



European  
Commission

**EENEE**

European Expert Network  
on Economics of Education

# Financing education in the context of COVID-19

*Reply to Ad hoc request  
no. 03/2021*

Education and  
Training

**PPMi**

**EUROPEAN COMMISSION**

Directorate-General for Education, Youth, Sport and Culture  
Directorate A — Policy Strategy and Evaluation  
Unit A.4 — Evidence-Based Policy and Evaluation  
*E-mail: eac-unite-a4@ec.europa.eu*

*European Commission  
B-1049 Brussels*

# **Financing education in the context of COVID-19**

Kristof De Witte and Mike Smet

**Please cite this publication as:**

De Witte, K., Smet, M. (2021). 'Financing education in the context of COVID-19', *EENEE Ad hoc report* no. 03/2021.

**ABOUT EENEE**

EENEE is an advisory network of experts working on economics of education and training. The establishment of the network was initiated by the European Commission's Directorate-General for Education and Culture and is funded by the Erasmus+ Programme. PPMI is responsible for the coordination of the EENEE network. More information on EENEE and its deliverables can be found on the network's website [www.eenee.eu](http://www.eenee.eu). For any inquiries, please contact us at: [eenee@ppmi.lt](mailto:eenee@ppmi.lt).

**Contractor:**

**PPMI**

Gedimino pr. 50, LT -  
01110 Vilnius, Lithuania  
Phone: +370 5 2620338  
E-mail: [info@ppmi.lt](mailto:info@ppmi.lt)  
[www.ppmi.lt](http://www.ppmi.lt)

**AUTHORS:**

**Kristof DE WITTE**, KU Leuven (Belgium)  
**Mike SMET**, KU Leuven (Belgium)

**PEER REVIEWER:**

**Miroslav BEBLAVÝ**, EENEE Scientific  
Coordinator

**LANGUAGE EDITOR:**

**Siobhán DENHAM**, Copyeditor/Proofreader

**Getting in touch with the EU**

Europe Direct is a service that answers your questions about the European Union.

You can contact this service:

- by freephone: 00 800 6 7 8 9 10 11  
(certain operators may charge for these calls),
- at the following standard number: +32 22999696 or
- by email via: [https://europa.eu/european-union/contact\\_en](https://europa.eu/european-union/contact_en)

Luxembourg: Publications Office of the European Union, 2021

© European Union, 2021

Reuse is authorised provided the source is acknowledged.

The reuse policy of European Commission documents is regulated by Decision 2011/833/EU (OJ L 330, 14.12.2011, p. 39).

For any use or reproduction of photos or other material that is not under the EU copyright, permission must be sought directly from the copyright holders.

# Table of Contents

- Table of Contents ..... 5**
- Introduction ..... 6**
- 1. The mechanisms ..... 7**
  - 1.1. Preparedness for online learning ..... 7
  - 1.2. Hampered online learning ..... 7
  - 1.3. Heterogeneity among students ..... 8
- 2. The educational impact of COVID-19..... 8**
  - 2.1. Immediate impact after the school closures..... 9
  - 2.2. Impact after the 2020 summer holiday ..... 10
  - 2.3. Higher Education ..... 11
- 3. Funding response..... 12**
  - 3.1. Search strategy ..... 12
  - 3.2. Overview ..... 12
  - 3.3. Additional spending categories..... 19
  - 3.4. Per pupil spending ..... 20
- Conclusion..... 21**
- References. .... 22**

## Introduction

The Covid-19 pandemic had an unprecedented impact on almost every aspect of society, including education and training. To slow down the spread of the virus, physical meetings at schools were suddenly stopped and schools were closed in all European Union (EU) Member States. During the past year, both school closures and distance learning varied (depending on the phase of the pandemic and on the country) in terms of length and intensity, ranging from school closure without any distance learning, over intense distance learning and hybrid formulas (e.g. part-time on site education combined with distance learning), to fully reopened schools.

Soon after the first school closures, it became clear that the education system in most countries was not well prepared for a smooth and efficient switch to distance learning. Neither teachers nor children had the necessary skills; the necessary infrastructure was lacking, leading to sub-optimal learning. In order to mitigate the negative impact of the pandemic on children and schools, several countries increased their educational spending. Compiling a non-exhaustive variety of sources (ranging from official governmental communication to newspaper articles), this report provides an overview of the policy response in terms of additional education funding in a selection of European Union Member States. These funding responses are grouped into a number of distinct categories (e.g. spending on ICT, hiring or training teachers, student counselling, etc.). The total amount of additional educational spending per country is converted into an amount per child and compared to the pre-Covid spending per child in order to assess the relative increase (the numbers presented in this report have been updated to 12 May 2021).

Before reviewing the education funding response, the first part of this report reviews the mechanisms on how the school closures might affect the learning outcomes of students. This is relevant as it might explain budgetary choices that policymakers took. In the second part of the report, we provide an overview of the available evidence of the impact of the Covid-19 crisis on educational attainments in compulsory and higher education in the short run (i.e. data collected in June 2020) and longer run (i.e. data collected in the autumn of 2020)<sup>1</sup>. The present report focuses on studies that collected test outcomes of students in 2020 and ignores studies that estimate the impact of the Covid-19 crisis by simulations. Examples of the latter are Psacharopoulos, Collis, Patrinos and Vegas (2020), Azevedo et al. (2020), Dorn et al. (2020) or the Czech counterpart by Jann, München and Zapletolova (2020).

To set the scene, we briefly summarise the main funding trends. In particular, we observe an increase in investment in accelerated digitisation projects, e.g. access to laptops or tablets for children, better or better performing internet access, increased capacity for digital learning platforms, upgrading ICT infrastructure in general, etc. In addition, there is also evidence of additional teachers being hired or additional training being provided for teachers as well as additional attention (and spending) for counselling and assistance for students. Moreover, some countries compensate schools for additional costs, e.g. to buy protective equipment, additional cleaning, disinfection products, etc.

---

<sup>1</sup> Available evidence until 12 May 2021.

# 1. The mechanisms

This section discusses some mechanisms on why school closures might result in reduced human capital formation. Overviewing the most important mechanisms is relevant to determine the optimal policy responses and the allocation of additional funding.

## 1.1. Preparedness for online learning

As schools were suddenly closed, teachers had to move abruptly to distance learning. However, the 2018 PISA data suggest that most education systems were not ready for this sudden change. The percentage of students in schools whose principal agreed or strongly agreed that teachers have the necessary technical and pedagogical skills to integrate digital devices in instruction ranges between 83 % in Lithuania and less than 50 % in Ireland (OECD, 2020). The EU is not performing well in this indicator as the best performing EU Member State is preceded by 11 other non-EU countries.

Next to preparedness by teachers, there was also a lack of availability of ICT equipment and online learning support. According to the 2018 PISA data: in Luxembourg an effective online learning support platform is available for only 22 % of the students, in Romania (31 %) and Germany (32 %) the availability was low before the Covid-19 pandemic. This is in sharp contrast with Denmark (91 %), Sweden (80 %) and Finland (80 %) where effective online learning support platforms were more generally available.

