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# **The impact of COVID-19 on student learning outcomes across Europe: the challenges of distance education for all**

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# **The impact of COVID-19 on student learning outcomes across Europe: the challenges of distance education for all**

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## Introduction

Nearly 1.6 billion learners in 188 countries have been affected by school closures due to the COVID-19 pandemic since March 2020, representing 94% of the world's student population from pre-primary to higher education (OECD, 2021, United Nations, 2020). Between February and November 2020, the average school students at primary or secondary level worldwide lost 54% of their annual contact time with teachers (Gustafsson, 2021). School closures led to the interruption of in-person contacts between teachers and students, as well as the interruption of the basic support schools provide to many students (including access to food) and other critically important aspects of schooling. These include various key elements involved in children's socialisation process, such as contacts with friends at school, personal relationships between students and teachers, school-based extracurricular activities, access to playgrounds, and team sports – all of which help to support students' mental and emotional well-being, as well as developing their socio-emotional and non-cognitive skills and providing a 'sense of routine', which is a key structuring factor for a child's development (Garcia and Weiss, 2020).

Every EU Member State was affected by partial or total closures of educational institutions, in one of the largest disruptions of education in recent history. Disruptions from pre-primary to upper-secondary levels included periods of total<sup>1</sup> and partial school closures<sup>2</sup> (see Figure 1 below). Across the EU, schools were fully or partially closed for an average of 25.6 weeks between March 2020 and March 2021. While some countries, such as Croatia and France, kept schools partially or totally closed for just 10 weeks between September 2020 and March 2021, others imposed a full or partial school lockdown lasting a total of more than 35 weeks. These countries include Czechia, Slovakia, Latvia, Poland and Italy.

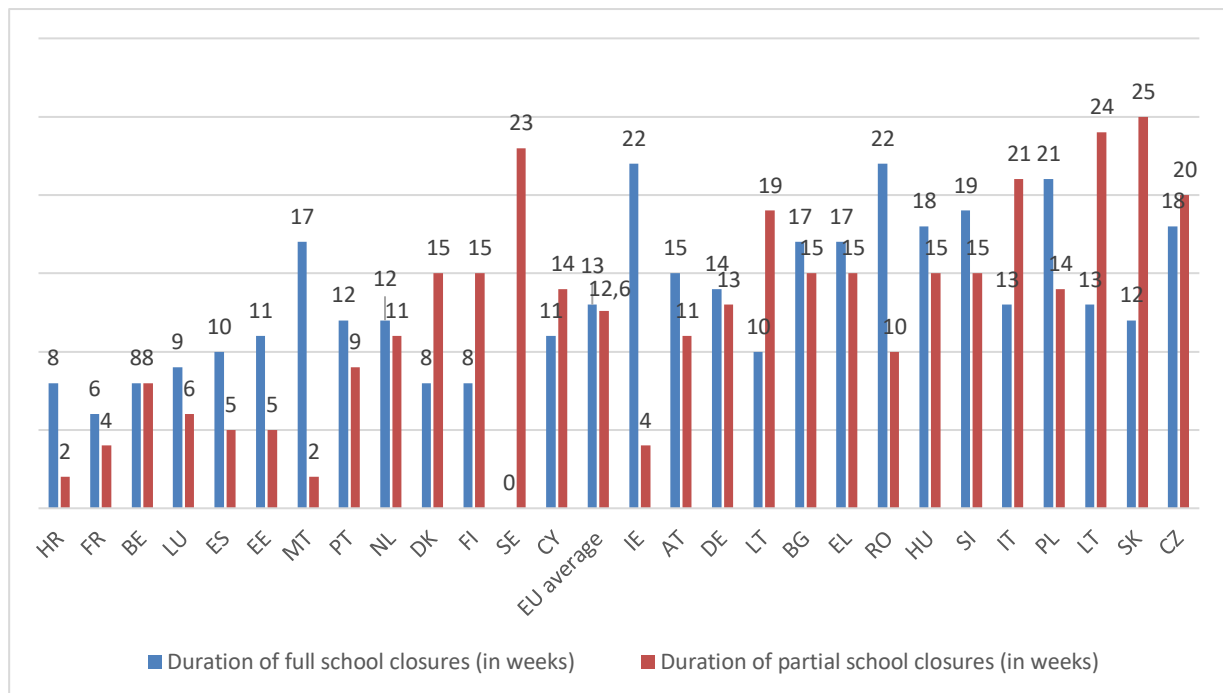
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<sup>1</sup> Schools were completely closed for between five and 14 weeks in some EU countries between March and August 2020 and for between one and 12 additional weeks between September 2020 and March 2021. Sweden was the only EU country that did not completely close all of its schools. Swedish upper-secondary schools closed as of March 18, 2020, while lower-secondary, primary schools and preschools remained open until the end of the school year in mid-June. This contributed to a doubling of the infection rate among lower-secondary teachers compared with their upper-secondary colleagues (Vlachos et al., 2021).

<sup>2</sup> Between two and 25 weeks, depending on the EU country. 'Partially open schools' includes the following situations: a) schools were partially open in certain regions only; and/or b) were partially open for some grade levels/age groups only; and/or c) schools were open but with reduced in-person class time, combined with distance learning (a so-called 'hybrid approach').

See: [https://en.unesco.org/sites/default/files/en\\_methodological\\_note\\_-\\_unesco\\_map\\_on\\_covid-19\\_caused\\_school\\_closures\\_reopening\\_final.pdf](https://en.unesco.org/sites/default/files/en_methodological_note_-_unesco_map_on_covid-19_caused_school_closures_reopening_final.pdf) (Accessed 16 May 2021).

**Figure 1. Duration of total and partial school closures in EU Member States (in weeks)**



Source: UNESCO data up to 29 March 2021. Total duration of school closures. Available at: <https://en.unesco.org/covid19/educationresponse#durationschoolclosures> (Accessed 2 May 2021).

Results from a survey carried out by the OECD, UNESCO, UNICEF and the World Bank on education during the COVID-19 pandemic (OECD, 2021) show that the number of days when schools were closed increased with the level of education. Across countries which participated in the survey, pre-primary institutions and primary schools stayed fully open in a larger number of countries than lower secondary and upper secondary schools. Results also show that countries with the lowest educational performance on the PISA 2018 survey closed their schools for longer periods of time on average, which shows that school closures amplified educational inequalities across OECD countries.

This report provides a review of the available evidence on the impact of COVID-19-related school disruptions on student learning outcomes at primary and secondary level across the EU, and characterises the various factors identified as having had an impact on student learning. These include a reduction in teaching and learning time, in the frequency of individual contact with teachers, and in the capacity of teachers and students to adapt to distance education<sup>3</sup>. In the report, we also review the available evidence on the role of

<sup>3</sup> The OECD defines distance education as 'education that uses one or more technologies to deliver instruction to students who are separated from the instructor and to support regular and substantive interaction between the students and the instructor synchronously or asynchronously' (OECD, 2021, p. 14).

digital education in supporting students' academic achievement in the context of distance schooling.

The main source of information for this report comprises secondary data collected from the academic literature, as well as international policy reports and from the institutions of EU Member States, mostly published since March 2020 and until April 2021. The literature reviewed was collected through semi-systematic searches of publicly available academic databases<sup>4</sup>, structured searches of recent empirical evidence, and by using a 'snowball' approach to gather additional evidence from research and grey literature.

The first section of the report presents a summary of the available evidence on the effects of COVID-19-related school disruptions on primary and secondary school student learning outcomes in the EU. The second section of the report discusses the role of digital education in mitigating inequalities in student learning due to the COVID-19 pandemic. The third and final section of the report concludes by providing some reflections on the challenges faced by education systems in implementing distance education.

## **1. Effects of the COVID-19 pandemic on student learning outcomes**

Based on the length of school closures, and the reduction in both teacher-student contact time and time spent learning at home, statistical estimations have attempted to predict the impact on student academic outcomes of the disruption of education due to the COVID-19 pandemic. Notably, these estimates used pre-pandemic evidence on the relationship between time spent learning and educational outcomes. Given the lack of widespread evidence on the impact of COVID-19-related school disruptions on students' learning outcomes, researchers focused on the impact of schooling disruptions and the loss of instruction time due to absenteeism, summer learning loss, teacher strikes, or natural disasters (see, for example: Engzell et al., 2021; Garcia and Weiss, 2020; Kuhfeld et al., 2020; Maldonado and De Witte, 2020). Research evidence shows a direct relationship between student performance and the length of the school day and amount of instructional time. It has determined that the cancellation of school days has a negative impact on student learning outcomes. Research on summer learning loss for example, shows a reduction in (or stagnation of) student learning outcomes over the summer, with a widening gap between students of lower socio-economic status and their counterparts of

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<sup>4</sup> Such as the Education Resources Information Center (ERIC) (<https://eric.ed.gov/>) and Google Scholar (<https://scholar.google.com/>).



high socio-economic status. Based on these findings, Kuhfeld et al. (2020) have estimated that students who did not receive remote instruction during spring 2020 would achieve only 63% to 68% of the typical learning gains during a school year in reading, and 37% to 50% of their learning gains in mathematics by the autumn 2020.

A study carried out by Di Pietro et al. (2020) for the European Commission's Joint Research Council draws four main hypotheses in relation to the estimated impacts of the COVID-19 pandemic on education:

1. A setback in student learning, due to less time spent learning, as well as to stress, changes in the way students interact, and lack of learning motivation. Based on evidence from France, Italy and Germany, Pietro et al. estimate a weekly learning loss for students across Europe of between 0.82 and 2.3 standard deviations.
2. A larger decline in learning outcomes among students of lower socio-economic status, driven by several key dimensions: a lack of non-financial parental support, as well as a lack of parents' financial resources, coupled with school attendance, and students' digital skills. These factors lead to a widening of the socio-economic gap in student performance (as well as between 'native' students and migrant students).
3. Increased inequalities in socio-emotional skills between students from lower socio-economic groups, who are more likely to be exposed to a stressful home environment than are their peers from more privileged backgrounds, and are less likely to be equipped with these skills.
4. Potential long-term and growing impacts of the widening socio-economic gap in both cognitive and socio-emotional skills, with expected consequences on students' future educational outcomes and labour market performance.

The following sections present evidence on the impact of COVID-19-related school disruptions on student learning outcomes, based on a review of the results of surveys, standardised tests and statistical estimates. They provide preliminary responses to the key hypotheses drawn by Di Pietro et al.

