ChelTechne 2.0

Mind The Gap: Building the Workforce for a Digital Future

Produced by Cheltenham Festivals in partnership with QA, supported by National Grid Electricity Distribution

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Introduction

What can we do about the digital skills gap?

This was the question that brought together experts from a range of fields at ChelTechne 2024, the annual summit as part of Cheltenham Science Festival.

In a variety of sessions over a full day participants wrestled with what it meant to have digital skills, how our country's young people could be properly equipped for a working and personal life that would be threaded-through with technology, how we could help them prepare for the challenges of an increasingly digital world, and how to harness that as a tool that could enhance their lives and their work.

In seeking to answer these questions, leading professionals from the tech and edtech industries, school leaders, education policymakers, and the creative sectors shared their knowledge and enlightened one another about the breadth and scope of possible change – as well as the limiting factors within which change would have to be wrought.

Executive Summary

Following a packed day of discussion over two main roundtable sessions, our participants reached broad consensus on a set of recommendations for the next government.

- In the short term, participants recommended that a broader and more balanced Progress 8 measure that included the assessment of digital skills ought to be considered, such that secondary schools in particular could be supported to promote digital literacy.

- To be effective, it was agreed that resource would be needed to support this effort, alongside help from the private sector – without which schools would face another burden amid congested timetables.

- The group advocated for a national policy requiring primary and secondary schools, and sixth form and further education colleges, to have a Digital Leader – whose responsibilities would include helping to upskill teaching staff, ensuring that pupils and students developed digital competencies, and managing the incorporation of a 'Digital Skills Passport' qualification.

- The 'Digital Skills Passport' must reflect, as closely as possible, the current state of technology, and must therefore be modular and stackable, allowing for sections to be updated more easily than a standard curriculum offering.

- The aim must not be to identify the most able students, but, like the driving test system, ensure that all school leavers possess an acceptable level of digital literacy.

- An independent body – the 'Digital Education Council' – must be created to help structure the Digital Passport, with input from industry, teachers and school leaders, policymakers, and politicians.

- To facilitate socio-economic fairness, upskill the existing workforce, and communicate the range of careers which require digital skills, efforts must be made to also extend the Digital Passport scheme into the wider community; potentially via existing resource hubs such as Jobcentre Plus offices, libraries, and other community hubs.

- Reporting to the Department for Education, the Digital Education Council would also play a convening role in rationalising the patchwork provision of overlapping industrysupported digital skills training schemes that exist across the country, diverting resources to underserved areas and cutting costs for private enterprise.

Over the course of the day, participants discussed in more detail potential funding models, the scope and role of the Digital Education Council in setting and delivering a long-term vision, the importance of ensuring young people also had the opportunity to 'log off' from digital devices, and considered the long-term potential benefits and disadvantages of the current assessment systems.

Analysis

- There is a well-attested digital skills gap[1], which exists across generations, between the UK and peer countries, and between school leavers and employer needs[2]. A widespread assumption that young people, by virtue of having grown up in an era of widespread computing and internet use, are 'digital natives'[3] also slows progress, despite evidence showing that many young people struggle to use digital systems necessary for work or university.

- While there is currently a computer science GCSE, just 12.6% of UK pupils take the qualification, and boys outnumber girls by 4 to 1.

- Without intervention at a national level, these digital skills gaps are set to grow further. A national focus is vital, since regional and socio-economic gaps presently exist, and are widening.[4]

- Young people will have been failed if action is not taken – they will leave school unprepared for the world of work, and unable to participate fully in society as informed, engaged and active citizens.

- While local authority-maintained schools are required to teach a certain level of digital literacy up to Key Stage 4, academies (which now account for over 80% of secondary schools[5]) have flexibility about its inclusion. This can be a benefit, but it is noteworthy that it is not part of the EBacc, since digital literacy at present falls outside

[1] The Behavioural Insights Team: Boosting the uptake of digital courses and careers among A/T level students and university students, p.10
[2] WorldSkillsUK, Learning and Work Institute, Enginuity: Disconnected? Exploring the digital skills gap, p.5
[3] Nominet Social Impact: 'Digital Youth Index 2021', p.33
[4] WorldSkillsUK, Learning and Work Institute, Enginuity Disconnected? Exploring the digital skills gap, p.25
[5] FFT Education Datalab, 'The size of multi-academy trusts'

of Progress 8 assessment. Ofsted similarly rarely comments on the provision of the computer science curriculum, although it is reviewing the feasibility of doing so.[6]

- Independent schools, meanwhile, benefit from greater resource to teach digital literacy – including through staff recruitment and facilities. These schools – less tethered still to the National Curriculum – have scope to adapt digital skills teaching to the pace of technological change in a more agile manner.

