All Party Parliamentary Group on Education Technology

Lessons from Lockdown:

What we learned about Education Technology in 2020

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BRITISH EDUCATIONAL
SUPPLIERS ASSOCIATION

Foreword by Caroline Wright, Director General, British Educational Suppliers Association (BESA)

I am grateful to Damian Hinds, Chair of the All-Party Parliamentary Group on Education Technology (EdTech) and his fellow Vice-Chairs for their vision and foresight in commissioning this 'Lessons from Lockdown' report, which contains valuable insights, ideas, and inspiration for educationalists and policy-makers.

The report shows so clearly what is possible when the education system and wider community pull together with shared purpose. In this case our nationwide response to the essential closure of education settings and institutions during the initial outbreak of the coronavirus in the United Kingdom. We saw parents, childcare workers, teachers, lecturers, school leaders, academics, industry, celebrity experts, civil servants, Parliamentarians, and Ministers unite behind the collective aim of helping educate our nation's children during a time of crisis. The nation's collective and awe-inspiring effort has helped limit the longer-term impact of the pandemic on many children. Without these efforts the damage and lost-learning to this 'Covid-generation' could have been even greater. The challenge is, of-course, still significant and I welcome the Government's appointment of catch-up Tzar Sir Kevan Collins who will be leading a co-ordinated catch-up 'charge' to help support children and learners over the coming period.

The Government's EdTech Strategy of 2019, brought in by Damian Hinds, was underpinned by an understanding of and commitment to the benefits that EdTech, when delivered effectively, bring to reducing teacher workload burdens, personalised learning approaches, assessment, system leadership and communication. Promising early results were achieved by a number of the strategy's key initiatives including the Chartered College of Teaching's online EdTech course, the LendED EdTech lending portal and the LearnED teacher CPD roadshows before the arrival of Covid-19 rewrote the 'normal operating procedure' for the UK's education sector.

As this report shows the pandemic has gone on to expose areas where more investment is needed. Lockdown meant access to school devices during the day and after-hours access to home-work clubs was impossible for those students most in need and the nation's digital divide has been laid out starkly, in terms of access to connectivity, kit and content. I'm proud that BESA members stepped up to provide an answer to the content challenge, providing £36 million in free educational resources and support to schools and families during the initial three months of lockdown, March–June 2020, alone. The EdTech sector became an unofficial 'emergency service' supporting school-home communications and stepping in to provide additional training and CPD to teachers to help them navigate and use unfamiliar digital tools effectively to aid online teaching and learning.

The DfE has acted too with a series of initiatives such as the Covid-premium, the National Tutoring Programme (although this currently excludes digital curriculum resources) and other devices and data schemes to support schools and learners. These efforts are to be welcomed, but what must follow is a revised and updated EdTech strategy and approach to address the challenges and opportunities outlined in this report.

It will be important that any DfE interventions recognise and celebrate, rather than stifle, the expertise and autonomy of school leaders and multi-academy trusts in supporting their school communities, alongside the innovation and creativity of the UK's vibrant EdTech sector. The EdTech industry looks forward to working together with Parliamentarians, policy-makers and practitioners to deliver an EdTech offer that will be fit for the post-pandemic needs of pupils and young people.

Caroline Wright, Director General, BESA.

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In September 2020, a group of MPs and Peers formed the EdTech APPG, with the support of BESA, the British Educational Suppliers Association, as a forum for Parliamentarians and policy-makers, the education sector and service suppliers.

As a group we firmly believe that EdTech can:

• enhance learning

• ease teacher workloads

• improve back-of-house processes

• augment support for students with specific learning needs

• facilitate parental engagement

• open up access to lifelong learning

• support international development.

British suppliers are very well positioned to deliver, domestically and around the world.

EdTech had been growing dramatically for some time but the pandemic brought a step-change in deployment. It will not revert to the status quo ante. There are limits to what can be said with confidence at this stage – but it is important that we consider, in this formative moment, the 'Lessons from Lockdown'.

For children, for parents and for teachers, clearly this has been a very difficult time. The challenges of making up lost ground, re-narrowing the attainment gap and supporting young people with their mental and physical health and well-being, will need sustained attention and resource.

But the experience of education in lockdown has been uneven, and part of that is about technology. In public debate the focus has largely been on the availability of devices and connectivity. Determination to close the digital divide must surely be a lasting legacy of lockdown. However there are lessons too in what uses of technology have been most effective for pupils, teachers and parents.

For this rapid assessment report, I am very grateful to the teachers, schools and tech providers who submitted evidence, the experts who addressed our meetings, and to my fellow officers of the APPG in both Houses of Parliament. A particular word of thanks goes to Caroline Wright, Nina Iles and Monica Thompson at BESA, as well as Alexander Shea and Daniel Cohen, for their analysis and drafting of this report, and for enabling the operation of the APPG.

Rt Hon Damian Hinds MP

Introduction

On the evening of Wednesday 18 March 2020, the UK Government announced that from Friday 20 March onwards, schools would close for the majority of pupils as part of the country's response to the coronavirus outbreak. The children of key workers, pupils receiving Education, Health and Care Plans (EHCPs), and vulnerable pupils could continue attending in person, but most pupils would learn remotely.

EdTech has been in use for many years, but during this period of partial school closure it became one of the primary means of delivering education to most children. Indeed, EdTech found its way into teachers', pupils' and parents' daily lives and routines in a way hitherto unimaginable. According to evidence submitted to the APPG, greater use of technology within schools, pre-pandemic, met with genuine resistance from some teachers who felt they had yet to see the benefits such use of technology could bring. It appears that COVID-19 caused many teachers to revisit such reservations, indeed some online learning platforms reported seeing increases, each week of lockdown, of up to 4 times their average pre-lockdown weekly numbers.[1] Another educational supplier told the APPG that teachers they work with had seen a huge range in the average daily use of their platform, with one reporting over 2 million hits during March and April.[2] Survey data from Teacher Tapp at the outset of the ensuing crisis suggested 51% of state primary and 82% of state secondary teachers were directing pupils to digital platforms.[3]

> **" EdTech found its way into teachers', pupils' and parents' daily lives and routines "**

The APPG's aim in this short report is to look at what worked and what we should take forward from this unprecedented period. It is important to do this, because we are not just seeing a period of emergency remote learning, but the emergence of a new normal, in which it is inconceivable that the use of EdTech will be relegated to pre-COVID-19 levels.

This report analyses information drawn from submissions by educationalists and others through the APPG's Call for Evidence and its three evidence discussions, as well as studies and analysis published by other bodies. The report also looks at "grey" literature produced during the pandemic – such as teachers' blogs, polling surveys, research reports and pupil testimony.

The evidence used is mostly drawn from the period of school closure in the 2019/2020 academic year, and the focus is mainly on the experience of schools in England.

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[1] Written evidence submitted to EdTech APPG by RM Education (05.10.2020); Maths Circle (05.10.2020)
[2] Written evidence submitted to EdTech APPG by 2Simple (30.09.2020)
[3] Teacher Tapp, What does distance learning look like in England?, 22.03.2020, link

At the outset, and by way of background, it is important to recognise that schools applied EdTech in very different ways during the first national lockdown. Some schools preferred to make use of video technologies enabling live broadcasts of teacher-led lessons, and a number turned to platforms such as Oak National Academy, which has sought to recreate the learning environment of the classroom through EdTech. Other schools have preferred to prioritise shared online spaces, such as Virtual Learning Environments (VLEs). VLEs allow pupils to access resources and learn in their own time and enable them to work on tasks together. Computer-assisted instruction technologies have also been available for use, including personalised learning technologies and intelligent tutoring systems.[4]

EdTech has also supported more 'social' learning activities such as peer learning, for instance through collaborative online writing platforms and peer communication networks. In other instances, EdTech has been used to foster thematic, project-based learning activities, involving learning units organised on a cross-curricular basis with pupils being asked to complete tasks or solve problems that they might encounter in a workplace or in their everyday lives.