### **Reduction in teaching and learning time**

Research highlights the link between teaching and learning time and student performance, with various levels of impact on different groups of students, showing that the support of trained teachers is a key factor for student educational achievement (see, for example: Azevedo et al., 2020; Grewenig et al., 2020; Gustafsson, 2021). School disruptions have led to sharp reductions in teaching and learning time since March 2020, prompting

concerns as to their potential impact on student learning outcomes and on educational inequalities.

Results from the School Barometer survey carried out between March and April 2021 in **Germany, Austria** and **Switzerland**<sup>5</sup> show that only 31% of primary and secondary students reported being engaged in learning tasks and schoolwork for 25 hours or more per week, corresponding to five or more hours per day (Huber and Helm, 2020). In these three countries, 18% of students reported learning for less than nine hours per week, corresponding to just under two hours per day. Evidence also shows that students were more engaged in learning at home when teachers regularly review their homework.

An analysis of time-use data from a survey carried out among parents of primary and secondary students in **Germany** found that school closures had a strong negative impact on student learning time, and that it increased educational inequalities in achievement (Grewenig et al., 2020). Evidence shows that German students reduced their daily learning time by more than half, from 7.4 hours on average to around 3.6 hours. Evidence from the **Netherlands** also indicates that 40% of students in a distance learning setting studied for less than half the amount of time they did before school closures (Maldonado and De Witte, 2020). In **Germany**, 57% of primary and secondary students received online lessons less than once a week, and only 6% received them daily, and had even less individual contact with their teachers (Woessmann et al., 2020). Evidence shows that the time students spent on 'conductive' activities (such as reading, arts, playing music or doing sports) increased from 2.9 hours to 3.2 hours during school closures, while 'detrimental' activities (such as watching TV, playing computer games or consuming social media) increased from 4.0 to 5.2 hours. Moreover, while no differences were seen in learning time between low- and high-achieving students before the pandemic, during school closures low achievers were found to spend 0.5 hours less per day on school-related activities than high achievers. Time spent on detrimental activities increased in a more pronounced way among low-achieving students (+1.7 hours) compared with their high-achieving peers (Grewenig et al., 2020).

In **France**, survey evidence shows a sharp reduction in student daily learning time compared with the pre-pandemic period: 38% of secondary school students dedicated at least three hours a day to schoolwork during the school lockdown period, and 12% less than one hour per day (DEPP, 2020b). The evidence shows a strong correlation between students' socio-economic background and time spent learning. The share of students who spent three hours a day or more learning was 15 percentage points higher among children

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<sup>5</sup> With more than 7,100 respondents, including 2,222 parents; 2,152 students; 1,949 school staff; 655 school leaders; 58 school authorities; and 80 members of the school support system (Huber and Helm, 2020).

from a privileged background (47%) than among disadvantaged children (32%). At lower-secondary level, the share of students who spent three hours or more studying in priority education schools<sup>6</sup> was 15 percentage points lower (25%) than average (40%). At upper-secondary level, a 15-point gap can be seen between the share of students in vocational education schools who declared spending three or more hours learning per day learning, compared with students in the general sector (23% and 38%, respectively).

In the **UK**, a survey carried out in May 2020 indicated that primary and secondary students each spent an average of around five hours a day on home learning (Andrew et al., 2020). During school closures, students from families with higher incomes and better-educated parents spent more time studying, had better studying supplies at home, and received more support. Another study using data collected through the UK Household Longitudinal Study (UKHLS) estimated that students spent an average of just 2.5 hours per day doing schoolwork, which mostly consisted of assignments, worksheets and watching videos (Green, 2020). Further evidence shows that the extent of online lessons provided by British state schools was 'minimal', with 71% of state school students receiving none or less than one online lesson per day; 20% of students did either no schoolwork at home, or less than an hour per day.

Evidence from **Switzerland** also suggests a sharp reduction in study time among secondary school students (including time spent in school and online lessons, as well as time spent on homework), from an average of more than 35 hours before the school closures, to just 23 hours per week during the period of school closures, corresponding to less than 4.6 hours of study time per day (Grätz and Lipps, 2021). This means that students spent around one-third less time studying during the period of school closures, compared with the pre-pandemic period. Moreover, survey data show that children from families with highly educated parents reduced their studying time in absolute terms more than children from families with less well educated parents<sup>7</sup>.

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<sup>6</sup> Schools in priority education networks (*réseaux d'éducation prioritaires*, REP) or reinforced priority education networks (*réseaux d'éducation prioritaire renforcés*, REP+). These nationally supported 'networks' provide schools in disadvantaged areas with additional funding, human resources and support for various educational projects. The REP and REP+ labels are attributed on the basis of specific educational and socio-economic criteria. These include: the prevalence of disadvantaged socio-professional groups; the rate of students benefitting from a scholarship; the rate of students residing in a priority area benefitting from urban policy public funding (*quartiers politique de la ville*, QPV); and the rate of students who have repeated a year before their sixth grade.

<sup>7</sup> Parental education is measured using the highest level of education achieved by the parents of survey respondents, distinguishing between a low level of education (if both parents completed only the lower track of the Swiss school system), medium level (if one of the parents completed at least upper-secondary school), and high level (if one of the parents completed a university degree) (Grätz and Lipps, 2021).

## Evidence from surveys of the impact of COVID-19 on student learning outcomes

Several studies across the EU and the UK have explored the educational consequences of the period of school closures via surveys of students, parents, teachers, school leaders and other actors in education at primary and secondary level (see, for example: Andrew et al., 2020; DEPP, 2020a, 2020b; Di Pietro et al., 2020; Huber & Helm, 2020; Pavlas et al., 2021). These surveys show that most students have learnt less since the beginning of the COVID-19 pandemic than during a 'regular' school year.

In spring 2020, the Direction for Evaluation, Prospective and Performance (DEPP) at **France's** Ministry of Education carried out seven surveys of secondary school students and parents, primary and secondary school teachers, school principals, principal educational inspectors<sup>8</sup> and educational counsellors<sup>9</sup>, totalling more than 100,000 respondents. At primary level, the results show that most teachers and educational staff considered that students learned 'satisfactorily' between March and May 2020: 77% of teachers, 74% of school principals and 73% of inspectors believed that students learned in a fairly or completely satisfactory manner (DEPP, 2020a). At secondary level, 84% and 78% of school administrators and principals in upper- and lower-secondary schools, respectively, were satisfied with student learning during the same period. The corresponding figures among educational counsellors in upper- and lower-secondary schools were 72% and 74%. However, the results show a considerable gap between the perceptions of school actors depending on the level of the school and its educational sector. In primary education, only 63% of teachers in priority education schools<sup>10</sup> believed that students learned satisfactorily, compared with 77% of all primary school teachers (Grewenig et al., 2020). The gap between priority education schools and other primary schools is confirmed by the responses from school principals: on average, 74% of school principals were satisfied with student learning, while just 55% of those working in priority education primary schools shared this opinion. In secondary schools, the level of satisfaction with student learning is also marked by sharp variations depending on the educational sector: while 85% of students in private schools declared that they were satisfied with student learning, the share in the public sector was 70%, and just 50% in priority education schools. Moreover, in vocational schools, 67% of secondary school administrators and principals, and 58% of educational counsellors, indicated that students learned satisfactorily – marking a 14 to 17 points gap with their colleagues in the general education sector.

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<sup>8</sup> *Inspecteurs de l'Éducation nationale (IEN), inspecteurs d'académie (IA) or inspecteurs pédagogiques régionaux (IAR).*

<sup>9</sup> *Conseillers principaux d'éducation (CPE).*

<sup>10</sup> REP and REP+.

UNICEF data from **Bulgaria** shows that one in five pre-primary, primary and secondary school students reported worse educational outcomes than they had before the pandemic (Yankova, 2020). Half of Bulgarian teachers were concerned that students lost their desire and motivation to learn; 45% thought that the number of students who would drop out of school activities would increase; and 40% were concerned that distance learning would have a negative effect on students' learning outcomes.

Results from **Austria, Germany and Switzerland** indicate that primary and secondary school students considered themselves more stressed during the period of school closure in spring 2020 (52%) than all other groups of educational actors, including school leaders (48%), parents (41%), school staff (39%), school administration and those in the school support system (38%) (Huber and Helm, 2020). On the other hand, most of the students surveyed indicated that they had not experienced any specific challenges relating to selected aspects of distance learning<sup>11</sup>. Nevertheless, for a quarter of students, learning at home, as well as arrangements with school and with teachers, represented special challenges.

In a study conducted in the **UK** during July 2020, based on survey responses from teachers and school leaders at primary and secondary level<sup>12</sup>, Sharp et al. found that 98% of teachers believed that their students were behind in curriculum learning at the end of the 2019-2020 school year. Teachers reported that they had covered an average of 66% of the usual curriculum during the 2019-2020 school year, and estimated that their students were behind by an average of around three months.

## **Evidence from standardised tests of the impact of COVID-19 on student learning outcomes**

Since the beginning of the crisis, limited quantitative research has been carried out on the impacts of the pandemic on student academic performance and the estimated time needed to compensate for learning losses (Clark et al., 2021). In the EU, only a few studies published by May 2021 have evaluated the impact of COVID-19-related school closures on primary and secondary students' standardised test results (Andreu et al., 2020a, 2020b, 2021; Engzell et al., 2021; Maldonado and De Witte, 2020). Results show that the period

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<sup>11</sup> Such as 'planning my own day', 'that I have many other things to do that keep me from studying', 'the arrangements with the school / with my teachers', 'learning at home', 'that my parents cannot help me', 'that my parents control me all the time', and 'that I don't have a computer/laptop/tablet to study appropriately' (Huber and Helm, 2020).

<sup>12</sup> From 1,176 senior leaders and 1,782 teachers in 1,305 primary and 898 secondary schools in England (Sharp et al., 2020).

of school closure has had a negative impact on student learning outcomes, particularly on students' mother tongue skills.

