

RESEARCH AND ANALYSIS

Learning during the pandemic: review of research from England

Report 4 of 5 on learning during the 2020
coronavirus (COVID-19) pandemic

ofqual

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With thanks to colleagues from

- Department for Education
- Education Endowment Foundation
- Education Policy Institute
- FFT Education Datalab
- GL Assessment
- ImpactEd
- Institute for Fiscal Studies
- Juniper Education
- National Foundation for Educational Research
- No More Marking
- Ofsted
- Renaissance
- Roger Murphy
- RS Assessment from Hodder Education
- SchoolDash
- University College London
- University of Exeter

Contents

| | |
|--|-----------|
| Authors | 2 |
| <i>With thanks to colleagues from</i> | 2 |
| Executive summary | 5 |
| <i>The pandemic has been a challenging period for teachers, schools and colleges, students and parents</i> | 5 |
| <i>The quality and quantity of learning students undertook declined as a result of the pandemic</i> | 5 |
| <i>Most students are reported to have some learning losses, while some have severe learning losses and some have learning gains</i> | 6 |
| <i>Learning losses appear to be most prevalent in maths and literacy.....</i> | 7 |
| <i>Experiences of teaching and learning during the pandemic were diverse, but disadvantage and deprivation appear to be most associated with less effective learning and overall learning losses</i> | 7 |
| <i>Learning experiences were diverse: there were differential experiences both between and within groups.....</i> | 7 |
| <i>There are important implications for learning recovery</i> | 8 |
| <i>There is much about learning during the pandemic that remains unknown and under researched.....</i> | 8 |
| Introduction | 9 |
| <i>The current review.....</i> | 9 |
| The impact the pandemic has had on learning | 11 |
| <i>Remote teaching and learning in the 2020 spring and summer terms.....</i> | 11 |
| <i>Teaching and learning in the 2020 autumn and 2021 spring terms.....</i> | 33 |
| <i>Schematic overview of the impact of the pandemic on learning</i> | 40 |
| The scale and nature of learning loss | 42 |
| <i>Teacher estimates of lost learning</i> | 42 |
| The differential experiences of learning loss | 48 |
| <i>Learning loss across different groups of students</i> | 48 |
| <i>Widening attainment gaps.....</i> | 57 |
| <i>Individual experiences of learning loss</i> | 57 |

| | |
|---|-----------|
| Discussion | 60 |
| <i>What do we know about learning experiences during the pandemic?</i> | 60 |
| <i>What do we know about learning losses during the pandemic?</i> | 61 |
| <i>What do we know about differential impacts of the pandemic on learning, and why are these important to consider?</i> | 62 |
| <i>Areas for further research.....</i> | 63 |
| <i>An evaluation of the literature sources</i> | 64 |
| Conclusion..... | 67 |
| Appendices | 68 |
| <i>Appendix A</i> | 68 |
| <i>Appendix B</i> | 70 |
| References | 71 |

Executive summary

This review is a report in our 'Learning During the Pandemic' series. It comprises a review of the literature exploring what is currently known about changes in students' learning in England over the duration of the coronavirus (COVID-19) pandemic. This supports Ofqual's effective policy making for assessments in 2021, and years to come.

Here, we focus on three elements relating to how the pandemic has impacted learning. First, we consider teaching and learning experiences across the course of the pandemic, from March 2020 to March 2021. We also explore the scale and nature of any learning losses. Finally, we highlight the differential experiences of learning and how this may be reflected in terms of any learning losses.

This review aimed to be comprehensive of the literature related to learning during the pandemic in England. We provide a summary of the key findings here.

The pandemic has been a challenging period for teachers, schools and colleges, students and parents

While adjusting to the new way of living during the pandemic, many teachers, parents and students took on additional responsibilities that went above and beyond their usual roles and duties, and they should be recognised for their efforts.

The quality and quantity of learning students undertook declined as a result of the pandemic

Spring and summer terms 2020

During the spring and summer 2020 terms teaching and learning was largely remote. Despite their best efforts, many schools and colleges often did not provide as effective teaching as they would have done under normal circumstances. The amount of work provided to students was in many cases much less compared with normal, and pedagogy was often less effective. Studying was most commonly independent of teachers or peers, comprising of worksheets, assignments and watching educational videos. Online lessons, which most closely resembled the usual classroom learning, were less common. With most learning being completed online, having sufficient access to electronic devices, the internet and a quiet study space at home became a critical issue. Most students had access to these resources to some degree, however there were still many who were not able to access their learning in this way.

The autumn term 2020

By the autumn term, schools and colleges reopened so that learning could once again be face-to-face. However, although this term, in general, offered better learning provision than remote learning, they were far removed from a normal year. There were many notable challenges to teaching in the 2020 autumn term. COVID-safe restrictions and social distancing in schools and colleges meant that often, individual students or student ‘bubbles’ had to self-isolate, and continue their learning remotely. This meant that teachers were often faced with the challenge of teaching in class as well as providing online learning for students who were isolating, which generally resulted in a decline in the quality of learning provision, particularly for individual students participating online. Even when students remained in the classroom, COVID-safe practices meant that the usual teaching in some subjects suffered, particularly because teacher-student and peer interactivity, sharing of equipment and practical tasks were reduced or ceased completely. As such, the autumn term was not felt by many to have been a successful period of learning recovery.

The spring term 2021

At the start of the 2021 spring term, England went back into a national lockdown, and learning was predominantly remote again. At this stage, we know less about the students’ learning in the 2021 spring term, but this period of remote learning is thought to have been more successful than previous periods, as teachers were better equipped to deliver remote teaching and access to digital resources for students who did not have them during the first lockdown was also somewhat improved. By March 2021, most students could return to school. While COVID-safe and social distancing restrictions are still in place in schools and colleges, the quality of learning experienced by students is still thought to be far less than it was before the pandemic.

Most students are reported to have some learning losses, while some have severe learning losses and some have learning gains

For most students, their learning has suffered to at least some degree. Teacher estimations indicate that while a small proportion of students made learning gains, most students have learning losses, and sometimes this was severe. The literature indicates that the extended periods of remote learning are likely to account for most of the learning loss.

Learning losses appear to be most prevalent in maths and literacy

Ofsted reports from the autumn terms indicate that students were most behind in maths and literacy skills. Practical skills were also identified as being behind, which was most problematic for qualifications with large practical components, such as some apprenticeships, and trades and beauty qualifications.

Experiences of teaching and learning during the pandemic were diverse, but disadvantage and deprivation appear to be most associated with less effective learning and overall learning losses

In this review we note the differential experiences of learning by: age or stage of education, deprivation and disadvantage, attending state or independent schools and colleges, lower attaining students, students with special education needs or disabilities (SEND), gender, ethnicity, region, and students in other circumstances (students living in single-parent households or with multiple siblings, vulnerable children and children of keyworkers).

In general, disadvantage and deprivation appear to be most associated with less effective learning. Teaching and learning for primary-aged students also appear to have been negatively impacted. Teachers' estimates of how much learning these students have lost reflect these findings, and further raise concerns about the impact of the pandemic on these students' future learning and occupational opportunities.

Learning experiences were diverse: there were differential experiences both between and within groups

While learning was broadly researched across different groups of students or students from different backgrounds, it is important to keep sight of the fact that the research and data analyses often minimise the role of individual experience. In reality, experiences of teaching and learning during the pandemic were diverse. Here, we briefly note that there are complex interactions between macro- and micro-level influences that give rise to complex and unique variations in experience (and relative impacts) for individuals between *and within* groups. Examples of factors that contribute to the diversity in experience are presented in

the schematic summarising the section on ‘The impact the pandemic has had on learning’ – see Figure 1.

There are important implications for learning recovery

Given the complexity and uniqueness of learning experiences and learning losses, a one-size solution for learning recovery is unlikely to be equally beneficial to all. This has important implications for learning recovery programmes within schools and colleges, and also for wider decision-making and policy implementation in the field of educational assessment.

There is much about learning during the pandemic that remains unknown and under researched

Overall, it is evident that this research field has produced a considerable amount of research in a short period of time to build a foundation of knowledge around the impact of the pandemic on learning in England. However, it remains that there is much that is still unknown. For instance, there is little information regarding the impact of the pandemic for specific subjects, qualifications (particularly for vocational and technical qualifications), and year groups for which the timing of the pandemic has been particularly disruptive to their high-stakes assessments (such as those in years 10 to 13). Further evaluation is required in these under-researched areas to build a more complete picture of learning experiences and any learning losses.

Introduction

This review is a report in our 'Learning During the Pandemic' series. In particular, it should be read alongside two specialist reports in this series: 'Quantifying lost time (report 2)', and 'Quantifying lost learning (report 3)'. This series of reports aimed to, as fully as possible, understand the impact of the pandemic on learning in the run up to high-stakes assessments. This review in particular focuses on the literature around students' learning, and learning losses in England over the course of the coronavirus (COVID-19) pandemic. Our work monitoring and evaluating the emerging research around learning during the pandemic supports Ofqual's effective policy-making in the run up to assessments in 2021 and beyond.

The current review

In preparing this report, we reviewed over 200 sources that discuss teaching, learning and students' experiences over the course of the pandemic: from school closures in March 2020 until March 2021. Although this report was not based on a 'systematic review' of the literature, it intends to be comprehensive, in that we reviewed all available literature that was relevant to the impact of the pandemic on learning. We provide an evaluation of the literature sources in the section titled 'Discussion'.

This review focuses on teaching and learning of students undertaking the assessments and qualifications that Ofqual regulates. As such, the focus is primarily on teaching and learning in England, from primary-aged children to school or college leavers, typically aged 19. It should be noted, however, that there is more literature within some contexts than others. For instance, the literature is more heavily focused on primary and secondary students' experiences. Specific subjects or qualifications tended not to be the focus of research, however, where this is apparent in the findings, we include these in the review. School closures on 20 March 2020 meant that much teaching and learning had to be undertaken remotely. There is widespread concern regarding the degree to which students' learning has suffered since the start of the pandemic, and the amount of learning they have lost. Here we explore several issues related to learning loss, which we discuss across three main sections:

- the impact the pandemic has had on learning: within this section we look at the literature around school and college, and home provision for learning, as well as student engagement
- the scale and nature of learning loss: within this section we explore accounts about how much learning has been lost, what aspects of learning have suffered the most, and what the recovery of learning loss looks like thus far

- the differential experiences of learning loss: within this section we address how the experiences of learning were diverse, both between and within groups. We provide an overarching summary of the scale of learning loss, and possible contributors to this, across different contexts, such as age, disadvantage and ethnicity, to name a few

The impact the pandemic has had on learning

The start of the pandemic in March 2020 changed how teaching and learning were undertaken for most learners. Schools and colleges went through periods of being closed to most students and learning were often undertaken remotely – although vulnerable children and children of keyworkers could still attend school during these periods. When schools and colleges re-opened for in-school teaching, the learning environment was far removed from what it was before the pandemic. Consistent with changes to social-distancing measures, school and college closures, and the degree to which students were able to return to school or college, the nature of teaching and learning and the relative impacts between March 2020 and March 2021 were diverse. It is important to note that much of the literature exploring the impacts of the pandemic on learning focuses on the immediate impact, typically between March and July 2020. Currently, at the time of writing, there is limited insight as to the nature and impacts of teaching and learning beyond autumn 2020.

We present the findings of the literature chronologically, firstly addressing findings related to the initial school closures in March 2020 through to the end of the 2020 summer term in July, and secondly addressing teaching and learning during the 2020 autumn and 2021 spring terms.

Remote teaching and learning in the 2020 spring and summer terms

The literature outlines several key aspects of teaching and learning that acted as barriers to learning or were protective against the negative impact of the pandemic. Here we categorise them into factors related to:

1. school and college provision
2. home learning provision
3. student intrinsic factors

These dimensions will be explored in turn. Where this is discussed in the literature, the differential impacts on different groups of students, or across different contexts, are introduced. Also see the discussion section for an overview of the differential experiences of learning loss during the pandemic.

School and college provision

School and college closures from 20 March 2020 until the end of the summer term meant that most¹ teaching and learning had to be undertaken remotely. There is a large amount of research focused on the initial phase of the pandemic, between March and July 2020. Here we separate the findings and present them under five key areas:

1. The type and amount of remote learning provision.
2. The quality of the remote learning provision.
3. Teacher engagement.
4. In-school provision for children of keyworkers and vulnerable students during the first lockdown.
5. The return to school for some students in June 2020.

The type and amount of remote learning provision

Overall, students were spending much less time on learning during the 2020 spring and summer terms than they would have done pre-pandemic. This issue is explored comprehensively in Report 2 from our 'Learning During the Pandemic' series, but to summarise, before the pandemic, students would spend around five to six hours learning per day in school, as well as taking additional time for homework. This contrasts with accounts from parents, teachers and students about the time spent on remote learning during the spring and summer terms, which estimate that students were spending, on average, around 2.5 to 4.5 hours on learning per day (Andrew, Cattan, Costa-Dias, Farquharson, Kraftman, Krutikova... & Sevilla, 2020a; Cattan, Farquharson, Krutikova, Phimister, Salisbury, and Sevilla, 2020; Green, 2020; Pensiero, Kelly & Bokhove, 2020; Williams, Mayhew, Lagou, & Welsby, 2020). This section looks into the learning activities students were undertaking during this time.

The types of learning that took place while schools and colleges were closed can be categorised into 'online' and 'offline' learning. Online learning refers to the use of real-time internet-facilitated resources, whereby students engaged in a live 'online class'. Online learning was typically delivered via online-conferencing software, and could involve text chats and verbal interactivity with teachers and peers. Offline learning refers to learning that is undertaken outside of an 'online class' and

¹ Note, that while schools were closed, in-school provision was still available for keyworker and vulnerable children, and in June 2020 some year groups were invited back into schools. We explore these contexts further in the sections, 'In-school provision for children of keyworkers and vulnerable students during the first lockdown, and 'The return to school for some students in June 2020' respectively.

independent of a teacher. This typically involved completing worksheets, undertaking project work or assignments or watching educational videos.

Offline learning was much more prevalent than online learning throughout the period of remote learning, with around 90% of parents of both primary and secondary children reporting that their child received offline learning resources. Provision tended to be more limited for online learning in schools, although colleges appear to have made more use of online learning platforms (Association of Colleges, 2020). Parents indicated that schools were more likely to provide online learning to secondary students than primary students (59% compared with 44%, respectively; Cattan et al., 2020; Williams et al., 2020). The Association of Colleges reports that online learning was adopted for the majority of subjects in 70% of colleges surveyed, but were condensed with 35% receiving a significantly reduced timetable (Association of Colleges, 2020).

For those who did receive online lessons across the school week, this accounted for a small proportion of students' remote learning time. Parent reports of their child's time use between April and June 2020 indicates that primary and secondary students spent, on average, between 1 and 2 hours on online learning per day, with secondary students receiving slightly more online learning than primary students (2.14 hours, compared with 1.48 hours, respectively; Lucas, Nelson and Sims, 2020; also see: Andrew et al., 2020a; Bayrakdar & Guveli, 2020; Pensiero et al., 2020).

However, using averages to understand students' remote learning provision can mask the experiences of many students. Looking further at the data, it is clear that some schools and colleges delivered far less provision for online learning than others. In April, shortly after schools and colleges closed and teaching and learning was remote, online provision was found to be delivered every day to around a third of students (Pensiero et al., 2020; Benzeval, Borkowska, Burton, Crossley, Fumagalli, Jäckle, ... & Read, 2020a). At the same time, 60% of parents of primary students reported that their child did not have any online lessons. For secondary students this was just over 50%, and for post-secondary students this was 39% (Eivers, Worth & Ghosh, 2020; Pallan, Adab, Clarke, Duff, Frew ... & Murphy, 2021).

In May 2020, online provision had increased, where the number of students not undertaking online classes had reduced to 30% of primary, and 28% of secondary students (Andrew et al., 2020a). In contrast to this, around 20% of secondary students reportedly spent more than 4 hours a day participating in online learning in May 2020. For primary students this was around 8% (Andrews et al., 2020a). Moreover, online learning provision was not available to all students every day, with only 7% of students receiving at least one online teaching lesson every day.

