HOUSE OF LORDS

SELECT COMMITTEE ON DIGITAL SKILLS
Key suggestions from witnesses

Introduction

This document compiles the key suggestions made by every witness who provided oral evidence to the Digital Skills Committee between July and November 2014. The suggestions have been grouped according to 'themes'. Some witnesses provided more than one suggestion.

All oral and written evidence is published online at: http://www.parliament.uk/digital-skills-committee.

Basic literacy and numeracy

Professor Alan Manning, London School of Economics: "I just go back to saying that the biggest weakness over generations of our education system is in basic literacy and numeracy among a sizeable fraction of the population and we should not lose sight of that. It is our single biggest problem."[1]

Basic online skills for all

Helen Milner, Tinder Foundation: "I think you should have a target for helping almost 100% of people to achieve basic online skills by 2020. We did the costings for that in our recent report by Catherine McDonald. It will cost around £850 million."[2]

Broad skillsets for the future

James Thickett, Ofcom: "My view is that we need to look at cognitive skills as being as important as basic digital or technical skills. Whenever we think about developing a digital skills strategy, we should consider incorporating cognitive skills because not only do they prevent negative online experiences, they equip people with the skills to get more out of the internet. It is particularly important to mould children and young people because they are most at risk from not having these skills. As they get very advanced in coding and things, there is a risk that they become overconfident and subject themselves to risk."[3]

Angela Morrison, Direct Line Group: "I would like to see technical skills being equivalent to reading, writing and arithmetic in schools. I know that is a big struggle because you need many skills, but the way that society is going we need three hours in computing— "computing" is not the word, but just that broader digital world. That needs to be up there because everybody uses and is impacted by it. They need to understand what they are doing so that needs to be a core subject."[4]

Martin Wolf, Financial Times: "I suppose probably this is going to make your life more difficult. I am going to say something rather different, which is that I think you have to be very careful about emphasising digital skills per se and emphasise—if you think about this in

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[1] Q 25
[2] Q 112
[3] *Ibid.*
[4] Q 75

the right context—that it is about fundamental skills and their ability to be used. If you produce people from the educational system who are enthusiastic, flexible, numerate and literate, they are going to do quite well in this world that is going to be very unpredictable. "[5]

Andreas Schleicher, Organisation for Economic Co-operation and Development: "In the long run it is teaching young people better mathematics skills. Those are highly correlated with digital skills. That would be the investment that would give you the biggest return. However, that of course does not solve today's problem. I would think that investment in those foundations, particularly in disadvantaged communities, is probably the biggest barrier in the UK."[6]

Dominic Field, Boston Consulting Group: "From a hard infrastructure perspective the UK is in pretty decent shape. It is about the soft piece and a focus on developing a stronger talent pipeline to produce more engineers, data scientists and people who can help to grow the businesses that will employ the UK population going forward."[7]

Professor Judy Wajcman, London School of Economics: "I was reading yesterday about an American college called Harvey Mudd College in California, where the woman Dean turned round the number of young women studying computer science in an incredibly short space of time, doing all the things you suggest: making them do problems; taking different approaches. Young people are on their social media all the time. They have skills at some level or other and the issue is how to translate the everyday usage of those screens into more creative ways and to make them realise that these are skills that can translate."[8]

Broadband access

Phil Fearnley, BBC: "I would come back directly to broadband take-up as an important issue, and doing things along the lines of what has been described."[9]

Guy Levin, Coalition for a Digital Economy: "Broadband is the most important one—access to high speed, fibre—but that has been covered elsewhere."[10]

David Pollard, Federation of Small Businesses: "One thing about broadband is that we all tend to think of it on a consumer basis, where it is about very fast downloads so that you can watch the TV through the internet and slow uploads because you are just sending e-mails, but if you are in business you need fast upload speeds. If you have done digital glazing and you want to send the product to your customer, you do not want to sit there and watch the computer for the next four hours while it uploads the film."[11]

Daniel Butler, Virgin Media: "There is huge appetite within the business to expand the network. That speaks to the funding and market-condition challenges that I mentioned earlier—the impact of red tape. Red tape constitutes 85% of our build-out costs, so anything that we can do to deploy the network cheaper means that we can provide more competition

