-0.941	-0.814	-0.735
Scottish Higher certificate			-1.429	-1.493	-1.331
Level 4-5 qualification			-0.429	-0.284	-0.292
Level 4-6 qualification			-1.812***	-1.902**	-1.872**
Level 6 and above qualification			-2.031***	-1.833**	-1.843**
White british				0.000	0.000

Not white british				-0.085	-0.009
Both parents attended university				0.000	0.000
One parent attended university				0.278	0.159
Neither parent attended university				-0.098	-0.253
Non-selective state school				0.000	0.000
Grammar / selective state school				-0.039	0.022
Independent / fee-paying school				0.399	0.428
Alternative Provision				0.222	0.200
Male#no children#age					0.000
Male#children#age					-0.039*
Female#no children#age					0.025
Female#children#age					0.033
N	1379.000	1379.000	1307.000	1155.000	1155.000
* p<0.05, ** p<0.01, *** p<0.001					

Table A.11 – Not in work or education regression model summary results

Modelling contributing factors to skill score

Sample selection

Bivariate linear regression shows that the question “I have had access to plenty of opportunities through the school/college I attended to grow the skills I selected” is a better predictor of skill score than the number of specific opportunities selected by respondents. Forming an index of both questions together, however, is a better predictor than either individually, and is used in this analysis where school opportunities are analysed. A similar approach is taken to form an index of in-work opportunity from two questions.

	min	max	q1	median	q3	std	skew
"I have had access to plenty of opportunities through the school/college I attended to grow the skills I selected"	0	3	1	1	2	0.88	0.30
Number of school opportunities selected	0	5	0	0	1	1.08	1.55
"I have had access to plenty of opportunities through my employers to grow the skills I selected"	0	3	1	2	2	0.88	-0.24
Number of in-work opportunities selected	0	5	0	0	2	1.24	1.16

Table A.12 – summary statistics for questions included in both opportunities indices

As in previous analyses involving skill score, respondents who did not give credible responses to skill surveys were excluded, reducing the sample from 2,261 to 1,606. Excluding those who did not answer questions about opportunities at school reduces the sample to 1,465. Where opportunities at work are analysed, those not in full-time work are excluded, as well as those who did not respond to questions about opportunities in work, reducing the sample size to 854.

Model parameters

Bivariate weighted linear regression shows a strong, statistically significant relationship between the opportunities at school index and skill score. For this model, and each subsequent model in this section, unweighted ordinary least squares regression is used to identify the top 5% of outliers according to Cook’s distance, which are then excluded from the weighted linear regression parameters presented. The result of this is that in the presented iteration of each model, the distribution of residuals is much closer to normal.

Controlling for demographics & social advantage greatly improves the accuracy of the model, but reduces the apparent effect of opportunities at school by only a small amount.

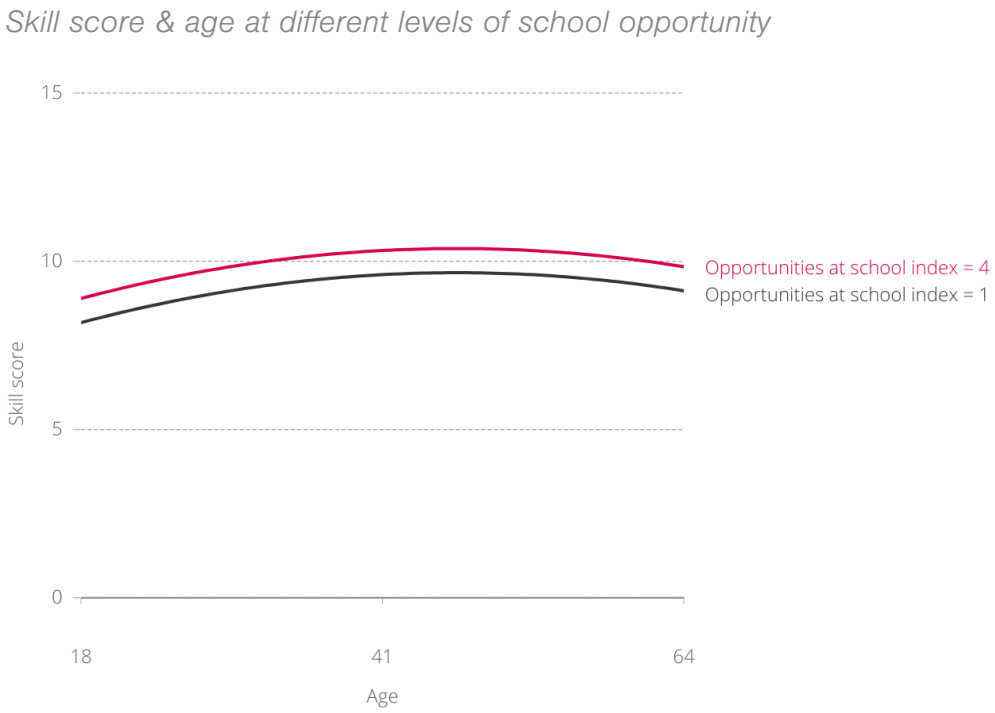


Fig A.13 – Effect of opportunities at school on skill score at different ages, controlling for demographic factors

Opportunities at work

For modelling opportunities at work, only those respondents in full-time employment are included, which reduces the sample size to 821. Bivariate regression shows a strong, statistically significant link, between opportunities at work and skill score. Adding additional controls has little effect on the magnitude of the relationship between opportunities at work and skill score.