Some schools also used EdTech to help pupils identify and practise the metacognitive strategies needed to undertake remote learning. It was deployed to, for example, assist pupils with expressing and processing their emotions, and to give directions for independent study. This ranged from creating 'pop-up' windows that prompted students to reflect on what their learning goals were for a particular day, to in the case of the Nesta supported EDUU School pilot, providing students direct access to certified counselling support. [5]

Of course, for pupils to access these online learning tools in the first place they will have needed an appropriate device and reliable broadband access. Unfortunately, however, as we have seen, this was not universally the case. The report will explore what lessons can be learned from attempts to ensure access for all pupils, and it will look at what steps can be taken going forward to close the 'digital divide', both between schools and between pupils in schools.

For pupils with special educational needs and disabilities (SEND), access to assistive technologies can often be important.[6] But there has not been much

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[4] For a full typology of EdTech resource categories, see Education Endowment Foundation (EEF), Remote Learning: Rapid Evidence Assessment, 23.03.2020, link

[5] For the example of pop-up windows, see Nesta & The Behavioural Insights Team, Applying Behavioural Insights in EdTech: an Incomplete Guide, 11.09.2020, link, p.21; Whole Education, EDUU School: Final Report from the Evaluation (08.10.2020), unpublished

[6] See for example Jules Dalby, Using Assistive Technology to give SEND learners Independence. Impact: Journal of the Chartered College of Teaching (4; 2019) link; It is important to note that the benefits of assistive technologies are not limited to individuals with SEND, rather their application can assist all population groups. See Dr Rhys Williams, What is Assistive Technology, who is it for and what does it enable? *University College London: Global Disability Innovation Hub*, link

investigation undertaken about the role that technologies have played in supporting children with SEND and their families.[7] We therefore have limited source material as to whether children with SEND were able to access educational technologies, and where they were able to, which technologies proved to be of benefit. Nevertheless, this report considers initial feedback and evidence published on this matter by organisations including Family Fund UK, The Alliance for Inclusive Education and University College London's Global Disability Innovation Hub.[8] We also look at what possible steps can be taken to strengthen the provision of – and access to – assistive and inclusive technology.

The report does find that some remote learning approaches resonated with pupils, families, teachers and school leaders. Although this period of remote online learning has not been without challenge, Ofsted research notes that school leaders have expressed they would like to retain some elements when 'normal' schooling resumes. Indeed, Ofsted found that school leaders could point to benefits in the new systems they had developed, that they believe could support pupils' learning going forward.[9]

There is now a real opportunity to continue to support our teachers and pupils post-lockdown through a deeper, lasting integration of EdTech into the education system. This is not just to ensure that the system is better prepared for possible periods of future disruption – important as that may be. It is also about making sure we embrace the pedagogic innovation that EdTech offers. To ensure that bold steps can be taken, however, it is crucial that we learn, and implement, the lessons from lockdown.

> " **a deeper, lasting integration of EdTech** "

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[7] For the role of EdTech in supporting disadvantaged learners, see for example Nesta and School Dash, Levelling up Maths during the Lockdown, 01.10.2020, link; on the absence of research concerning EdTech and SEND pupils during lockdown, see The Alliance for Inclusive Education, Submission to the Children's Commissioner for England: COVID-19 and Disabled Children's Education, 04.06.2020, link

[8] Written evidence submitted by Family Fund UK to Education Select Committee, 28.08.2020, link; University of Sussex School of Education and Social Work, Education and COVID-19: Evidence from parent carers of children with SEND, 03.08.2020, link; Global Disability Innovation Hub, link

[9] Ofsted, Research & Analysis: Remote Education Research, link

Summary of Findings

What worked in curriculum delivery?

Where pupils learning at home had access to a significant amount of structured guidance, learning resources, live online lessons and support from teachers, the familiar presence of routine and a familiar face during a period of heightened stress seemed to help children focus and apply themselves to learning. Where it was felt by parents that children were not receiving an adequate amount of learning resources and one-to-one support from a teacher, the experience of learning at home was not as positive.[10] There is emerging research which shows that, just as in the classroom, the presence of stable, caring relationships influences student's ability to engage with online learning.[11]

Teacher-led video lessons – both live and pre-recorded – could help structure some pupils' learning, whether it be establishing goals and outcomes, providing feedback or helping pupils see the relevance of a topic of discussion. Indeed, some pupils preferred live teacher-led lessons as they appreciated the opportunity of engaging directly with their teacher.[12] However, some secondary pupils preferred to access teacher-recorded content in the evenings and in segments; they seemed to appreciate the ability to rewind and process content in their own time.[13] Interestingly, the EdTech APPG heard that completing remote learning tasks online had a more positive impact on pupils' sense of progress than completing the tasks on paper.[14]

A growing body of research demonstrates that effective online learning also occurs where the course of study fosters collaborative learning among pupils, and where learners feel supported, not just instructionally but with co-curricular engagement and other supports.[15]

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[10] See The Open Data Institute (ODI), Data about Children's lives during the Pandemic, 04.11.2020, link, p.17; The Child Poverty Action Group, The Cost of Learning in Lockdown: Family experiences of school closures (18.06.2020) link, p.2; Education Development Trust (EDT), What does the research suggest in best practice in pedagogy for remote teaching? 11.08.2020, link, p.7

[11] See for example Alexandra Pentaraki, Emerging evidence regarding the roles of emotional, behavioural, and cognitive aspects of student engagement in the online classroom, European Journal of Open, Distance and E-Learning, (20:1, 2017), link; UNESCO, Covid-19 response: remote learning strategy, 02.03.2020, link

[12] Whole Education, EDUU School: Final Report from the Evaluation (08.10.2020), unpublished

[13] Whole Education, EDUU School: Final Report from the Evaluation (08.10.2020), unpublished

[14] Eemer Eivers, Jack Worth and Anusha Gosh, NFER, Home learning during Covid-19: Finding from the Understanding Society Longitudinal Study, July 2020, link; Megan Lucas, Julie Nelson, and David Sims, Schools' Responses to Covid-19: Pupil Engagement in Remote Learning, 10.07.2020, link; see also more anecdotally, The Royal Society, Lessons learnt during the COVID-19 crisis, 14.09.2020, link; Evidence submitted to EdTech APPG by Edurio (05.10.2020)

[15] This replicates findings seen in other European countries. See Barbara Means, Marianne Bakia and Robert Murphy, *Learning online: what research tells us about whether, when and how* (New York: 2014), Chapter 2

This collaborative, supported mode of online learning had a relatively small uptake during the first national lockdown. As of July 2020, 4% of primary schools were setting remote learning assignments that asked their pupils to work collaboratively with their peers, with this figure reaching just 8% among secondary schools.[16]

However, collaborative approaches to learning appear to have worked when teachers played an integral role in designing the learning experience and providing pupils with the knowledge necessary to access it. This reflects the fact that for pupils to have positive peer interactions, it was not sufficient to just provide them with collaboration tools. Teachers first had to help pupils practise self-regulation skills, as well as helping them to facilitate independent and balanced group discussions and teaching them how to follow lesson structures.[17]