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[5]   Q 14
[6]   Q 231
[7]   Q 85
[8]   Q 21
[9]   Q 112
[10]   Q 64
[11]   *Ibid.*

to BT in more postcodes up and down the country. I accept that there are white spots in cities that need addressing. Our view is that you should start by seeing how far the market can get you, without all this red tape, before immediately looking to the taxpayer to subsidise that expansion."[12]

Sean Williams, BT: "I would add on the hard infrastructure side that there are still some white spots—that is, non-fibre areas—particularly in cities, because network economics for cable operators and BT do not work. My ask of the Government would be to go forward to seek approval from the European Commission for a city fibre subsidy scheme to deal with the non-fibre areas in cities. The reason for saying that is that to achieve the universal coverage goal, we have to deal with the problem in cities. It would be really rather ironic if at the end of this we had 95% coverage across the whole of Cornwall and Northern Ireland but only 85% coverage across the whole of the city of London."[13]

Comprehensive digital strategy

Iain Wood, TalkTalk: "I would aim for a much more comprehensive digital economy strategy that puts digital skills right at the heart of debates around infrastructure, and particularly puts the funding priorities next to that. Within that, there are several things that need to happen. We need to continue our focus on having competitive markets so that there is competition that brings prices down and stops poverty being a barrier."[14]

Dinah Caine, Creative Skillset (Sector Skills Council for the Creative Industries): "The skills piece needs to be seen as an integrated part of an industrial strategy … I say that because in the past skills policy has tended to march to the beat of its own drum. If we have business over here, we have a whole machine doing skills over there. We are now starting to see the two being integrated, because at the end of the day in austerity Britain … if we are going to crack the skills issue, it has to be industry employers who lead that agenda".[15]

Paul Willmott, McKinsey & Company: "Is the single point that this agenda should reside with the Government? That would be my idea. I am sure you have better views than mine about exactly how to put that into motion. How much would it cost? I do not know. Maybe the way to think about that is to estimate the economic opportunity or downside if we do not get it right."[16]

Conversion courses

Professor Judy Wajcman, London School of Economics: "Lots of people there will not have maths A-levels or whatever, but there are loads of conversion courses we could do with adults. I am rather frustrated with the notion that we are going back to eight year-olds and I am going to have to wait again for what happens with the eight year-olds. I think we could have a lot of conversion courses with graduates, like we have law conversion courses now. Lots of my graduates do that. Why can we not have those? I have talked to people about this. It is true that you cannot in a year learn electrical engineering, but you can learn a lot of software programming. There are lots of things you can learn if you are bright and able. We

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[12] Q 86
[13] Q 85
[14] Q 142
[15] Q 209
[16] Q 75

would get not just more young women, but young men who did not do maths and engineering. We would get different sorts of people with more rounded skills. I think there are lots of industries we could explore."[17]

Creativity

Gary Warke, Humber Local Enterprise Partnership: "For me, it would be around supporting creativity and enterprise among our graduates. I described earlier that we have platform studios, and that the platform studios in Humber are in an incubation area for graduates who are not quite ready for work but are buzzing with enthusiasm and ideas but they have nowhere to go with all of that. None of that is funded. So we have a qualification framework and an education system that is all about outcomes and qualifications but we do stifle creativity, we do not support it and we do not fund it. I talk about the schools sector and I talk about FE [further education] and beyond, so it is about how we can invest energy, commitment and resources into funding that business start-up and to enhance competitiveness is what I would really like to see."[18]

Miles Berry, University of Roehampton: "I would come back to the point I just made, ensuring that all secondary schools offer GCSEs in computer science and IT for any student who wants to study these along with developing a similar robust academic, rigorous qualification in creativity in digital media. I am not sure how we label that but a qualification like that would be really nice to see."[19]

Professor Judy Wajcman, London School of Economics: "Jessica [Bland] mentioned the example of art and design schools. I think we should have more initiatives at that level, saying, 'Let's look at art and design'."[20]

Devolve skills funding

Angela Harrington, Manchester City Council: "We would like to further devolve the skills budget, so that we can build on the unique strengths, which I think have come out through our discussion here this morning, and make sure that we enhance digital skills in our cities and in our regions."[21]

Digital education

Professor Philip Brown, Cardiff University: "I would expect to have said something about the labour market but I am not, I am going to say something about the education system. I think we should look to digitalise some of the school curriculum and to go for much more challenge-based approach education of blended learning at all levels, because I think it is going to come in anyway and we need to embrace it. And I think we should scrap A-levels and move to an International Baccalaureate to allow this kind of development and to avoid that narrowness of education that we have been describing."[22]