At the start of the lockdown in March 2020, while almost all students in years 10 and 12 were provided with school work, almost half of parents whose children who were in years 11 (42%) and 13 (49%) reported that their school did not provide them with

any remote learning (Eivers et al., 2020). The cancellation of exams probably had a major role in this decision. By the time of the school closures, students had typically covered all of the course content, and would usually be in a period of revision in preparation for their exams. Without the exams to revise for, many schools and colleges likely prioritised learning for other year groups over the year 11 and 13s. It is not clear from the literature whether learning provision from the school or college picked up for year 11 and 13 students as remote learning continued through the summer term. This is unlikely to have happened, however, as these students would typically be on 'revision leave' from May onwards, to continue their learning independently.

Students spent more time undertaking offline work than online work during the first lockdown. On average, parents reported that primary and secondary students spent between 1 and 2 hours on offline learning per day. However, there was also large variation in time spent on offline work (Andrew et al., 2020a). Around 15% of primary students, and 25% of secondary students, reportedly did not undertake any offline learning (Green, 2020). Around 60% of primary, and 30% of secondary, students reportedly spent up to 2 hours on offline learning. At the other end of the range of experience, 25% of secondary students spent between 2 and 4 hours on offline learning and 17% spent more than 4 hours a day on offline learning.

The rapidity with which remote learning resources were implemented in light of the pandemic is striking. Schools and colleges, and individual teachers, constructed their own methods of remote teaching. This meant that there was diversity in the approaches teachers took and the resources that were available to facilitate this. Parental reports indicate differences in the provision of remote learning across different contexts (Andrews et al., 2020a; Andrews, Cattan, Costa-Dias, Farquharson, Kraftman, Krutikova, ... & Sevilla, 2020b). The most deprived students and students in state schools and colleges were less likely to experience online learning and have interactions with teachers, students and peers than less deprived students and students in independent schools. Independent schools were also nearly twice as likely to provide full school days than state schools (Eyles & Elliot-Major, 2021; Cullinane & Montacute, 2020). In place of online learning, paper-based resources were more common in schools with the most deprived students. This was largely driven by differences in digital resources and devices, but has further implications for the quality of students' learning, as will be discussed in the section, 'Quality of the remote learning provision'.

There were also regional divides, whereby 12.5% of students in London received daily online teaching, compared with 5% of students in the East Midlands. Also, while the average proportion of students who received four or more pieces of offline work per day was 20%, in the south-east this was 28% and in the north-east this was only 9%.

While there is less research exploring the impact of the pandemic for learners outside of schools and colleges, there is some that highlights that there are also contexts for which learning provision has been more limited or removed entirely. This is particularly the case for college students on practical courses and apprentices, who have been severely impacted by the pandemic (Association of Colleges, 2020; Ofsted, 2020a). During April 2020, a survey of employers (Doherty & Cullinane, 2020) reported that 36% of apprentices were furloughed, 8% were made redundant, and 17% had their off-the-job learning suspended. Apprentices experienced further challenges during the first lockdown, with 37% of surveyed employers reporting that a lack of equipment at home, or unsuitability of the work, meant that some apprentices could not work from home. A further 14% of employers reported that some apprentices did not have access to a digital device or the internet to continue their apprenticeship from home.

Quality of the remote learning provision

There was no prior requirement for schools and colleges across England to engage in remote teaching and learning before the pandemic. As such, investment in remote education solutions was lacking at the time of the initial school closures in March 2020. The lack of infrastructure to support online teaching resulted in many teachers feeling initially unprepared to deliver teaching remotely (Educate, 2020; Ofsted, 2020a).

Interviews with teachers carried out by Educate explored the change to teaching and learning across the period of initial school closures in the 2020 spring and summer terms. In total, 46 interviews were carried out between July and September 2020, where teachers were asked to reflect back on their teaching practices since the initial lockdown in March 2020. Overall, it was evident that to cope with the severe changes to the way teaching was delivered, most schools and colleges adopted Remote Emergency Teaching practices. Senior leaders report that this largely comprised of using materials provided by external providers (92%) and using externally provided pre-recorded video lessons (90%). Where schools and colleges did provide their own resources, they were typically worksheets (80%; Lucas et al., 2020). As previously discussed, fewer senior leaders reported that their teachers delivered active teaching provision such as live remote lessons (14%) or online discussions (37%, Lucas et al., 2020).

Teachers also reported that the move to remote teaching was not undertaken with ease. Out of 46 interviews Educate (2020) undertook, only 3 schools (1 state school and 2 independent schools) reported that the transition to remote teaching was seamless. Most of the teachers who took part in the interviews further indicated dissatisfaction with the teaching that they had delivered in the spring term, reporting that their approaches to remote teaching needed to be reviewed. This was

particularly driven by views around the lack of efficiency, interactivity and engagement between students and teachers.

Any type of learning provision is important to support students' learning during school closures, but it is important to consider that some methods of teaching may be more effective than others. Moreover, the quality of the teaching within those methods also has implications for effective learning. As we have seen, offline resources were the most common learning provision during the first lockdown in March 2020 (Andrew et al., 2020a; Green, 2020). Offline resources can be beneficial as they enable students to make better use of their time spent on their education, where students can move through the work at their own pace (Müller & Goldenberg, 2021). However, offline resources are unlikely to sufficiently substitute for the high-quality professional teaching delivered by teachers because they are likely to lack crucial elements of effective pedagogy. Effective pedagogy includes clear explanations about learning content, scaffolding to support learning and adapt to learning needs, and appropriate feedback that promotes development (Andrew et al. 2020b, Education Endowment Foundation, 2020a; Müller & Goldenberg, 2021). Effective pedagogy is particularly important for supporting younger students' learning, who are less likely to be able to effectively undertake independent learning in the way the older students can (Müller & Goldenberg, 2021).

Online lessons are the closest substitute to in-class learning that students will have experienced pre-pandemic. They are argued to be the most effective remote learning activity due to the presence of the teacher, which facilitates the aspects of effective pedagogy outlined above (Andrew et al. 2020b). The Education Endowment Foundation (2020a) further reported that pre-recorded material could be used by teachers, as what matters most is explanations building on pupils' prior learning and how their understanding is later assessed. It is not clear from the research how much online teaching was delivered with good pedagogy during the 2020 spring and summer terms. However, given that students generally reported that they would have liked more feedback and engagement with teachers and peers (Child Poverty Action Group, 2020), it is likely that the online teaching was below the quality that students receive during normal periods of learning, pre-pandemic.

It is worth noting, that while the time students spent on learning did not change over the period of the initial lockdown (see Report 2 in our 'Learning During the Pandemic' series), the quality of remote learning resources improved. As the school closures were extended into the summer term, schools and colleges reduced their reliance on offline resources, and started to incorporate more pre-recorded and live online lessons into their teaching (Cattan et al., 2020; Ecurio, 2020). This is shown in the increase of the proportion of parents reporting that their students were provided with online learning between April and June 2020, which rose from 44% to 51% for primary students, and 59% to 65% for secondary students.

In general, after the initial switch to remote learning, teachers reported feeling able to deliver remote learning well (Lucas et al., 2020), indicating they were happy with the way in which their school or college reacted and adapted to the new way of teaching. Those who felt this way were largely driven by feeling well-supported by their senior leaders. School leaders tended to adopt a flexible approach to deliver remote teaching, and considered relevant research and consultations with staff, students and parents. Some schools and colleges trained staff on how to refine their lesson delivery and teach effectively remotely (Ofsted, 2020b). With teaching mainly taking online forms, confidence in using digital resources also played a large part in teachers feeling able to deliver remote learning (Lucas et al., 2020). However, confidence in digital skills was not universally felt. There were further barriers when it came to less experienced teachers moving to a remote curriculum at speed, such as ensuring staff having digital skills to teach content remotely (Ofsted, 2020a).

Teachers were often using online resources for delivering remote lessons, assessing students, providing feedback and organising collaboration spaces for students to work together (Edurio, 2020). Findings across two surveys (undertaken in May, and June to July) exploring teachers' views about technological barriers to effective teaching indicate that, while 30% of teachers reported that they did not need any further training to support their teaching, a quarter said they would need training to use new online teaching tools effectively (Edurio, 2020; Menzies, 2020). The areas of training teachers reported would be most valuable to their new way of remote teaching was for using technology in general (18%), organising digital collaboration spaces for students (17%), and delivering online lessons (15%, Edurio, 2020).

The change to remote teaching had further impacts on the content that was delivered to students. Teachers adapted their teaching in a way that met the needs of their students, but sometimes this meant diverting away from covering the curriculum. Research shows that 80% of primary and secondary teachers (out of ~1,800 surveyed) reported that, up to May 2020, all or certain areas of the curriculum were receiving less attention than in a typical learning year (Lucas et al., 2020). Schools and colleges serving the most deprived communities were reported as struggling the most to cover the curriculum during lockdown (Lucas et al., 2020), and curriculum alignment was particularly difficult to achieve in primary schools. Around 83% of primary teachers reported struggling to cover the curriculum sufficiently, where 61% of secondary teachers reported that this was the case (Lucas et al., 2020).

There were two main contributors to reduced curriculum coverage: challenges related to student engagement, and challenges related to access to teaching provision. Primary teachers report prioritising learning activities that were engaging and motivating for students (Lucas, et al., 2020; Moss, Bradbury, Duncan, Harmey, and Levy, 2020a). The importance of parental engagement and support for primary students' learning was also well understood by primary teachers, and teachers often

adapted learning resources so they could be fun and accessible for the whole family (Moss et al. 2020a; Moss, Bradbury, Duncan, Harmey and Levy, 2020b). In addition, in primary schools, the focus in the spring and summer 2020 terms was on maintaining prior learning over learning new material (Lucas et al., 2020). Primary school leaders mentioned that the lack of activity-based teaching and learning often resulted in younger students not being able to develop the conceptual understanding for new materials that would be achieved in the classroom. Therefore, where new curriculum content was covered in their remote learning, younger children were struggling to embed it.

Teachers further adapted their teaching to ensure that primary students had the facilities to engage in learning activities. For many serving deprived communities, this meant prioritising ensuring that students without access to devices had learning opportunities even if they could not access online resources (63%; Moss et al., 2020a, Moss et al., 2020b). A quarter of primary teachers (responding to the survey) reported that they hand delivered hard copies of learning resources to students' homes (Moss et al., 2020a).

Even though two-thirds of secondary teachers reported that all or certain areas of the curriculum were receiving less attention than in a normal year (Lucas, et al., 2020), curriculum coverage in secondary schools was less of a concern than in primary schools. Although there is less research that addresses this directly, secondary students are less likely to share the challenges to learning that younger students have. Older children tend to be better able to undertake independent learning than younger children and are more likely to have access to (and be able to use unsupervised) digital devices with which to undertake remote learning. Although there were fewer barriers in teaching, learning and covering the curriculum for secondary students, compared with primary students, secondary students' learning of the curriculum was disrupted nonetheless, and many experienced, and continue to experience, learning loss.

We cover the scale and nature of learning loss experienced by students further in the section, 'The scale and nature of learning loss', but it is clear that student engagement with their learning and motivation also influence this (see the section, 'Student intrinsic factors'). Teaching of some parts of the curriculum was also understandably hindered by lockdown restrictions. For instance, some secondary leaders reported that because students were unable to access equipment, learning in more practical subjects was disrupted, for instance in PE, music, science, and design and technology (Ofsted 2020b; Ofsted 2020c).

Teacher engagement

Teacher engagement is a fundamental aspect of effective teaching and learning. The circumstances of the lockdown in the 2020 spring and summer terms meant schools and colleges were using, or sometimes inventing, new remote ways in which to

teach, engage, motivate and monitor the well-being of their students. With schools and colleges being closed, there was a shift away from teachers being in close daily contact with their students, where students could ask questions, work with peers and informally chat with teachers. Overall, teachers and students report that teachers not being able to wander around the classroom and directly engage with students was a barrier to effective educational communication (Ofsted, 2021). To overcome the reduced nature in which teachers and students could engage with each other, many schools and colleges delivered alternative means to keep in touch with students and continue effective communication about their learning. For instance, teachers report using chatroom discussions, 1-to-1 calls with parents and students, interactive questioning during live lessons, adaptive learning software, and digital exercise books with commenting, editing and feedback functionality (Ofsted, 2021). However, clarity, feedback and peer and teacher discussions were often reduced compared to when students were in school, or in some cases, were completely absent.

In May 2020, teachers reported that they were in regular contact with, on average, 60% of their pupils (Lucas et al., 2020). This comprised of teachers delivering online live lessons, setting work, checking in with students and providing feedback. In general, the majority of students (78%) reported they were happy with the way their school supported them in the period immediately following school closures (Yeeles, Baars, Mulcahy, Shield & Mountford-Zimdars, 2020). However, in a separate survey, students reported that they wished they had received more feedback from teachers on their work (Child Poverty Action Group, 2020).

Teacher feedback can be an important teaching tool that helps students adjust their skills and learning strategies. Students reported that during the initial school closures, teacher feedback helped them feel more motivated to continue with learning activities (Child Poverty Action Group, 2020). In May 2020, 60% of parents of primary school children and 40% of parents of secondary school children reported that their child did not receive personalised feedback from their teacher(s) during the lockdown (Educate, 2020). This may at least in part be due to secondary students having several teachers across their subjects, and therefore having more opportunities for contact and feedback. Of those students receiving homework and submitting it back to school, 65% report that at least half of the homework was checked by teachers. This proportion is higher among post-16 students, though (82%, Benzeval et al., 2020a). A few school leaders acknowledged the importance of immediacy of feedback to students about their work (Ofsted, 2021), however students separately reported that in general, they were often frustrated about the length of time they had to wait to receive comments from teachers on work they had submitted (Child Poverty Action Group, 2020). When considering the workload implications of rapid feedback, this is likely difficult to deliver. Nevertheless, research shows that in general, feedback for a large proportion of students' schoolwork was not delivered at all (Child Poverty Action Group, 2020; Educate, 2020; Green, 2020).

Because of the resource requirements and workload implications of maintaining the teaching and learning dialogue between teachers and students, there are variations in the degree to which teacher engagement was experienced by different groups of students. Again, much of the variation seen around this is associated with measures of deprivation, with the most deprived students experiencing less teacher feedback and engagement.

Teachers in the most deprived schools report being in contact with around half of their students at the beginning of school closures, which is a significantly smaller proportion than teachers in the least deprived schools (67%) (Lucas et al., 2020). Moreover, children with limited or no access to electronic devices were less likely to be able to submit their work to have it checked by their teacher and receive feedback (Andrew et al., 2020b; Green, 2020). Students attending a state school (53%) and students eligible for free school meals (40%) were less likely to have work checked by a teacher, compared with students attending independent schools (76%), or those not eligible for free school meals (56%, Green, 2020). With regards to giving feedback, special education providers reported that they personalised learning resources for the majority of their pupils (66%) and gave personalised feedback to 73% of their pupils (Skipp, Hopwood & Webster, 2020).

The amount of feedback and contact time with students differed depending on the phase of education, with more primary school teachers (62%) reporting they were in contact with their students than secondary school teachers (50%). However, the type of contact with pupils was also different across these phases of education. Primary school teachers focused more on checking in with students and parents rather than teaching and learning than secondary school teachers. Secondary school teachers also typically teach more students than primary teachers do, across different classes and year groups. This inevitably reduces the amount of time that can be dedicated to any one student (Lucas et al., 2020).

In general, where learning was remote during the 2020 spring and summer terms, individual students experienced a reduction in teacher engagement compared with when they were at school, pre-pandemic. However, it is important to reflect that teachers were faced with new and never-seen-before challenges, and were navigating the new means of teaching as best as they could. Setting-up and adjusting to new ways of working, ensuring students had sufficient resources to learn and adapting teaching to ensure that students without sufficient resources were still able to undertake learning activities, went beyond teachers' normal duties. Adapting to the new means of teaching resulted in increases in teachers' workload, with teachers being pushed to the limit of what they could deliver (Ofsted, 2020b; Ofsted, 2020c).

In-school provision for children of keyworkers and vulnerable students during the first lockdown

Although schools and colleges were closed to most students during the lockdown, they remained open for the children of keyworkers, and vulnerable children, including: children of social workers, health professionals and teachers; looked-after children; and those with an education, health and care (EHC) plan. Individual schools and colleges were free to decide the nature of provision they offered to children of critical workers and vulnerable pupils during lockdown. Survey data suggests that while most schools were teaching the curriculum to the students in school, there was still a meaningful variation in educational experiences between schools. A survey carried out with almost 19,000 teachers in April 2020 asked teachers how many hours per day learners were being taught in school. While half stated they were offering 3 or more hours of teaching per day, almost one quarter answered 'none – we're offering childcare' (Stewart, 2020, pg.1).

