

*Routledge Research in International and Comparative Education*

# **RISK, RESILIENCE, AND RECOVERY ACROSS GLOBAL EDUCATION SYSTEMS**

**THE LONG-TERM IMPACT OF PANDEMIC REFORMS**

Edited by Louis Volante, Kristof De Witte,  
Orazio Giancola, Luca Salmieri, and Don A. Klinger



*“This book offers an invaluable contribution to understanding the long-term impacts of pandemic-related education reforms. Its comprehensive analysis across various countries provides critical insights and practical recommendations for addressing learning loss and enhancing educational resilience. It is a must-read for academics, students, and policymakers interested in the economics of education and education policy.”*

**–Silvia Granato - European Commission, Joint Research Centre**



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# Risk, Resilience, and Recovery Across Global Education Systems

This book provides a critical review of the long-term effectiveness of education and social protection policies enacted by G10 countries in response to the global pandemic.

The COVID-19 pandemic caused the most significant disruption to education systems since the devastation of World War II. Successive waves and variants of the coronavirus resulted in school closures and spurred a range of policy interventions across national education systems to combat both the cognitive (i.e., achievement in reading, mathematics, and science) and non-cognitive (socioemotional development, mental and physical health) impacts on student achievement and wellbeing. This book aims to evaluate the long-term efficacy of such interventions, drawing on an analysis of a cross-section of nine industrialized countries: the United Kingdom, France, Germany, Italy, Sweden, Netherlands, Belgium, Canada, and Japan. It further offers cross-national insights for policymakers and discusses the critical importance of broader notions of academic resilience in a post-pandemic world. Ultimately, this volume aims to identify national policies that have helped to buffer students from the long-term challenges associated with the aftermath of the pandemic.

A timely and important text, it will be of interest to researchers and policymakers in education policy, pandemic response, impact evaluation, and student mental health.

**Louis Volante** (PhD) is Distinguished Professor at Brock University, Canada, and a Professorial Fellow at UNU-MERIT, Netherlands.

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**This book is dedicated to all the teachers and school staff who, in the midst of a global pandemic, continued to dedicate their time and energy to support students' education and learning.**



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# Foreword: A Call to Action

The COVID-19 pandemic was much more than a nightmare. A nightmare disappears when we wake up – and when the sun is out it stays at most as an unpleasant remembrance. However, many people acted and still act as if the pandemic was just a nightmare that did not deserve special attention.

Unfortunately, some governments cancelled standardised assessment during school closures and made few adjustments to address the deleterious impact of the pandemic on student populations. Fortunately, not all countries acted this way, which allows researchers to make comparisons and draw some lessons for future generations.

The easing of large-scale student evaluations of learning has been prolonged in various international contexts, which have made it more difficult to assess the difficulties students have encountered, and more importantly, to address them through effective policy interventions. The latter has increased the temptation to forget learning losses in the aftermath of the pandemic and to cope with the unequal cognitive and non-cognitive losses. Unsurprisingly, education disruption persists in many countries and regions.

Many reports show that within each country and regions, learning losses were unequal. In general, students from challenged backgrounds recorded larger negative impacts both in cognitive acquisitions and in social and psychological well-being.

Collectively, these negative impacts will persist into the future, particularly in national contexts that have devoted little attention to recovery efforts. It is widely recognized the education leaders and policymakers will need to continuously reevaluate their education systems and strengthen the capacity of educators to support their students – particularly those who have suffered the most negative losses.

The authors in this volume do a remarkable job of synthesising available national and international data to examine the varied and persistent problems in their respective post-pandemic contexts. Collectively, the volume considered a broad set of Western countries that have relatively advanced education systems. This focus on industrialized Western nations allows policymakers to

consider the efficacy of policy interventions in national contexts that have similar characteristics.

Auspiciously, this book is not limited to point out the education problems we now face. It also presents and discusses actions that are being taken and perhaps ones, with the benefit of hindsight, should have been taken. It presents available evidence supporting these measures and weights their relative effectiveness and merits.

Moving forward, the conclusion makes it clear that long-term recovery policies will be partially dependent on the availability of comprehensive assessment policies and national administrative data. Cost-effective targeted interventions for disadvantaged groups and cognitively weakened students need to be utilised. For these actions, we should depart from routine blind investment increases to focus on measurable effective impacts. Policy impact evaluation remains a critical element to ensure education funding is used and deployed wisely.

This book is a needed wake-up call for the persistent scars left by the pandemic and an even more needed wake-up call to action. Let us hope it is read widely and used judiciously to promote effective education policies.

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# Preface

Global evidence documented the immediate impacts of the COVID-19 pandemic on children's learning. In response, countries enacted educational policies intended to alleviate the negative impacts of the Pandemic, especially with respect to literacy and numeracy. In spite of these interventions, ongoing research in the post pandemic period since 2022 suggests that learning losses continue to be observed, although children were differentially impacted by the pandemic, with those children having risk factors (e.g., lower socioeconomic status, immigrants, learning challenges) experiencing greater negative impacts. Further, these negative impacts appear to extend beyond academic achievement to include socioemotional factors, mental health, and academic resilience.

This edited volume examines the ongoing impacts of the pandemic on our youth and the emerging evidence of ongoing policy efforts to ameliorate these impacts in the aftermath of the pandemic. The industrialised OECD nations included in the volume span Asia, Europe, and North America. These countries (England, France, Germany, Italy, Sweden, the Netherlands, Belgium, Canada, and Japan) have each focused on post COVID recovery in terms of the educational outcomes of their children. Their efforts have largely been informed by national assessments and international assessments and surveys such as PISA. Additionally, their attention expanded to also include efforts to address decreases in non-cognitive outcomes and attributes with a specific inclusion on academic resilience. The breadth of expertise of the authors has resulted in a critical analysis of jurisdictional efforts to support our youths' education and development.

# Acknowledgements

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**Part I**

**The pandemic and student  
outcomes**



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# 1 The global impact of the pandemic on student outcomes

*Louis Volante and Don A. Klinger*

## Introduction

The COVID pandemic disrupted the schooling of approximately 1.6 billion children and youth across the globe (UNESCO, 2023). For industrialised societies, the closure of schools largely resulted in an abrupt transition to online and distance education methods, with varying degrees of success. Research suggests the impact of the pandemic has been particularly acute for the most vulnerable students. Indeed, cross-national research has consistently reported lower socio-economic status (SES) student groups have suffered the most significant learning losses in core subject areas such as reading, mathematics, and science (see Schnepf et al., 2024). Coupled with negative findings in the non-cognitive domain such as socioemotional learning, growth mindset, and other areas of mental health (Pena et al., 2025), national policymakers are understandably concerned about the resilience of their student population in the aftermath of the pandemic.

This volume examines both the short- and long-term impacts of the pandemic on student outcomes from a cross-national perspective. Then ensuing national profiles analyse both cognitive (i.e., reading, mathematics, and science) and non-cognitive (i.e., socio-emotional learning, growth mindset) outcomes to provide a more robust and comprehensive analysis. The national profiles consider large-scale assessment results reported in national and international (i.e., Programme in International Student Assessment – PISA) benchmark measures. It is worth noting that PISA 2022 results, administered by the Organisation for Economic Cooperation and Development (OECD), were released in December 2023. These results offer researchers and policymakers with student outcome data in a sample of 700,000 15-year-old students, representing more than 80 countries and economies around the world (OECD, 2023a, 2023b). Collectively, this volume adds to the emergent literature – albeit by adopting a broader conceptualisation of student resilience, which has been somewhat lacking in cross-national comparisons of student achievement (see Volante & Klinger, 2023).

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### **Academic resilience**

To the layperson, the word resilience signifies the ability to recover in the face of adversity. However, in educational research resilience has largely been used to denote the academic achievement of lower SES student populations in relation to traditional content domains. By disaggregating large-scale assessment results, test agencies and researchers have examined the achievement gaps that exist between more and less affluent peer groups. The size and scale of these achievement differences are also used to evaluate the relative success of education policies over time (Volante et al., 2017). For example, transnational organisations such as the European Union (EU), routinely rely on PISA results to compare and contrast national education policies (European Commission, 2024).

Relying on cognitive student outcomes to gauge the relative effectiveness of education policies is necessary, but insufficient, to capture the full complexity of challenges facing contemporary students – particularly in the wake of the pandemic. Unsurprisingly, the pandemic has served to further underscore the importance of non-cognitive skills. Additionally, there is general consensus that cognitive and non-cognitive skills are associated with students' academic resilience (Rulida et al., 2024) and also influence school efficiency (Vittadini et al., 2022). Collectively, the available literature is replete with studies suggesting the development of cognitive and non-cognitive skills positively contribute to an adolescents' resilience and future success (Cabus et al., 2021; Hachem et al., 2022; Khine et al., 2020; Lee & Shute, 2009; Volante et al., 2021). Thus, understanding and ameliorating the deleterious impact of the pandemic on these skills are critical to nation states around the world.

### **The pandemic and student learning outcomes: A preliminary review**

The COVID pandemic has become and remains a central focus for educational researchers and policymakers. From the moment community lockdowns and school closures began in 2020, for periods of time that highly varied (15 to 40 weeks in Europe, 50 to 80 weeks in the Americas, and 25 to 80 weeks in Asia and the Pacific regions), to the most recent PISA results, researchers and policymakers have predicted and explored the impacts of the pandemic on children's educational outcomes (OECD, 2023; Pena et al., 2025; UNESCO, 2022a), and academic researchers began to predict the negative impacts of the pandemic on students' educational outcomes. As an example, with the extended school closures in 2020, Di Pietro et al. (2020) predicted the pandemic would have adverse impacts on students' educational outcomes, and that these impacts would be greater for students living in more challenging contexts. Further, the negative impacts would extend beyond academic outcomes (e.g., non-cognitive traits, health and well-being, health outcomes). Subsequently, Di Pietro (2023) conducted a meta-analysis and found the average learning loss to be 0.19 of a standard

deviation across 19 countries. Learning losses were greater for math and science and less pronounced in Europe. Similarly, [Fahle et al. \(2024a\)](#) calculated that the average learning loss across the 30 US states they examined was equivalent to a half a year in mathematics and one-third of a year in reading. In their review of relevant literature, [Mazrekaj and De Witte \(2023\)](#) found consistent evidence of negative impacts of the COVID lockdowns across international jurisdictions on aspects of children's mental health.

A significant challenge to monitoring the initial impacts of the pandemic was that community and school lockdowns themselves also led to the postponement of assessments or other measures typically used by educational jurisdictions to monitor these outcomes (e.g., [Gallagher-Mackay & Brown, 2021](#); [NAE, 2021](#)). As schools reopened, school attendance continued to lag, and school leaders increasingly decided to not participate in external assessment programmes such as PISA or TIMSS so that they could maintain their focus on helping students “catch up” on anticipated learning losses. Nevertheless, data emerging since the onset of the pandemic illustrates the early predictions regarding the negative impacts of the pandemic on children's educational outcomes have largely been realised. International examples abound documenting lower achievement outcomes during and subsequent to the aftermath of the pandemic (e.g., [Bailey et al., 2021](#); [Giancola & Salmieri, 2024](#); [Khan & Ahmed, 2021](#); [Maldonado & De Witte, 2021](#); [Molato-Gayares et al., 2022](#)). Further, children and adolescents have reported higher levels of depression, reduced mental and physical health, anxiety, and lower school engagement (e.g., [Duncan et al., 2023](#); [Guariso & Björkman Nyqvist, 2023](#); [Michaud et al., 2022](#); [Neville et al., 2022](#)).

Unfortunately, the early predictions regarding the greater negative impacts of the pandemic on children from challenging contexts (e.g., learning challenges and disabilities, low socioeconomic status; migrant status, and rural and remote communities) also appear to have been realised ([Bartholo et al., 2023](#); [Bennett, 2023](#); [Betthäuser et al., 2023](#); [OECD, 2023](#); [UNESCO, 2022b](#)). As one example, [Fahle et al. \(2024b\)](#) reported that students in the USA recovered about one-third of the learning loss in mathematics due to the pandemic during the 2023 school year and about one quarter for reading. However, they also found that children from lower socio-economic backgrounds experienced greater learning losses and a larger recovery lag, resulting in greater achievement gaps. These negative impacts are likely greater for developing nations ([Alasino et al., 2024](#); [Guariso & Björkman Nyqvist, 2023](#)).

### **Quality of evidence for policy evaluation**

We are now in a global recovery phase from the pandemic, and governments have shifted their initial efforts to provide online resources and supports to children and families to now focus on bringing children's educational outcomes

back to pre-pandemic levels. As noted above, these efforts have been hampered by the ongoing impacts of the pandemic, including greater educational disparities, increased absenteeism, and increasing reports of mental health challenges (e.g., Fahle et al., 2024; Michaud et al., 2022; NCES, 2022; OECD, 2024; Volante et al., 2024). The PISA 2022 results provide further evidence of the extent of the academic declines, with the 2022 results having the largest four-year decrease in mathematics and reading ever observed, 15 points and 10 points, respectively (OECD, 2023a, 2023b). These same results also highlight the ongoing socio-economic disparities in student achievement, with the difference being an average of 93 points in mathematics between students in the highest and lowest socio-economic groups across OECD countries. One surprising finding from the 2022 PISA result is that the socioeconomic achievement gap was the same in 2018 and 2022 across 75% of the countries (OECD, 2023a, 2023b).

As with the efforts to monitor student outcomes during the initial “disruption” phase of the pandemic, challenges remain with administration and participation of students in national and international assessment measures. The OECD reports slightly higher than desired exclusion rates for schools and lower levels of school and student response rates, with the student response rates typically being the most problematic (OECD, 2023a). It is most likely these exclusions and non-responses are biased towards lower socio-economic communities, schools, and students. This may partially explain the contradictory findings regarding the achievement gap as reported by PISA in comparison to other emerging research findings.

Collectively, these ongoing data issues negatively impact efforts to assess the effectiveness of educational policies during both the disruption and the recovery phases of the pandemic. As a result, academic researchers have been instrumental in guiding the directions for these policy interventions, relying on emerging and existing research on cognitive and non-cognitive development, student belonging and engagement, and health and well-being research, much of which had been of interest prior to the pandemic (Farrington et al., 2012; Freeman et al., 2011; Whitty et al., 1998). Such research has been critical in addressing the pandemic impacts on students’ physical health and well-being and mental health and identifying the supports most likely to effectively ameliorate the negative impacts of the pandemic.

Policy responses to the pandemic have certainly focused on students’ learning losses, and this is a continued focus. During the disruption phase of the pandemic, educational policies were directed at supporting both students and teachers, acknowledging the challenges of the pandemic on teaching and learning. Governments directed resources to support student recovery. As an example, the federal government in the USA dedicated \$190 billion in pandemic relief funds towards schools, with the vast majority going to Title 1 schools (low-income schools) (Fahle et al., 2023). Interestingly, Fahle et al. concluded

that the directed funds (which were not fully spent by 2023) could not account for the observed post COVID recovery in educational outcomes.

The supportive tone appears to be changing as emerging data from national and international assessments and surveys highlight ongoing lower levels of academic outcomes relative to pre-pandemic levels. In response, governments are mandating instructional methods, especially for mathematics and literacy (e.g., Junell, 2023; Stanford, 2024). At the same time, additional resources that were directed to education during the disruption phase and first year of the recovery phase are declining or being phased out. Given the continued challenges across cognitive and non-cognitive domains, along with physical and mental health, the declines in resources will likely further hamper efforts to mitigate the ongoing and long-term impacts of the pandemic. In the case of the USA, the shift in tone described above has also been closely related to its political climate. Since the 2024 election, educational policies in the USA have veered sharply and often unpredictably, making it unreasonable to include the USA in a current effort to conduct a policy evaluation.

The negative effects of the pandemic on learning, physical health and well-being, and mental health continue to confound educational policymakers. The challenge for researchers and policy makers is even more pronounced in the presence of economic instability, increasing military conflicts, global migration, and the emergence of new technologies. There is no longer a possibility for a return to a pre-pandemic “normality” for education across the globe. Nevertheless, understanding the effectiveness of educational policy interventions that ameliorate these long-term cognitive and non-cognitive outcomes is a pressing concern for policymakers around the world.

### **National profiles**

As with any edited volume, difficult choices need to be made to ensure that the book provides the reader with sufficient scope within a coherent structure. The present analysis considers industrialised Western nations that have a history of cooperation on economic issues – which unsurprisingly also include education, training, and human-related capital considerations. More specifically, our volume included national profiles representing England, France, Germany, Italy, Sweden, the Netherlands, Belgium, Canada, and Japan. Collectively, these countries offer the reader important insights from national contexts in parts of North America, Europe and Asia– without the pervasive methodological challenges that undoubtedly arise when comparing global north to global south nations. It is also worth noting that these countries have a long history of participation in international assessment programmes and also possess robust national administrative data that is publicly available. The latter affords researchers and policy analysts unique opportunities to juxtapose reliable achievement results against enacted education policies.

As previously suggested, the pandemic had a disruptive effect on the administration of national large-scale assessments and the collection of administrative data (Schnepf et al., 2024; Volante et al., 2022). However, these challenges are significantly more pronounced in developing countries, which also struggle with ongoing challenges with data corruptibility (Singh, 2020). Hence, the possible inclusion of developing nations within the current analysis is particularly challenging. That is, it becomes extremely difficult to draw valid comparison between industrialised and developing nations that have vastly different educational system structures, student enrollment and completion rates, monetary resources, and assessment data integrity to make reliable and valid conclusions about the impact of the pandemic-related policies. Indeed, it is common refrain amongst researchers that it is highly problematic to use a benchmark measure such as PISA to compare students from relatively rich modernised industrialised nations with youth from developing nations, who are likely preparing for different challenges in later life (Sjoberg, 2014).

### **Organisation of this volume**

As previously noted, governments around the world are faced with the challenge of assessing the short- and long-term consequences of the pandemic on their student population and developing and implementing policies to help ameliorate these challenges and promote academic resilience. To accomplish these dual objectives, they require timely data and research that evaluates the relative effectiveness of policy interventions. Organised into three parts, this edited volume attempts to contribute to the emerging literature base by examining the impact of the pandemic in a cross-section of ten of the largest economies in the world. More specifically, **Part I** considers the global impact of the pandemic on both cognitive and non-cognitive student outcomes by considering recent cross-national achievement survey results. The introductory chapter also provides an underlying rationale for the selection of cases and the contribution this volume makes to broader literature.

**Part II** examines the impact of the pandemic on student learning outcomes as well as the effectiveness of national interventions utilised in England, France, Germany, Italy, Sweden, the Netherlands, Belgium, Canada, and Japan. Collectively, these countries are prominent industrialised nations that consult on a range of economic and financial matters. Overall, the national profiles provide a critical analysis of the relative effectiveness of education policies enacted in response to the global pandemic – particularly in relation to both cognitive and non-cognitive outcomes for at-risk student populations.

**Part III** serves as a conclusion that evaluates the long-term efficacy of policy reforms in the aftermath of the pandemic. The final chapter attempts to understand why particular policy interventions have been more or less effective by considering both the national context and the available empirical evidence. It offers suggestions for future research to address potential gaps in the available.

## **Organisation of national profiles**

To facilitate comparisons across national profiles, each of the chapters in part II of the book will be organised around the following four sections. This first section of each profile provides a brief overview of the structure of compulsory K-12 school systems within a given country. The reader will understand the general organisation and institutional features of the compulsory school system and general governance structures used within the education system. The introduction also provides a brief overview of some of the more prominent recovery policies implemented to mitigate learning losses.

This second section describes the participation and general performance pattern in relation to national and international assessments (i.e., PISA), both prior and during the pandemic. This section quantifies the degree of “learning losses” experienced in the aftermath of the pandemic, along with large-scale surveys that capture non-cognitive outcomes (i.e., socioemotional skills, growth mindset). Where possible, this section quantifies the “learning loss” in terms of standard deviations using impact evaluation/comparison of progress to that of previous student cohorts, etc.

The third section provides a more detailed analysis of national recovery policy interventions and reforms enacted to support K-12 students in the aftermath of the pandemic. It includes a description of the specific features of the various policy reforms and juxtaposes these interventions against the established and emerging empirical literature.

The final section provides an impact analysis of K-12 policy reforms – with an emphasis on the most vulnerable student groups within each nation. Similar to the second section, the conclusion discusses whether students caught up and how big the remaining learning loss is five years after school closures. The final section also offers an overall assessment of the effectiveness of the recovery policies and offers insights and recommendations for policymakers in relation to cognitive and non-cognitive student development.

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## **Part II**

# **National profiles of academic resilience and policy reform**



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## 2 Academic resilience and policy reform in England

*Oleg Badunenko*

### Introduction

The COVID-19 pandemic caused widespread disruptions in education globally. Schools worldwide closed in 2020 to contain the virus's spread. Some countries quickly reopened in 2021, while others extended closures for longer periods (Alasino et al., 2024; Patrinos, 2023). For instance, the Netherlands exemplified a “best-case” scenario, with a relatively short lockdown (Engzell et al., 2021). Sweden, on the other hand, adopted a more lenient approach, transitioning to online instruction for upper-secondary schools while keeping younger students' schools open initially (Vlachos et al., 2021). The pandemic has had a profound and far-reaching impact on student outcomes, affecting both cognitive and non-cognitive aspects of education (The Guardian, 2024, September 9). Understanding the educational losses incurred due to COVID-19 and school closures is crucial because such losses can lead to substantial national income losses in the long run (Jakubowski et al., 2025). Workers who have experienced past recessions often face persistent earnings losses and reduced employment (Oreopoulos et al., 2012).

This chapter will first provide an overview of the structure of compulsory school systems in England. Next, it will analyse the academic performance of students between 2018 and 2022 using the results of the Programme for International Student Assessment (PISA) tests. The analysis will be conducted across three subjects and will also consider variations in performance scores by sex, socio-economic status, and region. Subsequently, the chapter will introduce and discuss key recovery policies to mitigate learning losses. Finally, the chapter will assess the effectiveness of these policies and conclude with an open-ended discussion of potential future directions.

In England, the compulsory school system is structured to provide a comprehensive education, equipping students with the knowledge and skills required for higher education, employment, or vocational training. The system ensures that children receive an education from ages 5 to 18, following a structured framework that supports progressive learning and development. The system

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begins with the Early Years Foundation Stage (EYFS) for children aged 3 to 5, where nursery education is optional but often funded by the government, and reception marks the first year of primary school. Primary education, covering ages 5 to 11, is divided into Key Stage 1 (years 1–2) and Key Stage 2 (years 3–6), with students undertaking Standard Assessment Tests (SATs) in English and Mathematics at the end of Key Stage 2. Secondary education spans ages 11 to 16 and consists of Key Stage 3 (years 7–9) and Key Stage 4 (years 10–11), closing with the General Certificate of Secondary Education (GCSE) examinations across multiple subjects. Post-16 education is mandatory until age 18, with students selecting one of three pathways: A-Levels, which serve as a prerequisite for university admission; vocational qualifications such as BTECs or T-levels, which focus on practical skills; or apprenticeships that integrate work-based training with academic study.

Regarding the types of schools, state-funded schools include Local Authority (LA)-maintained schools, which follow the national curriculum and are managed by local councils. Academies and free schools operate independently but receive government funding and have greater curriculum flexibility. Grammar schools are selective institutions requiring students to pass the 11+ exam for admission. Special schools cater specifically to students with Special Educational Needs and Disabilities (SEND), providing tailored support and education.

In terms of governance of education in England, the school system operates under a partially decentralised structure. While the Department for Education (DfE) sets national education policies, curriculum standards, and funding frameworks, schools have varying degrees of autonomy depending on their type. LA-maintained schools are more centrally regulated, following the national curriculum and being overseen by local councils. In contrast, academies and free schools have greater independence, as they receive funding directly from the government and can set their own curricula. School quality and assessments are monitored by Ofsted, which inspects educational institutions, and Ofqual, which regulates qualifications such as GCSEs and A-Levels. This mix of central oversight and school-level autonomy makes England's system semi-decentralised (Turner, 2004).

In response to COVID-19-related learning losses, England implemented several key recovery policies to support students (Department for Education, 2024, September 6). The National Tutoring Programme (NTP) was introduced to provide subsidised one-on-one and small-group tutoring for disadvantaged pupils, aiming to close attainment gaps (Department for Education, 2023, December 14). Recovery Premium Funding was allocated to schools to offer targeted academic support, with additional resources for students most affected by disruptions (Department for Education, 2023, June 23). The Education Recovery Plan extended funding for teacher training and professional development to enhance instructional quality. To support early learning, summer schools were established for secondary students transitioning to Year 7, focusing on

core subjects and well-being. Additionally, the government invested in Oak National Academy, a platform offering online lessons to supplement in-class instruction. Schools were also encouraged to implement flexible learning strategies, including extended school hours and catch-up sessions. These policies generally aimed to address lost learning time, support academic recovery, and reduce long-term educational inequalities worsened by the pandemic (Darmody et al., 2021).

### **National administrative data**

England participates in national and international assessments, such as the PISA. This allows for comparisons of the performance of 15-year-olds not only within a single nation but also across multiple countries. PISA has been collecting data in waves since 2000. The two recent surveys conducted in 2018 and 2022 enable comparisons of academic performance before and after the COVID-19 pandemic (Department for Education, 2023, December). It is evident that the pandemic had a negative impact on academic performance (as documented in, e.g., Baird et al., 2023). It resulted in both “learning loss” and the widening of the “learning gap” among students (Darmody et al., 2021). However, governments have taken steps to counteract this by implementing policies to support learning and mitigate the adverse effects of the COVID-19 pandemic on learning loss. These policies include recovery efforts that will be detailed below. England’s performance remained above the G7 average, indicating resilience in its education system (Fiscal Studies 2024); however, a more detailed analysis is required to conclude about performance in subpopulations. We start by discussing the overall academic performance and then take a nuanced approach to consider the PISA scores by students’ characteristics such as sex and socioeconomic status and also distinguish regional differences.

A word of caution should be said about the construction of unbiased measures of academic performance. The PISA survey gives “plausible values” in three subjects: mathematics, reading, and science. PV1MATH represents Plausible Value 1 (PV1) in Mathematics, one of multiple imputed values used in PISA to estimate student proficiency. Since PISA tests only a subset of possible questions, it assigns plausible values (PV1 to PV10) instead of a single score to account for measurement error and uncertainty. Operating with multiple plausible values improves statistical validity by preventing bias and providing more accurate population estimates. PV1 is not the only measure that is analysed in what follows. Instead, for each subject, all ten plausible values are used to compute a simple arithmetic average for accurate statistical analysis and meaningful comparisons. For mathematics, the score is calculated as the average of PV1MATH to PV10MATH. The reading score is calculated as the average of PV1READ to PV10READ. Finally, the science score is calculated as the average of PV1SCIE to PV10SCIE.

Approximately 5000 students are surveyed in each wave.<sup>1</sup> The Department of Education makes sure the survey is representative by defining strata and drawing schools that participate in the survey. Students come from approximately 165 schools in the three waves, which is approximately 5% of all secondary schools in England (Department for Education, 2024, June 6).

Even though the interest lies in comparing the scores prior to the pandemic and right after it started to fade away, it is informative to also look at the trend that started in 2015. The analysis of the evolution of the distribution of mathematics scores for all students across England reveals that there are no marked differences between the distributions in 2015 and 2018. There was virtually no change from 2015 to 2018 in the mean mathematics score. The mass of distribution of mathematics scores in 2022 has shifted to the left, implying that more students have performed worse in 2022 (average score of **496**) than they performed in 2018 (average score of **504**).

To compare changes over time or between countries in a consistent way, the change in average values can be standardised by expressing it in units of standard deviation. This is done by subtracting the average in the earlier period from the average in the later period and dividing the result by the pooled standard deviation. The pooled standard deviation accounts for the variability in both periods and is calculated using the sample sizes and standard deviations from each year. Specifically, it is the square root of the weighted average of the two variances, weighted by their respective degrees of freedom (sample size minus one for each year), and divided by the total degrees of freedom (the sum of both sample sizes minus two). This method allows for interpreting changes in terms of effect size, independent of scale. Thus, the decline in mathematics scores from 504 to 496 (over the pandemic) constitutes a decline of 0.081 standard deviations. This occurred against the backdrop of an average mathematics score increase of 0.02 standard deviations from 2015 to 2018.

The decline in reading proficiency was approximately half of that observed in mathematics (in absolute terms, the average score in reading dropped from 505 to 500). Notably, in contrast to mathematics, the average performance in reading has begun to decline since 2015. In absolute terms, the average score in reading decreased from 509 in 2015 to 505 in 2018 and further to 500 in 2022. Moreover, the distribution of reading scores has shifted to the left compared to before the pandemic. The reading score decreased by 0.046 standard deviations from 2015 to 2018 and by a further 0.044 standard deviations from 2018 to 2021.

Just like the reading scores, the science scores also experienced a decline. In fact, the average score between 2018 and 2022 remained relatively unchanged, fluctuating only slightly from 507.1 to 506.8. This standardised decline is a mere 0.0025. However, it's worth noting that the science score did decline significantly in 2015, dropping from 523 to 507 in 2018. This represents a substantial plummeting of 0.16 standard deviations.

The documented learning losses are comparable to those reported in the literature. For instance, [Alasino et al. \(2024\)](#) present evidence of substantial learning losses and partial recovery in Guanajuato, Mexico, during and after the school closures due to the COVID-19 pandemic. On average, students performed 0.2 to 0.3 standard deviations below the expected performance in Spanish and mathematics after schools reopened. [Carlana et al. \(2023\)](#) also find smaller but still significant average learning losses, averaging 0.14 standard deviations in mathematics and 0.05 standard deviations in reading in Italy. Students in the Netherlands were learning less during lockdown compared to a typical year. These losses are evident across all three subject areas: maths, spelling, and reading, for all age groups. The loss relative to the pre-pandemic period is approximately 0.08 standard deviations ([Engzell et al., 2021](#)). In Mexico, by June 2023, students had made up for approximately 60% of the learning loss accumulated during school closures but still scored 0.08–0.11 standard deviations below their pre-pandemic levels ([Alasino et al., 2024](#)).

Students' PISA scores in mathematics, reading, and science were analysed by sex and socioeconomic status (SES), including regional analysis. Throughout all years, girls consistently outperformed boys in mathematics and science. Notably, both boys and girls experienced an improvement in mathematics performance between 2015 and 2018. However, the COVID-19 pandemic had a detrimental impact on both genders. Similar findings are presented by [Sahu et al. \(2024\)](#). The entire distribution of scores shifted to the left. In science, the decline in boys' performance was gradual over time, while the pandemic did not affect girls' performance in science. In fact, the distribution of science scores for girls slightly shifted to the right from 2018 to 2022. In reading proficiency, despite boys outperforming girls, there was a consistent decline in performance for both groups. Alarming, the entire distribution of reading scores moved to the left from 2015 to 2022.