More independent study, or what we might call 'guided study', has been used too. This is where pupils are directed by teachers to curriculum materials such as online worksheets, BBC Bitesize resources, Oak National Academy and VLE platforms to complete in their own time. In April 2020, 92% of pupils in England were directed to follow guided courses of study each day by schools, a level that remained constant through to July.[18]

In addition to the guidance on home learning solutions released by the DfE, educators were also able to source innovative EdTech solutions through platforms such as BESA's LendED and EdTech Impact, which help sign-post tried and tested remote learning tools to teachers. We have also seen an opening up of resources, for example through the development of platforms such as Oak and Invicta National Academies, and through school partnerships sharing and pooling resources among their schools.[19]

Some pupils did prefer a more independent approach to remote learning, noting that it allowed them to progress at their own pace.[20] In considering "what worked" for these pupils, it is possible not only to consider the role played by teachers, school leaders and families, but also that played by dynamic and responsive online learning platforms in sustaining their motivation.[21]

[16] NFER, Schools responses to COVID-19: The challenges facing schools and pupils in September 2020, link, p.49

[17] Education Development Trust (EDT), What does the research suggest in best practice in pedagogy for remote teaching? 11.08.2020, link, p. 4

[18] Eemer Eivers, Jack Worth and Anusha Gosh, NFER, Home learning during Covid-19: Finding from the Understanding Society Longitudinal Study, July 2020, link

[19] Invicta National Academy, Resources, link; SSLP, 'Thinking About', link

[20] The ODI, Data about Children's lives during the Pandemic, link, p.18

[21] For an introduction to the learner design of remote learning platforms, see John Keller, *Motivational design for learning and performance: The ARCS model approach* (New York, 2010).

An important early finding here is that the platforms which were most successful in maintaining and encouraging independent study seem to have had certain user design features in common. Notably, they seem to have integrated insights from the learning sciences and behavioural psychology to engage children's attention.[22]

A website interface's design can influence the patterns of behaviour we exhibit online.[23] In the context of remote learning, researchers at the University of North Texas have previously detailed three key website design features that sustain pupils' levels of engagement with online platforms.[24]

The first of these is 'salience,' namely the degree to which a platform is able to attract attention via design features such as helpful pop-ups, animated or outsized buttons or a simple but novel design outlay. An example of 'salience' at work during Covid-19 is provided by a collaboration undertaken between Nesta, the Behavioural Insights Team (BIT) and the commercial EdTech provider HegartyMaths from May to September 2020.[25]

This collaboration found that introducing a simple, brightly-coloured pop-up message with a large "Get Help" button when students answered a question incorrectly on the HegartyMaths platform more than doubled the number of students accessing help when they answered the question incorrectly, and improved the overall ratio of correct to incorrect answers over time.[26]

Used imaginatively, features such as quizzes and competitions can also assist learners overcome some of the challenging features of remote learning. Indeed, a second effective design feature is where remote learning platforms integrate motivational and incentivising structures that reward children's engagement.[27] For example, the EdTech APPG heard that animated short videos with interactive games proved successful and popular with younger children (EYFS/KS1), and platforms where children can "learn and earn" by receiving points, stickers or badges as a reward for their efforts, seem to be more successful in maintaining students' levels of engagement. At the same time, research suggests that this increased engagement likely benefits from frequent feedback,

" motivational and incentivising structures "

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[22] For an overview of evolutionary psychology & education, see Nesta & The Behavioural Insights Team, Applying Behavioural Insights in EdTech: an Incomplete Guide, September 2020, link; Joaquin Rodriguez & Marcin Bartosiak, Nudging the Classroom, Journal of Education Sciences (3; 2019), link; Ben Williamson, Decoding ClassDojo, Journal Of Media Learning (1: 2017), link, pp. 1–14

[23] See Richard Thaler and Cass Sunstein, Nudge: The gentle power of choice architecture (Yale: 2016)

[24] Heather Robinson, Maha Al-Freih, Whitney Kilgore, Designing with care: Towards a care-centred model for online learning design, The International Journal of Information and Learning Technology (37:3, 2020), pp, 99-108

[25] Applying Behavioural Insights in EdTech. An incomplete guide by NESTA, Hegarty Maths and The Behavioural Insights Team, September 2020, link

[26] Ibid

[27] For an analysis of the role that motivational structures play in online learning, see Christian Graus, The Hidden Power of Small Rewards: The Effects of External Rewards on Autonomous Motivation to Learn, Academy of Management & Learning (15:1, 2015), link, pp.71-84

personalised guidance and courses of study that adjust automatically to target students' weaknesses.[28]

Evidence from the EDUU School pilot programme found that quizzes were popular, and that pupils were excited at the prospect of winning prizes. The pilot also found quiz outcomes were being used by pupils to inform which lessons to watch. It was also acknowledged that enhanced feedback could further boost the usefulness of quizzes.[29]

Thirdly, it would appear that teachers saw value in single sign-in platforms that enabled access to multiple third-party learning platforms.[30] This 'interlinking' could avoid children having to switch between websites to access lesson content – a good thing, as browser switching affords the opportunity to lose focus and visit a non-educational website instead.[31] The need to click on successive hyperlinks has been shown to require "extra, non-productive cognitive effort," reducing the cognitive resources available to the reader for deep learning and efficient memory consolidation.[32]

Platforms that facilitated access to instant messaging software, allowed teachers to edit and modify licensed content from across different platforms in one space and view pupil engagement data proved popular.[33]

This perhaps points to the increased levels of pupil engagement seen, as reported by the National Foundation for Educational Research (NFER), when schools centred their remote learning content around a VLE.[34] NFER found that the use of VLEs to inform pupils of learning activities correlated with higher levels of pupil engagement during lockdown, particularly when it came to revision and consolidation of topics previously studied in the classroom.

Some children who preferred a more individualist approach appear also to have favoured engaging in project-based, thematic approaches to learning.[35] Pupils noted that they felt a greater sense of purpose when engaging in real-world activities, particularly those that combined off-screen

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[28] Evidence submitted to the EdTech APPG by Classroom Secrets (05.10.2020); For an introduction to "gamification" and student engagement with EdTech, see Hanza Imran, "Evaluation of awarding badges on Student's engagement in Gamified e-learning systems," *Smart Learning Environments* (6:2019), link

[29] Whole Education, EDUU School: Final Report from the Evaluation (08.10.2020), unpublished

[30] Association of College and School Leaders. Coronavirus" Feedback from ASCL members on how they are leading remote learning, link, p.4; for prior research on this matter see Eyal Ophir, Clifford Nass, & Anthony Wagner, "Cognitive control in media multitaskers," in Report on Proceedings of the National Academy of Science of the United States of America (106; 2009), link, pp. 15583–15587; Betsy Sparrow, Daniel Wenger, Jenny Liu, "Google effects on memory: Cognitive consequences of having information at our fingertips," Science (333; 2011), link, pp. 776-778.

[31] Whole Education, EDUU School: Final Report from the Evaluation (08.10.2020), unpublished

[32] See Paul Kirschner, The disturbing facts about digital natives (08.10.2015), link.

[33] Written evidence submitted to EdTech APPG by Classroom Cloud (24.09.2020); Written evidence submitted to EdTech APPG by Maths Circle (05.10.2020)

[34] Megan Lucas, Julie Nelson, and David Sims (NFER), Schools' Responses to Covid-19: Pupil Engagement in Remote Learning, June 2020, link, p.4.

