Tech know-how.
The new way to get ahead for the next generation.

A study by BT and Accenture Strategy
November 2017

Forewords

Gavin Patterson, BT Group CEO

For the next generation, every job will be a tech job. But there's a risk that this tech revolution will sharpen the divides that exist in today's society. Too many young people don't understand how technology actually works. They grow up surrounded by it, but too often take it for granted and don't grasp how it will define their future. And as this research shows, without concerted effort we will see a double disadvantage – creating yet another barrier for young people from less privileged backgrounds.

At BT, we've made a long-term commitment to prepare the next generation to thrive in a digital world – helping them become confident, in control, and ultimately active creators with technology. We're convinced that building a culture of tech literacy is the only way to ensure young people can shape an economy and society that works for them.

That's because technology is transforming our personal and professional lives, and has the potential to create significant value and dynamic new opportunities. According to the World Economic Forum, 65 percent of children that started school in 2016 will do jobs that haven't yet been invented.

This report spells out the tech literacy dividend that can be created for individuals and the nation, highlighting the wage premium and GDP uplift that results from improved tech capability. But it also shows that we risk missing that potential and that young people from disadvantaged backgrounds are at the sharp edge of the challenge. It's a striking fact that while tech aptitude is evenly spread, access and opportunity differ along socio-economic, gender and regional lines.

That would stifle our country's future growth, threaten our status as a leading digital economy, and create greater social challenges as communities get left behind. Cracking it matters now more than ever as the UK reshapes its role on a global stage.

The research also reinforces the need to invest in a new generation of inventive and adaptable problem-solvers, with a combination of tech know-how and critical thinking skills. That's in tune with what we hear from corporate peers as well as government and civil society organisations on where the future workforce is headed. And it chimes with our experience with the Barefoot Computing Project, which has taken computational thinking to the teachers of more than 1.25 million[1] primary school children in the UK – and more than half of English primary schools. They report that starting early with the building blocks of the digital world has a positive impact on pupils' problem-solving, collaboration, literacy and numeracy.

But tackling skills supply is not enough on its own. Leaning in to support young people as they make the transition to work is key. At BT, we're one of the UK's biggest employers of apprentices. And our Work Ready scheme goes beyond our own workforce to give disadvantaged 16 to 24-year-olds skills development and hands-on experience of jobs powered by technology. Alongside Accenture, we're also working with other major employers as a founding partner of Movement to Work, a coalition of UK businesses collaborating on youth employment.

It's clear that we need to build a culture where young people see tech know-how as the new way to get ahead. That goes much further than a single-minded focus on coding – it's about creative problem-solving based on digital capability. This has to be a shared agenda. We must work together across business, government and civil society to bring young people from all backgrounds into the future workforce.

Helping young people with the skills and confidence to step up to the jobs of the future is the only way to super-charge social mobility and secure long-term prosperity for all.

Olly Benzecry, Chairman and Managing Director, Accenture UK and Ireland

BT and Accenture share the belief that tech literacy is paramount, not only for the disadvantaged, but for the future of the UK. We have commissioned this report to explore the relationship between tech literacy and social mobility, and its impact on productivity. Using our combined voice and convening power, we aim to create a shared understanding of this relationship, exploring the implications for young people and the future of the UK.

It's a complex challenge. Indeed, recent research by our Corporate Citizenship team revealed that 'tech know-how' is now one of six skillsets needed for inclusion in the digital economy, alongside others like collaboration, problem solving, creativity and a growth mindset.[2] There's no single answer to this challenge. We need a combination of access to training, deeper understanding of the relevance of tech to our future, and a cultural shift in attitudes towards it. And there's no single body responsible for taking action – we all have a role to play, as the private sector, as government, as educators and as parents.

At Accenture, we have been taking steps to provide access to skills for all. Our global flagship programme – Skills to Succeed – commits us to providing access to high quality skills training for three million people by 2020. We are using innovative technologies to level the playing field for disadvantaged young people, providing free, online training to encourage those not in education, employment, or training (NEETs) to aim higher, and to develop better skills and greater confidence. As a founding member of Movement to Work, we have offered work experience placements to 630 young people, more than half of whom have been inspired and equipped to go and get an apprenticeship or job within the sector. Additionally, our Accenture Digital Skills initiative addresses the digital skills gap in the market today, allowing anyone aspiring to build their skills and develop a better understanding of the role of tech in an increasingly digital workplace and economy.

So, we know that investing in the next generation is important; but what about the existing workforce who are at risk of being left behind? In this report, we highlight how employers risk reinforcing the status quo, being twice as likely to focus training efforts on higher paid workers, leaving lower paid workers behind. This could be exacerbating the divide between those that are higher paid and higher skilled, and those that are stuck in vicious cycles of low pay and skills, further raising the barriers to social mobility.

Organisations need to shift their own attitudes toward talent development, not only for people starting out in their careers, but also for those already in work. After all, as businesses, how do we expect to keep up with pace of change if – as our findings show –

only 23 percent of British workers feel supported by their employer to improve their digital skills?

The private sector has made a good start in incorporating issues regarding tech literacy and social mobility within their organisations, however we must make sure that we don't lose momentum now. It is time to act.
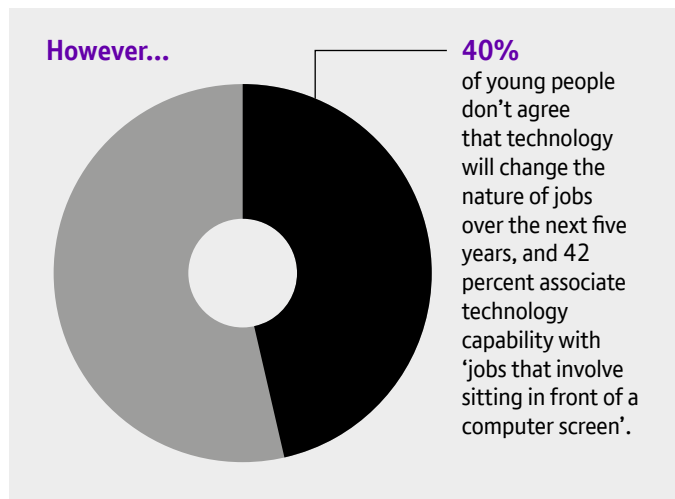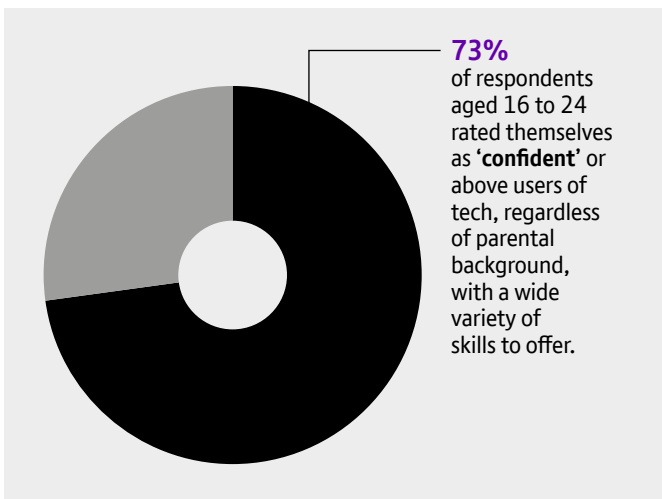
Executive summary

Technology is transforming how we live and work today, offering tremendous opportunity to drive economic growth and prosperity – but without concerted effort there's a risk that the digital revolution will entrench existing social challenges.

BT and Accenture commissioned this research to explore the relationship between tech literacy and social mobility in the UK. It tests our shared hypothesis that individuals with higher levels of tech literacy also experience improved professional prospects and greater social mobility.

Our research has revealed three key findings:

Finding 1:

As largely confident users of tech, most young people have strong foundations to build on when it comes to tech know-how, and are ambitious to improve.

73% of respondents aged 16 to 24 rated themselves as **'confident'** or above users of tech, regardless of parental background, with a wide variety of skills to offer.

However...

40% of young people don't agree that technology will change the nature of jobs over the next five years, and 42 percent associate technology capability with 'jobs that involve sitting in front of a computer screen'.

Finding 2:

Improving the next generation's tech literacy could bring significant economic opportunities for individual young people and UK plc.

If young people could improve their skills as they hope to, and these skills were matched with suitable jobs, the implied increase in salaries could add approximately £11 billion to UK GDP by 2022.

Generation Xers with higher levels of tech know-how earn more as their careers progress, earning an average 'tech literacy wage premium' of £10,000 per annum, versus those with lower levels of skills.

£11 billion
approximately could be added to UK GDP by 2022 if improved skills are matched to suitable jobs.

£10,000
is the average wage premium of Gen Xers with higher levels of tech know-how.

Finding 3:

We risk missing out as young people's attitudes to tech differ by background, gender and region, and employers risk reinforcing divides within their workforce.

Young people whose parents have a degree or higher degree are much more likely to see themselves as 'creatives' or 'experts' in the next five years than those young people whose parents only have school or vocational qualifications. Salary expectations also increase with parental education level.

19% Young people whose parents have a degree or higher degree expect their future salaries to be 19 percent higher than those whose parents hold only school or vocational qualifications.

x2 Employers risk entrenching existing divides, being twice as likely to focus their training efforts on higher paid workers – leaving already-disadvantaged groups behind.

There are also gender and regional disparities.

17% Young men are 17 percent more likely to report having had sufficient computer science training at school than their female counterparts.
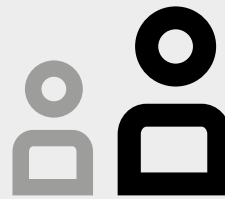
46% Young men are 46 percent more likely to receive encouragement from friends and family to build their tech skills, compared to their female counterparts.

■ Young women   ■ Young men

50%
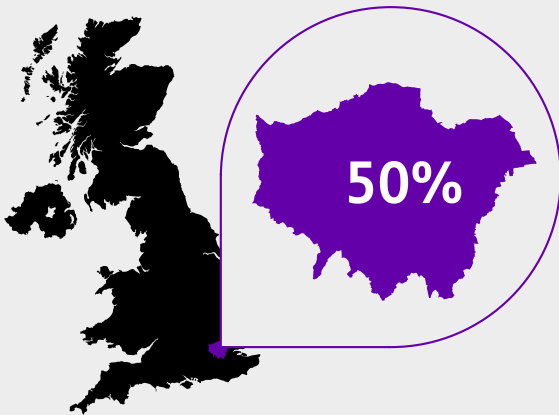
50% There is a 50 percent higher likelihood for young people in London to aspire to be 'creative' or 'expert' users of tech than the national average. Those in Northern Ireland, Wales and the North East display the lowest ambition to improve their tech know-how.

Cracking the challenges identified in this report will take concerted effort from business, government and civil society. This is a systemic issue, and no single organisation or sector can move the dial in isolation.

We have consulted a range of experts in shaping these recommendations – focusing on organisations that are already making a significant contribution to helping the next generation thrive in a digital world, and therefore hold a major part of the solution.

As a result, our recommendations focus on both the 'supply' and the 'demand' side of the debate, to ensure the next generation has both the capabilities and the opportunities to step up to the jobs of the future.

Recommendation 1

Break the single-minded focus on coding, to inspire a generation of creative-problem solvers that value tech know-how and where it can take them.

Action A:

Weave tech capability and adaptability into the core of the education system.

Policymakers and the education system should find ways to embed tech know-how into the curriculum, alongside core capabilities such as problem solving, judgement, interpretation, resilience, creativity and communication.

Action B:

Show young people – and those who influence them – the role tech plays in the things they love.

Parents, teachers, youth workers and future employers all need to play their role in helping young people to recognise tech in the activities that they already know and enjoy, with a view to encouraging them to explore further applications and opportunities.

Recommendation 2

The private sector, government and civil society must work together to provide the structures, mechanisms and resources to prepare young people for the jobs of the future and lifelong learning, regardless of their background.

Action C:

Give young people equal access to skills development and hands-on experience of the future workplace.

The private sector and government can target outreach activity to those young people most at risk of being left behind by the digital revolution, focusing on future-ready skills development and hands-on experience of tech-powered jobs across a wide range of sectors.

Action D:

Invest in continuous tech training for existing employees.

Businesses must seek to develop a philosophy of continuous learning – offering frequent, flexible, and modular digital training opportunities that foster growth mindsets and enable employees to stay current.

More detail can be found in the Recommendations.

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Context

Technology is transforming how we live and work today, offering tremendous opportunity to drive economic growth and prosperity.

Digital tech is revolutionising the way we live and work.