In **Belgium**, a study by Maldonado and De Witte analysed annual standardised test results in Grade 6<sup>13</sup> across Flanders<sup>14</sup> between 2015 and 2020. The study aimed to identify the impact of the COVID-19 school lockdown on students' results in the tests administered in June 2020. Its findings show that students from the 2020 cohort experienced significant learning losses compared with previous cohorts in all but one subject (social sciences)<sup>15</sup>. In mathematics, results show learning losses of between 0.18 and 0.25 standard deviations (meaning that their school averages were between one-fifth and one-quarter of a standard deviation lower than students from the five previous years). In Dutch, school averages from 2020 marked a decrease in standardised test scores amounting to 0.29 standard deviations. In science, the results show a decrease of between 0.22 and 0.33 standard deviations. In French, students' scores were significantly lower in 2020 compared with 2019, with the decrease ranging from 0.19 to 0.30 standard deviations. Social sciences was the only subject in which no significant decrease was seen in test scores, which could be explained by the fact that the parts of the curriculum concerned had been covered before the school closures, or that they had been sufficiently well covered during the period of school disruptions (Maldonado and De Witte, 2020).

In the **Netherlands**, Engzell et al. (2021) analysed the effects of school closures on primary school performance, based on the results of national standardised tests at grades 4 to 7<sup>16</sup> in mathematics, spelling and reading. Students' results from before and after lockdown were those of students over the same period during the previous three years. Despite 'favourable' national conditions such as a short period of school closures (12 weeks of full closure and 11 weeks of partial closure – see Figure 1 above), equitable school funding, and high rates of broadband internet access, the results show that Dutch primary school students made little or no progress when learning at home during the spring 2020 lockdown. Evidence indicates that in 2020, students faced a learning loss of about 3 percentile points in math, spelling and reading, or 0.08 standard deviations (which is equivalent to one-fifth of a school year), when compared against results from 2017.

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<sup>13</sup> In Flanders, primary education is targeted at children from 6 to 12 years old and comprises six consecutive school years. See: [https://eacea.ec.europa.eu/national-policies/eurydice/content/belgium-flemish-community\\_en](https://eacea.ec.europa.eu/national-policies/eurydice/content/belgium-flemish-community_en) (Accessed 16 May 2021).

<sup>14</sup> Administered by the network of Catholic schools in Flanders, which represent the majority of schools in the region (Maldonado and De Witte, 2020).

<sup>15</sup> From 2015 to 2020, mathematics and Dutch were tested annually, while science and social sciences were introduced in 2016 (first as a combined subject within 'world studies', and from 2018 as separate subjects); French (as a second language) was added in 2019 (Maldonado and De Witte, 2020).

<sup>16</sup> Students aged 8 to 11. In the Netherlands, general primary education lasts 8 years and is for all children aged 4-5 to 12. See: [https://eacea.ec.europa.eu/national-policies/eurydice/content/netherlands\\_en](https://eacea.ec.europa.eu/national-policies/eurydice/content/netherlands_en) (Accessed 16 May 2021).

Furthermore, learning losses were up to 60% greater among students from less educated households.

In **France**, national standardised tests were carried out at first and second grade for primary school students, and at sixth-grade level for lower-secondary school<sup>17</sup> students in September 2020, as well as midway through the first grade in January 2021. In first grade, 2020 results show a stark reduction in students' learning outcomes in both French and mathematics compared with 2019, as well as an increase in the attainment gap between priority education schools and non-priority schools (Andreu et al., 2020a). In French, test results show an increase in the share of first-grade students falling below evaluation targets<sup>18</sup> in all seven evaluated items<sup>19</sup> compared with 2019. In mathematics, the results show a decrease in all of the items evaluated except for one<sup>20</sup>. In second grade, students' learning outcomes fell in seven out of eight items in French, erasing the progress observed among students at this grade between 2018 and 2019. Results in several key items dropped significantly: the share of students who could read a text satisfactorily (-4.8 percentage points), the share of students who could read words properly (-4.3 points), and the share of students who could write words properly (-4.5 points). In mathematics, only one item decreased by more than one percentage point.

In non-priority education schools, test results show an increase in students' outcomes in three items out of seven, confirming the findings from Belgium suggesting that COVID-19-related learning losses were larger in reading than in maths (Maldonado and De Witte, 2020). Unlike first- and second-graders, standardised test results from September 2020 among sixth-graders show an increase in evaluation results in both French (+4.8 points) and mathematics (+3 points) compared with 2019 (Andreu et al., 2020b). Partly reversing the trend observed in 2020, the January 2021 results show a slow progression in learning outcomes for first-grade students compared with 2020 in all items but one<sup>21</sup>, both for students in the priority education sector and for other students (Andreu et al., 2021). In mathematics, evidence shows a progression in students' outcomes in all of the items evaluated, including four items for which the results show an increase of around 2

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<sup>17</sup> In France, primary education is provided in 'elementary schools' for children aged 6 to 11. Lower-secondary education is provided in *collèges* for four school years, for children aged 11 to 15. See: [https://eacea.ec.europa.eu/national-policies/eurydice/content/france\\_en](https://eacea.ec.europa.eu/national-policies/eurydice/content/france_en) (Accessed 16 May 2021).

<sup>18</sup> Students' results are categorised in the following way: students below threshold 1 (students with special educational needs); students between thresholds 1 and 2 (fragile students); and students above threshold 2 (Andreu et al., 2020a).

<sup>19</sup> The items evaluated are as follows: 'compare a series of letters'; 'recognise letters (among other letters)'; 'know letters and the sounds they produce'; 'manipulate syllables'; 'manipulate phonemes'; 'understand a text read by the teacher'; 'understand sentences read by the teacher'; 'understand words read by the teacher' (Andreu et al., 2020a).

<sup>20</sup> 'Associate a number with a position'. The other items are as followings: compare numbers; quantify collections; resolve problems; list full numbers; write full numbers; reproduce an assembly (Andreu et al., 2020a).

<sup>21</sup> 'Understanding oral sentences read by the teacher'.

percentage points compared with 2020, with the attainment gap between priority and non-priority education sectors remaining stable.

## Increase in educational inequalities

Evidence suggests that the COVID-19 pandemic and its various impacts on European societies and economies has had a disproportionate effect on socio-economically disadvantaged groups, and led to an ‘explosion’ of inequalities (Lambert and Cayouette-Remblière (dir.), 2021). This section explores evidence of the impact of COVID-19 on educational inequalities based on socio-economic status and gender.

### *Inequalities based on socio-economic status*

Evidence shows that the period of school closure led to an increase in educational inequalities and in the attainment gap based on socio-economic status, reinforcing pre-existing inequalities in educational achievement (see, for example, Joint Research Centre, 2020). In **Flanders (Belgium)**, test results show that schools which had a higher share of students living in a disadvantaged neighbourhood displayed larger learning losses in Dutch, but also that this effect remained constant in mathematics (Maldonado and De Witte, 2020). Schools with a higher share of students whose mothers had obtained at best a primary education degree experienced greater learning losses in mathematics and Dutch than schools with a higher share of better-educated mothers. Evidence indicates that the negative effects of school closures on student learning outcomes in Dutch and mathematics also correlate with the share of students who receive financial support in school. Furthermore, test results suggest that schools with a larger share of students who speak another language of instruction at home faced greater learning losses in Dutch, but not in mathematics. Finally, an analysis of inequality measured according to the Gini coefficient<sup>22</sup> shows an increase of 0.02 for mathematics and Dutch, corresponding with a significant increase of inequality within schools of 17% and 20% for each subject, respectively. Findings also indicate that inequality increased between schools from 2015 to 2020, although to a lesser extent than the increase in within-school inequality.

In **France**, standardised test results from 2020 in the first and second grades reveal large inequalities in academic outcomes between students in priority education schools and other students, in both French and mathematics. This confirms the increase in the attainment gap between priority and non-priority education schools observed in previous years (Andreu et al., 2020a; Deauvieau, 2020). In French, the attainment gap reaches as high as 33.5 and 33.9 percentage points for the item ‘understanding of words read by the

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<sup>22</sup> Or Gini index, which takes a value of 0 for ‘perfect equality’ and 1 (or 100) for ‘perfect inequality’. See: <https://stats.oecd.org/glossary/detail.asp?ID=4842> (Accessed 30 May 2021).



teacher' for REP+ first- and second-grade students, respectively, compared with non-REP students. In mathematics, the attainment gaps for the item 'resolution of problems' between REP+ and non-priority education students in both first and second grades are greater than 25 and 23.5 percentage points, respectively. Results of first-grade students from January 2021 show that the attainment gap between priority and non-priority education schools had increased by 1.3 percentage points on average in French compared with 2020 (Andreu et al., 2021). Conversely, at Grade 6, the results of standardised tests from September 2020 show that in French, the level of attainment had increased by 5.4 points and 5 points in REP and REP+ schools, respectively (Andreu et al., 2020b). In mathematics, however, the attainment gap between sixth-grade students in priority and non-priority education increased between 2019 and 2020 (which was not the case in French). The increase in the level of attainment in mathematics was higher in non-priority education public schools (+3.2 points) than in REP (+1.8 points) and REP+ schools (+0.3 points), compared with 2019 (Andreu et al., 2020b).

In the **UK**, teachers in the most disadvantaged primary and secondary schools were three times more likely to report that their students were four months or more behind in their curriculum learning than teachers in the least deprived schools (Sharp et al., 2020). Evidence shows large differences in the impact of school closures on students' learning outcomes, along a socio-economic divide. More than 55% of teachers in the least affluent state schools reported that students had returned a lower than normal standard of schoolwork since the shutdown, compared with 41% at the most affluent state schools and 30% at private schools (Montacute and Cullinane, 2021). Almost half of teachers (49%) in the least advantaged schools thought that there would be a substantial increase in the attainment gap due to the school lockdown, compared with just 25% in the most affluent state schools, and 8% in private secondary schools.

#### *Inequalities based on gender*

Evidence collected from various studies on the educational impact of school closures suggests that boys were more affected than girls in their educational outcomes.

In **Germany**, Grewenig et al. (2020) show that school closures increased learning gaps between boys and girls. While no significant difference was seen in the reduction in learning time between students based on the level of their parents' education, learning disruption was more pronounced among boys (-4.0 hours per day) than girls (-3.5 hours). A study from **Denmark** found no differences between boys' and girls' reading behaviour during the school lockdown period (Reimer et al., 2020). However, it showed a larger relative increase in reading activity among the girls whose parents had a university degree and above-

average income, compared with similar male students. In the **Netherlands**, Bol (2020) found that the parents of secondary school students were more likely to help their daughters with homework than their sons during the COVID-19 related period of school closures, partly because they felt more capable of doing so, and because they reported that their daughters enjoyed doing their homework more than their sons (a difference which is also observed at primary school level).

