Department for Education

Realising the potential of technology in education:

A strategy for education providers and the technology industry

This strategy covers the education sector in England only, although it includes commitments to support the UK-wide technology sector.

Contents

Foreword by the Secretary of State for Education

England has a world-class education system. From teachers in early years settings supporting children's cognitive, social and emotional development to universities preparing adults for active participation in further education, research and work, our teachers and lecturers are second to none. At the same time, we have a flourishing EdTech business sector, punching above our weight internationally and with a steadily growing export market.

Technology is often associated with increased automation and reduced human interaction, although within the education sector it will never replace the role of our great teachers. However, I believe technology can be an effective tool to help reduce workload, increase efficiencies, engage students and communities, and provide tools to support excellent teaching and raise student attainment.

I have seen first-hand, the difference that good use of technology can have in helping tackle some of the challenges we face in education. I visited Woodberry Down Primary School in London where teachers use cloud technology to share resources and collaborate, saving

teachers hours of time a week. Grimsby Institute of Further and Higher Education uses virtual and augmented reality to better prepare students for vocational careers. Nottingham Trent University is using data to help understand their students' engagement with their chosen degrees, allowing tutors to target interventions to better support their students.

These institutions face their own daily challenges, but they are all using technology for a purpose: to drive student engagement and attainment and to support effective working environments where staff can focus on teaching.

Yet all too often technology initiatives have failed to deliver value for money and, crucially, failed to have a positive impact. We know that not all education settings benefit from the modern broadband infrastructure needed to capitalise on the use of technology. It can be hard for leaders to understand how technology can support positive change and teachers are often told to just 'find a way to integrate technology or devices in the classroom'. It can be difficult for education leaders to separate evidence-based practice and products from a vast range of gimmicks. This strategy starts to address these challenges.

We have a longstanding history of innovation in this country, and our brilliant education innovators have the potential to have a transformational impact across our education system. Therefore, in addition to supporting teachers, lecturers and leaders, we will work in partnership with the EdTech business sector to ensure that businesses and investors access the wide-ranging offer set out in the government's

Industrial Strategy[1] to start, scale and grow successful EdTech businesses and to help encourage innovation to meet specific challenges facing the education sector.

We are living in a digitally enabled world where technology is increasingly part of our society. We owe it to our young people, and to anyone who wants to upskill, to do more to explore and reap the benefits that technology can bring. This strategy is the first step in helping us do just that across our education system.

Damian Hinds,
Secretary of State for Education
April 2019

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1 The Government published the Industrial Strategy in 2018 with the aim of boosting productivity by backing businesses to create good jobs and increase the earning power of people throughout the UK with investment in skills, industries and infrastructure: https://www.gov.uk/government/publications/industrial-strategy-building-a-britain-fit-for-the-future

1

Setting our vision for Education Technology

> **"** EdTech is not a silver bullet. In the 21st century, it should be seen as an inseparable thread woven throughout the processes of teaching and learning. It's senseless to pretend it isn't something that every teacher and every learner uses, every day. What we should concentrate on is when and in which ways it is best deployed to support these processes. **"**

Dominic Norrish
Group Director of Technology, United Learning Trust

What is education technology?

1. Education technology (EdTech) refers to the practice of using technology to support teaching and the effective day-to-day management of education institutions. It includes hardware (such as tablets, laptops or other digital devices), and digital resources, software and services that help aid teaching, meet specific needs, and help the daily running of education institutions (such as management information systems, information sharing platforms and communication tools).

Our aim

2. We aim to support and enable the education sector in England to help develop and embed technology in a way that cuts workload, fosters efficiencies, removes barriers to education and ultimately drives improvements in educational outcomes. In parallel, we will support the development of a vibrant EdTech business sector in the UK to provide proven, high-quality products that meet the needs of educators and foster a pipeline of fresh ideas.

3. Whilst it would be wrong to assume that technology will always deliver improvements, when used and integrated well, technology has potential to help create world-class education, training and care for everyone, whatever their background.

Technology in society

4. Technology has become embedded throughout society and has transformed the way we expect to engage with services and consume content. This is especially true for young people, where 46% of 5-15-year olds have their own smartphone, and 49% have their own tablet[2]. Yet the use of technology in education is highly variable and is rarely fully integrated.

5. Other sectors have seen the positive benefits that widespread use of technology can bring, including simplifying and automating tasks and processes, improving collaboration and access to information, and remodelling data collection and analysis. The health sector for example is using a broad range of technology to help improve services and increase efficiency; from electronic staff rostering to the electronic prescription service and the use of Artificial Intelligence to help identify diseases.

Opportunities for the use of technology in education

6. There are pockets of good practice across education too and the UK already has a growing, vibrant sector of EdTech businesses, providing a range of excellent and innovative products. There are many great and diverse examples across the country. Bolton College is using Ada, a virtual assistant that supports teaching and assessment to reduce workload. Ark Multi Academy Trust significantly cut costs by moving data and services to the cloud. The University of Wolverhampton is improving and increasing the flexibility and efficiency of physician training by using virtual dissection technology. Highfurlong Special School in Blackpool is using a range of assistive technology tools to enable their students, many of whom have high complex needs, to communicate and be active participants in their education. In these and many other settings, technology is supporting progress and leading to improved outcomes[3].

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2 Ofcom: Children and parents: Media use and attitudes report (2017) https://www.ofcom.org.uk/__data/assets/pdf_file/0020/108182/children-parents-media-use-attitudes-2017.pdf

3 EEF's teaching and learning toolkit reports that studies consistently find that the use of digital technologies are associated with moderate learning gains. They find on average an additional four months progress but with considerable variation in impact: https://educationendowmentfoundation.org.uk/evidence-summaries/teaching-learning-toolkit/digital-technology/

CASE STUDY

Bolton College has used IBM Watson to build their virtual assistant, 'Ada', who helps deliver on-demand requests for information, advice and guidance to their 11,000+ students. As of February 2019, Ada is able to respond to 2,500+ questions on general college enquiries as well as specific questions about students (e.g. attendance) and curriculum content across different IT systems. It is also available to staff and students via Amazon Alexa. Addressing student individual needs at scale in this way has saved staff many hours on administration activities and out-of-hours teaching, whilst continuing to deliver quality content to students.

CASE STUDY

Highfurlong School in Blackpool is a great example of where simple assistive technologies can lead to significant impact on student outcomes. Highfurlong School is a special school accommodating children with a wide range of needs. The staff have gone above and beyond to provide tools for students to communicate and express themselves. From simple switches to eye-tracking technology, or student-controlled sensory rooms, almost everything Highfurlong does focusses on empowering students to be active participants in their learning. Although the school recognises that excellent and passionate teachers drive this impact, they believe these methods of communication would be near-impossible without the technology to support it.

CASE STUDY

University of Wolverhampton is using a 3D visualisation system to supplement more traditional laboratory-based lessons on anatomy and dissection. Touch screens have increased student participation by allowing them to explore the complex relationships between different parts of the body, which would not otherwise be possible.

Across all phases of education, we are committed to supporting both the education sector and the EdTech industry to build on existing good practice and drive further innovation. We see five key areas of opportunity where technology can drive a step change:

- **Administration processes** – reducing the burden of 'non-teaching' tasks.

- **Assessment processes** – making assessment more effective and efficient.

- **Teaching practices** – supporting access, inclusion, and improved educational outcomes for all.

- **Continuing professional development** – supporting teachers, lecturers and education leaders so they can develop more flexibly.

- **Learning throughout life** – supporting decisions about work or further study and helping those who are not in the formal education system gain new skills.

7. Making the most of the opportunities afforded by EdTech will require a partnership approach that brings teachers, lecturers, leaders and experts from across the education sector together with businesses

to tackle common challenges. The measures in this strategy are intended to help ensure education providers, teachers and leaders are better equipped to adopt EdTech tools, and to ensure that businesses are better equipped to meet the needs of users and to measure impact.

Addressing the barriers to the good use of technology

8. We recognise that teachers, lecturers and education leaders often face a range of barriers to capitalising on the opportunities presented by technology, including:

9. A need for **modern infrastructure** to address slow internet connections and outdated internal networking and devices.

- The need for greater **digital capability and skills** including:

  i.   The skills and confidence to use technology effectively.

  ii. The leadership to instigate change and to empower teachers and lectures to be confident users of EdTech.

  iii. The awareness of available tools and expertise needed to compare and contrast different technology options.

- The need for **digital procurement capabilities** to make the right choices in selecting and buying technology products.

- Concern about **privacy, safety, and data security** and how education providers and students are being protected.