Confronted with home learning, students need to have access to a quiet place to study. The 2018 PISA data reveal that in some EU education systems, e.g. the Netherlands or Austria, most students have access to a quiet place, while in other education systems, e.g. Bulgaria (absence for 20 % of the students) and Malta (absence for 15 % of the students), a large group of students does not have access to similar facilities.

Finally, online instruction requires that students have a device, internet connection, technical equipment and experience to receive the course materials. The 2018 PISA data suggest that in many European countries, students did not frequently use ICT outside of school for homework<sup>2</sup>. In Ireland, Belgium and Luxembourg, in particular, before the Covid-19 crisis, ICT was rarely used outside school for schoolwork. Even the best performing EU country, Latvia is still outranked by Mexico, Australia and the USA.

## 1.2. Hampered online learning

Although in theory ICT-driven education has a significant potential and strong merits in terms of differentiation possibilities, learning paths, and feedback (Iterbeke, De Witte and Schelfhout, 2020; Iterbeke, Declercq, De Witte and Schelfhout, 2020), the sudden implementation during the Covid-19 pandemic resulted in various issues that potentially harmed education outcomes.

First, as schools were closed, the instruction time was not fully compensated by online instruction. For example, reports from the Dutch education inspectorates estimate that there was a 50 % reduction in instruction time in half of the primary education institutions

---

<sup>2</sup> Figure 1 in <https://www.oecd.org/coronavirus/policy-responses/strengthening-online-learning-when-schools-are-closed-the-role-of-families-and-teachers-in-supporting-students-during-the-covid-19-crisis-c4ecba6c/>

in the Netherlands. The reduced instruction time might lower education outcomes of students (Di Pietro et al., 2020).

Second, as students stay at home there is less interaction with peers and mixing of different socioeconomic status groups. Structural models indicate that the lack of peer interaction between high and low SES groups is the main channel to result in increased inequality in test scores (Agostinelli et al., 2020).

Third, in the absence of a teacher, metacognitive skills and intrinsic motivation of students becomes even more important for learning and for following the online offer. German data suggest that particularly low achievers reduced instruction time (-4.1 hours relative to the normal daily learning time of 7.4 hours), in contrast to high achievers (-3.7 hours) (Grewenig et al., 2020).

Finally, less direct instruction and teacher feedback might result in less profound learning. Students might know the theoretical background of the novel concepts (i.e. lower order cognitive skills) but might be unable to fully apply them in new concepts or link various parts of theory (i.e. higher order cognitive skills).

### **1.3. Heterogeneity among students**

The crisis might not impact all students in a similar way, resulting in increased inequality among students. Next to the earlier described learning environment students receive at home, heterogeneity arises from the personality traits of students. Itebeke and De Witte (2021) show how personality traits such as 'conscientiousness' (i.e. being goal-oriented, persistent) is an important predictor for students' experiences of remote learning, and by extension for the psychological consequences of the school closures. Conscientious students have better self-regulating learning strategies, such as time management, such that they can cope better with distance learning. Open students (i.e. creative, intellectually curious) are shown to be more willing to help others during the school closures and considered the period of school closures as an opportunity to learn new skills. Itebeke and De Witte (2021) show that extraverted students experienced more tensions at home and were more likely to expect a decrease in school results because of the crisis than introverted students did. Finally, neurotic students (i.e. with low emotional stability) have a more negative experience of the crisis and the Covid-19 school closures.

## **2. The educational impact of Covid-19**

Recently, there is an emerging literature that uses standardised tests to measure the impact of the school closures (see a recent review in Donnelly and Patrinos, 2021). This section makes a distinction between studies that use data collected in June 2020, hence immediately after the school closures, and data from September 2020, hence after the summer break. The distinction is relevant as data from the latter group of studies compare students who experienced a summer loss also before 2020 (in 2020 the summer loss might be even mitigated by the organisation of summer schools). Moreover, the psychological impact of the school closures might also be mitigated in the latter group of studies as there were few restrictions in Europe during the summer of 2020. A third subsection reports data for higher education.



## 2.1. Immediate impact after the school closures

The 'first paper worldwide' - (as testified by Slavin, 2020) using standardised test outcomes was written by Maldonado and De Witte (2020), and focused on the Dutch-speaking **Flemish schools in Belgium**. Their results show that due to 9 weeks of school closure, the 2020 cohort experienced significant learning losses, with a decrease in school averages of mathematics and Dutch language scores of about 0.19 standard deviations compared to the previous cohort. The findings hold when accounting for school characteristics and standardised tests of grade 4 of the cohort. The observed effect appears to be a combination of lost learning progress, (i.e. lack of learning due to school closures) and learning loss, (i.e. loss of previously obtained knowledge, as often discussed in the context of summer learning loss). The results remain stable in a number of robustness checks, such as limiting the sample using the same schools across all years, matching schools based on background characteristics, and using school fixed effects.

Furthermore, Maldonado and De Witte (2020) find that inequality both within and across schools increased in 2020, which holds when accounting for the time trend. They also find learning losses to increase in the share of students with a low socioeconomic status. The changes in inequality are hence driven by large learning losses in schools with large shares of disadvantaged students and small learning losses in schools with small shares of disadvantaged students<sup>3</sup>. Given the lack of standardised test scores in Flemish secondary education, insights on the impact of the Covid-19 crisis can be obtained from new reorientations of different study tracks. De Witte (2021) pointed out that after the Christmas 2020 exams about 12 % more students were reoriented from a general education study track to a technical, vocational and particularly an arts study track<sup>4</sup>. This was particularly the case in the first two cycles (out of three) in secondary education.

Soon after publication of the Maldonado and De Witte (2020) working paper, evidence from other countries became available. Engzell et al. (2021) make use of standardised math, spelling and reading tests in primary schools in **the Netherlands**, taken before and after the 8 weeks of 2020 school lockdown, and find an average learning loss of 0.08 standard deviations. Despite this modest effect for the average student, the losses are up to 60 % larger for disadvantaged students<sup>5</sup>. The learning losses increase by age, and are highest for the age 10 pupils in math (0.09 SD). The learning losses are confirmed on a different sample by Haelermans et al. (2021a). Comparing data from the 'National Cohort Research', their results suggest that the negative learning growth increases by cohort in primary education. In particular, the learning losses are smaller in the first grades of primary education (age 6-7: -6 % learning progress for math compared to the years before the Covid-19 crisis; -12 % for spelling; -12 % for comprehensive reading) and higher for the oldest studied primary education students (age 10-10: -39 % learning progress for math compared to the years before the Covid-19 crisis; -32 % for spelling; -42 % for comprehensive reading).

---

<sup>3</sup> As a proxy for disadvantaged students, Maldonado & De Witte (2020) used administrative data on financial support for students, a student's mother who obtained at best a primary education degree, not speaking the instruction language at home, and living in a disadvantaged neighbourhood.

<sup>4</sup> An increase in artistic education has also been observed in Portugal.

<sup>5</sup> As a proxy for disadvantaged students, Engzell et al. (2021) use parental education as a measure for school disadvantage (consisting of country of origin of the parents, length of residence of the mother in the Netherlands, and parents involved in debt restructuring).