Similar variation was apparent the following month, where almost three-quarters of senior leaders indicated that the focus of in-school provision was providing a place where students were safe and cared for, rather than providing curriculum-based teaching. Nonetheless, most schools still taught the curriculum, particularly at secondary level, and the authors concluded that students undertaking in-school learning experienced the same, if not better, learning provision than those being taught remotely. This was because there were more opportunities for teacher support and supervision (Julius and Sims, 2020). Just under half of primary and secondary school leaders reported they were teaching students based in school the same curriculum content that was being sent to children who were learning remotely. A further 41% of secondary leaders reported that children were being provided time or resources to work on curriculum content with limited teaching input. This was 14% in primary schools. At primary level the picture is more mixed. While most leaders report covering aspects of the curriculum as their main approach, just under a third reported that the main approach of in-school provision was extra-curricular activities, such as arts and crafts. This suggests that a significant minority of vulnerable pupils and the children of keyworkers in primary schools may have covered less curriculum content than their peers who were based at home.

As with much of the literature on online provision, there is evidence that the nature of in-school provision may vary considerably depending on the deprivation of the school community. While 58% of senior leaders in schools serving the most affluent communities report their main approach is teaching the same curriculum content as is sent to other students, this falls to 35% of senior leaders in the most deprived communities. Similarly, leaders in the most deprived schools were twice as likely to report that their main approach was to provide extra-curricular activities than those in the least deprived schools. There were also significant differences across regions

with leaders in the north-west twice as likely to report providing extra-curricular activities for pupils in-school compared to those in the south-west, the south-east and London (Julius and Sims, 2020).

Regarding provision in special schools, anecdotally, those children who had remained in education throughout were reported to have benefited from the experience and often flourished with smaller class sizes and more support. Some others enjoyed being at home and also made good progress (Skipp et al., 2020).

The return to school for some students in June 2020

In June and July of 2020, schools began to reopen for key year groups. Report 2 from our 'Learning During the Pandemic' series covers this in depth, but to summarise, from 1 June, primary schools were allowed to open for nursery children, as well as for reception, year 1 and year 6 students. From 15 June, secondary schools, sixth forms and further education colleges were allowed to open for years 10 and 12, to support students working towards their GCSEs and A levels the following year. However, guidance largely suggested that schools and colleges primarily educated these year groups remotely, and to keep in-school lessons to a minimum. Attendance in school was also not compulsory for students, and while 89% of primary and 74% of secondary schools did reopen, uptake of this provision was limited, with attendance at 27% for primary, and 5% for secondary school in July. As such, remote learning continued to be the predominant means of learning and 95% of secondary and 82% of primary teachers reported that they continued to provide remote learning (Sharp, Nelson, Lucas, Julius, McCrone & Sims, 2020).

For those students who did return to school, social distancing and other 'COVID-safe' practices appear to have negatively impacted the quality of in-school provision (Lucas et al., 2020). Despite being happy with the way in which their school adapted to remote learning early in the March lockdown, by July 2020, after a long period of teaching and learning under COVID-19 restrictions, the majority of teachers felt they were not able to teach to their usual standard (74%). The challenge of teaching under conditions of social distancing was the main reason for this (Sharp et al., 2020). Social distancing prevented teachers from moving around the classroom to support and interact with pupils. Practical and group work was also made more difficult to coordinate safely, and students were prevented from sharing equipment. In the same study, half of senior leaders reported using teaching assistants to lead classes to help manage the supervision of smaller 'bubbles', and almost half of teachers said they were mainly teaching pupils they did not usually teach (Sharp et al., 2020).

When returning year groups went back to school last summer, some schools focused on well-being and in-class teaching only for the 3 core subjects: maths, English and science (International Literacy Centre, 2020a, 2020b; Sharp et al., 2020). For instance, Teacher Tapp (2020a) found that 1 in 3 secondary schools

delivered face-to-face teaching in just the 3 core subjects daily. This is not to say, however, that these schools did not continue remote learning for the wider diet of subjects. Independent and better-resourced primary schools were more likely to be teaching the breadth of the curriculum as normal, whereas state schools were most likely to deliver an adapted curriculum (Teacher Tapp, 2020a).

Although the quality of remote learning provision improved as remote learning continued, compared with that in the initial weeks of lockdown (Cattan et al., 2020; Ecurio, 2020), evidence suggests that the quality of online provision for students continuing to learn remotely may have dipped as schools re-opened for some year groups. Teachers' focus was increasingly split between those learning at home and those learning in school, leaving students based at home with less support and teacher engagement than they had been used to (Sharp et al., 2020; Teacher Tapp; June 2020). During this time, teachers report most commonly asking students to access content from external sources, complete a worksheet or read a book (Sharp et al., 2020), and therefore in general included fewer active and interactive learning opportunities.

Home learning provision

While schools and colleges were closed, the home environment had a more crucial role in facilitating students' learning than before. This section looks at the impact of several important home provisions and their role in supporting students' learning. In particular, we address parental support, other family factors, home learning resources and home learning environments. Although the literature supporting this section largely refers to findings from the initial period of school closures during the 2020 spring and summer terms, it is likely that many of these findings can be generalised to account for experiences beyond that period. For instance, during further school closures in the 2021 spring term and when individual students or student bubbles had to self-isolate and continue learning from home. This is helpful as, as we discuss in the section, 'Teaching and learning in the 2020 autumn and 2021 spring terms', there is little research that tells us about home learning provision in the autumn 2020 and spring 2021 terms.

Parental support

With the closure of schools and colleges, parents took on more responsibility to support their children's learning at home. Just over half of teachers report that parents were engaged with their children's home learning (Lucas et al., 2020; Villasden, Conti & Fitzsimons, 2020). In total, 58% of parents reported that they were home-schooling their children during the initial lockdown. Parents typically took part in more home-schooling for primary compared with secondary-aged children (Andrew et al., 2020a; Lucas et al., 2020; Pensiero et al., 2020; Villasden et al., 2020). They spent just under 1 hour supporting secondary children with their learning

per day, compared with 2 hours supporting primary-aged children (Pensiero et al., 2020). Teachers further reported that 48% of parents of secondary-aged children were engaged with their child's learning, compared to 56% of parents with primary-aged children.

These differences in parental engagement and support likely reflect the type of assistance that is required by children across these ages, with the need to supervise children in their learning becoming less as they grow older. The learning content of secondary-aged children also becomes more difficult, and those in key stage 4 were most likely to report that they were unable to get sufficient support with their work from their parents: a quarter of students at this education level reported that their parents could not help them (Impact Ed 2020).

Around half of parents reported that they found it either 'quite' or 'very' difficult to help their children with their learning (Andrew et al., 2020a, 2020c), and only half felt confident in their abilities to home-school (Williams et al., 2020). Home-schooling was clearly a challenging task for both parents and students. Responses to a parent survey indicate that 63% of households said either the parent, the child, or both, had ended up in tears over remote learning (Education Endowment Foundation, 2020b). Parents reported that balancing homeworking with home-schooling was challenging and that limited time for parental support was a driving factor for why parents reported their children were struggling. This was particularly the case for parents of younger children (Child Poverty Action Group, 2020; Williams et al., 2020). Parents also felt they needed better support from schools and colleges to undertake the home-schooling task, reporting that they needed clearer instructions on how to use the resources provided to them as well as specific support around how to teach certain topics (Child Poverty Action Group, 2020).

Over the course of the 2020 spring and summer terms, engagement of parents of both primary and secondary-aged children reduced, from 55% in May to 44% in July. By July, in many occupations, employees were allowed to return to work. This is likely to have further reduced parents' capacity to support their children's learning at home. This effect is more greatly observed for parents of primary children, which again, is likely a reflection of how the supervision required to maintain home-schooling for younger children was critical, yet unsustainable for many parents (Lucas et al., 2020).

Different contexts gave rise to parents' differential experiences of home-schooling. Parents with graduate degrees reported feeling more confident to home-school their children compared with non-graduate parents (70% and 60%, respectively). Graduate parents were also likely to help their children more frequently, with 80% of graduate parents home-schooling their children 4 days a week, compared to 60% of non-graduate parents (Anders, Macmillan, Sturgis & Wyness, 2020). However,

further research reports that parental education was unrelated to the overall amount of time spent helping with their child's schoolwork (Eivers et al., 2020).

Parents in the top fifth of earnings were also more likely to report feeling confident in their ability to make up for lost learning as a result of school closures, than parents in the bottom fifth of earnings (86% and 29%, respectively, Eyles & Elliot-Major, 2021). In general, more deprived families found it difficult to support their children as they felt they had more limited resources to do so (Andrew et al., 2020a; Child Poverty Action Group, 2020). Parents in middle income households in particular were in a uniquely difficult position to support their children's learning. This is because resources were more limited. They were more likely to continue working at home through lockdown than the poorest households, while having fewer resources to support home learning than the wealthiest households (Andrew et al., 2020a; Green, 2020; Eivers et al. 2020).

Children receiving free school meals were more likely to receive help from their parents. This is largely driven by their parents being less likely to be working during the lockdown (Green, 2020). However, parents of children who were eligible for free school meals faced further challenges in that they were the least likely to feel confident about home-schooling, and least likely to understand their child's learning tasks (Education Endowment Foundation, 2020b). There were also regional differences in parental support provided to home-schooling during the 2020 spring and summer terms that may be related to regional deprivation. Teachers in schools serving the most deprived communities reported less parental engagement than the least deprived schools (Lucas et al., 2020). The northern regions of England (Yorkshire and the Humber: 50%) saw slightly lower levels of parental engagement than the south and east of England (excluding London: 59%).

Parents report that home-schooling was particularly difficult for children with SEND. In June and July 2020, Parentkind asked parents of children with SEND about their home-schooling experiences. Overall, these parents were struggling with home-schooling, with 34% of parents reporting they were not coping well with the arrangements for learning since school closures began. Almost half further reported that they were unsatisfied with the home learning support that was provided by the school (Parentkind, 2020a).

Other family factors

A number of other family factors also impacted home-learning for many students. In particular, the literature explores the impact of parental working patterns, single-parent households, and the presence of siblings on remote learning.

The presence of a parent in the home was associated with a greater volume of remote learning. For instance, students participated in more remote learning when both parents worked from home during lockdown, compared with parents with other

working patterns (Pensiero et al., 2020). Students with unemployed parents were also more likely to engage with more offline learning than students with working parents. The latter findings are likely to be a result of unemployed parents having more time to support their children, however, we should consider that these parents may also have been more aware of the activities their students were partaking in, and remote learning was likely more visible to them.

Employment status and working patterns during the lockdown are also closely linked to socioeconomic status, where the parents in the wealthiest families were more likely to continue working from home, compared with mid- and low-income families, where parents were more likely to continue working in their place of employment or be furloughed (ONS, 2021). It is therefore difficult to determine which factors were the most influential on students' remote learning, as parents who worked from home during lockdown were also more able to support their child's learning effectively, and provide home resources that facilitated this (Andrew et al., 2020a; Child Poverty Action Group, 2020; Eyles & Elliot-Major, 2021). But it is also true that the mere presence of a parent likely motivated and engaged students to undertake remote learning.

While there are small negative numerical differences in the home learning provision of children with lone parents compared with children who have more than one parent, these differences are not found to be statistically significant (Pensiero et al., 2020). There are similarities in the proportions of parents reporting that their child was home-schooled in May 2020: with 85% of single-parent households reporting their children were home-schooled, compared to 87% of households with more than one parent (Williams et al., 2020). There were also only marginal differences in the hours of schoolwork, hours of adult support and number of online lessons students took part in across single- and multiple-parent households (Pensiero et al., 2020). Overall, these findings indicate similarities in key aspects of remote learning across single and multiple-parent households, which contrast with earlier research that finds living in a single-parent household could hinder outcomes for the children that live in them (Hampden-Thompson & Galindo, 2015; Song et al., 2012). However, it should not be ignored that single-parent households are more likely to be supported by one income, and are therefore more likely to experience challenges in providing home-based resources (Benzeval et al., 2020). We discuss this further in the section, 'Home learning resources'.

Where parents continued to work at their place of employment, students with siblings were more likely to have had caring responsibilities. Living arrangements such as this likely resulted in challenges to remaining focused on their school work (Impact Ed, 2020). Indeed, parents of older children who had a young sibling aged 0 to 4 were significantly more likely to say that their older child was struggling with remote learning because of caring responsibilities for their younger siblings (39% compared with 7% who had siblings in older age brackets, Williams et al., 2020). These parents

were also most likely to report that their older child did not have a quiet place to study (41% compared with 13%).

Having siblings who were much older was beneficial to younger, primary-aged students as the older sibling often supported their younger siblings with school work. However, while this was beneficial for the younger siblings, for the older siblings this could distract away from their own learning (Pensiero et al., 2020). In contrast, for secondary school students with an older sibling, the younger sibling could be disadvantaged. This was because they often had to compete for resources, such as parental support and home-learning resources, such as computers and spaces to study (Pensiero et al., 2020). In general, having siblings undertaking remote learning in the same household was likely to reduce the degree to which students' remote learning was successful. This is particularly likely where home resources, such as amount and quality of parental support, digital resources and places to effectively study, are limited. It is therefore expected that students with siblings in the least wealthy households had less effective home-learning experiences than those in the wealthiest households.

Home learning resources

Given that learning was taking place in the home for most students during the first lockdown, resources in the home were a larger influence on students' learning. The main resources that parents, teachers and students reported were digital devices, access to the internet, access to study spaces and tutoring.

The move to remote learning with important aspects of it predominantly being online meant that digital devices and internet access within the home was more important than ever for students' learning. Around 85% of secondary and 90% of primary students were reported as having access to a computer, laptop or tablet for their remote learning during the first lockdown (Andrew et al., 2020a), but there were many students who did not have suitable devices and internet access when schools and colleges closed in March 2020. Data from Ofcom's Technology Tracker (2020) estimated that at the start of 2020, between 1.14 million and 1.78 million children in the UK under the age of 18 had no access to a laptop, desktop or tablet. They also estimated that between 227,000 and 559,000 students lived in households without internet access.

For those with access to digital resources, estimates indicate that around three quarters of secondary and post-16 students had access to their own device: either a computer or laptop (around 60-70%), or a tablet (around 10-20%; Andrew et al., 2020a; Pallan et al., 2021). For primary school students, expectedly, there was much less availability of personal computers and laptops. Around a third of primary students had access to their own device (Benzeval et al., 2020a), but many more had access to some form of digital device.

While around 25% of primary students used a computer or laptop as their main device when required, the predominant means of digital access for primary-aged students was via a tablet (40%). When considering the type of work that students were expected to take part in for their home learning, Andrew et al. (2020a) acknowledged laptops and computers seem to be the most useful devices for facilitating this. This is particularly the case for older students, considering that the work they would have completed typically involves more written text and complex structures, and therefore requires a device that can facilitate this type of work. The higher proportion of primary students using a tablet as their main device for their work also supports this idea, as primary-aged children received more paper-based worksheets, and online learning was largely used to catch up with their teacher or watch videos (Cattan et al., 2020; Lucas et al., 2020; Williams et al., 2020).

Although most students had access to devices for their remote learning, many are reported to have had to share them with family members (Child Poverty Action Group, 2020; Yeeles et al., 2020). Benzeval et al. (2020a) reports that more than half of students had to share their device with a family member (51%). This may be more of an issue for primary school students, as Andrew et al. (2020a) found that these students were more likely to share a computer and less likely to have access to their own device compared to secondary school students. Secondary students could be more likely to have their own devices and share with younger siblings, whereas younger siblings are more likely to have access only to someone else's device. There were mixed impacts resulting from having to share remote learning devices (Pensiero et al., 2020). For primary school children, using a shared computer reportedly had no negative impacts on their learning. However, for secondary school children, sharing a device is reported to have been disruptive, with those sharing being less likely to take part in online lessons. However, for secondary students who did share devices they were more likely to receive more adult support (Pensiero et al., 2020).