The PISA survey assesses a student's economic, social, and cultural standing. The resulting index is standardised to ensure comparability over time and across countries. The overall social, economic, and cultural status of the country has declined since 2018. This decline is likely attributable to post-pandemic effects, as distributions prior to 2018 remained relatively stable, suggesting that most of the deterioration occurred after the onset of the pandemic. Three groups were formed based on economic, social, and cultural status. The group labelled "low" includes students whose status falls below the first quartile or those from socio-economically disadvantaged backgrounds. The group labelled "high" includes students whose status is above the third quartile. Students whose status falls between the first and third quartiles are labelled "middle." Students from relatively disadvantaged socio-economic backgrounds performed worse than those from relatively less disadvantaged backgrounds across all three subjects. Unequal learning loss is also reported for the US schoolchildren ([Peters et al., 2024](#)). When comparing the difference in performance between the most and

least disadvantaged students, the performance gaps in England have widened whereby the performance of the most disadvantaged students declined by 0.019 standard deviations, while the performance of the least disadvantaged students increased by 0.0113 standard deviations (Sumdog, 2022). Even though the standardised loss was the largest in the middle group (0.053), in absolute terms, they still outperformed those from relatively disadvantaged socio-economic backgrounds. In reading proficiency, except for the middle group students, actual performance improved in 2022 compared to 2018. We find that the distribution for all three economic, social, and cultural state groups shifted to the right. Notably, the middle group experienced a decrease in the number of worst performers, resulting in a lower mean of 502 from 504 in 2018, or a 0.029 standard deviation decline. The trend in academic performance in the sciences is particularly noteworthy. Across all three groups, performance declined from 2015 to 2018. However, this downward trend reversed, and all three groups demonstrated improved performance in the post-pandemic period. The low and middle groups gained approximately 0.025 standard deviations, while the least disadvantaged students made a remarkable improvement of 0.21 standard deviations in their science performance.

Students from high socio-economic status have shown significant improvement in their academic performance across all three subjects. In mathematics, they have increased their scores by 0.113 standard deviations, in reading by 0.13 standard deviations, and in science by 0.21 standard deviations. This improvement highlights the widened gap between the most and least disadvantaged students (Blaskó et al., 2022). Notably, the gains or losses experienced by students in both low and middle socioeconomic groups remained relatively unchanged (The Guardian, 2024, August 22). The rapid transition to online instruction did not negatively impact student performance, as evidenced by the findings of Cavanaugh et al. (2023). However, this positive outcome was contingent on the students' access to digital devices. The improved performance observed in the least disadvantaged students can be attributed to better access to computers. The COVID-19 pandemic has revealed acute digital inequality in both developed and developing countries. The findings support the recommendation that institutions and instructors should embrace a diverse range of delivery modes in the future (Cavanaugh et al., 2023).

These closures that happened during the COVID-19 pandemic have likely had a negative impact on student learning and well-being, especially for students from disadvantaged backgrounds. The pandemic is a stressful life event, which resulted in extended home confinement, grief, intrafamilial violence, and overuse of the Internet and social media. All these factors worsened the mental health of adolescents during this period (Guessoum et al., 2020). The severity of symptoms, risk behaviour, and patterns of socialisation, for students are rather difficult to estimate (Vlachos et al., 2021). School closures had a negative effect on the social-emotional well-being of students who were not

interacting with their peers. Even in the best times, during holidays the amount of interaction goes down, which has an effect on children's well-being (Eames et al., 2011). The pandemic and home confinement have made this problem worse.

The pandemic widened pre-existing gaps by SES. For instance, Carlane et al. (2023) find that students in Italy in the bottom quintile of SES learnt 0.21 standard deviations less in math and 0.10 standard deviations less in reading. Additionally, they show that learning losses for immigrant students in math are larger than those for native ones. In the Netherlands, disadvantaged students are disproportionately affected. Among less-educated households, the learning slide is up to 60% larger than in the general population (Engzell et al., 2021).

The PISA survey is conducted in predefined regions: North, Midlands, South, and Greater London. We first notice that the performance in the three subjects was quite similar in the North, Midlands, and Greater London areas in 2018. In contrast, academic performance at Southern schools was significantly better. Changes in academic performance across England's four regions, expressed in standard deviation units, reveal varying trends between 2018 and 2022. In mathematics, the North saw a slight decline of 0.055 standard deviations, the Midlands declined by 0.117, and the South experienced the largest drop of 0.168. In contrast, Greater London showed a notable improvement of 0.168 standard deviations. In reading, the declines were generally smaller: the North and Midlands recorded modest decreases of 0.026 and 0.041 standard deviations, respectively, while the South declined by 0.119. Again, Greater London bucked the trend, improving by 0.115 standard deviations. For science, performance remained relatively stable or improved. The North improved slightly by 0.032 standard deviations, the Midlands saw a minor decline of 0.045, and the South declined by 0.058. Notably, Greater London showed a substantial improvement of 0.201 standard deviations. In 2022, the South of England still outperformed other regions while experiencing the most pronounced declines, particularly in mathematics and reading. The standardised results suggest that Greater London consistently improved across all three subjects. The North and the Midlands continue to lag behind, highlighting the persistent academic performance gap in England. These disparities have persisted significantly since the pandemic, with students in northern and midlands England generally underperforming compared to their southern counterparts (The Guardian, 2024, August 15). During the COVID-19 pandemic, students in Greater London demonstrated improved academic performance. Several key factors likely contributed to this resilience. Greater access to digital learning resources and high-quality schools facilitated effective remote learning, particularly compared to other regions (Cheshmehzangi et al., 2022). Additionally, well-regarded schools that adapted swiftly to remote learning, maintained high educational standards, and fostered increased parental involvement and targeted policy interventions

may have helped mitigate learning disruptions. These factors collectively contributed to the relative academic resilience observed among London students during the crisis ([The Times, 2024](#)).

### **Non-cognitive effects of the COVID-19 pandemic**

The effects of the pandemic go beyond reduced academic performance. Even though some impacts are invisible, and they don't directly relate to academic performance, they change lives by affecting emotions, behaviours, social development, and mental well-being. The COVID-19 pandemic significantly impacted the mental health of school pupils, introducing a range of psychological challenges ([Stiebahl & Lally, 2024](#)). Many students experienced increased levels of anxiety and depression, driven by prolonged uncertainty, social isolation, and the disruption of daily routines – particularly during lockdown periods. The non-cognitive effects were disproportional by sex. Girls and individuals who initially showed low risk for mental health issues experienced more significant declines in well-being during the pandemic ([Montero-Marin et al., 2023](#)). These emotional strains were often compounded by sleep disturbances. In more severe cases, some pupils faced grief and trauma, having lost loved ones or lived through highly stressful environments at home. [Holt-White et al. \(2022\)](#) document that psychological distress was particularly high among young individuals who had severe COVID-19 infections, had to isolate, faced food insecurity, or experienced personal losses during the pandemic. Notably, approximately two-thirds of children with severe long COVID-19 reported high levels of psychological distress. [Montero-Marin et al. \(2023\)](#) show that during the pandemic, cases of depression increased by 8.5%, compared to just 0.3% in the pre-pandemic group. Similarly, high or very high social, emotional, and behavioural difficulties rose by 7.9% during the pandemic, versus 3.5% before. Overall, possible or probable mental health difficulties increased by 12.8% in the pandemic group, compared to 4.5% in the pre-pandemic cohort.

The pandemic has negatively impacted students' social and emotional development, including delays in acquiring social skills. Limited peer interaction reduced opportunities for building interpersonal abilities. Emotional regulation also became more difficult for some students, particularly in the absence of consistent in-person support and guidance. [Jessiman et al. \(2022\)](#) suggest that school staff aiming to foster student mental health through school culture may be more effective if they recognise this interdependence and address all dimensions of well-being (structure, academic, community, and safety) together.

Finally, the pandemic intensified inequities and stigma among students, with some experiencing shame or embarrassment due to illness or family financial hardship ([Bhanot et al., 2021](#)). These effects disproportionately impacted pupils from disadvantaged backgrounds, widening existing socio-emotional gaps and deepening pre-pandemic challenges ([Galasso & Watts, 2022](#)). The attainment

gap between disadvantaged primary school pupils and their peers has grown (Weidmann et al., 2021).

### **Education policy reforms**

The pandemic brought about unprecedented disruptions to education, resulting in substantial learning losses. While the above analysis focused on 15-year-olds, the decline in academic performance was evident across different levels of education. For instance, in primary education, in 2024, only 61% of pupils in England achieved the expected standards in reading, writing, and mathematics. Although this represents a slight improvement compared to the previous year of 2023, it still falls short of the 65% benchmark set in 2019 (Woolcock, 2024, July 9). To mitigate the impact of the COVID-19 pandemic, various recovery policies were implemented. These policies targeted different stages of education, prioritising catch-up funding, tutoring, teacher training, and mental health support. To provide a comprehensive overview, it is useful to discuss these policies across various educational stages.

In response to the COVID-19 pandemic's impact on early years education (ages 3–5), England implemented several key recovery policies, seeking to strengthen early childhood education and equip educators with the necessary skills and resources to support young learners' development post-pandemic (National Audit Office, 2023, June 7). £180 million was invested to improve children's development in the early years (Department for Education, 2022, October 20). One major initiative was the Early Years Education Recovery Programme, which provided funding for workforce training, professional development, and resources to support early learning, particularly in language, literacy, and mathematics (Department for Education, 2024, October 20). Additionally, the Early Years Professional Development Programme (EYPDP) – “Building on Success” aimed to enhance practitioner skills to improve children's outcomes, focusing on communication and numeracy skills critical for school readiness (Education Development Trust, 2021). The government also introduced Education Recovery Support, which allocated financial aid to early years providers to address learning gaps and ensure quality provision in disadvantaged areas (Department for Education, 2024, October 20).

The key recovery policies for primary education (ages 5–11) included several policies. The NTP provided subsidised one-on-one and small-group tutoring for disadvantaged pupils, focusing on core subjects such as maths, English, and science (Department for Education, 2023, December 14). Delivered by trained tutors and external tuition partners, the NTP aimed to mitigate learning losses and support academic catch-up. The Education Recovery Premium allocated £145 per disadvantaged pupil to schools, with funds used for catch-up lessons, additional teaching staff, and targeted intervention programmes to address educational disparities intensified by the pandemic (Department for Education, 2022,

March 23). Additionally, £17 million was invested in Phonics & Reading Catch-Up, focusing on early reading programmes and additional phonics screening for Year 1 and Year 2 pupils (National Literacy Trust, 2024).

England implemented several key recovery policies in secondary education (ages 11–16). The NTP was expanded to include primary school pupils, prioritising those at risk of falling behind and providing additional tutoring support. This is similar to primary education (students aged 5–11). To further support disadvantaged students, the Education Recovery Premium provided funds (£276 per eligible pupil in secondary schools), which schools used for extra tutoring, study support, and exam preparation (Department for Education, 2022, March 23). Although targeted more at secondary education, measures like the adaptation of GCSEs and the provision of formula sheets in maths and science were part of broader efforts to accommodate learning disruptions across all stages. Additionally, there was a focus on mental health and well-being through the expansion of Mental Health Support Teams (MHSTs) and training for teachers in mental health awareness, ensuring students received the necessary emotional support to thrive academically. England introduced the 16–19 Tuition Fund, a £324 million investment aimed at supporting post-16 students – specifically those enrolled in A-Level, T-Level, and BTEC courses. This funding facilitated small-group tuition sessions focusing on core subjects such as maths, English, and vocational studies, targeting students who were most in need of academic support to recover lost learning (Department for Education, 2024, September 16). Additionally, flexible grading for university admissions was introduced, whereby grade boundaries in 2021 and 2022 were lowered to reflect pandemic disruptions, and more emphasis was placed on contextual admissions, that is, considering students' learning environment.

Comparing recovery policies across education stages, early years (3–5) prioritised extra funding for nurseries and speech and language support. Primary education (5–11) focused on phonics and reading catch-up. Secondary education (11–16) prioritised GCSE adjustments, small-group tutoring, and mental health support. Post-16 education (16–18) shifted the focus to A-Level and BTEC exams by reducing their content. These recovery policies aimed to address (i) learning gaps, (ii) mental health concerns, and (iii) exam disruptions.

### **Impact analysis of policy interventions**

Evaluating policy interventions is already challenging, but evaluating nationwide policies is even more complex. One can hope that observing trends before and after the pandemic, as done in this chapter, provides evidence of the effectiveness of policy implementation. The analysis suggests that in certain categories, such as socio-economic status or gender, the pandemic did not significantly impair academic performance. Furthermore, the analysis of the distributions of scores in mathematics, reading, and science indicates that some negative trends

existed before the pandemic and that the pandemic did not make them much worse. Unfortunately, there is limited direct evidence available to evaluate the effectiveness of the introduced policies. However, these policies, such as the NTP and the 16–19 Tuition Fund, align with emerging empirical literature that suggests that targeted, small-group interventions and increased tutoring are effective strategies for mitigating learning loss (Carlana & La Ferrara, 2021). The expansion of mental health support through MHSTs also reflects growing recognition of the psychological impacts of the pandemic, consistent with studies that highlight the importance of mental well-being in academic recovery (Ramos-Monsivais et al., 2024). Unfortunately, the COVID-19 pandemic magnified the social gaps in education between students with high and low SESs (Blundell et al., 2022).

Many policies were implemented to address intangible aspects of education, such as the mental health and physical well-being of schoolchildren. However, evaluating the effectiveness of these policies requires access to more comprehensive data on students at all stages of education, which is currently not feasible using the PISA data. Additionally, it would be beneficial to combine these data with economic data on households, as the government has introduced policies that support both the mental and economic well-being of households. Consequently, combined policies are likely to have an impact on the mental and physical well-being of schoolchildren. There is a complex interplay between education, mental health, and economic factors. In the conclusions that follow, the directions for exploring these relationships are proposed.

### **Conclusion and future directions**

The COVID-19 pandemic has undeniably impacted educational outcomes in England, leading to learning losses and aggravating existing disparities. While there were efforts to mitigate these losses, such as catch-up programmes, the overall impact of the pandemic on student attainment has been profound. The results from the PISA tests presented in this chapter identify academic performance gaps, especially among disadvantaged groups. Using the PISA data allows providing only limited insights for policymakers for the effective implementation of measures for fostering an equitable and robust education system. For a better understanding of these challenges and to inform targeted recovery efforts, the natural extension would be using more detailed data. School and college performance is measured annually in England by the DfE<sup>2</sup>. The data is collected comprehensively on all schools in England. For example, in the year 2023/2024, the data on performance and other measures like absences is collected for 25,113 schools (including primary schools and secondary schools) against only 165 secondary schools in the PISA study. The data is at the school level, so no individual performances can be obtained in this data set. Even more detailed data is collected in the National Pupil Database (NPD). The NPD is a detailed repository containing

individual-level data on students attending schools in England. It includes information on demographics, attendance, attainment, and special educational needs. The database integrates data from multiple sources, such as the school census and exam results, enabling longitudinal tracking of student progress. A comprehensive analysis of educational outcomes can be performed to inform both academics and policymakers and implement effective decision-making for improvements of the educational system at all levels.

## Notes

- 1 The number of students participating in the PISA survey varied slightly across the years but maintained consistent regional proportions. In Greater London, participation increased from 670 students in 2015 to 742 in 2018 and 777 in 2022. The Midlands saw a slight rise from 1,614 in 2015 to 1,662 in 2018, followed by a decrease to 1,507 in 2022. In the North, the number of participants declined gradually from 1,482 in 2015 to 1,436 in 2018 and 1,352 in 2022. Similarly, the South experienced a steady drop from 1,428 students in 2015 to 1,333 in 2018 and 1,127 in 2022. Overall, total participation slightly declined over time, from 5,194 students in 2015 to 5,173 in 2018 and 4,763 in 2022. Importantly, despite these changes in absolute numbers, the representativeness of the sample remained stable, and the proportions of students from each region were consistent across all three survey years.
- 2 The data collected centrally can be accessed at the [gov.uk](https://www.compare-school-performance.service.gov.uk) portal in the section “Compare school and college performance in England” (<https://www.compare-school-performance.service.gov.uk/>).

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# 3 Academic resilience and policy reform in France

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## Introduction

The French education system is characterised by its centralised structure, primarily regulated by the Ministry of Education (*Ministère de l'Éducation nationale*). This unified framework ensures a standardised approach to education across the country to provide uniform quality and equal opportunities to all students. The ministry defines national curricula to ensure consistency in teacher qualifications and dictates educational standards. Regional and local authorities manage logistical aspects, including school infrastructure and resource allocation, despite having limited influence over core educational content.<sup>1</sup>

Compulsory education in France begins at the age of 3 and continues until age 16. It is divided into several distinct stages, each with its own educational objectives and requirements. The first stage is *école maternelle* (preschool education); this early childhood education stage caters to children aged three to six. It is designed to support the developmental milestones of young children and prepare them for formal schooling. The curriculum focuses on basic skills such as language development, social interaction, and motor skills. The second stage is *école élémentaire* (primary school), from grades 1 to 5, serving children aged 6 to 11. The primary education curriculum includes fundamental subjects such as French, mathematics, science, history, geography, and arts to provide students with broad knowledge and skills. The third stage is *college* (lower secondary school), serving students ages 11 to 15 (grades 6 to 9), with specialised curriculum in various subjects, including French, mathematics, science, technology, history, geography, and languages. In the first days of lower secondary education, all students take tests to assess their level of knowledge acquired at the end of primary education. At the end of *collège*, students take a standardised exam, which evaluates their achievements and readiness for upper secondary education. The fourth stage is *lycée* (upper secondary education) for students aged 15 to 18, encompassing grades 10 through 12. *Lycée* offers three main educational tracks: general, technological, and vocational. The general education track includes literature, science, and economics streams, culminating

in the *baccalauréat* examination, which is a critical qualification for higher education. The technological track emphasises technical and scientific subjects with practical applications, preparing students for various technological fields. The vocational track equips students with specific trade skills and professional competencies. From kindergarten to the end of upper secondary school, 11,996,600 students are enrolled in the French education system (authors' calculations from [MENJ, 2024](#)). In France, private schools accounted for 21.5% of lower secondary students' enrolment in 2019<sup>2</sup> ([Moulin, 2023a](#)).

In terms of academic performance, France has slightly outperformed the average of OECD countries in mathematics, reading and science over the years. Despite positive trends, various studies have demonstrated that socioeconomic factors significantly influenced educational performance in France ([Heidmann et al., 2023](#); [OECD, 2019](#); [Thorn & Vincent-Lancrin, 2021](#)), and this performance gap between advantaged and disadvantaged groups has widened after the pandemic ([OECD, 2023](#)).

With the onset of the pandemic in early 2020, the French government acted swiftly and closed schools nationwide to limit the spread of the virus, starting on March 17, 2020. This closure affected all educational institutions, from kindergarten to secondary school, leading to an immediate shift to remote learning ([Bonnéry, 2020](#)), resulting in negative consequences for students' learning. Using the difference-in-differences method with the pre-pandemic cohort as the control group and the pandemic-exposed cohort as the treatment group, [Heidmann et al. \(2023\)](#) highlighted that first-grade students experienced a decrease in performance of 0.15 standard deviations in reading and 0.1 in mathematics. This decline was more pronounced among students from less advantaged social backgrounds and those with weaker abilities at the start of primary school. According to [Barhoumi et al. \(2020\)](#), who surveyed students, teaching staff, and parents at the end of the first lockdown, a quarter of secondary school students frequently or very frequently had issues with connectivity or equipment during remote teaching activities. However, nearly 80% of school activities always or often require a computer. Additionally, there are significant disparities in the percentage of students who could be monitored according to their educational sector; for instance, teachers estimated that 19% of students in priority lower secondary schools were unable to be monitored compared to 4% in private lower secondary schools between March and May, 2020 ([Barhoumi et al., 2020](#)). Moreover, the COVID-19 pandemic also had other effects on students in France, such as a decrease in life satisfaction ([Hurel et al., 2023](#)), children's socioemotional well-being ([Pailhé et al., 2022](#)), and prosociality ([Terrier et al., 2021](#)). Beyond these aspects, it also affected their early career trajectories after completing their studies, particularly their transition into the labour market ([Issehnane & Moulin, 2024](#)).

The COVID-19 pandemic created unprecedented challenges for the French education system, exacerbating pre-existing inequalities and disrupting

learning on a national scale. France's centralised structure allowed for a swift and coordinated response, with a key priority being to minimise school closures. Unlike many other countries, French schools were closed for a comparatively short period (De Witte & François, 2023). During the pandemic, emergency measures included the rapid deployment of the digital platform *ma classe à la maison* to ensure educational continuity, the *vacances apprenantes* programme to support vulnerable students during school holidays, the *devoirs faits* initiative for voluntary homework assistance, and the *stages de réussite* programme, which offered intensive tutoring sessions during school breaks to help students catch up on core subjects. Post-pandemic, the focus shifted to recovery and long-term reforms to address learning losses and reduce inequalities. Efforts included expanding digital infrastructure, implementing targeted academic support, and fostering innovative teaching practices to improve resilience. These measures sought not only to mitigate the immediate effects of the pandemic but also to build a more equitable and adaptable education system.

This chapter evaluates the impact of the pandemic on the French education system and the effectiveness of policies implemented during and after the crisis. By examining learning losses, equity issues, and the outcomes of remedial measures, it sheds light on lessons learnt and identifies steps to enhance the system's resilience and ability to address future challenges.

### **National administrative data**

During the spring of 2020, the schools were closed to an unprecedented extent to minimise the spread of SARS-CoV-2 and illness due to COVID-19. Globally, 94% of students were affected by school closures during the pandemic (United Nations, 2020). The effectiveness of these extreme measures in reducing transmission is still unclear (Domenico et al., 2020; Wu et al., 2021). School closure led to the interruption of face-to-face contact between teachers and students, fundamental supports that the school offers to the students and other critical aspects of schooling, which include many important components of students' socialisation process, such as interaction with classmates, teachers, and friends, extracurricular activities at school, and playground access. These activities help to support students' mental and emotional well-being and the development of their socioemotional and non-cognitive skills (García & Weiss, 2020; Sternadel, 2021). School closure has had a range of adverse outcomes on students' well-being, including feelings of loneliness, anxiety, stress, and suicidal thoughts (Mazrekaj & De Witte, 2024) that impacted hyperactivity, peer relationship difficulties, and emotional learning skills (Farrell et al., 2023; Viner et al., 2022). A systematic review study based on 41 observational studies from six European and seven other countries reported that higher rates of loneliness during the first

wave of the pandemic were associated with higher depression chances among children and adolescents (Farrell et al., 2023). Another systematic review study disclosed a reduction in physical activities and a rise in sedentary activities during the pandemic, which worsened the mental health of students (Viner et al., 2022).

The aim of this section is to determine the extent of learning loss experienced by students during COVID-19. This section also tried to elicit and analyse the effect of COVID-19 on students' well-being. The Programme for International Student Assessment (PISA)<sup>3</sup> data was utilised to determine the extent of learning loss and the reported level of non-cognitive skills by students during COVID-19.<sup>4</sup> We used four rounds of PISA data (2012–2022), and the sample included 23,799 students participating in four rounds of the survey. All the analyses were carried out using weight. The outcome variables for academic performance were mathematics, reading, and science scores. The outcome variables for non-cognitive skills were growth mindset, sense of belonging, loneliness, awkwardness, and exclusion.

Figure 3.1 illustrates the trends of mathematics, reading, and science scores in France and the average of 23 OECD<sup>5</sup> countries from 2000 to 2022. Overall, 2022 results were among the lowest ever measured by PISA in all three subjects, although the long-term trajectory differs across the subjects. The largest decline was observed in mathematics, and the average score in mathematics dropped by 21 points in 2022, which was almost stable between 2006 and 2018. In contrast, the fall in reading and science started in 2012. The mean score for France was 474 in mathematics, 474 in reading, and 487 in science, as opposed to 480, 482, and 491 in the respective subjects in the OECD countries that took part in the 2022 PISA survey.

Data from different survey rounds has been combined into a panel dataset that allows for comparison over different periods. Based on the content of the tests, we consider two different time periods for analysis: the years 2018 and 2022 can easily be compared in all subjects since the exact test was administered in these two years and thus represents the strongest sample. To account for time trends over the years and increase the statistical power, we extend the sample to 2012 and 2015. We standardised outcome variables to a mean of 0 and a standard deviation of 1. To precisely quantify the learning losses, we developed two statistical models: (i) linear regression, following the methodology used by Maldonado and De Witte (2022), and (ii) Inverse Probability Weighting (IPW). To explore the heterogeneity, we predict the learning loss by significant interaction terms with the dummy of COVID-19 and gender, and socioeconomic status (ESCS)<sup>6</sup>. Further, we estimate the average treatment effect, or average treatment COVID-19 effect on learning outcomes using propensity scores as an IPW technique (Omoeva et al., 2018). We use logit regression analysis to understand the COVID-19 effect on non-cognitive skills.

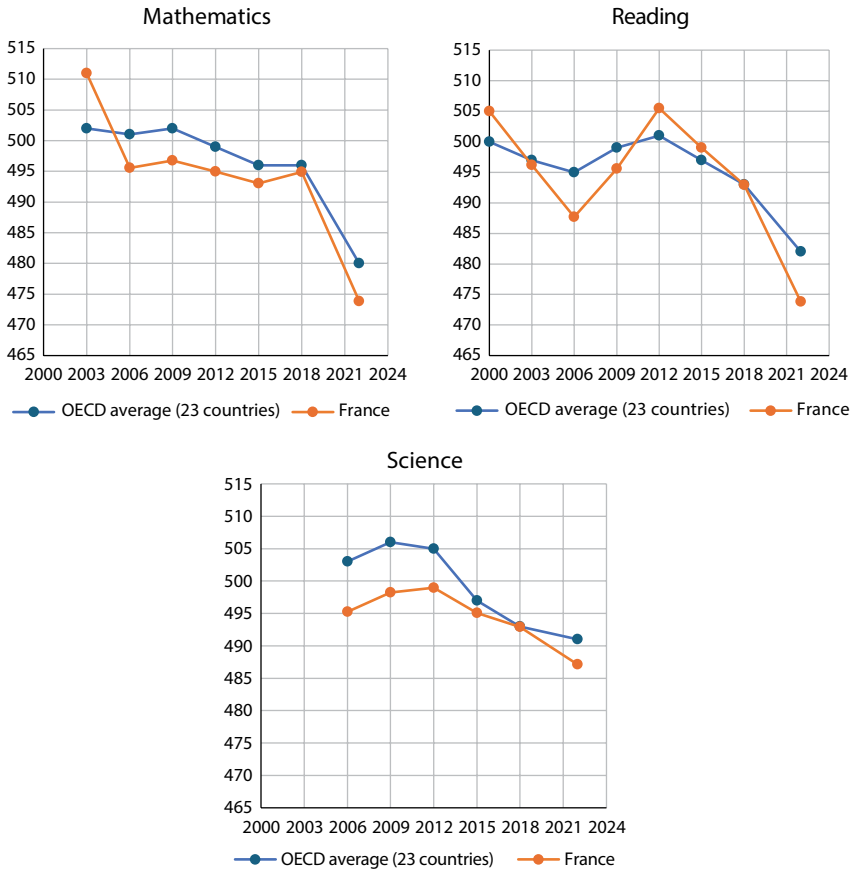


Figure 3.1 Trends of study performance among 15-year-old students in France and an average of 23 OECD countries, 2000–2022

Note: This figure illustrates the evolution of scores in mathematics, reading, and science since 2000 in France and 23 other OECD countries.

Source: <https://oecdch.art/a40de1dbaf/C136>.

Table 3.1 represents the estimated impact of COVID-19 on students’ standardised test scores in mathematics, reading, and science using two different statistical methods. The two panels present the results for the two different sub-samples. In each panel, COVID-19 was identified as the coefficient for the year 2022. The first column shows a significant negative impact on mathematics across the sub-samples. For 2018–2022, COVID-19 led to a  $-0.232$  drop in mathematics performance compared to the students who participated in the standardised test in the 2018 cohort ( $-0.235$  for IPW). Using 2012–2022 cohorts, we found a slightly

Table 3.1 The impact of COVID-19 on learning outcomes

Subject/ cohort	Math (1)		Reading (2)		Science (3)	
	Regression	IPW	Regression	IPW	Regression	IPW
<b>2018–2022</b> COVID-19	–0.232*** (0.035)	–0.235*** (0.035)	–0.192*** (0.034)	–0.195*** (0.034)	–0.069* (0.035)	–0.072* (0.034)
<b>2012–2022</b> COVID-19	–0.269*** (0.026)	–0.263*** (0.027)	–0.294*** (0.027)	–0.289*** (0.028)	–0.140*** (0.028)	–0.137*** (0.028)

Note: This table presents the results of assessing the impact of the COVID-19 pandemic on student learning outcomes in mathematics, reading, and science using two statistical methods: linear regression and inverse probability weighting (IPW). The analysis covers two distinct time periods: 2018–2022 and 2012–2022. Gender, immigration status, language at home, ESCS, school location, class size, and student-teacher ratio were included while estimating the linear regression and IPW. Significance levels: \*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001.

Source: Authors’ processing of OECD PISA 2012–2022 data.

larger negative impact, with a –0.269 points decline in regression and –0.263 in IPW. The second column shows results for the standardised reading scores. Compared to the students who participated in the standardised test in the 2018 cohort, the 2022 cohort has a decrease in reading scores with –0.192 in regression and –0.195 in IPW. Using 2012–2022 cohorts, we show a larger negative impact with an effect size of –0.294 in regression and –0.289 in IPW. The third column shows results for standardised science scores. The results were less pronounced for the 2018–2022 cohort compared to mathematics and reading. The effect was found to be negative, with an effect size of –0.069 in regression and –0.072 in IPW. Using the 2012–2022 sample, the effect of COVID-19 is –0.140 in regression and –0.137 in IPW (see Table 3.1). Thus, the school closures impeded students’ learning to some extent in all the study domains over the study period.

Further, heterogeneity analysis on the effect of learning loss due to COVID-19 was performed to better understand which group of students performed worse during the pandemic. The results are presented in Table 3.2. The first column of panel A shows the interaction between gender and the dummy cohort of COVID-19 in mathematics. In both sub-samples (2018–2022 and 2012–2022), boys outperformed girls in 2022, with an effect size of 0.392 for boys and a 0.235 standard deviation for girls in 2018 in mathematics, respectively. Further, boys in 2022 also performed better than girls in 2022, though the difference was smaller than the previous year’s standard deviation for boys and girls. On considering reading in column 2, boys and girls in the pre-COVID-19 cohorts had higher coefficients in both sub-samples than girls in 2022. Interestingly, in both

Table 3.2 Heterogeneity analysis on the effect of learning loss due to COVID-19

Subject/ cohort	Covariates	Math (1)	Reading (2)	Science (3)
<i>Panel A: gender and dummy of cohort 19</i>				
<b>2018–2022</b>	2022-Girl (ref.)	–	–	–
	2018-Boys	0.392***(0.041)	0.062(0.041)	0.135**(0.042)
	2018-Girls	0.235***(0.037)	0.203***(0.038)	0.049(0.036)
	2022-Boys	0.163***(0.026)	–0.118**(0.036)	0.047(0.036)
<b>2012–2022</b>	2022-Girl (ref.)	–	–	–
	2012-Boys	0.431***(0.03)	0.133***(0.034)	0.206***(0.033)
	2012-Girls	0.271***(0.03)	0.339***(0.032)	0.123***(0.032)
	2022-Boys	0.165***(0.025)	–0.115**(0.036)	0.048(0.035)
<i>Panel B: ESCS and dummy of cohort 19</i>				
<b>2018–2022</b>	2022-High ESCS (ref.)	–	–	–
	2018-Low	–0.419***(0.055)	–0.346***(0.049)	–0.575***(0.052)
	2018-Middle	–0.106*(0.048)	–0.108*(0.047)	–0.288***(0.046)
	2018-High	0.207***(0.047)	0.180***(0.045)	0.017(0.044)
	2022-Low	–0.610***(0.036)	–0.507***(0.044)	–0.645***(0.04)
	2022-Middle	–0.410***(0.035)	–0.346***(0.038)	–0.420***(0.04)
<b>2012–2022</b>	2022-High ESCS (ref.)	–	–	–
	2012-Low	–0.380***(0.041)	–0.270***(0.043)	–0.507***(0.04)
	2012-Middle	–0.099***(0.038)	–0.008(0.04)	–0.239***(0.037)
	2012-High	0.266***(0.038)	0.313***(0.036)	0.112***(0.036)
	2022-Low	–0.609***(0.037)	–0.502***(0.044)	–0.642***(0.039)
	2022-Middle	–0.411***(0.036)	–0.344***(0.037)	–0.420***(0.04)

*Note:* This table presents the results of assessing the impact of the COVID-19 pandemic on student learning outcomes in mathematics, reading, and science using linear regression. The analysis covers two distinct time periods: 2018–2022 and 2012–2022, and includes an examination of heterogeneity based on gender and ESCS. Immigration status, language at home, school location, class size, and student-teacher ratio were included while estimating regression. Significance levels: \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ .

*Source:* Authors' processing of OECD PISA 2012–2022 data.

sub-samples, the 2022 cohort boys had a decrease in reading scores with 0.118 and 0.115 standard deviation compared to girls in 2022. For science in column 3, we observed that in both periods, boys in the pre-COVID-19 cohorts had a higher coefficient than girls in 2022, and girls in the sub-sample of 2012–2022 had a slightly higher score than the 2022 cohort girls with a 0.123 standard deviation, though the findings were not significant for 2018–2022.

Panel B shows the interaction between ESCS and the dummy cohort of COVID-19. Across both sub-samples in all subjects, students from low-SES strata had a negative coefficient compared to students from high economic strata, with the largest negative coefficient among students from low economic strata of the 2022 category. In the sub-sample of 2018–2022, the 2022 cohort of low economic strata had a decrease of standard deviation with  $-0.610$  points in mathematics,  $-0.507$  points in reading, and  $-0.645$  points in science compared to the reference category. Similar findings can be observed in the 2012–2022 cohort. Students in middle ESCS in the 2022 cohort scored  $-0.411$  standard deviation in mathematics,  $-0.344$  standard deviation in reading, and  $-0.420$  standard deviation in science compared to students from high economic strata in the year 2022 (see Table 3.2).

Figure 3.2 illustrates the estimated impact of COVID-19 (2018–2022) on the non-cognitive skills of students. The observed decrease ( $-0.087$ ) in the growth mindset of students from the 2022 cohort compared to 2018 reflected a reduced belief in the ability to develop intelligence that is often linked to lower resilience. The significant increase ( $+0.379$ ) indicated that students in 2022 feel more integrated into their schools compared to 2018. A moderate rise in the

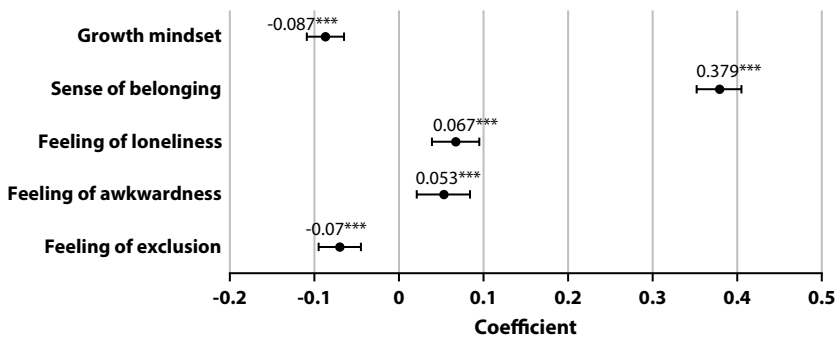


Figure 3.2 The impact of COVID-19 on non-cognitive skills of students, 2018–2022

Note: This figure presents the results of assessing the impact of the COVID-19 pandemic on student non-cognitive outcomes (growth mindset, sense of belonging, loneliness, awkwardness, and exclusion) using logit regression. The analysis covers the 2018–2022 cohort. Gender, immigration status, language at home, ESCS, school location, and student-teacher ratio were included while estimating the regression. Significance levels: \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

Source: Authors’ processing of OECD PISA 2018–2022 data.

coefficient of loneliness (+0.067) and awkwardness (+0.053) showed that students had felt more isolated and experienced greater awkwardness at schools after the pandemic compared to students in the 2018 cohort. However, a notable decrease (−0.07) for the feeling of exclusion among the cohort of 2022 students reflected a lower sense of being excluded than those in 2018 cohorts.

These findings are not inherently incompatible. A study on the well-being of adolescents during the pandemic from France using large-scale data observed that the majority of the students did not have a significant difference in life satisfaction between 2020 and 2021 (Hurel et al., 2023). This study's findings also reflect the multifaceted impacts of the pandemic on the non-cognitive skills of students. Institutional efforts to strengthen students' sense of belonging seem to have been effective (increased sense of belonging, reduced feeling of exclusion). However, persistent psychological effects, such as increased loneliness, awkwardness, and reduced resilience, continue to affect students even after the pandemic. Therefore, it is important to measure the long-term effect of the pandemic in order to support students efficiently and develop health promotion programmes to strengthen students' well-being.

### **Education policy reforms**

In this section, we provide an overview of remedial efforts and policies adopted in France during and after the pandemic to support the students in catching up on learning losses suffered due to the pandemic. The centralised nature of the French education system played a crucial role in shaping the national response during the COVID-19 pandemic. The government's ability to implement nationwide policies quickly and uniformly was both a strength and a limitation. On the one hand, it facilitated the rapid deployment of remote learning resources and the introduction of health and safety protocols. On the other hand, it also highlighted the challenges of addressing regional disparities and adapting to the diverse needs of students across different areas. In light of the pandemic situation, the French government has initiated programmes at different levels that cover two different stages of intervention: 1) During the pandemic, focusing on emergency measures such as the deployment of digital learning platforms and keeping schools open and 2) after the pandemic, where the focus shifted to long-term recovery through policies aimed at improving and accelerating education through digitalisation.

#### ***Emergency educational measures during the pandemic***

From the first day of lockdown in France, the teaching team aimed to sustain an educational connection between teachers and students to maintain the knowledge already acquired by students while allowing the acquisition of new

knowledge. A key policy during the pandemic was to limit school closures, with schools fully closed only during the first lockdown, while they remained (partially) open during the second and third lockdowns. Additionally, several tools were used as part of this educational continuity during the period from March to June 2020 (Bonnéry, 2020). One of the most important aspects was using online resources to communicate with students and deliver the lessons and instructional materials. The main initiative was *ma classe à la maison*, which provided an online platform for delivering lessons and instructional materials. This was complemented by educational videos broadcast on public television and radio channels. Furthermore, programmes such as *vacances apprenantes*, *devoirs faits*, and *stages de réussite* were introduced, offering structured learning activities during school holidays and tutoring sessions to help students catch up.

### ***Limiting school closures: The French approach to COVID-19 pandemic***

Planning and executing the reopening of schools was the main policy priority of French educational authorities in the aftermath of the first wave of the pandemic, while considering any potential adverse health effects and available financial and human resources (Reimers & Schleicher, 2020). Some countries, such as the United Kingdom, Spain, and Chile, faced aversion to school reopening plans from teacher unions and family organisations (OECD, 2021). However, France began a gradual reopening of its schools to maintain the consistency of students' education, starting from May 11, 2020. France has had only 8 weeks of school closure since the start of the pandemic, compared to Italy (15 weeks), Germany (8–11 weeks), and the United Kingdom (12 weeks), which experienced a longer school closure period (De Witte & François, 2023). Approximately 31% of primary schools, 25% of lower secondary schools, and 7% of upper secondary schools in France remained open between February and the end of June for children of essential workers (Barhoumi et al., 2020). From 11 May, kindergarten and primary schools reopened nationwide based on parents' decisions, which were non-compulsory. Then, the other types of schools, depending on the health situation in the departments, were classified into green and red categories. In green departments, where health indicators were better, schools were able to reopen more quickly. Reopening occurred on May 18 for lower secondary schools, but only for students in grades 6 and 7 in green areas. In contrast, red departments, characterised by higher virus circulation and higher hospital tension in intensive care, experienced a more limited and delayed reopening. Beginning on June 2, the reopening of lower and upper secondary schools was extended to all departments, and schools became compulsory again throughout the country. Further, during the second lockdown, which began on October 30 and ended on December 15, all schools, from kindergarten to upper secondary school, remained open. A third lockdown took place from April 3 to May 3. During this period, school holidays were unified across different regions for two

weeks, one week of classes was conducted remotely, and kindergarten and primary school students were able to return to school a week before the end of the lockdown. France was one of the European countries where schools were closed the least between March 2020 and August 2021 (De Witte & François, 2023).

#### *Ma classe à la maison*

This national online learning portal was launched in March 2020 and offered various tools to support both synchronous and asynchronous learning, such as digital exercises, interactive tools, and video lessons. Eight courses were available for children aged six to eleven years to ensure academic continuity. Every course offered an activity module for four weeks. A logbook was maintained for students' work that provides references for the collection of documents, online training, and a digital book. These logbooks were intricately designed in bright colours with visually appealing exercises that looked like holiday workbooks to make them more attractive to children. Instructions for families were also delineated to support students' learning. Interactive activities available on websites were drafted for students aged eleven and above (Mörch & Buffet, 2020). A collaboration was made between *La Poste*<sup>7</sup> and different stakeholders to facilitate the collection and distribution of computer equipment, pedagogical supports, and hardcopy documents to the students who required them (Groof et al., 2022).

#### *Vacances apprenantes*

The government launched a summer programme for one million participants at a cost of 200 million euros, known as *vacances apprenantes*, to cater to families who feel their children have been neglected in online learning. This scheme was an attempt to assist the most vulnerable students in ensuring their education and thus prepare them for the start of the school year in September. This learning vacation was structured into three different approaches, including an "open school system," "leisure activities," and "holiday camps." The "open school" system, in particular, enabled students to participate in academic curriculum, sports, and cultural activities in their regular school, educational facility, or a nearby establishment during school breaks. Outdoor excursions for youth were integrated into the open school system to explore the countryside and discover nature and local heritage while considering sustainable development. As part of an open school, a new initiative, called *mon patrimoine à vélo*, was introduced in the summer of 2021 to meet its tangible or intangible cultural and natural heritage. This project was implemented with the help of sports clubs, the tourism and cultural sector, and local authorities to integrate education for sustainable development as well as physical and sports education and cultural education.<sup>8</sup>

*Other programmes to support academic continuity*

During the pandemic, two other targeted programmes were introduced to address learning gaps and provide additional support to students. The *devoirs faits* programme aimed to assist students with homework by offering 1.5 million additional teaching hours, ensuring that all students could benefit from at least three hours of voluntary homework support per week (Azevedo et al., 2022). In parallel, the *stages de réussite* initiative focused on bridging foundational academic gaps in French and mathematics during the summers of 2020 and 2021, between August and October<sup>9</sup>. It was intended to assist the students in catching up and bridging the learning gap through small group work with the help of student volunteers. In 2020, 40,153 lower and upper secondary school students, as well as 236,570 schoolchildren, participated in this programme.<sup>10</sup>

***Post-pandemic reforms: Towards educational recovery and digitalisation***

Addressing the long-term effects of the pandemic, particularly related to educational inequalities, was the second most important policy concern. Amidst the global crisis triggered by COVID-19, the unprecedented use of technology for distance learning revealed the shortcomings of educational systems, particularly the availability and adequacy of digital infrastructure. At the same time, the digital divide between students and teachers emerged as a major concern across schools and countries, which led to the necessity of focused educational digitisation policies (Zancajo et al., 2022). To minimise this digital divide gap and develop digitisation plans, the European Commission has introduced the *Digital Education Action Plan 2021–2027* (DEAP), which specifies policy priorities and corresponding measures for high-performing digital education ecosystems in European Union countries. The plan focuses on two main sections: firstly, to enhance and expand education through the utilisation of digital technologies (such as devices, learning software, and applications). Secondly, training and digital skills (such as AI learning resources) should be provided to teachers and students so they can be prepared for the post-pandemic world scenario (Binder, 2023).

France's primary initiative, *Territoire Numérique Educatif*, was introduced post-lockdown to lessen the digital divide, tackle the challenges of transforming the education system, and nurture equal opportunities. Enriching pedagogical practices was one of the axes for enhancing student performance and strengthening their autonomy and engagement. The other axis was focused on enhancing the resilience of the education system, particularly in times of crisis. Parental participation was also emphasised to encourage their participation and educate them about the challenges of digital education (Ministère de l'Éducation nationale, 2023).

Other initiatives allied with the digitalisation of education were also introduced. It was suggested that 45,000 classrooms should be equipped with innovative digital solutions by the end of 2022, with greater flexibility, onsite, hybrid,

and remote learning possibilities, and immersive modules. The Ministry of Education in France organised an *Innovation and Artificial Intelligence partnership* (P2IA) to develop artificial intelligence-based solutions with different laboratories and companies. The main aim of P2IA was to assist elementary school teachers in helping their students learn French and mathematics by developing artificial intelligence-based assistance and recommendation solutions. France is also working on a hybrid synchronous teaching solution (mainly by the local education authority of Paris). In this approach, the teacher teaches part of their class in person and via videoconferencing for students temporarily away from the classroom for health reasons ([Ministère de l'Éducation nationale, 2023](#)).

### **Impact analysis of policy interventions**

In recent times, one of the most unexpected disruptions to education was caused by COVID-19, which induced an abrupt shift to remote learning. This chapter builds on these reflections by highlighting how the pandemic disproportionately affected students and exploring the relationship between students' social background and their learning opportunities during this period. In collaboration with previous international evidence ([Cucco et al., 2021](#); [Soriano-Arandes et al., 2023](#)), this study suggests that students from underprivileged backgrounds and girls have gone through inordinate learning loss as a consequence of the pandemic crisis. Research also indicates the link between children's social background and the amount of average time dedicated to learning in France ([Moulin et al., 2021](#)). Although schools and teachers did their best to ensure continuity of learning through adaptability and creativity of new techniques, they ventured into unknown and challenging situations. At the same time, the pandemic posed many opportunities, particularly accelerating digital transformation. The transformation was accomplished in a short span of time that would have taken many years to do in normal days. Also, governments are making more efforts to improve policy intervention in education owing to the sense of urgency. Even so, due to various constraints, such as limited data availability and resources and multiple confounding factors related to each intervention, there is a dearth of research on the impact analysis of all policy interventions implemented during and after the pandemic. In this section, we make an effort to evaluate the crisis response programmes based on the available evidence.

### ***Assessing the role of school closures and distance learning***

Based on the literature published since 2020, we can infer various conclusions regarding the effectiveness of school closure and distance learning approaches on students' learning outcomes. School closures during the pandemic were associated with financial costs, as school closures accompany various trade-offs, including unintended childcare needs. It has been estimated that the health worker's

childcare responsibilities were linked to an increase in the infection mortality rate from 2 to 2.35% owing to obligatory school closure (Bayham & Fenichel, 2020). A systematic review study conducted in 2020 concluded that compared to other social distancing initiatives, school closure alone would prevent 2–4% of deaths (Viner et al., 2020). It was projected that the benefit of school closure in France in reducing the peak incidence of the pandemic remains small, and eight weeks of school closure can delay the peak by almost two months (Domenico et al., 2020). However, the decision to keep schools closed negatively impacted academic performance (Azevedo et al., 2021). Several studies using national data reported a significant negative correlation between the length of school closure and learning loss depending on the socioeconomic background of students (Battisti & Maggio, 2023; Engzell et al., 2021; Goldhaber et al., 2022; Jack et al., 2022). Compared to other countries, the decision to limit school closures was arguably the most effective policy for mitigating learning losses in France.

### *The impact of virtual and hybrid learning approaches on academic outcomes*

Studies examining the effect of using digital technology for academic purposes do not indicate a direct association between the use of digital tools and academic performance (Gouédard et al., 2020). On the contrary, some studies have shown the negative impact of online learning approaches, such as virtual classes, on academic performance, resulting in lower outcome persistence than taking in-person courses (Bettinger & Loeb, 2017).

It is crucial to highlight that the outcomes can be different when digital tools are integrated into hybrid teaching methods, combining online and face-to-face learning. In France, entirely virtual classroom tools led to decreased learning compared to hybrid teaching methods (Pavlova & Voulgre, 2023). Similarly, in Italy, studies have shown that more articulated use of digital tools by teachers and the involvement of school principals in digital instructional leadership were positively associated with better student performance during the pandemic (Bertoletti et al., 2023; Moulin & Soncin, 2024).

A review of international literature on the efficiency of digital technology in education highlights that utilising these tools has a limited impact on students' learning, but in some situations, when they were utilised along with traditional teaching methods, they were more effective in enhancing students' digital skills as well as other skills, including learning mathematics (Escueta et al., 2017). In France, grade 1 students tested at the beginning of the 2020–2021 school year performed better in the middle of the school year, particularly in reading and mathematics, compared to their peers tested in 2019–2020. This indicates that they effectively recovered learning losses from school closure (Andreu et al., 2021) and suggests that utilising an appropriate combination of online and face-to-face learning had a promising impact on students' learning and was cost-effective.

***Equity and accessibility challenges of ma classe à la maison during school closures***

In terms of the equity effect of school closure and *ma classe à la maison*, it was found that these mitigation approaches confronted the general problem of the digital divide, which requires a computer-equipped workspace that includes printing facilities and a high-speed internet connection for interactive activities. Students from socially fragile backgrounds suffered more in learning loss (Schurman et al., 2023; Thorn & Vincent-Lancrin, 2021). As per 2018 PISA data, more than 20% of socially fragile students in France did not have digital working conditions (OECD, 2019), which were required for the implementation of schooling at home. Only 11% of students in France, who were homeschooled, were provided learning materials in printed form to continue learning, whereas the same figure was 19–21% in the United States of America and 34% in the United Kingdom (Thorn & Vincent-Lancrin, 2021). This could be an obstacle for students learning in France during the school closure. Another obstacle to this virtual learning was the lack of strong written French instructions that were consistent with school codes. No instructions were available in different languages for those parents who can't read.<sup>11</sup> This raises concerns about the availability of mastery of the instruction of the tutor in completing the learning activities.

***Impact of learning vacation program on learning outcome***

A report prepared by Mörch and Buffet (2020) indicates that the *vacances apprenantes* programme has played a pivotal role in mitigating learning loss and regaining skills among schoolchildren and adolescents in France. About 3800 schools and establishments remained open for sports and cultural activities between July 1 and August 31 in 2020, which was seven times greater than 2019, to 250,000 students whom the pandemic adversely impacted. More than 60,000 children went to learning holiday camps. A report from the French government<sup>12</sup> delineated that the majority of the families (95%) whose children participated in the camps or holiday activities were satisfied with these stays that combined group adventure, discovering outdoor activities, and learning various subjects through different mechanisms. Apart from positive aspects, the Ministry of National Education of France in September 2020 informed that learning camps did not have the expected success. Only 125,000 children, mainly from working-class neighbourhoods, benefited, whereas the government initially targeted 250,000 departures<sup>13</sup>.

**Conclusion**

COVID-19 has witnessed a significant shift in the role of digital technology for education in two ways: it has made the use of digital tools crucial for educational continuity and emphasised the inadequacy of the educational system to implement efficient and accessible remote learning for all students. As per the most recent Teaching and Learning International Survey (TALIS-2018), only 36% of

French teachers reported frequently or always letting students use digital technology for their projects or class work, which is lower than the OECD average (i.e., 53%) (OECD, 2022).

According to a survey conducted in March 2020, teachers immediately adopted using emails and telephones (70%), digital work environments (44%), and social networks (40%) for organising and assigning work to students after the first lockdown; moreover, only 12% of them organised virtual classrooms (Genevois et al., 2020). Another survey of teachers in the Besançon academy revealed an aspect of the piling up of digital tools used during the crisis and a lack of reflection on their roles and methods of use. These factors confronted the teachers with psychological risks such as overinvestment in work and a sense of disorientation as they were forced to completely alter their activities without essential digital and technical pedagogical skills and training (Boudokhane-Lima et al., 2021). This evidence highlighted the significant difficulties of schools and teachers and the lack of preparedness of the French education system for the sudden shift in implementing educational continuity, particularly via digital platforms.

Meanwhile, educational professionals in Europe improved their digital skills during the crisis. The findings from the *KEEP survey*<sup>14</sup> reported that the innovative practices adopted by teachers during the first lockdown played a crucial role in promoting the development of life competencies and transferable skills such as the ability to work in a team, critical thinking, autonomy and self-awareness among students (Pavlova & Voulgre, 2023).

The challenges and opportunities brought forth by the COVID-19 pandemic have triggered a renewed focus on the need for long-term educational reform. The rapid digital transformation, while beneficial in certain aspects, has also revealed critical inequalities in access to technology and resources, particularly for students from disadvantaged backgrounds. As France moves forward, it is essential to build on the lessons learnt during the pandemic. Prioritising equitable access to digital tools, improving teacher training in digital pedagogy, and strengthening student support systems will be critical for future educational resilience.

Various policy initiatives implemented in response to the pandemic, such as *ma classe à la maison*, *vacances apprenantes*, and additional tutoring programmes, represent important steps toward addressing the immediate needs of students and minimising learning losses. However, continuous evaluation of these interventions, alongside a commitment to long-term policy reform, is essential for better equipping the French education system to handle future disruptions and provide equal opportunities for all students.

In conclusion, while the pandemic has exposed vulnerabilities within the education system, it has also created a pivotal moment for reform and innovation. By learning from the past and planning for the future, France has the potential to emerge with a stronger and more resilient education system. This system can adapt to new challenges and support the academic and personal development of all its students.

**Notes**

- 1 <https://eurydice.eacea.ec.europa.eu/national-education-systems/france/overview>
- 2 Among these, 98% attended private schools under contract with the state and independent private schools accommodated the remaining students (see [Moulin, 2023b](#)).
- 3 PISA is a cross-sectional study conducted by the Organization for Economic Cooperation and Development (OECD) to measure the extent to which children have acquired key knowledge and skills essential for full participation in social and economic life. It is a learning assessment of 15-year-old students into three domains, including reading, mathematics and science. The survey is implemented every three years in all OECD and other partner countries since 2000 with only a longer four-year break between 2018 and 2022 due to the pandemic schools. Apart from the learning assessment, it also collects detailed information on students and their schools ([OECD, 2023](#)).
- 4 We opted to use PISA data instead of French administrative data to measure learning loss due to COVID-19, as access to the latter through the DEPP (*Direction de l'Évaluation, de la Prospective et de la Performance*) was not allowed.
- 5 The average of 23 OECD countries are considered to ensure that the same set of countries were analysed over the entire period of study, i.e., 2000 to 2022. Also, 23 OECD countries are usually representative of developed economies with advanced education systems.
- 6 The socioeconomic status was calculated using PISA index of economic, social and cultural status (ESCS). The students were categorized into three equal-sized group (tertiles) based on their relative positions on the ESCS scale. Group 1 (low) constitute the 33% of students with lowest ESCS score, Group 2 (middle) include middle 33% and Group 3 (high) represent the 33% of the students with the highest ESCS score ([Sortkaer, 2018](#)).
- 7 *La Poste* is the french national company responsible for postal services and mail delivery.
- 8 <https://www.education.gouv.fr/les-vacances-apprenantes-303834>
- 9 *Ibidem*
- 10 <https://www.education.gouv.fr/les-stages-de-reussite-1121>
- 11 <https://www.snuipp.fr/actualites/posts/coronavirus-ma-classe-a-la-maison>
- 12 <https://www.education.gouv.fr/les-vacances-apprenantes-303834>
- 13 <https://www.ozp.fr/spip.php?article25623>
- 14 Key Engaging Educational Practices Used by Secondary School Teachers to Keep Connected with their Students Following COVID-19 Pandemic. <https://www.france-education-international.fr/en/expertises/cooperation-education/projets/keep>

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## 4 Academic resilience and policy reform in Germany

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### Introduction

Germany consists of 16 federal states. Each state has its own educational administration. The state ministries provide educational legislation (e.g., school curricula). Therefore, K-12 schooling differs slightly between states. While compulsory schooling includes primary and secondary school, the number of compulsory school years, the length of primary school (mostly four years), and types of secondary schools vary between states. However, school leaving certificates can be obtained in all states after grade 9 (Hauptschulabschluss) or grade 10 (Mittlerer Schulabschluss). A higher education entrance qualification (Hochschulreife, also called “Abitur”) can be obtained at upper secondary school (see [McElvany, 2022](#), for further details).

To harmonise Germany’s 16 educational systems, the Standing Conference of the Ministers of Education and Cultural Affairs (Kultusministerkonferenz/KMK), a voluntary assembly of the ministers of education of all states, coordinates cross-state activities. For example, the KMK promotes educational standards for assessments and graduation exams. As it has no legislative power, the KMK cannot make binding decisions. Instead, it is up to each state to translate the KMK’s resolutions into state law. The Federal Ministry of Education and Research plays only a minor role in educational policies in Germany as laws prevent it from interfering with the states’ educational matters beyond financial help in specific situations.

With regard to the COVID-19 pandemic, Germany had its first confirmed case of COVID-19 in January 2020. By March 2020, there were several thousand confirmed infections. The KMK discussed general school closures during its session on March 12, but rejected the measure. The next day, Chancellor Angela Merkel, after consulting with the 16 minister-presidents, appealed to Germany’s population to reduce unnecessary social contacts and events. Within five days, all 16 minister presidents and their ministers of education mandated state-wide school closures along with other restrictions of social activities and indoor gatherings. The goal of these measures was to curb the spread of the coronavirus

in the general population. Schools remained closed until June 2020. By then, incidence rates had dropped considerably. Despite consultations of the KMK, each state chose its own reopening strategy (Fickermann & Edelstein, 2020). When the second wave of COVID-19 infections came in late 2020, all 16 German states suspended in-person learning once more, due to soaring incidence rates and very limited availability of the first vaccines. The length of school closures varied between and within states, school types, and grades (Schult et al., 2022b). On average, elementary students in Germany missed 64 days of in-person learning during the school closures in 2020 and 2021. Secondary school students in Germany missed 84 days of in-person learning, on average (OECD, 2021). There were no more general school closures after the summer of 2021.

The main goal of educational policy during pandemic school closures was to continue lessons and to fulfill the school curriculum. Right before the initial school lockdown, the educational ministries instructed teachers to provide textbook repetitions and worksheets for remote learning (Huber & Helm, 2020). However, the transition from in-person to remote learning was rocky: Teachers, students, and their families struggled with technical equipment, with online meeting software, and with the challenge to provide regular lessons amidst the ongoing pandemic. Remote learning situations varied substantially. Some teachers provided homework-like learning packages for their students while others provided fully interactive online classes. Often, not all students from a particular class attended the online lessons or turned in their worksheets (Schneider et al., 2021). Moreover, home situations were challenging for socially disadvantaged students (Sachse et al., 2022; Werner & Woessmann, 2023) and immigration status in particular (Henschel et al., 2022). Unsurprisingly, these disadvantaged students were more likely to fall behind or to drop out of classes completely (Jaekel et al., 2021).

The educational administrations were quick to draw up detailed regulations regarding hygiene standards and rules that allowed in-person learning for particular subgroups (e.g., exam classes, children of workers in critical infrastructure, students with special educational needs). These regulations were updated very frequently, usually on short notice, sometimes multiple times within the same week. This added to the challenges of school managers as well as teachers, students, and their families (Schult & Schneider, 2024). Each state provided its own regulations. More than once, one state ordered the use of a specific software while another state explicitly prohibited this software. Overall, most teachers and students adapted quickly to the new situation, following a hands-on, just-use-what-works approach. State-wide solutions such as centrally hosted learning platforms (e.g., Moodle) were introduced as quickly as possible.

In the end, the educational management of the COVID-19 pandemic in Germany was a combination of general, state-specific and individual, teacher-based actions. There was no uniform crisis management across the 16 states. Instead, the amount and the quality of remote instruction depended on the

efforts of teachers, students, and their families. Digital tools helped some students to connect, to communicate, and to learn. All in all, the time students spent learning dwindled during periods of school closures (Werner & Woessmann, 2023). There were also considerably fewer interactions between students during (online) lessons as well as in their free time due to general social distancing rules (Helm & Huber, 2023). School principals at socially disadvantaged schools were particularly prone to lowering their expectations towards learning (Kürzinger et al., 2025). As expected, the disruption of in-person learning resulted in learning loss and socio-emotional distress (Schult & Schneider, 2024).

### **National administrative data**

In Germany, the Federal Statistical Office does not collect data regarding individual learning trajectories. Representative data on students' learning outcomes come from international large-scale studies (PISA, TIMSS, PIRLS), supplemented by national educational monitoring assessments (IQB Trends in Student Achievement Study [IQB-BT]). However, these student cohort data are coarse because such assessments are not conducted every year, but at much longer intervals. Annual comparative assessments provide more detailed insights for students in grades 3 and 8 [Vergleichsarbeiten; VERA]. Some German states introduced additional annual assessments, for example, Baden-Württemberg in grade 5 ("Lernstand 5") or Hamburg in grades 2, 5, 7, and 9.