Evidence from the **United Kingdom** compares the test scores of students in all years of primary school from 2020 to results from 2019 and shows substantial decreases in attainment, which appear to be larger for disadvantaged students and schools (Blainey et al., 2020)<sup>6</sup>. In England, qualitative evidence suggests that teachers in the most deprived schools were much more likely to think there would be a substantial increase in attainment gap due to the school closures (Montacute and Cullinane, 2021).

In Ohio, the **US**, Kogan and Lavertu (2021) observed a decrease of standardised test scores of 0.23 SD, increase in inequality and strong differences between schools (up to 0.46 SD difference).

In **Switzerland**, Tomasik, Helbling and Moser (2020) used data from a computer-based formative feedback system. Comparing eight weeks before and after the Covid-19 school closures, they observe a slowdown in the learning gains of primary school children, while secondary school pupils seem to be largely unaffected by the school closures.

In New South Wales in **Australia** (Gore et al., 2020) no impact on primary school pupils' test scores was measured.

## 2.2. Impact after the 2020 summer holiday

A second group of studies uses data collected in September 2020, hence after a summer break that might mitigate learning losses (thanks to remedial teaching in, e.g. summer schools) and psychological effects (thanks to fewer restrictions at the time of the test).

Comparing data before and during the Covid-19 pandemic from incoming fifth graders, hence after a summer break with additional courses, evidence from Hamburg, **Germany**, does not find a loss in learning achievements for the average student, but strong losses (-0.21 SD in math) for students from a disadvantaged background (Depping et al., 2021). In Baden-Württemberg, Schult et al. (2021) observe a decline in the mean reading (-0.09 SD) and mathematics (-0.07 SD) competence scores of incoming fifth graders.

In the **United Kingdom**, Rose et al. (2021) compare the NFER standardised samples of 2017 and the autumn of 2020. They observe among year 2 students (i.e. aged 6-7) a decrease of -0.17 SD for reading, and -0.14 SD for math. The authors also observe a large and widened attainment gap between disadvantaged and non-disadvantaged students, amounting to seven months for both reading and math<sup>7</sup>. Also in the UK, the Department for Education (2021) estimates learning losses based on the expected progress for pupils based on prior attainment and historic rates of progress for similar pupils. Comparing this measure to the test outcomes from the autumn of 2020 suggests that all year groups experienced a learning loss in reading of about 1.7 to 2 months. The observed learning losses are greater in mathematics, as primary schools observed a loss of just over three months. More disadvantaged students experienced larger learning losses. Similar findings have been observed from the 'Progress Test Series' and the 'New Group Reading Test' taken in the UK in the autumn of 2020 (GL Assessment, 2021).

---

<sup>6</sup> As a proxy for disadvantaged students, Blainey et al. (2020) used the Pupil Premium status of children, which is additional funding for eligible students paid to the school.

<sup>7</sup> As a proxy for disadvantaged students, Rose et al. (2021) use reported eligibility to free school meals.

Despite the lack of standardised test scores and working with teacher assessed age-related expectations, Juniper (2021) uses the UK 'Juniper Education National Dataset' to compare teacher assessment data in the autumn of 2019, with summer and autumn of 2020, their results suggest that pupil learning bounces back. However, according to this teacher assessment, particularly for the youngest age groups (age 5-6), the recovery is more difficult.

A similar pattern is observed by Dominique et al. (2021) among grade 1-3 pupils in the **US** (age 6-9). After oral reading fluency scores largely stopped developing in the spring of 2020, the students' gains in reading were strong in the autumn of 2020. However, the recovery was insufficient to recoup the spring losses with the result that grade 2-3 students (age 7-9) are still about 30 % behind expectations.

In **France**, the analysis of the September 2020 national assessments suggests that in the first grade entry, there is a slight decrease in the share of students with satisfactory results in nearly all assessed education areas in French language and mathematics (OECD, 2021b). In the second grade class entry, there are differences for word reading fluency and word writing, but not for math. Comparing September 2020 with earlier years, there is a positive improvement in French and math for the sixth grade entry students.

Using the MAP Growth Assessments from autumn 2020, Kuhfeld et al. (2020) observe an insignificant change in reading outcomes between autumn 2020 and autumn 2019 among grade 3-8 students in the **US**. For math, students score 5 to 10 percentile points lower in the 2020 cohort. Comparing autumn 2019 and autumn 2020, MAP and STAR assessments, Pier et al. (2020) observed for Californian grade 4-10 students a significant learning loss in English language and math, with students in earlier grades most affected. This comparison of the autumn data also reveals that, particularly in English language, the socioeconomically disadvantaged students are falling behind more than others.

In the **Netherlands**, using the national cohort research data, Haelermans et al. (2021b) observe that one year after the first school closures, part of the initial learning loss has been caught up. Contrary to the test scores measured in June 2020 (see Haelermans et al., 2021a), the decline in learning progress corresponds to -19 % learning progress for comprehensive reading, -9 % learning progress for math, and -7 % learning progress for spelling. Expressed in standard deviations, by March 2021, Haelermans et al. (2021b) observe a learning loss of 0.17 SD for reading, 0.14 SD for math and 0.08 SD for spelling, as compared with tests in the same time period before the Covid-19 crisis.

### 2.3. Higher education

Overall, and in line with the mechanism of self-regulation and metacognition of students, there is little observed impact of the Covid-19 crisis on learning in higher education. Moreover, ICT availability and preparedness was higher in higher education compared to secondary education.

In **Belgium**, Flanders' largest university, KU Leuven, reports more bachelor students obtaining all credits as well as improved study progress in master years (Vermeersch, 2020).

In **Spain**, at the Universidad Autónoma de Madrid, Gonzalez et al. (2020) compared assessments before and after the 10 weeks of higher education closure due to the Covid-19 pandemic in three different subjects. Their results suggest a significant positive effect of the Covid-19 quarantine on student performance. Moreover, they observe a more

continuous study habit of the higher education students, and no decrease in student workload.

### **3. Funding response**

Given the scattered national responses, finding well-structured and comparable information on the impact of Covid-19 on educational spending is challenging. This section provides a first overview of the national education funding responses of EU Member States to the Covid-19 crisis, i.e. additional funding granted by the European Union recovery plan (e.g. NextGenerationEU) are not included in this overview.

#### **3.1. Search strategy**

Some reports from international organisations include a section on the (potential) impact of Covid-19 on educational spending in member or participant countries. The OECD (2021a) reports that about two third of the countries that participated in their Special Survey have increased their 2020 spending (and/or plan to increase their 2021 spending) on primary and secondary education to mitigate the impact of the pandemic. The remaining countries kept their budget unchanged (and no country reported a decrease). UNESCO, UNICEF and World Bank (2020) confirm that almost none of the high income countries reduced their spending on education. However, the OECD (2021a) also notes that most countries had difficulties in exactly quantifying and specifying the allocation of additional funding (e.g. because decisions have been made on various national and/or (sub)regional levels, in the midst of the pandemic with insufficient time to adequately adapt legislation and to set up a national monitoring system).

The OECD (2021a) distinguishes between the impact on (1) current expenditure (e.g. support to cover additional costs for protective equipment and cleaning, bonuses for staff to ensure continuity, targeted additional expenses to compensate learning losses for disadvantaged students, summer school programmes) versus (2) investment (e.g. buying additional computer equipment, investing in increased or better internet access).