10. Government is committed to helping to tackle these barriers. Our aim is for all education institutions in England to reach a good minimum standard of digital maturity, which is an essential pre-cursor to the effective use of technology. Good use of

technology often follows the 'framework for change' detailed below (Diagram 1), requiring a tailored journey that starts with developing a vision (e.g. by choosing an area of importance that technology can help support), moves towards addressing the barriers, and ends with implementation and an ongoing iteration and review process that ensures technology continues to meet needs.

11. This document sets our ambition and commitment to supporting the steps outlined in this 'framework for change' as well as the importance of supporting the development of a flourishing EdTech industry. Many of the actions focus on helping those schools and colleges who need the most support.
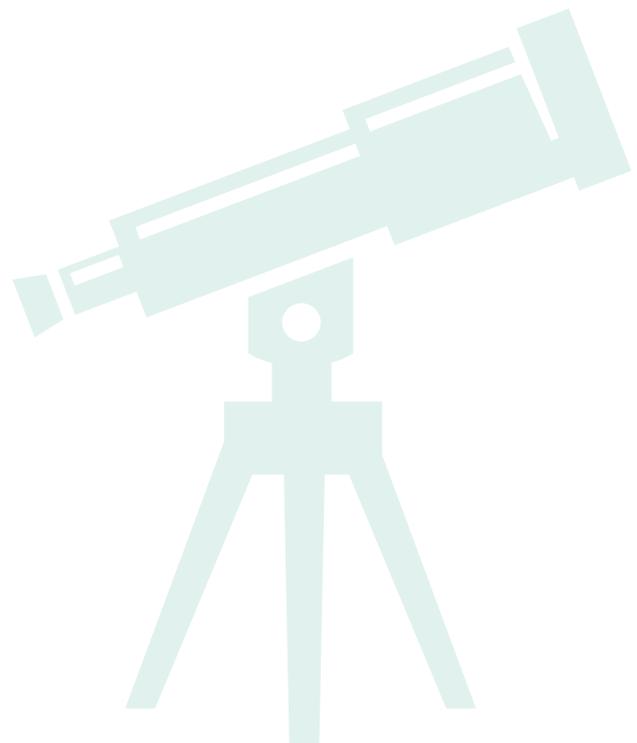
Diagram 1:
EdTech Framework for Change
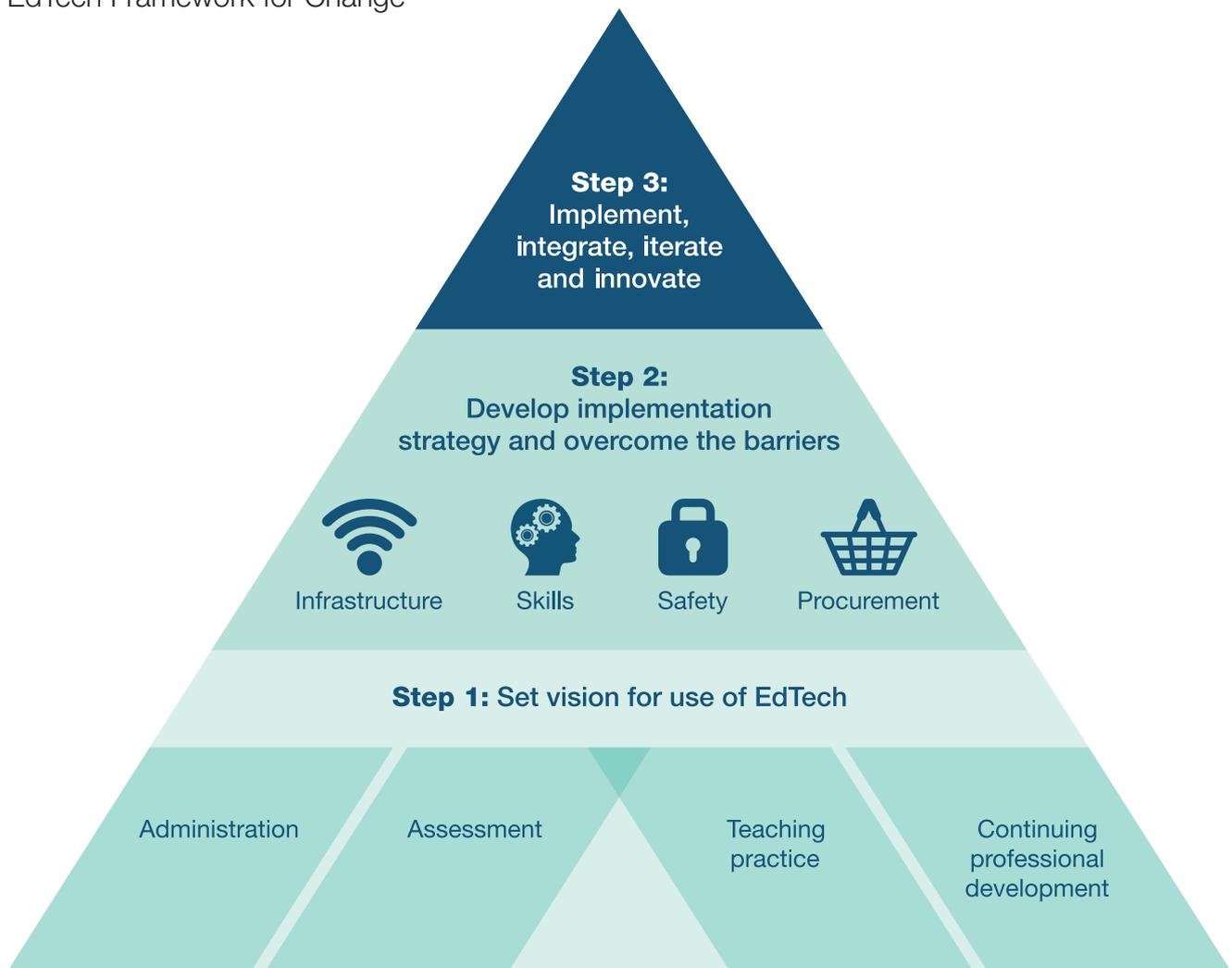
12. Outside of formal education, we see an increasing role for digital technology in supporting adults to up-skill and re-skill throughout their career, particularly as we respond to changes in the labour market. We know that adults can struggle to fit learning around their busy lives, with lack of time, competing work and/or caring responsibilities among the most common barriers, as well as a lack of appropriate local courses or having to travel too far to find suitable provision.[4]

13. Technology is playing an important role in supporting adults to overcome these obstacles. Online learning for example, can provide adults with flexibility, enabling them to learn the skills they need at a time and place that works for them[5] without being restricted to geographical boundaries or provision available locally. We are already piloting new approaches to the delivery of adult learning through the Flexible Learning Fund, which has made available £11 million to support a variety of projects across England. These projects are incorporating technology and other innovations in delivery

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4 Government Office for Science 2017, The Future of Skills and Lifelong Learning; Learning and Work Institute 2018, Adult Participation in Learning Survey.

5 DfE 2019, Review of the Online Learning and Artificial Intelligence Education Market (awaiting publication)

to improve the flexibility and accessibility of learning for adults, with many offering a blend of online and face-to-face provision.

14. In addition, at the 2018 Autumn Budget, the Government announced £100 million of new funding to continue testing and development of the National Retraining Scheme, which will give individuals in England the skills they need to progress in work, redirect their careers and secure the high-paid, high-skilled jobs of the future. This will include state-of-the-art courses combining online learning with traditional classroom teaching to help people develop key transferable skills.

Supporting the UK EdTech business sector

15. Supporting the continued development of a dynamic UK EdTech business sector will also be crucial to delivering our ambitions. Our aim is to ensure a choice of high-quality, proven products that meet the needs of teachers, lecturers and education leaders; to harness the new ideas and emerging technologies developed by innovative start-ups; and help those providers with proven products to scale and grow. In addition to the targeted commitments described throughout this strategy, our aim is to ensure that EdTech businesses and investors in the UK access the wide-ranging support offer set out in the government's Industrial Strategy.

16. We recognise the barriers that UK EdTech businesses can face in developing products, reaching customers, testing impact and growing their businesses. This strategy will support the UK EdTech business sector by providing:

- A clear vision of government's ambitions for EdTech and bringing new cross-sector leadership and clarity on the challenges that we most want to see addressed.

- Support to access the investment and business assistance set out in the government's Industrial Strategy to help industry develop ideas, test and evaluate products and grow companies both at home and abroad.

- Help to foster a vibrant and competitive market for EdTech products, with opportunities for buyers to meet sellers, and to test and iterate their ideas.