In **France**, the results of standardised tests in French language taken by first- and second-grade students in September 2020 tend to confirm previous results (Andreu et al., 2020a). These show that girls performed better than boys. In mathematics, girls had better results than boys at first grade (though to a lesser extent than in French) in all but one of the items evaluated. In second grade, girls performed worse than boys in five out of seven items in mathematics, just as they had in 2019. Results from January 2021 tend to confirm the results from 2020. At grade 1, girls performed better than boys in French, and boys continue to perform better than girls in mathematics (Andreu et al., 2021). For sixth-graders, the results of the September 2020 standardised tests show that the general increase in evaluation results observed in comparison with 2019 was stronger for boys than for girls.

In the **UK**, a survey of schools investigating the impact of the COVID-19 crisis on schools in England found that 21% of primary and secondary school teachers estimated that boys had fallen further behind in learning than girls (Sharp et al., 2020). Moreover, complementary research evidence indicates that 20% of girls spent four or more hours on schoolwork during the period of school lockdown, compared with only 14% of boys (Green, 2020). While children appeared to be reading (and enjoying reading) more during lockdown, the gender gap appears to have widened between boys and girls. Results from the 2020 Annual Literacy Survey show that the gap in literacy engagement between boys and girls increased from 2.3 percentage points in early 2020 to 11.5 percentage points during lockdown, and that the daily reading gap increased from 4.3 percentage points to 7.4 percentage points (Clark and Picton, 2020). Interestingly, audiobooks are the only format where more boys than girls indicated that they enjoyed reading more and were doing it more often than girls (25% of boys vs. 22,4% of girls). It also represents a format that has increased boys' interest in reading and writing more than that of girls.

### **Parental support and the home-schooling environment**

The COVID-19 crisis has not only affected the way education is delivered at school; it has also impacted the capacity of families to provide support for learning at home, which represents an important contributing factor to student learning. While schooling has

remained mandatory during the period of school closures, this period of imposed home schooling has paradoxically left parents largely free to organise their children's schoolwork, highlighting pre-existing inequalities in the capacity of parents to support their children's learning (Delès et al., 2021).

In **Germany**, school closures exacerbated pre-pandemic inequalities in parental involvement, which showed that the parents of low-achievers tended to spend less learning time together with their children than the parents of high-achievers (0.4 versus 0.6 hours per day) (Grewenig et al., 2020). During the spring 2020 lockdown, the parents of low-achieving students increased the time they invested in joint learning each day to a lesser extent than the parents of high-achievers (+0.5 versus +0.6 hours).

In the **Netherlands**, a study on parental support during the COVID-19 school closures indicates that at primary level, while a large share of parents did not help their students with schoolwork, most parents did check if their children were doing their homework (Bol, 2020). At secondary level, parents were much less likely to support their children in doing their homework, with 25% of parents not feeling capable of doing so. The study finds a large gap (0.5 standard deviations) between the lowest- and highest-educated parents in the extent to which they supported their children in secondary school during lockdown. Evidence shows that students from more privileged backgrounds receive more parental resources, and have access to more resources (including digital tools) with which to study from home.

In **France**, survey results from the DEPP show that only 26% of secondary school students were fully autonomous during the period of total school closure (DEPP, 2020b). Among the 74% of those who were not able to learn autonomously, a greater proportion of students from a disadvantaged background received regular help (34%) compared with students from a very privileged background (27%). However, the results show that the share of students who were not helped at all by their parents was higher among children from a disadvantaged background (14%) than among very privileged students (8%). A study based on a survey of more than 30,000 responses from parents of primary and secondary school students showed that working-class parents spent more time on average on their children's schoolwork than parents from more privileged classes (3 hours 16 minutes daily, compared with 3 hours and 7 minutes, respectively) (Delès et al., 2021). However, the survey results also indicate that working-class parents had greater difficulties in stabilising and structuring their children's schoolwork (for example, in setting up a weekly schedule,

which can help foster favourable learning conditions<sup>23</sup>), while parents from higher social classes were more at ease in doing so, thus contributing to widening educational inequalities. Moreover, evidence suggests that parents from the working classes mostly verified that their children's schoolwork was being done, but struggled to support their children further, such as by mobilising alternative pedagogical resources or working on complex tasks – something that parents from higher social classes did more frequently.

### **Possible long-term learning losses**

While the emerging data suggests that COVID-related school closures have had immediate negative effects on the learning outcomes of school students, evidence remains limited as to the medium- and long-term impacts of the crisis on students and education systems across the EU. Some studies on the impacts of natural disasters help to understand the possible longer-term effects of the COVID-19 crisis on students. For example, a study on the impact of the 2005 Pakistan earthquake suggested that learning losses continued to accumulate further even after children returned to school (Andrabi et al., 2020). The authors of the study estimated that after four years, students who experienced school closures lasting 14 weeks scored significantly worse on average in academic tests if they lived close to the fault line, and such students were 1.5 to 2 years behind those not directly affected by the earthquake.

A number of studies have been carried out using pre-pandemic evidence on the impact of school closures on student achievement, along with emerging research on the COVID-19 crisis, statistical modelling and projections. Several of these underline the substantial long-term learning losses that students may experience as a result of school disruptions. On the basis of PISA data, research estimates that on average, students' academic performance advances by 0.3 to 0.7 standard deviations per year, depending on the age of the student and the subject or skill being studied (Azevedo et al., 2020); Garcia & Weiss, 2020). Given that the 2019-2020 school year was reduced by at least one-third compared with its usual length, Garcia and Weiss (2020) suggests a loss of at least 0.1 standard deviations across all students, with a potentially larger impact on earlier grades. This is confirmed by research evidence from the Netherlands, which reveals that student learning loss could be around 3 percentile points or 0.08 standard deviations, equivalent to one-fifth of a school year (Engzell et al., 2021). According to World Bank estimates, COVID-19-induced school disruptions could result in the loss of between 0.3 and 0.9 years of schooling (Azevedo et

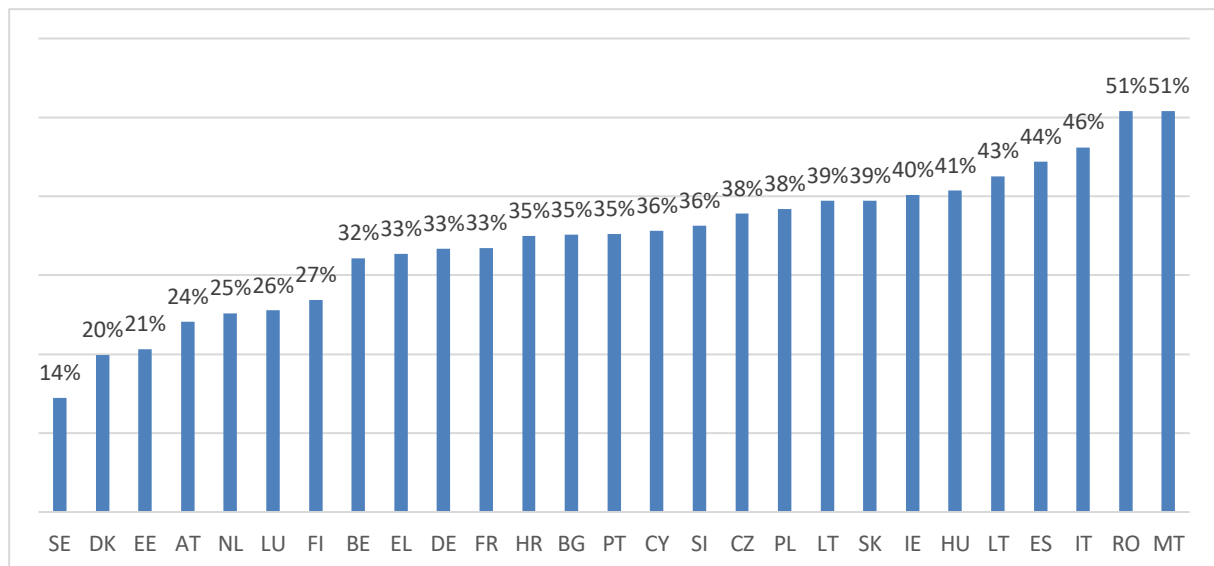
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<sup>23</sup> The survey results show that 77.3% of higher-class parents set up a weekly home-schooling schedule, while only 66.5% of working-class parents did so. Moreover, while 77.8% of parents from higher social classes laid down regular hours for schoolwork, only 70.1% of parents from working classes did so (Delès et al., 2021).

al., 2020). The crisis could therefore lead to a reduction in the effective years of schooling students achieve during their lifetime from 7.9 years to between 7.0 and 7.6 years.

A model created by the UNESCO Institute for Statistics expresses the loss of teacher-student contact time as a percentage of the year of learning lost, taking into account both full and partial closures. Building on the available evidence on the effect of school closures on the outcomes of standardised student tests outcomes, Gustafsson suggests that interruptions in contact time have led to larger learning losses than suggested by the actual time lost due to school closures (Gustafsson, 2021). While the average student worldwide lost around 54% of their contact time with teachers, this suggests that more than a year’s learning will have been lost on average, based on a ‘forgetting ratio’ of 2.0 (the number of days of learning lost for every day of schooling lost)<sup>24</sup>. Indeed, ‘interruptions to schooling represent not just a loss of contact time, but also time during which learners increasingly forget what they had learnt previously’ (Gustafsson, 2021, p.21). Based on this model, evidence shows that in most EU countries, the period of school disruptions due to the COVID-19 pandemic has led to more than one-third of the school year being lost; in Romania and Malta it was more than half (51%) (see Figure 2 below).

**Figure 2. Percentage of year lost due to total and partial school closures in EU countries**



Note: Data up to 11 November 2020

Source: Gustafsson (2021) based on combined UNESCO and OxCGRT data. Available at: <http://uis.unesco.org/en/blog/benchmarks-using-data-set-evidence-based-targets-improve-learning-proficiency> (Accessed 1 May 2021).

<sup>24</sup> According to Gustafsson, ‘for every month of contact time lost, two months of learning are assumed to have been lost’ (Gustafsson, 2021, p. 2).

Using a statistical model of a 'typical' learning process in low- or middle-income countries, Kaffenberger (2021) estimates that the long-term impacts of school disruptions are potentially severe. In line with Gustafsson (2021), she shows that today's Grade 3 students may lose as much as 1.5 years' worth of learning (or more) by the time they reach Grade 10 compared to a no-pandemic scenario, unless appropriate mitigation strategies are implemented. There is concern that these learning losses may accumulate after the full reopening of schools, and that students who have fallen behind during the period of school closures may never catch up (Kaffenberger, 2021) – a situation that may impact their future lives. Maldonado and De Witte (2020) note that a decrease of 0.2 standard deviations in students' standardised test scores could reduce their probability of future employment by up to 0.86%, and create long-term disadvantages for them in the labour market. Another model has estimated that the cost of lost education due to COVID-19-related school closures may amount to \$10 trillion over the coming generation (Psacharopoulos et al., 2020).