However, to the best of our knowledge, none of these reports include actual numbers of additional spending, either in monetary units or in percentages (e.g. percentage budget increase or increase of share of GDP spending on education due to Covid-19). In order to obtain concrete numbers for EU Member States, we performed desk research of official government documents, as well as media coverage on additional spending on education due to Covid-19. Since this search strategy is complicated by the fact that most of the sources are written in local language (i.e. non-English), we also asked our international network to point to local sources covering this topic.

#### **3.2. Overview**

The table below includes countries for which we could find concrete amounts of additional spending on education (i.e. countries for which we just found that there was some additional funding, without referring to a concrete amount, were not included in this table). If detailed information is available, we break-up the total amount into distinct categories. If possible we refer to official governmental sources, however in some cases we include links to media coverage.

It should be stressed that this table is constructed from scattered and imprecise information, and as such it should be used with caution: e.g.

- it is often unclear whether amounts mentioned in successive government announcements overlap or can be considered as cumulative;
- the time horizon is often unclear (e.g. are expenses once-off or recurring, are expenses spread over multiple years or not);
- a distinction between calendar years versus school years is sometimes missing making it difficult to correctly allocate the additional budget;
- a clear distinction between national and regional levels is not always available.

Country	Description of additional spending <sup>8</sup>	Source
Belgium	<p>Flanders</p> <ul style="list-style-type: none"> <li>- additional spending of € 353 million in 2021 and 2022 for a digital education project (Digisprong). Schools receive: <ul style="list-style-type: none"> <li>o €15 million (up to 4th year primary education) for shared devices (€ 25 /child)</li> <li>o €45 million (5th and 6th year primary education) for individual devices (€ 290 /child)</li> <li>o € 232 million (secondary education) for individual devices (€ 510 /child)</li> <li>o € 10 million (special needs education and dual learning) for individual devices (€ 510 /child)</li> <li>o € 50 million for infrastructure (€ 42 /child)</li> </ul> </li> <li>- € 147 million to hire additional teachers to mitigate learning losses</li> <li>- € 27 million to reinforce CLB (centres for student counselling)</li> <li>- 21.8 million euros for 'summer schools' (2020 and 2021)</li> </ul> <p>Wallonia</p> <ul style="list-style-type: none"> <li>- € 19 million to mitigate the impact of the pandemic in upper-secondary education</li> <li>- € 9 million to reinforce CPMS (centres for student counselling)</li> <li>- Additional 0.25 FTE per 100 students</li> </ul>	<p><a href="https://onderwijs.vlaanderen.be/nl/digisprong">https://onderwijs.vlaanderen.be/nl/digisprong</a></p> <p><a href="https://www.vrt.be/vrtnws/nl/2021/05/10/honderden-extra-leerkrachten-om-leerachterstand-bij-leerlingen-w/">https://www.vrt.be/vrtnws/nl/2021/05/10/honderden-extra-leerkrachten-om-leerachterstand-bij-leerlingen-w/</a></p> <p><a href="https://m.standaard.be/cnt/dmf20210512_91380883">https://m.standaard.be/cnt/dmf20210512_91380883</a></p> <p><a href="https://www.ccrek.be/Docs/2020_35_BegrotingVG_2020A2_2021_Bijlage2.pdf">https://www.ccrek.be/Docs/2020_35_BegrotingVG_2020A2_2021_Bijlage2.pdf</a></p> <p><a href="https://www.onderwijs.vlaanderen.be/nl/oproep-organisatie-zomerscholen-2021">https://www.onderwijs.vlaanderen.be/nl/oproep-organisatie-zomerscholen-2021</a></p> <p><a href="http://enseignement.be/index.php?page=26823&amp;do_id=8242">http://enseignement.be/index.php?page=26823&amp;do_id=8242</a></p>

<sup>8</sup> Descriptions in this table are (in general) obtained from literal translations (using Google Translate) of non-English (local language) documents.

Estonia	<p>In general, schools did not get any extra central financing. However, private educational institutions received some additional support:</p> <ul style="list-style-type: none"> <li>- € 15 million for private children's institutions and schools, hobby schools and private education providers</li> <li>- € 1.5 million to support the education and activities of young people and private education</li> <li>- € 4.3 million for private general education schools and providers of private hobby education (amount per student varies from €10-50, depending on the severity of the Covid-restrictions)</li> <li>- € 6 million mitigate the effects of the spread of the coronavirus and to cover unavoidable fixed costs for the period from 1 March to 30 April (€ 40 per student)</li> <li>- € 6 million for summer learning camps</li> </ul>	<p><a href="https://www.kriis.ee/et/uudised/valitsuse-liikmed-kiitsid-heaks-COVID-19-lisaelarvega-seotud-kriisimeetmed-0">https://www.kriis.ee/et/uudised/valitsuse-liikmed-kiitsid-heaks-COVID-19-lisaelarvega-seotud-kriisimeetmed-0</a></p> <p><a href="https://www.kriis.ee/et/uudised/valitsus-leppis-kokku-taiendatavates-toetusmeetmetes-ule-eesti-ja-suunatult-ida-virumaale-0">https://www.kriis.ee/et/uudised/valitsus-leppis-kokku-taiendatavates-toetusmeetmetes-ule-eesti-ja-suunatult-ida-virumaale-0</a></p> <p><a href="https://www.kriis.ee/et/uudised/valitsus-kiitis-heaks-haridus-ja-noortevaldkonna-toetuse-tingimused">https://www.kriis.ee/et/uudised/valitsus-kiitis-heaks-haridus-ja-noortevaldkonna-toetuse-tingimused</a></p> <p><a href="https://www.hm.ee/et/uudised/esmaspaevast-saab-hakata-taotlema-haridus-ja-noortevaldkonna-kriisitoetust">https://www.hm.ee/et/uudised/esmaspaevast-saab-hakata-taotlema-haridus-ja-noortevaldkonna-kriisitoetust</a></p> <p><a href="https://www.hm.ee/et/kriisitoetus">https://www.hm.ee/et/kriisitoetus</a></p> <p><a href="https://www.kriis.ee/sites/default/files/toetusmeetmed_est.pdf">https://www.kriis.ee/sites/default/files/toetusmeetmed_est.pdf</a></p>
Finland	<ul style="list-style-type: none"> <li>- € 70 million to local organisers of pre-primary and basic education (mainly municipalities) + € 14 million for early childhood education to offset the effects of exceptional circumstances, to prevent problems related to support for the child's learning, development and wellbeing, and to improve the conditions for learning in early childhood education (school year 2020/2021)</li> <li>- € 17 million were given to secondary education organisers (academic track) in 2020: The aim of these subsidies is to improve the learning and wellbeing of children and youths, and therefore to offset the impact of the coronavirus crisis.</li> <li>- € 67.8 million in 2021: a one-off education equality funding for municipalities to help reduce learning gaps between rich and poor areas</li> </ul>	<p><a href="https://minedu.fi/-/valtion-erityisavustus-varhaiskasvatukseen-ja-esi-ja-perusopetukseen-koronaviruksen-covid-19-aiheuttamien-poikkeusolojen-vaikutusten-tasoittamiseksi-1">https://minedu.fi/-/valtion-erityisavustus-varhaiskasvatukseen-ja-esi-ja-perusopetukseen-koronaviruksen-covid-19-aiheuttamien-poikkeusolojen-vaikutusten-tasoittamiseksi-1</a></p> <p><a href="https://www.oph.fi/fi/funding/valtion-erityisavustus-lukiokoulutukseen-koronaviruksen-aiheuttamien-poikkeusolojen">https://www.oph.fi/fi/funding/valtion-erityisavustus-lukiokoulutukseen-koronaviruksen-aiheuttamien-poikkeusolojen</a></p> <p><a href="https://yle.fi/uutiset/osasto/news/finland_earmarks_68m_for_educational_inequality_exposed_during_pandemic/11889547">https://yle.fi/uutiset/osasto/news/finland_earmarks_68m_for_educational_inequality_exposed_during_pandemic/11889547</a></p>