### ***Pandemic learning loss***

For elementary school students in Germany, Trends in International Mathematics and Science Study (TIMSS) data for mathematics and science has been available since 2007. While only slight changes in mathematics were observed between 2007 and 2019 for fourth-graders in Germany, the mean score did not change significantly between 2019 and 2023 ( $d = 0.04$ ; von Davier et al., 2024; Figure 4.1, up). For science, a larger decrease was already found between 2015 and 2019, but as for mathematics, no substantial change emerged from 2019 to 2023 ( $d = -0.04$ ; von Davier et al., 2024). For reading, the results of the international education monitoring study PIRLS show a different picture when comparing mean values before the pandemic with means during the pandemic (Mullis et al., 2023). While reading achievement improved between 2001 and 2006, it has shown a continuous negative trend since then. In 2016, the mean score in reading was at the baseline level of 2001. Between 2016 and 2021, the learning loss was significantly greater than between the previous assessments ( $d = -0.17$ ). National educational monitoring data from the IQB-BT 2021 (Stanat et al., 2022) show a consistent pattern of findings for elementary school students with significantly lower test scores in mathematics ( $d = -0.20$ ) and

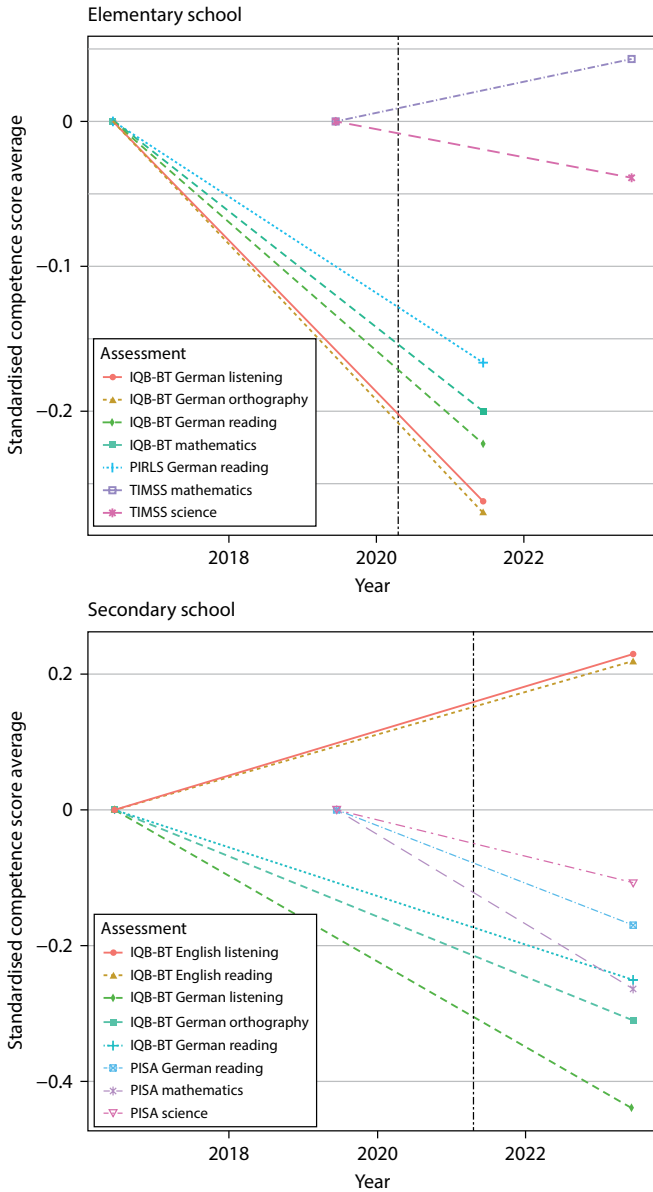


Figure 4.1 Average competence scores from large-scale assessments in Germany for elementary (up) and secondary school students (down).

Note: The mean scores were standardised using the mean and the standard deviation from the last pre-pandemic assessment (Cohen's *d*). The sample size per cohort was  $n > 25,000$  (IQB-BT),  $n > 4,000$  (PIRLS),  $n > 3,000$  (TIMSS), and  $n > 5,000$  (PISA), respectively.

German (reading/listening/orthography:  $d = -0.22/-0.26/-0.27$ ) during the pandemic in 2021 than in 2016.

For secondary school students, Germany's mean scores in PISA for 15-year-olds increased after PISA 2000 till 2012 in mathematics and science as well as till 2015 in reading before starting to decline again. In 2018, the last assessment before the pandemic, mean scores in mathematics and science were roughly back to the 2000 level. In reading, however, the value was still above the one in 2000. For all three domains, the mean test values in 2022 were significantly lower than in 2018 with the strongest decrease in mathematics (mathematics/science/reading:  $d = -0.26/-0.11/-0.17$ ; OECD, 2023; Figure 4.1, down). National administrative data for secondary school students are in line with these results: The IQB-BT 2022 (Stanat et al., 2023) with ninth-graders revealed lower mean values in 2022 in reading ( $d = -0.25$ ), listening ( $d = -0.44$ ), and orthography ( $d = -0.31$ ) in the subject of German compared to 2015. Additionally, annual VERA test results for eighth graders indicate small negative effects of school closures in mathematics ( $d = -0.02$ ) and reading ( $d = -0.04$ ) in the German state of Baden-Württemberg (Schult & Wagner, 2022).

In sum, achievement scores were mostly significantly lower in mathematics, science, and German during or shortly after the pandemic than prior to the pandemic for elementary and secondary school students alike. The only exceptions are the TIMSS results with comparable achievement scores of fourth graders in 2019 and 2023 in mathematics and science.

These overall trends also emerged controlling for changes in the students' background (e.g., Frey et al., 2023; Stanat et al., 2022, 2023). Moreover, regardless of grade level, reported learning losses were greater among socially disadvantaged students and those with an immigrant background. (e.g., Mang et al., 2023; Stanat et al., 2022, 2023).

The picture for competences in English is quite the opposite: While test scores already increased before the pandemic, they continued to do so in 2022 (VERA:  $d \geq 0.17$ , Schult & Wagner, 2022; IQB-BT 2015–2022: reading comprehension/listening comprehension  $d = 0.22/0.23$ ; Stanat et al., 2023). For English, too, differences in the extent of trends emerged with positive trends being smaller for socially disadvantaged students. However, ninth-grade students who grow up in multilingual settings exhibit achievement advantages over their peers who have comparable social background characteristics but only speak German in their families. This indicates that multilingualism may prove conducive for German students to the acquisition of English as a foreign language (Stanat et al., 2023).

### ***Differential trends results for non-cognitive outcomes***

Non-cognitive outcomes are regularly assessed in educational monitoring studies alongside tests on students' achievements. However, pandemic-related trends for non-cognitive outcomes are less consistent compared to those for

achievement. For fourth-graders, analyses with data from TIMSS revealed high levels of students' self-concept and positive attitude towards mathematics and social studies for all assessment years since 2007. Between 2019 and 2023, a decrease was found for both outcomes in mathematics (self-concept/positive attitude:  $d = -0.07/d = -0.16$ ; Selter et al., 2024) and for the self-concept in social studies ( $d = -0.12$ ; Steffensky et al., 2024). In line, an interest decline in mathematics was found in the IQB-BT between 2016 and 2021 ( $d = -0.10$ ), complemented by negative trends in the self-concept and interest in subject of German (self-concept/interest:  $d = -0.14/d = -0.17$ ; Stanat et al., 2022). For reading, on the other hand, the mean self-concept and intrinsic motivation assessed in PIRLS remained stable between 2016 and 2021 for students of the same age (McElvany et al., 2023). For ninth-graders, subject-specific trend results emerged in the IQB-BT. While self-concept and interest means in the subject of German declined between 2015 and 2022 (self-concept/interest:  $d = -0.23/-0.30$ ), no significant changes were observed for the subject of English (Stanat et al., 2023).

In addition, educational large-scale studies assess non-subject-specific characteristics of students like their satisfaction with school and feelings of social integration. Some favourable results can be seen here for fourth graders in the IQB-BT (Stanat et al., 2022): Means for school satisfaction were already high in 2016 and were significantly higher again in 2021 for students without immigration background and those whose parents as well as themselves were born abroad (first generation). These results probably reflect the students' joy at being able to learn together in school again after the pandemic-related school closures. For feelings of social integration, means for students without immigration background and those of the first generation remained stable over the respective time span. Small negative trends only emerged for students whose parents were born abroad, but who were born in Germany themselves (second generation). For ninth graders, there was mostly no change in school satisfaction between 2015 and 2022, with the exception of a slightly negative trend for first generation students. Yet, means remained on high levels (Stanat et al. 2023).

As part of analyses to describe the in-class and remote learning situations of secondary school students during the pandemic, data on students' emotional problems and on indicators of hyperactivity were compared between 2018 and 2022 (Schneider et al., 2023). Significantly more ninth graders in 2022 than in 2018 reported that they often have headaches and abdominal pain, that new situations make them nervous, that they are often unhappy and depressed, and that they often worry or have many fears. Accordingly, the mean value for the overall scale of emotional problems also showed an unfavourable change ( $d = -0.23$ ). Signs of hyperactivity increased in the same time span. For example, more students in 2022 than in 2018 reported that they are fidgety, easily distracted, have difficulties concentrating, and are often restless. Again, there is a negative trend for the overall scale ( $d = -0.19$ ).

## **Education policy reforms**

In early May 2021, the Federal Ministry of Education and Research (BMBF) and the Federal Ministry for Family Affairs, Senior Citizens, Women and Youth (BMFSFJ) introduced remedial measures aimed at mitigating the pandemic's impact on the learning outcomes and personality development of K-12 students. As part of the "Catching Up for Children and Youth" program (Aktionsprogramm "Aufholen nach Corona für Kinder und Jugendliche"), the federal states were allocated a total of €2 billion in funds for the years 2021 and 2022 (BMBF and BMFSFJ, 2021).

The measures taken to reduce learning deficits (€1 billion) in this policy intervention were largely based on the recommendations of the Standing Scientific Commission on Education Policy (SWK, 2021), an independent scientific advisory board of the Standing Conference of Ministers of Education and Cultural Affairs (KMK).<sup>1</sup> In line with the World Bank's RAPID<sup>2</sup> framework for tackling COVID-19 learning losses (World Bank, 2022), the Commission recommended focusing on core competences (e.g., reading and mathematics), facilitating transitions and graduations, and evaluating these interventions. Policies to promote literacy and numeracy should be implemented at three levels: basic support in the classroom, supplementary measures in the classroom, and extracurricular activities (mainly offered during holidays) (SWK, 2021). The SWK (2021) also proposed to focus on the most affected student groups and to train and employ additional educational staff. In addition to reducing learning deficits, the program "Catching Up for Children and Youth" aimed to strengthen social learning by expanding early childhood education, school social work, children's and youth camps, extracurricular youth work, and child and youth welfare service (€1 billion) (BMBF, 2021; BMFSFJ, 2023).

Due to the sovereignty of the federal states in the area of education, the overall objectives of the program were implemented very differently and with different priorities. For example, the importance of external tutoring, holiday courses or social-emotional skills was weighted differently across the 16 federal states (Helbig et al., 2022). Additionally, the federal states typically made independent decisions regarding the use of the additional funds to reduce learning deficits, often delegating this responsibility to individual schools. Across all federal states, it was primarily the teachers' responsibility to identify students' learning deficits (Helbig et al., 2022). Thus, in contrast to the recommended systematic learning assessment, students' learning levels were largely recorded in a decentralised and often non-standardised manner. In the final report of the KMK (2024), the deliberate decision to dispense with a standardised learning level diagnosis is justified by the urgency of implementing the measures. For this reason, not all measures had been empirically validated and a comprehensive evaluation could not be carried out.

However, it took time to implement the measures in the schools (e.g., hiring additional staff and organising additional remedial courses). Given the shortage

of teachers in Germany, recruitment was a particular challenge. For example, the states appealed to retired teachers to return to the classroom or offered student teachers positions as instructors at learning camps during the holidays. Schools also tried to recruit additional social workers to improve their students' social skills. But there is evidence that the recruitment of additional staff has been limited. Instead, the working hours of staff already employed in schools in these professional groups were sometimes increased (Helbig et al., 2022).

As a result of the delay, only a fraction of the funds was spent in 2021 (KMK, 2022). But by the end of 2023 a total of €2 billion had been spent in all 16 federal states (KMK, 2024). However, the additional expenditure of €93 per student per year in Germany is below the European average of €131 (Himmelrath, 2022). The SWK (2021) also criticises the amount of funds to fully compensate for the consequences of Corona pandemic.

By the end of 2023, at least 11 million K-12 students were reached with the measures to reduce learning gaps, according to the KMK (2024). However, the focus on the most vulnerable student groups has not been achieved in all states. In the absence of needs-based funding (e.g., on the basis of a social index) in some states, disadvantaged schools have had access to the same amount of funding as privileged schools (Helbig et al., 2022).

In summary, the recovery policy interventions enacted to support K-12 student learning in the aftermath of the pandemic illustrate increased collaboration between the federal and state governments. The strategy for implementing was based on existing measures, combined with further developed interventions (KMK, 2024), and focused on a high degree of self-responsibility on the part of schools and teachers. Helbig and his colleagues (2022) conclude in their evaluation of the learning-related program, that it is hardly possible to measure the impact of the interventions. However, the pedagogical offers and the cooperation between specialists can also create incentives for longer-term school development measures, and the increased cooperation between the states can contribute to positive learning effects for the education system.

Given the different priorities and the lack of scientific monitoring described above, it is difficult to compare the measures taken to reduce learning gaps in the 16 federal states regarding their efficacy. While staffing shortages were identified as a major challenge in general, the existence of organisational and regulatory frameworks for learning support seems to have played a key role in supporting the ad hoc integration of measures during the pandemic (Helbig et al., 2022). Notably, the city state of Hamburg stands out in this regard. In Hamburg, standardised assessments of learning levels are conducted regularly in grades 2, 3, 5, 7, and 8. Individual learning support aimed at reducing learning backlogs and the entitlement to all-day schooling with supplementary support measures up to the age of 14 are already anchored in school legislation. Instead of repeating classes, both Hamburg and the city state of Bremen regularly implement individualised support concepts that are supplemented by measures such as holiday courses to specifically reduce

learning deficits. Other states, such as Baden-Württemberg, which introduced holiday courses during the pandemic, initially had to set up such support structures on a temporary basis and have now discontinued them.

From a social equity perspective, it is problematic that not all federal states made use of available mechanisms to ensure that students particularly affected by the pandemic, especially those from disadvantaged backgrounds, received appropriate and targeted support. For example, Hamburg, Berlin, Hessen, Saarland, and Bremen allocated at least part of their resources based on social indices – thus pursuing a more needs-oriented distribution – while states such as Bavaria and Saxony employed a scattergun approach (Helbig et al., 2022). In addition, extracurricular support programmes such as holiday courses appear to have reached the target group of disadvantaged students only to a limited extent.

Independent of funds, regulations to simplify the final exams (e.g., more optional tasks, longer processing time) have been implemented to varying degrees (Helbig et al., 2022). However, in all federal states, better average Abitur grades were measured in the 2021 than in previous years. The 2022 Abitur examination had a similar positive tendency. 2023 was the last year in which the pandemic regulations were applied to the Abitur exams. In most federal states, the Abitur grades were slightly worse than in 2021 and 2022, but still better than the average grades in the years before the pandemic. In addition, transition rates to Gymnasium in 2021/2022 have not deteriorated either, although skill gaps (Stanat et al., 2022) have been identified for this cohort (Helbig et al., 2022).

### **Impact analysis of policy interventions**

The COVID-19 pandemic revealed strengths and weaknesses of Germany's educational system. In March 2020, school closures were a swift reaction to sharply increasing numbers of infections that curbed the spread of the virus (Deckart & Stich, 2024). As detailed above, school closures mostly had a negative effect on students' learning and socio-emotional development. Policy interventions such as the transition to remote learning began as ad hoc decisions with a short term focus. Eventually, educational administrations implemented digital learning opportunities to facilitate online classes during school closures. The federal administration provided considerable support to the states' and schools' efforts by pooling the financial resources in the 2021/2022 program "Aufholen nach Corona." Neither the initial decisions nor the following large-scale catch-up program were accompanied by wide-ranging impact analyses. Still, state-specific evaluations and independent research projects provide preliminary insights regarding the policy interventions' success.

### ***Reaching at-risk students***

The first student groups to return to in-person learning were graduation classes and students that were about to transition from elementary to secondary school.

Most states suspended class retention in order to keep students in their familiar class community. The number of students that left school without any degree actually decreased during the pandemic years 2020 and 2021 (6% of all adolescents), possibly due to more lenient grading. In line with a decade-long trend, the number of students that leave school without a degree then increased back to 7% (Autorengruppe Bildungsberichterstattung, 2024).

The final report of the Federal ministry concludes that the at-risk students (e.g., low socio-economic status, low pre-pandemic achievement) were exposed to remedial measures (BMFSFJ, 2023). Some states distributed their remedial funding with respect to the proportion of at-risk students at schools (Helbig et al., 2022). Such a focus helped reach at-risk students in particular as the superordinate administration usually not familiar with individual students' actual learning situation. In the end, it often depended on the teachers and the adequate teaching methods (Jaekel et al., 2021).

Starting in August 2024, over 2.000 of the schools that are characterised by a high proportion of socially disadvantaged students receive support from the "Startchancen" (starting chance) program (BMBF, 2024a). With a budget of €20 billion over ten years, this federal and state initiative, which is to be expanded to around 4.000 schools by the 2026/2027 school year, is the largest education program in the history of the Federal Republic of Germany. It takes into account the particularly persistent educational inequalities in Germany and the decline in basic skills that was already observed in the run-up to the pandemic. Given the high number of students who do not reach the minimum standards in reading and mathematics (Autorengruppe Bildungsberichterstattung, 2024; Stanat et al., 2022), this proportion should be halved as a target (BMBF, 2024b).

### *Assessing learning levels*

As recommended (SWK, 2021), educational administrations urged teachers to assess their students' learning levels after they returned to in-person learning. Potential remedial efforts should be adapted to each students' test results. The implementation of compulsory standardised testing varied between states. While states such as Baden-Württemberg and Hamburg had mandatory tests in at least three different grades in 2021, Niedersachsen delegated the choice of diagnostic tools to the teachers without offering a centralised testing option. In the subjects German and mathematics, at least 85 of German schools conducted some assessment to estimate students' learning losses (Schneider et al., 2023).

Initial assessments of students' competences showed sizeable learning losses (see above) that were about half as large as the worldwide mean (Betthäuser et al., 2023). Migration background and low socio-economic status were risk factors for learning loss. The downward trend of test scores during the pandemic was halted after schools returned to in-person learning (Nusser et al., 2024; Schult et al., 2022a). Educational large-scale assessments

such as PISA, TIMSS, and PIRLS compare cohorts several years apart. This makes it difficult to get a more fine-grained picture of longitudinal trends in the wake of the pandemic. Low-stakes tests such as VERA can provide annual data, but they are usually not suited for longitudinal trend analyses because the tests are not always mandatory for all schools and their metric may fluctuate. Secondary analyses of these tests using constant linking items across years can still provide a glimpse at longitudinal trends. Based on these secondary analyses, the estimated mean competences of incoming fifth-graders in Baden-Württemberg are shown in Figure 4.2 (based on the “Lernstand 5” assessment; Schult et al., 2022b). There is an overall downward trend across the years that is in line with the international large-scales studies as is the dent

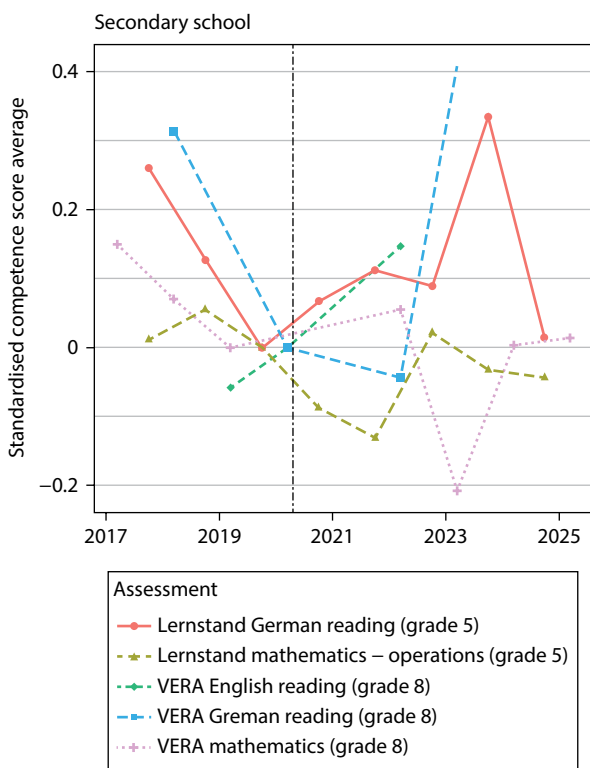


Figure 4.2 Average competence scores from large-scale assessments in Baden-Württemberg, representing around 13% of German students

Note. Mean scores were standardised using the mean and the standard deviation from the last pre-pandemic assessment (Cohen’s *d*). Missing years are due to postponed tests (VERA in 2021) or a lack of linking items. The scores are prone to slight fluctuations due to limited linking options and varying scoring procedures (Harych, 2022). The sample size per cohort was  $n > 78,000$  (Schult & Schneider, 2024).

in 2020, after the school closures during the first pandemic wave. Average test scores increased again after 2020. However, the overall negative trend re-emerged by 2024.

The mean competences of eighth-graders in Baden-Württemberg are also shown in [Figure 4.2](#) (based on the “VERA 8” assessment; [Schult & Schneider, 2024](#)). Again, there is a downward trend across the years with a dent in 2020, followed by a rebound after schools re-opened in 2021. The achievement gap between students with and without migration background did not change much over between 2017 and 2025, remaining rather stable at around  $d = 0.7$ .

### ***Prioritising teaching the fundamentals and increasing the efficiency of instruction***

The majority of emergency funds were spent on catch-up learning such as additional remedial classes and summer schools ([Helbig et al., 2022](#)). Over 90% of schools expanded their extracurricular activities with regard to remedial measures ([Schneider et al., 2023](#)). Schools used the remedial funds to create additional learning opportunities into their course framework ([Norwig et al., 2024](#)). A shortage of available teaching staff delayed some of the courses ([Kamm et al., 2023](#)). Additional courses and summer schools focused on basic competences in German and mathematics as well as on socio-emotional support ([Helbig et al., 2022](#)). However, extracurricular activities appear not to have reached disadvantaged students to the extent initially anticipated. Moreover, their full potential is realised only when combined with longer-term measures that are integrated into and complement classroom teaching ([Kaffenberger, 2021](#); [SWK, 2021](#)).

### ***Developing psychosocial health and well-being***

Socio-emotional challenges in the wake of the pandemic required additional measures beyond remedial programs aimed at fostering learning. The implementation, prioritisation, number, and scope of measures to strengthen social skills and personal development after the pandemic also varied widely between the individual federal states. In the federal state of Berlin, for example, about 20% of funds were spent on psycho-educational measures without further description what these measures were ([Kamm et al., 2023](#)). It is estimated that the offers for the promotion of early childhood education, for leisure, holiday, and sports activities as well as support for children and young people in everyday life and at school have reached almost nine million people ([BMFSFJ, 2023](#)).

With regard to children’s and adolescents’ well-being, an initial drop of health-oriented quality of life during the first months of the pandemic emerged in national monitoring, followed by a rebound to pre-pandemic levels

(Kaman et al., 2024). This could be interpreted as a success of the implemented countermeasures. For example, about 62% of the school principals at the IQB-BT 2022 participating schools reported hiring additional staff at the schools in spring 2022, 6% of these were social workers or social pedagogues. In some federal states, these values particularly high, e.g., in Schleswig-Holstein, where 79% of the school principals surveyed were able to hire additional staff, 14% of whom were social workers or social pedagogues (Schneider et al., 2023). In the fall of 2022, school social work services were available at 69 percent of schools in Germany, and school psychologists provided support at 35 percent of schools. However, half of the school principals at which school social work and school psychological support were already available rate them as insufficient (Robert Bosch Stiftung, 2023). In addition, extracurricular activities have been significantly expanded, including offers for student participation and social activities. With regard to social activities, more than half of the school principals stated that they had created new programs or expanded existing ones (Schneider et al., 2023). This could be interpreted as an expression of the desire to create opportunities for students to participate and strengthen their social and emotional skills after pandemic-related closures of schools and extracurricular educational venues (e.g., clubs, children's and youth work). As the federal educational large-scale assessments such as the IQB-BT include a wide range of socio-emotional constructs such as school satisfaction, future developments can be closely monitored.

### **Conclusion and actionable recommendations**

The results of evaluation studies indicate a positive impact of the federal measures on students' learning and well-being. However, the specific degree to which remedial efforts were successful cannot be exactly determined as they were already being implemented at the start of the evaluation. In general, the educational monitoring in Germany provided insights into learning losses and subsequent (partial) rebounds. Still, the lack of consistent longitudinal assessments impedes a fine-grained view on cognitive and non-cognitive student development. Likewise, the impact of policy interventions is confounded with ongoing social, economic, and political developments. The influx of Ukrainian refugees in 2022 put strain on Germany's educational system just when there was some relief after the disruptive pandemic years. Socio-demographic changes such as skilled labour shortages will further challenge Germany's goal of reducing socio-economic disparities in learning.

The educational administrations in Germany had to learn many lessons during the pandemic. What actionable recommendations can be derived from these experiences?

First, think big. Major challenges require strategic reactions. The pandemic made it clear that the administration has the responsibility to make swift decisions.

However, such immediate responses were only effective if they were embedded in a long-term plan. Only sustained efforts improve learning outcomes. While the pandemic necessitated initial funding that covered only one or two years at most, more recent federal initiatives have an unprecedented long-term perspective. As detailed above, Germany's federal and the state ministries of education started the "Startchancen-Programm" (starting chance program; [BMBF, 2024a](#)) in 2024 to help socially disadvantaged schools with a large proportion of at-risk students. The ten-year program focuses on improving the learning environment and the technical infrastructure, strengthening schools' autonomy and quality management, and establishing and supporting multidisciplinary teams of teachers, social workers, and further professionals. The project is accompanied by a national scientific evaluation that provides regular feedback to the administration regarding effective practical solutions and upcoming challenges.

Second, empower schools. At the onset of the pandemic, educational administrations sought to micro-manage the suspension of in-person learning. By the time remedial programs started in Germany, administrations had learned to provide only general guidelines instead of fine-grained regulations. As a result, schools could soon hire additional staff and initiate tailored support courses for their students. Teachers need state-of-the-art in-service training in order to obtain and maintain adequate skills and knowledge ([Huber et al., 2023](#)). The pandemic facilitated the shift from in-person trainings to remote events. Remote training events may provide fewer social interactions, but they are more scalable and can also be delivered on demand. Teachers' professional development becomes even more important in light of socio-demographic changes associated with fewer new hires and more heterogenous class compositions than in previous decades.

Third, foster stability. The federal structure of educational administration makes it difficult to agree on and implement long-term educational reforms. The common denominator is often small. The members of the KMK often fluctuate after state elections. In the city state of Hamburg, an agreement on a common educational strategy across all major parties held from 2010 to 2025. Administrative regulations remained rather stable during this period and learning outcomes improved considerably ([Stanat et al., 2022, 2023](#)). In 2025, three ministers of education from different parties agreed on pursuing fewer new goals in favour of clarifying and stabilising ongoing efforts ([Hubig et al., 2025](#)). Educational reforms can only be reliably appraised and executed with detailed knowledge of the situation. Other countries such as Estonia already have a comprehensive state register containing performance indicators of educational institutions. Meanwhile, Germany's ministries of education and the statistical offices are slowly closing in on an educational register containing individual educational careers.

Focusing on these three aspects can make Germany's educational system future-proof. The COVID-19 pandemic certainly had a negative effect on

Germany's education system. Still, it also accelerated the implementation of digital learning tools, showed the flexibility of the notoriously slow administrations, and highlighted the commitment of teachers to their students. Schools are often quite capable of overcoming known challenge posed by legal and administrative regulations. Frequent changes to the general conditions such as funding, training, and educational standards disrupt school development. Reliable support structures, on the other hand, benefit school managers, teachers, and students. A transparent educational monitoring over time should enable school authorities to give successful schools latitude regarding their professional development and to offer struggling schools tailored help (such as personnel resources) to overcome school-specific hurdles. Step by step, Germany is getting there.

## Notes

- 1 The SWK is made up of 16 education researchers from a range of disciplines and advises the federal states on the development of the education system by providing evidence-based recommendations.
- 2 (R)eaching every child and keeping them in school, (A)ssessing learning levels, (P)rioritising teaching the fundamentals, (I)ncreasing the efficiency of instruction, (D)eveloping psychosocial health and well-being

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## 5 Academic resilience and policy reform in Italy

*Orazio Giancola and Luca Salmieri*

### Introduction

The Italian educational system exemplifies an inclusive model, mandating at least ten years of compulsory education for students aged from 6 to 16. This period integrates primary education (grades 1–5, ISCED level 1), lower secondary education (grades 6–8, ISCED level 2), and the first two years of upper secondary education. A standardised national curriculum governs the initial eight years, culminating in a nationwide examination at age 13 and 14. This examination marks the conclusion of lower secondary school and serves as a pivotal transition point. Beyond this stage, students enter upper secondary education (grades 9–13), selecting one of three tracks: *licei* (general/academic), *istituti tecnici* (technical), or *istituti professionali* (vocational). Each track diverges significantly in content and purpose. *Licei*, comprising classical, scientific, applied sciences, economics, and humanities specialisations, prepare students for tertiary education. Technical schools offer specialised training in fields like engineering, biotechnology, and management, blending academic and practical skills. Vocational schools prioritise immediate labour market entry through training in sectors such as mechanics, gastronomy, and fashion. A fourth regional pathway – vocational education and training (IeFP) – allows students aged from 14 to 16 to pursue 2 to 3 year courses, though reintegration into the national upper secondary system after this track remains rare.

Italy's early tracking system, requiring students to choose their educational trajectory at 14, distinguishes it from most Organisation for Economic Co-operation and Development (OECD) countries, where common curricula typically persist until age 16 (Benadusi & Giancola, 2014). Only Austria, Belgium, Germany, and six other OECD nations adopt comparable or earlier tracking ages (OECD, 2023a). This structural feature exacerbates socioeconomic disparities. *Licei* enrol 64% of students from the highest socioeconomic quartile, but only 18% from the lowest, while vocational schools disproportionately serve disadvantaged students (Azzolini & Vergolini, 2014; Giancola & Salmieri, 2022a). Middle-class students often

opt for technical schools, particularly if academic performance is middling (Ballarino & Panichella, 2016). These divisions perpetuate inequities in tertiary education access. Only 35% of vocational school graduates enrol in university, compared to 85% of *licei* graduates (Colombo & Salmieri, 2022). Even among high-achieving lower-class students, only 40% select *licei*, constrained by familial cultural capital and institutional biases (Panichella & Triventi, 2014). Consequently, Italy exhibits one of the OECD's highest concentrations of disadvantaged students in technical/vocational tracks (64.4%), contrasting for example with Austria (52.1%) and the Czech Republic (48.9%) despite both featuring an earlier age for track selection respectively at ten and at eleven years (OECD 2023b). Performance gaps mirror this stratification: Italy's PISA mathematics score difference between top and bottom SES quartiles is -43.0%, far exceeding Austria (-14.4%) and the Czech Republic (-12.7%) (OECD 2023b).

Italy's student demographics have transformed over the past decade, with immigrant students rising from 7% (2012) to 11% (2022) of the total school population. First-generation immigrants (3% of 15-year-olds) face unique challenges depending on their age of arrival (OECD 2024). While 53% arrive by age 5, benefiting from early linguistic and cultural integration, 19% arrive after age 12, navigating adolescence alongside abrupt educational transitions (Cavioni et al., 2024). These late arrivals often struggle with language barriers, curricular mismatches, and social isolation, contributing to higher dropout rates. Socioeconomic disparities compound these challenges. Immigrant students are twice as likely as natives to reside in disadvantaged households (52% vs. 25%) (OECD 2024). This overlap of migrant and socioeconomic disadvantage creates a "double penalty," limiting access to high-status tracks. Only 12% of immigrant students enrol in *licei*, versus 31% of natives, with most funnelled into vocational programs (Barone et al., 2018). Regional disparities further skew outcomes: Northern Italy's immigrant students score 35 PISA points higher in mathematics than Southern peers, reflecting resource allocation gaps (INVALSI, 2023).