As seen above, the findings of surveys of education actors, research studies, national standardised tests and statistical projections tend to validate several of the hypotheses emerging in the early months of the pandemic (Di Pietro et al., 2020). They show a general setback in student learning outcomes, with a larger decline in learning outcomes among students of lower socio-economic status. However, evidence remains limited in relation to the impact of the crisis on inequalities in students' socio-emotional skills, and on its potential long-term impacts on both cognitive and socio-emotional skills, as well as on the socio-economic gap in students' development.

## **2. Policy responses to mitigate learning losses during the COVID-19 pandemic**

Inequality exists between education systems in their capacity to adopt measures to mitigate the effects of school closures, such as distance education tools and teaching practices. Carvalho and Hares (2020) showed that by the end of March 2020, 90% of high-income countries were providing some distance learning opportunities, compared with just 29% of low-income countries across the world. In the aftermath of COVID-19-induced school closures, all EU education systems that fully or partially closed their schools managed to organise some form of distance learning.

Online learning opportunities have been the most common solution proposed to remedy the effect of school closures, and access to digital tools became an essential feature of the

way distance learning has been organised during the pandemic, notably through online platforms such as Virtual Learning Environments (VLEs), particularly at the secondary level. Responses from the OECD's Special Survey on COVID-19 (OECD, 2021) show that online platforms were used across all 32 participating countries at both lower and upper-secondary levels, and at primary level in all countries except for Sweden and the Russian Federation.

However, not all EU education systems have demonstrated that they were fully prepared for the rapid switch to distance schooling, and numerous other types of initiatives have also been set up to maintain some form of educational continuity.

In **France**, the most commonly used methods of distance learning for secondary school students during the period of school closures were reading documents (96%), watching videos (88%), or carrying out exercises from school textbooks (87%) (DEPP, 2020b). Only 69% of students participated in the online classes carried out by their teacher, and just 22% were involved in group work. Evidence shows that there were large differences in the teaching and learning tools and practices used by teachers depending on the education level and sector. While 60% of all lower-secondary school students have participated in virtual classroom lessons, only 48% did so in priority lower-secondary schools.

In **Germany**, schools and teachers only carried out a minority of their usual teaching activities via distance schooling during the period of school closures. While 96% of students received exercises at least once a week and 87% were provided with exercise sheets to process independently, only 37% of students received feedback more than once a week (Grewenig et al., 2020). Teacher-student contact time dropped significantly, as only 29% of students took part in shared lessons for the whole class (such as by videoconference) more than once a week, and only 17% had individual contact with their teacher more than once a week. Grewenig et al. (2020) also show that educational inequalities increased in the level of access students had to online schooling: low-achievers were 13 percentage points less likely to have online lessons and 10 percentage points less likely to have individual teacher contacts more than once a week, compared with high-achievers.

Results from the **Netherlands** show that 75% of parents of secondary school students agreed or fully agreed that their children maintained regular contact with their teachers during the period of school closure in spring 2020, which indicates that a quarter of secondary school students did not have regular contact with teachers (Bol, 2020). On the other hand, evidence suggests that Dutch schools appear to have actively attempted to maintain contact with the most disadvantaged families; lower-educated parents reported that secondary schools reached out more often during the initial period of school closures

compared with higher-educated parents, such as by checking children's schoolwork more often.

Multiple other initiatives have been carried out across OECD and EU countries to provide access to distance learning resources and educational materials, using various technologies (including books and take-home packages; televised and radio programmes; one-way and two-way transmissions through open broadcasts, closed circuit, cable, microwave, broadband lines, fibre optics, satellite or wireless communication devices; audio conferencing; and video cassette, DVDs, and CD-ROMs), so far with little evidence as to their effectiveness (see, for example: Carvalho and Crawford, 2020; Garcia and Weiss, 2020; OEC, 2020c, 2021). In the EU, some countries have built partnerships with national educational media to provide free online learning resources, such as in **France**<sup>25</sup> and **Portugal**<sup>26</sup>. In other countries, the distribution of free electronic devices and learning materials has been organised. The OECD's Special Survey on COVID finds that measures to subsidise digital devices (PCs and/or tablets), flexible and self-paced platforms (asynchronous learning platforms) and measures aimed to improve access to infrastructure for learners in remote areas were the most common policy solutions to ensure the inclusion of populations at risk (OECD, 2021). In the EU, country examples include **Slovenia** (the collection of thousands of electronic devices to support children without access to a computer); **Italy** (including the provision of school support to Roma students), **Greece** (weekly homework packages were provided to students in refugee camps who were unable to connect to online platforms or the internet); **France** (including various initiatives carried out by local authorities); and **Portugal** (including public-private partnerships to provide laptops and internet access to students from disadvantaged backgrounds) (OECD, 2020b).

### **Preparedness of education systems for distance teaching and learning**

The COVID-19 crisis represents a turning point in the way technology is used in education and training (European Commission, 2020a). However, evidence from before and during the pandemic has shown that substantial inequalities remain in the preparedness of education systems to implement distance teaching and learning across the EU in an effective and inclusive manner.

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<sup>25</sup> Under the flagship initiative 'Nation apprenante', with the creation and dissemination of radio programmes related to school curricula. See: <https://www.radiofrance.com/actualite/revisez-avec-les-radios-de-radio-france#:~:text=Pendant%20toute%20la%20dur%C3%A9e%20de,lien%20avec%20les%20programmes%20scolaires> (Accessed 10 May 2021).

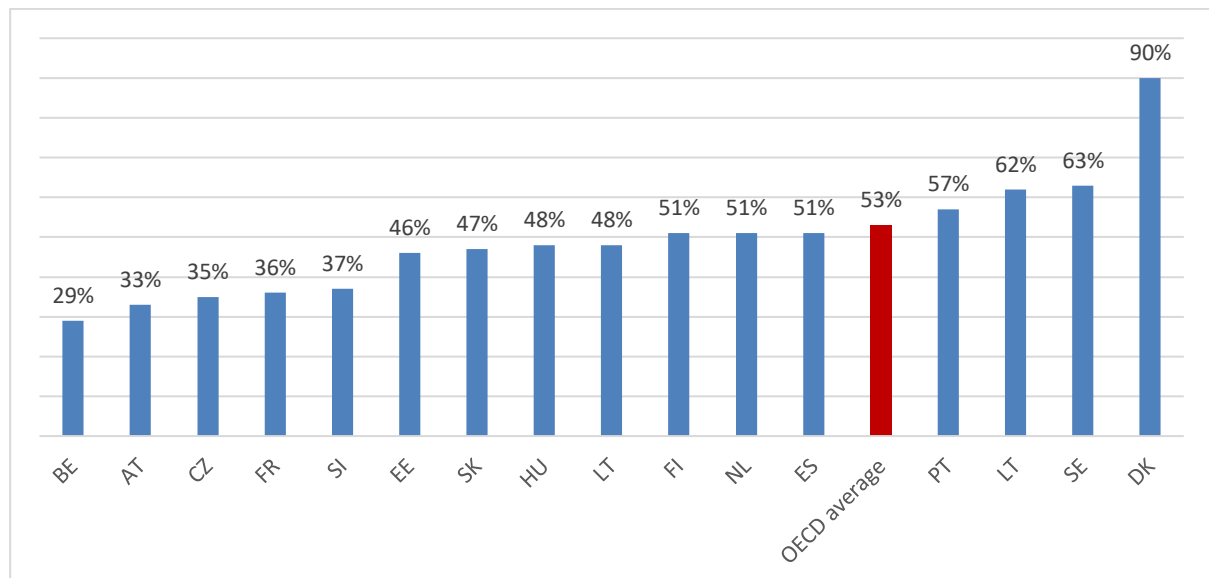
<sup>26</sup> The #EstudoEmCasa educational programme, mainly directed at primary students, was broadcast on the public television channel (OECD, 2020b).



### *Preparedness of teachers and schools for distance teaching*

During the period of school disruptions due to COVID-19, evidence from across the EU showed that the preparedness of schools and teachers for distance education was far from optimal, although education and training staff are reported to have generally improved their digital competences during the crisis (European Commission, 2020b). Pre-pandemic evidence from the 2018 Teaching and Learning International Survey (TALIS) shows that across the participating OECD countries and economies, only 53% of teachers allow students to use ICT for projects or class work ‘frequently’ or ‘always’. In many EU countries, the share of teachers who do so is less than 50% (see Figure 3 below). In 2019, the European Commission’s 2nd Survey of Schools on ICT in Education showed that primary and secondary teachers were still far from common in using ICT in their classes. The share of students taught by teachers who used ICT in 25% or more of their lessons ranged from 71% at primary level to 58% at lower-secondary level, and 65% at upper-secondary level (European Commission, 2019).

**Figure 3. Teachers who report that they ‘frequently’ or ‘always’ allow students to use ICT for projects or class work (TALIS 2018)**



Source: OECD, TALIS 2018.

Note: No data are available for Germany, Greece, Ireland, Luxembourg or Poland.

Although most OECD countries did provide some support to their teachers in their transition to distance education (such as through the provision of adapted teaching content; instructions on distance teaching such as TV, radio and learning platforms; special ICT training; professional development activities on pedagogy and ICT use; professional, psychosocial and emotional support such as chat groups and online teacher forums; ICT tools and connectivity, or guidelines for preparing a virtual classroom) (OECD, 2021),

evidence at EU and national levels shows that many teachers felt unprepared in this transition to remote instruction. A School Education Gateway survey conducted between April and May 2020 showed that 67% of teachers had to teach online for the first time during the COVID-19 crisis, and that access to technology (computers, software, stable Internet connection, etc.) was the most frequently mentioned challenge mentioned (reported by 34% of teachers)<sup>27</sup>.

In **Ireland**, a survey carried out in April 2020 showed that one in five school leaders reported that no arrangements had been put in place in their schools to enable teachers to interact with their students. Some respondents felt angry, unprepared and out of their depth with regard to the provision and organisation of distance learning (Burke and Dempsey, 2020). Nevertheless, more than 70% of schools said they interacted with their students at least once a week.