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[17] Q 21
[18] Q 204
[19] Q 172
[20] Q 21
[21] Q 204
[22] Q 25

Chris Mairs CBE, UK Forum for Computing Education: "I think this gets to the real heart of the single biggest challenge that we face here, which is that we have a new curriculum that I personally believe is going to be really, really important. However, we probably have about 200,000 primary school teachers who are being asked to teach this, and this is a huge, huge ask. Although we are doing some good stuff with CPD [Continuing Professional Development], which is being funded by government, I do not believe we are doing enough. But I also do not believe that even if we threw £100 million at future CPD we would get there. So we have to think about how to use technology to teach technology. As Mike [Warriner] said, the kids with peer learning will make progress faster than teachers, so we need to find a way to make the teachers comfortable with that method of learning, which is a bit scary if you are a teacher. There are potential opportunities to think about, such as having a new breed of learning technologists who go into classrooms and work alongside the teachers. It will not necessarily be cheap, but I think that is something we should look at as a serious way of empowering the teachers."[23]

Further education restructuring

Iain Wood, TalkTalk: "We also need to restructure skills training—we heard about fantastic examples this morning—around much shorter courses that are much more accessible and speak particularly to the harder to reach people who are never going to sign up for a three or four-year course. Within that, clearly there is budget restructuring that needs to happen."[24]

Gender divide

Professor Dame Wendy Hall, University of Southampton: "I have always wanted to try to give more scholarships to girls to study computer science, but we cannot because of the equality laws, which is fair enough. Some countries do that—I think Canada and possibly Ireland. It is Ireland. It is a country that has had a lot of success in giving scholarships to women to study computer science."[25]

Oliver Quinlan, Nesta: "I would agree that divides, particularly the gender divide, are really important areas to look at. I do not think they are necessarily areas with easy answers. Sometimes we see people trying to engage young girls with producing technology by focusing on different ways of manufacturing high-tech jewellery. There is a lot of danger of being incredibly patronising to young women with initiatives like that. It is very important to look at some of the underlying reasons why they might not be deciding or being encouraged to have interests. I think role models are very important. There is a great history in fact of female role models in technology who are not necessarily celebrated through the contemporary representation of what it is to be a producer of technology. I find it difficult to come up with specific recommendations, but I think as an area to explore and try to find the underlying reasons for—and things we can do to remedy it—it is very important."[26]

[23] Q 46
[24] Q 142
[25] Q 220
[26] Q 13

Government services

Lucy Hastings, Age UK: "I have mentioned that government online services need to be high-quality and easy to use, but nobody should be discriminated against if they cannot or choose not to use them."[27]

Identify key national sectors

Kevin Baughan, Innovate UK (formerly known as the Technology Strategy Board): "Do not make the next phase of digital an evolution of ICT. I think there should be a real break point in that so that we then inspire everyone to get involved. How do we do that in a powerful, cost-effective way? I think that comes back to the observation of using the power of digital to do that. If there is domain expertise in a particular area, do not be frightened to use the power of digital to take that out into every school or every college or every university. Do not confuse the fact that it is centralised for where it happens to be created with the ability to take it back out again. I think the costs are more controlled because you might be doing it once centrally but you then distribute it nationally. If we put those two pieces together we start to get a formula that might work."[28]

Increased investment

Mary Payne, UCanDoIT: "I think with charities like ourselves who are small but yet doing big things, it is more localised commission and smaller contracts. A lot of the time what happens is the tendering goes to the bigger private organisations, bigger charities. We are the little people, and we do not have the capital to compete with schemes that get paid by results, so we get left behind."[29]

Maggie Philbin, UK Digital Skills Taskforce and TeenTech CIC: "Perhaps making that very clear in the press so that people understand why an investment is being made would be very important. There are some fairly simple things that can be done."[30]

Mark Chambers, Naace: "Computing science specifically, since the redevelopment and re-launch of the computing curriculum has received significant national investment. If there were to be a similar or even a 50% or any other number you care to choose, prioritisation of the rest of the computing curriculum I believe that not only would we see a return on investment in terms of performance in computing, we would see a return on investment in terms of computing across the rest of the curriculum, sorry, competences across the rest of the curriculum where computing has such a multiplying effect."[31]