	Model 1	Model 2	Model 3	Model 4
opportunities at school index	0.248***	0.239***		
opportunities at work index			0.402***	0.385***
age		0.168***		0.174***
age2		-0.002***		-0.002***
education level		0.311***		0.217***
parental engagement		-0.075		-0.01
male		0		0
female		0.268*		0.096
white british		0		
not white british		-0.053		
Both parents attended university		0		0

One parent attended university		0.292		0.549*
Neither parent attended university		0.14		0.032
Non-selective state school		0		0
Grammar / selective state school		0.182		0.204
Independent / fee-paying school		-0.122		-0.283
Alternative Provision		-0.128		-0.496
Working full time (30 or more hours per week)		0		
Working part time (8-29 hours a week)		-0.063		
Working part time (Less than 8 hours a week)		-0.152		
Full time student		0.797**		
Retired		0.533*		
Unemployed		-0.048		
Not working		-1.479***		
Other		0.128		
N	1392	1171	821	710
r2	0.04	0.166	0.141	0.209
rmse	1.981	1.928	1.795	1.814
* p<0.05, ** p<0.01, *** p<0.001				

Table A.14 – opportunities regression model summary results

Limitations

This paper uses quantitative research methods to surface the relationships between higher levels of essential skills and specific outcome areas. The limitations of regression models using cross-sectional data apply in this study. Controlling for a range of socio-economic factors allows analysts to ensure that any relationships found – for example, between skills and an education outcome – cannot be dismissed as a mask for social privilege or a comparable indicator of advantage or gender. However, there may be additional factors that are not captured or not adequately proxied for in the available data.

Longitudinal research measuring skill levels against the Universal Framework along with opportunities to build skills and their impact on long term outcomes would be a valuable augmentation of this research strand based on correlations identified in cross-sectional data.

Skills questions in this survey rely on self-reported data. This is a common practice in cases where it is not feasible to use validated, external or objective measurements of skills. As with any self-reported data, they are subject to a number of response biases. In the future, we will look to control for some of these biases, for example by including questions to build a social desirability scale. We would welcome more work from researchers and analysts on methods to reduce response bias in self-assessment using the Universal Framework.

Appendix 2: Skills Builder Universal Framework of Essential Skills

Skill: Listening

The receiving, retaining and processing of information or ideas

Step	Statement
0	I listen to others without interrupting
1	I listen to others and can remember short instructions
2	I listen to others and can ask questions if I don't understand
3	I listen to others and can tell someone else what it was about
4	I listen to others and can tell why they are communicating with me
5	I listen to others and record important information as I do
6	I show I am listening by how I use eye contact and body language
7	I show I am listening by using open questions to deepen my understanding
8	I show I am listening by summarising or rephrasing what I have heard
9	I am aware of how a speaker is influencing me through their tone
10	I am aware of how a speaker is influencing me through their language
11	I listen critically and compare different perspectives
12	I listen critically and think about where differences in perspectives come from
13	I listen critically and identify potential bias in different perspectives
14	I listen critically and use questioning to evaluate different perspectives
15	I listen critically and look beyond the way speakers speak or act to objectively evaluate different perspectives

Skill: Speaking

The oral transmission of information or ideas

Step	Statement
0	I speak clearly to someone I know
1	I speak clearly to small groups of people I know
2	I speak clearly to individuals and small groups I do not know
3	I speak effectively by making points in a logical order
4	I speak effectively by thinking about what my listeners already know
5	I speak effectively by using appropriate language
6	I speak effectively by using appropriate tone, expression and gesture
7	I speak engagingly by using facts and examples to support my points
8	I speak engagingly by using visual aids to support my points
9	I speak engagingly by using tone, expression and gesture to engage listeners
10	I speak adaptively by changing my language, tone and expression depending on the response of listeners
11	I speak adaptively by planning for different possible responses of listeners
12	I speak adaptively by changing my content depending on the response of listeners
13	I speak influentially by changing the structure of my points to best persuade the listeners
14	I speak influentially by changing the examples and facts I use to best persuade the listeners
15	I speak influentially by articulating a compelling vision that persuades the listeners