- Help to drive demand for EdTech products and services by developing the technology infrastructure across the education sector and the awareness and skills needed to better implement EdTech.

Improving our own digital services

17. In addition to the many digital services the education sector purchases directly, the DfE itself also provides hundreds of digital services across the education system. Whilst many are world-leading examples of government digital services, not all of them meet user needs in the most effective way. Too often they fall short of the world-class standards we set for ourselves and the wider technology market. We are committed to improving these services and have begun to transform them, starting with those that are used most and where the biggest improvements are needed.

18. We will build on our evidence of the strengths and weaknesses across our service portfolio, so that we can continue to improve these services. Our work will build on the common standards, guidance and components developed by the Government Digital Service (GDS) that help to ensure consistent approaches to delivering public services and to solve common digital challenges across government. This includes the Technology Code of Practice and the Digital Service Standard, which provide shared government approaches to technology.

The UK as a world leader in EdTech

19. The UK is already a world leader in education, with a global reputation for excellence and quality. The value of our education exports is significant and continues to grow steadily – in 2016, total education exports were estimated to be £19.9 billion to the UK economy, marking a 22% increase since 2010[6]. For EdTech specifically, we already have the largest EdTech market in Europe and some of the fastest growing EdTech companies in the world but have more to do to compete with the likes of the US and Australia, and increasingly the Scandinavian countries. Through this strategy, and the recently published International Education Strategy, Global Potential, Global Growth, we will support UK EdTech businesses to achieve success both in the UK and internationally.

20. We have the opportunity to build the best EdTech ecosystem in the world. This strategy sets out our next steps to realise this ambition and bring together the energy and expertise of educators, academics and businesses. We intend to build upon the actions in this strategy in the future and we will report on our progress in a year's time.

CASE STUDY

City of London Academy (Southwark) has introduced a strategic approach to using technology to allow students with dyslexia and other specific learning difficulties to achieve their full potential within the mainstream school environment. All students with learning difficulties are supported to use a computer in class and for summative assessments. Students can then take advantage of the built-in accessibility features of modern word processing software to overcome difficulties with handwriting, reading and spelling. These features allow students to type legible text quickly, spell-check errors and read text out loud. Text-to-speech enables students to listen to assessment questions/instructions and proofread their answers.

"By using the technology, pupils can show people what they can do, as opposed to what they can't do. If you have someone who has illegible handwriting or un-decode-able spelling errors etc., all you're going to see are the errors and not the good work that's behind them. So using the technology means that you get a truer sense of their underlying ability in the subject". Candida Dearing, SENCO at City of London Academy

A key part of the school's approach is screening all children for literacy needs in Year 7. Those with additional needs can then begin using the technology as part of their normal way of working long before they need to apply for exam adjustments for GCSEs. The school further supports students to learn to use the technology independently, including by teaching these skills within the IT curriculum.

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6   Department for Education, 2019, 'UK revenue from education related exports and transnational education activities 2016'

2

Securing the digital infrastructure

66 Having new super-fast broadband reach our school has revolutionised the way we work. The much faster and reliable access to the web has allowed staff to work more efficiently, while the children, although still geographically remote, are no longer technologically isolated and will have the same opportunities as their urban peers in preparing for a more technological future. 99

Mary See
Headteacher at Cheselbourne Village School, Dorset

Addressing poor internet connectivity

21. One of the barriers to implementing technology effectively is internet connectivity. Without the right connection to the building, education institutions will be unable to reap the potential benefits of technology.

22. According to data from Ofcom, there are at least 500 schools in areas in England struggling with slow connections to the building, with around 100 of these in areas with average download speeds as low as 1-2Mbps. This connection speed prevents teachers from streaming video content without buffering, from working collaboratively with online tools, or from moving storage solutions to the cloud (see below).

Our aim is for all schools to have access to modern broadband infrastructure

23. Government has set out our goal of nationwide full-fibre by 2033 because full-fibre connections are faster, more reliable and cheaper to operate than their copper predecessors. Recognising the importance of broadband infrastructure in education, we are working with industry and the Department for Digital, Culture, Media and Sport (DCMS) to accelerate the full-fibre internet connectivity rollout to all schools in England. In addition to this, we are supporting those schools most in need[7], which will not otherwise receive a timely upgrade through commercial routes. DfE and DCMS have been working

to identify hundreds of schools where we will **accelerate connectivity by funding a new full-fibre connection over the next two years**, bringing schools, local communities and businesses onto an ultrafast, full-fibre connection. This work is part of DCMS's Rural Gigabit Connectivity Programme, using funding from the National Productivity Investment Fund. It represents the start of government's "Outside-In" approach, which was identified in the Future Telecoms Infrastructure Review as necessary to ensure future-proof connectivity to areas that are not likely to receive commercial full-deployment by 2033.

24. Colleges and universities tend to benefit from better internet connectivity than the school sector. For example, the Association of Colleges' survey data suggests that 97% of colleges in England are well-resourced with their internet connection[8]. We support Jisc[9] to provide full-fibre connections through their Janet network[10] to higher and further education institutions. Jisc is the independent expert organisation which provides digital infrastructure and services to the higher and further education sector. The Janet network was developed to expressly meet the needs of tertiary education and offers the high speed, reliable connection that is vital for research and teaching. It provides an unrivalled level of cyber-security against mass cyber-attacks. We will continue to work with Jisc to help ensure that their infrastructure remains robust and reliable and meets the needs of the sector it serves.

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7 As announced in the Future Telecoms Infrastructure Review, which set out the government's ambitions for telecommunications connectivity, the market alone is unlikely to support network deployment in the final c.10% of premises. https://www.gov.uk/government/publications/future-telecoms-infrastructure-review

8 AOC: College IT and Digital Technology Survey (2018): 97% of colleges believe they are well resourced with their internet connection: https://www.aoc.co.uk/files/aoc-college-it-and-digital-technology-survey-2018-summary-resultspdf

9 Jisc formerly known as he Joint Information Systems Committee, provide digital solutions for UK education and research: https://www.jisc.ac.uk

10 Janet is a high-speed network provided through Jisc for the UK research and education community.

25. Ensuring fibre connectivity to the building is just the first step. The actual internet speed experienced is also affected by the technology and Wi-Fi arrangements in place within institutions. With the growing number of devices in schools, colleges, universities and other providers, the demand for robust and reliable local networking and high-speed Wi-Fi is greater than ever before. We know that schools[11], colleges[12] and universities[13] can struggle with the interruption to teaching and the wasted time caused by buffering and slow upload, download and login times that accompany poorly implemented local networking and Wi-Fi.

26. We have published a **suite of guidance documents that will help steer schools, colleges and other providers through the key questions and issues to consider when implementing technology infrastructure,** including broadband and local infrastructure issues. In addition, Jisc provide colleges and universities with infrastructure, training, guidance, consultancy and services such as Eduroam, which delivers secure and seamless internet access across locations and devices.

Moving to 'the cloud'

27. Securing high speed internet connectivity opens opportunities for education providers to move to cloud-based services and storage. Cloud technology allows information and services to be stored, maintained and managed remotely through the internet rather than on a local hard drive or an on-site server.

CASE STUDY

Ark Multi Academy Trust (MAT) has employed a 'Cloud First' approach across the MAT to improve collaboration and communication within and between its schools. Providing cloud solutions (where data is stored, maintained and managed remotely and accessed through the internet rather than on a local hard drive or server) has allowed practitioners and school leaders to focus on the things that matter – teaching and learning in the classroom, supporting effective professional development, and providing students with the support and resources that they need.

Core to the MAT's software selection is the ability to extract and use staff and student level data to derive actionable insights that can support the network. For example, they are able to support reductions in teacher workload by automating the transfer of assessment data between two systems. Additionally, Ark has reported saving over 50% on on-premise hardware by moving to the cloud.

"There are a huge number of cloud software services out there, and it makes no sense for all of our schools to use different ones. It is when we aggregate data and information across our schools and from different tools that we can really start to leverage the strength of being in a network. It is a bonus that this is often more cost effective as well!"
Lauren Thorpe
Head of Data & Systems Strategy, Ark Schools

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11 BESA ICT survey (2018): Only 78% of primary schools and 81% of secondary schools believe they are well resourced with Wi-Fi

12 AOC: College IT and Digital Technology Survey (2018): 86% of colleges believe they are well resourced with Wi-Fi
   Jisc: Digital experience insights survey 2018: 79% of college teachers believe they have access to reliable Wi-Fi

13 Jisc: Digital experience insights survey 2018: Only 82% of university students and 84% of university teachers believe they have access to reliable Wi-Fi

28. **We recommend that all education providers actively consider and evaluate the benefits of moving to a cloud-based approach for their IT system** (moving away from relying solely on 'on-site' servers). Cloud-based systems are usually more secure, cheaper to run and enable more flexible working. This recommendation aligns with the Government Cloud First policy introduced in 2013, which requires central government to consider and fully evaluate potential cloud solutions first, before considering any other options, and strongly recommends that all public sector organisations should do the same. Further information is available in the **Technology Code of Practice guidance**. Our suite of **guidance documents** for schools, colleges and other providers mentioned above also includes advice on moving to the cloud. Further information on support for procuring and moving to cloud-based services is provided in section 4 below.