Italy's centralised governance model of the education system contrasts with its European peers. The Ministry of Education dictates curricula, teacher hiring, and funding, while regions manage ancillary services like transportation and school meals (Giancola & Salmieri, 2022b). Schools possess moderate pedagogical autonomy – 67% of instructional decisions (e.g., timetable design, textbook selection) are school-level – but minimal control over staffing (33%) and budgets (OECD 2018). This hybrid model situates Italy between highly centralised systems (e.g., Greece) and decentralised ones (e.g., Sweden) (Christ & Dobbins, 2016). Despite 96.4% public school enrolment, socioeconomic inequities persist, albeit less acutely than in Southern Europe. Family background explains 14% of Italian students' PISA score variance versus 18% in Spain and 20% in Portugal (OECD 2023a). However, regional resource gaps undermine

equity: Northern schools spend 28% more per student than Southern counterparts, correlating with North-South performance divides (Giancola & Salmieri, 2022c).

The National Institute for Educational Evaluation (INVALSI) administers Italy's standardised testing regime, assessing mathematics, Italian, and English proficiency at grades 2, 5, 8, 10, and 13. These census-based tests, aligned with PISA methodologies, enable longitudinal tracking of competencies across tracks, regions, and demographics (Giancola & Salmieri, 2022b). Since 2016, INVALSI has conducted external school evaluations, pairing test data with contextual indicators (e.g., teacher qualifications, infrastructure) to identify underperforming institutions. The COVID-19 pandemic disrupted this system, suspending 2019/20 tests and delaying grade 10 assessments to 2021/22. This hiatus complicated learning loss measurement, necessitating multi-cohort comparisons.

## **National data on learning loss**

### *Cognitive skills*

Previous research indicates pandemic-induced learning loss in Italy varied significantly by grade level and socioeconomic status (SES). Upper secondary students suffered the most severe losses, with grade 13 cohorts facing deficits of 0.4 standard deviations (thereafter: s.d.) in core subjects, jeopardising transitions to higher education or employment (Contini et al., 2023). Socioeconomic disparities also intensified: lower-income students lost 0.21 s.d in math and 0.10 s.d in reading, contrasting with minimal losses or gains among advantaged peers (Carlana et al., 2023). While some studies note reduced achievement gaps among high-achieving disadvantaged students, broader trends confirm systemic inequities exacerbated by the pandemic (Giancola & Salmieri, 2024). Regional disparities further compounded losses, with under-resourced Southern Italy disproportionately affected.

Contini et al. (2021), just in the aftermath of school closure and focusing specifically on primary school students, found that the COVID-19 pandemic and school closures had a large negative impact on mathematics skills of Italian primary school pupils, with an average learning loss of -0.19 s.d. which is equivalent to about three months of school, consistent with the duration of school closures in Italy during the first wave of the pandemic. The study also found (through different regression models) that the learning loss was consistent for pupils from disadvantaged backgrounds (low-educated parents) and that girls experienced a larger learning loss (-0.29 s.d.) compared to boys (-0.13 s.d.). The overall negative impact on mathematics skills is congruent with the general trend of declining or stagnating scores in mathematics (Giancola & Salmieri, 2024).

Learning loss – defined as the regression or stagnation of skills due to educational disruptions – is quantified through comparative analysis of standardised test scores. By leveraging INVALSI data, our analysis now spans an extended longitudinal timeframe encompassing pre-pandemic (2019), pandemic (2020–2021), and post-pandemic (2022–2024) periods. This expanded temporal scope, exceeding the duration of prior studies, enables a more comprehensive examination of Italian students’ average performance across various competencies, capturing both immediate disruptions and longer-term eventual recovery trajectories. For analytical consistency, INVALSI standardised the 2019 pre-pandemic scores at a baseline of 200, allowing for the measurement of any subsequent learning losses or gains relative to this reference point. The Italian education system’s resilience and adaptability are put to the test, as reflected in the fluctuating scores across different subjects and grade levels.

In Italian reading and comprehension, an ongoing pattern of modest regression or stagnation emerges across most grade levels (Table 5.1). For example, the second year of primary school exhibited a decline from the 2019 baseline of 200 to 195.5 by 2024, with marked fluctuations during intervening years. Scores for the fifth year of primary school maintained relative stability, consistently approximating the 200 benchmark. The most pronounced deterioration, however, occurs in the final year of upper secondary school (grade 13), where performance declined from 200 in 2019 to 189.5 in 2024. This disparity suggests that older students may have been disproportionately impacted by pandemic-related disruptions, potentially reflecting cumulative effects on critical literacy skills during formative academic stages.

The mathematics performance data reveal distinct patterns across educational stages, marked by post-pandemic declines and uneven recovery trajectories. In primary education, the second grade experienced a sharp drop from 197.5 in 2021 to 191.8 in 2022 following the resumption of assessments, with only marginal recovery to 192.3 by 2024: a persistent 7.7 point deficit compared to the 2019 baseline. Similarly, fifth-grade scores fell to 192.5 in 2022 before rebounding to 194.9 in 2024, remaining 5.1 points below pre-pandemic levels. These trends indicate that foundational mathematics skills were more susceptible to disruption than literacy, with younger students facing sustained challenges in regaining pre-pandemic proficiency.

At the lower secondary level (grade 8), scores declined to 193.6 in 2021 but stabilised near 195.2 by 2024, reflecting a partial recovery of 4.8 points below baseline. This contrasts with Italian reading performance at the same grade, which showed no meaningful recovery, stagnating at 194.5 in 2024. Moving to upper secondary education, grade 10 scores plateaued around 196.8 post-pandemic, maintaining a 3.2-point gap from baseline – smaller than the equivalent deficit in Italian reading (195.0 vs. 200). However, the most severe decline emerged in grade 13, where scores plummeted to 190.9 in 2021 and recovered only to 193.0 by 2024, remaining 7.0 points below baseline. This mirrors the

Table 5.1 Italian Students' core competency mean scores: Pre-Pandemic, pandemic, and post-pandemic trends (2019–2024)

	<i>Italian (reading and comprehension)</i>	2019	2020	2021	2022	2023	2024
2	2 <sup>nd</sup> year of primary school	200.0	**	204.8	169.9	194.1	195.5
5	5 <sup>th</sup> year of primary school	200.0		204.8	198.7	195.8	195.7
8	3 <sup>rd</sup> year of lower secondary school	200.0		196.8	196.6	196.6	194.5
10	2 <sup>nd</sup> year of upper secondary school	200.0		**	198.4	196.1	195.0
13	5 <sup>th</sup> year of upper secondary school	200.0		186.3	185.4	184.9	189.5
	<i>Mathematics</i>	2019	2020	2021	2022	2023	2024
2	2 <sup>nd</sup> year of primary school	200.0	**	197.5	191.8	190.1	192.3
5	5 <sup>th</sup> year of primary school	200.0		197.7	192.5	190.2	194.9
8	3 <sup>rd</sup> year of lower secondary school	200.0		193.6	194.2	193.9	195.2
10	2 <sup>nd</sup> year of upper secondary school	200.0		**	196.8	196.7	196.8
13	5 <sup>th</sup> year of upper secondary school	200.0		190.9	191.0	191.1	193.0
	<i>English (listening)</i>	2019	2020	2021	2022	2023	2024
2	2 <sup>nd</sup> year of primary school	*					
5	5 <sup>th</sup> year of primary school	200.0	**	200.4	206.4	202.1	214.1
8	3 <sup>rd</sup> year of lower secondary school	200.0		202.9	205.9	209.2	214.0
10	2 <sup>nd</sup> year of upper secondary school	200.0		202.0	***		
13	5 <sup>th</sup> year of upper secondary school	200.0		201.2	202.0	205.5	210.2
	<i>English (reading)</i>	2019	2020	2021	2022	2023	2024
2	2 <sup>nd</sup> year of primary school	*					
5	5 <sup>th</sup> year of primary school	200.0	**	201.2	205.8	201.8	211.1
8	3 <sup>rd</sup> year of lower secondary school	200.0		204.3	206.7	209.9	214.0
10	2 <sup>nd</sup> year of upper secondary school	200.0		198.0	***		
13	5 <sup>th</sup> year of upper secondary school	200.0		197.6	198.9	202.0	206.2

\*The subject has no standardised testing at this level; \*\*assessment suspended during COVID-19; \*\*\*no longer includes testing

Source: INVALSI multiple academic years.

steep deterioration observed in Italian reading for the same cohort, underscoring older students' heightened vulnerability to academic disruptions.

While mathematics demonstrated marginally greater resilience than Italian reading in lower secondary grades, both subjects exhibited fragility during critical transitional phases, such as the final year of upper secondary education. Notably, the incomplete recovery in primary grades raises equity concerns, given the strong correlation between early mathematics proficiency and long-term academic success (OECD, 2023a). The systemic failure to restore pre-pandemic

baselines in any grade or subject highlights broader challenges in Italy's educational recovery framework. On the opposite, English language skills, assessed through listening and reading tests, present an optimistic picture. Unlike the native language and mathematics scores, English proficiency shows marked improvement across most grade levels. For instance, in English listening, the fifth year of primary school scores increased from 200 in 2019 to an impressive 214.1 in 2024. Similarly, the third year of lower secondary school saw an increase from 200 to 214 over the same period. English reading scores mirror this positive trend, with the third year of lower secondary school (grade 8) improving from 200 in 2019 to 214 in 2024. This consistent improvement in English language skills across different age groups is particularly noteworthy, especially given the challenges posed by remote learning during the pandemic. It suggests that digital learning tools and increased exposure to English-language media during lockdowns may have inadvertently boosted students' English language acquisition. The shift to digital and remote learning during the pandemic may have been more conducive to the development of foreign language skills, most likely because learning a foreign language, particularly English with its global resonance, is well-suited to listening and reading activities conducted remotely using multimedia materials. Additionally, English serves as the reference language for computing and digital communication. Another contributing factor might be the increased consumption of internationally sourced digital content, which has grown significantly, especially among adolescents, starting from the pandemic.

The contrasting trends between core subjects like Italian and mathematics versus English language skills highlight the complex and multifaceted impact of the pandemic on Italian education. While traditional subjects seem to have suffered, possibly due to the challenges of remote learning and reduced in-person instruction, English language learning appears to have thrived. The PISA 2022 survey provides a snapshot of Italian tenth graders 15-year-olds' academic performance, concluding two years before the latest INVALSI data used in our analysis. However, findings from PISA 2022 survey confirms the short-term learning loss. Mathematics scores showed a notable decline from 2018, reversing much of the previous progress and regressing to levels seen in 2003 and 2006. Compared to 2012, more students failed to reach basic proficiency in mathematics and science, increasing by four and five percentage points, respectively.

A persistent North-South divide in educational achievement remains evident. Despite temporary disruptions from the pandemic, this long-standing regional imbalance remains unchanged. Students in the North continued to outperform their peers in the South, with central Italy occupying an intermediate position. This disparity is not solely due to differences in school quality but also reflects broader socioeconomic conditions beyond the education system's control (Argentin & Pavolini, 2020; Giancola & Salmieri, 2020). Educational inequalities among school tracks are stark. By 2022, students in general education tracks

(*liceo classico/scientifico*) consistently outperformed the national baseline of 200 points, while technical and vocational students, who disproportionately come from disadvantaged backgrounds, lagged behind (Giancola & Salmieri, 2024). Vocational pupils experienced the most severe deficits, reflecting systemic inequities where workforce-oriented curricula and limited academic support reinforce socioeconomic stratification, further exacerbated by Italy's weak labour market (OECD, 2024). Before the pandemic, gender disparities in educational outcomes in Italy were evident, with boys outperforming girls by 8 points in financial literacy. By 2022, this gap had widened to 20 points, indicating an increased disparity (OECD, 2024). Additionally, students with an immigrant background consistently scored lower than their native peers. In 2022, the average difference in financial literacy performance between immigrant and non-immigrant students was 12 points, after accounting for socio-economic background (OECD, 2024). The pandemic exacerbated these disparities, as remote learning posed greater challenges for disadvantaged and immigrant students. Foreign-born students, especially first-generation immigrants, bore the brunt of school closure measures. The shift to remote learning via videoconferencing eliminated the linguistic socialisation and social integration typically fostered by in-person schooling – crucial processes that contribute to the acquisition of fundamental skills in reading, comprehension, and mathematics. The equalising effect of physical classrooms and the benefits of cooperative learning among peers were fundamentally undermined. The absence of daily interactions with teachers and classmates, vital for achieving appropriate proficiency levels, resulted in significant learning deficits, particularly among non-native students, those from disadvantaged backgrounds, and individuals with pre-existing learning gaps (Giancola & Salmieri, 2024).

### *Non-cognitive skills*

The COVID-19 pandemic profoundly disrupted the socioemotional development and mental health of Italian children and adolescents, with cascading effects on life satisfaction, school belonging, and perceptions of loneliness. Empirical studies consistently document declines across these domains, mediated by age, socioeconomic status, and regional disparities (Curatola et al., 2022; Liang et al., 2020; Pellerone et al., 2023). Younger children (3–5 years), those from low-SES households, and residents of Northern Italy – a region disproportionately affected by early pandemic waves – experienced the most severe alterations in emotional regulation, including heightened anxiety, sleep disturbances, and reliance on maladaptive coping strategies (Bacaro et al., 2021; Bonvino et al., 2023; Cellini et al., 2021). Other psychometric-type analyses (Di Giunta, 2021) reveal that adolescents aged from 11 to 16 faced deteriorating mental health, marked by rising internalising (e.g., depression) and externalising (e.g., aggression) behaviours alongside diminished prosociality and resilience.

While not all changes reached statistical significance, the directional consistency across studies underscores a systemic erosion of socioemotional capacities during prolonged social isolation.

The pandemic's toll extended to adolescents' self-perception and social integration. School belonging – a critical determinant of mental health – declined notably, with only 64% of Italian students reporting a sense of attachment to their schools in 2022, far below the OECD average of 75% (OECD 2024). Concurrently, 14% reported persistent loneliness, and 13% felt excluded, reflecting a deterioration from pre-pandemic baselines. Life satisfaction mirrored this decline, as 18% of students rated their well-being between 0 and 4 on a 10-point scale in 2022, up from 15% in 2018 (OECD 2024). These metrics correlate strongly with non-cognitive skill development; students with weaker school belonging exhibit lower resilience and empathy, aggravating feelings of alienation (Allen et al., 2018; Arslan, 2018). The reciprocal relationship between belonging and socioemotional competencies underscores schools' dual role as academic and social ecosystems, a duality fractured by remote learning (Yeager & Dweck, 2012).

Remote education's infrastructural limitations amplified existing inequities (Bertoletti et al., 2023). Mascheroni et al. (2021), analysing 1,028 internet-accessible Italian households, found 27% lacked sufficient devices for simultaneous work and schooling, forcing 41% to purchase computers mid-pandemic. Even with devices, 6% of students faced connectivity barriers, disproportionately affecting Southern Italy. While 93% adapted to online platforms, younger children struggled with self-directed learning due to underdeveloped digital literacy, exacerbating declines in motivation and self-discipline. Parental support, though well-intentioned, proved inconsistent: 92% of parents felt digitally competent, but 28% lacked time to assist their children, leaving many adolescents to navigate academic and emotional challenges alone. The erosion of peer interactions further stunted social skill development, as virtual platforms failed to replicate the nuanced dynamics of in-person collaboration (Mascheroni et al., 2021).

Familial contexts mediated these impacts unevenly. Supportive parental emotional socialisation buffered against maladjustment, fostering adaptive coping strategies, whereas dismissive or critical approaches correlated with heightened dysregulation (Di Giunta et al., 2021). Yet such protective factors were unequally distributed. Low-SES households, already strained by economic precarity, reported higher rates of parental stress, reducing capacity for empathetic engagement (Pellerone et al., 2023). Regional disparities compounded these effects; Northern Italy's higher device ownership and internet access marginally mitigated educational losses compared to the South, where systemic under-investment deepened vulnerabilities (Mascheroni et al., 2021). Despite these challenges, limited protective mechanisms emerged. Social media usage helped some adolescents maintain peer connections, counteracting isolation (Mattioli et al., 2021; Vannucci et al., 2020). However, such benefits

were context-dependent and failed to offset broader declines in empathy and teamwork, skills traditionally cultivated through collaborative learning (Duckworth & Yeager, 2015). Resilience, though strained, retained predictive power: adolescents with stronger pre-pandemic social emotional skills exhibited slower declines in prosocial behaviour, suggesting foundational competencies buffer against systemic shocks (Martinson et al., 2022).

We have conducted a comparative analysis of pre-pandemic (2018) and post-pandemic (2022) student well-being, derived from merged PISA datasets using harmonised variables. Findings reveal profound shifts in psychological and social conditions (see Figure 5.1). By aligning cross-sectional data from these two cohorts of Italian tenth graders – methodologically consistent though not longitudinal – we observed statistically significant declines across multiple

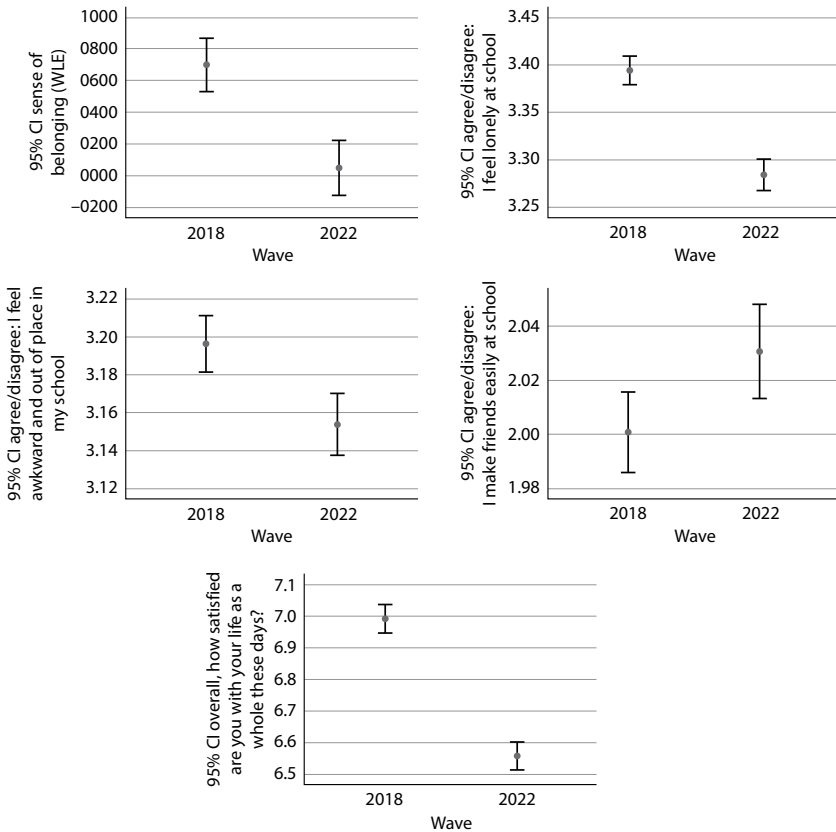


Figure 5.1 Differences over time in some non-cognitive dimensions of the school experience

Source: OECD PISA 2018–2022 dataset. All the differences between waves are significant for  $p = 0.001$

dimensions of student well-being, even as cognitive outcomes such as mathematics and reading performance remained a focal point of public discourse. We focused on four dimensions: sense of belonging, perceptions of loneliness, discomfort at school, perception of making friends easily at school, and overall life satisfaction. Central to the findings is the erosion of social connectedness within educational environments.

Students in 2022 reported a markedly weaker sense of belonging compared to their 2018 peers, reflecting diminished attachment to school communities. This decline was paralleled by heightened perceptions of loneliness, measured through a scale where stronger disagreement with the statement “I feel lonely at school” corresponded to higher scores (1 = Strongly agree, 4 = Strongly disagree). The 2022 cohort demonstrated a significant downward shift in mean scores, with non-overlapping confidence intervals confirming the robustness of this trend. By contrast, the 2018 data indicated relatively stronger disagreement with feelings of loneliness, underlining a likely pandemic-driven deterioration in peer integration. These trends were further compounded by a growing sense of alienation among Italian students in 2022, reflected in increased agreement with the statement “I feel out of place at school,” and a corresponding decline in their sense of belonging compared to the 2018 cohort (see [Figure 5.1](#)). The mean score dropped between cohorts, again supported by non-overlapping confidence intervals, signalling a broader deterioration in social cohesion. These interrelated declines in belonging, loneliness, and comfort suggest a systemic unravelling of the supportive networks traditionally fostered within schools, likely worsened by prolonged remote learning and reduced face-to-face interactions during critical developmental stages. In this context, agreement with the statement regarding the ease of making friends at school decreased significantly, highlighting an additional relational issue that adds to and combines with the previous non-cognitive dimensions investigated (which, moreover, are strongly correlated with each other).

Beyond the school environment, students’ overall life satisfaction – measured on a 10-point scale (1 = Lowest, 10 = Highest) – also declined sharply. The 2022 cohort reported significantly lower mean scores than their 2018 counterparts, with confidence intervals illustrating a statistically unambiguous downward trajectory. Notably, this decrease is even more pronounced when comparing the average scores of students in the highest and lowest ESCS (Economic, Social and Cultural Status) quartiles across the two periods, suggesting that socioeconomically disadvantaged students experienced a disproportionately negative impact. This decline in overall life satisfaction, extending beyond educational contexts, underscores the pervasive psychological toll of pandemic-related disruptions, including social isolation, familial stress, and existential uncertainty [Buzzi et al. \(2020\)](#).

The analysed data demonstrate a very minimal statistical correlation between students’ psychological-social well-being indicators and their performance on

standardised PISA cognitive assessments. Within the Italian educational context, analyses show pandemic-induced learning losses were disproportionately severe in mathematics, while reading comprehension deficits remained relatively contained – although it should be noted that Italian students’ academic performance continues to lag behind both OECD and European Union averages across disciplines. While these well-being indicators might initially seem disconnected from measurable academic achievements, they nevertheless paint a disquieting portrait of students’ holistic welfare status. The documented declines in school belonging, deterioration of peer relationships, and reduced life satisfaction reveal fundamental dimensions of the educational experience that remain systematically neglected due to disproportionate emphasis on cognitive outcomes. These findings emphatically argue for a paradigm shift in educational priorities, recognising emotional stability and social competencies as indispensable components of comprehensive student development.

The results now illustrated indicate a broader deterioration in well-being extended beyond the school environment, mirroring the multifaceted challenges students encountered during a period characterised by profound uncertainty, widespread social disruption, and fundamental alterations to daily life. When considered collectively, these trends illustrate a sobering reality regarding the pandemic’s impact on adolescents’ psychosocial welfare. These patterns highlight the critical need for targeted policy interventions designed to reestablish a sense of community belonging, strengthen interpersonal connections, and implement robust mental health support systems for students. Furthermore, these outcomes reinforce the essential role of cultivating inclusive, nurturing school environments that serve as crucial protective mechanisms during societal crises.

### **Education policy reforms**

Italy’s educational system emerged as a paradigmatic case among Western nations during the COVID-19 pandemic, being the first in Europe to implement a nationwide school closure in March 2020 and maintaining 13 weeks of full shutdown within the initial phase alone – among the longest such periods globally (UNESCO, 2022). By September 2020, partial reopening introduced stark disparities: upper secondary students remained predominantly remote, while younger cohorts resumed in-person learning. Regional risk protocols, classifying areas into red (high), orange (medium), and yellow (low) zones based on infection rates, further fragmented educational access. Northern Italy, bearing the pandemic’s brunt with elevated case and mortality rates (Bosa et al., 2022), faced recurrent transitions to remote instruction. These measures persisted through April 2021, with high schools in red zones confined to distance learning and others adopting hybrid models (50–75% in-person attendance), contingent on fluctuating case numbers and evolving public health mandates (UNESCO, 2022).

The prolonged disruption (spanning 24 weeks of partial closures and intermittent regional lockdowns) intensified psychosocial strain. Students, particularly adolescents aged from 11 to 16, endured eroded social emotional skills, diminished resilience, and heightened behavioural difficulties, compounded by Italy's uniquely protracted exposure to pandemic stressors (Forte et al., 2021; Orgilés et al., 2021). Social isolation disrupted normative developmental milestones, curtailing opportunities for peer interaction, collaborative learning, and extracurricular engagement – key drivers of prosocial behaviour and emotional regulation (Grazzani et al., 2022). The decline in these competencies was particularly acute given Italy's cultural emphasis on communal activities; restrictions on sports, leisure, and informal social gatherings deprived adolescents of critical outlets for skill practice and identity formation.

Two distinct policy phases emerged: (1) preventative measures during closures, and (2) post-hoc remediation efforts. The former prioritised digital equity, provisioning devices to disadvantaged students and training educators in remote instruction tools – accelerating pre-existing computerisation plans. Schools received supplemental funds for sanitation protocols and hybrid learning logistics, yet summer 2020 saw no remedial programming to counteract skill erosion. By contrast, post-2021 interventions, such as selective in-person tutoring in underserved areas, relied on localised needs assessments but lacked scalability or rigorous impact evaluation. This bifurcation underscores Italy's emphasis on systemic resilience over individualised academic recovery, a strategy that aligned with broader European trends but faltered in addressing acute, cohort-specific vulnerabilities.

The socioemotional toll of these policies was profound. Prosocial behaviour, dependent on peer interaction, declined sharply as adolescents lost structured and informal social venues (Orgilés et al., 2021). Concurrently, resilience scores fell, reflecting diminished capacity to adapt to adversity (a regression linked to attenuated social emotional learning opportunities; see Grazzani et al., 2022). Once again, these trends were most pronounced in the Northern regions, where stringent lockdowns coincided with higher pre-pandemic reliance on community-based extracurricular activities. Paradoxically, while Italy's mortality rates stabilised post-vaccination, educational disparities widened: Southern students, already disadvantaged by weaker digital infrastructure, faced compounded academic and psychosocial setbacks (UNESCO, 2022).

After the pandemic period, government responses prioritised infrastructural modernisation over targeted academic recovery. Post-2021 initiatives allocated €1.5 billion to construct 200 schools, upgrade digital resources, and renovate classrooms, aligning with the National Recovery and Resilience Plan. However, these measures, tethered to multi-year EU funding timelines, offered little immediacy for pandemic-era learning losses. Similarly, teacher training programs focused on methodological upskilling, addressing chronic pedagogical gaps in

secondary education rather than remediating student-specific deficits (Salmieri, 2019). Notably absent were national assessments to evaluate intervention efficacy, reflecting a reactive rather than evidence-based policy framework.

Critically, Italy's recovery strategy overlooked non-cognitive dimensions of learning loss. Investments focused on physical and technological infrastructure, neglecting programs to rebuild social connectedness. The absence of mental health supports, or community-building initiatives left students navigating re-entry into altered educational environments without scaffolding to address loneliness or reintegration anxiety. This gap mirrored broader European patterns but proved particularly detrimental in Italy, where familial and communal ties traditionally buffer socioeconomic precarity.

### **Impact analysis of policy interventions**

The COVID-19 pandemic has had a significant and multifaceted impact on student achievement in Italy. While the overall trend points to substantial learning losses, particularly in mathematics and among older students, the effects on educational inequalities are more complex than initially anticipated. Our analyses reveal a complex interplay of factors contributing to learning losses and widening achievement gaps, particularly among upper secondary students and those from disadvantaged backgrounds.

The immediate consequence of school closures was the suspension of in-person instruction, with a disproportionate impact on students who depend most heavily on structured educational settings. While Northern Italy experienced the most severe health-related effects of the pandemic – marked by high infection and mortality rates, which necessitated recurrent and prolonged shifts to remote learning – the educational repercussions were most acutely felt in the South. The pandemic thus intensified Italy's enduring North–South disparities in educational achievement, as schools in Southern and rural areas encountered heightened challenges stemming from longstanding deficiencies in digital infrastructure, socioeconomic disadvantage, and uneven territorial development. Although public authorities swiftly allocated resources for digital tools and teacher training, the implementation of these measures varied widely across the country, revealing and reinforcing existing inequalities in institutional preparedness and access to remote education. Cognitive development among students suffered significantly, particularly in mathematics and reading. While primary school students benefitted from relatively earlier returns to in-person learning, upper secondary students experienced more significant learning losses due to prolonged reliance on remote education. The absence of consistent and high-quality digital learning platforms further hindered students' academic progress.

Non-cognitive skills, such as resilience, communication, and collaboration, were also adversely affected. Remote learning curtailed opportunities for peer interaction, a critical component of social development, and weakened students'

emotional connections with their teachers and classmates. Vulnerable students, in particular, faced difficulties adapting to remote learning environments, as they often lacked supportive home environments conducive to education.

The immediate policy response to school closures prioritised containment of contagion, often at the expense of educational continuity. The distribution of digital devices to disadvantaged students and the organisation of extracurricular tutoring sessions were implemented, albeit in a fragmented manner. These localised efforts, while well-intentioned, lacked the scale and coordination necessary to address nationwide learning deficits effectively.

Italian interventions aimed at recovering or mitigating learning loss relied on pre-existing, small-scale, and localised strategies. These included teacher support for struggling students, additional homework, school-specific initiatives for disadvantaged students, and extended learning groups for low performers. Notably, Italy did not implement a comprehensive national program specifically targeting pandemic-induced learning loss. The absence of a coherent policy strategy and systematic impact evaluations has hindered the assessment of recovery measures' effectiveness. The interplay between a centralised educational system and decentralised health management led to significant regional disparities in school closure durations and frequencies. This inconsistency, coupled with the lack of robust data collection frameworks, has complicated efforts to measure outcomes comprehensively and develop targeted activities.

The Italian education system, characterised by a relatively centralised decision-making structure, clashed with the regionalised approach to pandemic management in the healthcare system. This contradiction led to an uneven landscape of learning loss as the pandemic progressed. School closure policies varied based on infection rates and speeds across Italy's 20 administrative regions, following a colour-coded system indicating contagion severity. This decentralised health crisis management conflicted with the centralised educational system, intensifying historical educational gaps between the country's North and South and introducing new variations at the subregional level. Over the past three years, the efforts of Italian governments have predominantly focused on a series of interventions, which we categorise into three key policy areas: (1) Strengthening and modernising school infrastructure and digital resources: this includes addressing long-standing issues with non-compliant school buildings and upgrading digital tools. However, these measures appear insufficient to address pandemic-induced learning losses, as they represent universal interventions benefiting all students rather than targeting those with significant academic delays. While these improvements may bolster resilience against future disruptions to in-person schooling, their impact on recovering lost competencies remains limited. (2) Funding for school-requested psychological counselling services: these initiatives provide extracurricular psychological support to students. Yet their fragmented implementation relies heavily on individual schools' capacity to identify and address deficits

in socioemotional skills, resulting in uneven coverage and effectiveness. (3) Initiatives to strengthen foundational competencies: aimed at students with learning gaps, these programs seek to curb the longstanding decline in core academic skills – a trend predating the pandemic and persisting across successive cohorts of Italian students. While critical, their design reflects a reactive approach to systemic educational challenges rather than a proactive strategy for holistic recovery.