The falling cost of advanced technologies is transforming the way that we live day-to-day. There are eight billion devices currently connected to the internet globally, and the forecast is one trillion by 2030.[3] This rapid uptake of tech is enabling a digital transformation that is taking hold at an exponential pace – the 'fourth industrial revolution'.[4]

Within the workplace, there is growing recognition that it is not just computing roles that require tech capabilities, but most occupations, with industry experts claiming that "every employee [will need to be] a digital employee".[5] This trend is visible in the current campaign from the Royal College of Nursing for "every UK nurse to be an e-nurse by 2020",[6] and is backed by a recent study which found only two job categories in the US have no digital element – cooking and dishwashing. Every other type of work requires some sort of computer usage today,[7] let alone in the future.

> "We are currently preparing students for jobs that don't yet exist, using technologies that haven't been invented, in order to solve problems we don't even know are problems yet."
>
> Richard Riley, Former U.S. Secretary of Education[8]

This tech revolution offers significant value to UK plc.

The estimated cumulative value of digital transformation to the UK economy is more than £800 billion of combined benefits to both industry and wider society over the next decade.[2]

Taking Artificial Intelligence as an example, a 2016 report by Accenture found that working using this technology could be 25 percent more productive by 2035, boosting UK Gross Value Added (GVA) by 1.4 percent within that timeframe.[9]

And while tech is expected to impact nearly all industries,[10] the UK's digital sector itself is one of the fastest growing in the UK, contributing to the economy at twice the rate of non-digital industries.[11] With a turnover of £170 billion in 2017, and currently supporting 1.64 million jobs, the digital sector is driving new business models and promoting competition.[12] Having attracted £6.8 billion equity investment in just one year, a rate 50 percent higher than any other European country,[11] the UK's digital sector shows no sign of slowing down, with an estimated one million new jobs to be created by 2023.[13]

As one of the most digitally ready countries in the world, we should be poised to reap the rewards.

The UK is in a strong position to take advantage of the digital opportunity, being ranked fifth place in Accenture's global Digital Density Index,[14] which compares countries' readiness to apply digital based on current strengths, regulatory frameworks and historical adoption of technology. With 70 percent of UK businesses expecting their organisations to become digital businesses in three years' time[15] and 90 percent of the UK population regularly online, we are well positioned to harness the digital revolution.[16]

The Government is supporting this with forward-looking policy and regulation such as the Government Digital Strategy, which commits all government services to being provided digitally,[17] and the Digital Economy Bill, that provides every household and business the right to decent broadband through the Universal Service Obligation.[18]

But without concerted effort there's a risk that the digital revolution could entrench existing social challenges.

The increasingly digital nature of work could make the job market harder to access for everyone.

According to the UK Science and Tech Committee, 90 percent of new jobs in the UK require digital capabilities,[19] reflecting how penetration of digital technologies in the workplace have triggered a reset on the 'basic skills' required to access the job market.[10] At the same time, candidate availability is at a 16-month low, with recruiters flagging a shortage of suitable applicants for over 60 different roles.[20]

Three in four UK businesses are reporting internal digital skills gaps,[10] with negative repercussions for UK productivity rates, which are currently ranked second lowest among the G7 countries for GDP (Gross Domestic Product) per worker.[21] Over half of UK businesses are already reporting increased staff workloads due to skills shortages, and 29 percent complain of higher operating costs.[4]

A wide range of jobs have been forecast to disappear from our economy due to tech disruption over the next two decades,[22] prompting concerns that the remaining roles will be harder to access. Following current trends, nine million low-skilled people will be chasing four million jobs in the UK, alongside a shortage of three million workers to fill 15 million high-skilled jobs, by 2022.[23] This changing skills profile and the resulting skills shortage could cost our economy £90 billion per year.[24] This impact is likely to be exacerbated by the 50 percent reduction in foreign recruits to the UK expected as a result of Brexit – a potentially damaging trend in a country where currently 10 percent of workers, including a third of those in the tech industry, are international.[25]

There's a real risk of double disadvantage for young people from lower socio-economic backgrounds, who experience tech literacy as yet another barrier to social mobility.

Social mobility is low in the UK, with individuals from families of professional backgrounds two-and-a-half times more likely to achieve professional careers than those from less advantaged backgrounds.[4] These differences are also reflected in income, with 45 percent of earnings inequalities being passed across generations, and people from working-class backgrounds receiving an average of £6,800 less per year than individuals from professional backgrounds.[4] Even when comparing remuneration to colleagues of the same education, occupation and experience levels, professionals from working-class backgrounds still receive salaries that are on average £2,240 lower.[4] Moreover, with real wage growth stagnating, millennials are predicted to be the first generation in modern times to earn less than their parents.[27] There is, therefore, a risk of double disadvantage, as tech know-how becomes another barrier for young people from disadvantaged backgrounds. This is in line with research from the Prince's Trust, which found that those who lack digital capabilities do not have equal access to opportunities provided online, causing the most disadvantaged young people in the UK to slip through the net and miss out on subsequent education and employment opportunities.[5]

Without concerted effort, the tech revolution has the potential to further stall social mobility in the UK and further widen the gap between societal groups.

"Social mobility is arguably the most important and challenging issue facing British society today. How [do] we make our country one where aspiration and ability, not background or birth, determine where people get to in their lives?"

Alan Milburn, Social Mobility Commission Chair[26]

For BT and Accenture, building a culture of tech literacy means helping young people be curious about how technology actually works, confident and in control of it, and ultimately active creators with it. The ambition is to ensure the next generation can thrive in a digital world.
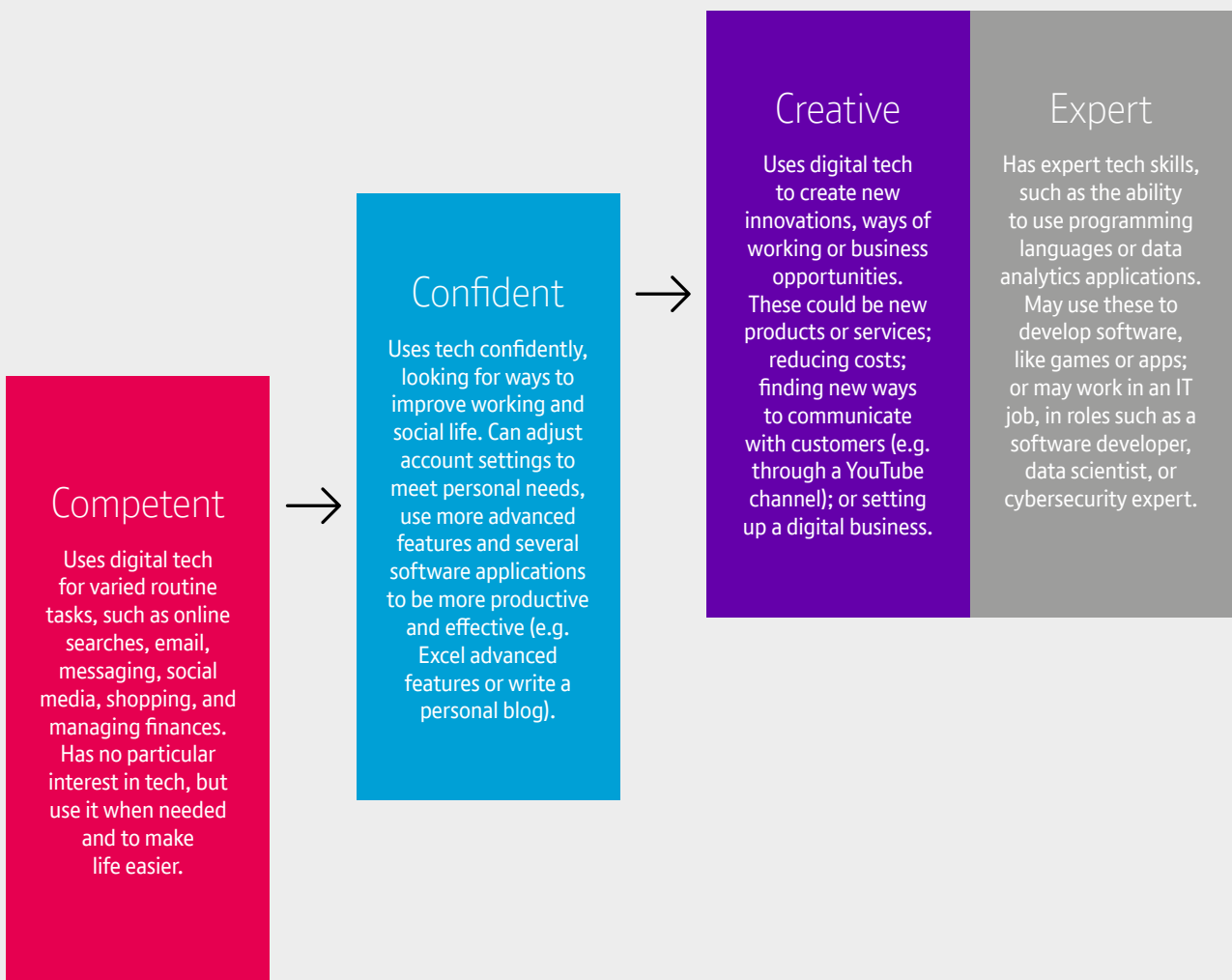
In this research, survey respondents were asked to self-assess their tech literacy by describing how they use and view tech today, alongside their attitudes towards developing their tech skills over the next five years. They were asked to rate their digital capabilities, both at present and future estimations, using the four-point framework detailed in Figure 1.

This builds on existing frameworks from business, government and civil society. Where it differs is in the addition of a 'creative' category – recognising that tech literacy isn't just about digital expert jobs that require advanced coding skills, but that individuals can use their digital capabilities to generate new opportunities across a range of sectors.

For this reason, we consider the 'creative' and 'expert' bands to be equivalent but different landing points to which individuals could aspire.

Figure 1 – Tech Literacy Progression Framework

Competent

Uses digital tech for varied routine tasks, such as online searches, email, messaging, social media, shopping, and managing finances. Has no particular interest in tech, but use it when needed and to make life easier.

Confident

Uses tech confidently, looking for ways to improve working and social life. Can adjust account settings to meet personal needs, use more advanced features and several software applications to be more productive and effective (e.g. Excel advanced features or write a personal blog).

Creative

Uses digital tech to create new innovations, ways of working or business opportunities. These could be new products or services; reducing costs; finding new ways to communicate with customers (e.g. through a YouTube channel); or setting up a digital business.

Expert

Has expert tech skills, such as the ability to use programming languages or data analytics applications. May use these to develop software, like games or apps; or may work in an IT job, in roles such as a software developer, data scientist, or cybersecurity expert.

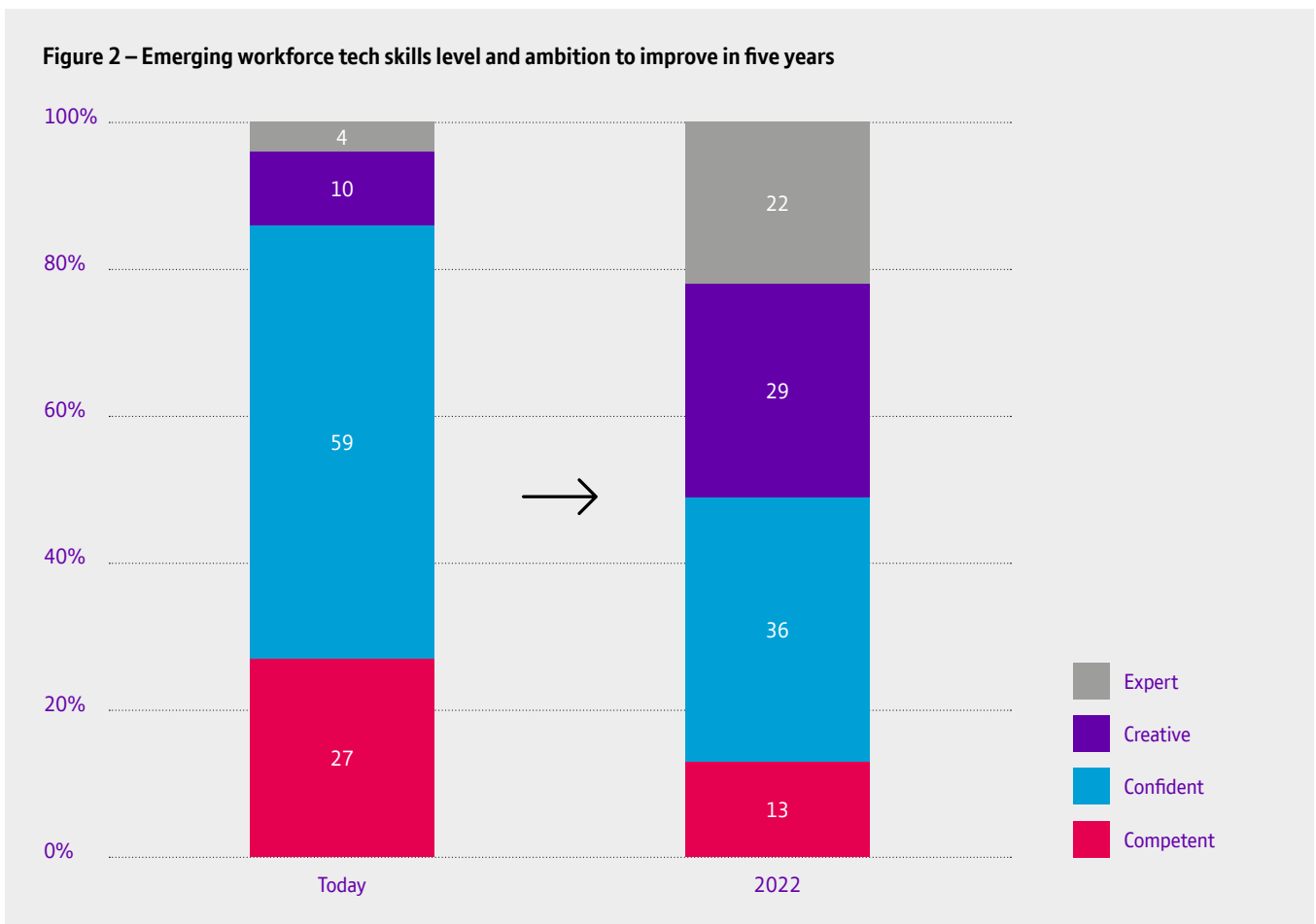# Key findings

As largely confident users of tech, most young people have strong foundations to build on when it comes to tech know-how, and are ambitious to improve.