Technology infrastructure within further and higher education

29. Having high-speed internet availability and effective data storage enables education providers to be more innovative with their digital infrastructure. Some universities and colleges, for example, are beginning to use data analytics and new Internet of Things[14] (IoT) technology to help improve the management of their campuses by directly and automatically responding to student interactions and adapting to meet their needs. Jisc are committed to working with the higher and further education sector to upgrade infrastructure so that members can manage new IoT services through a dedicated portal.

CASE STUDY

Nottingham Trent University's (NTU) technology infrastructure has enabled them to use learning analytics to support students. This helps build better working relationships between students and staff, and helps students to better regulate their approaches to learning. Their Student Dashboard draws data from 7 institutional data sources and uses Solutionpath's StREAM tool to show how engaged students are with their studies in comparison to their peers. Without the university's technology infrastructure, such targeted systems would not be possible.

The Dashboard is designed to be used by both students and staff, who are encouraged to periodically check student engagement. It has helped build better relationships between students and personal tutors; tutors report that they are able to target their interventions more appropriately, and that there has been a positive impact on student behaviour. Tutors discuss engagement scores with their students and are automatically alerted by email when student engagement drops. Students themselves have responded positively to the Dashboard; 27% of students reported a positive change in their behaviour in response to seeing their own engagement ratings.

The University reports that a culture of transparency and a close partnership with the student body was critical to the success of the initiative and was instrumental in reducing concerns about the ethical use of student data.

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14 The Internet of Things (IoT) refers to the extension of internet connectivity into physical devices and everyday objects. These devices could be sensors that collect information and then send it to the internet, devices that receive information and act on it and devices that can do both

3

Developing digital capability and skills

Teachers are central to the effective use of education technology. At the Chartered College of Teaching we believe technology must be driven by the needs of the classroom and not the other way around. We want our teachers to have the resources and expertise to use technology effectively and be able to draw on the best available research evidence. We are pleased to be working with the Government on this important work and to foster greater collaboration. "

Dame Alison Peacock
CEO of Chartered College of Teaching

Supporting education leaders to develop a vision for technology

30. Technology works best in education when strategically introduced by skilled, and confident staff. The best leaders place a strong focus on how technology can improve processes and teaching, they build digital capability amongst their staff and achieve good value for money through their procurement. We know however that many leaders can struggle to know where to start with technology; they may be experts in education but are often not experts in digital technology. The same is true for teachers – we know that confidence and willingness are among the main barriers to adopting digital technologies[15][16], and that ensuring teachers have adequate training available is often the biggest challenge[17].

Continuing professional development and understanding of what works

31. Our aim is for teachers to feel supported to use technology through high-quality continued professional development, and to have understanding of what is available and access to evidence of what works. In partnership with the Chartered College of Teaching we have launched **online training courses for teachers and leaders in education,** which strive to improve the use of technology in teaching, alongside other training opportunities offered by industry. The first of these is available at www.futurelearn.com/courses/technology-teaching-learning. Access to the training is freely available online for all educators. The Chartered College of Teaching are working

with its members and with the sector to encourage take-up.

32. We have also supported a special edition of the Chartered College of Teaching's journal, Impact, which is designed to disseminate best practice and encourage research-rich teaching. The special edition, available online, focusses on the impact of EdTech through the lens of teaching, including latest research, best practice and teacher reflections on successful application. The articles build on existing resources such as the Digital Technology strand and associated guidance of the Education Endowment Foundation's teaching and learning toolkit, which provides a summary of the international evidence on the use of technology in teaching.

33. Schools, colleges and other providers have told us that they value hearing and learning from their peers and seeing what works in context. Therefore, **we will be launching a network of 'demonstrator' schools and colleges** to showcase best practice and offer peer-led hands-on support for those schools and colleges that need it. The demonstrator schools and colleges will leverage existing expertise in the sector and help to provide peer-to-peer support and training. We will be designing this network with the support of the EdTech Leadership Group (see Section 6), drawing in industry expertise and support and learning from schools and college leaders about what they would find useful. We want every school and college to have the opportunity to visit one of these schools or colleges and see the impact of effectively used technology for themselves.

34. In addition, Jisc provide colleges and universities with training, guidance,

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15 BESA EdTech survey (2018): Schools state teacher willingness as the most common barrier to using more EdTech (29%). Primary schools are more likely to state teacher willingness as a barrier (32%) than secondary schools (25%)

16 AOC: College IT and Digital Technology Survey (2018): 93% of colleges reported staff skills and confidence as a barrier to better uptake of technology

17 BESA ICT survey (2018): Training on their ICT resources is the largest ICT challenge faced by both primary (54%) and secondary (66%) schools

consultancy and services to help build digital capability and skills. Jisc's annual sector-wide insight assessments on staff and student digital skills also enable colleges and universities to understand their digital skills gaps and support them to use technology in a way that transforms the learning experience and maximises student success.

35. We have also been supporting the BESA LearnED programme, which is bringing together teachers and industry to showcase products and best practice through 8 accredited **continuing professional development roadshow events** across England. The events run up to summer 2019 and over 1,200 teachers and education leaders are expected to attend. They are free to teachers and education leaders and provide the opportunity to see a range of technology in action in the classroom

as well as to hear from the experience of other educators on their EdTech journey. Following the success of these events, we will continue to support BESA in their plans to repeat the roadshows in the 2019/2020 academic year.

CASE STUDY

Grimsby Institute of Further & Higher Education has transformed teaching practice to not only provide their students with necessary skills to be active participants of the future workforce, but also provide a pipeline into local industry.

Grimsby's use of Augmented Reality and Virtual Reality allows them to provide 'real life' work experiences to better prepare students for working life. For example, they have an offsite training facility (Modal) which acts as a fully immersive marine and logistics simulator hub, where students can experience day-to-day high-pressure scenarios of working on a ship.

"The immersive experiences that we provide mean students can experience things going wrong in a simulated environment before they go wrong in real life. It prepares them for high-risk scenarios in their career that could be life-saving. Additionally, we provide students with industry standard technology that gives them a better opportunity to find and transition into their chosen career paths".

None of this would have been possible without the support and drive of the leadership team who provide an active and innovative culture of learning that allows their staff to trail new teaching methods, set their own training goals and investigate new technologies in a specially dedicated staff learning space. The institute also makes use of free resources to help their staff continuously improve, such as the Microsoft Innovative Educators programme.

Debra Gray
Principal at Grimsby FE & HE Institute

CASE STUDY

Woodberry Down Community Primary School in Hackney is using technology to help level the playing field for their students and to help reduce workload for their staff. Technology is being used to help teachers communicate and to collect and record student progress seamlessly – from enabling them to take photos and file pupils' work instantly, to marking work digitally and sometimes automatically. The ability to capture work on-the-go means teachers don't need to spend additional time collating and filing evidence. Instead, they can just tap into their digital portfolio and pull out evidence at the click of a button. It has reduced the need to duplicate, removing the need for a paper trail.

The school is part of New Wave Federation alongside two other schools. Continuing Professional Development is highly valued in the community and school leaders understand that many teachers may lack confidence in embedding technology into their teaching. Consequently, New Wave Federation hosts several differentiated sessions depending on a teacher's level of experience with the technology. As an Apple Regional Training Centre, the school also hosts a wide range of free training events on how to use technology to target specific challenges or to increase efficiency and efficacy.

"The technology has just been transformative. It has reduced my out-of-class workload by almost an hour every day. It's also introduced a level of flexibility that just wouldn't be possible before – I can teach without standing in front of the classroom and I can home in on children's digital devices to see who needs the most help even when they are not asking for it. I can target my teaching to where it's needed the most."

Class Teacher
Woodberry Down Community Primary School

4

Supporting effective procurement

> Teachers – (and parents!) – need to know the total cost of ownership when they are buying technology. Often, however, EdTech companies do not make this clear. This means the benefits for teaching and learning aren't maximised, and schools/families don't get value for money from the technology they buy and become locked into tools and services that don't do what they need it to do.