[35] Whole Education, EDUU School: Final Report from the Evaluation (08.10.2020), unpublished; Sara Bubb and Mari-Ana Jones, Learning from the COVID-19 home-schooling experience: Listening to pupils, parents/carers and teachers, *Improving Schools Journal* (4, 2020), link

activities such as arts & crafts and learning outdoors. One particular area of interest among pupils was where digital platforms integrated activities such as virtual trips for fieldwork or interactive career guidance applications, which created a sightline between current learning and future work.[36] This appears to have helped students see beyond the boundaries of COVID-19.

Looking ahead, even with the return of schools there will still be a need to provide additional support for pupils who have fallen behind during the periods of partial school closure. A range of catch-up initiatives have been put in place for these pupils, including the National Tutoring Programme, which offers subsidised direct tutoring online, either one-to-one or in small groups. The APPG has, however, heard concerns that the National Tutoring Programme does not allow for as full a use of complementary technologies as it could, alongside direct tutoring. There is of course an important role for approved tutors and clearly they are integral to the programme, though given reports that the demand for tutoring has been considerably higher than forecast[37], making available a wider range of EdTech through the programme, for example virtual tuition technology, could allow even more children to be reached.

Indeed, the APPG has heard from a provider who runs a virtual tuition platform that is programmed to assess pupils' abilities and guides them through relevant learning activities, summarising their performance in data for teachers and parents. It does seem that there has been demand for this virtual tuition during lockdown; the provider found that new subscriptions to their virtual tutoring programme increased by 411% in April 2020 compared to the previous year.[38]

What worked for pupils with Special Educational Needs and Disabilities?

In recent years, policymakers' attention has turned to the role that technologies can play in helping children with special educational needs and disabilities (SEND) to surmount barriers to learning and complete educational tasks in a more empowered, efficient and independent manner. Notably, the Department for Education's 2019 EdTech Strategy listed among its ten sector "Challenges" the need to identify those technologies that best serve to level the playing field for children with SEND.[39]

Assistive technologies (AT) currently available range from low-tech devices, such as pencil grips and tactile rulers, to high-tech pieces of computer equipment and software, such as screen reader software or eye-gaze

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[36] Ibid; Whole Education, EDUU School: Final Report from the Evaluation (08.10.2020), unpublished
[37] TES, 'Exclusive: Tutoring Demand Outstrips Forecast by 500%', 02.03.2021, link
[38] Written evidence submission to the EdTech APPG by a Maths virtual tutoring company (05.10.20)
[39] Department for Education, Realising the Potential for Technology in Education, 04.04.2019, link

sensory input systems. Alongside support strategies from practitioners and therapists, they aim to assist children's core functioning across several specific domains, from cognition through to emotional self-regulation. Such solutions may work in tandem with a growing number of technologies, from web browsers with adjustable text sizes, to multimedia that incorporate British Sign Language (BSL) and are seeking to be universally accessible by catering for different pupils' needs.

There are over 25,000 categories of AT available in the UK.[40] Yet, little is known to date about the prevalence or best practice use of AT within the UK's education systems. As a Department for Education rapid evidence assessment published in April 2020 found, only two large scale studies focussed on AT's use in schools in the UK appear to have been in print prior to the first national lockdown.[41] This presents substantial challenges in understanding which assistive learning technologies and support strategies worked best during lockdown.[42]

What data exists is based on small geographic samples and is difficult to extrapolate. This lack of a "benchmark" has rendered it difficult to determine whether efforts that have been undertaken to distribute ATs to homes have been sufficient, or whether, as some have speculated, there is still a large amount of unmet need.[43]

In May 2020 the Department for Education provided £10 million of grants to assist families purchase items including assistive technologies, but it is hard to assess whether this was sufficient to help most families.[44] Similarly, in that same month, the Department appointed Balcarras School, National Star College and Highfurlong Special School as specialist SEND-focussed EdTech Demonstrator Schools, but again, it is too early to assess whether this was sufficient to provide a suitable breadth of resources to pupils.[45]

The lack of an established research agenda in assistive technologies appears to have led to the experience of pupils with SEND being underrepresented in the accounts of home learning produced since March 2020. As the Alliance for Inclusive Education (ALLFIE) has noted, while considerable resources have been dedicated to investigating the impact that remote education is having upon children from a low socioeconomic

[40] Department for Education, Assistive Technology Stakeholder Report: Researchers, 01.08.2020, link, p.6

[41] Department for Education, Rapid literature review on assistive technology in education: research report, 01.07.2020, link, p.30; for the two studies, see Dave Edyburn, Advances in special education technology - Volume 1: Efficacy of assistive technology interventions (UK; 2009) pp. 13-50; Bryanna Quinn and Margaret Brausch, "Who is using assistive technology in schools?," Journal of Special Education Technology (24:1; 2009) pp. 1-13.

[42] Department for Education, Assistive Technology Stakeholder Report: Researchers, link

[43] Margaret Bausch and Melinda Ault, Assistive technology in schools: Lessons learned from the National Assistive Technology Research Institute. In Dave Edyburn, (Ed.), Advances in special education technology - Volume 1: Efficacy of assistive technology interventions (London; 2015), pp. 13-50)

[44] Department for Education, Emergency funding to help disabled or seriously ill children in England, 19.05.2020, link

[45] Department for Education, EdTech demonstrator schools and colleges: successful applications, 24.04.2020, link

status, and the degree of access they have to resources such as computer equipment, broadband and parental support, little comparable focus has been paid to the equivalent effects on children with SEND.[46] This conclusion has since been echoed by the NFER, which has found that initial indications of poor home learning engagement among pupils with SEND have not prompted the same research attention as other cohorts of pupils.[47]

Early in the pandemic, parents noted that materials and lessons provided by both schools and online resource platforms such as Oak National Academy were inaccessible for disabled students. While the APPG for Assistive Technology has since heard that the Oak Academy has now developed a significant set of SEND resources, there were early concerns that the lessons had been designed with "neurotypical" children in mind, did not provide differentiated standards of learning and had few accessibility features such as British Sign Language (BSL).[48] The EdTech APPG received feedback from The National Deaf Children's Society for the purpose of this report.[49] They told us that deaf learners are more likely to tire when accessing remote live-streamed learning due to the high cognitive demand of understanding new learning and the additional language and communication demands. They added that remote education will only work for deaf children if accessibility is not an afterthought.

A YouGov survey commissioned by Ofsted in January 2021 revealed that 59% of parents of a child with SEND did not believe them to have been engaged with remote learning, compared with 39% of parents of children who do not have SEND. The same survey unveiled concerns from schools that learning gaps will be greater for children with SEND and that the negative social and emotional impact of the disruption would be greater for some of these children. Fewer than half (46%) of the teachers surveyed said that they had been able to provide additional remote learning support for children with SEND at their schools. The key takeaway was that the most efficient solutions for pupils with SEND tended to be bespoke, and took into consideration the specific needs of each child. The report rightly states that greater focus and planning will be needed in the future to ensure that the worst effects of learning loss and the physical, social and emotional impacts of lockdown are mitigated for these pupils.[50]

[46] The Alliance for Inclusive Education (ALLFIE), Submission to Children's Commissioner for England: COVID-19 and Disabled Children's Education, 04.06.2020, link

[47] Megan Lucas, Julie Nelson, and David Sims (NFER), Schools' Responses to Covid-19: Pupil Engagement in Remote Learning, 16.06.2020, link, p.10

[48] The Alliance for Inclusive Education (ALLFIE), Submission to Children's Commissioner for England: COVID-19 and Disabled Children's Education, 04.06.2020, link

[49] Written evidence submitted to the EdTech APPG by the National Deaf Children's society (05.10.2020)

[50] Ofsted, Research & Analysis: Remote Education Research, link

[51] Ofsted, COVID-19 series: briefing on local areas' special educational needs and disabilities provision, 04.11.2020, link