While few are highly skilled today, the emerging workforce have good base understanding of tech know-how and have big ambitions for the next five years.
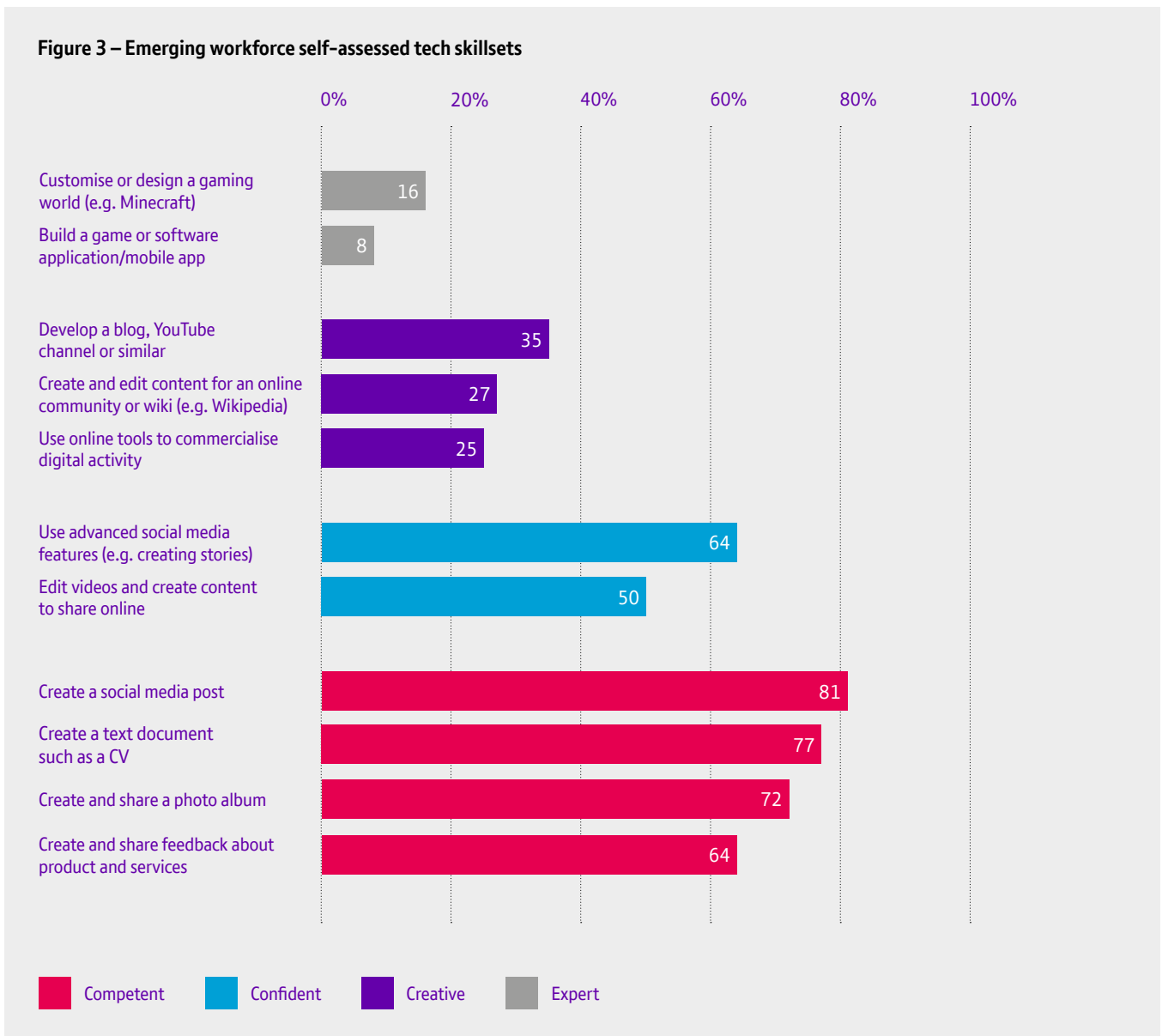
73 percent of young people rate themselves as 'confident' users of tech or above, demonstrating a solid base level of capability.

Figure 2 – Emerging workforce tech skills level and ambition to improve in five years

	Today	2022
Expert	4	22
Creative	10	29
Confident	59	36
Competent	27	13

While only a small minority of the emerging workforce consider themselves as 'creative' or 'expert' users of tech at present, more than half aim to be in these top two skills categories in the next five years. By 2022, young people predict that the number of 'competent' users will halve, becoming the smallest group, and three times as many will be 'confident' and 'creative' users of tech, and five times as many will become tech 'experts'.

When asked for more detail on their specific capabilities, respondents displayed a wide spectrum of skills, as reflected in Figure 3.

These results reveal that young people are leading much of their lives online, and using tech in surprisingly creative ways, beyond what their self-assessment of skills would suggest. For example, while only 10 percent currently consider themselves 'creative' users of tech, 35 percent of respondents are comfortable creating blogs or YouTube channels. This portrays a positive message, as these encouraging results are presented as a base, with room to further develop young people's 'creative' and 'expert' uses of tech.
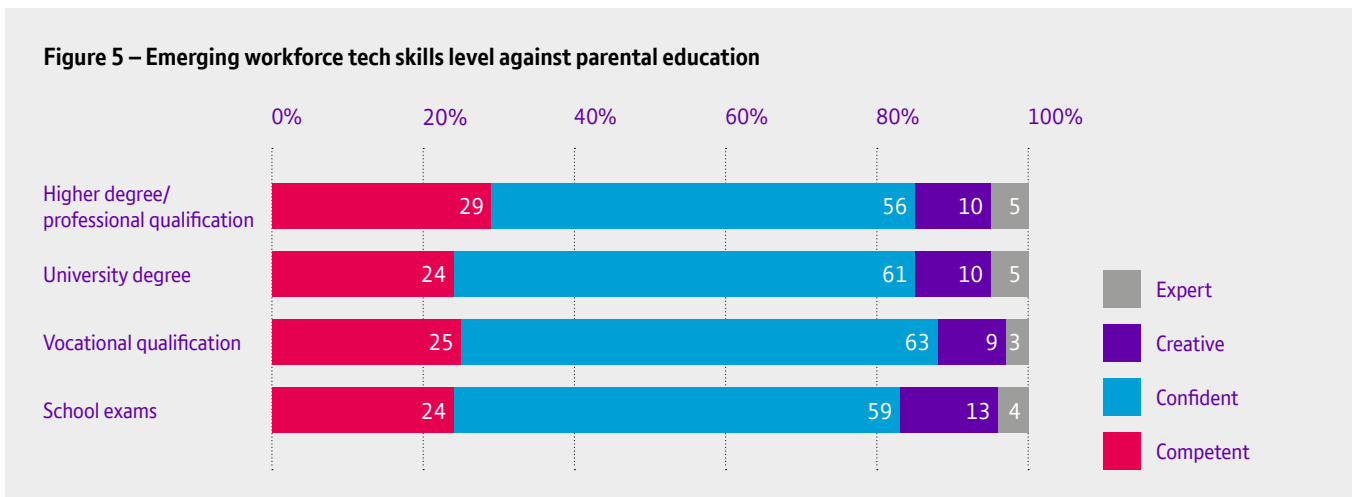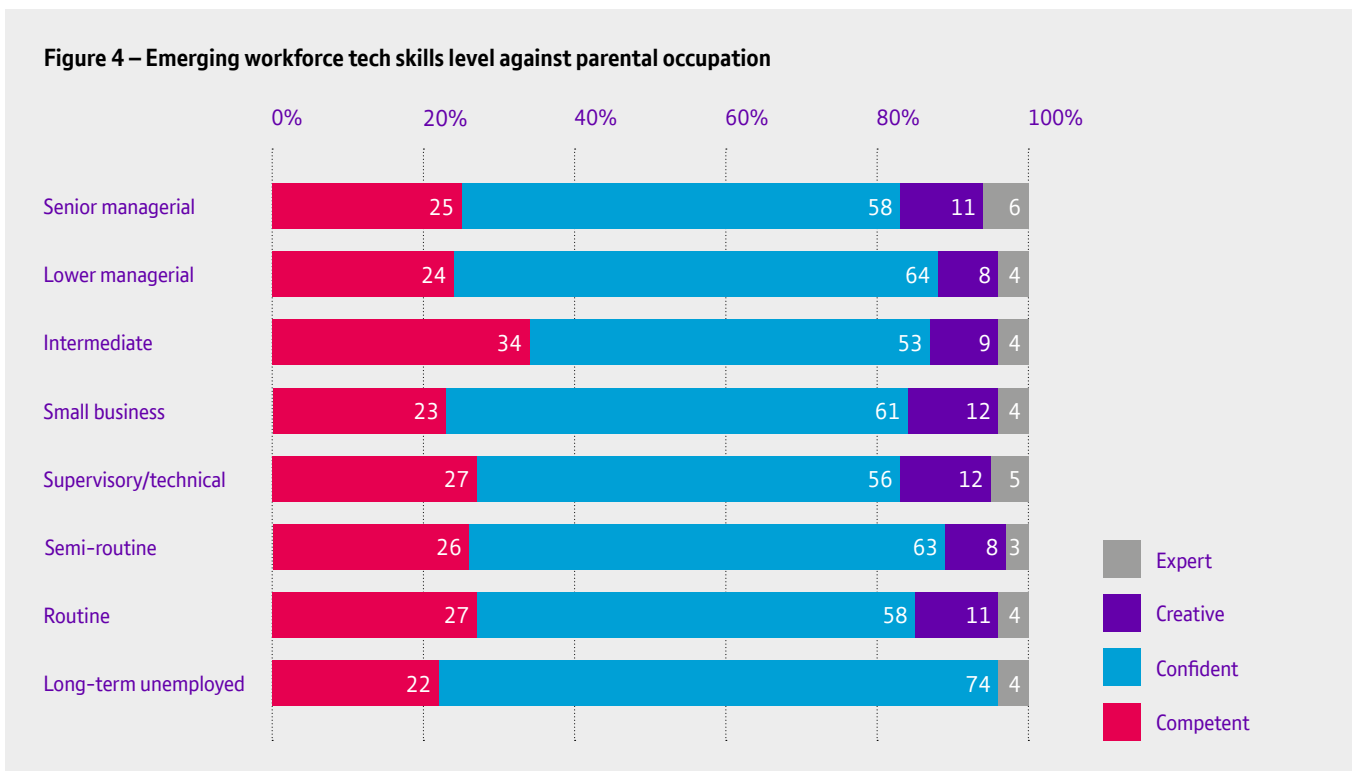
Figure 3 – Emerging workforce self-assessed tech skillsets

Skill	Value
Customise or design a gaming world (e.g. Minecraft)	16
Build a game or software application/mobile app	8
Develop a blog, YouTube channel or similar	35
Create and edit content for an online community or wiki (e.g. Wikipedia)	27
Use online tools to commercialise digital activity	25
Use advanced social media features (e.g. creating stories)	64
Edit videos and create content to share online	50
Create a social media post	81
Create a text document such as a CV	77
Create and share a photo album	72
Create and share feedback about product and services	64

Competent • Confident • Creative • Expert

These findings are consistent across young people of all backgrounds.