Katy Potts
Computing and Online Safety Lead at Islington Council

Helping education providers to get the best value when purchasing technology

36. Each year, schools in England spend around £10bn of non-staff costs, including £470 million on software and hardware for learning[18]. Colleges spend £140 million a year on technology[19]. However, due to the nature of school and college accounting, we believe that schools and colleges are spending far more than these figures imply, including for example spend on ICT by schools to support school administration.

37. We have developed recommended buying deals for schools so they can get cheaper prices through pre-negotiated contracts for a wide range of products and services, including education technology. This includes 7 different endorsed ICT deals covering a wide range of technology products and services.

38. One of the 7 ICT deals, a deal known as 'the G-Cloud deal', which is available through the government Digital Marketplace platform, is helpful for schools that want to purchase either cloud-based technology that is not included in standard buying catalogues, or cloud support to help move information and services to the cloud or provide ongoing support. Further guidance on the G-Cloud framework is available at www.gov.uk/guidance/the-g-cloud-framework-on-the-digital-marketplace. We assess and refresh the list of recommended deals on a regular basis, working with partners and schools to continuously improve the offering.

39. The buying deals and procurement guidance are available from The Buying for Schools Gov.UK page. Further developments are being planned to make it easier for schools to use our deals. We are also taking steps to assess the benefits of existing buying catalogues and will consider how to signpost the best products from these catalogues.

40. We understand that knowing what technology to buy to address an education provider's needs is often a challenge. We have been working with the British Educational Suppliers Association to support a trial of their LendED service, an **online lending library for EdTech software** where educators can try products before they buy. This service will enable schools, colleges and other providers to access information about a wide range of products, read user reviews and try out products for free. The service already has well over 150 products and services available for educators to view, compare and try.

41. We will explore how to facilitate a better online marketplace for EdTech, to help schools and other providers connect with a wide range of trusted, quality products. This will ensure that they are able to draw on the opinions and experiences of their peers, achieve value for money and help to buy products and services quickly and effectively.

42. We are also **trialling an offer of independent and tailored buying advice** through Buying Hubs in the South West and the North West of England, which includes testing a service to directly manage procurement for schools. The aim of the pilots is to test models for potential national roll-out.

43. The department also directly engages with local School Business Manager Networks to increase awareness of our work to improve procurement practices across the school system.

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18 Figure based on the 2016-17 Consistent Financial Reporting data across all schools in England.
19 https://www.gov.uk/guidance/esfa-financial-management-college-accounts

44. In higher and further education, Jisc negotiates on behalf of universities and colleges to procure and license high-quality content from digital publishers and large suppliers of digital software and storage services to ensure the sector gets the best price and terms.

CASE STUDY

LendED is an online platform developed by BESA in partnership with DfE designed to match teachers with relevant quality EdTech products, as well as helping them to become more informed buyers of technology. Each product on the platform includes case studies demonstrating impact within schools and is available for a free trial.

The platform has 1200+ users per month, with visits increasing on a week by week basis. Feedback from teachers using the platform has demonstrated a real need for the service and suppliers have welcomed the initiative, with many proactively asking how best to demonstrate the impact their resources have. Although launched in January 2019, teacher reviews are already being added to the site, giving an additional layer of peer-to-peer recommendations.

"I found LendEd to be extremely intuitive to use when searching for products for my subject area. It is something I will definitely be using in the future when looking for good value quality products. I particularly like the detailed case studies on the products which helps to quickly identify if the product is fit for purpose."

Leon Fortt
Design and Technology Department,
Langley Park School for Boys

CASE STUDY

Strode College, a small further education college in rural Somerset with around 1,500 full-time 16-18 year olds, as well as higher education students and adult learners, has reported saving thousands of pounds using digital resources procured and licensed by Jisc (for example using e-books).

This has allowed the college to level the playing field for the student experience. Their students can access the resources they need from home or on the move – something that is really important to a rural college like Strode where some students can commute on buses for up to two hours to and from campus. The simplicity in accessing content online and the flexibility it provides, ensures students remain engaged.

5

Promoting digital safety

66 We live in the information age and it's important that we teach young people how to be critical users of information. We teach our pupils fundamental skills about using technology, but we also need to teach them to search out for bias, to be analytical and to question and aggregate information because that's how the modern economy works. We are preparing them for third level education, we are preparing them for the world of work, but we also want them to access the very best learning resources and the interactivity that comes with using technology. 99

Fergal Moane
Deputy Headteacher and IT Strategy Lead at Sandringham School, St Albans, Hertfordshire

Securing digital safety and security

45. Many are rightly concerned about the privacy, security and safety implications that come with adopting technology[20]. Education leaders and teachers will have seen the problems that can come with poor products and poor implementation. Information and cyber security are fundamentally about understanding and acknowledging risks and working through all avenues to appropriately reduce them. There are examples across public services where serious incidents have arisen from poor risk management and practice. For example, the WannaCry cyber-attack, where a computer virus infected computers and demanded a ransom payment to allow access, which affected the National Health Service in 2017, led to disruption in care in at least 34% of trusts in England and could have been prevented by following ['basic IT security practice'](#).

46. Schools, colleges, universities and other providers are directly responsible for their own security and data protection and need to ensure they have the appropriate level of security protection procedures in place in order to safeguard their systems, staff and learners.

47. We have published a [data protection toolkit](#) which helps guide schools through key data protection activity, including compliance with the [Data Protection Act 2018](#), by developing policies and processes for data management, from collecting and handling their data through to the ability to respond quickly and appropriately to data breaches.

48. The [National Cyber Security Centre](#) (NCSC) provides advice and support on how to avoid computer security threats. Their published [guidance](#) advises how organisations, such as schools, colleges, universities and other providers can protect themselves in cyberspace. We are also working with the NCSC to review and produce appropriate guidance for schools on cyber security.

49. [Jisc](#) provide a range of security products and services, advice and support to help keep users and data safe, and universities' and colleges' networks and systems working. Jisc's Security Operations Centre continually monitors and resolves security incidents on the Janet network. Those schools that procure their internet service through a Regional Broadband Consortia[21] also benefit from Jisc's security offering.

50. Schools, colleges, universities and other providers should report any personal data breach under the Data Protection Act 2018 to the [Information Commissioner's Office](#), and security incidents to [Action Fraud](#) (the National Fraud and Cyber Crime Reporting Centre) who work alongside the [National Fraud Intelligence Bureau](#) (NFIB). Action Fraud also provide help and advice through the Action Fraud contact centre.

51. Schools and colleges, however, should also be doing all that they reasonably can to limit children's exposure to potentially harmful material by ensuring appropriate filters and monitoring systems are in place, as set out in the **[Keeping children safe in education](#) (KCSIE) statutory guidance**, which schools and colleges must regard. KCSIE signposts schools and colleges to the UK Safer Internet Centre's [guidance](#) that helps

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20 BESA EdTech survey (2018): 25% of both secondary and primary schools cite E-safety or data protection as a key barrier to using more EdTech
BESA ICT survey (2018): 50% of primary and 39% of secondary schools cite security concerns as a major barrier to adopting cloud-based storage

21 Regional Broadband Consortia were created in the UK in 2000 to secure lower prices for broadband connections and services for schools by aggregating demand across a region and entering into region wide contracts.

to explain what 'appropriate' filtering and monitoring might look like.

52. The statutory guidance for schools and colleges on safeguarding children and safer recruitment, **Keeping children safe in education**, is clear that schools and colleges should consider a whole school approach to online safety. In addition to monitoring and filtering, this should include ensuring that children are taught about online safety as part of a broad and balanced age-appropriate curriculum, considering online safety as part of their staff training requirements and having a clear policy on the use of mobile technology.

53. EdTech suppliers should adhere to the **Cyber Essentials minimum standards developed by the National Cyber Security Centre** as well as the guidelines developed within the government's **Code of Practice for Consumer IoT Security** to ensure that any products connected to the internet are secure by design.

54. A joint Department for Digital, Culture, Media and Sport (DCMS) and Home Office White Paper will be published shortly, setting out a range of legislative and non-legislative measures detailing how we will tackle online harms and set clear responsibilities for tech companies to keep UK citizens safe. DCMS will continue to work with DfE across the range of Government work relating to online safety and safeguarding for children and young people.

CASE STUDY

Cam Everlands Primary School located in Gloucestershire looks to technology to support school improvement, particularly for progress in reading, writing and maths.