Despite many students having access to suitable digital devices to undertake their remote learning, there was still a substantial number of students who did not. In May and July 2020, senior leaders and teachers reported that limited internet access was a significant challenge for around a quarter of students (Lucas, et al., 2020; Sharp et al., 2020), and around 4% of students overall were estimated to have had no access to a digital device at all during the first lockdown (Benzeval et al., 2020a). Using this and other sources, we can estimate that around 3-10% of students were accessing their remote learning using a mobile phone² (Andrew et al., 2020a; Pallan et al., 2021). Where students were using mobile phones to access their online learning,

² Andrew et al. (2020a) estimate that 15% of secondary and 10% of primary students either did not have access to a computer, laptop or tablet for their remote learning or were using a mobile phone to access remote learning.

senior leaders raised concerns about how effective these would be (Andrew et al., 2020a). Although those students using mobile phones were able to access the learning content, this method was likely to be less conducive to learning than using a laptop, on account that the screen size and typing functionality of phones is greatly reduced (Andrew et al., 2020; Ofsted, 2021). This was likely problematic for being able to see the content of live lessons and videos, as well as for completing assignments, particularly those with large word counts or with more complex structures. Using mobile phones to access online learning is therefore likely to have been more disruptive to older students' learning.

For students who did not have suitable digital devices at home, some schools were able to provide them. This provision was greatest in independent schools, where, as reported in May 2020, 38% of independent primary and 20% of independent secondary schools provided their students with devices, compared with 1% of state primary, and 7% of state secondary schools (Menzies, 2020). Access to digital resources was a key concern for schools and colleges at the start of the pandemic, and continued to be through to the autumn 2020 and spring 2021 terms. The government aimed to supply devices to children in the first lockdown to help with access to remote learning (Department for Education, 2020a), however there were delays and difficulties in achieving this (Education Policy Institute, 2020). By mid-June only 115,000 of the 200,000 devices that were ordered were delivered to local authorities or academy trusts (Department for Education, 2020a). The government further introduced the Get Help with Technology programme in January 2021 (Department for Education 2020b). However, access to digital devices with which to undertake remote learning was a concern that persisted throughout the 2020 spring, summer and autumn terms (we discuss this further in the section, 'Teaching and learning in the 2020 autumn and 2021 spring terms').

For some students, finding a suitable quiet space to work at home was also often challenging (Lucas et al., 2020). This was particularly the case for younger students. Around 20% of primary school students reportedly did not have a designated space to study at home, whereas this was the case for around 10% of secondary students (Andrew et al., 2020a; Andrew et al. 2020b). Those students without a suitable space to study found remote learning more difficult, and this had further negative implications for their motivation to study (Yeeles et al., 2020).

In addition to the remote learning provided by the school or college, some students received additional tuition. During the first lockdown, it seems that the majority of children were not receiving paid tuition. Andrew et al. (2020a) found that only 4% of primary students and 5% of secondary students spent any time with a paid tutor weekly. However, on average these students spent an hour and a half per day in tutoring. The uptake of additional tuition during the pandemic was most common from the autumn term, when there was more of a focus on identifying and recovering

from lost learning. We discuss this further in the section, 'The return to school in September 2020'.

Evidence indicates that there was variability in the degree to which home resources were able to effectively support remote learning. As is the general theme seen throughout this report, students who were most deprived tended to have home environments that were less conducive for remote learning. Disadvantaged pupils seem to have access to the fewest resources when learning at home. Child Poverty Action Group (2020) found that low-income families were twice as likely to report a lack of resources when supporting home learning, with 40% missing at least one essential resource. Students in the most deprived schools are less likely to have suitable IT access to engage in online learning remotely, in comparison with peers in the least deprived schools (Cullinane & Montacute, 2020; Sharp et al., 2020; Teach First, 2020). For instance, Lucas et al. (2020) found that the proportion of students with little or no IT access in the least deprived schools (19%) is half that of students in the most deprived schools (39%). Moreover, the most deprived students were around three times more likely to have used a phone or had no device to access schoolwork, compared to the least deprived students (Andrew et al., 2020c; Pallan et al., 2021).

Green (2020) found 20% of students eligible for Free School Meals (FSM) had no access to a computer at home in comparison to 7% of non-FSM students. This had further implications for teacher-student interactions, where students eligible for FSM were less likely to have their work checked by a teacher because they were unable to submit it.

Access to a quiet space to study at home also seemed to be a more prominent issue for disadvantaged students. Andrew et al. (2020a) found children from wealthier families are more likely to have access to a study space. Secondary school students in the poorest households were twice as likely not to have access to a study space (12%) compared with their counterparts in the wealthiest households (6%). For younger children, almost 60% of primary students in the least wealthy households did not have access to their own study space, compared with 35% of students in the wealthiest households (Andrew et al., 2020c). Similarly, in March to April 2020, it was found that around 29% of Pupil Premium students did not have a quiet area to study, compared with 16% of non-Pupil Premium students. Access to a quiet study space did not improve over the spring and summer terms (Cattan et al., 2021; Yeeles et al., 2020). Disadvantaged students were also more likely to have to share their quiet study space with others, and Pupil Premium students were more likely to report that the quiet study space in their home was not readily available for their use (Yeeles et al., 2020).

As well as being less likely to lack key resources, students in the least deprived families were most likely to benefit from learning resources above what they would

usually experience. For instance, Eyles and Elliot-Major (2021) found parents in the highest fifth of incomes were over 4 times more likely (15.7%) to pay for private tuition compared to parents in the lowest fifth of incomes (3.8%). Where students from the least wealthy families did receive tutoring, they still received much less tutoring time (between 1-4 hours) than the wealthiest families (5 hours). Students from wealthier families are also reported to spend more time on remote learning because they are more likely to have better home learning conditions and resources to support this (Andrew et al., 2020c).

Schools and colleges offered various ways of supporting students over the first lockdown period. However, nationally available resources were not suited to students with special learning needs (Skipp et al., 2021). In addition, families of children with SEND often required specialist equipment to support their child in their home learning. Lack of suitable equipment was also an issue for apprentices. Doherty and Cullinane (2020) found that 37% of employers reported that some apprentices were unable to work from home because they did not have access to the equipment needed to continue working. Employers further report that 14% of apprentices could not learn from home due to a lack of internet or devices.

Of the households who were struggling to provide devices for their children, there was a disproportionate number of single-parent households (21%) compared with two-parent households (7%; Williams et al, 2020). However, struggling to access a device was not a universally held experience of students in single-parent households. A separate survey finds that a higher proportion of students with single parents have their own computer (59%) compared with students living in a household with more than one parent (44%; Benzeval, Booker & Kumari, 2020b). It therefore appears that there is a large range of experience in these contexts.

Student intrinsic factors

The previous sections discuss how school or college and home provision enabled, or disabled, students to continue their learning at home while schools and colleges were closed in the 2020 spring and summer terms. Another important element to learning centres on students' internal responses. In particular, here we discuss findings from the literature regarding students' engagement with learning during lockdown, and the roles of well-being and motivation to learn in this.

Many children and young people found the transition to life in lockdown difficult, particularly from a mental health and well-being perspective (Pallan, et al., 2021; The Children's Society, 2020a, 2020b). There were many factors about living under lockdown restrictions, online learning and being unable to socialise with friends, that were reported as detrimental to students' mental health, well-being and desire for learning.

Many students reported that increased screen time associated with online learning led to headaches, burnout and stress (Müller & Goldenberg 2020a, 2020b, 2021; Open Data Institute, 2020). Although many reported enjoying the flexibility of offline learning (Muller & Goldenberg), the lack of structure and routine could be difficult to navigate. For instance, some students reported being unmotivated or having no discipline to study, while others, particularly girls, lacked the discipline to restrict learning to normal school hours and often worked longer than they would usually, compared with boys (Impact Ed, 2020; NSPCC, 2020; Müller & Goldenberg, 2020b; Open Data Institute, 2020; Young Minds, 2020a).

Many young people also reported feeling stressed and anxious about different aspects of their life. This included worries about school work, family and homelife and the pandemic, and some were also experiencing bereavements (Child Poverty Action Group, 2020; Impact Ed, 2020; Mountford-Zimdars & Moore, 2020; Open Data Institute, 2020; The Children's Society, 2020a; Young Minds 2020b). Overall, the evidence indicates that school closures had direct and large negative impacts on students' mental health and well-being. This had important implications for their remote learning.

Analysis of survey data shows that there was a positive correlation between students' well-being and learning during the pandemic (Impact Ed, 2020). This means that those reporting better well-being were also engaging more with their learning, and vice versa. In separate studies, more than half (53%) of students reported they were struggling to continue with their education during lockdown, and more than three quarters of students (77%) reported that learning from home was much more difficult than learning at school (Williams et al, 2020; Yeeles et al., 2020). The most common reason given for why students were struggling was lack of motivation (Williams et al, 2020), and when asked to describe their day-to-day life in three words, around a third of students (31%) expressed boredom and around a fifth (18%) described life as repetitive (Yeeles et al., 2020).

The largest source of evidence relating to students' engagement with learning during the first few months of lockdown is a survey of over 3,000 teachers and senior leaders conducted in May 2020 (Lucas et al., 2020). When asked about the degree to which students were completing work set by the school or college, teachers reported that on average, they are in regular contact with around 60% of students, but that less than half of students had returned their last piece of set work (42%). Student's own reports of their learning indicate widespread disruption (Pallan et al., 2021). Almost all surveyed – 96% – reported they were not learning at their normal level. They, on average, rated their learning at 61% or what it usually was.

Senior college leaders reported that engagement was lower for certain students. Adult learners found it more difficult to continue their learning because of competing

homelife priorities, and students studying practical subjects were restricted in continuing the hands-on aspects of the course (Association of Colleges, 2020).

The degree to which students engage with their learning is only partly impacted by their well-being and motivation to learn. Their ability to access learning, the amount of parental support, and provision given by the school or college must also be considered. The overwhelming evidence indicates that the most deprived students are less likely to have internet access, digital resources, parental support and quality learning resources from the school (as previously discussed in the section, 'Home learning provision'). Indeed, differences in the degree to which students from different backgrounds were engaged with their learning are reported.

Secondary teachers reported that 89% of students with limited digital resources and learning environments were less engaged than their peers (Lucas et al., 2020). NFER further notes that secondary students are particularly at risk of disengagement compared with primary students, because older children are less likely to have parental supervision. For secondary students with younger siblings, the older children are also likely to be supporting their younger siblings with their learning, which often detracted from their own learning (Pensiero et al., 2020; Williams et al., 2020). Students in years 11 and 13 also showed reduced engagement and motivation to learn during the 2020 spring and summer terms, although this may be related to the cancellation of national examinations such as GCSEs and A levels, and less provision for their learning, at least during the initial stages of school closures (Eivers et al., 2020).

Teachers serving the most deprived communities further reported that on average, only 30% of students returned work during the first lockdown, compared to 49% of pupils in the least deprived schools (Lucas et al., 2020). The lack of this type of engagement is, at least partially, driven by the most deprived students being less likely to have access to devices with which to submit their work. The schools with the higher proportion of students eligible for FSM are also less likely to report that students were engaging with learning. Moreover, teachers thought that 62% of vulnerable students were less engaged with learning than their peers. This was 58% for SEND students, 52% for Pupil Premium students, and 48% for young carers.

Teaching and learning in the 2020 autumn and 2021 spring terms

This section discusses provision for learning between September 2020 through to March 2021. This period saw students returning to school for the September term, school closures resulting in remote learning in January 2021, and returning to school in March 2021. However, there were exceptions to this, whereby many students were undertaking remote learning when many students were in school in the autumn

term and from March 2021, and where many students were attending school during the periods of lockdown, when schools and colleges were closed to most, but not all students, between January and March 2021. Learning provision and experiences over these periods were diverse, and to understand them fully we address each period of learning separately, first addressing the return to school in September 2020, then the school closures from January 2021, and finally the re-opening of school from March 2021. Within these sections we look at how the school environment was different to in a normal year, and the barriers to teaching and learning students experienced. As mentioned previously, there is much less literature that looks at the impact of the pandemic on teaching and learning across this period, and this is particularly the case for the 2021 spring term. However, it is likely that the evidence previously explored that related to the 2020 spring and summer terms can be generalised to similar contexts on learning in the 2020 autumn and 2021 spring terms. We identify where we make these extrapolations.

Although students' school or college attendance is clearly linked to learning provision over these periods, we leave this issue to be addressed more fully in Report 2 from our 'Learning During the Pandemic' series. In summary, attendance rates for students in school were largely dependent on how the pandemic affected their local area. For instance, attendance was lower for students in urban areas, and was lower for students in more deprived areas (Sibieta & Robinson, 2020). Attendance in regions that had the highest rates of COVID-19 cases also tended to be lower.

The return to school in September 2020

From September 2020, schools and colleges were expected to fully re-open to all students for the duration of the term. In order to control the spread of COVID-19, schools and colleges were required to ensure high standards of hygiene and promote social distancing as far as possible. Common approaches to this included separating classes or year groups into 'bubbles', reducing students' movement around the school, arranging desks in forward-facing rows, and asking staff to socially distance from students and one-another (Sharp et al., 2020).

This 'new normal' in schools and colleges posed obvious challenges for teachers and school leaders as they were tasked with managing the conflict between maintaining social distancing, achieving full curriculum coverage and ensuring high-quality teaching and learning. Over the term, these challenges became, if anything, more significant. School leaders felt they were increasingly 'firefighting' as cases of COVID-19 increased nationally (Ofsted, 2020d). Keeping educational settings 'COVID-secure' took considerable planning, time and resources (Open Data Institute, 2020). This is likely to have impacted on the quality of pupils' education and may have slowed the pace of learning, or catch up on learning, among pupils in the autumn term.

We have little data about the progress of any catch-up over the 2020 autumn term. However, in the fourth Parentkind Coronavirus Surveys carried out in November, 70% of parents surveyed felt their child was getting some or all of the support they needed to catch up on missed learning. Another 9% felt their child did not need support, but 10% of parents believed their child was not receiving the support they needed (Parentkind, 2020b).

For many schools and colleges, on the return to school in the autumn term catching up on lost learning was not the immediate focus. An NFER survey of school leaders in July found their top priorities for September were: providing support for pupil's emotional and mental health and well-being, re-engaging pupils with learning, and settling them into school (Sharp et al., 2020). In primary schools, children's well-being was an even greater focus, with over 83% of primary teachers and 72% of secondary teachers identifying this as their top priority in September (Sharp et al., 2020; see also International Literacy Centre, 2020a).

When schools and colleges reopened in September, most students had not been in a school for 6 months. In the intervening time, they had experienced stress, anxiety and even bereavement as a result of the pandemic (Child Poverty Action Group, 2020; Impact Ed, 2020; Mountford-Zimdars & Moore, 2020; Open Data Institute, 2020; The Children's Society, 2020a; Young Minds, 2020b). Many schools and colleges therefore focused initially on students' mental and emotional well-being, particularly for younger students, before the process of re-engaging them with learning could begin in earnest (International Literacy Centre 2020a, 2020b; Ofsted 2020b; Sharp et al., 2020). For many schools and colleges, the autumn term was not a 'quick fix' period for lost learning (Ofsted 2020a; Ofsted 2020b; Ofsted 2020c; Ofsted 2020d; Sharp et al., 2020), although students on exam courses may have been an obvious exception to this.

As the autumn term progressed, schools and colleges grappled with how to build a detailed picture of learning loss (Ofsted 2020a; Ofsted 2020b; Ofsted 2020c; Ofsted 2020d). In October, 61% of teachers reported that identifying the gaps in their students' learning and determining how to help those who needed the extra support was a key challenge of their daily lives (Open Data Institute, 2020). We discuss the scale and nature of learning loss more fully in the section, 'The scale and nature of learning loss'. As and when teaching and learning gaps were identified they adapted their curriculum accordingly.

By October, in primary education there was an increased focus on English and maths teaching (Teacher Tapp, 2020b), with curriculum adaptations being made in consideration of what had been missed (Ofsted 2020b). Schools and colleges used different strategies to support this focus. Some reduced teaching time for foundation subjects, but even when they continued to teach the full breadth of subjects, most made at least some adaptations to the order and content of the curriculum in

response to gaps in learning and to COVID-19 restrictions. Practical aspects of subjects such as PE and music were sometimes not being taught (Ofsted 2020b; Ofsted 2020e), and there was a reduction in practical science being taught in primary schools (Teacher Tapp, 2020c). During this term, learning losses in certain subjects and content areas may therefore have persisted.