Measuring young people's backgrounds through their parents' occupations and education levels, we found their skill levels to be fairly consistent across a wide variety of backgrounds, as displayed in Figure 4 and Figure 5.

Such similarity in skill capability across the emerging workforce indicates that tech has the potential to help young people get ahead regardless of their background.
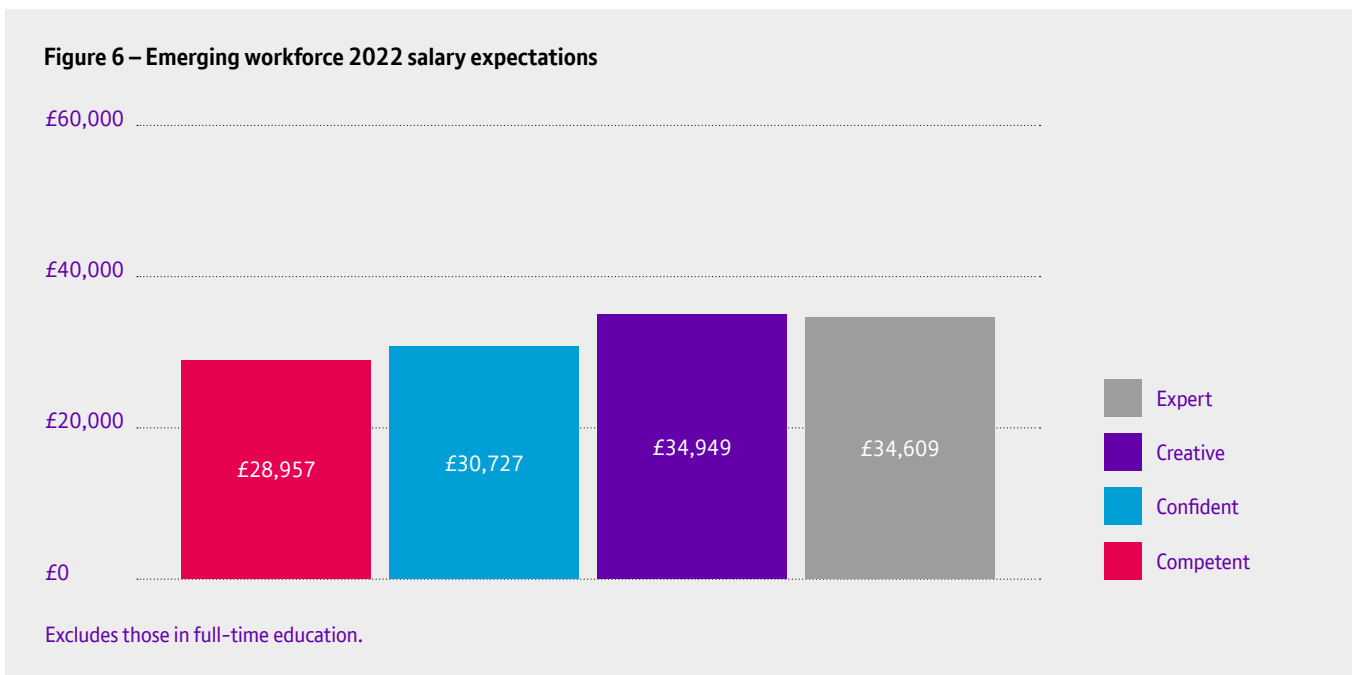
Figure 4 – Emerging workforce tech skills level against parental occupation

Parental occupation	Competent	Confident	Creative	Expert
Senior managerial	25	58	11	6
Lower managerial	24	64	8	4
Intermediate	34	53	9	4
Small business	23	61	12	4
Supervisory/technical	27	56	12	5
Semi-routine	26	63	8	3
Routine	27	58	11	4
Long-term unemployed	22	74		4

Figure 5 – Emerging workforce tech skills level against parental education

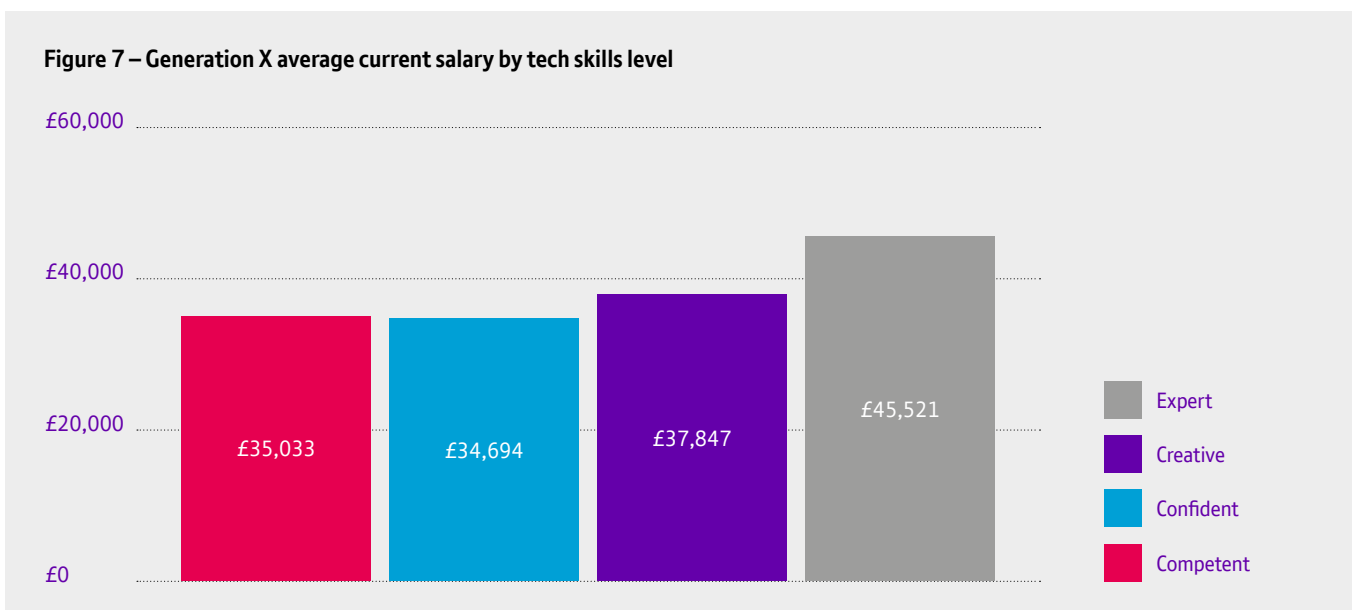| Parental education	Competent	Confident	Creative	Expert
Higher degree/professional qualification	29	56	10	5
University degree	24	61	10	5
Vocational qualification	25	63	9	3
School exams	24	59	13	4

Improving the next generation's tech literacy could bring significant economic opportunities for individual young people and UK plc.

Young people recognise that better tech skills are better rewarded.

Young people who aspire to be 'creative' or 'expert' users of tech in five years' time also expect their future salaries to be approximately 20 percent higher than those who expect to be 'competent' users.

Figure 6 – Emerging workforce 2022 salary expectations

£60,000
£40,000
£20,000
£0

£28,957 £30,727 £34,949 £34,609

Expert
Creative
Confident
Competent

Excludes those in full-time education.

This is supported by evidence from Generation X respondents – those who consider themselves 'expert' or 'creative' users of tech report higher average annual salaries than 'competent' users by approximately £10,000 and £3,000 respectively.

Figure 7 – Generation X average current salary by tech skills level

£60,000
£40,000
£20,000
£0

£35,033 £34,694 £37,847 £45,521

Expert
Creative
Confident
Competent

If young people reach the skill level that they expect to in five years' time, the benefit to the UK economy from the increase in salaries could be in the region of £11 billion.

As young people's tech skills improve across the four skill levels of the tech literacy framework, their expected salaries increase, as shown in Figure 6. If they can reach their target skill levels – and find the right opportunities to bring those capabilities to bear in the workplace in exchange for the salaries they expect in five years' time – the implied increase in salaries could add approximately £11 billion to UK GDP by 2022.

This is a conservative assessment of the economic benefit in five years' time, on the assumption that 21 to 29-year-olds find work using their expected level of technology skills. We already know

that, for example, technology workers across the UK receive much higher pay than that estimated by respondents in Figure 6, with the average digital role being advertised for £51,000 – 44 percent higher than the national average.[12]

£11 billion

approximately could be added to UK GDP by 2022 if improved skills are matched to suitable jobs.

Key finding 3

We risk missing out as young people's attitudes to tech differ by background, gender and region, and employers risk reinforcing divides within their workforce.

Young people display mixed understanding of the impact tech could have on their futures.

As reflected in Figure 8, young people have mixed understanding of the value of digital skills. 66 percent agree that digital skills will be increasingly important to enable them to carry out their jobs, and 70 percent predict that they will help open job opportunities.

However, only 60 percent of respondents agree that tech will change the nature of their jobs in the next five years, while over 40 percent still associate digitally skilled jobs with sitting in front of a computer screen, rather than working with people, and only 57 percent see improving their tech skills as a "cool thing to do".

Figure 8 – Emerging workforce attitudes towards technology and skills (agree/strongly agree responses)

|	%
I agree that tech skills will help open job opportunities	70
I agree that digital skills will be increasingly important to enable me to carry out my job	66
Technology will change the nature of my job in the next five years	60
I see improving tech skills as a "cool thing to do"	57
I associate digitally skilled jobs with being sat in front of screens rather than working with people	42
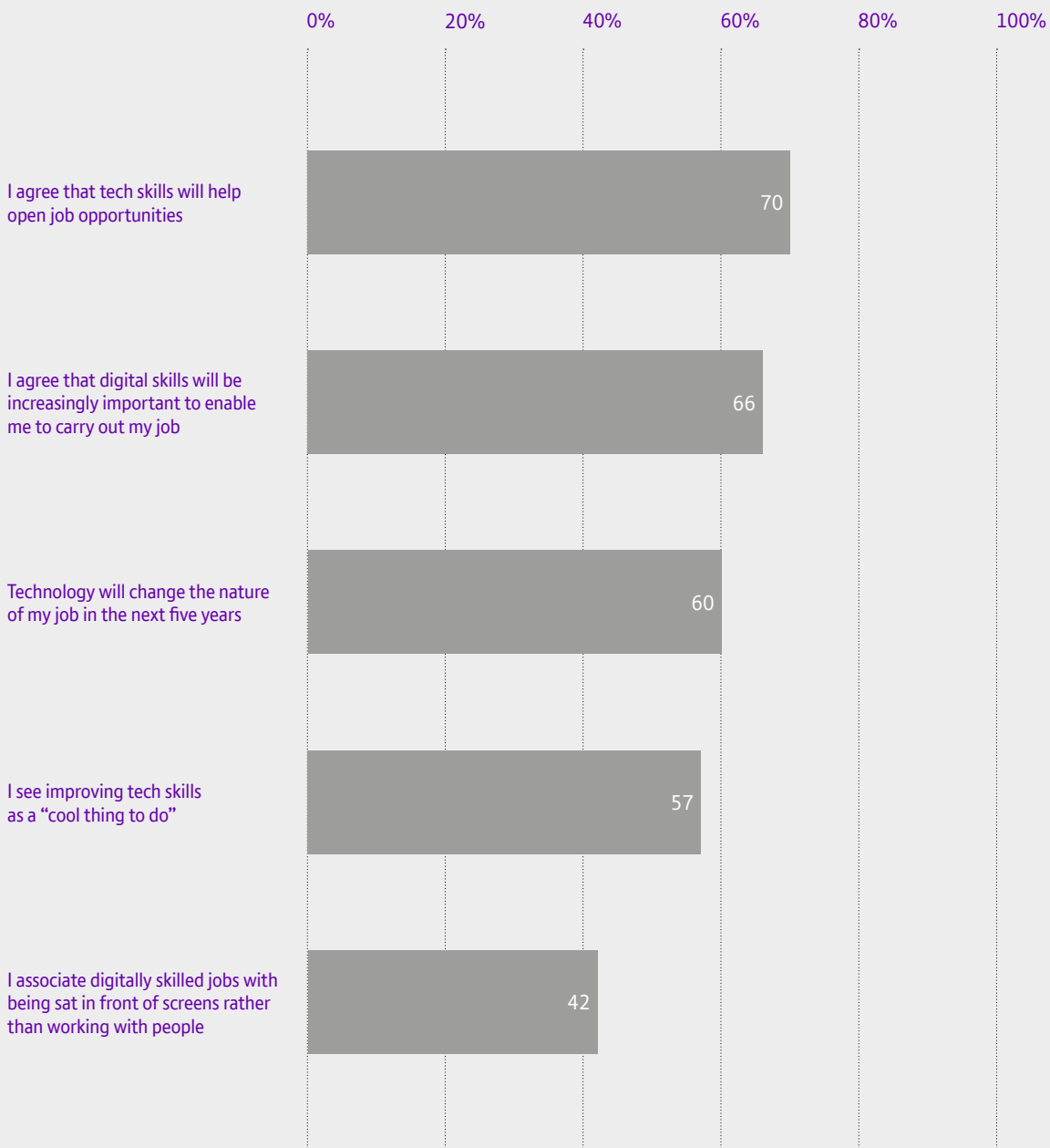
Discrepancies in attitudes emerge as those who aim to improve their skills the most tend to come from better educated backgrounds.