- As a result, existing digital skills gaps between young people from more and less affluent households are likely to continue to grow. Unequal geographical provision of internet infrastructure, devices, and teaching staff threatens to further entrench digital divides between different regions of the country.[7]

- Tackling this gap only increases in importance: in today's world digital skills – including an understanding of computer technology, data analysis and presentation, the use of common commercial IT systems, and internet safety – are essential across almost all sectors of the economy, not just 'tech' or 'IT' roles.

- Furthermore, there is a level of digital competence and literacy which is essential not only for young people's future working lives, but will be essential to function effectively in the world.[8] Any digital skills strategy must empower young people to engage positively with the world – in their personal lives, their work, and as proactive, empowered citizens in society.

- Lastly, the rapid pace of change of technology means that, alongside the great value of learning via knowledge acquisition, the skills of learning, unlearning, and relearning in response to change – and the resilience that accompanies that – may prove to be equally important.

Recommendations

1. Provision must be made, as a matter of national policy, to require all schools to have a Digital Leader, akin to present numeracy and literacy leaders. These must be provided for primary schools, secondary schools, sixth-form, and further education colleges. This must be fully resourced, with budget set aside for the training and recruitment of Digital Leaders, and resource provided for those Digital Leaders to further upskill their teaching colleagues.

2. Digital Leaders will help implement the introduction of a Digital Skills Passport, composed of stackable, repeatable modules which add up to a qualification. This

[6] Ofsted: 'Research review series: Computing', May 2022
[7] Ofcom: 'Adults' Media Use and Attitudes report 2022', p.5
[8] AQA: '"A, B, C, it's easy as 1,2,3" Towards new assessments for Numeracy, Literacy, and Digital Fluency', p.18

must be presented as a right held by young people, with schools supported to enact its provision, and recognised for doing so.

3. Young people must have had the opportunity to acquire their Digital Skills Passport by the time they leave school, and ideally by the age of 16.

4. DfE, Ofqual and Awarding Organisations must work together to develop a new regulatory approach to enable rapid updating of modules to enable the qualification to keep up to date with developments in digital technologies.

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5. 'Digital skills' should be reinstated as a required professional competency for trainee teachers in England. (It was a requirement for teachers throughout the UK until 2012 and remains so for teachers in Scotland).

6. The Digital Skills Passport must emphasise the breadth of careers which require those skills – highlighting their importance in such disparate fields as the creative arts, medicine, public policy and politics, communications and marketing, academia, the legal profession, trade, commerce, and hospitality – to name but a few.[9]

7. Developing digital skills requires a holistic approach that should start early and build in the support of parents and carers who need to keep up to date with digital skills to function in a technology-driven society. Therefore, a key recommendation is to facilitate the broader provision of digital skills teaching, drawing on existing community IT resources such as those to be found in libraries, Jobcentres, and other community hubs. Not only can this allow for mid-career upskilling for those currently in work, but it will help change the perception of digital skills and competence as being the preserve of only small segments of society, and enhancing in-home support for students keen to develop their competencies and expertise.

8. Efforts must be made, via community digital skills teaching, to help level the socioeconomic playing field: while over 90% of young people have internet access, 30% of children and teenagers from households with incomes of £20,000 or less can only gain access through a smartphone or tablet device.[10] The Cambridge Centre for Housing and Planning Research has asserted that learning sufficient digital skills requires access to desktop or laptop computers, noting that there exists unused provision in libraries and community centres across the country.[11]

9. Industry must be encouraged to support the Digital Skills Passport scheme, the Digital Leader programme, and wider community-based digital teaching. Industry experts must therefore be invited to participate in constructing the Passport as part of an independent, cross-sector Digital Education Council.