In secondary education, most secondary schools reported that their students came back to studying the full range of subjects when they returned (Ofsted, 2020e). Most schools visited by Ofsted had re-ordered their curriculums to prioritise key concepts and knowledge (Ofsted, 2020e). Many also reported restrictions on practical work, for example, suspending elements of music or PE. Some schools also had limited access to practical activities in Key Stage 3 for subjects such as science, design and technology, and computing. This was often because specialist teaching areas were not accessible to all student 'bubbles' and leaders tended to prioritise pupils in Key Stages 4 and 5 for these spaces.

'COVID-secure' practices continued to impact on pedagogy through the autumn term. A survey by Teacher Tapp in September found that primary schools were doing more mixed-ability teaching than in previous years, with almost three quarters of teachers teaching maths and reading in mixed-ability groups, an increase of around 15% compared with in 2019 (Teacher Tapp, 2020d). In some secondary schools, there was also an increase in mixed-ability maths teaching, although this was not widely practised (Teacher Tapp, 2020c). Work that facilitated engagement and collaboration between students was also reduced, with teachers reporting a reduction in group and paired work in the classroom (Sharp et al., 2020; Teacher Tapp, 2020c).

Adaptions to the curriculum, subject content and teaching practices were not the only changes students faced, however. The autumn term was characterised by further disruption of teaching and learning as a result of often frequent bouts of COVID-19-related illness and self-isolation for students and their teachers (Ofsted, 2020c). The impact of this was felt unevenly across the country, an issue which we explore in-depth in Report 2 from our 'Learning During the Pandemic' series, but it is also worth noting here in relation to the impact this had on the quality of teaching and learning.

Like in the summer term when schools reopened for some year groups, in the autumn term, schools and colleges regularly had to provide a mixed diet of face-to-face and online teaching, as individual students or 'bubbles' had to self-isolate. This way of teaching was challenging for teachers, but crucially it had an impact on the quality of provision for those having to studying at home (Open Data Institute, 2020; Sharp et al., 2020). In their autumn visits, Ofsted found that the remote learning experience was "patchy and, in many cases, was not aligned effectively with the classroom curriculum" (Ofsted 2020d). In particular, children isolating as part of a bubble appeared to receive better provision than those isolating individually. When

bubbles isolated at home, many teachers used live or recorded video lessons. In contrast, when individual students isolated, there was often no live or recorded video teaching (Ofsted, 2020b; Ofsted, 2020c), and work set tended to consolidate previous lessons, rather than provide new material (Parentkind, 2020b; Murphy & Isaacs, in prep). Ofsted concluded that the experience of learning loss these children experienced in the summer was being repeated (Ofsted, 2020f).

COVID-19-related sickness and self-isolation also took its toll on staffing, resulting in students missing lessons with their usual teachers, and sometimes relying on supply teachers or non-subject specialists (Murphy & Isaacs, in prep). One in five teachers surveyed reported they had covered a class for an ill colleague that week, with 30% taking on other additional duties to cover absences (Teacher Tapp, 2020e).

All of this resulted in a teaching and learning experience that was far removed from what many teachers and students would have been used to. During the autumn term, there was recognition of the efforts of many schools to provide additional pastoral care (Ofsted 2020b; Ofsted, 2020c; Ofsted 2021) and support students in catching up (Parentkind, 2020b). Students seemed to have settled back into learning well (Parentkind, 2020b; Ofsted, 2020e; Ofsted, 2020b). Nonetheless, the various forms of disruption to teaching and learning caused by COVID-19 mean that the autumn term may have been associated with further learning losses for some students, rather than the productive period of catch-up that many had envisaged.

Many students continued to undertake periods of remote learning during the autumn term. Although access to devices was an initial barrier to learning in the first lockdown, by the autumn term most schools had overcome this (Ofsted, 2021). Many schools used parent questionnaires to identify students who needed digital provision, and sourced devices (such as laptops) for them from the local community. Some worked with external stakeholders (for example, charities, businesses) to acquire laptops. Only a few leaders stated access to digital provision remained difficult and, in such instances, leaders provided non-digital learning resources for these students.

Responses from a parent survey in November and December 2020 indicate that 1 in 10 parents were concerned about their child's ability to access a suitable device and having poor internet (Ofsted, 2021). Many more parents were concerned about the content their child was studying (40%). These findings suggest that access to appropriate technology seems to have become less problematic in autumn term compared with the first lockdown, however there were clearly some students who were continuing to struggle with their home learning. This is particularly problematic considering the 2021 spring term started with another prolonged period of national remote learning.

The impact of the disruption to teaching and learning that students experienced over the autumn term would have varied significantly across individuals and schools and colleges. We have come across little data to suggest how the experience varied

between different groups of students. However, it is clear that face-to-face teaching was most interrupted in schools and colleges in regions with the highest COVID-19 cases. This was initially problematic for the northern regions of England, however as the autumn term continued, COVID-19 cases also began to rise in London, the south and south-east (for more details see Report 2 from our 'Learning During the Pandemic' series).

From attendance data, it is clear that urban schools and colleges and those serving the most deprived communities had the most interrupted in-school learning time (Education Policy Institute, 2020), and it is also expected that schools and colleges with the most limited resources would have faced the most challenges in delivering concurrent in-school and online teaching. Similarly, the challenges to home resources students faced in the 2020 spring and summer terms for their remote learning are likely to have persisted, particularly with regards to lacking a quiet space to study and parental support. Moreover, although access to digital devices and the internet may have improved in the autumn term for many who needed them, some students were still unable to access their remote learning.

School closures in January 2021

Continued concerns about the rise in COVID-19 cases resulted in schools and colleges being closed from January until March 2021, which meant teaching and learning entered the second phase of national remote learning. In light of ongoing concerns about access to digital devices, at the start of the 2021 spring term, the government increased the help available for accessing laptops and tablets with the Get Help with Technology programme (Department for Education 2020b). This enabled wider accessibility of digital devices for students to undertake their learning where they did not have them. Challenges to accessing digital devices persisted, with almost half (47%) of senior leaders reporting that half or less than half of their students who needed a laptop had been supplied with one (Montacute & Cullinane, 2021). During this time, students in the most deprived schools were still more likely to have poor access to digital devices at home than those in the least deprived schools (25% compared with 15%, respectively; Nelson, Andrade & Donkin, 2021).

The quality of remote teaching provision appears to have improved during this period compared with the first lockdown in 2020, with live online lessons being much more prevalent across primary (49%) and secondary schools (78%) during this period (Nelson et al., 2021). In January 2021, 68% of teachers reported that every student they taught could take part in at least one online live lesson, compared with 17% in May 2020 (Teacher Tapp, 2021a). Student engagement also appears to be improved in January 2021 compared to in May and June 2020, with twice as many teachers being more likely to report that at least three quarters of their students were engaged with their work in January 2021, compared with in May and June 2020 (77% versus 39%, respectively, Teacher Tapp, 2021b). Higher proportions of

students were returning work during this period too, with teachers reporting a rise from 42% in March 2020 to 55% in January-February 2021 (Nelson et al., 2021).

There were small, but statistically significant, increases in curriculum coverage during January and February 2021, compared with in March 2020 (66% to 70% respectively; Nelson et al., 2021). However, despite these increases, there were still large parts that remained uncovered. This is likely because the remote and COVID-safe nature of teaching meant some learning tasks were undeliverable.

Again, there seems to have been a disadvantage divide in the type of learning resources received across contexts, with 10% of the most deprived secondary schools not providing live online teaching in January 2021. For the most deprived primary schools, this was 48%. This contrasts with 4% of most affluent secondary state schools, and 37% of the most affluent primary state schools, who were not providing live online teaching during the same period (Teacher Tapp, 2021c). Provision for delivering online live lessons appears to have increased for schools serving disadvantaged communities as the spring term continued, with teacher reports about the resources offered to students in March 2021 showing no significant differences across the most and least deprived schools. Despite increases in the quality of learning resources, students in the most deprived schools were still less likely than students in the least deprived schools to attend the online lessons (59% and 78%, respectively), and return set work (47% and 67%, respectively, Nelson et al., 2021). This is likely a result of students in the most deprived schools continuing to have poorer home learning environments and digital access.

Despite schools and colleges being closed to most students during this time, they remained open for vulnerable children and children of keyworkers. Attendance data shows that the uptake of this provision was dramatically increased compared with the first lockdown (see Report 2 from our 'Learning During the Pandemic' series). This meant that many more schools and colleges would have been responsible for delivering more concurrent online and in-school teaching during this period of school closures, compared with in the first lockdown in 2020. Although there is no evidence to describe how this impacted teaching and learning provision, it is likely that the challenges reported in the autumn term for teaching via dual methods persisted into the spring 2021 term. No doubt, the challenges were likely felt more strongly in schools where resources were more limited.

The re-opening of schools and colleges in March 2021

After a second period of lockdown during the 2021 spring term, schools and colleges re-opened once again on 8 March 2021. We have little data on this new phase of teaching and learning. A March poll from Teacher Tapp confirms a strong focus on well-being and socialisation and re-establishing behaviour rules, particularly in primary schools. In secondary schools, these were also the priorities for students

returning to school, but there was more of a focus to return to the curriculum as usual for secondary schools. Independent schools, in particular, planned to return to normal as quickly as possible, including reintroducing extra-curricular activities where they could (Teacher Tapp, 2021d). Overall, students seemed to be motivated and engaged with learning on the return to school in March, with teachers reporting that students had returned to school displaying behaviour which is similar or even better than it would be in normal times (Teacher Tapp, 2021e).

Schematic overview of the impact of the pandemic on learning

Figure 1 shows a summary of features that have influenced teaching and learning during the pandemic³. This schematic shows the features associated with school and home provision, and student intrinsic factors, as well as the role of a range of contexts on learning.

³ Figure 1 is reproduced as text in Appendix A.

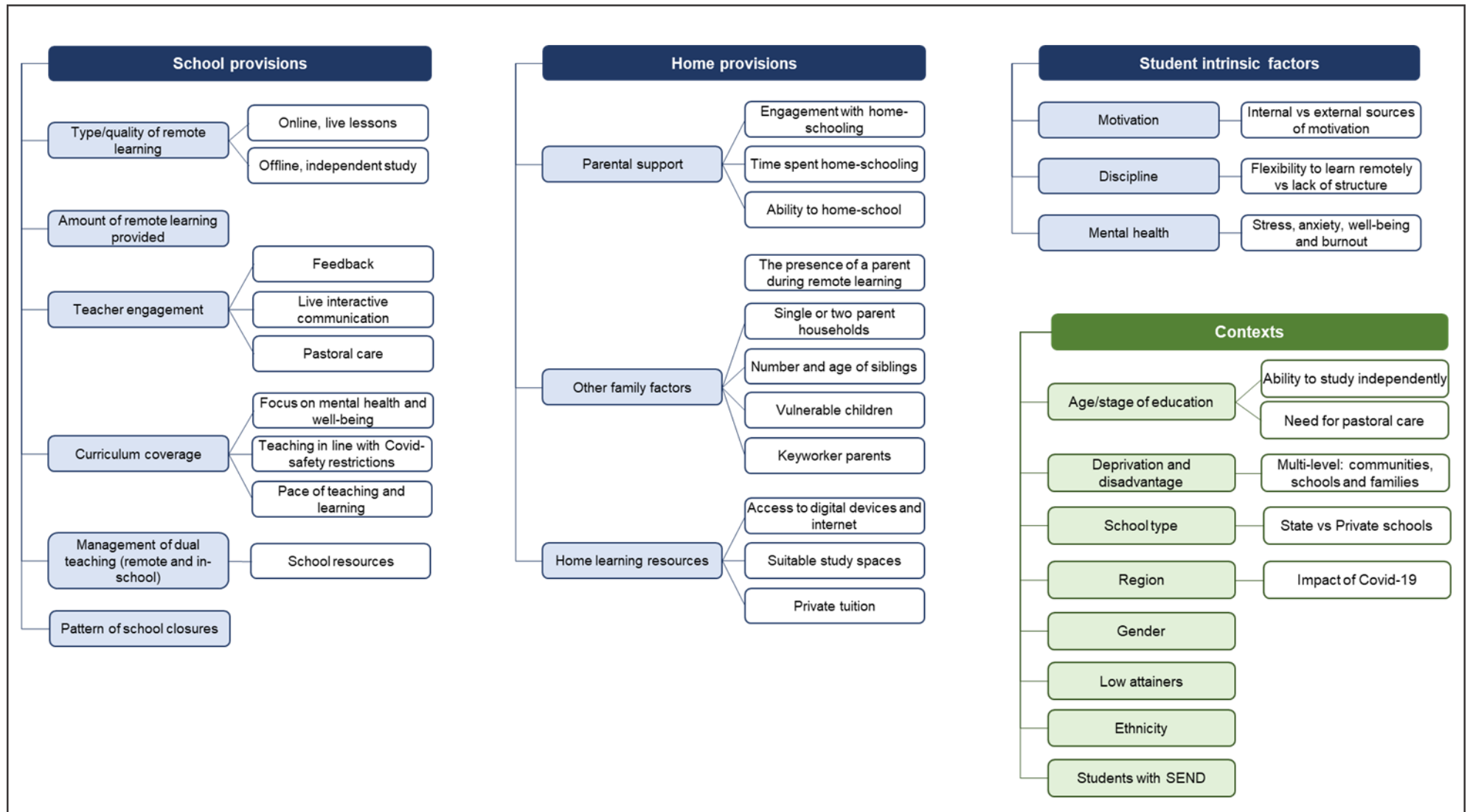


Figure 1. A summary of the features that have influenced learning during the pandemic.

The scale and nature of learning loss

As we have seen, the COVID-19 pandemic has had far-reaching effects on the learning experience of students in England, in terms of learning resources, quality and time (see Report 2 from our ‘Learning During the Pandemic’ series). There is widespread concern that students have fallen behind with their learning compared with where they would have otherwise been, and that many will need substantial support to ‘catch up’ (see Edurio, 2020; Sharp et al., 2020). Media articles also highlight dramatic learning loss (Lough, 2020). However, we have relatively little data about the scale of any learning loss caused by COVID-19, and no historical precedent of disruption on this scale from which we can draw estimates. There are broadly two means by which research explores the scale of lost learning. The first is research that aims to quantify the amount of learning students have lost during the pandemic, for instance through looking at student performance data. Report 3 from our ‘Learning During the Pandemic’ series looks at this in detail. The second is research that looks into teacher observations and estimates, which we focus on in this report. Note that we further discuss the differential experiences of learning loss across different contexts and backgrounds in the section, ‘The differential experiences of learning loss’.

Teacher estimates of lost learning

Various studies use teacher perceptions to quantify the impact of the pandemic on students’ learning. These all highlight some degree of learning loss, at least for the ‘average’ student (Murphy & Isaacs, in prep; Sharp et al., 2020). Here we look at teachers’ reports of learning loss and the degree of catch-up needed over the course of the pandemic, how learning loss was differential across different groups of students, and the nature of learning losses.

Estimates of the scale of lost learning

At the end of the 2019-20 school year, it was widely suggested that most students would need some form of additional support to ‘catch-up’, but that just under half (44%) of their pupils needed *intensive* catch-up support (Edurio, 2020; Sharp et al., 2020). Nearly all teachers (98% surveyed) reported that their students were behind where they would expect them to be in their curriculum learning⁴ (Sharp et al., 2020). At that stage, on average, teachers estimated students to be 3 months behind. There are significant differences between teacher estimates, however, suggesting

⁴ Defined by NFER as “the knowledge and skills that pupils are expected to acquire through the curriculum, including specific learning standards or objectives that they are expected to meet” (Sharp et al., 2020, p.14).

'average' figures mask great variation between individual students and schools and colleges. At one extreme, 2% of teachers reported their pupils were not behind in their learning at all, whereas at the other, 4% felt students were 6 months or more behind. Interestingly, the extent to which students had apparently fallen behind was strongly associated with perceptions that parents were less engaged with their child's learning, poorer teacher training provision, and teachers' perceptions that they were unable to teach at their usual standard during national lockdown.