Young people with positive attitudes towards tech, who are seeking to improve their skills to 'creative' or 'expert' levels, are more likely to have come from families with higher levels of education. Figure 9 displays the emerging workforce's ambition to improve versus their parents' highest level of education. Looking at either end of the education scale, our findings reveal that 57 percent of the emerging workforce whose parents have a higher degree aim to have 'creative' or 'expert' skills by 2022, versus 43 percent of those whose parents did not pursue further training or education.

Overall, respondents whose parents have a degree or higher degree are 26 percent more likely to see themselves as 'creatives' or 'experts' in the next five years than those whose parents have maximum school or vocational educations. Expected salary also increases with parental education level, as young people whose parents fall in the top two education levels expect to receive 19 percent higher salaries than the bottom two.

Figure 9 – Emerging workforce ambition to improve tech skills against parental education

Legend: ■ Top–two tech skills in five years ■ Expected salary in five years
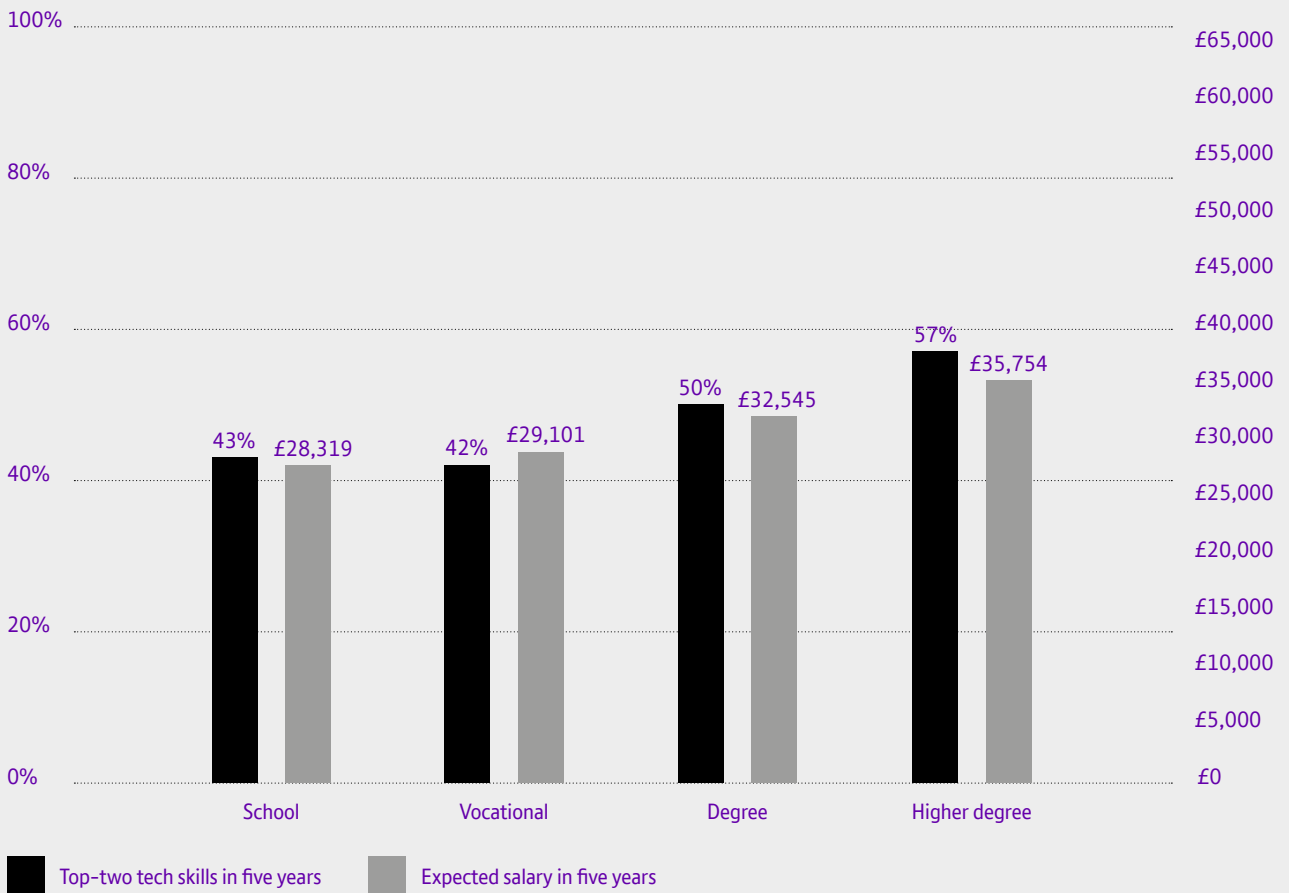
The same group also have higher expectations for their future careers. Young people with positive attitudes towards improving their skills to 'creative' or 'expert' levels expect to secure better jobs than their parents. Figure 10 shows that 59 percent of those who are aiming for higher occupations than their parents' today, currently consider themselves to be 'creative' or 'expert' tech users – a rate that is 8 percent higher than the emerging workforce average. This indicates that young people may recognise the correlation between possessing digital skills and achieving professional progression.

Figure 10 – Current tech skills level of emerging workforce who aspire to more senior level occupations than their parents

51%   49%

Emerging workforce average

41%   59%

Emerging workforce aiming for
occupations higher than their parents

■ Bottom-two tech skills   ■ Top-two tech skills
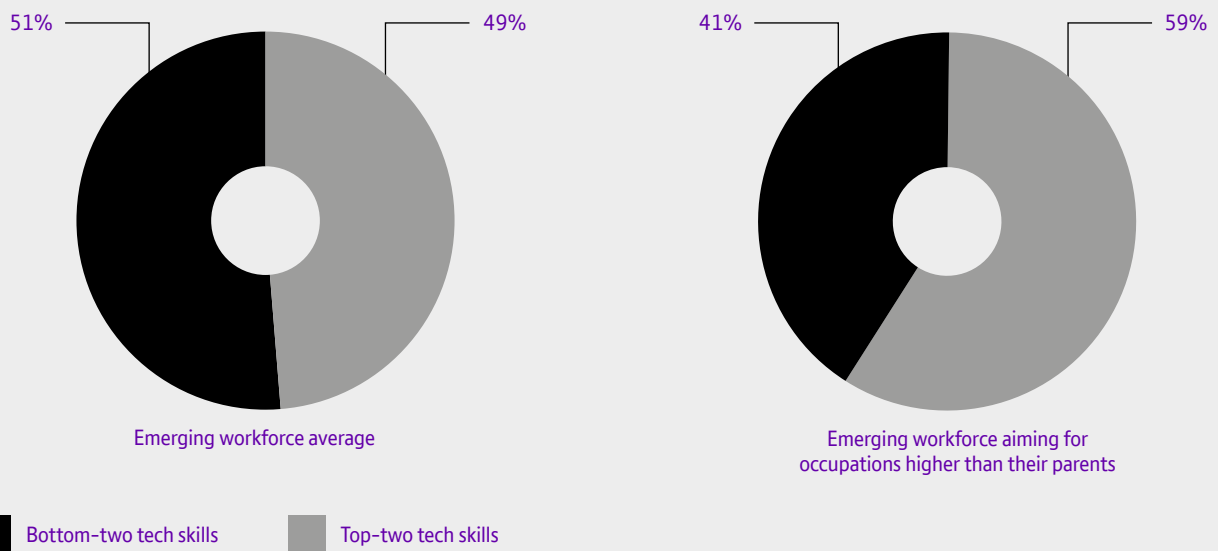
Further, Figure 11 shows that 51 percent of young people who predict that they will be 'expert' users of tech in five years also expect to hold more senior occupations than their parents in this time.

In other words, the ambitious individuals who aspire to be 'experts' by 2022 are at least 26 percent more likely to see themselves doing better than their parents than the other skills bands.

Figure 11 – 2022 tech skills ambition of emerging workforce who aspire to more senior level occupations than their parents
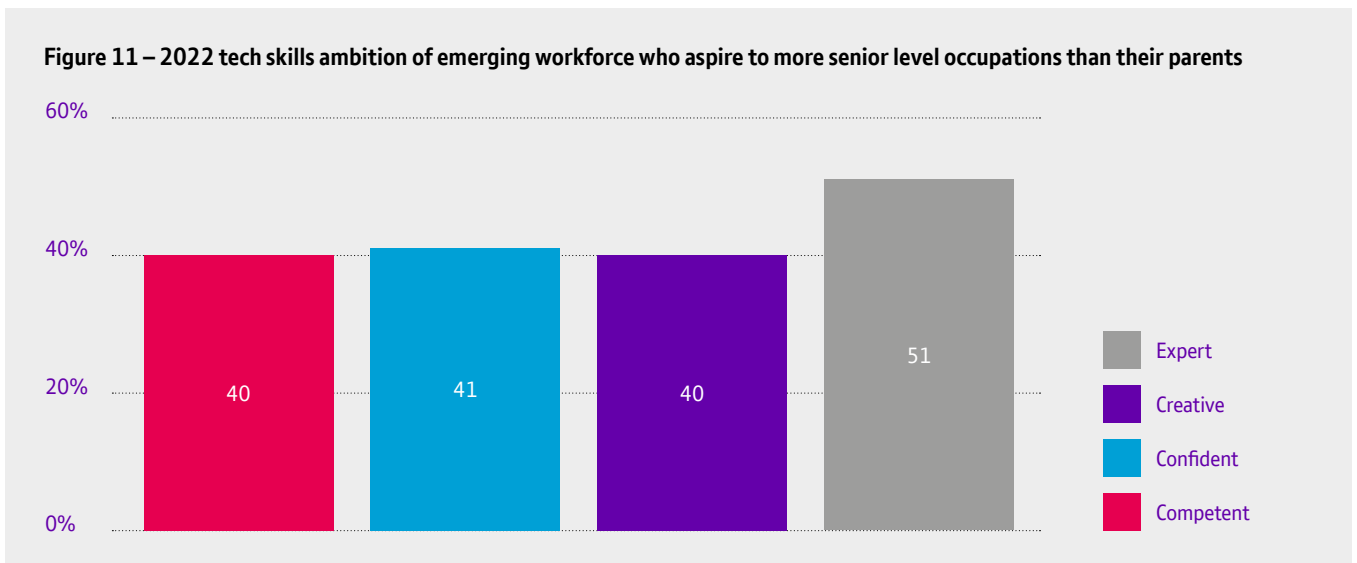
Young women receive less encouragement to build their tech skills, despite similar levels of interest.

A notable gender bias can be seen in Figure 12. Young men and women display similar understanding of the value of tech for their careers – 51 percent of young men and 54 percent of young women claim to be more interested in improving their tech skills than they

were five years ago. However, while 44 percent of young men receive encouragement from parents and friends to build their digital skills, only 30 percent of young women receive the same.

Young men are also 17 percent more likely to report having had enough computer science training at school than their female counterparts, despite their comparable attitudes.