[52] The Family Fund, Impact of COVID-19 Research: UK Findings, 13.05.2020, link

From the research that is available, it would appear that many children with SEND faced considerable difficulties during the first national lockdown. As a case-study interview approach conducted by Ofsted with the parents and carers of 28 children with SEND in October 2020 attests, the loss of established routines, family support networks and specialist services had produced negative effects on the wellbeing of many children.[51]

Previously, in survey data published by the Family Fund in May 2020, 74% and 71% of families respectively were concerned about deteriorations in their child's educational and emotional progress.[52] 34% of affected families reported receiving no support to provide remote education to their children, while as of July 2020, teachers in England reported that children with SEND were 58% less likely to be engaged in remote learning than their peers.[53]

What is welcome is that there is a strong appetite across the Assistive Technology and education sector to work together to improve the quality of provision across the UK. As the Children and Families Minister, Vicky Ford MP, noted in a speech on 24 November 2020, there is also increasing impetus across Government to ensure that assistive and accessible technologies become the norm across schools.[54] These efforts will be boosted with the commencement of an Assistive Technology Testbed, that will see trials of technologies take place in 100 schools.[55]

> **action needs to be taken to mitigate the effects of the pandemic on children with SEND**

In the immediate term, action needs to be taken to mitigate the effects of the pandemic on children with SEND. A good place to start would be to look at interventions which did work during lockdown.

Some pupils enjoyed the more contained surroundings of a home environment and made progress.[56] Ofsted's research published in January 2021 found that for some pupils with SEND, there were some noteworthy benefits to online learning. For example, various platforms could be used to serve the different needs and address issues that may have previously caused pupils to be excluded from certain lessons.[57]

One school for pupils with an Autistic Spectrum Condition (ASC) and/or Social and Emotional Mental Health (SEMH) needs, who submitted evidence to the EdTech APPG for this report, shared with us how they found a hybrid approach to learning to be vital. For some students a hard copy pack of work

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[51] Ofsted, COVID-19 series: briefing on local areas' special educational needs and disabilities provision, 04.11.2020, link

[52] The Family Fund, Impact of COVID-19 Research: UK Findings, 13.05.2020, link

[53] Megan Lucas, Julie Nelson, and David Sims (NFER), Schools' Responses to Covid-19: Pupil Engagement in Remote Learning, 16.06.2020, link, p.10

[54] Department for Education, Children's Minister keynote address on assistive technology, 25.11.2020, link

[55] Department for Education, Science Minister announces the UK's world-leading role in EdTech, 22.02.2020, link

[56] Ofsted, COVID-19 series: briefing on local areas' special educational needs and disabilities provision, 10.11.20, link, p. 2

[57] Ofsted, Research & Analysis: Remote Education Research, 25.01.2021, link

was an essential, tangible link to the familiarity of school. However, some students who had felt unable to engage in a face to face therapy session engaged with the screen-based offer. The Complete Education System also adapted their extra-curricular offer to ensure children had lots of opportunities to be creative during lockdown. This culminated in an 'Art of the Possible' virtual art exhibition.[58]

It is true that many pupils had difficulty accessing the requisite technology. As research produced by the national charity Family Fund has noted, as of August 2020, 54% of families with a child with SEND reported difficulties accessing a mobile, tablet or laptop.[59] Where computer devices and broadband were not a problem, research carried out by the APPG for Assistive Technology uncovered low student/teacher/parent awareness of mainstream accessibility features and specialist assistive technologies.[60]

As a symposium of expert speakers from the SEND community told the All Party Parliamentary Group on Assistive Technology in November 2020, there are hopes that the rapid adoption of technology in schools and colleges as a result of COVID-19 represents a significant opportunity to improve education providers' digital skills, accessibility awareness, and inclusive practices in the long term.[61] This highlights an opportunity that must be grasped to ensure all EdTech is designed and used with SEND pupils in mind in order to empower them to realise their unique talents.

Likewise, we need to ensure that we support educators to fully make use of the inclusive elements within EdTech solutions. ALLFIE and the APPG on Assistive Technology heard evidence to the effect that many professionals could benefit from opportunities for training and CPD in assistive technologies. Strategies that have been suggested include adding curriculum content on accessibility to initial teacher training and NQT training and creating a nationally recognised programme for assistive technology specialists.[62] The ultimate aim should be that all teachers are confident teachers of pupils with SEND.

Additionally, support needs to be provided to educators and families as to where to find inclusive EdTech to mitigate difficulties in finding and navigating the emerging sources of information, assessing the quality of their evidence basis and determining how their contents might be applied to the curriculum.[63]

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[58] Written evidence submitted to the EdTech APPG by TCES, The Complete Education Solution (05.10.2020) link
[59] Social Work, Education and COVID-19: Evidence from parent carers of children with SEND, 03.08.2020, link
[60] See The All Party Parliamentary Group for Assistive Technology, Inclusive Home Learning Symposium: Outcomes at Policy Connect, 24.11.2020, link
[61] Ibid
[62] Ibid
[63] Ibid

What worked in providing pastoral support?

During lockdown some children experienced heightened vulnerability in their home environment. As Barnardo's *See, Hear, Report* programme has detailed, these vulnerabilities could include greater exposure to family strife including, in some cases, domestic violence, as well as reduced household income, living standards, limited access to educational materials and a lack of independent study space.[64]

The impact of time spent away from school appears evident in Ofsted's second interim report on its autumn 2020 school visits.[65] Its description of children who have regressed in a variety of key basic skills has chimed with findings from previous periods of prolonged school absence among children, which have been associated with, for example, corollary losses in fine motor skills, reductions in working memory and executive functioning skills.[65]

Other reports published by the National Society for the Prevention of Cruelty to Children (NSPCC), YoungMinds and Barnardo's regarding the mental health of adolescents also raise concerns.[67]

Evidence collected by bodies such as The Open Data Institute and the University of Cambridge note that it was the weekly phone call from a teacher, the message of support from a school leader or a video message from a friend that best supported most pupils' sense of wellbeing. Many teachers were also providing direct support to their most vulnerable pupils, for example through the distribution of food parcels.[68]

> **It appears that the remote learning approaches that best supported students' wellbeing had four design elements.**

Nevertheless, there is early evidence that certain technologies also proved effective in supporting pupils' wellbeing. It appears that the remote learning approaches that best supported students' wellbeing had four design elements.

First, teacher presence. Where teachers taught pupils strategies for independent study and sent reminder and check-in emails, it appears to have been well received. Furthermore, where teachers provided detailed feedback to essays, and marked each student's submissions sequentially rather than all in one go at the end of term, students felt more valued. This

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[64] The Open Data Institute has analysed 7,000 dataset records provided by Barnardo's, See, Hear, Respond Partnership, see The Open Data Institute, Data about Children's lives in the Pandemic, 14.11.2020, link, p. 25

[65] Ofsted, Children hardest hit by COVID-19 pandemic are regressing in basic skills and learning, 10.11.2020, link

[66] Cambridge University Cross-Disciplinary Special Interest Group for Policy related to children and young people (CUSP), Written evidence to the Education Select Committee, 04.06.2020, link

[67] Barnardo's, Time for a Clean Slate: Children's Mental Health at the Heart of Education, 21.09.2020, link; National Society for the Prevention of Cruelty against Children (NSPCC), Record numbers contact the NSPCC during lockdown, 10.07.2020, link; Young Minds, Coronavirus Report: Impact on Young People with Mental Health Needs, 28.09.2020, link