Recognising that security and online safety can be a concern, the school made e-safety a core part of their technology implementation strategy. They focused on ensuring that the tools they used were secure and efficient to help protect sensitive data. As a result, safeguarding concerns are now recorded digitally, resolved quicker and with a smaller chance of information loss compared to having a paper trail.

Recognising that this strategy would also include parents – most of whom were already using technology – they focused on teaching both students and parents to be safe online. They now provide drop-in sessions for parents to increase their understanding of how to keep themselves and their children safe online, from understanding how to use email to setting parental controls.

CASE STUDY

Jisc's Security Operations Centre (SOC) helps to keep their members safe by monitoring their Janet network against thousands of attacks a year and by sharing intelligence and advice with its members' security teams.

They help to mitigate and protect against the impact of major cyber security issues, such as Distribution Denial of Service (DDoS) attacks, confidentiality breaches and loss of data by drawing on a range of market-leading protection solutions, combined with in-house tools. By monitoring the network in a targeted way, the team can identify and deal with threats before they become a reality.

Within the SOC, Jisc's Computer Security Incident Response Team work with institutions faced with security incidents to investigate and recover from them as quickly as possible. The team share information with security teams across the sector and more widely, including government agencies, to help investigate and deter further attacks against education and research.

6

Developing a dynamic EdTech business sector

"   EdTech is a fast-growing sector and I have the pleasure of accompanying an ever-increasing number of UK companies at leading education events around the globe providing technology-led solutions to support schools and Ministries of Education internationally. It is therefore vital that our own Government supports the continued growth and development of this exciting future-focused industry. The DfE's work partnering with key teaching and industry bodies to focus on practical school-led solutions, showcasing best-practice uses of technology in schools, and teacher tech training in peer-to-peer groups will help raise both the confidence and competence of the teaching workforce. "

Caroline Wright
Director General at the British Educational Suppliers Association (BESA)

Supporting a world leading EdTech business sector

55. A vibrant UK EdTech business sector is essential to ensure we realise the ambitions of this strategy. As the sector continues to grow and mature, our aim is to ensure a pipeline of innovation and encourage scale-up for proven products and services which are evidence-based and focused on the needs of teachers, lecturers, education leaders and students.

56. The government's Industrial Strategy sets out our ambitions to place the UK at the forefront of the technology sector and other sectors of the future. The UK EdTech sector is one such sector: it is already a success story – projected to be worth £3.4bn by 2021[22], developing some of the most imaginative EdTech ideas and putting cutting-edge technologies in the hands of teachers and students. The sector is therefore already well-placed to meet the ambitions set out in this strategy and we will support the sector and innovative businesses to grow further.

57. Government is already working closely with EdTech businesses and key sector organisations to understand how we can help businesses to grow, and ensure they are meeting the needs of the education sector. The Industrial Strategy sets out wide-ranging support to help UK businesses in any sector to start, scale and grow, alongside more focussed support for innovative, tech-led businesses. We will continue to work in partnership with businesses and leaders in the UK EdTech sector, highlighting our ambition and vision for EdTech, to ensure that UK EdTech businesses and investors access this support.

58. In addition, many of the actions described in this strategy will help to tackle the challenges that businesses have told us they face in terms of getting their product to market and scaling up their growth. For example, this includes the following actions which will help EdTech businesses reach teachers, lecturers and education leaders:

- Raising the profile of the importance and potential benefits of using EdTech in schools, colleges, universities and other providers.

- Helping education providers improve procurement practice and understand their procurement options, which also helps aggregate demand and cut the costs of sales for companies.

- Supporting the opportunity for schools to meet EdTech companies and see products and services in action through the BESA LearnED programme of roadshows.

- Supporting a BESA-led trial of their LendED service allowing schools and colleges to compare and trial technology products and services and giving EdTech companies a new platform to engage with schools and colleges.

- Exploring how to facilitate a better marketplace where schools, colleges and other providers can buy with confidence, whilst also making it more efficient and effective for businesses to gain their route to market.

59. We also support the work of the joint Emerge Education/Jisc Higher Education/Further Education Advisory Board, attended by universities and colleges, and supported by key industry partners[23]. As part of the group's programme of work, it has steered

22 According to Benjamin Vedrenne-Cloquet, co-founder of London EdTech Week and EdtechXGlobal, and partner in IBIS Capital, an EdTech investment firm https://edtechnology.co.uk/Article/the-uk-ranks-1-in-edtech-venture-capital-funding-in-europe/
23 Led by Mary Curnock Cook OBE

the 'EdTech Launchpad', a scheme designed to identify and support further and higher education focused start-ups, aid product development, and to make it easier for universities and colleges to work with start-ups.

60. In addition, the following actions and ongoing activity below will help support individual UK EdTech businesses to grow at home and internationally.

Providing businesses with a clear vision for EdTech and strong leadership for the sector

61. Through this strategy, we will underline the crucial role that technology will play in transforming education, establish this vision and galvanise the energy of the sector. We have already taken steps in this area, through our increasing engagement with businesses, and through partnership activity like supporting the Rocket Fund **initiative** that has boosted support and engagement with local communities to help UK schools procure and embed innovative technology.

62. To support the type of coordinated sector leadership that is a feature of other more established business sectors, the DfE and the Department for Business, Energy & the Industrial Strategy (BEIS) will **establish an EdTech Leadership Group,** that will ensure that both the business sector and the education sector are able to drive the delivery of this strategy across England. **We will work with the Group to agree a plan by the end of the year,** including on how industry and the English education sector will support the aims set out in this strategy, and will work with this group to utilize their networks and communication channels to discuss this with the broader sectors.

63. BEIS will also take steps to engage beyond the current EdTech business sector, to inform and inspire innovators in the UK

technology sector more widely. We will aim to tap the potential of technology innovators who are not already bringing their products and ideas to bear in education settings. BEIS will therefore work with key organisations in the UK technology sector, including TechUK and Digital Catapult, to ensure we further galvanise activity.

Stimulating a vibrant market for EdTech in the UK

64. One of the main challenges felt by both businesses and schools is a deep-seated issue of market fragmentation. Thousands of schools, multi academy trusts and colleges in England procure goods and services individually and it is difficult for businesses to engage efficiently to build a customer base.

65. The activity described throughout this strategy will pay a crucial role in driving demand and developing this vibrant market, directly benefitting EdTech businesses. The DfE and BEIS will maximize the impact of that work by ensuring that outputs are disseminated to technology innovators (through the EdTech Leadership group, and other technology sector networks) so that businesses understand school procurement approaches in England and can respond accordingly.

66. EdTech businesses often struggle to access education institutions to test, pilot and prototype their products. Teachers, school and college leaders and business managers are rightly focused on the day-to-day needs of their students and their organisations. This means the feedback that EdTech products and services developers receive can be limited, which in turn hinders the ability of EdTech innovators to evaluate and refine their offer.

67. We will therefore work with industry, research and education groups to establish small **'testbeds' of schools and colleges in England** to support the development, piloting and evaluation of technology**.** They

will help to build evidence of what works to benefit both education and industry.

Ensuring a business environment that supports UK EdTech businesses to thrive

68. Innovative EdTech start-ups and SMEs[24] share many of the same characteristics and challenges as businesses within the wider technology sector. The challenges that many of these businesses face derive from their innovative nature, their unproven business models, their aspiration to break into and transform established sectors, and their application of emerging technologies to novel contexts.

69. Through our Industrial Strategy we are providing support for UK technology innovators to access finance and business investment as well as support to source the practical help and advice they need to develop their ideas and grow. BEIS will work with our new Leadership Group mentioned above, to ensure UK EdTech businesses and potential EdTech Investors are aware of these opportunities and are able to access and benefit from them.

70. The **British Business Bank (BBB)** was established in November 2014 as a government-owned economic development bank that makes finance markets for UK smaller businesses work more effectively. It enables debt and equity finance for businesses at each stage of their development. The government's Budget in 2017 provided significant additional funding to BBB to support entrepreneurs and businesses with high potential for growth, including £2.5bn for the British Patient Capital (BPC) programme. BBB is working to make sure the offers are understood by investors, businesses and tech-innovators.

BEIS will work with UK EdTech investors to ensure they are aware of and able to access government facilities, including through the BBB's angel, venture capital and patient capital programmes.

71. The Industrial Strategy also strengthens the local business support offer available through **38 Growth Hubs located in Local Enterprise Partnerships across England**, through which innovative, technology-led businesses can access advice and one-to-one business support, and a range of peer learning and network opportunities. The Growth Hubs will continue to work with EdTech and wider Tech Sector leaders to ensure that the offer is promoted to EdTech businesses in England.