This triad of policies underscores a focus on infrastructural resilience and incremental skill-building, yet reveals gaps in targeted, evidence-based interventions to remediate pandemic-specific learning losses and socioemotional deficits. For policymakers, these findings underscore the importance of adopting a more integrated and equitable approach to education reform. Future initiatives should focus on reducing regional disparities by investing in digital infrastructure and teacher training, particularly in underserved areas. Implementing targeted recovery programs that address both cognitive and non-cognitive development is crucial for mitigating the long-term impacts of the pandemic. Establishing a robust system for monitoring and evaluating the effectiveness of these interventions will also be essential to ensure that resources are allocated efficiently and equitably. Moreover, policymakers should consider the unique pattern of learning loss observed in Italy, where upper secondary students experienced more severe deficits compared to their primary school counterparts. This phenomenon necessitates tailored interventions that account for the specific needs of adolescent learners, including strategies to re-engage them in the educational process and strengthen their socioemotional connections within the school environment.

The pandemic has also highlighted the critical role of non-cognitive skills in student development and well-being. Future policies should integrate socioemotional learning into curricula, expand access to school-based mental health resources, and foster peer mentorship programs to rebuild interpersonal networks. Such measures would not only address immediate post-pandemic deficits but also fortify schools against future crises by reinforcing their role as dual pillars of cognitive and emotional development. Furthermore, addressing the digital divide remains a priority. While initial efforts were made to distribute devices and improve connectivity, a more comprehensive approach is needed to ensure equitable access to high-quality digital learning resources across all regions. This includes not only providing hardware but also investing in teacher training to effectively integrate technology into pedagogical practices.

The implications of findings on non-cognitive skills loss extend beyond academic policy. The erosion of social connectedness and life satisfaction among adolescents signals a generational vulnerability, with potential long-term consequences for mental health, civic engagement, and workforce readiness. While public debates have prioritised measurable academic outcomes, these analyses underscore the necessity of holistic recovery strategies that integrate emotional and social support systems into educational frameworks.

A review of Italy's pandemic response in education suggests the relevance of a dual-horizon policy approach that distinguishes between immediate recovery actions and longer-term systemic reforms (UNESCO et al., 2021). Emerging evidence from international and national experiences indicates that combining targeted interventions with structural innovation is increasingly recognised as essential to address both the short- and long-term consequences of the crisis (OECD, 2021; UNICEF, 2022). In the short term, interventions might focus on academic and socioemotional recovery, especially among the most affected student populations. Potential measures include: a) High-intensity tutoring programs and small-group instruction, particularly for upper secondary students, who appear to have experienced the most significant learning setbacks; b) Summer schools and extended learning time, with a focus on disadvantaged territories, to consolidate foundational skills and prevent disengagement; c) Strengthened support for socioemotional learning, through embedded classroom activities and the expansion of school-based psychological counselling, in order to restore peer interaction and emotional well-being.

Over the longer term, more structural interventions could be considered to mitigate existing inequalities and enhance system-wide resilience: a) Postponing early tracking and fostering more inclusive lower secondary pathways may help reduce the stratifying effects of academic selection, particularly among students from disadvantaged backgrounds; b) Integrating socioemotional learning into curricula on a more systematic basis, ensuring that it is not relegated to extracurricular or ad hoc initiatives; c) Bridging the digital divide, not only through hardware distribution but also by supporting pedagogical innovation and continuous teacher training; d) Establishing a national system for the evaluation of recovery measures, enabling more informed decision-making and the redistribution of resources based on territorial and school-level needs. While these directions remain open to contextual adaptation and empirical scrutiny, they offer a framework to think critically about how to transform a reactive crisis response into an opportunity for long-overdue reform. The combination of targeted support, structural change, and evaluation capacity appears essential to advancing a more equitable and robust education system.

In light of the evidence discussed, the Italian education system's response to the COVID-19 pandemic reveals the inadequacy of siloed approaches to education in times of crisis. The interplay between declining well-being and variable academic outcomes exemplifies the need for integrated policy responses that harmonise academic rigour with human-centric support. By reimagining schools as environments that nurture both intellectual growth and emotional resilience, stakeholders can mitigate the enduring impacts of the pandemic while cultivating a more inclusive and adaptive educational landscape. This dual focus is not merely aspirational but a pressing necessity, as the well-being and future prospects of an entire generation hinge on the system's capacity to address both cognitive and socioemotional aspects of learning in a comprehensive and equitable

manner. The pandemic has laid bare the systemic inequities and regional disparities that have long characterised Italian education. By leveraging this crisis as a catalyst for transformative change, policymakers have the opportunity to build a more resilient, equitable, and effective education system that can better serve all students, regardless of their background or geographic location.

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# 6 Academic resilience and policy reform in Sweden

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## Introduction

Sweden took a different approach to the COVID-19-pandemic, compared to most other countries. From the onset of the pandemic, the Swedish government, guided by the Public Health Agency of Sweden, decided to keep preschools and schools for children aged seven to fifteen years open. This decision was rooted in the belief that the benefits of in-person education outweighed the risks, especially considering the potential negative social and psychological effects of school closures on young children.

Upper secondary schools, however, transitioned to distance learning to reduce the spread of the virus among older students, starting in mid-March 2020. This decision was made to reduce the spread of the virus among older students, who were considered more likely to transmit COVID-19 than younger children. The shift to online education required significant adjustments from both students and teachers. Many upper secondary schools were already utilising digital platforms and tools, which facilitated a smoother transition to remote learning. However, there were still challenges, including ensuring all students had access to necessary technology and internet connectivity. Teachers had to adapt their teaching methods to an online format, which sometimes led to difficulties in maintaining student engagement and participation.

Despite these challenges, the overall academic performance of upper secondary students appears to have remained relatively stable. The Swedish National Agency for Education as well as [Statistics Sweden \(2023\)](#) reported that students' grades did not show a significant decline during the pandemic. Still, there were concerns about the long-term effects of prolonged distance learning, particularly regarding students' mental health and social development.

This chapter delves into the specific policies implemented by Sweden during the pandemic, examining how these strategies influenced the educational landscape. It explores the effects in the short run on students, teachers, and the broader school community. The chapter also highlights the challenges and successes of Sweden's approach, providing an overview of how the country

navigated the complexities of maintaining educational continuity amidst a global health crisis. This chapter is structured as follows: First, some background to the Swedish school system will be given. This is followed by a section on the policies that regulated and guided the schools during the pandemic. In section three, effects on educational and non-cognitive outcomes will be addressed. In the final section of the chapter, findings will be discussed with some concluding remarks.

### *The Swedish school system*

The Swedish school system is characterised by its comprehensive and inclusive nature, providing education from preschool through to upper secondary school (K-12). The current education system includes non-compulsory pre-school (up to age 6), followed by preschool class (compulsory at age 6) and nine years of compulsory education, typically from age 7 to 16 (compulsory school). The system is designed to promote equality and accessibility; all schooling is publicly funded and tuition-free. Also, technical equipment such as laptops and similar are often provided to the students by the schools at upper secondary level ([Swedish National Agency for Education, 2016](#)). Preschools are subsidised to help all children begin learning on equal footing. The national curriculum emphasises not only academic knowledge but also the development of social and practical skills, with the purpose to prepare students for further education and the labour market. Students typically complete compulsory education at age 16, after which most continue to upper secondary education. Upper secondary school, or “gymnasium,” in Sweden typically covers three years of education. This stage offers a variety of programs, broadly divided into vocational and academic tracks, all providing basic eligibility for higher education. Most programs are national, ensuring uniformity in format and content across the country. Core subjects, such as Swedish, English, Mathematics, Social Science, History, and Natural Science, are mandatory. Course levels and additional subjects vary depending on the program. While not strictly standardised, schools have some flexibility to tailor content, giving programs specific orientations, though overall consistency is maintained<sup>1</sup>.

The Swedish school system is a highly centralised system in some respects. All schools are regulated by the school law, there is a national curriculum for each school level, and common syllabuses for all elementary schools and for the national programmes at upper secondary level. All Swedish schools are overseen by the Swedish Government and its agencies. The Swedish Parliament (Riksdag) and the Ministry of Education establishes laws and educational goals, while the National Agency for Education (NAE) ensures that these are implemented, guiding schools on their teaching requirements and regulations. The School Inspectorate is responsible for ensuring that schools comply with regulations.

However, although the Swedish system is centralised in terms of governance, it is also a very decentralised system when it comes to how resources to education are allocated and how education is carried out in practice. School organisers in Sweden are the 290 different municipalities. They have the responsibility to make sure that all students have access to pre-school and run the majority of the compulsory and upper secondary schools. They are also responsible for allocating resources enough to fulfill the goals set out by the government. Equality between municipalities, in terms of financial resources, are ensured through the national general equalisation system granting municipalities with high costs (and low tax bases) and taxing municipalities with low costs. But there are also opportunities for alternatives; private entities, or cooperations of various kinds, can apply to be authorised to run schools (so called independent schools). In 2020, there were approximately 4,800 compulsory schools in Sweden, out of which 800 were independent schools. Among the approximately 1,300 upper secondary schools, more than one-third are run by an independent organiser<sup>2</sup>. Schools are funded by taxes and operate on a voucher system irrespective if they are run by the municipalities or by independent organisers. Tuition fees and other fees are not allowed. This means that schools compete mainly by attracting and passing students.

### ***Educational assessment***

Since this chapter aims to describe and discuss effects from the COVID-19-pandemic on education, it is relevant to describe how educational achievement is assessed within the Swedish school system. One very special feature with the Swedish school system is the absence of external examinations and high stakes testing, which can make it challenging to evaluate educational outcomes. Grades and national tests can give some information, but these measures are problematic for making comparisons between schools and over time.

In the Swedish educational system, there has been for many years a tension between valuing educational statistics and measurement on the one hand and resisting testing and student “labelling” on the other, resulting in a strongly regulated system but with a lot of responsibility given to the schools and the teachers when it comes to assessment and grading. Teachers are expected to base their grading decision on information collected in various ways in the classrooms, supported by information from national tests. National tests are compulsory in core subjects at some age levels within the school system, both at compulsory and upper secondary levels. It should be mentioned that the view on assessment and testing has changed somewhat in later years, especially from a policy perspective. There are likely several reasons for this, one is the problems with grade inflation and the lack of comparability that hampers the use of reliable and valid information for educational evaluation and fair student selection to further education ([Swedish Government, 2025](#)). Disappointing results

on international surveys such as PISA, also revealing increasing gaps between high and low achievers, have previously been arguments for introducing earlier assessment and grading and more external control mechanisms. Such reforms have however not been introduced without debate on potential consequences (Högberg et al., 2019). When this chapter is written a governmental proposal is being considered, suggesting a much stricter model for both grading and how national testing is carried out, with the main purpose to make grades more suitable as selection instruments (Swedish Government, 2025). How educational evaluation is to be carried out over time is still an unresolved matter and will therefore continue to rely mainly on international surveys such as PISA and TIMSS.

### **Schools and school policy during the pandemic**

In Sweden, trust in authorities is highly compared to many other countries, reflecting the nation's strong social and institutional frameworks. Furthermore, to prevent political interference in administrative matters, national agencies form a layer between political decisions and practical implementation and operate with a high degree of independence from the government. They are often run by professionals within the specific field. For example, the head of the National Board of Health and Welfare, the Public Health Agency of Sweden, is Sweden's state epidemiologist, which during Covid19 was Anders Tegnell, an experienced physician specialising in infectious diseases<sup>3</sup>.

The national agencies are responsible for applying and carrying out the laws decided by parliament and the ordinances decided by the Government. This includes a wide range of tasks, including public health and education. This model with the responsibilities of national agencies played a significant role in shaping Sweden's COVID-19 policy, which was notably different from that of many other countries. For two years, starting in early March 2020, representatives from The National Board of Health and Welfare and the Swedish Civil Contingencies Agency (MSB) gave frequent press conferences on public television. First daily, and then twice a week until March 2022. Approximately 200 press conferences were broadcasted over these two years. During these sessions, the press and public were informed on the current situation with regards to covid, the health care situation, the recommended precautions and the reasons why. Sweden's approach relied heavily on voluntary compliance and personal responsibility rather than strict lockdowns and mandates. There were regulations regarding distances between people in public facilities, restaurants, etc., and citizens were advised to maintain distance and practice safety measures such as not conducting inter-regional travel during times, but there were no strict lockdowns like in many other countries.

***Distance education***

As previously mentioned, the Swedish government never decided to close preschools, schools, or other operations in the school sector during the pandemic. Sweden was thus an international exception. However, the rapid spread of COVID-19 in late February and early March 2020 prompted the Swedish Parliament and Government to take measures in the school sector. On March 13, the Government decided on a regulation that made it possible for school operators to offer remote or distance education. A few days later, the Parliament passed a new law, allowing the Government to decide on the temporary closure of, among other things, preschools and schools during extraordinary events in peacetime. This law also implies that, under certain conditions, school operators can decide to temporarily close operations in the school sector, for example, if many staff members are absent or to limit the spread of infection. The law also states that if preschools and schools are closed, there should be provisions ensuring that children in need of care for psychological, physical, or other reasons should have access to preschool and after-school care. This extends to including also children and students who need care to maintain essential societal functions. School authorities were also given the opportunity to adapt school operations. This can, for example, be done by offering remote or distance education even when the government, based on the new law, has issued regulations for the temporary closure of school units at the national, regional, or municipal level<sup>4</sup>. As a result, school activities remained open for children and students to almost the same extent as usual in preschools and primary schools (K-6), secondary and upper secondary special schools throughout the pandemic years. School units that completely shut down during certain periods, did so due to either widespread infection or staff absences (Swedish Government, 2021).

This policy did not include upper secondary schools, however. They were recommended to conduct all teaching remotely during the major parts of the first and second wave of the pandemic. During the spring of 2020 they were recommended to transfer to distance learning, a recommendation that the schools generally followed. Municipal adult education, vocational adult education, and higher education institutions also shifted to distance learning when the first wave of the pandemic hit. After the summer break in 2020, most upper secondary students were back in the schools, but during the second wave of the pandemic in late autumn 2020 and early 2021, education was again conducted remotely. During the remainder of the 2021 spring semester, upper secondary schools were recommended to conduct part of the teaching remotely.

As previously described, the situation was different for compulsory schools, that were expected to stay open. However, it was possible to conduct teaching remotely also for these schools if circumstances made it difficult or risky for staff or students to stay open. During the early part of the pandemic, such decisions only affected a small proportion of the compulsory students; generally,

the older students in years seven to nine. The number of students being taught remotely increased during the later part of autumn semester of 2020 and continued to increase in the spring of 2021. Schools that remained open implemented various infection control measures, such as enhanced hygiene practices, physical distancing, and adjustments to classroom layouts to minimise close contact.

### ***The digital transition***

Schools that changed to distance education and online teaching leveraged existing digital platforms and tools to facilitate the transition. This included ensuring access to online resources and overcoming digital challenges to maintain educational continuity. For vocational training and apprenticeships, schools made exceptions to allow small group training in school buildings when suitable workplaces were unavailable due to the pandemic. The government initially allocated resources through a few targeted support measures. Through the Swedish Association of Local Authorities and Regions (SKR), an umbrella organisation for the municipalities and regions, resources were allocated to assist school organisers in the process of transitioning to digital education and distance learning. To improve the working conditions for teachers and students during the transition to remote and distance learning, the government also decided to commission the Swedish National Agency for Education to implement measures to support principals, teachers, and other staff in the school system during the pandemic (SOU 2021:89).

Distance learning requires that the necessary equipment is available at home, and that both students and teachers have the technical skills needed for the education to be carried out. The overall impression is that the digital transition for the upper secondary schools and adult education in Sweden went better than expected (Swedish Post and Telecom Authority, 2021). However, this does not mean that the transition was without problems. Experiences from countries that have introduced distance education are that, it is the students who are already vulnerable or not digitally engaged who have been most affected. This primarily concerns students with disabilities or language difficulties, but also those who are socioeconomically disadvantaged, lack access to the internet and digital equipment, and those who cannot receive sufficient support at home. Combinations of such obstacles are of course especially problematic. A challenge has also been to digitally adapt courses or subjects with practical content. In some cases, this has meant that the study period for affected students has had to be extended. (Swedish Government, 2021)

Even though Swedish households are among the most highly digitalised in the world, the Swedish experience is that not all students had access to the necessary technical equipment at home during the COVID19-pandemic. Some students needed to share technical devices with other family members, and others did not have a sufficiently good internet connection. Often, but not always, schools have

been able to lend out computers. When this was not possible, measures were taken to allow students to come to school or visit libraries, thereby combining remote learning with in-person learning. Sometimes this resulted in a higher workload for teachers (Swedish National Agency for Education, 2022a).

In a survey conducted by the Swedish National Agency for Education at the end of 2021 and the beginning of 2022 (Swedish National Agency for Education, 2022b), it was found that student absenteeism was higher at all school levels compared to the period before the pandemic. Staff absenteeism was also higher. School organisers had to assess whether it was possible for students to make up for missed education. The majority indicated that it would be possible to make up for the missed education during the spring of 2022. It was mainly indicated that so-called holiday schools, homework help, and special measures in specific subjects were the ways in which the learning loss could be reduced. Some school organisers indicated that it was particularly students with high absenteeism before the pandemic and those in need of special support who might have difficulty making up for missed education.

The issue regarding absenteeism and missed education was also the main motivation for government grants to the education system in 2021. These funds could be used in various ways. Perhaps the most important was to create conditions for increased teaching time to avoid negative impact on children's and students' knowledge development. An expanded holiday school would provide greater opportunities to offer students the education they were unable to receive during the pandemic, and many schools therefore offered enhanced voluntary teaching during school holidays in compulsory school. However, one should keep in mind that education in compulsory and upper secondary school is a municipal responsibility in Sweden, and that the total amount of money allocated directly from the government to school organisers for these purposes was, at best, modest. To cover the losses in tax revenue, municipalities were compensated through an increased general intergovernmental grant. Grants were in excess of the revenue losses, but it is unclear how much of the extra money that went to increased school budgets.

### **Effects of COVID-19 on learning outcomes and non-cognitive outcomes**

In order to study the effects on learning and other non-cognitive outcomes, reliable and valid information is necessary. Within the Swedish school system, the obvious instruments for evaluating learning outcomes should be school grades and national test scores, as these are expected to provide information on learning outcomes as described in the national curriculum, the syllabuses, and criteria defining what students are expected to learn and achieve. However, as previously mentioned, although the grading system is criterion-referenced and should be suitable for educational evaluation, both the grades and the national test scores have proved to be somewhat problematic for evaluative purposes.

As mentioned earlier, grading practices are not entirely comparable between teachers and schools, and there is also grade inflation to consider. The national tests are more reliable but can still not be expected to be strictly parallel over administrations, and these are also scored by teachers and thus not entirely objective. Consequently, both grades and national test results can give useful information but comparisons between administrations should be made with caution. It is therefore important to consider other information as well.

Sweden has been a frequent participant in international comparative studies such as the Programme for International Student Assessment (PISA), Trends in International Mathematics and Science Study (TIMSS), and Progress in International Reading Literacy Study (PIRLS). Sweden has participated in PISA ever since it was first introduced (Rönneberg & Wikström, 2022). The tests within this program have many strengths for evaluating performance: First of all, they are developed for such purposes. What is being measured by PISA is relevant for measuring learning outcomes, and a strength of this survey is also the inclusion of non-cognitive measures. A limitation is that test administrations and thus scores are strictly sample based and only carried out at certain intervals. The students being tested are 15 years old, which means that PISA tests can only be used for evaluating outcomes towards the end of elementary school. In contrast, TIMSS measures the mathematics and science knowledge of students in the fourth and eighth grades and is conducted every four years, and PIRLS measures the reading literacy of fourth grade students conducted every five years.

In the Swedish educational system, there is also the SweSAT, the Swedish Scholastic Assessment Test. It is a high stakes test used in the admission to higher education in Sweden. The SweSAT is measuring generic knowledge in verbal and quantitative areas. It is not strictly linked to the upper secondary school curriculum although more so for the quantitative section of the test. A limitation for an evaluative purpose is also that the test is voluntary and mainly taken by students on academic track. Although it is not developed for evaluative purposes, a strength from an evaluative perspective is that test scores are comparable over time. In the context of this study, it is reasonable to assume that the SweSAT could have potential to give some information on the COVID-19-pandemic effect on Swedish upper secondary students' educational attainment, if it is possible to identify comparable groups.

### ***Swedish Students' performance – Comparisons pre- and post-COVID-19***

As previously described in this chapter, Sweden's approach to maintaining open schools meant that especially at compulsory level education, classroom assessment practices and national testing in the main continued as normal, however with some disruptions. Many students were absent from class during periods of time since the recommendations were to stay at home if not feeling well or

if anyone in the family or the student had been in contact with had shown flu-like symptoms. This also affected participation in the national tests and similar (Wiberg et al., 2021).

The PISA report from 2022 showed some concerning results that could be interpreted as covid-effects, in part. The latest results for Swedish students' reading and mathematics in PISA 2022 plummeted, reaching the lowest levels seen in the 21st century. The scores dropped back to the levels recorded in 2012, a year that was marked by what was termed as Sweden's "PISA shock." According to the Organisation for Economic Co-operation and Development, Sweden lost nearly all the gains it had made in educational outcomes since 2012. The OECD's international report (OECD 2023) highlights that the improvements observed over the past decade have been almost entirely reversed. This regression is a significant concern for educators and policymakers who had hoped that the previous upward trend would continue (Figure 6.1).

The OECD report on the results (OECD, 2023) suggests that various factors might be contributing to this decline, including changes in educational policies, teaching methods, and possibly broader socioeconomic issues. A hypothesis is also that the decline is a COVID-19-effect. Students from disadvantaged backgrounds were especially affected when education was remote or otherwise more limited than normal, as they had less access to resources and support, which could partly explain the decline. This is however not unique for Sweden, although a smaller effect would have been expected due to the fact that Swedish compulsory schools stayed open throughout the pandemic years. In the latest

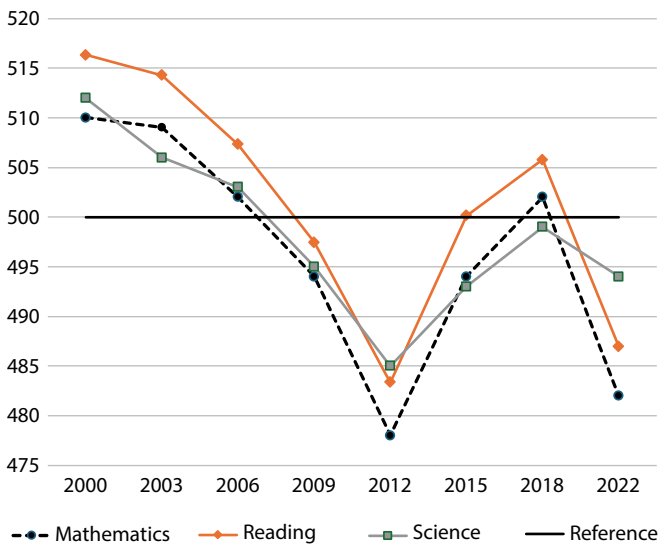


Figure 6.1 Overall PISA test results for Sweden 2000–2022

PIRLS study (2021), Swedish fourth-grade students showed a decline in reading comprehension compared to the results from 2016. A concerning finding was also that the proportion of low-performing students had increased, while the proportion of high-performing students remained unchanged. Such findings could also be linked to students' home resources, such as access to books and educational materials, and parents' educational levels ([Swedish National Agency for Education, 2023](#)).

In contrast to the PISA and PIRLS results, Swedish students in the fourth and eighth grades had, according to the TIMSS 2023 study, over an overlapping time period improved their results in mathematics, when comparing TIMSS 2023 to TIMSS 2019. In science, students' performances remained consistent with previous results. Additionally, the findings were, in line with the other international studies, that there are tendencies towards an increased gap between high- and low-performing students.

The Swedish National Agency for Education reported that the overall performance of students remained stable during the pandemic, despite challenges such as increased absenteeism among students and teachers ([Swedish National Agency for Education, 2022c](#)). Increased absenteeism during the pandemic is, however, a potential explanation for a decline in results, particularly regarding the increased disparity in performance observed between students with varying levels of home resources. The effects of absenteeism of COVID-19 are difficult to measure as it would require the researcher to connect short-term attendance rates to educational outcomes. By combining data on absenteeism during COVID-19 with previous literature on the effects of absenteeism on educational outcomes, [Sjögren et al. \(2021\)](#) attempts to estimate the effects of absenteeism on outcomes in preschool and comprehensive school. The effects in the short run are likely to have been small taking account of both teacher and pupil attendance and therefore strengthens the view that learning outcomes have been largely stable.

[Svaleryd and Vlachos \(2021\)](#) studied the development of school grades pre- and post-COVID-19. They found that upper secondary school final grades positively trended over time, such that average grades increase by approximately 0.1 standard deviation per year, and that the year 2020 was no exception. Many courses have already been graded by the time students enter their final year, so Svaleryd and Vlachos also studied the changes in final year courses and found that grades were higher in 2020 than in any of the preceding years. National tests were not carried out in the spring of 2020, so this finding is consistent with increased grading bias. The few national tests that were held in the autumn of 2020 did not yield results different from previous cohorts.

That compulsory schools were relatively unaffected is supported by research showing that there was no significant learning loss among Swedish primary school students during the pandemic. For example, a study analysing reading assessment data from 97,073 students in grades 1 to 3 found that their word

decoding and reading comprehension scores were not lower during the pandemic compared to before it (Hallin et al., 2022). Svaleryd and Vlachos (2021) also studied the educational outcomes in compulsory school and the results generally confirm the view that educational outcomes were not much affected. However, there are exceptions. The grades in grade 9 during the spring term of 2020 declined among students with a previous psychiatric diagnosis. The relative decline in performance for this group was moderate in size but similar across all subjects.

The cancellation of national tests in 2020 and 2021 led to a greater reliance on teacher assessments, many of which were conducted remotely in digital learning environments. There were concerns about cheating on tests and home assignments (Wiberg et al., 2021), as well as inconsistencies in assessment and grading practices. To investigate the conflicting results further, where grades and national test scores suggest that school outcomes were not much affected by the covid-pandemic, in stark contrast to PISA-results, we will complement the previous studies with an analysis of how secondary school students performed on the Swedish Scholastic Assessment Test (SweSAT).

### ***The effect of COVID-19 on SweSAT test results***

Having noted the general difficulties to establish the effects of COVID-19 on academic performance in Sweden, and the scarce information on the effects of covid on the later years of the school system, we here conduct an analysis using the SweSAT. Besides upper secondary school grades, SweSAT is the main admission instrument for higher education in Sweden, and in this context, results from the SweSAT are useful in that they can indicate whether the cohorts whose education was affected by COVID-19 had worse chances of competing for university places compared to the cohorts that were not affected.

The SweSAT is a test battery consisting of two sections with four subtests in each section, measuring verbal or quantitative skills, relevant for academic studies<sup>5</sup>. The SweSAT is administered twice a year. It is especially popular to take among students in upper secondary school and students who recently have graduated. A test can be retaken unlimited times, and if a test taker has retaken the test, the best score will be used. Before the pandemic the test was open for all, without a lower age limit. In 2021, during the pandemic, an age limit of 19 years old (or in final year of upper secondary school) was temporarily introduced with the aim to reduce the number of test takers (Wiberg et al., 2021). In 2022, the age limit was lowered to 18. Since a test score is valid in the admission to higher education for eight years, it is very important that the tests are parallel. This is taken into consideration in the test development and in the administration: each test is equated to previous tests and raw scores are scaled to a normed score on a scale from 0.00 to 2.00, using both an anchor design (anchor items included in the test) and equivalent groups design. Test takers are receiving a

verbal and a quantitative score, and a total score which is the average of the two section scores.

To study if students' higher educational opportunities (as measured by the SweSAT) were affected by the COVID-19 pandemic, test taker scores were analysed over the time period 2017 to 2023, where the test administrations of 2017 to 2019 represent the pre-covid period and 2020 to 2023 the post-covid period. As previously mentioned, most individuals take the SweSAT in proximity to the year they finish upper secondary school. Therefore, students at ages 18 to 21 were selected. Students who attended upper secondary school during the COVID-19 pandemic are considered the "treated" group, while students who had finished upper secondary by 2020 is the comparison group. Since test participants is a relatively heterogenous group, a natural selection here is to study those students who attend (or attended) theoretical programs in upper secondary school. This selection of data generates about 272 000 observations, out of which 42 per cent are treated and 58 per cent controls.

Previous studies show that test participants improve their results with repeated testing, especially between the first and second attempt (Cliffordson, 2004; Törnkvist & Henriksson, 2006). Due to the age restriction during the pandemic and the subsequent limitation to 18 years, older cohorts have had the opportunity to take the test more times than younger cohorts. A potential effect of the age restrictions is therefore that younger cohorts have not been able to achieve the same results at a given age. In these data, it is primarily the cohort born in 2003 that did not get to participate in 2001, but also the cohorts of 2001 and 2002, as availability was severely limited due to the test being administered only once in 2000. It is therefore of interest to distinguish these cohorts in the analysis.

We impose a few background variables to control for differences between the test administrations. Males on average perform better than females. Older students on average perform better on the verbal part of the test and worse on the quantitative part. It is also well known that students participating in the science program in upper secondary school perform better than students from other program orientations, and they often compete for study positions in other and more competitive programs than other students. In addition to gender and age, we therefore also control for program orientation. We present results for the test as a whole (total) as well as for the quantitative and verbal parts of the test separately.

Columns one and two in [Table 6.1](#) present the main results where we present score differences between COVID-19 students and the comparisons. In the first column, all students test results are included irrespective of the number of tests taken. The results in the first column firstly tells us that the score differences between covid students born in 2001 and 2002 and non-covid students are positive, meaning that normed scores were higher for those students who attended the second and third years of upper secondary school during the COVID-19

*Table 6.1* SweSAT score differences between COVID-19 and non-COVID-19 students

<i>Score differences</i>	<i>All tests</i>	<i>First test</i>
A. Total score diff	0.014** (0.002)	0.049** (0.002)
2003 interaction	-0.004* (0.002)	0.025** (0.003)
R-squared	0.16	0.16
B. Quant. score diff	0.021** (0.002)	0.056** (0.003)
2003 interaction	-0.008** (0.002)	0.025** (0.003)
R-squared	0.26	0.27
C. Verbal score diff	0.008** (0.002)	0.041** (0.005)
2003 interaction	-0.001 (0.001)	0.025** (0.003)
R-squared	0.05	0.04
Number of observations	272,521	134,718

*Note:* The dependent variables are the total (t), quantitative (q), and verbal (v) normed scores. The overall means (standard deviations) of the dependent variables are for  $n = 272,521$ :  $t = 0.890$  (0.382),  $q = 0.980$  (0.453),  $v = 0.799$  (0.40), and for  $n = 134,718$ :  $t = 0.789$  (0.365),  $q = 0.858$  (0.435),  $v = 0.720$  (0.387). Individual controls include a male indicator, age, and upper secondary school orientation. School orientation constitutes four dummy variables for humanities, social sciences, business and economics, and technical programs in upper secondary (natural sciences is the comparison). \*indicates statistical significance on the 95-per cent level; \*\*indicates statistical significance on the 99-per cent level.

pandemic. This somewhat surprising result holds for the whole of the test as well as for the quantitative and verbal parts of the test. Secondly, the size of the effects is very small. The total score difference of 0.014 translates into 0.034 standard deviations. Similarly, the effects for the quantitative and verbal parts translate to 0.05 and 0.02 standard deviations respectively. As a comparison, the male–female total score difference (not shown in the table) is about ten times higher (0.32 standard deviations). The variable “2003 interaction” measures the added effect to the score difference attributed to the 2003 cohort. The added effects are negative but very small, and we conclude that the 2003 cohorts limited opportunities to take the SweSAT before the age of 19 have not affected their chances for higher education compared to the cohorts born in 2001 and 2002.