Greece	<ul style="list-style-type: none"> <li>- € 12.1 million for the supply of tablets for schools (2020)</li> <li>- € 112 million for vouchers for the purchase of computers or tablets for families with equivalent family income up to € 6,000. The vouchers are worth € 200 (for each dependent child aged 4 to 24, who is studying in a public educational institution in Greece) and should be made available to 560 000 children</li> </ul>	<p><a href="http://www.minedu.gov.gr/">http://www.minedu.gov.gr/</a></p> <p><a href="https://digital-access.gov.gr/">https://digital-access.gov.gr/</a></p> <p><a href="https://zakynthosinformer.com/greece-voucher-200-euros-for-tablets-laptops-the-process-begins-the-beneficiaries/">https://zakynthosinformer.com/greece-voucher-200-euros-for-tablets-laptops-the-process-begins-the-beneficiaries/</a></p>
Italy	<ul style="list-style-type: none"> <li>- € 1 billion (2 year period) dedicated to school building requirements and adapting educational activities for 2020/2021 in order to make them safe and to hire new teachers ('August Decree' and 'Relaunch Decree')</li> <li>- € 331 million ('Relaunch Decree') for the proper functioning of schools for disabled children, ensuring that they can reopen safely and that the 2020/2021 school year could go ahead appropriately, in line with the requirements of the epidemiological situation [note: unclear whether or not this amount is part of the 1 billion of the first bullet point)]</li> <li>- € 85 million for the 'Fund for digital innovation and teaching workshops' ('Cure Italy Decree')</li> <li>- € 400 million (2020) + € 600 million (2021) for the 'Fund for the Covid-19 epidemiological emergency' for the implementation of measures to contain the epidemiological risk</li> <li>- € 510 million for summer 'bridging' programmes</li> </ul>	<p><a href="https://www.mef.gov.it/en/covid-19/The-measures-introduced-by-the-Italian-government-to-support-families-00001/">https://www.mef.gov.it/en/covid-19/The-measures-introduced-by-the-Italian-government-to-support-families-00001/</a></p> <p><a href="https://miur.gov.it/web/guest/-/piano-estate-lingue-musica-sport-digitale-arte-laboratori-per-le-competenze-via-libera-a-un-pacchetto-da-510-milioni-per-le-attivita-rivolte-a-student">https://miur.gov.it/web/guest/-/piano-estate-lingue-musica-sport-digitale-arte-laboratori-per-le-competenze-via-libera-a-un-pacchetto-da-510-milioni-per-le-attivita-rivolte-a-student</a></p>
Lithuania	<ul style="list-style-type: none"> <li>- € 6 million to provide schools with laptops (ESF-funding) in 2021</li> <li>- € 1.348 million to provide individual counselling to students who have learning difficulties due to distance learning</li> <li>- € 250 000 for volunteers from non-governmental organisations to provide teaching / learning assistance or supervision in educational institutions</li> <li>- € 160 000 to produce thematic videos and provide open consultations to teacher graduates or teachers of graduates and teachers who train them</li> <li>- € 300 000 to support children's summer camps with learning-oriented programmes through various non-formal education activities</li> <li>- € 650 000 for counselling students who have learning difficulties</li> </ul>	<p><a href="https://www.smm.lt/web/lt/lawacts/view/item.2919/type.custom">https://www.smm.lt/web/lt/lawacts/view/item.2919/type.custom</a></p> <p><a href="https://lrv.lt/lt/naujienos/mokiniu-konsultacijoms-papildomi-pinigai-is-vyriausybes-rezervo">https://lrv.lt/lt/naujienos/mokiniu-konsultacijoms-papildomi-pinigai-is-vyriausybes-rezervo</a></p> <p><a href="https://pagalbamokytis.lt/">https://pagalbamokytis.lt/</a></p>



Malta	<ul style="list-style-type: none"> <li>- € 30 million to mitigate the impact of the pandemic on children's education</li> </ul>	<a href="https://www.independent.com.mt/articles/2021-03-07/newspaper-opinions/COVID-a-learning-curve-6736231548">https://www.independent.com.mt/articles/2021-03-07/newspaper-opinions/COVID-a-learning-curve-6736231548</a>
The Netherlands	<ul style="list-style-type: none"> <li>- € 8.5 billion for the next 2.5 years (5.8 billion for primary, secondary (excluding vocational education) and special education; and 2.7 billion for secondary vocational education and higher education). Schools can choose how to spend additional money</li> <li>- € 645 million per year to compensate higher education for additional student enrolment (due to skipping break year, travel year, etc.)</li> <li>- reduced tuition fees (50 %) and extended use of public transport card</li> </ul>	<a href="https://www.rijksoverheid.nl/actueel/nieuws/2021/02/17/85-miljard-euro-voor-nationaal-programma-onderwijs">https://www.rijksoverheid.nl/actueel/nieuws/2021/02/17/85-miljard-euro-voor-nationaal-programma-onderwijs</a> <a href="https://www.rijksoverheid.nl/documenten/ka-merstukken/2021/02/17/nationaal-programma-onderwijs-steunprogramma-voor-herstel-en-perspectief">https://www.rijksoverheid.nl/documenten/ka-merstukken/2021/02/17/nationaal-programma-onderwijs-steunprogramma-voor-herstel-en-perspectief</a> <a href="https://www.rijksoverheid.nl/documenten/publicaties/2021/04/21/qa-plannen-kabinet-korting-collegegeld-bekostigd-hoger-onderwijs">https://www.rijksoverheid.nl/documenten/publicaties/2021/04/21/qa-plannen-kabinet-korting-collegegeld-bekostigd-hoger-onderwijs</a>
Portugal	<ul style="list-style-type: none"> <li>- € 10 million for artistic education to mitigate the effect of COVID-19 (to compensate for higher enrolment in artistic education)</li> <li>- € 62.5 million for 250 000 notebooks, 4G units, headsets and backpacks (this is part of the 335 000 computers that should be distributed in the second term of 2020/2021, in addition to the 100 000 that were distributed in the first period to students of basic and secondary education)</li> <li>- € 4.5 million for 15 000 additional computers in 2021</li> <li>- € 400 million from the 'The Economic and Social Stabilisation Programme' (PEES) for the digitisation of schools</li> <li>- € 500 million from the 'Recovery and Resilience Plan (PRR)' to equip schools, train teaching and non-teaching workers, as well as for moving to digital educational materials</li> </ul>	<a href="https://www.lusa.pt/article/_PMxWhETPqECG8TUXlfl9DMSZM5iuSI1/COVID-19-governo-aumenta-financiamento-do-ensino-art%C3%ADstico-em-cerca-de-10-me">https://www.lusa.pt/article/_PMxWhETPqECG8TUXlfl9DMSZM5iuSI1/COVID-19-governo-aumenta-financiamento-do-ensino-art%C3%ADstico-em-cerca-de-10-me</a> <a href="https://www.publico.pt/2021/01/26/sociedade/noticia/ministerio-educacao-garante-computadores-ate-marco-1947884">https://www.publico.pt/2021/01/26/sociedade/noticia/ministerio-educacao-garante-computadores-ate-marco-1947884</a> <a href="https://eco.sapo.pt/2021/01/26/governo-paga-625-milhoes-por-mais-de-250-mil-portateis-para-alunos-saiba-quem-os-esta-a-fornecer/">https://eco.sapo.pt/2021/01/26/governo-paga-625-milhoes-por-mais-de-250-mil-portateis-para-alunos-saiba-quem-os-esta-a-fornecer/</a> <a href="https://www.jornaldenegocios.pt/economia/educacao/detalhe/ministerio-da-educacao-compra-15-mil-computadores-adicionais">https://www.jornaldenegocios.pt/economia/educacao/detalhe/ministerio-da-educacao-compra-15-mil-computadores-adicionais</a> <a href="https://expresso.pt/sociedade/2021-01-26-Ministerio-da-Educacao-preve-inicio-de-">https://expresso.pt/sociedade/2021-01-26-Ministerio-da-Educacao-preve-inicio-de-</a>