72. A UK-wide network of incubators and accelerators provide mentoring, support and working space for innovative, tech-led businesses. BEIS will work through the EdTech Leadership group, and key partners including BESA, TechUK and the Digital Catapult to engage incubators and accelerators and ensure EdTech businesses are aware of the opportunities they offer.

Stimulating the growth of the British EdTech exports

73. The British EdTech industry is already well-regarded internationally for excellence and quality. The total export value of the UK education technology sector is estimated to be around £170 million[25]. We have the largest EdTech Export market in Europe, but on a global scale have more to do to compete with the likes of the US and Australia, and increasingly the Scandinavian countries. The Department for International Trade works closely with education ministries in various countries to understand the challenges they face and position the UK's EdTech sector as a suitable technology partner in helping

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24 Small and Medium sized Enterprises
25 British Educational Suppliers Association, 2018, 'Member Reported Turnover 2017 and 2018; BESA EdTech Market Map'

to overcome these. In the UK, we work with industry partners to disseminate knowledge regarding global opportunities as well as funding to facilitate participation at global EdTech events, trade missions to promote the British EdTech offer and help EdTech companies flourish abroad. In addition, the International Education Strategy outlines the further steps we will take to help the UK EdTech industry flourish internationally.

CASE STUDY

UCL Educate is a programme focused on supporting growth in the EdTech sector through research-led development of new EdTech tools. Alongside their business partners BESA, F6S and Nesta, they bring together start-ups and Small and Medium Enterprises (SMEs) with researchers and educators to help companies develop more impactful products.

As a research accelerator, they use evidence and evaluation to help EdTech companies align their product development to the needs of educators and students. They support SMEs to work with schools, colleges and higher education providers to understand how technology can support learning and identify where it can be most effective.

They have a dedicated research team who analyse emerging trends and use this data to identify the best conditions for companies to scale. Their participating companies are diverse, catering to all stages of education and topics, from facilitating assessment and behaviour management to improving mental health and wellbeing.

As of January 2019, the programme has helped 160 companies to maximise impact through evidence-led iteration and to build business models that provide a better foundation to succeed.

CASE STUDY

Edspace is a co-working space and community of education innovators and entrepreneurs that supports early stage EdTech companies to scale and grow.

Founded by Emerge Education, an early-stage investment firm focused on education technology, Edspace provides members, which range from charities to high-growth for-profit start-ups, access to expert mentors, community and networks that understand the EdTech market, including projected trends and barriers to growth for new and scaling companies.

Based at New City College Hackney, Edspace provides a range of business support including workshops, webinars and advice on various topics, such as fundraising, marketing and evidence-led product development to share best practice and help companies better understand the steps needed to be successful.

Through building connections with a network of schools, colleges and universities, Edspace helps companies align their product development with the challenges faced within these institutions and informs discussions around technology use in the sector.

Edspace has supported over 85 education enterprises including successful EdTech start-ups EasyPeasy, Unifrog and Wonde. Every month community members reach more than 15 million people around the globe through their platforms and services.

7

Supporting innovation through EdTech challenges

" The English education sector is alive with innovation and cutting-edge developments in EdTech. Outstanding use of technology can help level the playing field for learners with barriers to learning and provide a 21st Century solution to closing skills gaps and raising achievement. "

Debra Gray
Principal of Grimsby Institute of Further and Higher Education

Innovation through collaboration

74. The commitments in this strategy are intended to create a culture where schools, colleges and universities in England are better equipped to realise the benefits of technology and UK EdTech businesses are able to innovate and grow. We need the future of technology in education to be driven by collaboration between industry, the education sector (including academia) and government, and to ensure that actions are underpinned by a culture of ensuring evidence of impact.

75. We have identified five broad "**opportunities**" where we think activity should focus:

- **Administration processes** – reducing the burden of 'non-teaching' tasks.

- **Assessment processes** – making assessment more effective and efficient.

- **Teaching practices** – supporting access, inclusion, and improved educational outcomes for all.

- **Continuing professional development** – supporting teachers, lecturers and education leaders so they can develop more flexibly.

- **Learning throughout life** – supporting decisions about work or further study and helping those who are not in the formal education system gain the skills they need now and in the future.

76. To encourage a further step-change in the use of technology across the education system in England, we are **launching a series of** "**EdTech challenges**". They are designed to support a partnership between the EdTech industry and education sector to ensure product development and testing is focused on the needs of the education system and on what has most impact. The challenges are to industry, the education sector and academia to prove what is possible and ultimately to inform the future use of EdTech across our English education system. We will draw on evidence that already exists, including from the Department for International Development's EdTech Research and Innovation Hub. We intend that the challenges will acknowledge and build upon existing high-quality products and services already being used in the sector and:

- Where relevant technology does not exist, we want industry to help fill these gaps.

- Where the evidence of impact does not exist, we want research bodies and industry to help undertake robust evaluation to determine whether or not technology has a positive impact.

- Where good practice is available, we want to share it more widely.

77. The challenges have been identified through user research, engagement with industry and sector experts and an analysis of the evidence base. We have prioritised challenges that tackle known issues faced by the education sector, those that have the potential to reduce teacher workload, improve pupil outcomes or generate cost savings and which will help to drive long-term culture change.
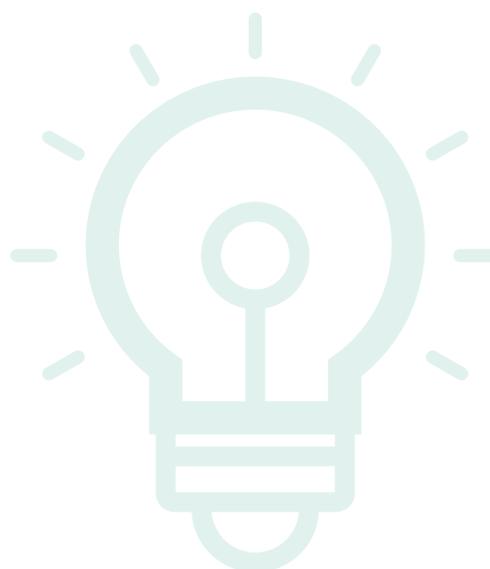
THE EDTECH CHALLENGES

The challenges present a call to industry, the English education sector and academia to prove, through the use of technology, <u>whether the following challenges are possible</u> (all challenges are to be delivered by 2021):

Administration:

Challenge 1:   "Improve parental engagement and communication, whilst cutting related teacher workload by up to five hours per term."

Challenge 2:   "Show how technology can facilitate part-time and flexible working patterns in schools and colleges, including through the use of time tabling tools."

Assessment:

Challenge 3:   "Cut teacher time spent preparing, marking and analysing in-class assessments and homework by two hours per week or more."

Challenge 4:   "Show that technology can reduce teacher time spent on essay marking for mock GCSE exams by at least 20%."

Challenge 5:   "Identify how anti-cheating software can be developed and improved to help tackle the problem of essay mills[26]."

Teaching Practice:

Challenge 6:   Challenge the research community to "identify the best technology that is proven to help level the playing field for learners with special educational needs and disabilities"

Continued professional development:

Challenge 7:   Demonstrate how technology can support schools and teachers to diagnose their development needs and to support more flexible CPD.

   (Our expert Teacher CPD Advisory Group chaired by David Weston will review, shape and finalise Challenge 7 so that it most aptly matches teachers' and schools' needs.)

Learning throughout Life:

Challenge 8:   "Prove that the use of home learning early years apps (both those aimed at parents and those aimed at children) contributes to improved literacy and communications skills for disadvantaged children."

Challenge 9:   "Widen accessibility and improve delivery of online basic skills training for adults."

Challenge 10:   "Demonstrate how artificial intelligence can support the effective delivery of online learning and training for adults."

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26 Essay mills refers to the practice of academic fraud, i.e. procuring a third party to write a piece of work on a student's behalf)

CASE STUDY

Department for International Development's (DfID) EdTech Research and Innovation Hub is investing £20 million over 8 years to form a global 'what works' evidence hub to catalyse innovation in the education sector. The programme is a partnership between DfID and the World Bank and will bring together experts in technology, education, research and innovation to answer key research questions such as:

- What works (and what doesn't work) to accelerate, spread and scale education technology interventions to deliver better learning outcomes for all children, including the most marginalised, in developing countries?

and

- Which education technology interventions present the greatest value for money and social return on investment?