Older cohorts have had time to take the test on more occasions than younger cohorts. This is especially true for the cohort born in 2003. As a comparison, column 2 in [Table 6.1](#) shows the results when only the first test occasion is included. Students who attended upper secondary school during the COVID-19

pandemic have better results than the comparison group, and the difference is now approximately 0.05 (0.13 standard deviations) for the test as a whole. Thus, it may be that COVID-19 students actually perform better than the comparison group due to better knowledge. However, there are also other explanations, such as the COVID group being better motivated than the comparison group due to the uncertainty that arose when the test in spring 2020 was cancelled or that the group is selected in a different way than the comparison group. The interaction effect for the cohort born in 2003 is positive and larger in magnitude in this case. This may be a consequence of students who wanted to take the test earlier not being given the opportunity affecting the group composition.

In addition to the main results, several auxiliary regressions were run to see if the results are sensitive to (i) the number of included test administrations and age, (ii) gender-specific score differences, and (iii) orientation in upper secondary school. A non-negligible proportion of upper secondary school students take the test already at the age of 17. This group is positively selected, resulting in slightly better average test results. To control for this, regressions were estimated for cohorts born between 2000 and 2002 for the ages 17 to 21. The score differences are slightly smaller than in [Table 6.1](#) but the main differences remain. Separate estimates for men and women showed that the score differences are larger for men, although still positive for the cohorts born in 2001 and 2002 in both cases. Finally, separate estimates of score differences for the different upper secondary school orientations show that for most orientations the results are qualitatively similar to the results in [Table 6.1](#). Among social science students the score differences are slightly negative when estimating on the full sample including all test occasions. It seems safe to conclude that upper secondary school students during the COVID years did not experience negative effects in terms of SweSAT test results to the extent that their opportunities to compete for seats in higher education has been hampered. Unfortunately, there is no information in the data on the socioeconomic background of participants. An interesting continuation of this study would be to include such information to study if low SES participants performed differently from high SES students.

### ***Effects on mental health and well-being***

One of the expected effects of the infection control measures introduced during the pandemic was that mental health would be negatively affected. Just like in studies of educational outcomes, it is difficult to separate the effects of the pandemic from other causes, as there are often no clear groups that can be compared to isolate the effects of the pandemic and since omitted factors may bias the results. In Sweden, a few studies have been conducted, primarily epidemiological studies, that have tried to pinpoint effects on various aspects of well-being.

An early study is Chen et al. (2022). They use the corona outbreak as a “natural experiment” to study the impact of COVID-19 on 15-year-old adolescents.

A total of 1900 adolescents participated in the 2-year follow-up survey, divided into control and COVID-19-exposed groups. Swedish adolescents exposed to COVID-19 during most of 2020 showed no differences in longitudinal changes in mental health, relationships with parents and peers, and health behaviours compared to those not exposed to COVID-19. [Nyberg et al. \(2022\)](#) studied 13- to 14-year-old students in the Stockholm area and their results suggest that the pandemic has impaired the mental health of Swedish adolescents but that increased physical activity was related to positive changes in the mental health quality of life outcome. [Kapetanovic et al. \(2021\)](#) reported changes in substance use, everyday life, relations, victimisation, and mental health during the COVID-19 outbreak based on a survey with more than 1,600 respondents. Most adolescents did not report changes in their psychosocial functioning, although a critical number reported more substance use, conflict with parents and poorer control over their everyday life. The majority of adolescents also experienced less victimisation during the COVID-19 outbreak. [Källgren and Hallgren \(2024\)](#) evaluated the association between changes in exposure of COVID-19 restrictions and changes in mental health problems among Swedish adolescents (ages 15 and 17) using a repeated cross-section of data. Unexposed and exposed students were assessed in 2020 and 2022, respectively. Adolescent girls self-reported worse mental health following COVID-19 exposure, while boys did not. They argue that girls may have been more affected by social distancing regulations in Sweden during the pandemic than boys.

Apart from self-reported studies, research using register-based data is useful to paint a broad picture on the effects of the pandemic. In connection with the official Swedish COVID-19 investigation, background reports were conducted, and in Svaleryd and Vlachos (2001), effects on well-being among students in a broad sense were studied during the period up to the first quarter of 2021. The report examines how mental health developed during the pandemic using the National Board of Health and Welfare's registry data on hospital admissions, healthcare contacts with specialist care, and prescription drugs. They first show that the number of young people receiving care or medication for psychiatric conditions has been increasing over a longer period. This increase continued in the same way during the pandemic, except that upper secondary school students had a slightly lower increase compared to student in grades 7 to 9. Upper secondary school students are then compared with grade 7- to 9 school students as distance learning was introduced in the former but not in the latter. Contrary to expectations, the change in mental health disorders during the pandemic was significantly lower among upper secondary school students compared to grade 7 to 9 students. The results also show that there were slight differences between socioeconomic groupings. The data used in the study was later used in a published study ([Björkegren et al., 2024](#)), which also contains a longer follow-up period. Their analysis shows that the reduction in mental health care use persists at least up until the end of the study period in December 2021.

This is an interesting finding because it contradicts the interpretation that health-care opportunities were limited during the pandemic, which would have led to underreporting rather than a decreased need for care. It also suggests that mental health issues in youth, at least in part, could be related to the school environment.

### **Discussion and concluding remarks**

Numerous studies have examined the societal impacts of COVID-19, with many long-term effects still unfolding. In this chapter, we have described the Swedish approach, and how students and their educational achievement seem to have been affected. Our primary sources of information have been scientific papers, governmental evaluations and reports, but also other public information regarding school grades, national test results, and performance on international comparative surveys. We have also analysed scores from the Swedish Scholastic Aptitude test (SweSAT) before, during, and after the pandemic.

Unlike most other countries, Sweden adopted a distinctive strategy aimed at keeping society as open as possible – particularly schools. While upper secondary schools and higher education institutions shifted to distance learning, preschools, and compulsory schools remained open for the majority of the pandemic. This decision was based on the belief that the benefits of in-person education outweighed the associated risks, especially for younger children who could be adversely affected socially and psychologically by school closures. Keeping schools open also enabled many parents to continue working, thereby supporting broader societal functioning. This was not without controversy, but overall, Sweden’s approach sought to balance public health priorities with the need to maintain essential societal operations.

Our findings reveal a mixed picture, which is unsurprising given the complexity of the societal disruptions and the range of measures implemented during this period. Research indicates that while some students managed relatively well, others – particularly those lacking adequate support at home – were more adversely affected. The evidence on educational performance is varied. When analysing grades, national test results, and other indicators of academic achievement within the Swedish education system, the overall performance of students appears to have remained relatively stable – even at the upper secondary level, where instruction shifted to remote learning. Both school grades and national assessments provide inconclusive evidence, suggesting either no significant change or marginal improvements in average student performance at both the elementary and upper secondary levels.

Also, the international studies give varied information: Some report a decline in students’ academic outcomes, while others suggest improvements. For instance, results from the PISA and PIRLS assessments indicate a drop in the average performance of Swedish students. In contrast, the TIMSS 2023

results show an upward trend: Swedish students in both 4th and 8th grades improved their mathematics scores between 2019 and 2023. Notably, 8th-grade students performed above the EU and OECD averages – an achievement not seen in several years. A concerning trend across these assessments is the growing proportion of low-performing students, which appears to correlate with socioeconomic background. Whether this trend is directly attributable to the COVID-19 pandemic remains unclear. It is possible that the pandemic accelerated pre-existing developments rather than initiating them. Although disentangling the specific causal effects of the pandemic from other contributing factors is highly challenging – especially when relying on international comparative data – future research may uncover valuable insights in this area.

When evaluating the results from the sources mentioned above, we considered whether any trends could be observed in SweSAT scores. The SweSAT offers valuable insights, as it enables comparisons over time and across multiple administrations. It is also suitable here since the main part of the test takers are in their final year of upper secondary school or recently have graduated. However, while this provides a unique opportunity for longitudinal analysis, the SweSAT is not a flawless measure for our purposes, due to disruptions and regulatory changes during the pandemic years. For example, individuals who graduated from upper secondary school before the pandemic had more opportunities to take the SweSAT. Students in the final years of upper secondary education during the most intense phases of the pandemic faced limited or no opportunities to sit for the test. This was due to the cancellation of the spring 2020 administration and other restrictions that followed. However, the group we are particularly interested in, those whose main part of upper secondary school took place during the covid years, could take the test without restrictions other than the lower age limit. Still, findings should be interpreted with caution, given the uneven testing conditions, and participation rates during this period.

Our findings indicate that students who attended upper secondary education during the pandemic, on average, performed better on the SweSAT than those who completed their education prior to the pandemic. This is an interesting finding, and supports the view that, overall, the COVID-19 pandemic did not significantly disrupt student learning. One possible explanation is that students who experienced upper secondary education during the pandemic may have been better equipped in certain ways than earlier cohorts. However, the underlying reasons for this difference remain unclear and warrant further investigation. Another explanation to these rather positive findings can be that the disruptions were not too grave: Sweden's upper secondary schools were already utilising digital platforms, which facilitated a seemingly smooth transition to remote learning. Challenges such as ensuring access to necessary technology and internet connectivity, and adapting teaching methods to an online format, were significant. However, the experience

is that Swedish youth had good access to digital means, and this would most certainly have helped schools to conduct the transition during the pandemic.

The digital transition in education during the pandemic is another focal point of the chapter. Sweden's upper secondary schools were already utilising digital platforms, which facilitated a smoother transition to remote learning. However, challenges such as ensuring access to necessary technology and internet connectivity, and adapting teaching methods to an online format, were significant. The chapter has explored how these challenges were addressed and the implications of increased reliance on digital learning tools. The empirical evidence regarding the effects of "digital position" in an international comparison is unknown. However, the experience is that Swedish youth had good access to digital means, and this would most certainly have helped schools to conduct the transition during the pandemic.

Non-cognitive outcomes, including student engagement, motivation, and absenteeism, have also been discussed in the chapter. For many years now, mental health problems in Swedish youth shows a worrying negative trend. The expectation, if any, was that this trend was to continue or even worsen as the pandemic struck. The impact on students' mental health and social development is highlighted in the chapter, with concerns about the long-term effects of school disruptions and prolonged distance learning. The chapter references various studies that indicate mixed results regarding the mental health of Swedish adolescents during the pandemic, suggesting that effects may be heterogeneous and not easily captured by broad social groupings. Distance learning entails a looser affiliation with the school environment, and it may be reasonably assumed that disruptions to regular instruction disproportionately affect more vulnerable student groups, affecting well-being as well as learning. This is an important area of future research, as even a small fraction of unfortunate students can imply large social costs for society.

## Notes

- 1 <https://sweden.se/life/society/the-swedish-school-system>
- 2 <https://www.skolverket.se/skolutveckling/statistik/sok-statistik-om-forskola-skola-och-vuxenutbildning?sok=SokC>
- 3 [https://en.wikipedia.org/wiki/Anders\\_Tegnell](https://en.wikipedia.org/wiki/Anders_Tegnell)
- 4 <https://www.cedefop.europa.eu/en/news/swedish-actions-education-response-corona-pandemic#group-links>
- 5 <https://www.umu.se/en/department-of-applied-educational-science/swesat/>

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# 7 Academic resilience and policy reform in the Netherlands

*Carla Haelermans and Willemijn Havermans*

## Introduction

Nearly five years after the start of the COVID-19 pandemic, the consequences for students are still visible. Learning losses and inequalities between students are still very much prevalent in the aftermath of the pandemic (Van Vugt et al., 2024b). In this chapter, we analyse the consequences of COVID-19 for students in primary and secondary education in the Netherlands for both cognitive and non-cognitive skills. We seek to explain how resilient students are, and if they are bouncing back from the learning losses that were developed during the pandemic. We start this chapter by an overview of the data that we used for our analyses, followed by an analysis of the cognitive outcomes for comprehensive reading and mathematics in primary education, and an analysis of the PISA data for secondary education. We also dive into several non-cognitive skills of students in primary and secondary education. In all analyses, we seek further detail by describing differences in learning outcomes by gender and parental education. We conclude this chapter with an overview of interventions and measures during and after the pandemic, and its impacts on schools.

We consider both cognitive and non-cognitive outcomes in pre-, during-, and post-COVID-19 times. We use national as well as international assessments and discuss outcomes for both primary and secondary education. The first section is divided into three parts. First, we look at outcomes in primary education for comprehensive reading and mathematics, in three grade levels, for the three points in time, using Dutch national data. Second, we use the international assessment PISA to look into reading and mathematics in secondary education. We have two pre-COVID-19 measures (2015 and 2018) and a COVID-19 measure (2022). Unfortunately, we do not have a post-COVID-19 measure. Lastly, we use analyses from the *Onderwijsmonitor Limburg* (in English: Education monitor Limburg) to capture non-cognitive outcomes for both primary and secondary education, pre-, during- and post-pandemic. In all three parts, we perform heterogeneity analyses by gender and educational level of the parents. So, in all parts, we look at similar points in time in relation to the pandemic and focus on

comparable subjects in primary and secondary education, similar age levels, and add the same heterogeneity analyses for the same groups.

The national administrative data used for the first group of analyses comes from the Netherlands Cohort Study on Education (in Dutch abbreviated to NCO: *National Cohortonderzoek Onderwijs*) dataset (for a description of this project, see [Haelermans et al., 2020](#)). NCO is part of the Netherlands Initiative for Education Research (NRO, as part of the Netherlands Organization for Scientific Research, named NWO) and biannually collects data on compulsory standardised tests in primary education. The tests are usually written in January/February (Mid-term test) and in May/June (end of term test). The standardised tests are written in three domains: comprehensive reading, spelling and mathematics. For consistency reasons (comparability with PISA), we only look at comprehensive reading and mathematics in this chapter. The comprehensive reading test assesses the student's ability to understand written texts, including both factual and literary content. The mathematics test contains both abstract problems and contextual problems that describe a concrete task ([de Leeuw et al., 2023](#)).

These standardised tests are strictly comparable across grade levels as well as across school years. The data collected concern standardised test scores from school year 2013/2014 onwards. Schools use administration systems to store the information about the standardised test scores, and with permission of the schools, the administration system exports the data on the standardised test scores to Statistics Netherlands, who pseudonymise the student-id and school-id, so the data are fully anonymous to the researchers that use these data. Before any data was exported, parents were informed about the project and data export by the school and were given the opportunity (during four to six weeks) to object against export of their child(ren)'s data (by informing the school written or orally). The school registered any objections in their administration system, and data was not exported from those students whose parents objected. In practice, only one or two parents per school objected to this, which means that there is no selection issue due to this passive consent procedure.

In the secured virtual environment of Statistics Netherlands, standardised test scores can be matched to background information of the students and their parents. The data on background information that we use are the highest level of education of the parents and student gender. Parental education is defined as *low* when the highest obtained degree of (one) the parent(s) is in pre-vocational secondary education (vmbo b/k), or a degree in upper secondary vocational education (mbo 1), or grades 7 to 9 in pre-vocational secondary education (vmbo gl/tl) or senior general secondary education or university preparatory education (1; 11% of the students), *middle* when a degree in upper secondary vocational education level 2, 3 or 4, or when completed senior general secondary education or university preparatory education (2; 33% of the students), and *high* when a degree at a university of applied sciences is attained or higher (3; 55% of the students). This division of parental education over three categories is also used

in the Netherlands Cohort Study on Education and leads to a division in categories that is not only relevant at the content level, but also provides us with large enough groups to have statistical robustness. Student gender is classified as either boy (50.1%) or girl (49.9%).

The dataset includes data on Dutch primary students from about 2,650 schools (around 45% of all primary schools in the Netherlands). Although schools self-selected into participating in this study, these 45% of schools are representative for all primary schools in the Netherlands (Van Vugt et al., 2024a) and our conclusions can therefore be extrapolated to all Dutch primary school children<sup>1</sup>. Apart from the few children whose parents objected to the data export, our dataset includes all children that attend these 2,650 schools resulting in a total of 700,000 unique students for which we have standardised test scores for comprehensive reading and mathematics, as well as detailed (social) background information. To remove the influence of outliers, the top and bottom 1% of the absolute learning gains scores are not included in the analyses.

## **National administrative data**

### *Cognitive outcomes for primary and secondary education*

#### *Primary education*

For the part about the national assessment data, we analysed the above-described data and made a comparison between three timeframes: pre-COVID-19, during COVID-19 and in the aftermath of COVID-19. We analysed how test scores have developed during and after COVID-19 and compare this to the scores before the pandemic started. We looked at end-term test scores for comprehensive reading and mathematics in primary education. For the pre-COVID-19 years, we look at grade 1 in 2016/17, grade 2 in 2017/18, and grade 3 in 2018/19. We consider grade 1 in 2019/20, grade 2 in 2020/21, and grade 3 in 2021/22 as COVID-19 years. Lastly, we look at post-COVID-19 and include grade 1 in 2021/22, grade 2 in 2022/23, and grade 3 in 2023/24 in this period. Note that 2021/22 is considered both a COVID-19 year as well as a post-COVID-19 year. This is due to the assumption that students that were in grade 3 in 2021/22, are most likely affected by COVID-19 in grades 1 and 2. The students that were in grade 1 in 2021/22, however, are less likely to have experienced impact from COVID-19 in primary education, as they were still in kindergarten during COVID-19, and they had not learned to read and write yet<sup>2</sup>. We chose to include only lower primary school grades (grades 1 to 3) in our analyses as we wish to keep a clear distinction between the pre-, during-, and post-COVID-19 cohorts as much as possible. Hence, the duration of the pandemic as well as the data we have available guided the choice to use these three grade levels, as we were able to distinguish three ‘clean’ cohorts, with hardly any overlap in data (except

for the school year 2021/2022 which we use as during COVID-19 for grade 3 and post-COVID-19 for grade 1). In Figure 7.1 we present the standardised test scores during- and post-COVID-19, with pre-COVID-19 as the baseline (=0).

If we take the pre-COVID-19 years as a baseline, we notice that for comprehensive reading as well as for mathematics, test scores in almost all grades have declined during the pandemic. For comprehensive reading, the biggest decline compared to pre-COVID-19 is notable in grade 2, whereas for mathematics the decline is largest in grade 1, as shows from Figure 7.1. Post-COVID-19, we still notice learning losses for most grades for both subjects, compared to pre-COVID-19. For comprehensive reading, we see that there is a learning

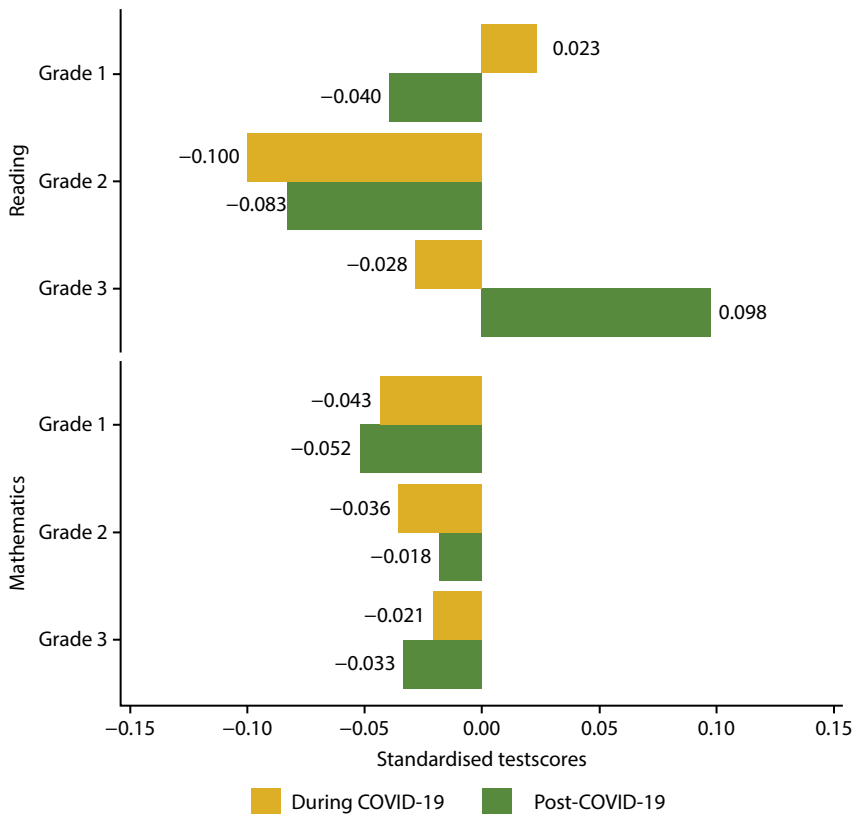


Figure 7.1 Comparison of standardised effects for reading and mathematics of grades 1 to 3 during COVID-19 (2019/20, 2020/21, and 2021/22) and post-COVID-19 (2021/22, 2022/23, and 2023/24), standardised on the period pre-COVID-19 (2016/17, 2017/18, and 2018/19)

Source: Own calculations based on administrative data of 700,000 students in 2,650 primary schools in the Netherlands.

decline compared to pre-COVID-19 for grade 1 after the pandemic, while this was not visible during the pandemic. There is also still a loss for grade 2, but this is smaller than during the pandemic. Grade 3 seems to have caught up after the pandemic. For mathematics, we also notice a learning loss for all grades compared to pre-COVID-19, and test scores are mostly similar post-COVID-19 as during the pandemic. So, we could argue that students are catching up in comprehensive reading, albeit slowly, but not yet for mathematics.

A comparison between students with low, middle, and high-educated parents shows that students with low educated parents score lower in all grades in all years than students with middle- or high-educated parents, in both domains. For mathematics, students in all groups have similar scores post-COVID-19 compared to during COVID-19 and in both periods score slightly lower compared to pre-COVID-19 in most grade levels. For comprehensive reading, scores are better or similar post-COVID-19 than pre-COVID-19. So, between groups we still see differences, but within groups they are catching up to pre-COVID-19 levels, for both domains.

If we compare boys and girls, we notice that boys have lower scores for comprehensive reading than girls in all years in all grade levels, but higher scores for mathematics in all years and grade levels. Boys score better post-COVID-19 for mathematics than during COVID-19, while girls have lower scores post-COVID-19. Both boys and girls have higher scores after the pandemic than during for comprehensive reading in grades 2 and 3, but not in grade 1. The differences between boys and girls are largest during COVID-19 for comprehensive reading for grade 1 and 2, but larger post-COVID-19 for mathematics for all grades. Thus, boys seem to be better at catching up post-COVID-19 for both domains, while for girls this is only the case for comprehensive reading.

### *Secondary education*

For secondary education, we base our analysis on the international assessment method PISA (Programme for International Student Assessment). PISA is a worldwide assessment of knowledge and skills of 15-year-old students, in the areas of reading, mathematics, and natural sciences. For the PISA research, a representative sample of students is drawn from the population of 15-year olds (Feskens et al., 2016). For the current analysis, we use data from PISA research in 2015, 2018, and 2022 for The Netherlands. In 2015, the sample consisted of 5.385 Dutch students from 187 schools (Feskens et al., 2016). In 2018, the sample included 4.765 students from 156 schools (Gubbels et al., 2019). In 2022, there were 5.046 students from 154 schools in the sample (Meelissen et al., 2023).

For this analysis, we look into reading and mathematics and use the mean scores of the measures for these two indicators. For PISA, mathematical performance is measured by the mathematical literacy of a 15-year-old to formulate, employ, and interpret mathematics in a variety of contexts to describe, predict,

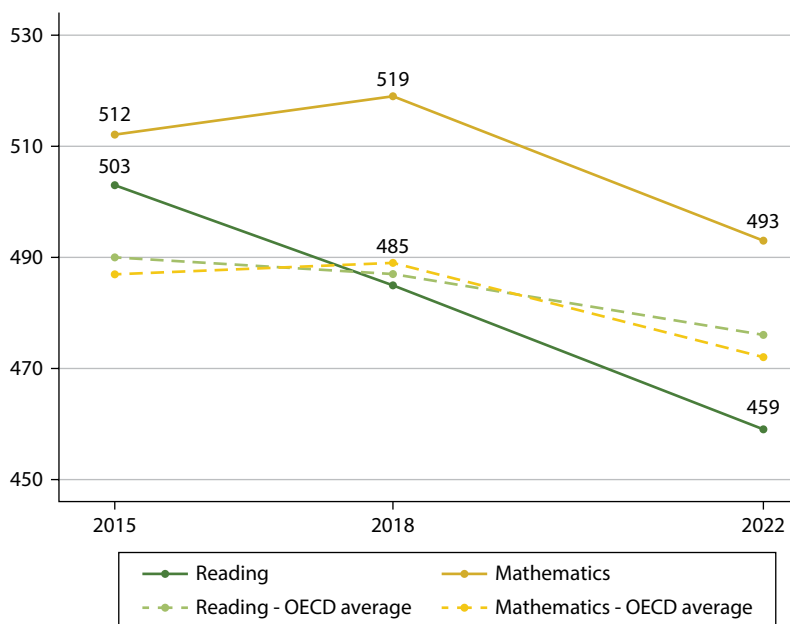
and explain phenomena, recognising the role that mathematics plays in the world (OECD, 2023). Reading performance, for PISA, measures the capacity to understand, use, and reflect on written texts in order to achieve goals, develop knowledge, and potential, and participate in society (OECD, 2023). We use the mean scores for the two indicators as calculated and shown in the reports of CITO (for 2015) and the University of Twente (for 2018 and 2022) (Feskens et al., 2016; Gubbels et al., 2019; Meelissen et al., 2023).

As PISA 2022 was conducted during the pandemic, it is interesting to compare these results to earlier PISA assessments. Note that we cannot consider PISA 2022 to be a post-COVID-19 measurement, as this group of students has been (severely) impacted by the pandemic in previous years. We therefore consider the 2015- and 2018-PISA data as pre-COVID-19 years, to show a “normal” performance, and compare this to 2022. However, to be able to draw conclusions about the impact of COVID-19 on the students in the PISA 2022 data, we have to make the assumption that these students are comparable to students in earlier PISA data in terms of performance, as PISA is cross-sectional and provides data only for a certain group at a certain time point. To substantiate the assumption of comparable performance in the absence of COVID-19, we look into the same cohort of students, but then in our national assessment of students in primary education, which was used for the earlier described analysis. By doing so, we seek to provide evidence that the students of PISA 2022 were in fact a “normal” cohort in performance, similar to other, later, cohorts in primary education. Note that we cannot compare them to earlier cohorts, due to data limitations, since the PISA 2022 students were presumably mostly in grade 1 in primary education in 2013/14 (our first year of data). Therefore, we first discuss the comparison in test results for comprehensive reading and mathematics, in primary education, for the cohorts starting in grade 1 in 2013/14, until the cohort that started in grade 1 in 2018/19 (for clean comparison we of course only consider pre-COVID-19 cohorts). Next, we describe and compare PISA results for reading and mathematics in 2022, 2018 and 2015.

First, to be able to assume that the PISA 2022 students are comparable to earlier PISA students, we analyse whether the 15-year-olds in 2022, who were mostly in grade 1 in primary education in 2013/14, were a “normal” cohort. To do so, we look at the Dutch NCO Factsheets on basic skills in the Netherlands that we published in 2023 (Van Vugt et al., 2023a, 2023b). The students that were eligible for PISA 2022 assessment, belong to the cohort that was in grade 1 in 2013/14, and hence in grade 5 in 2017/18. In these factsheets, we see that in grades 1 and 2, the ‘PISA 2022 cohort’ showed slightly lower scores than the following cohorts until 2021/22, but showed similar or higher scores in grades 3, 4, and 5 compared to all later cohorts. For comprehensive reading, only grade 1 shows lower scores compared to following cohorts, but scores for grade 2 to 5 are higher in the 2017/18 cohort compared to all following cohorts until 2021/22. It seems therefore safe to assume that the PISA 2022 students were a “normal”

cohort in primary education, as they performed comparable to following cohorts and the difference were very small. Note however, that we cannot draw hard conclusions, as we cannot directly link individual students of PISA 2022 to the same individual students in our data in primary education.

Second, now that we feel confident to make the comparison between the PISA cohorts and attribute differences to COVID-19, we look at the results of PISA in 2022 compared to 2018 and 2015. The average scores are presented in [Figure 7.2](#). The results in PISA 2022 for the Netherlands show a decline in 26 points for both reading and mathematics compared to 2018. For reference, the learning loss for 2018 compared to 2015 was 18 points for reading, while there was a learning growth of 7 points for mathematics. As is shown in [Figure 7.2](#), the average reading scores from Dutch students in 2018 and 2022 was lower than the OECD average. The learning loss in 2022 compared to 2018 was highest for students with high educated parents, compared to middle and lower educated parents, for both domains. For reading, this is opposite to the learning loss between 2018 and 2015, where students with lower educated parents had relatively



*Figure 7.2* Comparison of average PISA test scores for reading and mathematics for 2015, 2018,cc and 2022, for the Netherlands and the OECD average

*Source:* Adapted from reports on PISA data from 2015, which consisted of 5,385 Dutch students from 187 schools (Feskens et al., 2016), from 2018, which included 4,765 students from 156 schools (Gubbels et al., 2019), and from 2022, based on 5,046 students from 154 schools (Meelissen et al., 2023).

more learning loss compared to middle and high educated parents. For mathematics, students with high and low educated parents had similar relative learning losses in 2018 compared to 2015. We see some comparable results in our own analyses for comprehensive reading in *primary education*: Students with high educated parents show the greatest learning loss post-COVID-19 compared to during COVID-19, in relation to students with middle or low educated parents, but only in grade 1. Also, similar to PISA data, students with low educated parents show the greatest learning loss during COVID-19 compared to before the pandemic, in all grades. For mathematics, we see opposite results in PISA and in our own analyses, as students with low educated parents show learning losses in all grades during the pandemic compared to pre-pandemic, while scores for students with high educated parents stay rather similar.

If we consider the difference between boys and girls in PISA, we see that the learning loss for girls was relatively higher for reading than for boys in 2022, while this was relatively higher for boys in 2018 compared to 2015. For mathematics, girls had relatively more learning loss than boys in 2022 compared to 2018, while their growth was almost similar in absolute numbers in 2018 compared to 2015. So, girls seem to have been impacted more by the pandemic than boys in both domains. In our own data, we see that post-COVID-19, both boys and girls seem to be catching up again in comprehensive reading, as scores are higher or similar than during the pandemic. This is different from what we see in PISA, as girls still have higher learning losses in 2022 compared to 2018, and compared to boys in 2022. For mathematics, boys score better or similar in all grades post-COVID-19 compared to during COVID-19 in primary education, while scores are lower in 2022 than in 2018 in secondary education for boys. For girls, we still see learning losses post-pandemic compared to pre- and during-COVID-19, in both primary as well as secondary education.

In conclusion, the PISA comparisons show that students with high educated parents seem to be impacted relatively more during the pandemic in their learning losses relative to students with middle and low educated parents in primary and secondary education. We find a similar patterns for girls compared to boys, where girls are impacted more.