Professor Simon Peyton Jones, Computing At Schools: "We need to pay sustained attention, which does mean some sustained money, but relatively small kinds of money will do a lot. I think that £5 million or £10 million applied for central things like CAS [Computing At Schools]—but not only CAS—to support the continued development of the subject and its pedagogy, particularly, which is still developing, would be extremely helpful. If we fail to do

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[27] Q 142
[28] Q 39
[29] Q 142
[30] Q 128
[31] Q 172

that, there may be a shrivelling up. Then that would lead to disappointment and disillusionment and people asking, 'Why did we do all this and was it any good?'."[32]

Industry input

Clare Sutcliffe, Code Club: "For me and from my point of view, it would be about strengthening or giving more responsibility to industry for passing on information about the skills that they require but also actually delivering training as well and passing on some kind of requirement for them to do this. It should not be left to just the larger companies to try to address this problem. I am sorry, I do not know any answer to it, but that will be the most helpful thing for our project, and I think for so many others as well."[33]

Marcus Mason, British Chambers of Commerce: "I think we would like to see better reform of the accountability system for schools by having more business governors on school governing boards, and by having schools judged more on the employment outcomes of their pupils."[34]

Internet as a utility/internet for all

Lucy Hastings, Age UK: "My second point, if I could have one, is that access to the internet should be treated as a utility service, the same as others, and that means the Government should recognise the significant cost of getting and staying online and nobody should be digitally excluded on cost grounds."[35]

Maggie Philbin, UK Digital Skills Taskforce and TeenTech CIC: "I still do not quite understand why we do not share our wi-fi more so that people do not have to pay huge amounts. Why can we not do that and just make it easier? Things do not necessarily have to be expensive, but I think it does have to be addressed."[36]

Joined-up working

Megan Richards, European Commission: "Making sure that these problems are known at the highest political level and that government works hand in hand with industry and with the educational system. I cannot see how any one group can succeed in this without working together with others."[37]

Rachel Neaman, Go ON UK: "I still want to say that I think a key role for government is to facilitate this joined-up strategy and to focus on that. If they are promoting the digital-by-default way of working and way of living, they should ensure that inclusion is included within that properly."[38]

Helen Milner, Tinder Foundation: "I would put that alongside joining up, so it is nice to think that the money may come from multiple departments. We already get some funding from NHS England, which recognises that health inequalities and digital inequalities go hand in

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32 Q 157
33 Q 142
34 Q 75
35 Q 142
36 Q 128
37 Q 231
38 Q 128

hand. Perhaps we could persuade others to ensure that it works, such as through Work Programme 2. Let us make sure that we do not have a Work Programme that does not include basic digital skills as a fundamental element."[39]

Lifelong/online learning

Helen Milner, Tinder Foundation: "In the formal sector there is a paucity of online learning, which needs to be improved, and there is an over-reliance on qualifications. Many large employers train people only up to a level 2 qualification, which actually excludes basic online skills."[40]

Marketing strategy

Professor Patrick Barwise: "My main recommendation would be to ask GDS [Government Digital Service], in collaboration with Go ON UK and its partners, to add a five-year branding and marketing strategy to its current excellent supply-side strategy, the aim being that when BCG [Boston Consulting Group] and Google do their world rankings in 2020, we will still be up there with the Nordics. That seems perfectly doable to me, and the sort of money I am talking about to make it happen, if it is properly executed, is between £50 million and £100 million a year; in other words, not an enormous amount of money relative to the other things we are talking about."[41]

Match funding by industry

Helen Milner, Tinder Foundation: "We recommend that that is £50 million a year from the Government over the period of the next Government, and that is already being matched by the voluntary sector. It is already giving the Government around £50 million a year. The private sector should be asked to match the figure both in cash and in kind. If we do that we will be as good as the Nordics, and perhaps better, and we will definitely be the world leader in basic online skills."[42]