Evidence from **Austria**, **Germany** and **Switzerland** shows that on average, school staff rated teachers' competences in relation to the use of digital teaching formats as 'mediocre', and that collaboration among school staff during the spring 2020 lockdown was fairly weak (Huber and Helm, 2020). While 67% of school staff considered the level of mutual support within their staff to be high, 44% noted that the staff were not currently working on concepts for school development, and 53% had not worked together to create material for digital teaching and learning during the week before the survey was carried out. The survey results indicate a positive correlation between the level of collaboration among school staff and their self-assessments concerning digital teaching and learning.

In **Czechia**, the share of teachers who had access to digital technology provided by their own school for synchronous, online teaching from home, increased from only 58% to 75% at the level of primary education, and from 57% to 59% at general secondary level, between April 2020 and February 2021 (Pavlas et al., 2021).

Teachers' preparedness to implement distance schooling should also take into account differences in students' socio-economic backgrounds and their capacity to carry out schoolwork at home. In **Austria**, a survey of teachers' attitudes and self-efficacy beliefs showed that teachers' attitudes towards students of low socio-economic status were more negative than their attitudes towards students with low skills in the language of instruction, and towards students with special educational needs (Kast et al., 2021). These results

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<sup>27</sup> Based on 4,859 responses from more than 40 countries (of which 86% were from teachers or school heads). See: Survey on online and distance learning – Results. Available at: <https://www.schooleducationgateway.eu/en/pub/viewpoints/surveys/survey-on-online-teaching.htm> (Accessed 8 May 2021).

highlight the risk that teachers find home learning more difficult and challenging in relation to certain groups of at-risk students.

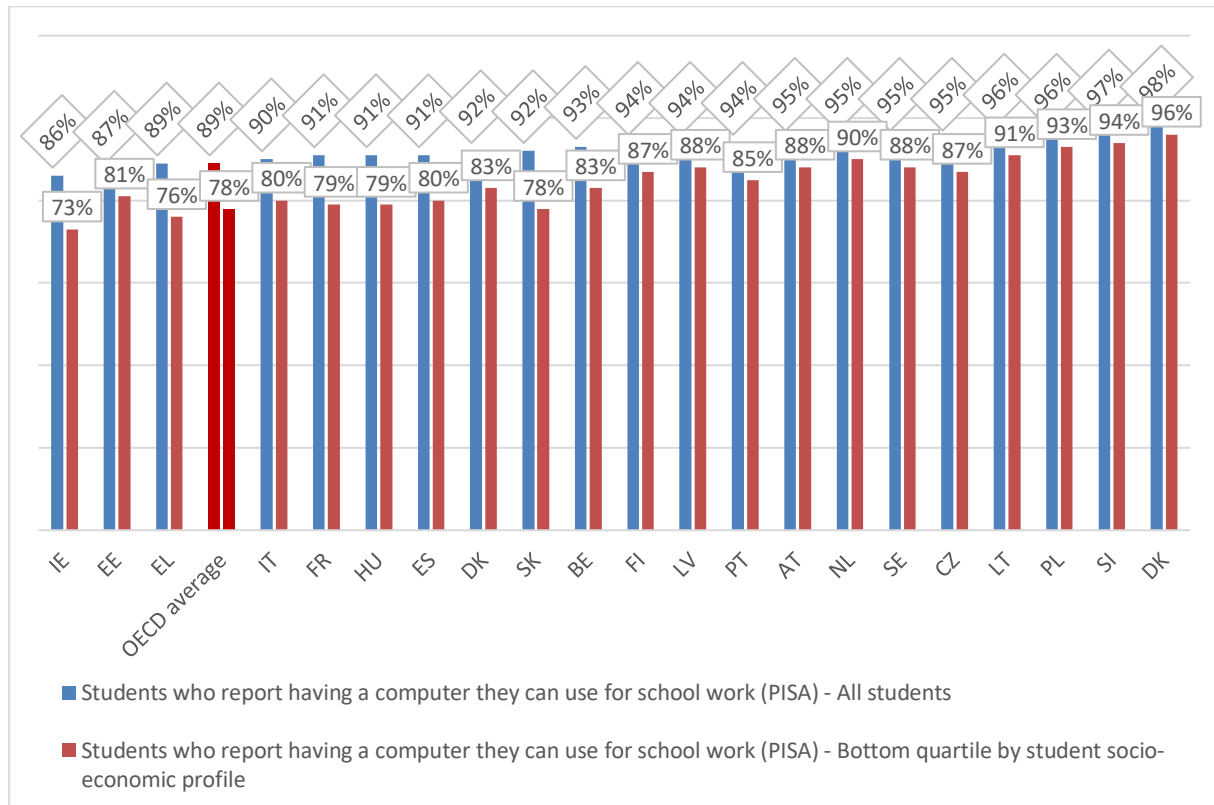
Research results from **France** based on a survey of 6,000 teachers suggest that primary- and secondary-level teachers in priority education areas were more likely than other teachers to provide individualised support to students and their families, and to practice teaching methods based on differentiated instruction – although their declared weekly teaching time was on average 3 hours less than their colleagues from non-priority education schools (Chauvel et al., 2021). A study from the **Netherlands** shows large differences between educational tracks in the level of involvement by schools in their students’ schoolwork during the first period of school closures in spring 2020 (Bol, 2020). The parents of students in the general sector of secondary education reported that their children were much more likely to have digital classes, to receive a structured educational programme, and to have their schoolwork checked regularly, than children in the pre-vocational sector. In the **UK**, a study showed inequalities in the likelihood of schools to provide online classes and access to online videoconferencing with teachers, based on the type of school. Andrew et al. (2020) show that 64% of secondary-level students in state schools from the most advantaged backgrounds had access to active support from schools such as online teaching, compared with 47% of the poorest fifth of British households.

#### *Students’ preparedness for distance learning*

While EU education systems have strived to provide resources for distance learning during the COVID-19 crisis, access to such resources largely depends on students’ access to and use of digital technology at home as well as on their learning conditions at home. Across the EU, inequalities in access to digital technology posed major challenges for students during the period of school closures, creating a critical gap in opportunities for students from disadvantaged backgrounds (see, for example: European Commission, 2020a, 2020b; Garcia and Weiss, 2020). PISA 2018 results showed that the vast majority of EU students were equipped for a potentially prolonged period of school closure, with more than 90% of students in almost all EU countries having a computer that they can use for schoolwork (see Figure 4 below). The results of the European Commission’s 2nd Survey of Schools on ICT in Education show that in 2017-2018, between 92% of students (at primary level) and 97% (at upper-secondary level) across the EU had access to computers at home (European Commission, 2019). Nevertheless, PISA 2018 data show that in some EU countries such as **France, Spain, Italy, Ireland, Greece, Slovakia** and **Hungary**, more than 20% of students from the bottom quartile by student socio-economic profile do not have a computer that they can use for schoolwork (OECD, 2020a). Children from disadvantaged groups tend to be less able to access digital technology and the internet,

and therefore present a risk of falling further behind in the absence of additional and targeted support during periods of distance learning (Carvalho and Hares, 2020).

**Figure 4. Students who report having a computer they can use for schoolwork (PISA 2018)**



Source: OECD, PISA 2018.

Access to digital technology and the internet is a key challenge and success factor for student learning outcomes in the context of the COVID-19 pandemic. In a survey by the School Education Gateway, pupils' access to technology (computers, software, stable internet connection, etc.) was the most frequently mentioned challenge during the spring 2020 school lockdown (49% of respondents), followed by increased workload and stress among teachers and school leaders when working from home (43% of respondents), as well as keeping all pupils motivated and engaged (43%)<sup>28</sup>.

In the city of Antwerp in **Belgium**, up to a third of primary school students were not reached during school closures, prompting concerns that students lacked the tools needed for distance learning, and did not have a quiet room in which to learn from home (Maldonado and De Witte, 2020). In **Czechia**, the participation of general secondary school

<sup>28</sup> Survey on online and distance learning – Results. Available at: <https://www.schooleducationgateway.eu/en/pub/viewpoints/surveys/survey-on-online-teaching.htm> (Accessed 8 May 2021).

students in online distance learning increased from around 62% in April 2020 to 79% in February 2021, suggesting that 21% of all students did not participate in online distance activities (Pavlas et al., 2021). In the **UK**, survey evidence from January 2021 (Montacute and Cullinane, 2021). shows that while 77% of parents reported having a sufficient number of internet-enabled digital devices suitable for their children's online learning, 35% of households in the lowest income quintile did not have a sufficient number of devices at home, compared with 11% of those on in the highest quintile of income.

Moreover, students' preparedness for distance learning also depends on the space available at home for doing schoolwork. In 2018, across OECD countries, 9% of 15-year-old students did not have a quiet place to study at home (OECD, 2020a). One of the most direct effects of the spring 2020 lockdown across Europe was the increased pressure relating to the size of households, due to the higher proportion of family members who were confined at home due to school closures and the increased prevalence of teleworking. In **France**, Cayouette-Remblière et al. (2021) show that one-quarter of all French households had to adjust to a new experience of 'co-presence' at home, compared with 'normal' periods when in 51% of all households, the number of household members at home decreases between 08:00 and 17:00 on working days. During the spring 2020 lockdown, in 47% of households with school-age children, all children had to share a common room to do their schoolwork, compared with 42% of households where each child could do their schoolwork in a separate room. Access to a separate room was more common among children from families with a privileged background (54%) than among children from families in which the adults are predominantly employees, workers or unemployed (34%). In the **Netherlands**, a study of inequalities in distance learning published in April 2020 found that most primary school students had their own bedroom (91%), and around two-thirds had their own workspace (68%), as well as a laptop or tablet of their own on which to do their homework (66%) (Bol, 2020). At secondary education level, the author observes that 90% of parents reported that their children had their own room, a quiet place to study, and a laptop or tablet of their own.

Distance and digital learning also require students to develop self-regulatory skills and autonomy. Based on prior research, Huber and Helm (2020) underline that volitional competence, including persistence and perseverance, are facilitated by a supporting learning environment and a social context in which parents, teachers and peers participate in supporting students' basic psychological needs for autonomy, competence development and social integration. Based on data from the School Barometer Survey in **Austria**, **Germany** and **Switzerland**, the authors show that home resources such as digital tools and parental support play a role in student outcomes in terms of emotions, learning effort

and learning success – but that students’ self-regulation skills and the quality of instruction during the period of school closure are even more important.