[68] The Open Data Institute, Data about Children's lives in the Pandemic, 14.11.2020, link

replicates research finding that online learning experiences benefit when there is the presence of a caring relationship.[69]

Second, platforms that sustained pupil relationships and enabled children to receive feedback from their peers, as well as their teachers, proved popular. The EdTech APPG heard that platforms which allowed pupils to complete tasks independently and then upload their work themselves worked well when they enabled pupils to share their home learning with the rest of their class and supported peer-to-peer praise and communication. Where students took more responsibility for their own learning, forums also encouraged collaboration.[70]

Third, remote learning platforms which incorporated activities that developed children's self-regulation, self-esteem and self-influence received some encouraging feedback. For example, many families spoke positively about Year 6 to Year 7 transition programmes that had been offered by educational publishers. Many of these were based on Talking about School Transition (TaST) lessons, which have previously been used to help children's self-appraisals, coping skills and emotional resilience prior to the transition to secondary school and appears to have been effective here.[71]

Findings also indicate that whether a learner is successful in following a course of online learning is dependent on robust self-regulation skills – that is their ability to effectively manage their emotions, behaviour and thoughts in the pursuit of long-term goals. Those seeking help in these areas can be supported by online pastoral support tools.[72]

The EDUU School pilot, (an online pilot platform supported by Nesta, Shireland Collegiate Academy Trust (SCAT) and GLUU), which was aimed exclusively at 1,863 disadvantaged children from schools in Birmingham, Dudley and Sandwell Local Authorities, sought to help students develop and strengthen their self-regulatory skills through its 'Tools for Coping' offer, made available via the EDUU School platform. It helped children to reflect upon their learning and emotional experiences. As a direct result of being able to access pastoral support online, students who needed additional help were provided with over 1,000 hours of free therapy, plus additional psycho-education materials. Such self-referrals were found to mostly occur after 22:00. The inclusion of a dashboard, featuring practical tools proven to assist self-regulation such as automated "to do" lists, diary planning and reminders also led to substantially higher levels of engagement among

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[69] Ibid, p. 18
[70] Evidence submitted to EdTech APPG by 2Simple (30.09.2020); Firefly Learning (05.10.2020)
[71] Written evidence submitted by Charlotte Bagnall (University of Glasgow) to the Education Select Committee Inquiry on the Impact of COVID-19 on education and children's services, link
[72] Whole Education, EDUU School: Final Report from the Evaluation (08.10.2020), unpublished

users of their platform than the national average.[73] This example provides grounds for greater research as to how user design might be developed so as to integrate gateways to pastoral support via education platforms more broadly.

Fourth, the value of interlinking services becomes apparent once again here. The EDUU school pilot programme described above brought together the curriculum of the Shireland Collegiate Academy Trust, the user design of the remote learning platform, and the counselling expertise of the national charity, the Trauma Response Network. Eduu.School as the online interface was known, featured a hyperlink enabling students to access free sessions with a professional counsellor.[74]

What worked in supporting school staff?

Research carried out by University College London, via Teacher Tapp, found that the period of partial school closures in 2020 had a detrimental effect on the mental health of many educational staff. According to a Teacher Tapp survey conducted in September 2020, around 30% of teachers continued to report COVID-19 related anxiety.[75] Whereas headteachers began the COVID period with lower incidences of stress levels than teachers, this later reversed with one in four headteachers reporting that they felt completely overwhelmed by their work as of November 2020, compared to one in five in June.[76]

This stress can be in part attributed to the fact that many school staff felt – understandably – unprepared for the shift online. Indeed, at the beginning of lockdown only 66% of teachers deemed themselves to have the immediate competence and capacity to deliver remote learning.[77]

Historically the UK has tended to focus less on technology informed learning. However, during the pandemic and the ensuing need to provide remote education, the EdTech APPG heard that using platforms which allowed teachers to set assignments with detailed instructions and include templates alongside scaffolding material enabled staff to build an organised series of lessons with clear assignments for students to complete. Additionally, platforms which allowed for the setting of submission dates to hand work in and supported digital assessment and feedback proved to be of value to teachers and reflected working patterns they were used to.[78]

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[73] Ibid

[74] Whole Education, EDUU School: Final Report from the Evaluation (08.10.2020), unpublished

[75] Teacher Tapp & UCL Social Research Institute, How did the early stages of the COVID-19 pandemic affect teacher wellbeing? 26.06.2020, link; Nuffield Foundation, News, 22.09.20, link

[76] Rebecca Allen, John Jerrim and Sam Simms, How did the early stages of the COVID-19 pandemic affect teacher wellbeing? 26.06.2020, link

[77] Nuffield Foundation, The most disadvantaged pupils are less likely to be engaged in remote learning, 16.06.2020, link

[78] Evidence submitted to EdTech APPG by The Emmanuel Schools Foundation (30.09.2020)

During the period of partial school closure some teachers engaged in peer interaction, often with teachers from other schools. These teachers appear to have particularly enjoyed using third-party apps or platforms that allowed them to review recordings of other teachers' remote teaching practices, whilst also receiving feedback on their own content. More formal support was of course also available through Department for Education's newly appointed 38 EdTech Demonstrator Schools, which also included a peer-based element. The Demonstrator programme attracted more than 1,500 enquiries in its first six months.[79]

Teachers appeared to welcome a clear school strategy for delivering online learning. The APPG received evidence from a large Multi-Academy Trust which benefits from a central EdTech function made up of technologists with school leadership experience. This meant they were able to provide Continuity of Learning advice for teachers in their Primary and Secondary schools throughout lockdown, which encouraged the use of both commercial materials and curriculum materials produced by the centre's subject advisors and, increasingly, highly specific content created by teachers themselves. The submission noted the value of having a digital strategy that is owned by the school's educational leadership and founded on solid pedagogical principles is the success factor with the greatest influence on pupils' experience of remote education.[80]

" the value of having a digital strategy "

In addition, the APPG heard from a school where staff were strongly encouraged to trial new technologies to make the remote learning experience more engaging for pupils, as well as more useful for teachers, in terms of helping them to track their pupils' progress and check for misconceptions. The staff community shared success stories across departments, discovering a number of different apps and platforms that enabled greater assessment for learning within the realms of a virtual lesson. The school firmly believes that the use of EdTech which allows more effective planning of revision lessons and targeted intervention will go a long way to negating the negative effects of the pandemic. [81]

Evidence submitted to the APPG by an EdTech provider substantiated similar views form teachers using their product, noting that feedback they had received during the pandemic indicated teachers and parents were satisfied with the level of intuitiveness built into their programmes, as they allowed pupils to get started and continue with their learning journey with little, if any, input, from parents or the teacher.[82]

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[79] EdTech UK, EdTech Advisory Forum, Vision 2025, link, p.15
[80] Written Evidence submission to the EdTech APPG by the United Learning Trust (05.10.2020)
[81] Written Evidence submission to the EdTech APPG by The Petersfield School, part of the Bohunt Education Trust (05.10.2020)
[82] Written Evidence submission to the EdTech APPG by Maths Circle (05.10.2020)

Additional supplier-led evidence received reflected on feedback provided by a teacher who praised their EdTech solution as being "…vital…." in assisting their new to English pupils to continue to make progress during the pandemic.[83]

Although not the only system available, teachers and senior leaders alike appeared to value cloud-based Management Information Systems (MIS). School leaders apportioned significant value to MIS' role in helping them monitor student engagement patterns, track the progress of vulnerable cohorts of pupils, and explore contextual data analysis performed by the MIS to spot anomalies and trends across students' performance.[84] Reports to the EdTech APPG suggest that teachers believed the MIS information gave deep insights into their students and were valuable in informing interventions.