Dinah Caine, Creative Skillset (Sector Skills Council for the Creative Industries): "I would say that the current patterns of industry investment being used to co-invest with industries, where industry is collaborating to address some of the key hotspot issues that have been identified through the industrial strategy, that co-investment should follow the industries. It should be niche to meet the needs of the industries or the progression of digital creative skills. Within that, without repeating where we were, I therefore think that there is a particular address to schools, to FE [further education] and to HE [higher education] that flows through to enable that. We have done quite a lot of assessment of the levels of co-investment that we believe need to flow into the industries, which will then, we believe, create a kind of supply side response, which will deliver to driving jobs and economic growth."[43]

David Hughes, National Institute of Adult Continuing Education: "The third one would be to use the European Social Fund locally and engage employers to be funders for delivering skills

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[39] Q 112
[40] *Ibid.*
[41] *Ibid.*
[42] *Ibid.*
[43] Q 209

to the workforce as well as to the community. I think that a specific focus for the ESF [European Social Fund] could be on that aspect."[44]

Ofsted

Hugh Milward, Microsoft: "Okay. What about Ofsted measuring the take-up of technology or the use of technology in schools as a formal measure for performance at schools? A thrust in that direction might encourage schools to think about it a bit more broadly. It is possible."[45]

Chris Mairs CBE, UK Forum for Computing Education: "There is a specific thing that Ofsted can do, which is that, probably in about 18 months' time, it might be extremely valuable to do some research and surveying in schools, not as a stick but as a means of understanding how well they are now managing to deliver this new curriculum. In 18 months' time we might find that significant intervention is required."[46]

Prioritising funding

Sue Husband, Skills Funding Agency: "You get what you pay for, in the sense that we would fund whatever the priorities are through local enterprise partnerships, seeing where the skills need is and putting the funding to address where the real need is, and so paying for what the economy needs."[47]

Raising internet safety awareness

Phil Fearnley, BBC: "In answer to your preliminary question, on 11 February this year we supported Safer Internet Day. Some 15 million people heard the message around safe internet use. We did a whole range of things including strips on the BBC 'One Show' and 'Newsround'. We had an additional 1.5 million people see news articles about the issue, and we used local radio. The effect of all that was that 25% of children heard the message about safe internet use and what it means, and 48% of the 25% actually changed their behaviour as a result. These things can be incredibly effective when they are done well."[48]

Regional strengths

Michael Gleaves, The Hartree Centre: "The main specific centres of excellence, the main skills such as adding the digital savvy skills to the main expertise, are the key aspect … I think you look at market sectors. The north-west of England is strong in chemistry and material science in effect. That cluster is there, so it makes sense to place the main specific application of graphene technologies or new lightweight material technologies in that area. Glasgow has a heavy industrial heritage and perhaps you would look at something in that area to try to build a cluster around that. I think that those act as melting pots and things for things to cluster around to demonstrate that capability".[49]

Gerard Grech, Tech City UK: "I think more institutes that have a centre of excellence. The Alan Turing Institute is very welcome. That obviously will have excellence in computational science, but we need to recognise that, to be first in digital as a country, there are many

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[44]   Q 102
[45]   Q 51
[46]   Q 52
[47]   Q 249
[48]   Q 112
[49]   Q 39

digital capabilities that we need from machine learning to user experience and user design. If we were to have these institutes that are attracting the best and brightest talent from around the world, we will certainly be recognised for being at the forefront of digital innovation."[50]

Charlie Taylor, National College for Teaching and Leadership: "We should think in terms of how the networks that already exist can be part of the delivery of this. For example, I visit teaching schools all around the country and I am just astonished by the sorts of things that they are achieving. Do not ignore the networks that are already there, which are already doing some amazing stuff around this. That would be my advice."[51]

Baroness Shields: "This would not cost a lot of money, but I have watched east London transform around a number of incubators, accelerators and Google Campus. Google Campus is run by Google and funded by Google, but it is not a Google P&L; it is separate. The last I heard, 22,000 businesses started from Google Campus. It is a hive. It is the most positive place in London."[52]

Relevance of higher education courses

Nick Coleman, IBM Services: "I think for me the one thing we can do is make the university system much more relevant, as in: continue that journey to make it a fast-moving response to emerging technology. If I think five years back we were hardly talking about cloud. Now if you are leaving university without an understanding of cloud, how are you relevant? Also, we see a lot of graduates where, frankly, soft skills—not just the formal education but the way of responding and fitting into employment—would be helpful. I do not think it will cost very much and I think we do a lot of it in a lot of places already, but we should make sure that the curriculum on those master's degrees and those undergraduate degrees, both in computing and the specialist degrees, is focused on keeping track of where the technology is, so it is experiential learning rather than all applied."[53]