		<p>entrega-de-computadores-aos-alunos-carenciados-ate-marco</p> <p><a href="https://tek.sapo.pt/noticias/computadores/artigos/orcamento-de-estado-preve-investimento-de-400-milhoes-de-euros-para-programa-escola-digital">https://tek.sapo.pt/noticias/computadores/artigos/orcamento-de-estado-preve-investimento-de-400-milhoes-de-euros-para-programa-escola-digital</a></p>
Romania	<ul style="list-style-type: none"> <li>- 150 million Romanian lei (i.e. approximately € 30.5 million) for the purchase of tablets connected to the internet for children from disadvantaged backgrounds (for approximately 250 000 children)</li> </ul>	<p><a href="https://romania.europalibera.org/a/guvernul-aloca-150-de-milioane-de-lei-pentru-tablete-destinate-elevilor-din-mediile-defavorizate/30600811.html">https://romania.europalibera.org/a/guvernul-aloca-150-de-milioane-de-lei-pentru-tablete-destinate-elevilor-din-mediile-defavorizate/30600811.html</a></p> <p><a href="https://www.edupedu.ro/costul-standard-per-elev-pentru-anul-2021-aprobat-de-guvern-nicio-crestere-pentru-salarii-dar-o-majorare-pana-la-36-pentru-componenta-cheltuielile-cu-pregatirea-profesionala-evaluarea-periodica-a/">https://www.edupedu.ro/costul-standard-per-elev-pentru-anul-2021-aprobat-de-guvern-nicio-crestere-pentru-salarii-dar-o-majorare-pana-la-36-pentru-componenta-cheltuielile-cu-pregatirea-profesionala-evaluarea-periodica-a/</a></p> <p><a href="https://www.unicef.org/romania/ro/pove%C8%99ti/guvernul-rom%C3%A2niei-trebuie-s%C4%83-dubleze-c%C3%A2t-mai-repede-fondurile-investite-%C3%AEn-educa%C8%9Bie">https://www.unicef.org/romania/ro/pove%C8%99ti/guvernul-rom%C3%A2niei-trebuie-s%C4%83-dubleze-c%C3%A2t-mai-repede-fondurile-investite-%C3%AEn-educa%C8%9Bie</a></p>
Slovakia	<ul style="list-style-type: none"> <li>- € 500 000 for tutoring within the first phase of the project 'Together Wiser' to support students from socially disadvantaged backgrounds. [however, unclear if this is directly related to COVID-19]</li> <li>- € 1 million for the subsequent phase of 'Together Wiser', in order to cover all schools that meet the conditions</li> </ul>	<p><a href="https://www.minedu.sk/rezort-skolstva-na-projekt-doucovania-vyclenil-v-prvej-faze-pol-miliona-eur/">https://www.minedu.sk/rezort-skolstva-na-projekt-doucovania-vyclenil-v-prvej-faze-pol-miliona-eur/</a></p> <p><a href="https://www.minedu.sk/na-projekt-spolu-mudrejsi-sme-vyclenili-dalsi-milion/">https://www.minedu.sk/na-projekt-spolu-mudrejsi-sme-vyclenili-dalsi-milion/</a></p>

### 3.3. Additional spending categories

Categorising the information on spending, we can distinguish the following broad categories:

- General, non-earmarked funding (or specific target not mentioned) (GEN)
- ICT-related funding, e.g. laptops, tablets, internet access (ICT)
- Investment in better infrastructure, e.g. buildings (INF)
- Protective equipment, cleaning, prevention (PRE)
- Hiring additional teachers, bonuses for teachers, training for teachers (TEA)
- Summer 'bridging' programmes (SUM)
- Counselling and assistance for students (COU)

The following table presents a short overview per country.

**Table 1. Overview of additional funding by spending category**

	GEN	ICT	INF	PRE	TEA	SUM	COU
Belgium (Flanders)		X			X	X	X
Belgium (Wallonia)	X	X		X	X		X
Estonia	X						
Finland	X	X					
Greece		X					
Italy		X	X	X	X	X	
Lithuania		X					X
Malta	X						
The Netherlands	X				X	X	
Portugal	X	X			X		
Romania		X					
Slovakia	X						

From this table, it is clear that additional spending on ICT (e.g. laptops, tablets, better internet access, improved ICT infrastructure at schools, etc.) is the category that is most commonly mentioned ('ICT' in the table above). For a number of other countries we do find a concrete amount of additional spending, however, this increase is either not earmarked or it is not clear whether the money should be dedicated to serve specific

targets or not ('GEN' in the table above). Further, some countries specifically mention 'hiring additional teachers' or 'additional teacher training' ('TEA' in the table above). The other spending categories are mentioned by fewer counties.

### 3.4. Per pupil spending

In order to be able to compare the additional spending between countries, we relate the total amount with the number of children (from early childhood education up to post-secondary (but non-tertiary) education) to obtain the additional spending per child. The additional funding we could identify ranges between EUR 2 per child in Slovakia and EUR 2 795 per child in the Netherlands. Four countries invest less than EUR 100 per student and six countries invest between EUR 100 and 700. The median is EUR 163 per student. It should be noted that the amount for the Netherlands (more than EUR 9 billion, or almost EUR 2800 per child) is exceptionally high, compared to the other countries.

