



# Covid-19 learning deficits in Europe: analysis and practical recommendations

*Executive summary*

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Luxembourg: Publications Office of the European Union, 2023

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**Please cite this publication as:**

De Witte, K. and François, M. (2023). 'Covid-19 learning deficits in Europe: analysis and practical recommendations', *EENEE Analytical report*. doi: 10.2766/469119.

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## Executive summary

### 1. Aim

The aim of this report is threefold. Its first section provides an overall sketch of the situation across Europe and the underlying mechanisms for the differences in European countries. The second section focuses on the heterogeneities within each country. It examines the disparities among students in order to understand which of those correlate with larger learning deficits or worsening mental health. Section 3, considers the findings of the first two sections in order to discuss five policy recommendations for the short and long run.

### 2. The influence of COVID-19 on educational attainment in the EU

Overall, learning deficits due to the COVID-19 crisis vary between no effect at all, reported in the Nordic countries (Denmark, Finland, Sweden), and the large effects observed in Greece and Poland. In Greece, the learning deficit is estimated at 0.22 standard deviations (SD) in 2019-2020, further accumulating to 0.3 SD in 2020-2021. In Poland, an average learning deficit of 0.3 SD is observed in 2020-2021. More generally, for the countries included in this report we computed an average learning deficit around 0.11 SD. Although the value is small, it can be considered equivalent to between one and three months' learning deficit, as a broad indication.

Although the learning deficits occurred because of multiple reasons, the learning deficits observed in Europe reveal the following picture:

- **The more accustomed a country is to relying on ICT for educational purposes, the more resilient the test scores are for that country.** In line with the reports made by the OECD Education Policy Outlook (OECD 2020a, 2020b and 2020c), the PISA and TALIS databases (OECD, 2019a; OECD, 2019b), those in the Digital Economy and Society Index (DESI), as well as the index (IRDLL) developed by the Centre for European Policy Studies (CEPS), countries with advanced levels of digitalisation suffered lower learning deficits than countries with low levels of digitalisation pre-pandemic.
- Nonetheless, **advanced digitalisation is only a necessary condition for avoiding large learning deficits; a sufficient condition to reduce learning deficits is the intensive use of ICT in education prior to the pandemic.** For example, Belgium (Flanders) ranked 9th in terms of its digital economy (DESI, 2019a), but used little ICT in schools before the pandemic (OECD, 2019a). Similar patterns are seen in France and Spain (Basque Country). Moreover, if digitalisation is a resilience factor, it can also improve education outcomes. Several articles reported evidence of higher educational achievements among students who used remote learning tools both before and during the school closures (Birkelund and Karlson, 2021; König and Frey, 2022; Reimer et al., 2021; Van der Velde et al., 2021).
- **The younger the students, the larger the learning deficits observed.** In a meta-analysis, we observe a negative non-significant correlation of -0.32 between student ages and learning deficits. Regression analysis reveals that a student who was one year older is likely to have higher education outcomes (in other words, a lower learning deficit) by +0.005 SD (however, insignificant, due to a lack of power). Despite the insignificant relationship in our meta-analysis, country-specific studies observe a significant relationship between age and learning deficits (e.g. DEPP, 2020b; Ludewig et al., 2021; Molnár and Hermann, 2022; Schult et al., 2022; Tomasik et al., 2021; Blainey and Hannay, 2021).
- **The longer the school closure, the larger the learning deficit.** In line with a previous review (Patrinos et al., 2022) our meta-regression for European countries suggests that for one week longer school closure, achievements decrease by 0.007 SD (non-significant result due to a lack of power). In a separate meta-analysis, we

observe a non-significant correlation of 0.615 between the length of the school closure in weeks and the learning deficit. Despite the insignificant relationship in our meta-analysis, country-specific studies observe a significant relationship (Blainey and Hannay, 2021; Lambropoulos and Panagiota, 2022; Molnár and Hermann, 2022).