Review of education and training

Karen Price OBE, on behalf of the Tech Partnership (e-skills UK): "My suggestion is that we commission an employer-led review of public spending on education and training in the IT space or the digital space, at school, college and university and across the publicly funded private training providers. The objective would be to improve the relevance of what is on offer. Are the courses and qualifications relevant and do they remove the duplication and enormous waste that is going on? People are being trained in the wrong things or the same things twice. We should try to reduce the fragmentation and get some sort of national framework in place."[54]

Martin Hottass, Siemens: "I would welcome the opportunity to tailor learning more to how the learner wants to learn. That sounds like a woolly answer, so let me explain. I learnt through books, as I assume all of you did, and the blackboard. A young learner these days learns through the iPhone or through social media. If we can use those channels to

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[50] Q 204
[51] Q 157
[52] Q 220
[53] Q 191
[54] Q 128

disseminate knowledge and engender appetite, that would be inexpensive because it is obviously an open-access platform. It would also give people knowledge they do not have and obviously better knowledge of careers. That would be the bit that I would incentivise."[55]

Chris Jones, City & Guilds: "I suppose I come at it from a slightly different perspective. There have been 61 Secretaries of State in the last 30 years responsible for skills. I would call for stability and I would call for greater independence of the skills policy from government."[56]

Smart immigration

Professor Nick Bostrom, University of Oxford: "I think there will be a massive premium in the digital economy on being able to attract the top global talent to your country, and there should be policies that could help with that. You can imagine that instead of just passively sometimes opening the door to immigrants and sometimes closing it, you could have a headhunting programme where you might advertise in countries where there are few opportunities to try to attract bright, young people without means to come here maybe to study. If they started a company during those years, they might have the opportunity to get to citizenship, so maybe we could embed them during their period here with opportunities for entrepreneurship and put them in contact with networks of mentors and locals. We should seek them out and make an active effort, just as a company would do that tries to recruit the best: they do PR, they look around, they go to job fairs and advertise in all kinds of places. Countries might want to consider doing the same."[57]

Standardised certification and accreditation

Karen Price OBE, on behalf of the Tech Partnership (e-skills UK): "Then I would come up with a series of certificates that individuals can gain, at school, college, university and in the workplace, so that employers know exactly what they are getting when they hire somebody from school, college or university. They know what they can do in this online world and where they can make best use of that talent. They also know where to train the people who are already on their payroll. If they, as a company, want to go digital or if an individual says, 'I see a further career opportunity for me by acquiring digital skills', they know where to go."[58]

Paul Hynes, George Spencer Academy: "I would like to see some qualification that recognised the work of student digital leaders reflected in performance tables that takes it on a step. Things like the nice idea of open badges takes it to one step but I would love to see a more robust certification that would be recognised by employers for that, reflected in league tables as well."[59]

Student fees

Professor Martin Weller, Open University: "My answer would be that we need to create a context within which innovation and experimentation can flourish. We are talking about digital skills almost separately, as if we could simply enhance them, but actually lots of things work against them. So off the top of my head I will refer to, for example, student fees. At the

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[55] Q 249
[56] *Ibid.*
[57] Q 39
[58] Q 128
[59] Q 172

moment they work against someone coming in and trying out a bit of learning, and perhaps then going away and coming back. They also make both students and universities quite risk averse. I would refer to the Research Excellence Framework as well, which tends to make academics think that they must publish in the traditional journals and should not do any of the other things. You need to look at the whole context within which digital skills develop. You want to allow for experimentation and innovation, but lots of things serve to constrain them."[60]

Talent pipeline

Antony Walker, techUK: "The one thing I would ask for is an approach that looks at interventions for the short, medium and long term—a comprehensive view of the pipeline. If you deliver that, that is the one thing that will be really successful."[61]

Tax relief

Hugh Boyes, The Institution of Engineering and Technology: "I would like to see greater encouragement of people to take up training in this area, or training generally in technology skills. At present, the way our tax system works, training cannot be set against tax, either at personal level or often at a company level. We need to ensure that we are upskilling our workforce. Technology is moving fast and the Government could do various things to encourage employers and the individual to raise their skill levels through formal and informal training."[62]