Figure 12 – Emerging workforce attitudes to tech skills by gender (agree/strongly agree responses)
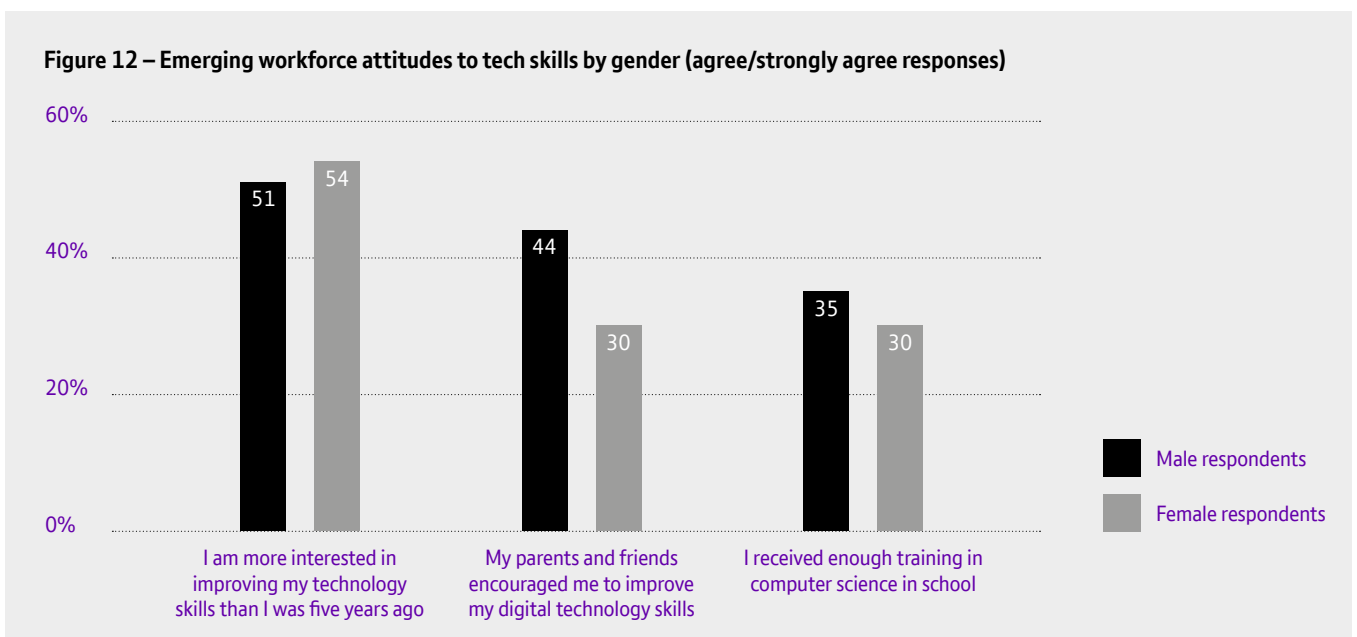
These results could further exacerbate the existing gender gap in digital skills revealed in a 2015 report by Go ON UK, finding that 80 percent of men have 'basic digital skills', in comparison to 74 percent of women.[28]

This unequal provision of support has implications for girls' capabilities in later life. They are 29 percent less likely to take part in additional tech training, and 27 percent less likely than their male counterparts to aspire to be 'expert' tech users.

There are also regional disparities in attitudes towards tech literacy – potentially perpetuating the regional divide.

Hot and cold spots can be seen regionally across the UK, revealing significant differences in digital skills, attitudes and understanding of the value of tech.

Figure 13 shows that respondents in London were the most optimistic about improving their tech literacy, followed by the South East and North West of England. This is in line with Tech Nation statistics showing that the highest concentration of digital tech jobs is currently in London, Manchester (North West) and Reading (South East),[12] suggesting that supply will increase where there is demand.

Figure 13 – Emerging workforce current and expected future tech skills by region

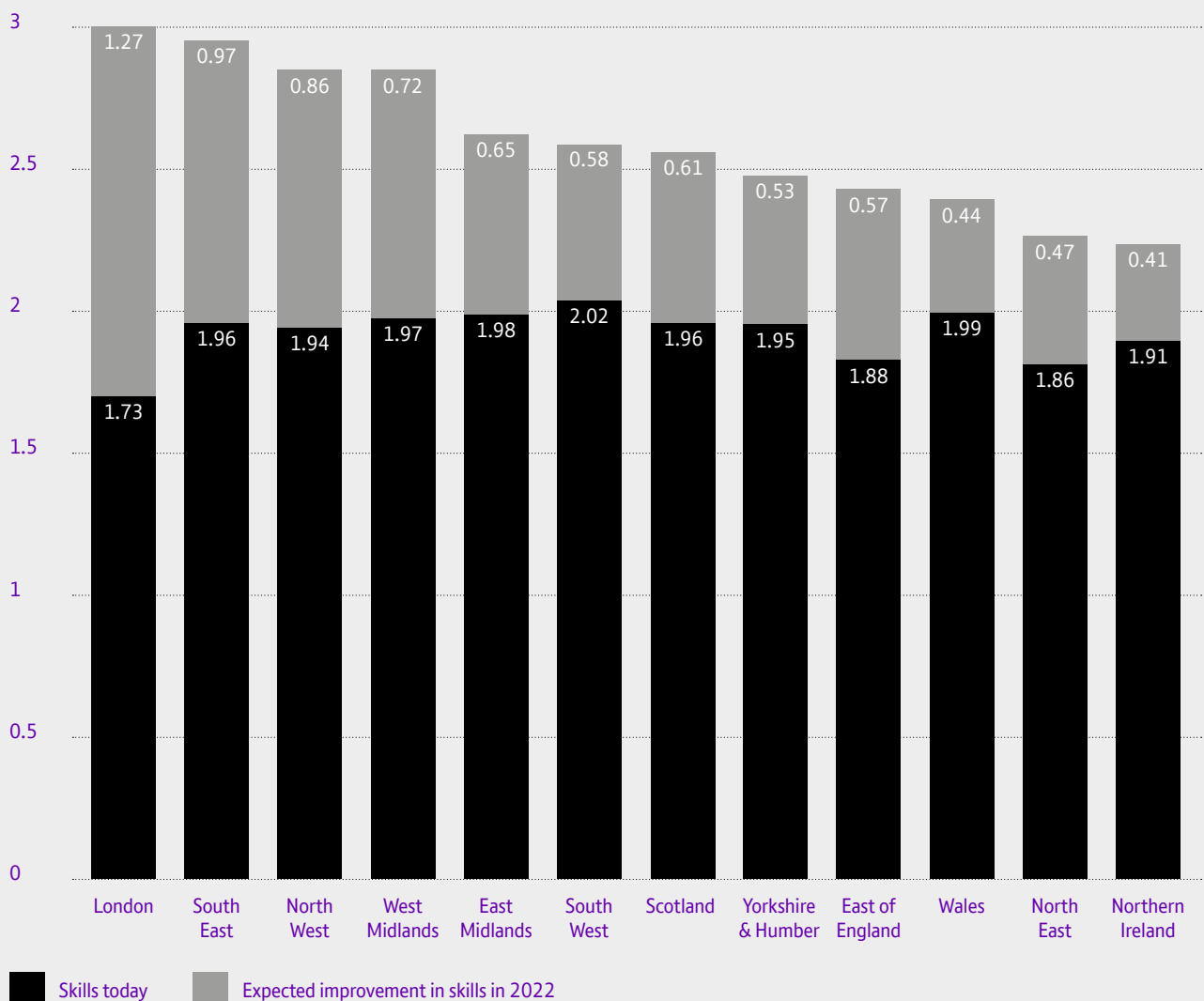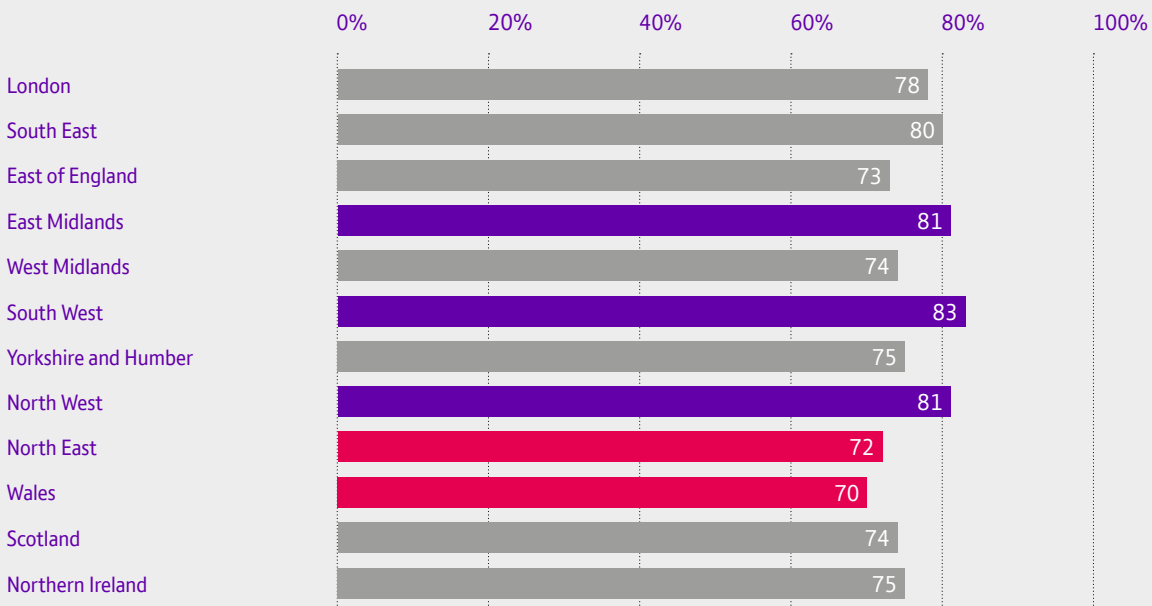| Region	Skills today	Expected improvement in skills in 2022
London	1.73	1.27
South East	1.96	0.97
North West	1.94	0.86
West Midlands	1.97	0.72
East Midlands	1.98	0.65
South West	2.02	0.58
Scotland	1.96	0.61
Yorkshire & Humber	1.95	0.53
East of England	1.88	0.57
Wales	1.99	0.44
North East	1.86	0.47
Northern Ireland	1.91	0.41

Figure 14 shows that young people in London, the South, South East and South West of England all have a strong understanding of the value of tech skills. The attitudes towards tech in the South West do not appear to align with the level of tech know-how and aspiration t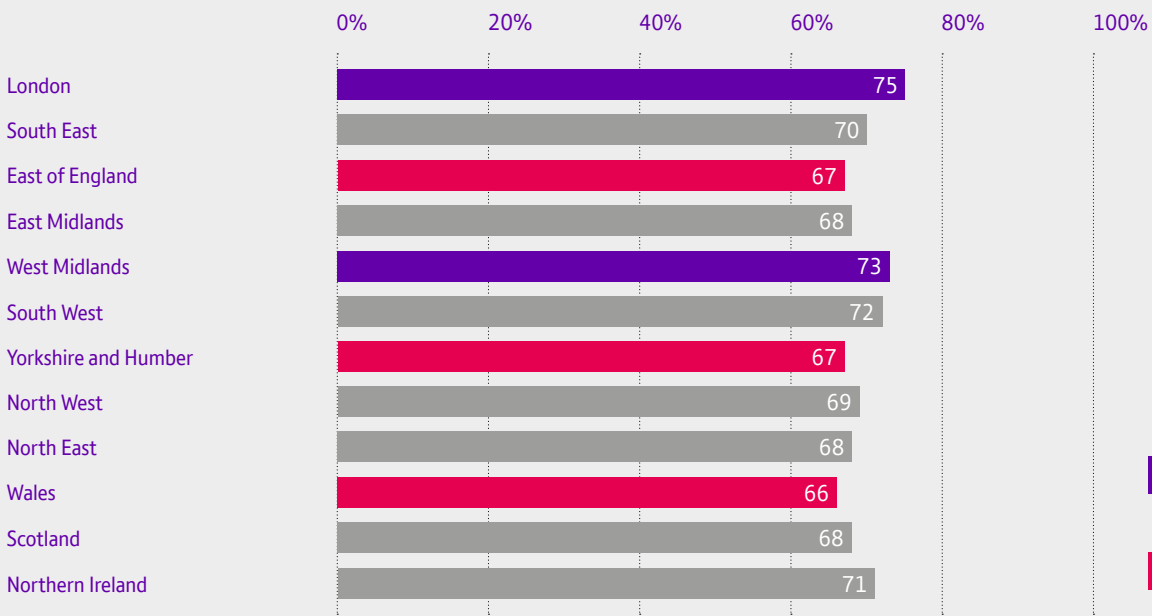o improve (Figure 13), suggesting that further engagement is needed. At the other end of the spectrum, respondents in Wales and the East of England score poorly in understanding the significance of tech on the future of work, indicating a potential opportunity for focused intervention.