These estimates of lost learning are slightly higher than suggested by the assessment data (see Report 3 from our 'Learning During the Pandemic' series). It is difficult to know what to make of this difference. It could, for example, reflect the fact that teachers were asked to make an estimation of learning loss overall, rather than for specific subjects. These views may therefore reflect more learning loss in non-core subjects for which we don't have supporting evidence from the assessment data. Alternatively, this could reflect limitations with using teacher estimates in this context. While in usual times, we would expect teachers to have a good understanding of students' progress, at the end of the 2020 summer term most would not have seen their students for many months and may have struggled to judge their progress. Indeed in May 2020, around 15% of teachers reported that they did not know which of their students were having a successful learning experience (Teacher Tapp, 2021f). Moreover, it is also likely to be difficult for teachers to accurately judge the average learning loss across all students they teach given the significant variation in student experiences of learning in the pandemic. Teachers' judgements may also be skewed by some of the extreme cases of learning loss they have encountered. Some judgements may also reflect the volume of curriculum content taught by the teacher, while others may reflect the volume of knowledge that individual students have acquired. For that reason, it is advisable to interpret these estimates with caution.

During the 2020 autumn terms, teachers' concerns regarding learning loss remained. In October 2020, in collaboration with Teacher Tapp, the Open Data Institute asked over 6,000 teachers in England what proportion of the pupils they teach were currently behind in their learning. Over two thirds stated that one fifth of their class or more was behind, and 44% said that one third of their class or more was behind. Again, there were extremes within this, with 5% of teachers saying that just one in 30 students was behind, compared with 8% who felt almost all of their pupils were behind (Open Data Institute, 2020).

Over the autumn 2020 term, Ofsted carried out hundreds of 'interim' visits to schools, colleges and other providers. In their findings they note that most students had slipped backwards in their learning to some degree, although there was little consensus on the scale of this. They note that "lost learning is unarguable, but it is hard to assess" (Ofsted, 2020d). In the early visits in particular, schools were grappling with the problem of how best to identify how much learning had been lost

(Ofsted 2020b; Ofsted, 2020e). As the term progressed – and teachers had been better able to assess students' progress – senior leaders increasingly talked about students having many gaps in their learning, or even having regressed. By the November visits, Ofsted reported a widespread view among primary school leaders that pupils were at the same level as they were before March, learning little during the first national lockdown or even falling back further. Other primary leaders quantified this in terms of being 6 months behind (Ofsted, 2020c). The picture was less clear in secondary schools, as teachers reported greater variability in gaps in learning between students.

At the start of the 2021 spring term during the second wave of national school closures, a former director at Ofsted is reported in a TES article acknowledging that although there is not currently data to highlight this, he suspects that learning loss in the 2021 spring term would be reduced compared with that in the initial March 2020 lockdown. This was accountable to schools and colleges becoming more proficient at remote education (Muijs, 2021) and wider access to digital devices with which to undertake remote learning in line with the Get Help with Technology programme. Surveys of teachers and college leaders in spring 2021 indicate, however, that their concerns over lost learning had not diminished. A quarter of secondary state school teachers indicated that all or the majority of students were behind in their learning due to missed learning over the course of the pandemic, with a similar picture for college students and adult learners (Association of Colleges, 2021; Teacher Tapp, 2021g).

One theme that emerged strongly in the Ofsted reports is the difficulty in quantifying learning loss given the varied learning experience that students had during the first national lockdown, particularly given their differing home environments. They place students into 3 broad groups (Ofsted, 2020d):

1. Coping well: some students have been, and continue to be, coping well with their learning in the face of restrictions. These students are in line or ahead of where teachers would expect them to be in a normal year.
2. Slipped back: the majority of students appear to be behind in their learning compared with where teachers would expect them to be in a normal year.
3. Hardest hit: some students' learning has been more greatly impacted by the pandemic. These students have the most learning loss and are severely behind where teachers would expect them to be in a normal year. This is predominantly a result of the interplay between their individual circumstances and the impact of the pandemic on them.

The literature does not, at least yet, report teachers' views on the degree to which their students were behind in their learning in the 2021 spring term.

The nature of learning loss

Although we have some emerging data on the amount of learning students may have 'lost', there is little evidence exploring which specific aspects of learning have been lost. Much of what we know is taken from the findings of Ofsted visits in the autumn term. This is by no means a systematic assessment of the nature of learning loss, however, it does identify a number of subjects or content areas that school leaders identified as particularly concerning. We summarise the aspects of learning that are reported as having the most learning losses in Figure 2⁵.

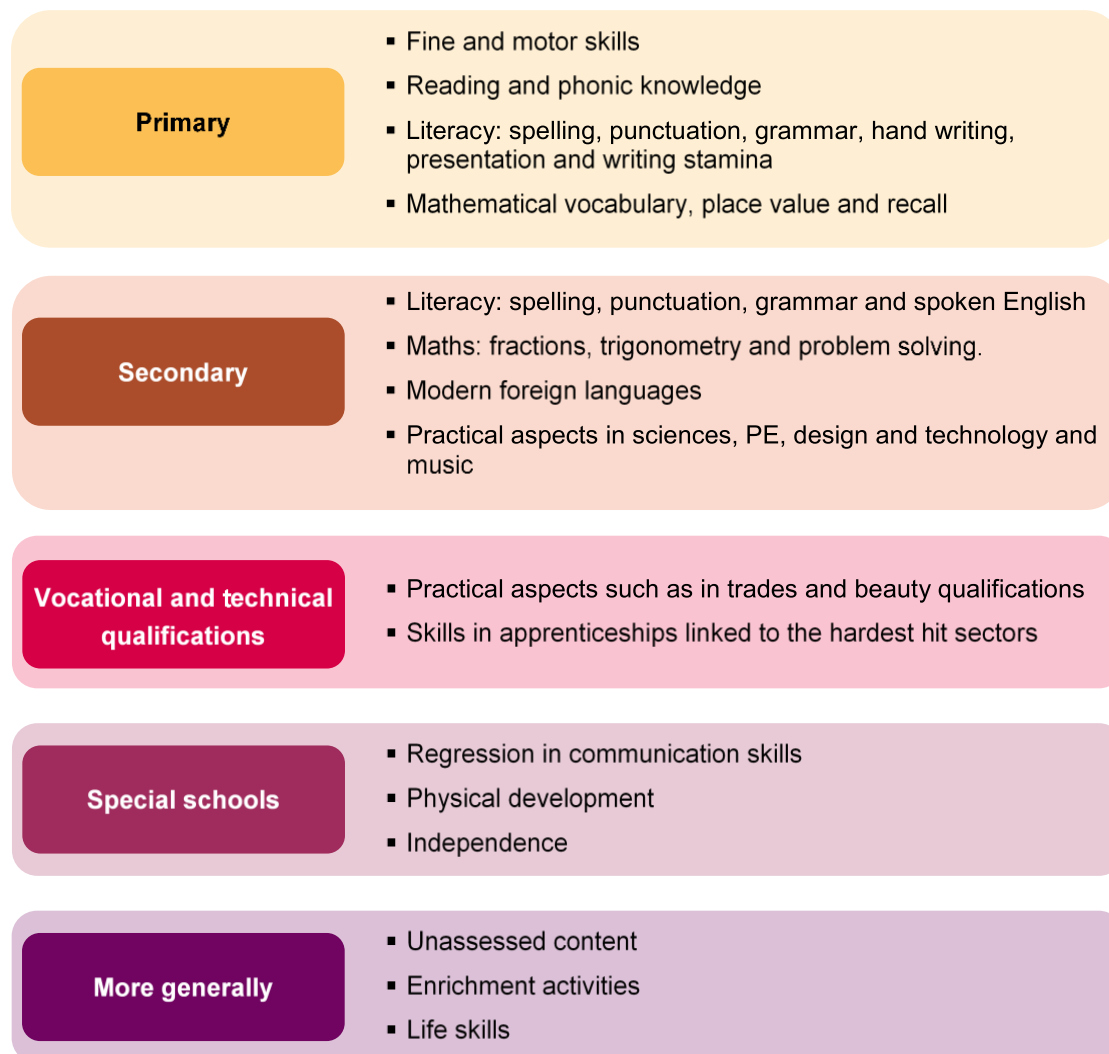


Figure 2. Aspects of learning with the most notable losses.

Inevitably, the nature of learning loss varies depending on the phase of education. As reported earlier, primary leaders were most likely to report significant learning

⁵ This is reproduced as a text version in Appendix B.

loss, with the youngest pupils apparently most negatively affected by the pandemic. In early primary education, school leaders noted issues with basic fine and gross motor skills. Some pupils were unable to hold a pencil or eat with a knife and fork, when they had been doing so before. Reading and phonic knowledge were of most concern to leaders. There was also loss of early progress in maths, with pupils falling behind in mathematical vocabulary, place value and recall, for example. Some leaders found writing was also an issue for pupils. Many had lost stamina when writing at length and struggled with spelling, grammar, presentation, punctuation and handwriting (Ofsted, 2020b).

At the start of the autumn term, some primary leaders also felt Reception children were not as ready for school as they usually are. A YouGov study found a similar issue with school readiness, suggesting that Reception children were less prepared for school than usual due to them having spent less time in nurseries during the pandemic (Kindred², 2020).

Like primary leaders, secondary school leaders often said that students had fallen behind in maths and literacy. Leaders found 'basic mathematical skills' had been affected, as well as specific knowledge and skills including fractions, trigonometry and mathematical problem solving. 'Basic literacy' was leaders' greatest concern with regard to English – again, spelling, grammar, punctuation and spoken English were all emerging issues. Some secondary leaders had also found that a lack of access to equipment in the first national lockdown had affected pupils' learning in more practical subjects, such as in science, PE, design and technology, and music. They also mentioned that pupils had particularly fallen behind with their proficiency in modern foreign languages (Ofsted, 2020b; Ofsted, 2020c).

Some aspects of learning are most at risk of learning loss. These include content that the student will not be assessed on, enrichment activities and life skills. Indeed, in January 2021, primary teachers reported that they were not scheduling work for design and technology (53% of teachers), computing (44%), modern foreign languages (43%) and music (42%) (Teacher Tapp, 2021h). It is not clear from the literature if this is the case in secondary schools.

We know little about the nature of learning losses across vocational and technical qualifications, however, remote learning will have particularly hindered the learning of practical skills in these qualifications. This, in particular, has implications for many apprenticeships, and trades and beauty qualifications (see Association for Colleges, 2021). Many of these courses were not running fully by October 2020 and are linked to sectors hardest hit by the pandemic (Ofsted 2020a).

In special schools, the areas of learning affected most depended largely on students' different needs, but also on their experience during the first national lockdown. The loss of physiotherapy, speech and language therapy and occupational therapy had caused issues, especially for children with more complex needs. Where the

therapists are still not back in school working with the pupils, the impact continues. For example, the impacts are observed through regression in communication skills, physical development and independence. Leaders of special schools are further concerned about children being able to eat. Many leaders felt there was a need for further social and emotional support when students return to school. This especially applied to some pupils with autism spectrum disorder who had adapted to the isolation while learning at home (Ofsted, 2020b).

The differential experiences of learning loss

As previous sections highlight, there is diversity across different groups of students with regards to the experiences of teaching and learning during the pandemic. These experiences differ in terms of the type, amount and quality of learning provision; home resources to facilitate remote learning; and students' levels of engagement. It is clear that all of these aspects of teaching and learning would impact the degree to which different groups of students have been able to maintain the pace of learning that would be expected in a normal year. It is therefore important to consider the differential impacts of these differences in experience, firstly in terms of what this means for learning loss, and secondly what this means for the already existing attainment gap between advantaged and disadvantaged students.

Learning loss across different groups of students

This section considers what the literature tells us about the scale of learning loss across different contexts. We also summarise findings relating to the different experiences of learning, as already discussed in the section, 'The impact the pandemic has had on learning', as a way of understanding how differential learning loss may have arisen.

This section summarises what the literature tells us about learning during the pandemic across the following contexts:

- age or stage of education
- deprivation and disadvantage
- attending state or independent schools
- students in other circumstances
- lower attaining students
- students with SEND
- gender
- ethnicity
- region

Age or stage of education

Most of the studies published so far suggest there have been some differences in the level of lost learning depending on student age or phase of education. Teacher estimates suggest more profound learning loss in primary education. NFER's July study (Sharp et al., 2020) found primary teachers estimated students were slightly further behind normal expectations (by 3 months on average), compared to secondary school teachers' estimates of their students (2.5 months behind). Approximately a third of primary teachers reported that their pupils were 4 or more months behind where they normally would be, compared to a fifth in secondary schools. By October, over half of primary teachers (52%) felt that at least one-third of their class was behind in their learning, whereas a third of secondary teachers felt the same (Open Data Institute, 2020).

In line with the above findings, Ofsted's interim visits over the autumn term also point towards greater learning loss among primary students, particularly at key stage 1. The picture at secondary level appeared more variable, with most students generally 'keeping up', but others with significant learning gaps. However, Ofsted report that many secondary leaders expressed concerns about year 7 students as they missed out on a 'normal transition', and some leaders were concerned about year 11 students preparing for national examinations (Ofsted, 2020c).

There are a number of reasons why younger children may have experienced larger learning losses, which we have touched on previously. Compared to secondary students, for primary students, there was a greater focus on pastoral care than on curriculum coverage (Julius & Sims, 2020). Secondary students were also more likely to have better access to digital devices and online learning activities such as live lessons (Lucas et al., 2020). Numerous sources also suggest that parental engagement is particularly critical to the progress of primary pupils learning online (Child Poverty Action Group, 2020; Lucas et al., 2020; Sharp et al., 2020; Williams et al., 2020). Where parents have not been engaged, or able to engage, in their children's remote learning during school closures, younger children are likely to have had their learning more severely disrupted because their ability to work independently is far reduced compared to older students. Indeed, students whose parents could help them during national lockdowns appear to have been more resilient to learning losses (Ofsted, 2020f).

As discussed previously, the learning experience also differed across secondary year groups, especially for year 11 and year 13 students in summer 2020. These students were less likely to receive remote learning resources from their school during the first national lockdown (Benzeval et al., 2020a; Eivers et al., 2020). Exam cancellations will have played a major part in the relative absence of school work for students in the second year of their qualifications. Regardless of the absence of the need to prepare for exams, some of these students whose learning was not provided

for towards the end of their course may have missed opportunities to learn some content and consolidate their knowledge through revision. Some students will have disengaged entirely from their education for up to 6 months before starting a new course. While there is currently no research to indicate as such, it is likely that they will have found the return to education (either for key stage 5 or university courses) more challenging than students in a normal year.

Deprivation and disadvantage

Throughout the published literature, there is a strong focus on the interplay between economic disadvantage and experiences of learning in the pandemic. Some reports published early in the pandemic warned that COVID-19 is likely to increase educational inequalities between children from better-off and the poorest households due to its disproportionate impact on the most deprived (Children's Commissioner, 2020; Edge, 2020; Education Endowment Foundation, 2020c; Montacute, 2020; Montacute & Cullinane, 2021). It was estimated that school closures may ultimately widen the existing attainment gap between disadvantaged children and their peers among primary school children by 36%⁶ by September 2020 (Education Endowment Foundation, 2020c). The emerging data suggests these fears are likely to have been borne out to at least some degree.

Teacher estimates of lost learning suggest that students in schools serving more deprived communities have fallen further behind their peers. This was increasingly felt across the duration of the pandemic (Edurio, 2020; Montacute & Cullinane, 2021; Open Data Institute, 2020; Teacher Tapp, 2020b). For instance, in July 2020, NFER (Sharp et al.) found that more than half (53%) of teachers in the most deprived schools reported pupils were 4 months or more behind on average, compared to 15% in the least deprived schools. The need for intensive catch-up support was also 25% higher in the most deprived schools, compared to the least deprived schools (Sharp et al., 2020). By January 2021, 84% of teachers felt the pandemic would cause the attainment gap between the most and least disadvantaged to widen in their school (whereas it was 76% in November), with a third believing this gap would be "substantial" (33%, up from 28% in November). Teachers serving the most disadvantaged schools were most concerned about the attainment gap (Teacher Tapp, 2020b).

Overall, there is overwhelming research indicating a large disparity in the remote learning experiences of the most and least disadvantaged students. Deprivation and disadvantage seem to be most associated with poorer learning experiences and

⁶ However, Education Endowment Foundation note that estimated rate of gap widening varied substantially between studies, meaning that there is a high level of uncertainty around this average. Plausible "good" and "bad" estimates range from the gap widening from 11% to 75%.

learning losses during the pandemic, with students in the poorest families, whose parents have lower levels of education, those who are eligible for FSM, and pupil premium students, being worse affected compared with their counterparts. The paragraphs that follow gather together the research findings discussed in the section, 'The impact the pandemic has had on learning' to form a fuller picture of why this is the case.