Since regular public spending on education (i.e. not-COVID-19 related expenses) may differ substantially between countries, the additional spending per child is compared with the regular average spending per child in primary and secondary education. This makes it possible to calculate the percentage increase in public educational spending that can be attributed to COVID-19. The median increase in spending per child is approximately 3 %, with a broad range from 0.05 % in Slovakia to 32 % in the Netherlands.

**Table 2. Additional spending per child**

	Additional spending (in million euros)	Additional spending (per child)	Average spending per child (2017)	Increase
Belgium (Flanders)	548.8	486	10 091	4.82 %
Belgium (Wallonia)	28.0	44	10 071	0.43 %
Estonia	32.8	183	3 827	4.77 %
Finland	168.8	144	9 011	1.59 %
Greece	124.1	76	3 511	2.16 %
Italy	2 326.0	261	6 581	3.96 %
Lithuania	8.7	18	2 616	0.68 %
Malta	30.0	520	5 690	9.15 %
The Netherlands	9 145.0	2 795	8 675	32.22 %
Portugal	977.0	711	5 246	13.55 %
Romania	30.5	10	1 264	0.80 %

Slovakia	1.5	2	3 286	0.05 %
<i>Median</i>		<i>163</i>	<i>5 468</i>	<i>3.06 %</i>

Source: Own calculations based on Eurostat (Pupils and students enrolled by education level, sex and NUTS2 regions [EDUC\_UOE\_ENRA11]; Public expenditure on education per pupil/student based on FTE by education level and programme orientation [EDUC\_UOE\_FINE09]) and OECD (PISA (2018)).

## Conclusion

This report provides an overview on the potential mechanisms that resulted in learning losses due to the Covid-19 pandemic. It also summarises the first empirical findings of studies using standardised test scores collected in June 2020 (after the first wave of school closures) and September 2020 (after a summer holiday break, and a first period of less restrictions). Finally, it outlines the policy response in terms of additional education funding in EU Member States.

Overall, the results suggest a substantial decline in test scores for students in compulsory education. The observed decline seems larger if measured immediately after the first wave of school closures (June 2020). Comparing the estimated effects before and after the summer break, the available evidence suggests that the learning losses are already partly mitigated by September 2020. This might be due to remediating policy actions (e.g. summer schools, tutoring) or to a lower psychological impact of the crisis. Nevertheless, even by September 2020, the estimates in most countries remain large and significant. Given that human capital formation has been linked to income (Chetty et al., 2014), employment (Currie and Thomas, 2001), and general prosperity (Hanushek and Woessmann, 2020), and given that theoretical models suggest that learning losses might accumulate over time (Kaffenberger, 2020) close monitoring of the learning losses is necessary.

As a response to the crisis, many EU Member States increased the education budget to fund short- and long-term remediation actions. The additional funding we could identify ranges from EUR 2 per student in Slovakia to EUR 2 795 per student in the Netherlands. The median is EURO 163. If we relate these amounts to current spending, we find that this corresponds to an increase in public spending on education of between 0.05 % in Slovakia and 32 % in the Netherlands. The median increase is approximately 3 %.

Overall, the results suggest that the funding concentrates on ICT provision and general, non-earmarked funding. Several countries realised that current ICT availability and competences were not adequate to organise distance learning and decided to invest in upgrading ICT equipment and tools. For several countries, this may be an opportunity to embrace the potential advantages of digital learning tools and to use them to enhance learning.

Many EU Member States are declining in the international education rankings (e.g. the OECD PISA scores). The Covid-19 crisis amplified the weaknesses at system level in those Member States in particular. For example, education systems with weak ICT availability and ICT integration, might be more severely hit by the crisis. Also education systems with strong budget cuts in the past, might see the necessity to catch up now. We therefore recommend that the additional funding be integrated in an overall strategy, rather than on

an ad hoc basis. This will avoid fragmented budgets and make the Covid-19 pandemic the impetus for resolving declining educational outcomes.

It should be stressed that the amounts of additional spending reported in this document are compiled from a variety of sources (ranging from official governmental communication to newspaper articles) and are probably not exhaustive. While we are likely to miss some measures and amounts in various countries, in other countries the same measures may be included in several announcements, or measures already decided may be repackaged as reactions to the Covid-19 pandemic. These complexities were difficult to fully assess and disentangle, given the limited timeframe and the fact that most documents are written in local (i.e. non-English) language.

Future availability of harmonised amounts for more countries (e.g. Eurostat or OECD indicators on public spending on education in 2020 and 2021) would provide an opportunity for interesting future research. This would allow the increase in public spending with (for example) learning losses, the number of days of school closure, availability of ICT at school or at home, digital competences of teachers and children, etc. to be correlated. This would also allow several hypotheses on the amount of additional spending to be investigated.

## References

Agostinelli, F., Doepke, M., Sorrenti, G., & Zilibotti, F. (2020). When the Great Equalizer Shuts Down: Schools, Peers, and Parents in Pandemic Times (No. w28264). National Bureau of Economic Research.

Azevedo, J. P., Hasan, A., Goldemberg, D., Iqbal, S. A., & Geven, K. (2020). Simulating the potential impacts of COVID19 school closures on schooling and learning outcomes: A set of global estimates (Policy Research Working Paper 9284). The World Bank.

Blainey, K., Hiorns, C., & Hannay, T. (2020). The impact of lockdown on children's education: a nationwide analysis.

Chetty, R., Friedman, J. N., & Rockoff, J. E. (2014). Measuring the Impacts of Teachers II: Teacher Value-Added and Student Outcomes in Adulthood. *American Economic Review*, 104(9), 2633–2679. doi: 10.1257/aer.104.9.2633

Currie, J., & Thomas, D. (2001). Early test scores, school quality and SES: Longrun effects on wage and employment outcomes. *Research in Labor Economics*, 20, 103–132.

De Witte, K. (2021). Hoe kunnen we de leerachterstand ombuigen? Naar een Vlaamse 'Build-Back & Build-Better' strategie. Vlaams Parlement 12 maart 2021. Consulted from <https://feb.kuleuven.be/drc/LEER/downloads/vlaams-parlement-leerachterstand-12-03-2021.pdf>

De Witte, K., Haelermans, C. & Rogge, N. (2015). The effectiveness of a computer-assisted math learning program. *Journal of Computer Assisted Learning*, 31 (4), 314-329.

Department of Education (2021). Understanding progress in the 2020/21 academic year - Interim findings. United Kingdom. Pp. 42.

Depping, D., Lücken, M., Musekamp, F., & Thonke, F. (2021). Kompetenzstände Hamburger Schüler\*innen vor und während der Corona-Pandemie [Alternative pupils'

competence measurement in Hamburg during the Corona pandemic]. DDS – Die Deutsche Schule, Beiheft 17, 51–79. <https://doi.org/10.31244/9783830993315.03>

Di Pietro, G., Biagi, F., Costa, P., Karpiński, Z., & Mazza, J. (2020). *The likely impact of COVID-19 on education: Reflections based on the existing literature and recent international datasets* (Vol. 30275). Publications Office of the European Union.

Dominique, B. W., Hough, H. J., Lang, D., & Yeatman, J. (2021). Changing Patterns of Growth in Oral Reading Fluency During the COVID-19 Pandemic. *Policy Analysis for California Education*.