Research by Ofsted has highlighted the workload burden placed on teachers when the need arose to provide both face-to-face and remote learning when schools opened more widely for the Autumn term, 2020. Where technology was being used by teachers to supplement in-person learning, they were likely to be more able to adapt to provide aligned, online education, using such solutions to manage remote learning delivery, mark questions, identify gaps in learning and provide timely feedback to their students outside of the classroom. The APPG received multiple examples of testimony that cited teachers praising the efficiency of cloud-based teaching and class management tools supporting hybrid learning in this way.[85]

While not all schools had a digital strategy in place at the outset of the COVID-19 pandemic, in the move to provide online and remote learning during the first and subsequent periods of lockdown, schools and teachers were offered considerable support by organisations including the Publishers Association (PA) and the British Educational Suppliers Association (BESA), whose members provided a combined £60 million worth of free goods and services to schools. Guidance was also provided by the DfE.[86]

[83] Written Evidence submission to the EdTech APPG by Flash Academy and Anderton Park Primary School (02.10.2020)

[84] The Open Data Institute, Data about Children's lives in the Pandemic, 14.11.2020, link, p. 24

[85] Written Evidence submitted to EdTech APPG by Net Support on their solution Classroom.Cloud (05.10.2020); LbQ (24.09.2020); and 2 Simple (30.09.2020)

[86] Department for Education, Guidance: Remote education good practise, 2020, link

Safeguarding

Where safeguarding issues – or perhaps a lack of in-school safeguarding policies specific to the delivery of remote education – were of major concern to teachers, this may have led them to record lessons themselves or signpost their pupils to platforms containing pre-recorded content, rather than to live stream their lesson content.

To ensure that we can both maximise the use of EdTech and adequately protect pupils, it is vital that robust safeguarding measures are firmly in place and kept under regular review.

> **Security should never be treated as an add-on**

EdTech products and services must be secure by design. Security should never be treated as an add-on, to be organised by schools who may lack the necessary in-house skills or budgets for external consultancy.

Some schools have found it easier to safeguard vulnerable children during the pandemic, as they have been able to communicate with them more regularly.[87] However, this will not have been the case for all schools and pupils. Safeguarding clearly links to pastoral care and we know that some children studying from home during the lockdown were more vulnerable to abuse, whether it be to domestic abuse (including from siblings) or on-line abuse, where those studying from bedrooms and on their own are vulnerable to on-line abuse and grooming. In May, the Internet Watch Foundation (IWF) received 41% more public reports of online child abuse, and in June they received 80% more public reports than in June 2019.[88]

Many leading broadband providers offer web filtering, but far more must be done to help schools access guidance that will help them check the security and probity of content, email traffic and services suppliers. For example, London Grid for Learning includes secure e-mail and domain name authentication for the schools they work with, as well as a wide variety of other safety and security services. SW Grid for Learning hosts the UK Safer Internet centre.

While members of such organisations like the PA and BESA are subject to strict codes of conduct, one of the pandemic's legacies will be the need for schools to examine and audit the terms and conditions of all providers whose resources they are looking to implement. Furthermore, submissions to the APPG included a referenced call for statutory Codes of Practice in EdTech to protect the rights of children and young people across the digital environment in education.[89]

[87] Ofsted, Research & Analysis: Remote Education Research, link
[88] Internet Watch Foundation, News, 16.07.2020, link
[89] Defenddigitalme, The State of Children's Data Report: Mapping a child's digital footprint across England's state education landscape (June 2020), link

Pupils' access to technology & broadband

Clearly, the nature of home learning will have differed by pupils' age – and, correspondingly, so too did the tools pupils needed to learn remotely.

The ONS' report on home-schooling between April and June 2020 found that the percentage of parents who said that their children had used real-time online learning resources increased according to the age of the child. Indeed, 13% of parents with younger children (aged between 5 and 10 years old) reported that their children used online learning resources, compared to 44% of parents with older children (aged between 16 and 18 years old).[90]

This seems to correspond with preliminary findings by the Children's Commissioner that older children / those aged 13 and above required a computer or laptop to complete either all or the majority of their school work.[91]

These preliminary findings also found that in the five days to the end of April 2020, there were still a significant number of children either without a computer entirely or having to use a shared device. 36.6% of pupils aged 12 or under had their own computer, and 60.9% of those aged 13 plus had their own computer. However, 58.8% of pupils aged 12 or under had a shared computer, as did 36% of those aged 13 plus. 4.6% of those aged 12 or under, and 3.2% of those aged 13 plus, had no computer at all.[92] A more recent study commissioned by education charity Teach First found that 37% of parents say they have at least one child with no exclusive use of a device to learn from home. Furthermore, they found that 6% of parents surveyed have a child with no access to device at all for home schooling and that 7% of parents in England have at least one child mainly accessing schoolwork via a smartphone.[93]

In addition to these findings, The Sutton Trust noted that at the start of the partial school closures, when it became clear there would be a need to educate most children remotely, just 5% of teachers in state schools said that all their pupils had an appropriate device through which to access remote learning, compared to 54% of pupils at private schools.[94]

It is clear that the pace of change brought about by partial school closure and the need to deliver education in home settings has exposed significant digital divides between schools and between pupils at the same schools.

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[90] ONS, Coronavirus and homeschooling in Great Britain: April to June 2020, 22.07.2020, link
[91] Children's Commissioner, 'The numbers behind home schooling in lockdown', 11.06.2020, link
[92] Ibid
[93] Teach First, Press Release, 10.02.2021, link
[94] Sutton Trust, 'Learning in Lockdown' report, 21.01.2021, link

As is well known, attempts have been made to provide devices to pupils who at the outset of the crisis did not have an appropriate device of their own. By mid-February 2021, the DfE had dispatched 1,055,745 laptops to schools in need of them. Efforts by the Government have been further supported by organisations such as London Grid for Learning who are leading a significant national procurement programme, which aims to secure up to 2 million additional devices.

The APPG also heard from schools and multi-academy trusts (MATs) who felt they were able to provide the requisite equipment to pupils who needed it, including both devices and internet access. One MAT, for example, told the APPG how they had purchased 11,000 Chromebooks, as well as internet access, and set up provisions for safeguarding.

The digital divide, in terms of pupil access to devices, must be closed. Doing so requires a paradigm shift, which sees devices treated as an essential component of a child's learning toolkit. In the first instance, Government efforts to supply devices should not end with the pandemic. Rather, what is needed is a longer-term programme that works towards the ambition of ensuring all pupils can access a secure device and the appropriate software.

> **ensuring all pupils can access a secure device and the appropriate software**

Of course, a device also requires an internet connection. Ofcom's Online Nation 2020 report points out that only 2% of households with children do not have access to the internet at home.[96] However, this does not mean that all those households had an optimal connection for remote learning. For example, where there were multiple people in one household needing to connect to the internet, that connection will have needed to be robust enough to serve multiple devices.

Broadband quality varies across the country. At this stage it would be difficult to say conclusively that pupils living in one area suffered a disadvantage in online learning versus pupils living in another area due to the quality of broadband. However, it is known that the quality of a pupil's broadband connection could impact their online learning experience. A lesson here is that going forward, the resilience of online learning platforms in the face of

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[96] Ofcom, Online Nation 2020 Report, 24.06.2020, link p.10

internet connectivity issues needs to be considered, including how platforms can protect and store work in such a way that reduces the risk of it being lost.