- **COVID-19 reinforces existing trends.** Analysing PISA results since 2006 indicates an average downward trend in learning outcomes since 2012 across Europe, which has been exacerbated by the COVID-19 crisis. From a quantitative perspective, this pattern is crucial since, if it is not accounted for in empirical analysis, the negative trend effect will be absorbed into the pandemic effect, leading to biased estimates. Similarly, if not accounted for, the downward trend in test scores means that the older the control cohort, the larger the estimated learning deficit.
- **Future trends are unclear.** Early simulations suggested that the learning deficits following the COVID-19 pandemic would increase over time (Angrist et al., 2021; Kaffenberger, 2020) and could lead to 3% decrease in lifetime income (Hanushek and Woessmann, 2020). Our findings are not so pessimistic, but the overall picture remains unclear. Articles measuring the effect one year after the school closures – i.e. using test data from 2020-2021 on average report better results than articles relying on test data from immediately after the school closures in 2019-2020 (Borgonovi and Ferrara, 2022; Education Policy Institute, 2021). However, these findings cannot be considered to represent a general situation. Germany, Greece and the Netherlands indicate a large worsening of results in 2020-2021, even compared with those from 2019-2020 (Haelermans et al., 2022b; Lambropoulos and Panagiota, 2022; Ludewig et al., 2022; Schult et al., 2022). Moreover, there also appears to be heterogeneity between the subjects tested (Gambi and De Witte, 2021). Overall, prior analyses and empirical evidence emphasise the needs of acting quickly to maintain a high quality education among the generation that was at school during the COVID-19 disruptions.

### 3. Attention to specific subgroups

In addition to heterogeneity between EU Members States, the literature review has identified multiple subgroups among whom learning deficits are more evident. Membership of each subgroup has an independent influence on learning deficits, but they also correlate with one another.

- **Socio-economic status (SES).** Across all of the articles analysed, SES is the most commonly studied variable. Low-SES students are commonly identified as those with parents who have a low level of education, living in a disadvantaged neighbourhood, or earning a low income. Students in low-SES groups are, on average, associated with more than double the learning deficit compared with average pupils (Contini et al., 2021; Engzell et al., 2021; EPI, 2021; Haelermans et al., 2022a; Maldonado and De Witte, 2021; Rose et al., 2021). These findings are even more conspicuous when comparing high- versus low-SES pupils.
- **Inequalities between strong and weak students.** The COVID-19 crisis also raised the gap between the highest- and lowest-performing students. Several papers from Denmark, Germany, Belgium (Flanders) and Italy report an increase in the polarisation of the scores (Birkelund and Karlson, 2021; Maldonado and De Witte, 2021; Schult et al., 2022). Interestingly, in Italy two articles linked inequalities in school performance with the SES of students. One found that low-SES, but high-performing students suffered more from the school closures than high-performing students from high-SES backgrounds (Contini et al., 2021) while the other one found the opposite (Borgonovi and Ferrara, 2022).
- **Gender gap.** We observe mixed evidence regarding whether school closures reinforced a gender gap in education. This mixed evidence seems to be rooted in the methodologies applied.
- **Mental health.** At first sight, the lengthy school closures have been associated with negative effects on the well-being of students, including feelings of loneliness, anxiety, depression and suicidal behaviour (Champeaux et al., 2020; Mazrekaj and De Witte,

2022). One crucial implication of this poor socio-emotional status is that the evidence suggests it is related to greater learning deficits (Arenas and Gortazar, 2022). However, inequalities also exist in relation to such effects. For instance, more “conscientious” and “open” individuals are more likely to have experienced the school closures in a positive way, and therefore have not suffered from a decrease in their socio-emotional status (Iterbeke and De Witte, 2021). Furthermore, Champeaux et al. (2020) observe that less well-educated parents reported that school closures had more negative effects on their children compared with highly educated parents.