Donnelly, R. & Patrinos, H.A. (2021). Learning loss during COVID-19: An early systematic review. *Centre for Economic Policy Research* 77, 145-153.

Dorn, E., Hancock, B., Sarakatsannis, J., & Viruleg, E. (2020). COVID-19 and student learning in the United States: The hurt could last a lifetime (McKinsey & Company Public Sector Practice). McKinsey & Company.

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*, 118 (17).

GL Assessment (2021). Impact of COVID-19 on attainment – initial analysis.

Gonzalez, T., De La Rubia, M. A., Hincz, K. P., Comas-Lopez, M., Subirats, L., Fort, S., & Sacha, G. M. (2020). Influence of COVID-19 confinement on students' performance in higher education. *PloS one*, 15 (10), e0239490.

Gore, J., Fray, L., Miller, A., Harris, J., & Taggart, W. (2021). The impact of COVID-19 on student learning in New South Wales primary schools: an empirical study. *The Australian Educational Researcher*, 1-33.

Grewenig, E., Lergetporer, P., Woessmann, L., & Zierow, L. (2020) COVID-19 and educational inequality: How school closures affect low- and high-achieving students. CESifo Working Papers, No. 8648. Retrieved from [https://www.cesifo.org/DocDL/cesifo1\\_wp8648.pdf](https://www.cesifo.org/DocDL/cesifo1_wp8648.pdf)

Haelermans, C., Jacobs, M. & Van Vugt, L. (2021a). factsheets eerste schoolsluiting n.a.v. covid-19-crisis. <https://www.nationaalcohortonderzoek.nl/factsheets/>

Haelermans, C., Aarts, B., Abbink, H., Jacobs, M., Van Vugt, L., van Wetten, S. & van der Velden, R. (2021b). A full year COVID-19-crisis with interrupted learning and two school closures: The effects on learning gains and inequality in primary education. Working paper. Mimeo.

Hanushek, E. A., & Woessmann, L. (2020). The economic impacts of learning losses. *OECD Education Working Papers*, 225. Pp. 24.

Itebeke, K. & De Witte, K. (2020). Helpful or harmful? The role of personality traits in student experiences of the COVID-19 crisis and school closure. Department of Economics KU Leuven Discussion Paper Series 20.19, 30.

Itebeke, K., De Witte, K., & Schelfhout, W. (2020). The effects of computer-assisted adaptive instruction and elaborated feedback on learning outcomes. A randomized control



trial. *Computers in Human Behavior*. In Press. (also KU Leuven Discussion Paper Series DPS20.20).

Iterbeke, K., De Witte, K., Declercq, K. & Schelfhout, W. (2020). The Effect of Group Formation and Differentiated Instruction in Financial Literacy Education. Evidence from Two Randomised Control Trials. *Economics of Education Review*, 78, 101949.

Jann, O., Münich, D. & Zapletalova, L. (2021). Výluka prezenční výuky během pandemie COVID-19: odhad neviditelných ekonomických ztrát. Institute for Democracy and Economic Analysis. CERGE. Pp. 28.

January 2021 OECD (2021). The state of school education – One year into the COVID pandemic. 51.

Juniper (2021). The impact of the COVID-19 pandemic on primary school children's learning. Juniper Education National Dataset Report, 21.

Kaffenberger, M. (2020). Modeling the Long-Run Learning Impact of the COVID-19 Learning Shock: Actions to (More Than) Mitigate Loss. RISE Insight Series, 2020/017. doi:doi.org/10.35489/BSG-RISE-RI{\\\_}2020/017.

Kogan, V., & Lavertu, S. (2021). The COVID-19 Pandemic and Student Achievement on Ohio's Third-Grade English Language Arts Assessment. Ohio State University, January 27.

Kuhfeld, M., Tarasawa, B., Johnson, A., Ruzek, E., & Lewis, K. (2020). Collaborative for student growth. Learning during COVID-19: Initial findings on students' reading and math achievement and growth. NWEA Research. <https://www.nwea.org/content/uploads/2020/11/Collaborative-brief-Learning-duringCOVID-19.NOV2020.pdf>

Maldonado, J. & De Witte, K. (2020). The effect of school closures on standardised student test outcomes. Department of Economics KU Leuven Discussion Paper Series 20.17, 49.

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

OECD (2020). Learning remotely when schools close: How well are students and schools prepared? Insights from PISA.

OECD (2021b). French national evaluations contribution to the analysis of the impact of the health crisis. Consulted from 'Country education responses to the coronavirus (COVID-19) pandemic'.

OECD (2021a). The state of school education - One year into the COVID pandemic. <https://doi.org/10.1787/201dde84-en>

Pier, L., Hough, H. J., Christian, M., Bookman, N., Wilkenfeld, B., & Miller, R. (2021). COVID-19 and the educational equity crisis: Evidence on learning loss from the CORE Data Collaborative. *Policy Analysis for California Education*.

Psacharopoulos, G., Collis, V., Patrinos, H. A., & Vegas, E. (2020). Lost wages: The COVID-19 cost of school closures. Available at SSRN 3682160.



Rose, S., Twist, L., Lord, P., Rutt, S., Badr, K., Hope, C., & Styles, B. (2021). Impact of school closures and subsequent support strategies on attainment and socio-emotional wellbeing in key stage 1: Interim paper 1. *Education Endowment Foundation, National Foundation for Educational Research, London.*

Schult, J., Mahler, N., Fauth, B. & Lindner, M. A. (2021). Did Students Learn Less During the COVID-19 Pandemic? Reading and Mathematics Competencies Before and After the First Pandemic Wave. PsyArXiv Preprints. Doi: 10.31234/osf.io/pqtgf.

Slavin, R.E. (2020). *How Much Have Students Lost in the COVID-19 Shutdowns?* Retrieved from <https://robertslavinsblog.wordpress.com/2020/10/01/how-much-have-students-lost-in-the-COVID-19-shutdowns/22>

Tomasik, M. J., Helbling, L. A., & Moser, U. (2020). Educational gains of in-person vs. distance learning in primary and secondary schools: A natural experiment during the COVID-19 pandemic school closures in Switzerland. *International Journal of Psychology.*

UNESCO, UNICEF, World Bank (2020). What Have We Learnt? : Overview of Findings from a Survey of Ministries of Education on National Responses to COVID-19. Paris, New York, Washington D.C.: UNESCO, UNICEF, World Bank. <https://openknowledge.worldbank.org/handle/10986/34700>

Vermeersch, B. (2020). Impact van corona valt mee aan KU Leuven. VRT Nieuws. <https://www.vrt.be/vrtnws/nl/2020/10/01/impact-van-coronamaanden-valt-mee-aan-ku-leuven-meer-eerstejaar/>.

## **Finding information about the EU**

### Online

Information about the European Union in all the official languages of the EU is available on the Europa website at: [https://europa.eu/european-union/index\\_en](https://europa.eu/european-union/index_en)

### EU publications

You can download or order free and priced EU publications at: <https://publications.europa.eu/en/publications>. Multiple copies of free publications may be obtained by contacting Europe Direct or your local information centre (see [https://europa.eu/european-union/contact\\_en](https://europa.eu/european-union/contact_en)).