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[9] House of Lords Education for 11–16 Year Olds Committee: 'Requires improvement: urgent change for 11–16 education', p.34

[10] Digital Poverty Allance: 'UK Digital Poverty Evidence Review 2022', p.45

[11] House of Lords Covid-19 Committee: 'Beyond Digital: Planning for a Hybrid World', p.15

Strategy for Delivering our Recommendations

- The new Government faces significant financial constraints. Inflation has eroded national purchasing power, the cost of servicing the national debt has increased, interconnected pressures of climate change, the war in Ukraine, and conflict in the Middle East have created supply chain issues and soaring prices for energy and goods – all amid ongoing efforts to recover from the Covid-19 pandemic.

- As a result, it is necessary to be creative and open-minded in finding avenues to fund the recommendations. As a first port-of-call, it is proposed that the Government enacts its manifesto pledge to reform the Apprenticeship Levy. The British Retail Consortium last year called for the scheme to be widened to a Skills Levy, noting that £3.5bn had expired, unused, due to overly strict restrictions on its use.[12] Plans to restructure the scheme into a Growth and Skills Levy ought to explore earmarking some of the unlocked funds for digital skills teaching.

- Industry must also be involved – both to help fund the recommendations and impart its expertise in shaping the Digital Skills Passport. Employers have warned that young people's digital skills are insufficient to meet their business needs[13] – as shown in surveys and reinforced by industry representatives on the panel.

- Including industry recommendations on key skills will help ensure buy-in for the Digital Leader and Digital Skills Passport schemes; easing some of the posteducation training costs on business, and helping young people be adequately prepared for their working lives.

- The forum therefore recommends the creation of a cross-party Digital Education Council, composed of school leaders, teachers, policymakers, Members of Parliament (Lords and Commons), and industry representatives – with the latter group comprising leaders in a range of fields, and including household name tech companies such as Microsoft, Google, Apple, Amazon, Accenture, and IBM.

- The Digital Education Council would report to the Department for Education, providing insight, expertise, and long-term policy planning.

- More importantly, the Council would act as a central convenor for industry funding. At present, individual companies are operating a patchwork of schemes across the country. While undoubtedly beneficial, the lack of a central vision creates regional inequalities of provision.

[12] https://brc.org.uk/media/681658/joint-letter-on-apprenticeship-levy.pdf

[13] WorldSkillsUK, Learning and Work Institute, Enginuity: Disconnected? Exploring the digital skills gap, p.4

- Students across the country are sometimes served by a range of competing digital apprenticeship or training schemes funded by local employers – though there are areas where no such schemes or very few schemes exist.

- Additionally, the current patchwork system can act as a disincentive to students, locking them in to beginning their working lives in certain industries or areas – such as aerospace, infrastructure, and other STEM sectors. Students who are disinclined to enter such fields can find themselves digitally disadvantaged as a result, according to participants.

- The Digital Education Council would collate the overlapping schemes, identifying areas which are underserved and ensuring a more equitable and rational distribution of resources; helping industry schemes work with each other rather than in competition, and in alignment with the formal education sector.

Further considerations

While it was beyond the scope of this year's ChelTechne discussions, many of our roundtable participants were in broad agreement that a long-term ambition must consider alternatives to the single point-of-failure model of assessment at age 16, and to take steps to ensure that the achievements of more young people of that age are recognised.

Every generation faces unique challenges. Nonetheless, young people will be entering a complex world, one marked by converging challenges such as the growth of AI, an ageing population, the consequences of climate change and resource scarcity, the greater likelihood of great power conflict and the erosion of the post-Cold War liberal democratic order.

Alongside this, the pace of change will continue to increase. A knowledge-based curriculum is immensely valuable both as a store of common understanding and as a well-evidenced method of effective pedagogy, yet it is equally important to impart the ability to adapt, to unlearn, to relearn, and to view failure as an opportunity to try again.

The goal of any educational system is not just to provide skills and knowledge to bring into one's working life, but also to prepare young people for the challenges and opportunities of citizenship, as well as impart resilience, openness, and curiosity.

Young people must be given the opportunity to draw joy and lifelong nourishment from their education, and be equipped to engage with culture, with society, with the outside world, with their physical selves, and with whatever career suits them best.