Schools serving the most deprived communities were less likely to provide online live lessons. Teachers were less likely to be in contact with deprived students, and were less likely to give feedback on their work, which can in part be accountable to the digital divide that was observed, particularly at the beginning of the pandemic. Many students in low-income families were missing essential resources to support their learning, such as digital devices and internet access. FSM eligible students were particularly at risk of this (Green, 2020). This meant that deprived students were less likely to engage with teachers and peers, submit work and receive feedback (Green, 2020). Teachers' time was also more likely to be strained when they were teaching more deprived students, as there was a greater need to cater for a range of students' circumstances. Teachers were often divided between creating and delivering online learning for those with digital access, as well as creating and delivering paper-based learning resources to those without digital access.

The home environment was also less effective in facilitating students' remote learning for deprived and disadvantaged students. Although parental education was unrelated to the overall amount of time spent helping their child with school work (Eivers et al. 2020; Villasden et al. 2020), research indicates that less-educated parents were less likely to support their children with home-schooling, and were less confident doing so (Anders et al., 2020). This, in particular, reflects the experiences of students eligible for FSM (Education Endowment Foundation, 2020b). Lower-earning parents also felt less confident in their ability to make up for lost learning and were less likely to be able to provide resources to facilitate home schooling, such as digital devices and private tuition (Eyles & Elliot-Major, 2021). Many deprived students were also hindered by not having a quiet space to study at home. This was particularly problematic for Pupil Premium students (Yeeles et al. 2020).

Attending state or independent schools

In line with differential learning experiences for the most and least deprived students, there are also large differences between perceptions of learning loss between state maintained and independent schools. While 16% of independent school teachers surveyed in October 2020 reported that 1 in 5 students in their class are behind in their learning, this rose to 26% of state school teachers (Open Data Institute, 2020). By March 2021, once students had returned to school, around 8% of independent secondary school teachers reported all or a majority of students were behind in their learning, compared to 40% of teachers in the most deprived schools (Teacher Tapp, 2021g).

Overall, it is clear that students attending independent schools were more likely to have received better learning provision from their school, and to have had a home environment that better supported their remote learning. This is somewhat expected, given that school fees were still being paid and students' and parents' expectations of quality of teaching and learning remained high (Green, 2020). Independent school students seemed to be receiving more remote online lessons than state school students, and they were more likely to receive a full school day's worth of remote learning (Elliot-Major, Eyles & Machin, 2020). In addition to online lessons, students attending independent schools were likely to receive more offline work than students attending state schools, and unsurprisingly, given the extent of teaching and learning provision, were likely to spend more time on their school work. The challenges in accessing digital resources that some students attending state schools experienced were not typically shared among students attending independent schools (Menziez, 2020), with almost all independent school children having computer access at home with which to undertake their remote learning (Green, 2020).

Students in other circumstances

During lockdown there was a breadth of circumstances that negatively impacted students' experiences of learning, which go beyond the usual contexts that we tend to recognise as being disadvantageous. This includes students living in single-parent households or with multiple siblings, vulnerable children and children of keyworkers. Again, the literature does not provide teacher estimates of learning loss for students across these circumstances. However, we can infer from the wider research that some circumstances are more likely to be associated with greater learning losses than others.

There is mixed evidence relating to the impact of living in a single-parent household. Research indicates that the duration a child was home-schooled by their parent(s) did not differ if the students had a single or more than one parent, and had no impact on their learning outcomes (Pensiero et al. 2020; Villasden et al. 2020; Williams et al., 2020). This contrasts with earlier evidence finding that a single-parent household

could hinder student outcomes (Hampden-Thompson & Galindo, 2015; Song et al., 2012). There was also contrasting evidence regarding access to suitable devices to undertake remote learning. Benzeval et al. (2020a) found that students in single-parent households were more likely to have their own computer than students with more than one parent. In contrast, Williams et al. (2020) found that single parents disproportionately overreported a lack of suitable devices for their children. The mixed evidence base exploring the impact of single-parent households may suggest that there is a wide range of experiences for students with a single parent. Research further indicates that having siblings in the same household could negatively impact remote learning success, particularly for older students where they take on caring and home-schooling responsibilities for their younger siblings (Impact Ed, 2020; Williams et al., 2020).

In the first lockdown, schools and colleges closed to most students, although not to those considered vulnerable. Julius and Sims (2020) found that vulnerable children were lacking engagement and parental support, with many vulnerable students not engaging in remote learning during this time. In addition, their in-school attendance was low, especially for secondary-aged students. In contrast, almost a fifth of teachers reported vulnerable children were more engaged than their classmates. This is likely most applicable to the students who continued to attend school during periods of national school closures. Many vulnerable students and keyworker children had similar and, in many cases, better supported learning than children learning remotely. However, a small share of vulnerable students and keyworker children did not receive a main focus on the curriculum during in-school provision. These students were disproportionately more likely to be younger (primary-aged) children in the most deprived schools. Students with keyworker parents appeared to not be disadvantaged with regards to the amount of home-schooling support they received, with this being similar to that received by students whose parents were not keyworkers (Villasden et al., 2020).

One reason for disadvantaged students' low participation and engagement is found to be due to 'new' personal or family challenges they were facing during the lockdown (Hodgen, Taylor, Jacques, Tereshchenko, Kwok & Cockerill, 2020). For example, there was a worsening of pre-existing mental health problems for young people during lockdown (Young Minds, 2020a). In addition, Impact Ed (2021) raised concerns around children that struggled the most but were not previously identified as vulnerable – also referred to as 'lost' children. Teacher Tapp polling for IPPR also found that half of teachers were not confident in knowing which children had faced issues such as bereavement, abuse, parent mental health issues and new caring responsibilities during lockdown (IPPR, 2020).

Lower attaining students

There are few studies which consider the differential impact of the pandemic on students according to their prior attainment. Where these do exist, they suggest that lower attaining students (or schools serving these students) may have experienced, on average, more lost learning. In their survey of teachers, NFER found that teachers in 'lower attaining' schools were significantly more likely to report that their pupils were further behind compared to where they would normally expect them to be at this time of year (Sharp et al., 2020). A similar pattern emerged from a survey of teachers carried out in June and July 2020. When asked to assess changes in pupil attainment, 80% of teachers said that the attainment gap between the most and least able pupils was increasing, with 4 in 10 saying that it was "increasing a lot" (Edurio, 2020).

Students with SEND

Qualitative data from Ofsted's interim visits to schools in autumn present a mixed picture about the degree of learning loss for students with SEND, whether in mainstream or special education (Ofsted, 2020b). While some school leaders in mainstream education felt that SEND students have fallen further behind with their learning than their peers, others are reported to have benefitted from learning remotely at their own pace (Ofsted 2020g). Other school leaders noted that being in school throughout the first lockdown was protective against learning loss for some students with SEND, and some students were further ahead with their learning because they had had more individual attention and support. In special education, however, many school leaders found that some pupils' communication and physical skills had regressed, particularly those with more complex needs who rely on multi-agency support which was not available during lockdown, and may not have restarted during the autumn term due to COVID-19 restrictions. Nationally available resources were also not tailored to students with special needs, and many struggled to engage with home learning as their learning environment was not designed to cater to their learning needs (Skipp et al., 2021).

Gender

Generally, there does not seem to be a clear message in the research in terms of differential learning loss between boys and girls. Most teachers surveyed by NFER (Sharp et al. 2020) reported no difference between genders in learning loss (78%), although those who did report a difference (21%) reported that boys had fallen further behind than girls. This was more marked among secondary teachers. Indeed, some studies found that girls completed more schoolwork than boys (Green, 2020; Pensiero et al. 2020). However, this difference is also observed for learning before the pandemic. These differences may also reflect reporting bias. Much of the data on

students' home learning comes from parental reports, which can more easily recognise learning activities undertaken by girls rather than boys because of differences in study behaviours (Green, 2020).

Ethnicity

We have little data as to the degree of learning loss for students according to their ethnic group. In one study, teachers from schools serving the highest proportion of pupils from Black, Asian and Minority Ethnic (BAME) backgrounds were significantly more likely to estimate that their pupils needed intensive catch-up support, these views persisted even after controlling for the effects of deprivation. However, in the same study, there was no link between how far behind in their learning pupils were perceived to be and the proportion of BAME students within the school (Sharp et al., 2020).

Although primary language is not inherently related to ethnicity, it is also worth noting that Ofsted anecdotally report that some school leaders felt that pupils who speak English as an additional language were struggling more than others with some aspects of reading, writing and oral fluency (Ofsted, 2020b).

The Equality and Human Rights Commission (2020) noted that differences in remote learning support during the pandemic could widen inequalities for those that already perform less well than their peers, such as Black pupils and some Gypsy, Roma and Traveller students. According to the Department for Education (2020c) data, a smaller proportion of students of these ethnic groups receive grades 9-4 in English and mathematics.

There is evidence that students from some ethnic backgrounds were more likely to have disadvantageous learning experiences during the pandemic (Bayrakdar & Guveli, 2020). Mixed ethnicity students received less support in terms of computer access, other home resources and having their work checked by a teacher (Green, 2020). When looking at differences in actual learning during lockdown however, it is found that Asian students received more offline and marginally more online schoolwork than others (Green, 2020). But, these were small and statistically non-significant differences, not translating into large differences in time spent on homework. Another study found that Pakistani or Bangladeshi children spent significantly less time on schoolwork at home during school closures than others (Bayrakdar & Guveli, 2020). In contrast, Black children spent the most time on school work across all ethnic groups.

Differences in remote teaching and learning experiences can largely be accounted for by differences in school policies and the learning provision provided by the school or college, with BAME students more likely to attend schools that had poorer remote teaching provision (Green, 2020). It should also be considered that BAME students are more likely to be from more deprived communities, and as noted earlier in this

section, these students are less likely to have experienced the better volume and quality of teaching and learning support compared to students from the least deprived communities, which likely contributes to these students falling further behind in their studies compared with their peers (Montacute, 2020; Montacute & Cullinane, 2021).

It is worth noting that COVID-19 has had a disproportionate health impact on people from certain ethnic groups (Mamluk & Jones, 2020). There is no data directly investigating how this has affected learning loss for these students. However, it is likely that in the least, these students will have had, in general, more negative experiences as a result of how the pandemic has impacted their lives, with regards to health anxiety, family members having the virus, and family bereavements. Students from BAME backgrounds were less likely to return to school when they reopened, which may have been a direct result of parents' safety concerns in light of the increased risk of COVID-19 for these populations (Sharp et al., 2020).

Region

The literature does not provide details regarding teacher estimates of lost learning by region. However, from the wider research there are some patterns and probable impacts of the pandemic on regional learning loss. The evidence points towards there being regional differences in students' learning experiences as a result of the pandemic.

There were some differences in remote learning and educational engagement during the pandemic by region, which is noted to be largely a result of difference in schools' policies between regions as well as regional differences in managing cases of COVID-19 (Green, 2020). Teachers reported lower student engagement in the West Midlands than in London. Some students in the northern regions were particularly disadvantaged compared to the south and south-east. In the northern regions there were lower levels of parental engagement and home resources, such as access to digital resources. Students also received fewer offline learning resources, and were less likely to be engaging in online conversations with teachers and other students in the north. Students in London and south-east England reportedly spent the most time on schoolwork, and students in these areas received the most offline learning provision. Schools and colleges in London also provided the most online teaching (Green, 2020; Lucas et al., 2020).

Regardless of region, more urban areas were typically more at risk than rural areas of disrupted learning, with student bubbles having to self-isolate or whole schools closing, meaning that those students not in school had to continue to learn remotely. All of these factors are likely to contribute to interrupted learning, and may manifest as increased loss of learning within regional clusters.

Widening attainment gaps

We have seen how the pandemic has impacted different groups of students differently, in terms of their experiences of learning during the pandemic and also what this means for their learning trajectories. It is clear from the research that remote teaching and learning pulled more heavily on home resources and parental support, and also relied on schools and colleges to be able to react quickly and effectively in their delivery of remote teaching. Because of the changing source of resource and support in learning during the pandemic, there are concerns about the disproportionately negative impact of the pandemic for disadvantaged students and the degree to which the pandemic has further exacerbated the attainment gap between disadvantaged and advantaged students (Children's Commissioner, 2020; Education Endowment Foundation, 2020c; Montacute, 2020).

For those students experiencing the most lost learning, it is suggested that additional support is required from across the community above what would normally be available to enable students to recover their lost learning (Elliot-Major & Machin, 2020). These interventions may be critical for ensuring that inequalities in teaching and learning experiences do not damage future educational and occupational opportunities (Elliot-Major & Machin, 2020).

Overall, it is likely that the circumstances of the pandemic will contribute to the disadvantage gap widening. However, at this point the size and significance of this contribution is still unclear (see Report 1 from our 'Learning During the Pandemic' series).

Individual experiences of learning loss

The nature of much of the research into understanding learning during the pandemic is that it tends to present individual experiences using collective measures, either by students as a whole, or by different groups of students and students from different backgrounds. This is also how we have presented the findings in this report. Representing experience in this way is helpful for many reasons, not least because it facilitates wider understanding of the issues at stake, and helps to highlight inequality of experience across broad groups. However, this can also fail to represent many whose experiences do not align with the norm. Throughout the report we indicate that average measures tend to mask the experience of many students. Taking the example of time spent on remote learning tasks, for instance: on average, students reportedly took part in 1 to 2 hours of online learning provided by the school during the first national lockdown. However, there were many students who did not receive any online learning provision, and many students who were provided with a full day's online learning.

The complexity of influential factors

Sometimes, differences in learning experiences were due to more macro-level influences. For instance, local variations in responses to COVID-19 during periods of regional increases in cases resulted in some areas seeing school closures and not others. The resources a school or college has access to also seems to impact the quality of provision delivered to students. Sometimes, differences in learning experiences were due to more micro-level influences, for instance, whether a student has sufficient access to a device at home for their remote learning, or the degree to which they are motivated to engage with school work. There is a complex interplay between these macro- and micro-level influences, which contribute towards unique experiences of learning, and learning loss, during the pandemic.

To explain the interplay between macro- and micro-level influences, we present three main features that explain how differences in students' learning experiences during the pandemic may have arisen.

They are that disadvantageous experiences are:

1. often accumulative
2. are compounded
3. that this gives rise to variation in experience between groups and within groups

Let's consider these ideas more closely.

Disadvantageous experiences are often accumulative. By this we mean that disadvantage in one aspect is more often associated with disadvantage in another aspect, and vice versa. For instance, students who were provided fewer and lower quality provision from their school or college were more likely to have fewer, and lower quality, home resources too. In contrast, students who were provided with the largest and best quality school provision were more likely to have more and better-quality home resources. However, we emphasise that this is not the case for everyone. There will have been many students who lacked home-based resources, but were provided with high quality remote learning resources from the school, and vice versa. The issue is therefore much more complex than being that of privilege versus deprivation (see Ofsted, 2020f).

This leads us to the next feature, that disadvantageous experiences are compounded. By this we mean that there are many contributing factors with complex interactions that give rise to learning loss; which, collectively, contributes to the third feature: importantly, that these complex interactions *may, or may not, play out as disadvantageous for individual students*.

The negative impact of the pandemic on learning is not based on the *number* of disadvantageous experiences a student has. But, there are clearly elements that

have more *weight*, and therefore more impact than others. We explain this across a series of hypothetical scenarios – note that these scenarios are intended to be illustrative rather than exhaustive.

Scenario one

A school provides the best online learning provision, but a student does not have access to an electronic device with internet access and this is a barrier to their learning.

Scenario two

A school provides the best online learning provision, and a student has the best home resources. But, the student lacks the internal motivation and discipline to engage with their learning. In this case, the student's lack of intrinsic drive to undertake learning is a barrier.

Scenario three

A student does not receive good quality learning provision from the school, but has excellent home resources (for example, good parental support, access to additional learning resources and private tutoring). Although the poorer school provision is a barrier to learning, good home resources may make up for this. This student is therefore likely to have fared better than their classmates who did not have access to resources and private tutoring.