Skill: Problem Solving

The ability to find a solution to a situation or challenge

Step	Statement
0	I complete tasks by following instructions
1	I complete tasks by finding someone to help if I need them
2	I complete tasks by explaining problems to someone for advice if I need
3	I complete tasks by finding information I need myself
4	I explore problems by creating different possible solutions
5	I explore problems by thinking about the pros and cons of possible solutions
6	I explore complex problems by identifying when there are no simple technical solutions
7	I explore complex problems by building my understanding through research
8	I explore complex problems by analysing the causes and effects
9	I create solutions for complex problems by generating a range of options
10	I create solutions for complex problems by evaluating the positive and negative effects of a range of options
11	I analyse complex problems by using logical reasoning
12	I analyse complex problems by creating and testing hypotheses
13	I implement strategic plans to solve complex problems
14	I implement strategic plans to solve complex problems and assess their success
15	I implement strategic plans to solve complex problems and draw out learning to refine those plans over time

Skill: Creativity

The use of imagination and the generation of new ideas

Step	Statement
0	I imagine different situations
1	I imagine different situations and can say what I imagine
2	I imagine different situations and can bring them to life in different ways
3	I generate ideas when I've been given a clear brief
4	I generate ideas to improve something
5	I generate ideas by combining different concepts
6	I use creativity in the context of work
7	I use creativity in the context of my wider life
8	I develop ideas by using mind mapping
9	I develop ideas by asking myself questions
10	I develop ideas by considering different perspectives
11	I innovate effectively when working in a group
12	I innovate effectively by seeking out varied experiences and stimuli
13	I support others to innovate by sharing a range of tools
14	I support others to innovate by evaluating the right creative tools for different situations
15	I support others to innovate by coaching them to be more creative

Skill: Staying Positive

The ability to use tactics and strategies to overcome setbacks and achieve goals

Step	Statement
0	I can tell when I feel positive or negative
1	I can tell when others feel positive or negative
2	I keep trying when something goes wrong
3	I keep trying and stay calm when something goes wrong
4	I keep trying when something goes wrong, and think about what happened
5	I keep trying when something goes wrong and help cheer others up
6	I keep trying when something goes wrong and encourage others to keep trying too
7	I look for opportunities in difficult situations
8	I look for opportunities in difficult situations, and share these with others
9	I look for opportunities in difficult situations, and adapt plans to use these opportunities
10	I look for opportunities in difficult situations, and create new plans to use these opportunities
11	I identify risks and gains in opportunities
12	I identify risks and gains in opportunities, and make plans to manage them
13	I support others to stay positive, by managing my own responses
14	I support others to stay positive, by helping others to see opportunities
15	I support others to stay positive, by helping others to see opportunities and creating plans to achieve them

Skill: Aiming High

The ability to set clear, tangible goals and devise a robust route to achieving them

Step	Statement
0	I know when I am finding something too difficult
1	I know what doing well looks like for me
2	I work with care and attention to detail
3	I work with pride when I am being successful
4	I work with a positive approach to new challenges
5	I set goals for myself
6	I set goals informed by an understanding of what is needed
7	I set goals, ordering and prioritise tasks to achieve them
8	I set goals and secure the right resources to achieve them
9	I set goals and plan to involve others in the best way
10	I create plans that are informed by my skill set and that of others
11	I create plans that include clear targets to make progress tangible
12	I create plans that are informed by external views, including constructive criticism
13	I develop long-term strategies taking into account strengths, weaknesses, opportunities and threats
14	I develop long-term strategies that use regular milestones to keep everything on track
15	I develop long-term strategies that include feedback loops to support flexibility and adaptability

Skill: Leadership

Supporting, encouraging and developing others to achieve a shared goal

Step	Statement
0	I know how I am feeling about something
1	I know how to explain my feelings about something to my team
2	I know how to recognise others' feelings about something
3	I manage dividing up tasks between others in a fair way
4	I manage time and share resources to support completing tasks
5	I manage group discussions to reach shared decisions
6	I manage disagreements to reach shared solutions
7	I recognise my own strengths and weaknesses as a leader
8	I recognise the strengths and weaknesses of others in my team
9	I recognise the strengths and weaknesses of others in my team, and use this to allocate roles accordingly
10	I support others through mentorship
11	I support others through coaching
12	I support others through motivating them
13	I reflect on my own leadership style and its effect on others
14	I reflect on my own leadership style, and build on my strengths and mitigate my weaknesses
15	I reflect on my own leadership style, and adapt my approach according to the situation

Skill: Teamwork

Working cooperatively with others towards achieving a shared goal

Step	Statement
0	I work with others in a positive way
1	I work well with others by behaving appropriately
2	I work well with others by being on time and reliable
3	I work well with others by taking responsibility for completing my tasks
4	I work well with others by supporting them if I can do so
5	I work well with others by understanding and respecting diversity of others' cultures, beliefs and backgrounds
6	I contribute to group decision making
7	I contribute to group decision making, whilst recognising the value of others' ideas
8	I contribute to group decision making, encouraging others to contribute
9	I improve the team by not creating unhelpful conflicts
10	I improve the team by resolving unhelpful conflicts
11	I improve the team by building relationships beyond my immediate team
12	I influence the team by reflecting on progress and suggesting improvements
13	I influence the team by evaluating successes and failures and sharing lessons
14	I support the team by evaluating others' strengths and weaknesses, and supporting them accordingly
15	I support the team by bringing in external expertise and relationships

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