Digital skills are increasingly a pre-requisite for much of the above; in the hope that ensuring that the time young people with screens is valuable, rather than wasted through overexposure, and that digital confidence will engender judicious and conscious use of digital tools and technology.

Our roundtable's hope is that the necessary adaptability necessitated by modular digital assessment will seed itself across our country's views on education policy – entrenching the vital characteristics of adaptability, perseverance, and creativity.

Appendix 1:
Roundtable Discussion

Question One:
How can we ensure that children and young people are equipped for the work place of the future and ready to pursue digital careers?

After the introductions, our participants split into three groups divided by subject-matter expertise: an 'Education' group comprising teachers and school leaders, a 'Policy' group composed of current and former civil servants and education consultants, and an 'Industry' group – including representatives from tech and edtech companies, STEM and creative professionals, and industry associative bodies.
They discussed the question: "How can we ensure that children and young people are equipped for the work place of the future and ready to pursue digital careers?"

Education group

The education group (teachers and school leaders) were initially chiefly concerned with capacity. While it was agreed that today's children and teenagers needed to be equipped to pursue digital careers, the group was keen to place these ambitions in the context of limited resources.

The education group was unified on the vital need to ensure that teachers were themselves given the time, space, and resources to receive training in digital skills. While many teachers already incorporate digital skills into their classroom teaching, they were aware that in many instances, their students' knowledge exceeded their own in certain areas.

They acknowledged that the sector was not unified on what constituted digital skills, and what form preparing their students for a digital career would take. The group noted the different requirements and expectations between primary and secondary education, the differing incentives of secondary schools, academies, maintained and independent schools, sixth-form and further education colleges.

Policy group

The policy group approached the question from a different perspective, focusing on the avenues through which the next Government could be accessed.

They discussed how to ensure that the Education Secretary would be convinced of the importance of closing the digital skills gap – how to ensure that the question was relevant to them and could align with their priorities.

Their collective experience of engaging with Government, and working in Government, offered valuable insight into the hurdles to overcome: schools need to be supported to make change by ensuring that their efforts are recognised by Progress 8 assessments[14], the processes to alter curricula are, while rigorous, insufficiently agile to incorporate digital skills teaching compared to technology's rate of change, and how a national framework would be needed in order to ensure that geographical inequalities could be prevented from emerging.

The policy group agreed structural changes were needed to deliver change at the necessary pace, whilst ensuring that those changes did not sacrifice the rigour and care that must be taken to ensure responsible stewardship of the education that young people deserved.

Industry group

Representatives from industry were positive about the country's potential, noting that despite the challenges of recent years, the UK remained one of the strongest countries in the world for skills – with an enviably well-qualified and trained workforce.

Britain's culture was touted as a key strength – industry representatives agreed that the UK's was a culture that praised and rewarded entrepreneurship, and that there remained an appetite for risk.

Participants discussed a sense in the UK that things were possible; that with hard work young people in this country could succeed in their chosen fields – and that the flexibility and expansiveness of British culture meant that this held true for minoritised groups within society.

Nonetheless, concerns remained about the UK workforce's digital capabilities – that despite other skills there was a significant gap between UK workers of all ages and their international peers in the digital realm; and that this gap was more noticeable in recent school leavers.

Industry representatives expressed the view that young people were, at present, being insufficiently prepared for the nature of work today, and that businesses and employers were having to invest heavily to train university and school leavers in the digital skills necessary for their employment.

> *Following the presentations, participants converged back at the central table, different nodes of subject matter expertise interweaving as the next phase of discussion began.*

With each group having presented the conclusions of their discussions, the roundtable came together to discuss and critique each others' contributions.

[14] "Progress 8 aims to capture the progress that pupils in a school make from the end of primary school to the end of KS4. It is a type of value-added measure, which means that pupils' results are compared to other pupils nationally with similar prior attainment."
https://assets.publishing.service.gov.uk/media/6620e69b651136bd0b757d4f/Secondary_accountability_measures_-_2023-2024_guidance_-_April_24.pdf

The participants discussed the current provision of digital skills, noting issues with the Computer Science GCSE in particular. In schools where Computer Science is offered at KS3 there are sharp drop offs in GCSE uptake – with 94% of girls and 78% of boys [15]choosing not to continue it.