### **Lessons learned about distance education during the COVID-19 pandemic**

Studying the effectiveness of the various modes of distance education used during the period of school disruptions due to the COVID-19 pandemic is key to anticipating potential new situations for school disruptions, as well as to better accompany students’ progress and learning process in the future.

Evidence is limited with regard to the effectiveness of online education on student learning outcomes in the context of school closures (see, for example: Clark et al, 2021; Garcia and Weiss, 2020; OECD, 2020c). However, available research does indicate that no direct correlation exists between the use of digital technologies and educational outcomes (OECD, 2020c). A study from the US has shown that online courses may actually lead to worse student learning outcomes and persistence than in-person courses, and may increase students’ likelihood of dropping out of higher education (Bettinger and Loeb, 2017).

Based on a review of the literature on the effectiveness of technology-based approaches in education<sup>29</sup>, Escueta et al. (2017) show that access to digital technology has a limited impact on students’ learning outcomes in general, but that it does help to improve students’ digital competences and some other cognitive outcomes. They find that computer-assisted learning (such as online programmes providing students with rapid feedback on their homework) can have positive effects in aiding student learning, especially in mathematics. They show that while the effects of blended learning may be similar to those of fully in-person courses, evidence indicates that online-only courses may lead to negative learning outcomes when compared with courses that involve some degree of face-to-face teaching. On the other hand, some research evidence also demonstrates that the use of digital tools may be beneficial to students’ learning achievements when used to complement traditional teaching methods (OECD, 2020c).

Research evidence is still scarce regarding the effects of online learning during the COVID-19 crisis on student learning outcomes, and on its capacity to compensate for the negative effects of school disruptions on education. Emerging evidence from around the world suggests that the negative impacts of school closures due to the COVID-19 pandemic may only have been mitigated to a limited extent through distance learning and outside-school interventions aimed at disadvantaged households (Gustafsson, 2021). Evidence from the **US** suggests that online education has actually impeded teaching and learning rather than

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<sup>29</sup> Technology-based approaches in education include basic access to technology, computer-based learning, technology-enabled behavioural interventions in education, and online learning.

supporting it, in the absence of the necessary requirements to guarantee the effectiveness of such an approach (Garcia and Weiss, 2020). These include consistent access to the internet and computers for all students, as well as targeted training and support for teachers.

A study by Clark et al. (2021) evaluated the effectiveness of distance education on academic outcomes during the COVID-19 lockdown of 9th-grade students from three middle schools in **China**, focusing on exam results in Chinese, mathematics, English, politics and history. Their findings show that online learning improved students' academic achievement by 0.22 standard deviations compared with that of students who did not receive any learning support from their school during lockdown. Moreover, students who had access to online lessons from external 'best-quality teachers'<sup>30</sup> improved their performance in exam results by an additional 0.06 standard deviation, compared with students whose online lessons were prepared by their own teachers. The results also show that the academic benefits of online learning did not differ between rural and urban students, and that student academic achievement was stronger among those using a computer for online education compared with those using a smartphone (Clark et al., 2021).

Further evidence is required at EU level to explore the effects of online education during the period of school disruptions, both for the teaching and learning of previously taught parts of the curriculum and in relation to new materials, as well as to study the comparative effects of face-to-face and distance education on student performance.

## **Conclusion: a way forward for policies**

This report shows that school disruptions due to the COVID-19 pandemic led to a general setback in primary and secondary student learning outcomes across the EU (with some exceptions in relation to certain school subjects and levels of education). Available research evidence also demonstrates that students with a lower socio-economic status suffered a larger decline in their academic achievement than their peers from higher socio-economic backgrounds, and that this period may have long-term impacts on the development of students' cognitive and socio-emotional skills.

However, while evidence shows that teachers and students were not all adequately equipped and prepared for distance education, evidence is still limited as to the specific effects of online learning on student learning outcomes. Emerging evidence suggests that

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<sup>30</sup> Selected by the Education Board of Baise City in terms of their qualifications, teaching experience, teaching awards received and other professional recognition, who recorded online classes for each subject in each grade at primary and lower-secondary level (Clark et al., 2021).

the negative impacts of school closures may have been only partly mitigated through distance learning as well as outside-school interventions aimed at students and families. According to the available evidence, online learning still represents a 'sub-optimal substitute for face-to-face instruction' (OECD, 2020c, p. 2). Further research is needed to evaluate the long-term impacts of school closures on students' academic outcomes, socio-emotional competences and psychological development, to measure the extent to which this period has led to the reinforcement of pre-existing educational inequalities, as well as to better estimate the role that distance teaching and learning may have played in mitigating these impacts.

Several key policy pointers, drawn on the basis of these findings, contribute to identifying and responding to the challenges posed to EU education systems by the COVID-19 pandemic, as well as to better anticipating potential disruptions to schooling in the future.

**Contingency planning.** The implementation of distance teaching and learning in spring 2020 happened suddenly and unexpectedly for the education systems in all EU Member States. Responsibility for the organisation of distance learning (including decisions about teaching arrangements and pedagogical practices) was largely left to schools and teachers (OECD, 2021), which led to wide gaps in implementation and practice between EU countries, regions and schools. Evidence shows that a lack of contingency planning increases the negative impacts of disruptions to schooling caused by recessions, natural disasters and pandemics (Garcia and Weiss, 2020). To better anticipate these impacts and to ensure the effectiveness of distance schooling, contingency planning should be carried out across the whole education system, preparing education institutions and actors at all levels. This should include funding mechanisms aimed at schools (with a specific focus on areas with a higher proportion of families with a lower socio-economic status), continuous professional development for teachers, and individualised support to students and parents. Contingency planning should also include the design of adapted policy options to implement online schooling. Hodges et al. (2020) identify nine factors that determine the quality of online teaching and learning, which should be carefully considered when determining online instruction modalities:

1. Modality: fully online, blended, or web-enabled face-to-face
2. Pacing: self-paced, class-paced, class-paced with some self-paced
3. Student-Instructor ratio
4. Pedagogy: expository, practice, exploratory, collaborative...
5. Instructors' role online: active instruction online, small presence online, or none



6. Role of online assessments<sup>31</sup>: determine if students are ready for new content, adaptive instruction, providing students or teachers with information about their learning state, input into grades, identifying students at risk of failure...
7. Students' role online: listening or reading, completing problems or answering questions, exploring simulations and resources, collaborating with peers...
8. Synchrony of online communication: asynchronous only, synchronous only, or some blend of both
9. Sources of feedback: automated, teacher, peers

**Personalised distance education and access to learning support.** Research into distance education underlines that it can be effective under a narrow range of circumstances, which should be guaranteed in the event of school disruptions. These include smaller class sizes, task groups supported by teachers, personalised in-school and out-of-school learning support (such as after-school support classes, on weekends and during holidays, targeted especially at disadvantaged areas and students), regular online live instruction, delivery of education materials to individual students and their families, and the multiplication of education technology solutions to support distance learning (print, digital/online, radio etc.) to complement teacher-led instruction.

**Targeted initial teacher education and continuous professional development.** Research shows that online learning and teaching can only be effective if students have consistent access to the internet and computers, and are provided with relevant and individualised pedagogical support. In addition, online instruction must be used to complement traditional teaching methods, and teachers must have received adapted initial teacher education and relevant continuous professional development opportunities. Other measures to better assist teachers in online teaching in the event of school disruptions include clear guidance and support for educational staff from Ministries of Education and educational institutions and the delivery of free digital tools and educational resources.

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<sup>31</sup> In **Czechia**, the share of primary and secondary school teachers who changed their assessment methods increased by more than 20% during the first half of the 2020-2021 school year (Pavlas et al., 2021). For final evaluations, principals in a larger share of schools began to use other methods to assess learning outcomes in addition to the most commonly used standardised methods.

## References

- Andrabi, T., Daniels, B. & Das, J. (2020). Human capital accumulation and disasters: Evidence from the Pakistan earthquake of 2005. Oxford: RISE.
- Andreu, S., Cioldi, I., Conceicao, P., Eteve, Y., Fabre, M., Le Breton, S., Persem, E., Portelli, T., Rocher, T., Rue, G., Vourc'h, R. & Wuillamier, Ph. (2020a). Evaluations 2020. Repères CP, CE1 : Premiers résultats. Document de travail 2020-E04, Novembre 2020, DEPP.
- Andreu, S., Ben Ali, L., Bret, A., Santos, R., Durand de Monestrol, H., Lambert, K., M'Bafoumou, A., Paillet, V., Rocher, T., Rue, G., Stachowiak, J-F., Vourc'h, R. & Wuillamier, Ph. (2020b). Evaluations de début de sixième 2020 : Premiers résultats. Document de travail 2020-E05, Novembre 2020, DEPP.
- Andreu, S., Cioldi, I., Conceicao, P., Eteve, Y., Fabre, M., Le Breton, S., Persem, E., Portelli, T., Rue, G., Rocher, T., Vourc'h, R. & Wuillamier, Ph. (2021). Evaluations 2021. Point d'étape CP : Premiers résultats. Document de travail 2021-E03, Mars 2021, DEPP.
- Andrew, A., Cattan, S., Costa-Dias, M., Farquharson, C., Kraftman, L., Krutikova, S., Phimister, A. & Sevilla, A. (2020). Learning during the lockdown: Real-time data on children's experiences during home learning. IFS Briefing Note BN288. The Institute for Fiscal Studies.
- Azevedo, J.P., Hasan, A., Goldemberg, D., Iqbal, S.A. & Geven, K. (2020). Simulating the potential impacts of COVID-19 school closures on schooling and learning outcomes: A set of global estimates. Washington: World Bank.
- Bettinger, E. & Loeb, S. (2017). Promises and Pitfalls of Online Education. The Brookings Institution, Evidence Speaks Reports, Vol. 2, N°15.
- Bol, T. (2020). Inequality in homeschooling during the Corona crisis in the Netherlands. First results from the LISS Panel. <https://doi.org/10.31235/osf.io/hf32q>.
- Burke, J. & Dempsey, M. (2020). Covid-19 Practice in Primary Schools in Ireland Report. Maynooth University. April 2020.
- Cayouette-Remblière, J., Lambert, A., Girard, V., Guérait, E., Le Roux, G. & Bonvalet, C. (2021). Cadres statistiques. Des inégalités exacerbées : les effets sociaux du confinement saisis par les chiffres. In: Lambert, A. & Cayouette-Remblière, J. (eds.) (2021). *L'explosion des inégalités. Classes, genre et générations face à la crise sanitaire*. Paris: Editions de l'Aube, 47-91.