Clearly, we also need to ensure the best possible provision of broadband connectivity is made available. To ensure that no learner is left behind, there is a need to make sure that education settings and other community spaces where learning takes place are among the first in line for infrastructural upgrades to broadband. In addition, all education platforms should benefit from being zero-rated by data providers.

> **"all education platforms should benefit from being zero-rated by data providers "**

Finally, it is worth bearing in mind that not all remote learning was delivered digitally during lockdown, and that where devices were not available in the home, the APPG heard that work packs were delivered to students and collected once schools re-opened to them. However, the gap between work being completed and students receiving feedback was too great for the feedback to have the impact it would have done if delivered sooner.

While the focus has, understandably, been on providing remote digital learning via laptops and tablets, the APPG would also like to see a much greater repurposing of existing technologies to support learning during periods of school disruption. Indeed, an increase in the amount of formal educational content broadcast by Public Service Broadcasters would be welcomed. This output would also, ideally, be complemented with content broadcast by commercial multi-channels, as well as a greater level of content being made available through streaming services and podcasts. Inevitably, it would be difficult to align all of this content with the curriculum, but it would still add value in terms of delivering the core subject knowledge required to keep pupils engaged and learning. There would also be value in ensuring programmes are subtitled where appropriate to support children's literacy.

> **"a much greater repurposing of existing technologies "**

Conclusion

As discussed at the outset, this period of online learning is far from a controlled experiment. However, the evidence provided to the EdTech APPG for this report, combined with an understanding of other literature and studies, still allows us to learn some valuable lessons – for periods of potential future disruption, and crucially also for education more broadly.

Lessons for periods of school disruption:

Lesson 1

Schools should not just seek to replicate classroom teaching online but should **embrace the pedagogic advances that EdTech allows**. A timetable of live lessons is not necessarily a gold standard; there is a role for teacher-led video lessons, both live and pre-recorded, as well as for content produced by the educational supplies sector, and peer and collaborative study. Of course, remote learning should also encourage and incorporate non-screen-based activities, including reading books, putting pen to paper, arts and crafts and physical exercise.

Lesson 2

In addition to schools delivering devices, the efforts to provide internet access to those without, and educational suppliers making content available, **there needs to be a far greater mobilisation of existing, widely-available technologies** to help pupils continue learning throughout periods of school closure. During the pandemic, Public Service Broadcasters such as the BBC have taken some welcome steps by increasing the volume of televised educational content, but the APPG would like to see this go much further, for example with the repurposing of entire channels (like BBC 3 and BBC 4) to deliver formal educational content during any future periods of disruption to the school term. There is clearly potential too in what streaming and podcasts services could offer.

Lesson 3

There is early evidence that certain technologies and remote learning practices can prove effective in **supporting pupils' wellbeing** during periods of emergency school closure, and **four overarching design themes** appear to underpin these. Those four themes are: teacher presence; facilitation of peer-caring; activities that supported pupils' self-regulation, self-esteem and self-influence; and the interlinking of support services. Of course, the use of platforms encompassing these features need not be exclusive to periods of disruption going forward.

Lessons for ongoing education:

Lesson 4

As schools reopen, they should **ensure traditional classroom teaching is coupled with the use of EdTech as a matter of routine**, to enrich the variety of pedagogic approaches. This more blended style of learning would be on campus, within the school setting, but not necessarily always in the classroom.

Lesson 5

In addition to direct one-to-one tutoring, the **National Tutoring Programme** should utilise **a more diverse range of EdTech solutions** to help pupils catch up on lost learning and to maximise its reach.

Lesson 6

The use of EdTech in schools should not be limited to curriculum delivery. It should be **holistic**, covering all key areas of pupil development. Innovative solutions that have supported pupil wellbeing during lockdown should continue to be used to strengthen the provision of pastoral care. Additionally, tools that help pupils organise themselves and self-regulate should also be made widely available, as should those which allow for continued communication with parents and guardians.

Lesson 7

Early evidence submitted to the APPG, along with the findings of other recent work, suggests **certain EdTech design features resonated**. This includes features which engage pupils' attention; allow pupils to 'get help' with their work securely; provide motivational structures; and interlink resources in one place.

Lesson 8

The Department for Education's laptop and tablet procurement programme should not end with the reopening of schools. It should morph into a longer-term programme that works towards the ambition of **ensuring that all pupils can access secure devices and the appropriate learning software**. Procurement of these devices should be a shared and sustainable endeavour between government, schools, business and industry.

Lesson 9

Closing the digital divide also means ensuring the best possible provision of broadband connectivity across the country. This includes making sure that education settings and other community spaces where learning takes place are **prioritised for infrastructural upgrades to broadband**. It also means ensuring that all education platforms benefit from being **zero-rated by data providers**.

Lesson 10

Initial Teacher Training and the Early Career Framework must equip teachers with the knowledge and confidence to source and deploy effective EdTech solutions to support both the teaching and learning process and to drive efficiencies across school management. Schools should also **provide inset or equivalent training and guidance** for teachers as part of regular CPD. At the same time, the technology must be made considerably easier to find, procure and integrate too.

Lesson 11

EdTech has great potential to significantly **ease the workloads of school leaders and teachers**. Schools should not revert back to more traditional paper-trail methods of administration, but should continue (or take up) using systems that support teachers with lesson planning, marking and data analysis.

Lesson 12

It is vital that we nurture the individual talents that all children with SEND possess and ensure they get the most out of their time at school. There is a strong appetite across the Assistive Technology and education sector to work together to improve the quality of provision across the UK and this should be harnessed. The APPG would like to see **deeper consideration given to the impact EdTech can have and how it can be used to help realise and nurture the diverse talents of children with SEND**. It is important that we get these interventions right, but at the same time we need to proceed with a sense of urgency, given the difficulties that we know many children with SEND have experienced over the past year.

Central to this mission will also be a) ensuring that all future EdTech solutions include necessary features for children with SEND and b) helping teachers to fully utilise the EdTech solutions available to them.

Lesson 13

The APPG's Call for Evidence exercise, which provided the evidence underpinning much of this report, was UK-focussed. However, as the APPG heard during its panel discussion on international comparisons in November 2020, the challenge of delivering remote education at speed was addressed in a variety of different ways around the world. There is value in keeping abreast of other nations' experiences of using EdTech, as it can help to inform our own decision-making, where appropriate. Of course, we should also **advance opportunities for our own world leading EdTech sector**, which has much to offer pupils in this country and around the world.

Likewise, International EdTech trade associations, incubators and accelerators benefit from strong relations with their counterparts in the UK, in order to foster the sharing of best practice and opportunities in each of their respective territories. For example, the European EdTech Alliance (EEA), which represents over 10 national trade associations and clusters working with EdTech providers across Europe, meets regularly to discuss regional policy updates, share insights into what is working well and to discuss common challenges and opportunities for collaboration.

Lesson 14

Deploying EdTech during the unprecedented period of remote learning has not been without challenge, but the use of technology in education will not revert back to the status quo ante. Given the changed context, the Department for Education should build on its 2019 EdTech Strategy by developing an **EdTech sector deal to improve the functioning of the industry's ecosystem** and ensure it better serves all stakeholders. The key aim of such a sector deal must be to bring industry, schools and policymakers much closer together, as only by doing so will we see the step-change in user and product research and innovation, communication and ease of procurement that is required to fulfil the conclusions of this report.

References and acknowledgements

The EdTech APPG is grateful to all those who contributed to this report, including through the Call for Evidence process. All submissions to the Call for Evidence, whether referenced in the report explicitly or not, contributed to its formulation.

In the coming months the APPG will continue to explore and make the case for the use of technology into education.