The lack of a practical component to the GCSE was also discussed, with some expressing the view that its emphasis on theory failed to spark enthusiasm among students – though

others noted that courses with higher proportions of coursework could historically have had a disproportionate negative impact on students from disadvantaged backgrounds.

What was more important, the group agreed, was to ensure provision of digital skills teaching within and across subjects. As well as issues with the structure of the computer science GCSE, the participants agreed that the overwhelmingly white, male, 'tech bro' stereotype associated with computer science disincentivised female and ethnic minority students.

Once again, issues of resource and capacity came to the fore, alongside the risk of entrenching class and geographical inequalities. The group discussed the very real challenges of providing a level playing field with unequal technological infrastructure – with fibre optic or 5G internet unavailable across swathes of the country.

Similarly, there were concerns over the necessary hardware – emphasising the importance of ensuring that there was sufficient provision of devices such as tablets, laptops, or PCs either in schools or in the hands of students directly.

The group agreed that a paramount concern was ensuring digital literacy, rather than discrete skills, noting the importance of entwining that literacy within a holistic emphasis on creating effective and adaptable lifelong learners. Participants discussed the importance of entrenching training of the fundamentals of digital skills within the broader aim of ensuring that students knew how to handle new information and learn effectively; acknowledging that the *"pulse of iteration in the digital world"*, as Simeon Quarrie, CEO of Vivida, put it, rendered prescriptive curricula impossible.

Question Two:
What do we need to consider ensuring that the pathways to effective change are equitable and sustainable?

The second session kicked off with discussion of some important caveats. Participants discussed the importance of ensuring that, while young people should be prepared for the world of work, the key priority must continue to be the nurturing of young minds – providing an education that is intellectually and morally nourishing.

In the words of Rhys Morgan, Director of the Royal Academy of Engineering, *"learning should be a rich experience for young people, regardless of where they go."* A Head Teacher commented that "*It is not just the responsibility of schools to prepare young people*

[15] Disconnected? Exploring the digital skills gap, p.23

for the world of work, but equally the responsibility of industry to make itself accessible to learners, and to work with the school system to support learning."

With those sentiments front of mind, the first group presented their ideas. They explored the idea of radically shifting how students are assessed and the role of the Department for Education. The group discussed the potential of replacing GCSEs with modular assessments, allowing students scope to fail and try and fail and try again, with stacking modules that could lead to full qualifications in core subjects and in key skills – including digital skills.

Alongside this, the participants considered the potential advantages of taking education outside of political control: What would happen if we entrusted the administration of curricula and the assessment of schools and students to a cross-party body selected for its expertise and composed of representatives from education, industry, and policy experts?

The rationale was to untether education policy from the short-termist thinking engendered by the electoral cycle – granting space to educators and policymakers for truly long-term thinking, and the scope to prepare today's children for the world of work as it will exist in 15 or 20 years' time.

In the robust discussion that followed, some participants stressed the importance of accountability. Concerns were raised about who would decide the composition of the council and whether it could be altered, how its success or failure could be assessed and how changes could be made if it failed to deliver. The principle that such a significant segment of the UK's budget – almost £60bn – must be subject to democratic accountability was also discussed.

Participants did broadly agree nonetheless that serious reform to education policy would require longer-term planning than that allowed by the electoral cycle, that cross-party involvement was therefore necessary, and that an animating spirit of national unity would need to suffuse attempts at far-reaching change.

The second group started from the principle of ensuring equitable provision of digital skills training across the country and proceeded from there to lay out concrete recommendations. They proposed ensuring that every school and college have a digital leader role among the teaching staff, mirroring current numeracy and literacy leader roles.

This digital leader would work to ensure that digital skills provision would be a priority within schools – keeping digital skills teaching at the forefront of the agenda.

They would both act as an in-house resource, managing and arranging teacher training, and be responsible for integrating digital skills across the curriculum. They stressed that this would need to be fully resourced, with significant budget allocation as part of national policy.

Underlying this, teacher training needed to be updated to incorporate digital skills – noting that this had been a requirement for teachers throughout the UK until 2012 and therefore could be reintegrated again.