Carvalho, S. & Crawford, L. (2020). School's Out: Now What? Center for Global Development. Available at: <https://www.cgdev.org/blog/schools-out-now-what> (Accessed 5 May 2021).

Carvalho, S. & Hares, S. (2020). More from Our Database on School Closures: New Education Policies May Be Increasing Educational Inequality. Center for Global Development. Available at: <https://www.cgdev.org/blog/more-our-database-school-closures-new-education-policies-may-be-increasing-educational> (Accessed 5 May 2021).

Chauvel, S., Delès, R. & Pirone, F. (2021). Enseigner pendant le confinement en Réseau d'Éducation Prioritaire (REP et REP+) : Entre difficultés accrues et montée en réflexivité. *Administration & Éducation*, 1(1), 119-124. <https://doi.org/10.3917/admed.169.0119>.

Clark, A.E., Nong, H., Zhu, H., Zhu, R. (2021). Compensating for academic loss: Online learning and student performance during the COVID-19 pandemic. *China Economic Review*, N°68, 101629. <https://doi.org/10.1016/j.chieco.2021.101629>.

Clark, C. & Picton, I. (2020). Children and young people's reading in 2020 before and during the COVID-19 lockdown. National Literacy Trust research report.

Deauvieu, J. (2020). Crise sanitaire et démocratisation scolaire. GRDS, 24 juin 2020. Available at: <https://www.democratisation-scolaire.fr/spip.php?article319> (Accessed 30 May 2021).

Delès, R., Pirone, F. & Rayou, P. (2021). L'accompagnement scolaire pendant le premier confinement de 2020 : De la différenciation dans l'« École à la maison ». *Administration & Éducation*, 1(1), 155-161. <https://doi.org/10.3917/admed.169.0155>

Di Pietro, G., Biagi, F., Dinis Mota Da Costa, P., Karpinski, Z. & Mazza, J. (2020). The likely impact of COVID-19 on education: Reflections based on the existing literature and recent international datasets, EUR 30275 EN, Publications Office of the European Union, Luxembourg, ISBN 978-92-76-19937-3, doi:10.2760/126686, JRC121071.

Direction de l'évaluation, de la prospective et de la performance (DEPP) (2020a). Crise sanitaire de 2020 et continuité pédagogique : les élèves ont appris de manière satisfaisante. Note d'information n°20.26. Juillet 2020.

Direction de l'évaluation, de la prospective et de la performance (DEPP) (2020b). Confinement : un investissement scolaire important des élèves du second degré, essentiellement différencié selon leur niveau scolaire. Note d'information n°20.42. Novembre 2020.

Direction de l'évaluation, de la prospective et de la performance (DEPP) (2021). Dispositif d'évaluation des conséquences de la crise sanitaire : le point de vue des directeurs et directrices d'école. Note d'information n°21.04. Janvier 2021.

Engzell, P., Frey, A. & Verhagen M.D. (2021). Learning loss due to school closures during the COVID-19 pandemic. *Proceedings of the National Academy of Sciences*, April 2021, 118 (17) e2022376118; DOI: 10.1073/pnas.2022376118.

Escueta, M., Quan, V., Nickow A.J. & Oreopoulos, Ph. (2017). Education technology: An evidence-based review, NBER Working Paper, No. 23744, <http://dx.doi.org/10.3386/w23744>.

European Commission (2019). 2nd Survey of Schools: ICT in Education. Objective 1: Benchmark progress in ICT in schools. Final report. Prepared by Deloitte and Ipsos MORI. Luxembourg: Publications Office of the European Union.

European Commission (2020a). Digital Education Action Plan 2021-2027. Resetting education and training for the digital age. Brussels: Publications office of the European Union.

European Commission (2020b). Commission Staff Working Document. Accompanying the document Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Digital Education action Plan 2021-2027: Resetting education and training for the digital age. SWD(2020) 209 final.

Garcia, E. & Weiss, E. (2020). COVID-19 and student performance, equity, and U.S. education policy. Lessons from pre-pandemic research to inform relief, recovery, and rebuilding. Washington DC: Economic Policy Institute.

Grätz, M. & Lipps, O. (2021). Large loss in studying time during the closure of schools in Switzerland in 2020. *Research in social stratification and mobility*, 71, 100554. <https://doi.org/10.1016/j.rssm.2020.100554>.

Green, F. (2020). Schoolwork in lockdown: new evidence on the epidemic of educational poverty. LLAKES Research Paper 67.

Grewenig, E., Lergetporer, P., Werner, K., Woessmann, L. & Zierow, L. (2020). COVID-19 and educational inequality: How school closures affect low-and high-achieving students. IZA Discussion Paper 13820, Institute of Labor Economics, Bonn.

Gustafsson, M. (2021). Pandemic-related disruptions to schooling and impacts on learning proficiency indicators: A focus on the early grades. UNESCO Institute for Statistics.

Hodges, C., Moore, S., Lockee, B., Trust, T. & Bond, A. (2020). The Difference Between Emergency Remote Teaching and Online Learning. *Educause Review*, March 27, 2020. Available at: <https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning> (Accessed 8 May 2021).

Joint Research Centre (2020). Educational inequalities in Europe and physical school closures during Covid-19. *Fairness Policy Brief Series*: 04/2020.

Kaffenberger, M. (2021). Modelling the long-run learning impact of the Covid-19 learning shock: Actions to (more than) mitigate loss. *International Journal of Educational Development*, Vol. 81. <https://doi.org/10.1016/j.ijedudev.2020.102326>.

Kast, J., Lindner, K.-T., Gutschik, A. & Schwab, S. (2021) Austrian teachers' attitudes and self-efficacy beliefs regarding at-risk students during home learning due to COVID-19. *European Journal of Special Needs Education*, 36:1, 114-126, [doi:10.1080/08856257.2021.1872849](https://doi.org/10.1080/08856257.2021.1872849).

Kuhfeld, M., Soland, J., Tarasawa, B., Johnson, A., Ruzek, E. & Liu, J. (2020). Projecting the potential impacts of COVID-19 school closures on academic achievement. *Educational Researcher*, Vol. 49, N°8, pp. 549-565. doi: 10.3102/0013189X20965918.

Lambert, A. & Cayouette-Remblière, J. (dir.) (2021). *L'explosion des inégalités. Classes, genre et générations face à la crise sanitaire*. Paris: Editions de l'Aube.

Montacute, R. & Cullinane, C. (2021). Learning in Lockdown. Research Brief, The Sutton Trust, January 2021.

OECD (2018). Bridging the digital gender divide. Include, upskill, innovate. Paris: OECD Publishing.

OECD (2020a). PISA 2018 Results (Volume V): Effective Policies, Successful Schools, PISA, OECD Publishing, Paris, <https://doi.org/10.1787/ca768d40-en>.

OECD (2020b). The impact of COVID-19 on student equity and inclusion: Supporting vulnerable students during school closures and school re-openings. Available at: [https://read.oecd-ilibrary.org/view/?ref=434\\_434914-59wd7ekj29&title=The-impact-of-COVID-19-on-student-equity-and-inclusion](https://read.oecd-ilibrary.org/view/?ref=434_434914-59wd7ekj29&title=The-impact-of-COVID-19-on-student-equity-and-inclusion) (Accessed 2 May 2021).

OECD (2020c). Strengthening online learning when schools are closed: The role of families and teachers in supporting students during the COVID-19 crisis. Available at: [https://read.oecd-ilibrary.org/view/?ref=136\\_136615-o13x4bkowa&title=Strengthening-online-learning-when-schools-are-closed](https://read.oecd-ilibrary.org/view/?ref=136_136615-o13x4bkowa&title=Strengthening-online-learning-when-schools-are-closed) (Accessed 2 May 2021).

OECD (2021). The state of school education. One year into the COVID pandemic. Available at: <https://www.oecd.org/education/state-of-school-education-one-year-into-COVID.htm> (Accessed 1 June 2021).

Pavlas, T., Zatloukal, T., Andrys, O. & Neujmayer, O. (2021), Distanční vzdělávání v základních a středních školách. Přístupy, posuny a zkušenosti škol rok od nástupu pandemie nemoci covid-19. Tematická zpráva. Praha: Česká školní inspekce.

Psacharopoulos, G., Patrinos, H., Collis, V. & Vegas, E. (2020). The COVID-19 cost of school closures. Available at: <https://www.brookings.edu/blog/education-plus-development/2020/04/29/the-covid-19-cost-of-school-closures/> (Accessed 5 May 2021).

Reimer, D., Smith, E., Andersen, I.G. & Sortkær, B. (2021). What happens when schools shut down? Investigating inequality in students' reading behavior during COVID-19 in Denmark. *Res. Soc. Stratif. Mobil.* 71, 100568. <https://doi.org/10.1016/j.rssm.2020.100568>.

Sharp, C., Nelson, J., Lucas, M., Julius, J., McCrone, T. & Sims, D. (2020). The challenges facing schools and pupils in September 2020. National Foundation for Educational Research.

United Nations (2020). Education during COVID-19 and beyond. Policy Brief, August 2020. Available at: [https://www.un.org/sites/un2.un.org/files/sg\\_policy\\_brief\\_covid-19\\_and\\_education\\_august\\_2020.pdf](https://www.un.org/sites/un2.un.org/files/sg_policy_brief_covid-19_and_education_august_2020.pdf) (Accessed 5 May 2021).

Vlachos, J., Hertegård, E. & Svaleryd, H.B. (2021). The effects of school closures on SARS-CoV-2 among parents and teachers. *Proceedings of the National Academy of Sciences*, 118 (9) e2020834118; DOI:10.1073/pnas.2020834118.

Woessmann, L., Freundl, V., Grewenig, E., Lergetporer, Ph., Werner, K. & Zierow, L. (2020). Bildung in der Coronakrise: Wie haben die Schulkinder die Zeit der Schulschließungen verbracht, und welche Bildungsmaßnahmen befürworten die Deutschen? ifo Schnelldienst, 2020, 73, Nr. 09, 25-39. ifo Institut, München.

Yankova, M. (2020). Rapid Assessment of COVID-19 impact on education in Bulgaria: Deepening learning loss and increasing inequalities. UNICEF Europe and Central Asia. Available at: <https://www.unicef.org/eca/rapid-assessment-covid-19-impact-education-bulgaria>. Accessed 2 May 2021

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