Figure 14 – Emerging workforce understanding and attitude to tech by region
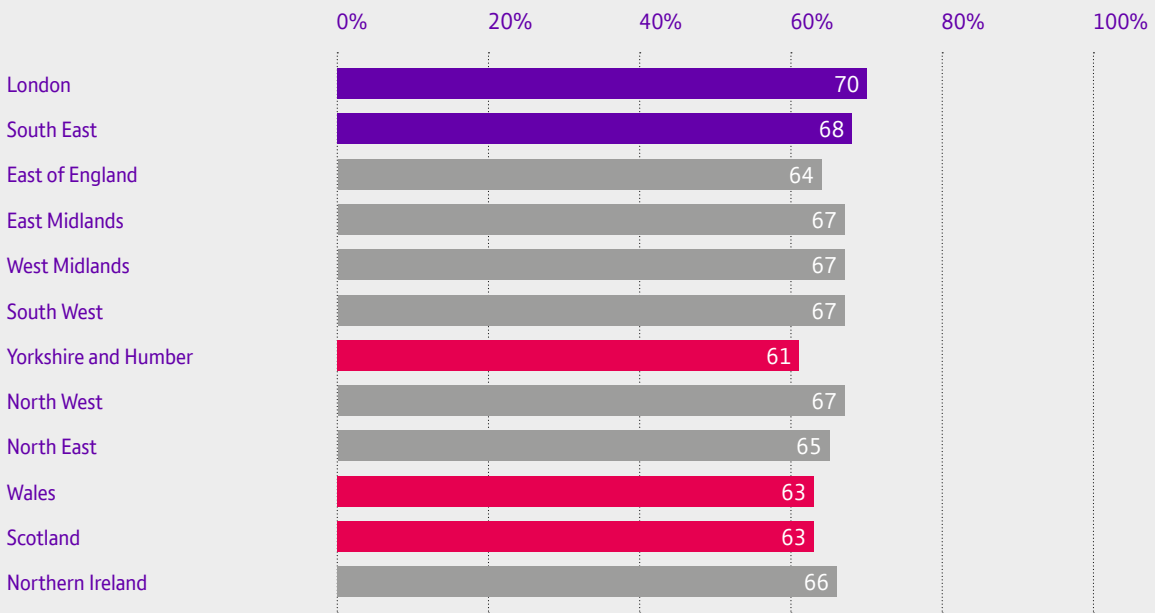
Using technology makes me more effective

Region	Score
London	78
South East	80
East of England	73
East Midlands	81
West Midlands	74
South West	83
Yorkshire and Humber	75
North West	81
North East	72
Wales	70
Scotland	74
Northern Ireland	75

Technology skills open new opportunities

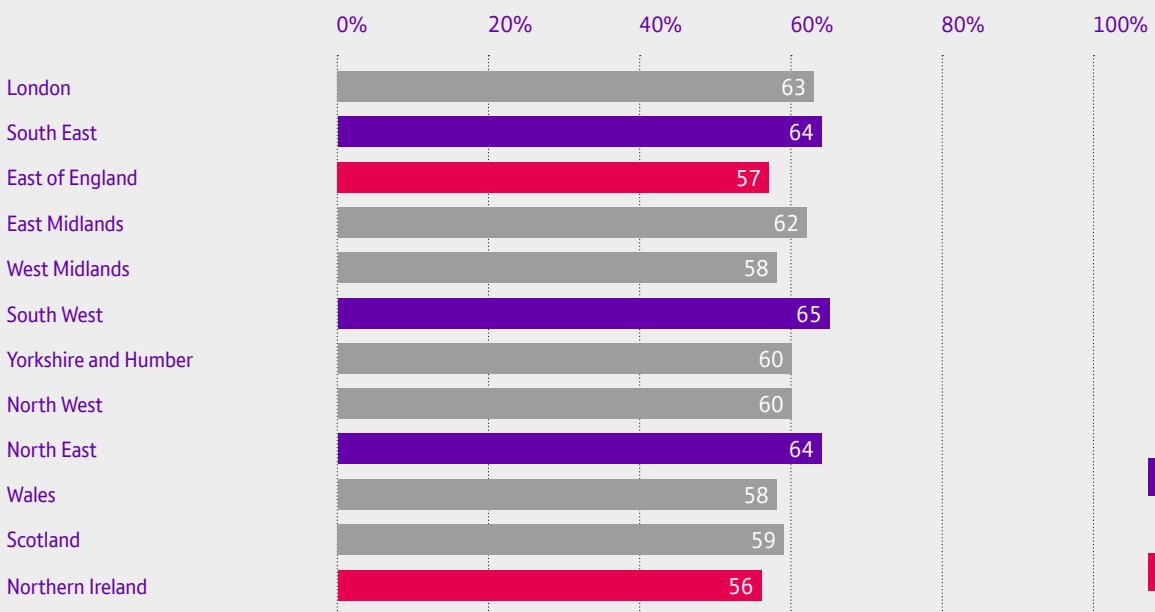| Region	Score
London	75
South East	70
East of England	67
East Midlands	68
West Midlands	73
South West	72
Yorkshire and Humber	67
North West	69
North East	68
Wales	66
Scotland	68
Northern Ireland	71

Top scoring regions

Bottom scoring regions

Figure 14 – Emerging workforce understanding and attitude to tech by region

Technology skills are important for my future job

Region	Score
London	70
South East	68
East of England	64
East Midlands	67
West Midlands	67
South West	67
Yorkshire and Humber	61
North West	67
North East	65
Wales	63
Scotland	63
Northern Ireland	66

Technology will change the nature of my job

Region	Score
London	63
South East	64
East of England	57
East Midlands	62
West Midlands	58
South West	65
Yorkshire and Humber	60
North West	60
North East	64
Wales	58
Scotland	59
Northern Ireland	56

Top scoring regions

Bottom scoring regions

Employers risk reinforcing these challenges, being twice as likely to focus their training efforts on higher paid workers, leaving lower skilled workers behind.

67 percent of all respondents show understanding of how digital tech skills have or will open more job opportunities, and 57 percent feel that offering employees digital training courses would be effective in improving organisations' digital skills – yet only 23 percent feel supported by their employer to do so.

Individuals who are already disadvantaged receive the least support, as just 22 percent of companies' lowest paid employees, receiving under £10,000, are being offered digital training, versus 48 percent of their highest paid employees, earning over £70,000, as reflected in Figure 15.

Figure 15 – Employer support in improving digital skills against employee salary (agree/strongly agree responses)

Legend:
- Under £10,000 (black): 22
- Over £70,000 (grey): 48
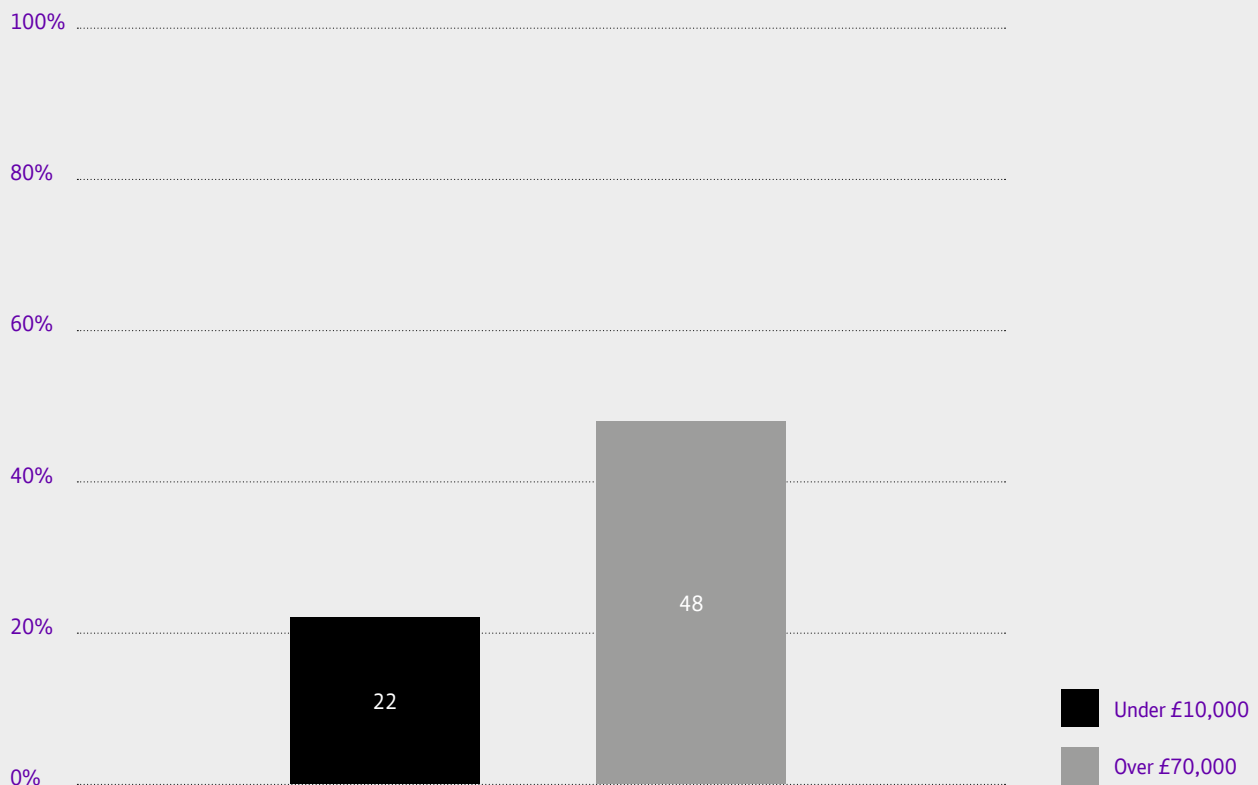
What's more, while 45 percent of Generation X's higher skilled 'creative' and 'expert' users have received workplace support during their careers, only 29 percent of the 'competent' and 'confident' users have, as shown in Figure 16. The training offered to better paid employees can put them at an advantage by improving their understanding of how digital skills can aid their career prospects and drive positive attitudes to improve. They are subsequently more likely to have completed additional tech skills training since education.

This skewed level of business support therefore further reinforces the divide between higher and lower paid employees and raises barriers to social mobility.

Figure 16 – Generation X attitudes towards tech by skills level (agree/strongly agree responses)

	Generation X higher tech skills	Generation X lower tech skills
My employer supports me in improving my digital skills	45	29
My parents and friends encouraged me to improve my digital technology skills	42	19
My school provided encouragement to improve my skills in using digital technology	30	19
I have taken part in additional training on using digital technology	55	19
I have arranged additional training in digital technology myself	48	42

Recommendations

Cracking the challenges identified in this report will take concerted effort from business, government and civil society. This is a systemic issue, and no single organisation or sector can move the dial in isolation.

We have consulted a range of experts in shaping these recommendations – focusing on organisations that are already making a significant contribution to helping the next generation thrive in a digital world, and therefore hold a major part of the solution.

As a result, our recommendations focus on both the 'supply' and the 'demand' side of the debate, to ensure the next generation has both the capabilities and the opportunities to step up to the jobs of the future.

Recommendation 1

Break the single-minded focus on coding, to inspire a generation of creative-problem solvers that value tech know-how and where it can take them.

Action A:

Weave tech capability and adaptability into the core of the education system.

Action B:

Show young people – and those who influence them – the role tech plays in the things they love.

Recommendation 2

The private sector, government and civil society must work together to provide the structures, mechanisms and resources to prepare young people for the jobs of the future and lifelong learning, regardless of their background.

Action C:

Give young people equal access to skills development and hands-on experience of the future workplace.

Action D:

Invest in continuous tech training for existing employees.

Recommendation 1

Break the single-minded focus on coding, to inspire a generation of creative-problem solvers that values tech know-how and where it can take them.

Young people have solid foundations to build on when it comes to tech know-how. But they still don't see the range of professional opportunities it brings, and have negative and limited perceptions of 'careers in tech'.

In sharp contrast to the realities of the future workplace, 40 percent of 16 to 24-year-olds do not agree that technology will change the nature of jobs, and 60 percent of 16 to 18-year-olds see digitally skilled jobs as sitting in front of computer screens.

The realisation of tech's central role increases as young people grow up, with 12 percent more 22-year-olds considering themselves to be 'creative' or 'expert' users than 16-year-olds.

It is vital to tackle gaps in understanding and attitudes by going beyond coding to show the next generation the range of creative and digital capabilities they'll need to thrive as they grow up – and to inspire them with a varied and positive vision of the opportunities those skills will unlock.

Action A: Weave tech capability and adaptability into the core of the education system.

In a world shaped by tech, capabilities like problem solving, judgement, creativity, interpretation, resilience, creativity and communication will be more important than ever before – all underpinned by tech know-how.

These future-ready skills should be embedded across all subjects and levels of academia, from primary school through to GCSEs, A-levels, the new T-levels, apprenticeships and degrees. BT's experience with the Barefoot Computing Project shows that introducing computational thinking – the building blocks of the digital world – to children at an early age boosts digital capability, interpersonal skills and the learning of English and maths.

Policymakers and the education system should find new ways to put these attributes on a par with traditional qualifications, and to measure future skills and capabilities so that employers can assess digital work readiness. Schools, colleges and universities should also offer young people opportunities to experience digital making both in the classroom and in extracurricular settings.

This approach would produce a generation of both digitally skilled and emotionally capable individuals. It has the potential to supercharge social mobility while meeting employers' needs for 'workforce chameleons',[29] who can apply softer skills and solve unstructured problems across a variety of roles.