Kerry Harrison, Digital Skills Partnership Lead at the Lancashire Skills and Employment Hub, pointed out that digital skills have remained part of required professional competencies in Scotland – both proving further the achievability of their reintegration, and highlighting another example of geographic inequalities. It was argued that this could additionally help rebrand digital skills, and that the digital leader role could help emphasise the breadth of careers and fields in which digital skills were necessary.

The group were well aware of the financial constraints that would bind the next Government, proposing to alleviate the cost by calling on industry to support the scheme. While it was accepted that it would be difficult to secure cash funding, partnerships with IBM, Microsoft, Accenture, and Google were proposed to help fund the distribution of digital devices to allow students to develop skills inside and outside of the classroom.

Crucially, the second group emphasised the importance of upskilling parents alongside their children, both to help unlock the potential of in-work adults, and to ensure that young people could learn in a supportive environment.

To that end, the group proposed the roll out of digital literacy community style centres. Working in tandem with digital leaders in schools, these centres could support whole-family digital learning, with resources accessible on-site – sponsored or partially funded by industry – which could support digital literacy across generations.

This proposal, it was argued, could allow digital education funding to be drawn from several different departments – further boosted by reform of the Apprenticeship Levy scheme, which industry groups across the board have criticised for being too prescriptive in its current form.

In considering the second set of propositions, the group reached four main areas of consensus:

- Schools needed to be supported to teach digital skills and literacy by ensuring that doing so is recognised in the Progress 8 assessment framework, and prioritised by the Ofsted inspectorate.
- It is vital to move away from a model of educational assessment with a single point of failure at 16, as the pace of technological change means assessment of digital skills requires a modular, repeatable approach.
- Digital skills training and education will be most effective when the family unit as a whole has sufficient digital literacy.
- Any efforts to close the digital skills gap will need to be fully resourced – that includes time and space for teachers to receive training, internet infrastructure, provision of devices, and – if necessary – physical spaces.

Question Three:
How can we achieve these aims?

Over the course of the final part of the session, the participants debated the feasibility of the proposals. Recurrent concerns included potential funding models, the importance of supporting schools to participate through Progress 8 assessment, a possible increase in the complexity of objectively assessing school exam performance that could be brought about by modular assessment, the difficulties of guaranteeing equitable provision, and the need for an underlying unifying mission and purpose.

It was noted that while preparing young people for a digital world was important, it was equally vital to ensure that children and young people had ample opportunity to disconnect. Participants stressed that young people deserved to have rich experiences in the offline world – to spend time away from screens, to encounter and explore the natural world, to overcome challenges and solve problems without a digital component. Teachers and school

leaders discussed the growth of anxiety among young people – noting that while its causes were no doubt varied and complex, social media and the intrusion of social politics into students' home lives that came with it appeared to be one of them.

Participants reached a firm consensus on the central importance of balance – discussing how care must be taken to ensure that young people with different learning styles, attributes, skills and temperaments would be served by changes to the education system. Particular attention was paid to ensuring equitable provision for neurodiverse young people and those with special educational needs, with widespread agreement that the underlying purpose of digital skills education must support the broader aim of giving all young people the tools and resources to develop confidence, curiosity, resilience, and a love of learning that would they could carry with them throughout their adult lives.

Appendix:

Participants

Taylor Watson: Co-Founder of Project Pioneers and IT Consultant, CGI

Mike Zealley: Partner and Managing Director (Learning Services), KPMG

Ian Lithgow: Managing Director (Health and Public Services), Accenture

Helen Lindsay: Managing Director (Leadership and Culture), Accenture

Rhys Morgan: Strategic Projects Director (Skills and Inclusion), Royal Academy of Engineering

Julia Adamson MBE: Managing Director (Education and Public Benefit), BCS, The Chartered Institute for IT

Simeon Quarrie: Chief Executive, Vivida

Reza Schwitzer: Director of External Affairs, AQA

Katie James: Headteacher, Charlton Kings Infants' School

Claudia Nicholl: Chief People Officer, National Grid

Toby Barnard: Managing Director (UK Public Sector), QA

Kerry Harrison: Digital Skills Partnership Lead, Lancashire Skills and Employment Hub

Chloe Jacquet: Poet, Filmmaker, and Spoken Word Artist

Ali Mawle: Co-Chief Executive, Cheltenham Festivals