DFID uses affordable EdTech as a tool to confront the challenges faced by education systems around the world such as: access to education, poor learning outcomes, teacher shortages, teacher quality, and data management. For example, the DFID funded Strategic Partnerships for Higher Education Innovation and Reform (SPHEIR) programme includes a number of EdTech interventions to solve key higher education challenges and deliver systemic and sustainable change at scale in Sub-Saharan Africa, Asia and the Middle East.

Supporting a partnership between education, Industry and academia

78. It is only by working in partnership, by breaking down the barriers between industry and users, that we can hope to realise these major systemic opportunities. These challenges act as a call to industry, academia and educators to help demonstrate just what is possible when using technology, and are not intended as targets for all teachers, lecturers, students and leaders to achieve. We look forward to hearing from industry and researchers how to best measure the impact of technology and to promote progress against these challenges. We will also expect the new EdTech Leadership Group mentioned in Section 6 to play a key role in implementing the EdTech Challenges.

79. To support these challenges, we will establish:

- A series of **innovation competitions** to promote product development in areas where the existing market offer is not yet well developed. The competitions will include a call to industry to bid for funds to develop, test or refine EdTech products and services. We expect that the winning bidders will work in partnership with the education sector and evaluators to help build our understanding of what works.

- A small **'testbed' of schools and colleges** to support the development, piloting and evaluation of technology (as mentioned in Section 6).

- Leading **'demonstrator' schools and colleges** (as mentioned in Section 3) to exemplify how these technologies can be used to best effect, and which build on existing good practice in the sector.

80. We will be building on the experience of other government innovation funds, such as the Defence and Security Accelerator and the GovTech Catalyst, as well as drawing on the expertise of industry and the education sector and will work with a range of organisations to deliver the challenges. We look forward to working with organisations to take forward further challenges and the wider commitments in this strategy. The new Leadership Group (detailed in Section 6) will be instrumental in taking forward the demonstrator schools and colleges, drawing on existing good practice across the country. Within this programme of work, we will aim to exceed the government's target that at least £1 in every £3 spent by government will be with Small and Medium Enterprises (SMEs).

8

Improving the Department for Education's digital services

Improving our own digital services

81. As a government department, DfE directly provides a range of services across education in England for pupils, students, parents, teachers and education leaders. Many of our services start from GOV.UK and education professionals rely on information from government to do their jobs and it is equally important to parents and students. Our ambition is that all our services will be user-centred by default, be of high quality and meet the standards of both digital government and the private sector, helping to save time and money.

82. We are at the start of our journey to improve the services provided by DfE. Of the 200+ digital services that we provide directly, we have already transformed a number of these to deliver user-centred and streamlined online customer journeys, including:

- Support for people who want to become new teachers by making it easy to find a postgraduate training course and apply for teacher vacancies

- Help for teachers and school leaders to buy products and services

- Systems for schools and colleges to more efficiently send data securely to the DfE

- Help for parents to find and pay for childcare, including access to 30 hours free childcare

- Support to help young people to find an apprenticeship

- An online tool to help students to apply for a student loan to support further study.

Developing new services

83. We are also working on the provision of new digital services including:

- **Developing a new National Retraining Scheme** to help adults whose employment is at risk of automation, to upskill or retrain for the new economy

- Exploring the needs of teachers in **accessing quality curriculum materials**.

84. However, we know it is not always easy for people to find the information and services they need to help support their teaching, parenting, learning or educational choices and we have an ambition to develop enhanced digital services to address this. Initially, **we will work on piloting ways of engaging with users that brings together relevant information and easy to use services based on what our users need.** We will start with focusing on how we can improve the services available for teachers and parents, based on their feedback.

85. We will also explore how such a digital service could encourage a more informed marketplace to support the buying and selling of EdTech as mentioned earlier in Section 4.

86. Through transforming our services, we will role-model existing good practice standards for digital technology and services and take a user-centred approach to delivery. Our work will build on the common standards, guidance and components developed by the Government Digital Service (GDS) that help to ensure consistent approaches to delivering public services and to solve common digital challenges across government. This includes following the government digital service standard and the technology code of practice to help ensure that our services meet the same high standards as other leading services in government.

CASE STUDY

The Teaching Vacancies Service on gov.uk was launched to help schools reduce an estimated £75 million a year spent on recruitment advertising[27].

This free service provides a national listing of teaching jobs available which can be filtered by location, salary and working pattern.

Roll-out of the service began in September 2018 and, as of March 2019, over 7500 schools have signed up to the service and 4500 jobs have been listed.

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27 PWC, 2016, 'Feeling the squeeze: schools' response to constraints in teacher recruitment'
https://www.pwc.co.uk/assets/pdf/teacher-recruitment-pwc-education-insight-23may2016.pdf

9

Conclusion – implementing, integrating and innovating

"Technology is incredibly important in how I learn at school. Without it, I don't think that I would be able to make my work as effective as it is. I love that I can listen to my teacher's comments about my work and that I can explain to her how I made my work better from what she has said. Also, if I have a question, I can just jump online and find the answer instantly. I don't need to sit and wait with my hand up – I can be independent and do it myself!"

Year 6 Pupil at Layton Primary School in Blackpool

87. The use of technology often polarizes opinion. There is a danger we view it as 'just one more thing to do', but when implemented well, technology has the potential to transform educational experiences and education provider administration, helping teachers and lecturers spend more of their time on the things that make a real difference to student outcomes.

88. There are very real barriers to the use of technology in schools, colleges and universities but we are committed to government playing its part in helping to break them down and to support the sector to capitalise on the opportunities. We also know there is enormous ambition within the education community and EdTech industry to develop plans which can revolutionise our approach to technology. This strategy marks the start of creating a technology revolution in education in England, which must be delivered in partnership with education and industry. We welcome your input and openness to new and innovative approaches as we embark on this journey.

'The Government's EdTech strategy highlights some exciting opportunities for teachers to harness technology that allows them to dedicate their energies to the substance of education: effective teaching of the curriculum that produces great outcomes for pupils.'

Chris Jones
Director for Corporate Strategy at Ofsted

Annex A:
Summary of commitments

Key commitments	
1.	Work with industry to accelerate the rollout of full-fibre internet connectivity to schools most in need
2.	Continue to support Jisc to provide full-fibre connections through their Janet network to colleges and universities
3.	Encourage and support schools, colleges and other providers to consider moving to a cloud-based approach for their IT systems and storage
4.	Continue to review and improve our guidance documents that help steer schools, colleges and other providers through the key questions and issues to consider when implementing their technology infrastructure
5.	Work with the Chartered College of Teaching to launch online courses for teachers and headteachers so that they can learn how to make their uses of technology more effective
6.	Launch a network of 'demonstrator schools and colleges' that will leverage the existing expertise in the sector and help to provide peer-to-peer support and training
7.	Work with the British Educational Suppliers Association (BESA) to support the LearnEd programme, bringing together teachers, education leaders and industry to showcase best practice and products through events across the country
8.	Continue to improve our support for schools to access and use our pre-negotiated and recommended buying deals for schools, helping to secure cheaper products

Key commitments	
9.	Continue to work with BESA to support a trial of the LendEd service, an online lending library for education technology software, so educators can try before they buy to help identify the 'right' products for them
10.	Explore how to build on existing practice and facilitate a better online marketplace where schools, colleges and other providers can buy with confidence and sellers have an efficient and effective route to market
11.	Trial an offer of independent Buying Hubs in the South West and North West regions, including testing a service to directly manage procurement for schools (before national roll-out)
12.	Engage with local School Business Manager networks to increase awareness of the support available to improve procurement practice
13.	Set up a new EdTech Leadership Group made up of representatives across the education sector (including academia) and industry to continue to drive this agenda forward, find new ways to collaborate and to agree a plan on how to support the aims of this strategy by the end of the year
14.	Help galvanise activity across the wider technology sector to support the aims of this strategy
15.	Work with industry, research and education groups to establish small 'testbeds' of schools and colleges to support the development, piloting and evaluation of technology
16.	Work with EdTech investors to ensure they are aware of and able to access government facilities including through the British Business Bank's (BBB) angel, venture and patient capital programmes

Key commitments	
17.	Work with the EdTech Leadership Group and key partners to engage incubators and accelerators and ensure EdTech businesses are aware of the opportunities they offer
18.	Launch a series of 'EdTech Challenges' to stimulate a step-change of activity in key areas where we believe education technology can make a significant impact. We will support these challenges by launching a series of innovation competitions to promote product development where needed and through the aforementioned 'testbed' and 'demonstrator' schools and colleges
19.	Create a step change in the digital services available to parents, students, teachers and education leaders. We will pilot ways of engaging with these groups that brings together relevant information, so that the education sector and the public get the services they need.

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