Case study – the Barefoot Computing Project

Barefoot is a computational thinking programme from BT and CAS (Computing at School). It helps primary school teachers get confident with the building blocks of tech literacy – computational thinking – by giving teachers free teaching materials and face-to-face workshops from specially trained volunteers.

So far it has reached more than 45,000 teachers in nearly half of UK primary schools and, through them, 1.25 million children. An Ipsos MORI study showed that teachers who use computational thinking see positive impacts on pupils' numeracy, literacy, problem-solving and collaboration skills.[30]

Find out more at: **www.barefootcas.org.uk**

Expert view

"We need to consider what we really want education to be for, and which skills we actually want to provide young people for an unpredictable future."
Maggie Philbin, TeenTech

"Business engagement with schools, that nurtures teachers' digital interests and skills, can help bring tech-driven opportunities to life for teachers and pupils. Doing so is a win-win: driving inspiration and growing tech literacy for young people and helping companies address skills gaps."
Pippa Morgan, CBI

Action B: Show young people – and those who influence them – the role tech plays in the things they love.

Giving young people new ways to access future-ready skills is not enough on its own. They also need to be inspired to want to build those skills. And parents and guardians need the understanding and support to reinforce that message, so they see it as the new way for their children to get ahead.

To be successful, support at home should complement activity in schools – but crucially, it needs to go beyond it, connecting to the things young people love and where their attention is focused.

Young people need to understand the range of jobs that are out there and the role technology plays in each. Businesses should showcase individual roles in a way that young people can relate to – emphasising the real-world relevance of what they learn in the classroom. They should also work to show both girls and boys the pathways into the jobs of the future.

Tech has become slick and invisible, and that cycle must be broken. Industries like sport, music, broadcast and fashion have young people's attention and therefore are well-placed to use their assets and channels to show the role technology plays today, how human ingenuity and tech come together, and the kinds of jobs that underpin it.

Case study – Google Made with Code

Google Made with Code aims to inspire teenage girls to recognise that tech capability can help them pursue their passions – whether that's film, fashion, music, or design. It provides interactive online resources based on high-profile real-world projects, using topics like the latest TV shows or VFX developments to get users active with the building blocks of the digital world.

These activities are reinforced by video content from near-peer role models, who give young people practical yet inspirational guidance on the capabilities they'll need to achieve their potential.

Find out more at: **www.madewithcode.com**

Expert view

"Many businesses discuss the criticality of engaging the next generation with technology but too little is being done to truly connect young people in an authentic way. Employers who work with students on our TeenTech Award projects have witnessed significant impact - not only on individual students but entire year groups. Employers need to think longer term. After three years of structured engagement with our programmes, one girls' school saw the uptake of Physics GCSE rise to 87.5 percent because the students could 'see the point of the subject'. In another school the number of students choosing Design & Technology rose by 300 percent over a five year period. Students and schools need ongoing, age appropriate support."

Maggie Philbin, TeenTech

Recommendation 2

The private sector, government and civil society must work together to provide the structures, mechanisms and resources to prepare young people for the jobs of the future and lifelong learning, regardless of their background.

Despite broadly similar levels of baseline tech aptitude, young people whose parents have a degree or higher degree are 26 percent more likely to see themselves as tech 'creatives' or 'experts' in the next five years than those whose parents have maximum school-level or vocational educations. And young people whose parents fall in the top two education levels also expect to earn salaries that are 19 percent higher than the bottom two.

Those inequalities persist throughout people's careers. Results from the Generation X sample of 41 to 51-year-olds show that the private sector currently risks entrenching existing divides. Businesses are twice as likely to focus their employee training efforts on higher paid workers – leaving already disadvantaged groups behind.

The private sector, government and civil society must work together to create the structures and mechanisms to help tackle those challenges. That means identifying areas of greatest and unmet need, and coordinating activity and resources to avoid duplication of efforts.

Orchestrating concerted action is not easy but is essential to give the next generation hands-on experience of the jobs of the future, and lifelong learning opportunities once they get there – with a particular focus on levelling the playing field for young people from disadvantaged backgrounds and young women.

Action C: Give young people equal access to skills development and hands-on experience of the future workplace.

This research finds that attitude and opportunity are the barriers to unlocking the full economic and social potential of the digital revolution. The private sector and government can be part of the solution by targeting outreach activity to those young people most at risk of being left behind by the digital revolution.

It should focus on providing future-ready skills development and hands-on experience of tech-powered jobs across a wide range of sectors. And in parallel, the government should consider how the apprenticeship levy can be used to power up the third sector organisations that work with young people on the ground.

Giving young people from underrepresented or disadvantaged backgrounds meaningful exposure to the jobs of the future would create a generation that knows what it takes to thrive in the modern workplace. And it would help to ensure that socio-economic status and parental background is less of a factor in their future aspirations.

Case study – Movement to Work

Movement to Work is a coalition of UK employers committed to tackling youth unemployment through provision of high quality work experience and vocational training opportunities for young people that are not in education, employment or training. Through the network of Movement to Work employers, young people are offered structured, high quality work experience placements and employability training, providing them with the experience, skills and confidence to find a job. Participating employers will, where possible, link placements to jobs or apprenticeships. So far more than 60,000 placements have been delivered, with 54 percent of participants going onto employment, or further education or training.

Find out more at: **www.movementtowork.com**

Expert views

"Employers have a crucial role in enabling social mobility. By ensuring they are genuinely open to people from all backgrounds, which includes offering young people work experience that isn't just for those who have connections, they will maximise their potential talent pool and achieve better results."

Paul Johnston, Social Mobility Commission

Action D: Invest in continuous tech training for existing employees.

The skills gaps identified today will shift over time as new technologies and capabilities emerge. With only 23 percent of Generation X feeling supported by their employer to improve their digital skills, businesses must seek to develop a philosophy of continuous learning – offering frequent, flexible, and modular digital training opportunities that foster growth mindsets and enable employees to stay current.

Rather than trying to make everyone an expert, businesses would benefit from fostering a sense of curiosity across all employees, encouraging teams to self-organise and innovate new solutions.

Rebalancing employee training efforts would help at-risk sections of the workforce make the most of the digital transformation, instead of being shut out as the skills profile shifts. And employers stand to unlock new value and creativity from their people, while reducing the burden of hiring to fill capability gaps.

Case Study – AT&T's Talent Overhaul

AT&T found itself in a position where its legacy business was quickly becoming obsolete due to tech advances shifting consumer demand away from hardware and towards the cloud. Rather than overhauling their current talent supply, they decided to rapidly retrain their 280,000 workers and build what they believed to be the workforce of the future.

Investing over $260 million on education and tuition, AT&T engaged employees in acquiring new skills and experiences, leveraging creativity, gamification, and partnerships. Thousands of employees acquired 'nanodegrees' on tech-related topics, not only building employee self-confidence but also qualifying them for alternative career paths and promotions, as well as receiving 'badges' on their intranet that publicly recognise training milestones. In doing so, AT&T made progress in engendering a culture of perpetual learning or, in their words, "a mindset in which each individual becomes CEO of his or her own career."[31]

Find out more at:
www.about.att.com/innovationblog/building_workforce

Expert views

"There's not enough being done within companies to support staff development. Ultimately, companies will lose out as they will lack the skills needed to survive in the future. Steve Jobs famously stated that innovation is about joining the dots... but first you need to know where the dots are."
Maggie Philbin, TeenTech

"Companies need to view tech literacy as a business priority – if they don't invest, they face a fundamental business risk."
Pippa Morgan, CBI

"The people who currently benefit most from investment in skills is the people who already have high skills. This needs to change to a focus on upskilling and retaining those with the lowest qualifications and skills – with a particular focus on skills for the future, like digital."
Paul Johnston, Social Mobility Commission

A note on methodology

To explore the relationship between tech literacy and social mobility in the UK, we gathered primary data from 4,000 young people (aged 16 to 24), in addition to 1,000 from Generation X (aged 41 to 50) to provide a point of comparison with individuals further along in their careers. The sample was selected to reflect the UK's diverse educational, occupational and income groups. This primary data was combined with a range of secondary sources to explore new connections between tech literacy and social mobility. The findings were then tested through a series of interviews with experts and thought leaders, to formulate recommendations for tackling the challenges identified in this study.

Economic benefit calculations

We calculate the expected average salary in five years' time based on i) no change in tech skills and ii) the expected increase in tech skills. Taking the difference between these two estimates, we can approximate the average salary increase resulting from an upskilled emerging workforce. We then gross this up by the approximate size of the emerging workforce to generate an estimate for the economy-wide increase in salaries. Given that employee compensation is a component of GDP(I), we directly attribute the increase in salaries associated with higher tech skills to an increase in GDP.

This is a conservative assessment of the economic benefit in five years' time that does not account for any other direct or indirect effects on GDP from an increase in tech skills. Based on the assumption that 21 to 29-year-olds find work using their expected level of technology skills, it could be reasonably expected that there are additional economic benefits not accounted for here. For example, the benefits of improved education also improves opportunity for other age groups. There could also be benefits in future years, as the next cohort of young people benefit from improvements to the education system. Improved tech skills will provide increasing benefits throughout individuals' working lives, in terms of increased salaries (for example as demonstrated by Generation X survey respondents, with experts paid £10,000 per annum on average more than competent users). Tech skills open up more career opportunities and provide job security in an increasingly uncertain employment market.

Contributors

About BT and Tech Literacy

BT's purpose is to use the power of communications to make a better world. It is one of the world's leading providers of communications services and solutions, serving customers in 180 countries.

Its principal activities include the provision of networked IT services globally; local, national and international telecommunications services to its customers for use at home, at work and on the move; broadband, TV and internet products and services; and converged fixed-mobile products and services. BT consists of six customer-facing lines of business: Consumer, EE, Business and Public Sector, Global Services, Wholesale and Ventures, and Openreach. For more information, follow **@BTGroup**, or visit **www.btplc.com**

Tech Literacy

BT has made a long-term commitment to build a culture of tech literacy. That means helping young people get curious about how technology actually works, be in control of it, and ultimately become active creators with it. Our first goal is to reach five million young people by 2020. We take action with our partners on three crunch-points in young lives:

Primary education

The Barefoot Computing Project is a computational thinking programme for primary school teachers from BT and CAS. It helps them get confident with the building blocks of tech literacy through free teaching materials and face-to-face workshops from specially trained volunteers. It has reached more than 45,000 teachers and through them 1.25 million children, and is used in 50 percent of primary schools in England. An Ipsos MORI study showed that teachers who bring computational thinking into the classroom see positive impacts on pupils' numeracy, literacy, problem-solving and collaboration skills.

Teenage years

We're partnering with 5Rights to find new ways to empower young people to confidently navigate the digital world. Together, we're researching what it means to be tech literate and using that to inform ideas for a new digital tool to meet unmet needs.

Transition to work

BT's Work Ready programme helps disadvantaged 16 to 24-year-olds prepare for the modern world of work, through skills development and hands-on experience of jobs powered by technology. More than 2,000 young people have started a Work Ready placement, and of those who complete, more than 50 percent go on to education, training or employment. Working with the Rio Ferdinand Foundation we're reaching even greater numbers of young people from disadvantaged inner-city areas, including London, Manchester, Doncaster and Belfast.

About Accenture and Skills to Succeed

Accenture is a leading global professional services company, providing a broad range of services and solutions in strategy, consulting, digital, technology and operations.

Combining unmatched experience and specialized skills across more than 40 industries and all business functions – underpinned by the world's largest delivery network – Accenture works at the intersection of business and technology to help clients improve their performance and create sustainable value for their stakeholders. With approximately 425,000 people serving clients in more than 120 countries, Accenture drives innovation to improve the way the world works and lives. Visit us at **www.accenture.com**

Accenture Strategy operates at the intersection of business and technology. We bring together our capabilities in business, technology, operations and function strategy to help our clients envision and execute industry-specific strategies that support enterprise wide transformation. Our focus on issues related to digital disruption, competitiveness, global operating models, talent and leadership help drive both efficiencies and growth. For more information, follow **@AccentureStrat** or visit **www.accenture.com/strategy**

Accenture's global Skills to Succeed programme aims to plug gaps in employment and entrepreneurship using technology. We aim to help three million people to develop critical workplace skills by 2020. In an increasingly digital world, global demand for highly-skilled, technologically-savvy employees continues to grow. To meet this need, Accenture in the UK have focused its Skills to Succeed programme on helping disadvantaged young people to get ready for an increasingly digital economy. How we work, and what you need to know to work is changing. Accenture in the UK has combined our learning and technology expertise to create innovative learning programmes such as our online Skills to Succeed Academy, our Digital Skills platform and our Movement to Work technology work placements to help young people enhance their chances of success in a digital world.

Acknowledgements

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