It is important to consider the unique experiences of learning during the pandemic, particularly when evaluating how to recover lost learning and implement assessment policy decisions. It is clear that students' experiences of learning during the pandemic, and therefore the degree to which they experience learning losses, is varied, not only across regions and schools, but also across students in the same school or class. It is therefore unlikely that decisions to address these issues would benefit all students, let alone to the same degree.

Discussion

What do we know about learning experiences during the pandemic?

We've seen how there are many factors that have contributed towards effective, or ineffective, teaching and learning since the pandemic caused schools and colleges to initially close in March 2020. In general, the quantity and quality of teaching and learning during the pandemic was reduced compared with normal times.

The literature identifies several barriers to teaching and learning. From March 2020, teachers had to adjust quickly to new means to teaching remotely. Some reported that their limited confidence and skills in using IT and creating online resources made delivering online learning difficult. For many, particularly those serving deprived communities, they found they spent much of their time creating learning resources that could be accessed by all. Some teachers even reported hand-delivering paper-based resources.

Many students reported dips in motivation, on top of difficulties with their mental health and well-being. This, coinciding with fewer opportunities to engage with peers and teachers, meant that they found it difficult to stay on track with their learning. For some students, the home environment was also not conducive to effective learning. This was particularly problematic where they had limited access to the internet and devices with which to undertake their schoolwork. Some students also took on responsibilities to support their siblings with home-schooling, and for many, their parents were not able to give enough learning support.

Although in-school teaching is seemingly more conducive to effective pedagogy than remote learning, teaching and learning was somewhat deprioritised in many schools on the initial return to school in September 2020. This was particularly the case for primary, and less so for secondary, schools. For many students, the impacts of the pandemic took considerable toll on their social, emotional and mental health. For many schools and colleges, at least initially on students' return, they therefore felt a more pressing need to support their students' well-being over covering the curriculum.

The most notable challenge to teaching in the autumn 2020 term was the learning environment. COVID-19 restrictions and social distancing in schools and colleges reduced teacher-student engagement, and for many students, large proportions of the term were still not spent in the classroom with the teacher. Overall, although the quality and amount of learning in the autumn term was better than when it was remote, it was still far removed from the quality of teaching delivered before the pandemic. Teachers reported feeling as though they were 'firefighting': their efforts to

support mental health and well-being, recovery of lost learning and covering the curriculum, keeping students and school staff safe.

In January 2021, further school closures meant that learning was undertaken remotely again. It is likely though that this phase of remote teaching was more successful than the initial phase when schools and colleges were closed from March 2020. This is because teachers were more attuned to delivering remote teaching, and there was better access to digital devices for students to engage in their remote learning. However, a larger proportion of students continued to attend school in January than during the first lockdown. Where teachers had to deliver remote teaching at the same time as in-school teaching, this was likely met with challenges and had implications for the quality of learning experienced.

What do we know about learning losses during the pandemic?

Most students appear to have experienced learning losses to some degree, and some have experienced severe learning losses. Reports often indicate that maths and literacy skills are most notably behind. Practical skills are also reported to have suffered, which is particularly problematic for courses that are largely practical in nature, such as some apprenticeships and trades and beauty qualifications.

Much of the learning losses are due to periods of remote learning. However, even when students were back in school, a need to focus on well-being, as well as changes to the learning environment as a result of COVID-safe restrictions, meant that learning could still not continue as normal. A small proportion of students seem to have thrived in their new learning environments and actually experienced learning gains above what would be expected in a normal year. This group includes students who had the best remote and in-school learning resources, such as those in the least deprived state schools and independent schools. Some students with special educational needs are also reported to have made better progress with their learning during the pandemic, particularly when learning remotely. Others, however, were unable to make progress with their learning remotely as they were lacking vital equipment that was otherwise available in school.

While teachers gave estimates of the scale of learning loss, these accounts were often subjective and could be based on the level of content a teacher had been able to teach, rather than an objective measure of content the student understands. We discuss more objective measures of learning loss in Report 3 from our 'Learning During the Pandemic' series. Nevertheless, it is likely that the extent and nature of learning losses will not be known until much later. We may gather some insight into learning loss as a result of the pandemic by measuring students' preparedness to

study new courses in September 2021, as well as from the National Reference Tests this year, and from end of course assessments for years to come.

What do we know about differential impacts of the pandemic on learning, and why are these important to consider?

A running theme throughout this report is that experiences of teaching and learning during the pandemic were diverse. The clearest driving factor of this is disadvantage and deprivation. The most deprived schools and households were, in general, less able to support students' learning compared with the least deprived. This was the case during periods of both remote learning, as well as when students returned to school. Teachers also reported that gaps in learning were more pronounced for the more deprived students. This leads to concerns around the already existing attainment gap between the most and least advantaged students, and how the uneven impact of the pandemic is likely to have widened the attainment gap further.

Despite this broad picture, Ofsted's visits remind us that the picture is not a simple one. While, on average, deprived students and schools serving more deprived areas may have suffered disproportionately from learning loss, the reality is that each child has had their own very unique experience of the pandemic and has faced different challenges. When discussing the groups who have been most affected by the pandemic, Ofsted note "This shouldn't be confused for a simple message about privilege versus deprivation" (Ofsted, 2020f, p2).

There were further concerns about younger children. Teaching and learning during the pandemic were particularly negatively impacted for primary students. The level of support that younger students needed for their remote working was less readily available and learning tasks for this age were less amenable to a remote context. Teachers reported the most learning losses among primary students and raised concerns about how this may negatively impact their learning trajectories for years to come.

The literature identifies differential learning experiences and learning loss across groups of students and identifies groups of students that are otherwise not typically associated with being disadvantaged. This includes vulnerable students, students whose parents are keyworkers, and to some extent, students who had caring and home-schooling responsibilities for younger siblings. While it can be helpful to explore issues with relation to overarching groups of students, the unique individual experiences students had should not be ignored.

We have explored how there is a complex interaction between macro- and micro-level influences that contribute to the differential learning experiences between and within groups. In particular, it appears that factors that impact effective learning were

typically accumulative, but compounded, giving rise to complex and often unique variations in experience. This means that there will have been students who appear to have had an arsenal of high-quality learning resources, who have nevertheless found their learning during the pandemic incredibly disrupted.

This consideration of the complexity and uniqueness of learning experience and any related learning losses is an important one. Schools, colleges and policy makers should be mindful of this when deciding the best course of action for education to recover from the pandemic, particularly as a one-size solution is unlikely to be equally beneficial.

This report focuses on the impact of the pandemic on students' learning, and associated learning losses, but we should also acknowledge that the changes to teaching in the last year also had a large impact on teachers and school staff. Teachers took on many responsibilities that went beyond their usual work and should be recognised for their efforts. While also managing impacts of the pandemic in their own lives, many were also undertaking training in digital teaching, hand-delivering work for students who had barriers to accessing digital resources, putting an extra focus on pastoral care, making changes to lesson plans, changing how some course content was taught, as well as taking on extra work to cover staff illness.

Areas for further research

The existing literature offers a lot of useful insight into learning during the pandemic, and the research community has produced a large amount of research in a relatively short time. However, there are still some specific learning contexts for which we are largely unaware of the impact of the pandemic and would be a useful focus for future research. We have already discussed the value in exploring individual's experiences in more depth and grappling with the extent and nature of learning losses. We identify some additional contexts for further research.

Overall, the literature is relatively lacking in research and analysis focused specifically on students who were in years 11 and 13 at the start of the pandemic in March 2020. The research mostly groups students into primary or secondary phases of education, although 'post-secondary' is also mentioned in some literature and presents findings in these groups. This is a relatively simplistic breakdown given the differences between students, and that provision is likely to have been different across year groups within these phases. Consider, for instance, that students in year 7 would be in the same 'secondary' group as the students in years 10 to 13; and year 1 students would be in the same 'primary' group as students in year 6. As we have mentioned above, when the pandemic initially resulted in school closures, students in years 11 and 13 who were preparing for their exams in summer 2020 are reported to have received less learning provision on account of their exams being

cancelled. It is not clear if learning (or revision) provision picked up again as the pandemic continued or not. This has important implications for the degree to which students in these year groups were prepared for their next educational or occupational endeavours. Similarly, there is little to no information about the experiences of learners who continued to be assessed in summer 2020. Students who were in years 10 and 12 in March 2020, and other students who were preparing for assessments in 2021, are also likely to have had a very different experience of learning over the past year compared to students who are not on assessed courses. Again this is also something we currently know little about.

There is also large variation in maturation of students across the primary and secondary year groups. It is therefore not unreasonable to assume that the most suitable provision for students across these phases would differ based on this too. For instance, the degree of scaffolding and parental or teacher support needed to maintain student engagement in remote learning would be different depending on if the child was in year 1 compared with in year 6, and similarly different for year 7 students compared with year 11s.

From the literature, it seems that some aspects of learning were more difficult to deliver in a COVID-safe way. In some cases, the impact of this could be relatively small. For instance, where teachers report not being able to share equipment to undertake science practical work, this is likely to impact a smaller proportion of learning. Learning in some qualifications is also likely to have been more disrupted. Most schools and colleges offer GCSEs, A levels and a suite of vocational and technical qualifications. Those qualifications for which learning (or aspects of) could not continue remotely are likely to be the hardest hit. The literature is yet to explore this fully, but we have seen how students on more practical courses and apprenticeships have suffered.

It also appears that some schools deprioritised learning that was not linked to assessments, such as enrichment activities and complementary subject content. The impact of this is currently unknown, but may have negative implications for future learning, life skills and well-being.

An evaluation of the literature sources

We note in the introduction that we reviewed a considerable volume of research that contributed to this report. Although this report did not take a methodological 'systematic review' approach, it intended to be comprehensive. As well as reviewing all of the literature we had access to that was relevant to the impact of the pandemic on learning, we were also in contact with research groups contributing much of the research within this report to ensure our interpretations of the research are reflective of the original findings.

There are a few things to be mindful of when interpreting the findings from the research literature. Firstly, although student accounts are also taken into consideration, a lot of the literature uses teacher and parent reports to understand students' experiences. Because of this, the accounts may not wholly or accurately reflect students' experiences. For instance, a teacher may report that they provided several opportunities for teaching and learning, however the student may not have engaged with them. Similarly, when estimating the degree of learning losses, teachers may confound comparisons with content that has been taught with the knowledge, skills and abilities the students actually acquired. Parents are also likely to only report on the educational engagement that they observe or believe their children to be undertaking. Findings may therefore under- or over-inflate students' actual learning experiences.

Secondly, as previously discussed and therefore not dwelled upon here, the full diversity of learning experiences during the pandemic is unlikely to be captured by the existing literature. This is because much of the research focuses on large-scale data sets and survey responses, from which findings are averaged and opportunities to explore experience in-depth are lacking. Although there are undeniable benefits to these pieces of research, as discussed above, experiences that do not fit the 'norm' are often not represented.

Thirdly, the research findings between reports can often be different, despite similarities in the issues explored. Mostly, these reflect small differences across reports in the proportions of individuals that share the same experiences. These instances are typically due to sample differences. However, sometimes there are more striking differences. These are generally accountable to differences in methodology: how the issues were explored and the context responses were collected within. By and large the research findings reporting learning experience during the pandemic have comparable narratives. Where the research findings were more varied, we highlighted these in the body of the report and identified potential reasons for the dissimilarity.

It is clear too that the literature has evolved over the duration of the pandemic. After the initial school closures, there was a focus on how teachers, students and parents were managing remote learning during the first lockdown in 2020. This research is largely comprised of surveys, which are a useful tool in being able to react quickly to changing circumstances, as they can be rapidly launched and analysed. As the pandemic continued, the focus of the literature generally shifted to looking at how the pandemic impacted the return to school, the degree to which students' learning had been interrupted, the nature of lost learning, and how lost learning was being recovered. Like the initial array of research, survey data contribute to these findings, but this is complemented with in-school observations and measures of where students were at with their learning. What is noticeable is that the volume of research is much less as the pandemic continued through the autumn term, and into spring

2021. There could be a couple of reasons for this. This could be a result of the expected delay between undertaking research and disseminating it: as such it is likely that we will see a larger research response in future. Alternatively, research groups could be focused on issues that are not in scope of this report, such as using attainment to measure the scale of learning loss, focusing on arrangements for assessments in 2021, or thinking ahead to educational issues for 2022.

The literature included in this review is varied. It includes academic peer-reviewed journal articles, as well as 'grey literature'. Grey literature refers to work that has not undergone a process of peer review. It is typically produced by those who have an interest in the topic and is considered to provide useful contributions to knowledge in its field (Adams, Smart & Huff, 2017; Sharma et al., 2015). A large body of literature referred to in this report has been undertaken by organisations that have an established interest in teaching, learning and student experiences. This is beneficial as these organisations often have access to information and means of gathering data that could otherwise be less easily and rapidly acquired. This has further positive implications for the ecological validity of the research, that is, the degree to which the data accurately reflects real experiences. Examples of this, for instance, are the Ofsted reports that reviewed schools' teaching practices through in-school observations. Grey literature is not without its limitations, however, as it is possible that findings could reflect the organisational agendas by which they are produced. Because of this, additional care has been taken when evaluating findings and interpreting conclusions of these pieces of research for this review.

Conclusion

Overall, the coronavirus (COVID-19) pandemic has had a detrimental impact on learning in England. There were challenges to learning, both when it was remote and in-school, which resulted in a reduction in the quality and quantity of students' learning.

Learning has been disrupted for most students. For a small proportion, learning has been severely disrupted, while for some others there have been some learning gains. Teachers report the most learning losses in literacy and maths. Practical qualifications and practical aspects of courses have also been particularly disrupted. The impacts of the pandemic on learning are reported by teachers to have been uneven. Learning has been the most disrupted for the most deprived and disadvantaged students, and least disrupted for socioeconomically advantaged students, although there will of course be exceptions to this.

While students with similar backgrounds are more *likely* to have had similar experiences of learning and learning loss, this report highlights the importance of considering individual experiences. Indeed, there are stark differences between and within contexts, which we note are driven by the complex interactions of the unique circumstances that each student is in and are therefore difficult to predict. It is therefore crucial that mitigations of lost learning, wider educational assessment policy-making and learning recovery programmes acknowledge this complexity to ensure that the benefits are fair and far-reaching.

Appendices

Appendix A

A summary of features that have influenced teaching and learning during the pandemic.

School provisions

Type/quality of remote learning

- Online, live lessons
- Offline, independent study.

Amount of remote learning provided

Teacher engagement

- Feedback
- Live interactive communication
- Pastoral care

Curriculum coverage

- Focus on mental health and well-being
- Teaching in line with Covid-safety restrictions
- Pace of teaching and learning

Management of dual teaching (remote and in-school)

- School resources

Pattern of school closures

Home Provisions

Parental support

- Engagement with home-schooling
- Time spent home-schooling
- Ability to home-school

Other family factors

- The presence of a parent during remote learning
- Single or two-parent households
- Number and age of siblings
- Vulnerable children
- Keyworker parents

Home learning resources

- Access to digital devices and internet
- Suitable study spaces
- Private tuition

Student intrinsic factors

Motivation

- Internal vs external sources of motivation

Discipline

- Flexibility to learn remotely vs lack of structure

Mental health

- Stress, anxiety, well-being and burnout

Contexts

Age/stage of education

- Ability to study independently
- Need for pastoral care

Deprivation and Disadvantage

- Multi-level: communities, schools and families

School type

- State vs private schools

Region

- Impact of Coronavirus (COVID-19)

Gender
Low attainers
Ethnicity
Students with SEND

Appendix B

Aspects of learning that are reported as having the most notable learning losses.

Primary

- Fine and motor skills
- Reading and phonic knowledge
- Literacy: spelling, punctuation, grammar, handwriting, presentation and writing stamina
- Mathematical vocabulary, place value and recall

Secondary

- Literacy: spelling, punctuation, grammar and spoken English
- Maths: fractions, trigonometry and problem solving.
- Modern foreign languages
- Practical aspects in sciences, PE, design and technology and music

Vocational and Technical qualifications

- Practical aspects such as in trades and beauty qualifications
- Skills in apprenticeships linked to the hardest hit sectors

Special schools

- Regression in communication skills
- Physical development
- Independence

More generally

- Unassessed content

- Enrichment activities
- Life skills

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