Teaching the teachers

Oliver Quinlan, Nesta: "So from an education angle my recommendation would be to explore how we take forward the three areas of use of digital technology in schools in terms of teacher skills, because I think that is the area that is lacking. Number one, we have a gap with teacher skills in terms of those who are delivering the new computing curriculum. That is something that there has been some funding to address, but there is much less funding than for a subject such as maths, which it could be argued is not a completely new subject in the curriculum. Teachers have largely never even studied it before in many cases, particularly at primary. The other area of the CPD [Continuing Professional Development] is the subject-specific use of digital technology. The example I gave was of science and how that has been impacted on. If someone has been a teacher for a number of years they may not have experienced how technology is specifically impacting on that subject. That is really important. The other area is how teachers professionally use technology for the best delivery of learning, which is a different and distinct area, in my opinion. The delivery of learning through technology is separate from those other two areas. So my recommendation would be exploring ways that teacher skills in those three areas can be supported, both in terms of the gap that I believe we have at the moment and the continuing engagement with things as they develop in a very fast-moving field."[63]

Mike Warriner, Google: "The number one thing that can make a change is investing in our teachers, whichever type of teacher we are looking at, and helping them to understand how

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[60] [Q 102](#)
[61] [Q 65](#)
[62] [Q 191](#)
[63] [Q 14](#)

they can teach technology to those aged five to aged 95 and use technology to change the way they teach it. Building on that framework is absolutely critical."[64]

Chris Mairs CBE, UK Forum for Computing Education: "I cannot stress enough how much of a challenge the teachers at primary schools and at KS3 in particular in secondary schools, are facing with the new curriculum. A lot of these teachers have never been taught computing themselves, so it is a big challenge. They need to be demystified and helped. It is so important, for the reasons that Mike [Warriner] articulated, that this is not about teaching people to code, per se, but about using that as a vehicle for teaching them flexibility and a way of thinking that will help them in the new world."[65]

Dr Bill Mitchell, BCS, The Chartered Institute for IT: "It is extremely important that teachers can get access to some local CPD [Continuing Professional Development]. We are suggesting to the Department for Education that they should be funding 1,000 master teachers. At the moment they are funding about 400. That is a very doable thing and is not at all expensive compared to the budget for the whole of education. It is a few million, so I would suggest that. The other thing that I would say is extremely important is to do some real research at primary school to see whether the good teaching of computing genuinely does support literacy in maths, because if that is true—and demonstrably so—it will transform what happens in primary schools."[66]

Sir Andrew Carter, South Farnham School: "Focus on teaching schools and focus on the school-led system. I have mentioned the governor in every school. A compulsory lead teacher for computing in every school. Seed funding for pupils and more training at initial teacher training. But that will come out of our report as well."[67]

Jack Evans, Kingsmead Primary School: "I would suggest highlighting the idea of training primary school teachers, looking at just for my background, in computing skills. I did not qualify too long ago, five years ago, and the computing that we did we had to pass a test for it but that was so tiny. You might be able to help me out slightly, Mr Berry, about what you do now but I would say focusing on the fact that it is a huge part of what we teach in primary schools now and making that training very rigorous."[68]

David Pollard, Federation of Small Businesses: "One thing on the business of teaching is that back in the 1980s when I ran a technical consultancy, we used to do work experience for teachers and they would come in during the Easter holidays and see what the business was like. I suggested to Elizabeth Truss, on the reform of the computing curriculum, that one of the problems is that so many teachers go from school to university, to teacher training and back to school, and they do not understand how important the digital economy is in business. So my other recommendation would be work experience where teachers can go to companies and see just how much the computer is an integral part of everybody's job, not

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64 [Q 51](#)
65 [Q 52](#)
66 [Q 157](#)
67 *Ibid.*
68 [Q 172](#)

just the software guys or the designers but the people in logistics, the people loading up the trucks for delivery and so on."[69]

Stephanie Daman, Cyber Security Challenge: "I would say, 'Get it right in the schools, because that is the fundamental thing'. If you give the teachers the resources they need to teach this properly at that level, you serve two purposes. You serve the wider digital skills agenda, but you also build that pool of people who I want coming out the other end, who I can upskill into the cybersecurity profession. With that one thing, I think you would serve two purposes."[70]

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[69] Q 65
[70] Q 191