- **Children of parents who are essential workers.** Some essential workers may also be defined as low-paid workers who work long hours and who struggle to provide support to their children, or to have school-related interactions with them (Garbe et al., 2020; Mutch, 2021). In the EU, an important share of the essential workers during the pandemic were low-skilled workers employed mainly in commerce distribution, food processing or health (OECD, 2020e). Although these workers constituted 42% of the workforce in 2020 (Samek Lodovici et al., 2020), little attention has been paid to them except for studies in the USA and New Zealand. The description of essential workers given above is similar to that used to identify low-SES parents. This implies that figures relating to the effect that having parents who are essential workers has on children’s learning deficits can be approximated by considering the results for low SES.
- **Migrants.** Most papers presented in this report did not find amplified learning deficits among students with a migration background (Arenas and Gortazar, 2022; Ludewig et al., 2022; Maldonado and De Witte, 2021; Schult et al., 2022). However, a qualitative study from Slovenia indicates that migrants reported greater difficulties in understanding the national language during remote learning compared with face-to-face classes. This, in turn, increased language barriers and led to less interaction through which to practice the national language (Gornik et al., 2020).
- **Students with special educational needs (SEN).** Evidence is mixed in the case of students with SEN. Several issues that existed prior to the pandemic have been aggravated since the beginning of the pandemic. For instance, the COVID-19 crisis increased the difficulty of these students in receiving learning support, lost access to certain specialised tools and reduction of social interactions (Koelher et al., 2022). Nevertheless, such effects may vary widely, in Germany for instance, pupils with SEN appear not to have been more impacted than other students by the COVID-19 crisis (Nusser, 2021).

#### 4. Conclusion and recommendations

Based on the disparities between and within EU Member States, the present analysis has allowed us to formulate policy recommendations targeted at country level and at the level of students.

- **(a) Short term – Compensatory policies:** The implementation of compensatory policies, such as summer schools or tutoring programmes, is an evidence-based way to recover from the effects of the pandemic (Arcia et al., 2022). The articles covered in this report emphasise the positive outcomes and the cost-effectiveness of compensatory policies to counteract the learning deficit caused by the COVID-19 crisis (Borgonovi and Ferrara, 2022; Depping et al., 2021; EPI, 2021; Gambi and De Witte, 2021).
- **(b) Short term – Targeted compensatory policies.** Given the larger learning deficits among low-SES students, compensatory policies should focus on disadvantaged students. In addition, our analysis shows that in relation to socio-emotional skills, the current “one-size-fits-all” approach to education does not work (Iterbeke and De Witte, 2021). Instead, ways of teaching should be adapted according to the needs and preferences of the students. For instance, students with high levels of conscientiousness and low levels of extraversion self-report improved education outcomes as a result of remote learning, such that remote teaching could be

maintained for this subgroup even after the pandemic. Remedial programmes should also focus on the youngest students, as evidence indicates that younger students have suffered more from the COVID-19 crisis. In countries where the length of school closures differed by location (e.g. in Italy, Germany, the Netherlands), efforts should focus on those areas that underwent longer periods of remote teaching.

- **(c) Short and long term – Monitoring.** To implement recommendations (a) and (b) in an adequate way, standardised tests could be used to detect needs, but also to monitor whether or not progress has been made. Furthermore, questionnaires evaluating personality traits could help educators to adapt their recovery plans. For reasons of efficiency and comparability, these tests should be standardised at EU level.
- **(d) Long term – Adapt the curriculum.** Simplifying and adapting the curriculum has been suggested in order to focus on the needs and strengths of the students. The idea is to prioritise those basic skills in which learning attainments were lowered by the pandemic: numeracy, literacy, etc. On the other hand, to ensure that a focus is not lost on top-performing students, strong students could receive a more demanding curriculum.

**(e) Long term – Investments.** The Recovery and Resilience Facility (RRF) helps EU Member States to make large investments in education. Around 14% of these investments, or EUR 71 billion, is directed towards education. However, these investments should be made in the most cost-effective way. Therefore, we recommend rigorous testing (e.g. through the use of experiments or quasi-experiments) of the impact of such investments, linking the costs of each initiative with its effectiveness. Although the report by Fack et al. (2022) reviews a number of different cost-effective measures, the present literature review signals the importance of ICT investments. Countries that used ICT hardware and software in education were better able to cope with school closures. Furthermore, ICT investments should also be targeted with respect to inequalities in educational outcomes.

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