### ***Non-cognitive outcomes for primary and secondary education***

In the third part of this paragraph, we look into non-cognitive outcomes for primary and secondary education. We look at results from *OnderwijsMonitor Limburg* (in English: Education Monitor Limburg). This is a cooperation between Maastricht University and almost all schools in primary and secondary education in the province of Limburg. The goal of the monitor is to get insight into cognitive and non-cognitive skills during the school career of students, starting from kindergarten until the transition to higher education. The monitor has collected data since 2009 and uses validated questionnaires (OnderwijsMonitor

Limburg, 2024<sup>3</sup>). The monitor uses four indicators of non-cognitive skills for primary and secondary education: creativity, curiosity, critical thinking, and problem-solving abilities. The development of the four non-cognitive skills in primary and secondary education over different years that are described below is based on the factsheets that are published by OnderwijsMonitor Limbug.

### *Primary education*

For primary education, non-cognitive skills are assessed by a self-report of grade 6 students. They collect data every two years in spring and visualise and interpret this data in factsheets (Schils et al., 2024a, 2024b). For this part, we consider the data from 2017, 2021, and 2023, as these years are available for all four indicators (Schils et al., 2024a, 2024b). We can consider 2017 as pre-COVID-19, 2021 as during the pandemic, and 2023 as post-COVID-19.

The results show that *curiosity* has declined significantly in 2023 compared to 2021, and between 2021 and 2017. For all three years, boys had higher scores in curiosity compared to girls, but for both a significant decline in 2023 compared to 2021 has been detected. While there were significant differences in curiosity for students with different educated parents pre-COVID-19 and during COVID-19, there are no significant differences between the groups in 2023 anymore.

*Creativity* has decreased significantly in 2021 compared to 2017 but is on a comparable level in 2023 as in 2021. Boys and girls show comparable levels of creativity in all years. In 2023, the levels of creativity have increased for boys compared to 2021 but was similar to 2021 for girls. Students with high educated parents consider themselves most creative in all years, with significant higher scores in 2021 and 2023 than students with parents with other education levels. For the three groups of students with low, middle, and high educated parents, 2023 and 2021 show comparable results.

Results for *critical thinking* are comparable for 2021 and 2023 but are significantly lower than in 2017. Boys report higher critical thinking skills than girls in all years (but not significantly higher in 2021), and their skills have increased in 2023 compared to 2021. Girls show a declining trend from 2017 to 2023. Students with different educated parents show no differences in critical thinking in 2023, while there were differences between groups in 2021 and 2017. Between 2017 and 2023, there is a decline visible in critical thinking for high educated parents, but not for the other groups.

*Problem-solving skills* have decreased significantly in 2021 and 2023 compared to 2017. There is a slight, non-significant increase in 2023 compared to 2021. In 2017 and 2023, boys and girls have comparable problem-solving skills, while girls have significantly higher levels in 2021 than boys. In all years, students with parents who are low educated consider themselves less skilled in problem-solving than other groups, but the difference is smaller in 2021 and 2023 than in 2017.

Summarised, we see that students in primary education consider themselves less curious in 2023 compared to 2017, and less skilled in critical thinking and problem-solving in both 2021 and 2023 than in 2017. For creativity, the decline is visible between 2017 and 2021, but not between 2021 and 2023. We can conclude that during and after the COVID-19 pandemic, most non-cognitive skills have declined compared to before the pandemic for students in primary education.

### *Secondary education*

For secondary education, the same indicators for non-cognitive skills were assessed as for primary education. The skills are self-reports of students from grade 9. This is the same age group as the students that were assessed for PISA. Data is available for 2018, 2020, and 2022 (Van Vugt et al., 2023c, 2023d). We consider 2018 as pre-COVID-19, 2020 as during COVID-19, and 2022 as post-COVID-19. It must be noted that in 2020, there was a school closure due to the pandemic. Part of the students filled out the questionnaire before the closure, while others did so immediately after the closure or even later, after the summer break. For this part, we only take into account the measures after the school closures and consider these as COVID-19 measures.

*Curiosity* was stable over the course of time. Girls scored lower on curiosity than boys in 2018, but their scores have increased over time. Still, girls consider themselves less curious in 2022 than boys. Students with high educated parents score higher on curiosity than other groups.

During the pandemic, perceived *creativity* has increased for both measure moments compared to pre-COVID-19. In 2022, creativity has also increased compared to the measures during the pandemic after the school closures. Boys and girls consider themselves similarly creative in 2022, while girls scored significantly lower than boys in 2018. Students are also similarly creative considering different educational levels of parents: the lowest score was in 2018 which increased in 2022, and was highest, on average, in 2022.

*Critical thinking* has increased during and after the pandemic compared to before the pandemic. The differences are significant, and scores in 2020 and 2022 are very similar. In general, boys score higher on critical thinking than girls, but they have similar scores over the years. Girls, however, have higher scores in 2020 and 2022 compared with 2018. Students with high educated parents score higher on critical thinking than other groups, while there is an increase in critical thinking for students with low educated parents in 2022 compared to 2018.

Students' scores on *problem-solving skills* have declined post-COVID-19 compared to pre-COVID-19. There are no significant differences between boys and girls in the decreasing trend between 2018 and 2022. The decrease is also visible for students with low or middle educated parents, but not for students with high educated parents.

Concluding, critical thinking and creativity have increased post-COVID-19 compared to pre- and during the pandemic for secondary education. Problem-solving abilities have declined post- to pre-COVID-19, and curiosity did not differ significantly between the timeframes. For reference, in primary education, students considered themselves lower on curiosity, critical thinking, and problem-solving post- than pre-COVID-19. While most non-cognitive skills declined in primary education post-pandemic compared to pre-pandemic, most skills have increased or stayed similar in secondary education. Visuals of these results are all shown as margin plots in the associated factsheets (Schils et al., 2024a, 2024b; Van Vugt et al., 2023a, 2023b).

### ***Intermediate conclusion***

Combining all analyses, we can conclude that students in general are catching up after the pandemic, this holds for both primary and secondary students, and for both cognitive and non-cognitive skills. However, if we look into more detail, we can argue that boys are doing better post-pandemic than girls. In primary education, we notice that boys are catching up for both comprehensive reading and mathematics after the pandemic, while girls are only catching up for comprehensive reading. Similarly, in secondary education, the learning loss is larger for girls than for boys post-COVID-19 for reading and mathematics. We also see this for the non-cognitive skills in primary education: Boys have higher scores for some non-cognitive skills after COVID-19 compared to during COVID-19, while girls show no significant increase for the four skills in this period. Furthermore, the learning loss after the pandemic is relatively larger for students with high educated parents compared to students with middle or low educated parents, for both reading and mathematics in primary as well as secondary education. For non-cognitive skills, we see similar results for critical thinking in primary education, while for most other skills students from this group score higher or similar post-COVID-19. The students with high educated parents thus seem to be less impacted in their non-cognitive skills than in their cognitive skills after the pandemic. Potential explanations for these findings are discussed after describing the educational policy reforms and their effects.

### **Education policy reforms**

The following section describes the measures that were provided by the Dutch government during and after the pandemic and how schools implemented these measures. In the first part of this section, we analyse the impact of these measures.

#### ***National Education Programme in primary and secondary education***

Already during the first phase of the pandemic, the Dutch government made money available for remediation programmes for vulnerable students. Schools

could apply for this money and the programmes could start as of September 2020, thinking the pandemic was over. However, as there was a school closure again during the winter of 2020/21, the remediation programmes were also put on hold during that period. In the spring of 2021, the schools re-opened, and remediation programmes could continue. At that time, the Dutch Ministry of Education also introduced the National Education Programme (NEP) to alleviate the consequences of the pandemic on the learning of students. A total of 5.7 billion euros was available for all education sectors together (from preschool to university education). All schools received a share of this budget based on the number and share of vulnerable children at their school (Ministry of Education, 2022a). As part of this programme, the Ministry introduced a ‘menu’ of interventions that primary and secondary schools could choose from. The basis of this programme comes from the Teaching and Learning Toolkit which is part of the Education Endowment Foundation (EEF) (Ministry of Education, 2022a). Examples of these interventions are one-on-one tutoring, remedial teaching, summer schools, teacher professional development, strengthening parental engagement, support during school hours, extended school days, and peer tutoring. In addition to the National Education Programme, the government introduced a compulsory so-called school scan. This scan is written by the school itself, in which they identify vulnerabilities and possible improvement. The school scan focusses on the impact of COVID-19 on students, the wishes and needs of the school, and which interventions from the menu the schools wish to implement and how they will do that (Ministry of Education, 2022d). Most schools (85%) chose instructions for students in small groups, a focus on the well-being of their students (75%) and education specialists, and advisers as a support for teachers in class (Ministry of Education, 2022d). Schools were not able to fully implement the interventions from the menu in the school year 2021/22, due to COVID-19-related absence among teachers. In the beginning of 2022, schools resumed their activities as part of the NEP. Below, we will discuss some of the interventions that are part of the NEP and are currently still running, following the pandemic.

### ***Labour market allowance***

One part of the NEP is the so called *Arbeidsmarkttoelage* (in English: Labour market allowance). The labour market allowance is a temporary supplement to the salary of personnel at schools in primary and secondary education with relatively many students with a high risk on learning losses. Whereas all schools faced learning losses after COVID-19, this is especially challenging for schools with a high(er) risk. These schools also face more difficulties in attracting personnel (Ministry of Education, 2022b). The supplementary labour market allowance should make it more attractive for teachers to work at these schools, and hence should contribute to more equal opportunities for students. In the school

years 2021/22 and 2022/23, there was a budget available of 375 million euros for 15% of the schools in primary and secondary education. In the following years, extra budget was made available, and the arrangement was extended for 2023 and 2024 (Visser et al., 2024).

### ***School meals programme***

A second measure that was implemented after the pandemic, although not a part of the NEP, is the *Programma Schoolmaaltijden* (in English: School meals programme). This programme was launched in the spring of 2023 and provided budget that allowed schools in primary and secondary education to arrange either school meals (breakfast or lunch) or support students via a weekly allowance of 11 euros for parents and caretakers to buy meals for their children, by the so called ‘grocery cards’. Although this programme is not directly aimed at targeting the negative consequences of COVID-19, indirectly it is, as the negative effects of COVID-19 were unequally spread, and the children that were hit the hardest are also the ones that come from families that have the tightest financial situation and might have difficulties providing in sufficient and health food. This is particularly relevant as life became more expensive after the pandemic, which this led to financial worries and food insecurities for families (Nederlands Jeugdinstuut, 2022). Stress and hunger can lead to worse performance for students in school (Muskens et al., 2023). The programme therefore aims at providing (healthy) food for students, so families have less worries about food shortages and students have enough energy in class. Furthermore, schools that choose to offer breakfast thereby extend the school day because of the earlier start, which is expected to indirectly benefit mostly the disadvantaged students (Patall et al., 2010), who were hit the hardest at the start of the COVID-19 pandemic (in their cognitive and non-cognitive skills). Schools can apply for this subsidy if at least 30% of their students come from a low-income family.

### ***Master plan basic skills***

Another measure, also not part of NEP, is the *Masterplan Basisvaardigheden* (in English: Master Plan Basic Skills). This is an initiative that focuses on a structural improvement of education by investing one billion euros each year to improve basic skills of students in all education sectors (Ministry of Education, 2022c). Basic skills are crucial to participate in society. However, there is a visible decline in students’ performance in these basic skills, such as reading, writing, mathematics, and digital literacy (Van Vugt et al., 2023a, 2023b). The main goal that the programme aims to reach by the end of school year 2027/28 is that all primary school students master the fundamental level of these skills. Furthermore, secondary students and students attending higher education should meet the target levels that were defined for their respective track levels

(Ministry of education, 2023). One part of this master plan is the subsidy for the improvement of basic skills. This subsidy can be used by schools to implement evidence-informed interventions to improve the basic skills of students (Ministry of Education, n.d.).

## **Impact analysis of policy interventions**

### *National Education Programme in primary and secondary education*

An implementation monitor keeps track of how schools spend the resources of the NEP and what are the results of the implemented measures (Van den Broek et al., 2024). School leaders from all education sectors and all municipalities were invited to fill in a questionnaire for this monitor. In the sixth measurement, which was conducted in August and September 2024 and focuses on the school year 2022/2023 and 2023/2024, the response rate was 47% for the school leaders. According to school leaders in primary education, interventions with the most positive effects on students are those that focus on small group tutoring, educational assistants, and interventions focused on well-being of students. The least effective interventions are those that focus on parental involvement. In line with these results, we know from the literature on remediation programmes, that one-on-one tutoring is largely effective, and training in small groups is somewhat less effective than one-on-one tutoring (Kortekaas-Rijlaarsdam et al., 2020). The deployment of educational assistants is almost just as effective in one-on-one tutoring in primary education as is the use of teachers. The involvement of parents, on the other hand, only has little effects on students in primary education, and it can be hard to involve parents (Kortekaas-Rijlaarsdam et al., 2020). School leaders notice most positive impacts on the well-being of students, followed by developments in their learning performance in language and mathematics, and their motivation for mathematics. According to school leaders, the NEP led to more possibilities for professional development of teachers, and did not lead to more work pressure. In addition to the evaluation of the implemented measures via questionnaires, the Netherlands Cohort Study on Education publishes a quantitative effect evaluation twice a year since 2021, in which the combined effects of COVID-19 and the education policy reforms are presented. The evaluations show that in the first period(s) of COVID-19 there was a severe learning loss on comprehensive reading, spelling, and mathematics (see e.g. Haelermans et al., 2022a, 2022b), in the later evaluations the effects of the policy reforms started to show, and learning development was back to normal (Van Vugt et al., 2024b).

In secondary education, most school leaders mention that they implemented the plans and interventions (very) well. The most positive developments in students are found from interventions that focus on the well-being of students, educational assistants, reducing group sizes, small-group instructions, and one-on-one tutoring.

Digital technology and parental involvement seem to be the least effective for the development of students. This is comparable to what is found in primary education. Most positive effects are found for the well-being of students, which is similar to what was found in primary education. This is followed by executive functions, learning performance in vocational subjects and Dutch language, students' motivation, and learning performance in mathematics and other subjects. In secondary education, school leaders did experience work pressure of professionals as an obstacle for the implementation of interventions, in contrast to what was found in primary education. The reasons for increased work pressure may be due to teachers being expected to provide extra support to students with learning delays, as well as increased administrative burdens. In addition, intensified work pressure is also caused by the teacher shortage ([Academie & Vakvereniging Schoolleiders, 2021](#)).

### ***Labour market allowance***

The effects of the first year of the labour market allowance (2021/22) has been analysed by the Netherlands Bureau for Economic Policy Analysis ([Visser et al., 2024](#)). Schools that received the labour market allowance had a 6.5% higher increase in teacher salaries than schools without the allowance. However, the study shows that there is no substantial effect of the allowance on the mobility of teacher in primary nor secondary education. There was no effect visible on the inflow, outflow, or teacher retention, nor the number of hours that teachers work and the number of students per teacher. However, it cannot be ruled out that the allowance had a small effect on the labour market for teachers. In practice, it could have had an effect which was too small to show with the used research method. Reasons for this are, among others, that the measures were done about one year after the implementation of the allowance, so there was a relative short time to respond to the allowance by schools and teachers that might be willing to move. Also, at the start of the implementation it was not clear that the allowance would be extended twice and that a possible structural allowance would become available, which might make teachers think twice whether they wanted to move schools for an allowance for one year only. Lastly, there were still COVID-19 measures in the school year 2021/22, such as a lockdown, which might have influenced the labour market for teachers, as that was a time of low to no teacher mobility.

### ***School meals programme***

The effectiveness and implementation of the school meals programme have been studied for the school years 2022/23 and 2023/24 ([Muskens et al., 2023](#)). Schools (participating and non-participating) and parents (of participating schools) received questionnaires in the fall of 2023. For the purpose of this analysis, we only focus on the school data. The study shows that more than 50% of the schools that belong to the target group of the programme, participated

in the programme. Most schools chose to have meals at school, around 75%, while the other 25% of schools chose the grocery cards. Schools are optimistic about the implementation and time it costs to implement the programme. For the schools that have chosen to implement the meals at school more than half of respondents say that students seem less hungry in class (58%), and that the programme seems to have positive effects on the lifestyle and eating habits of students at home (67%). Also, about 70% of respondents report that students seem to have more energy in class.

For schools that chose the grocery cards, less than half of the schools report that students seem to be less hungry at school (44%), and about one-third reports that students seem to experience positive effects on the lifestyle and eating habits at home. Schools are rather neutral about the seemingly effects of the grocery cards on the energy levels of students in class. Schools experience difficulties in knowing what is exactly done with the grocery cards at home.

Next, schools were asked if it was easy for them to reach the students that were targeted with the programme. They reported that students that receive the grocery cards are harder to reach (53% compared to 84% of the meals at school), because of, for example, organisational or psychosocial (e.g. stigma around this topic) reasons. Finally, according to the schools, the school meals programme leads to financial relief for families and more equality among students. A quantitative causal effect analysis will also be carried out, but results have not been published yet.

### ***Master plan basic skills***

The first report of the master plan basic skills was launched in November 2023 ([Ministry of Education, 2023](#)). The report shows the performances of students in all education sectors for four basic skills: Language, mathematics, citizenship, and digital literacy. The monitor combines previous research publications with new research. The monitor shows that especially students in secondary education still experience the consequences of the COVID-19 pandemic. This also shows from the fifth monitor of the National Education Programme, which was published in December 2024 ([Ministry of Education, 2024](#)), which for cognitive skills also focuses on mathematics and language. This report shows that the reading performance in the lower grades of secondary education shows a declining trend ever since the start of the pandemic. The performance for Dutch language and mathematics also declined at the end of school year 2023/24 compared to the previous school year for the lower grades in secondary school. Primary school students, on the other hand, seem to be recovering after the pandemic, as comprehensive reading is at the same level or even higher as before the pandemic for almost all grades. For mathematics, scores are similar or even better compared to 2022/23, although most grades did not yet reach the pre-pandemic levels yet.

## Conclusion

Based on all the presented evidence and descriptive information, we might conclude that students are slowly catching up after the COVID-19 pandemic. This seems to be more prevalent in primary education compared to secondary education. Also, boys seem to do better at catching up than girls. Students with high educated parents seem to be getting back to pre-COVID-19 levels more slowly than students with middle or low educated parents, which might be the result of the many policy interventions mainly focuses on disadvantaged students in the beginning of the pandemic. Also, higher educated parents work, on average, more hours and experienced more conflict in combining working from home, taking care of the children, and offering home schooling (Verweij et al., 2022). This could possibly have (indirect) effects on children's school performances. In secondary education, we still see learning losses after the pandemic compared to during the pandemic. We conclude that most non-cognitive skills also declined during and after the pandemic compared to pre-pandemic, especially in primary education. In secondary education, however, some non-cognitive skills are higher post-pandemic than during and before, whereas others are lower. From our impact analyses of the policy interventions, we see some promising results on student performances, although not all interventions have reached the desired effects (yet). In sum, we see the resilience of students in bouncing back after the pandemic, but in many aspects, the Netherlands are still not at the same levels as before the COVID-19 pandemic.

## Notes

- 1 Note that the number of schools that is mentioned here deviates from the number of schools mentioned in the technical explanation we refer to, as we mention the number of schools and students that were included in the analyses for this chapter.
- 2 We should treat the results of grade 1 children post-COVID-19 with care as some literature shows that closure of kindergarten during COVID-19 has negatively affected short- and long-term cognitive performance of children (Molnár & Hermann, 2023).
- 3 See [www.onderwijsmonitorlimburg.nl](http://www.onderwijsmonitorlimburg.nl)

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# 8 Academic resilience and policy reform in Belgium

*Letizia Gambi and Kristof De Witte*

## **Introduction: Education in Belgium**

Belgium has a highly decentralised governance system, with decision-making powers divided among the federal government, three geographical regions (Brussels, Flanders, and Wallonia), and three language-based communities (Dutch, French, and German-speaking). Each language community oversees person-related matters such as culture, language, and education, while the federal government's role in education is limited to setting the compulsory school age (5–18), defining minimum quality standards for educational institutions, and establishing broad regulations for teacher retirement and diploma recognition (Golden et al., 2017). This decentralised structure results in three autonomous education systems. In line with the general population in the three regions, a majority of students (58%) attend schools affiliated with the Flemish Community, 41% with the French Community, and only 1% with the German-speaking community. As a result of this structural heterogeneity, education policies, as well as the resources available for schooling, vary greatly across the country.

While the Belgian regions are geographically defined (Flanders in the north, Wallonia in the south, and Brussels-Capital in the center), the language communities do not follow the same territorial boundaries. For example, in the Brussels-Capital Region, education is managed by both the Flemish and French communities, serving 21% and 79% of the region's students, respectively (Institut Bruxellois de Statistique et d'Analyse (IBSA, 2021; OECD, 2022b)). Similarly, in the Walloon Region, schools are overseen by both the French and German-speaking communities.

Despite these divisions, the Belgian constitution guarantees families the freedom to choose their school, enabling institutions to host students from multiple language communities. Furthermore, the principle of freedom of education, established in Belgium's constitution, grants every natural or legal person the right to open a school. Across the three language communities, this high degree of educational freedom has resulted in the organisation of education into three main “networks,” based on their funding and governance arrangements:

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public official education directly managed by the language-based community; grant-aided public schools run by municipal or provincial authorities; and grant-aided private schools, which include mostly religious institutions as well as schools with distinct educational philosophies, such as Montessori schools (Golden et al., 2017). For example, in the Flemish Community, education is offered primarily through two networks: public official education and private but grant-aided education. Public schools include the GO! network, operated by the Flemish government, which provides secular education in a neutral environment that promotes diversity and individualism. Private, grant-aided schools are largely represented by Katholiek Onderwijs Vlaanderen, a Catholic school network that is also the largest education provider in Flanders. Although rooted in religious tradition, these schools adhere to the official curriculum and meet the same standards as public schools.

Belgium demonstrates a strong commitment to education through high levels of public financial investment, which are among the highest in the OECD. In 2020, Belgium's total expenditure on primary to tertiary educational institutions per full-time equivalent student was USD 16,429, significantly above the OECD average of USD 12,647 (adjusted for purchasing power). Similarly, in 2019, Belgium ranked 8th out of 36 OECD countries for annual expenditure per student (USD 15,024) and 10th for expenditure as a percentage of GDP (5.6%) (OECD, 2022a, 2023a). Notably, during the first year of the COVID-19 pandemic, Belgium increased its spending on education by 2.3%, compared to the OECD average increase of 0.4% (OECD, 2023a). This additional investment supported a range of emergency and recovery policies implemented during and after the COVID-19 school closures. In particular, Belgium introduced several educational reforms in the aftermath of the pandemic, focusing on three key areas: digitalisation (enhancing both digital literacy and infrastructure), mental health support (addressing the well-being of both students and teachers), and learning recovery (notably through initiatives such as summer schools in the Flemish Community and the shortening of the summer holiday in the French-speaking community). In section "Education Policy Reforms," we provide a detailed overview of the policy interventions and reforms implemented across the three language-based communities of Belgium.

### **Impact of the pandemic by relying on national administrative data**

This section outlines the general patterns of student performance in national and international assessments, quantifying the extent of learning losses experienced in the aftermath of the pandemic. The section draws strongly on the latest findings from PIRLS, TIMSS, and PISA, De Witte and Gambi (2024) and Gambi and De Witte (2025). Despite substantial public investment in education (OECD, 2023a), Belgium faces a negative trend in student achievement and

significant challenges in ensuring equity across its student populations, with disparities more pronounced than in many other OECD countries (OECD, 2023c). Since national administrative data for the whole of Belgium is not available due to the absence of a standardised national<sup>1</sup> assessment and differing methods of student progress evaluation across the language communities<sup>2</sup>, comparing performance across communities is challenging and only partly possible through international student assessments. Specifically, while the Flemish Community participates in all three major international student assessments – PISA, PIRLS, and TIMSS – the French Community participates in PISA and PIRLS (joining TIMSS for the first time in 2023), and the German-speaking community participates only in PISA.

To assess the impact of the COVID-19 school closures and determine the extent of the learning deficit, this section first presents the general performance patterns of the three communities, where data is available, in international assessments of primary (i.e., TIMSS and PIRLS) and secondary school (i.e., PISA) students. This section then outlines recent research on primary education that draws on standardised test score data, combined with administrative data at the school level, from the largest school network in the Flemish Community, Catholic Education Flanders. These data come from standardised curriculum-based tests administered annually in the fourth grade and the final year (sixth grade) of primary school in the Flemish Community. The data covers a large sample of Flemish primary schools over a 10-year period from 2015 to 2024, with the same test version administered from 2019 to 2024, making the analysis of these test scores and related inferences particularly robust (Gambi & De Witte, 2023). Conducting a similar analysis for secondary education is not possible, as none of the language communities collect standardised assessment data for secondary school students. Nevertheless, the impact of school closures on Flemish secondary education can be inferred from a significant increase in the number of students transitioning to lower study tracks after 2020. Notably, there was an approximately 12% rise in reorientations from general education tracks to technical, vocational, or arts tracks during the 2021–2022 school year (De Witte, 2021; De Witte & Smet, 2021).

The lack of comparable data on educational performance and resources across Belgium's three communities prevents a comprehensive understanding of the national situation. During the first lockdown, no new topics were introduced via distance learning in the French and German-speaking communities in primary education (Fédération Wallonie-Bruxelles, 2021), and unlike the Flemish Community, they did not organise large-scale catch-up lessons for struggling students in the summer of 2020 (Gambi & De Witte, 2021, 2024). Consequently, a greater decline in educational attainment was expected among French and German-speaking students compared to their Flemish-speaking peers. However, international assessment data reveal a negative trend across all three communities: PISA 2022 results indicate

declines in both reading comprehension and mathematics, while PIRLS 2021 shows similar declines for the Flemish- and French-speaking communities in reading comprehension in grade 4. Notably, the decline appears steeper among Flemish fourth graders, likely reflecting the interplay of multiple challenges affecting the Flemish-speaking education system, such as increasing teacher shortages.

### ***Performance in international student assessments***

While the three language-based communities differ in several aspects, students in Flemish-speaking schools consistently score significantly higher than those in the French and German-speaking communities across all international educational assessments. Despite these differences, Belgium's three education systems are renowned for maintaining high educational standards. Overall, Belgian students perform above average in mathematics and science according to PISA 2022 (15-year-old students) and in mathematics according to TIMSS 2023 (4th graders), while their mean performance is not significantly different from the OECD average in reading according to PISA (OECD, 2023c; von Davier et al., 2024). Furthermore, Belgian students score near the international median in reading based on PIRLS results, and just below average in science according to TIMSS (Mullis et al., 2023; von Davier et al., 2024). When examining the language-based communities separately, French-speaking students tend to perform lower in science and mathematics compared to their peers in Flemish- and German-speaking secondary schools (OECD, 2023c). Likewise, the PIRLS and TIMSS results reveal that French-speaking students score significantly lower in comparison to Flemish-speaking students. Despite these relatively positive indicators, a downward trend in student performance across all domains tested by PIRLS, PISA, and TIMSS has been observed in Belgium over the past decade (Dockx et al., 2019; Mullis et al., 2019; OECD, 2023c).

On the one hand, PIRLS 2021 data revealed a significant decline in reading achievement among Grade 4 students in both Flemish- and French-speaking communities between 2006 and 2021 (Mullis et al., 2023). This decline coincides with a rise in the proportion of low-performing students. In Flanders, the average PIRLS score dropped sharply from 547 in 2006 to 525 in 2016, and further to 511 in 2021 – placing Flanders below the PIRLS median of 520 for the first time. In the French-speaking community, the decline was slower: scores increased slightly from 500 in 2006 to 506 in 2011, but then fell to 497 in 2016 and 494 in 2021. However, the 2021 decline was not statistically significant compared to 2016. Student attitudes toward reading have also deteriorated, with students who “do not like reading” scoring significantly lower than their peers who enjoy it (Hooper, 2020). In Flanders and Wallonia, this pattern is evident, though less pronounced. For instance, Flemish students who dislike, somewhat like, or very much like reading achieved average scores of

505, 512, and 516, respectively. In Wallonia, these scores were 484, 498, and 498 (Mullis et al., 2023).

On the other hand, TIMSS 2023 data showed a marked decline in mathematics and science performance among Flemish students, while comparisons with previous years are not possible for the French-speaking community, as it participated in TIMSS for the first time in 2023. Of the 58 participating countries, 19 (including Flanders) scored significantly lower in mathematics compared to 2019, and 17 (including Flanders) recorded significant declines in science (von Davier et al., 2024). Specifically, Flanders now ranks 24th in mathematics (521 points) and 35th in science (488 points), while Wallonia ranks 40th in mathematics (489 points) and 38th in science (481 points). The share of students failing to achieve basic proficiency levels has risen: 5% of Flemish students scored below 400 points in mathematics, and 12% fell below this threshold in science. Furthermore, fewer students are reaching “average,” “high,” or “advanced” performance levels, with even top-performing students scoring lower (Verhelst et al., 2024; von Davier et al., 2024).

Finally, a similar negative trend is evident in PISA results, where the average performance of Belgian students showed further declines compared to 2018, with average scores (taking results of all three language-based communities together) dropping by 14 points in reading and nearly 20 points in mathematics – equivalent to losing three-quarters of a year’s learning (OECD, 2023c).<sup>3</sup> Specifically, students in Flemish-speaking schools scored an average of 483 in reading, 501 in mathematics, and 499 in science. In French-speaking schools, the respective scores were 474, 474, and 479, while students in German-speaking schools scored 467, 483, and 487. Furthermore, socioeconomic disparities remain stark: students from privileged backgrounds or whose parents have attained higher levels of education consistently outperform their peers.

While some neighbouring European countries have stabilised or improved in international assessments, Belgium – and particularly Flanders – continues to show a deepening decline. Data from PIRLS, TIMSS, and PISA thus suggest that the downward trend in student performance, compounded by further learning losses observed in the aftermath of the pandemic, has not yet bottomed out, contrary to earlier expectations (Gambi & De Witte, 2024a).

### ***Performance in primary schools in the Flemish-speaking community***

The general decrease in performance on international student assessments is also reflected in earlier findings (Gambi & De Witte, 2023, 2024b, 2025; Maldonado & De Witte, 2022), as their analysis of annual curriculum-based tests administered in grade 6 (the last year of primary school) in the Flemish-speaking community highlights a similar downward trend in standardised test scores. Specifically, their investigation of trends in student performance before and after school closures reveals an ongoing decline across all domains – Dutch

language, mathematics, science, and social science – since 2018 (Gambi & De Witte, 2023). This decline became even more pronounced in key subjects, particularly Dutch language, following the onset of the COVID-19 pandemic.

First, in the immediate aftermath of the pandemic (June 2020), student performance significantly declined in three out of five tested subjects compared to pre-pandemic years (2015–2019). This decline was particularly evident in lower school averages for mathematics (a reduction of 0.17 standard deviations) and Dutch language scores (a decline of 0.19 standard deviations). However, the impact was not uniform across all students and schools. Institutions serving more disadvantaged student populations – measured by factors such as maternal education level and financial support – experienced larger deficits. In schools where nearly all students came from low socioeconomic status (SES) backgrounds, declines in mathematics and Dutch language scores reached as much as 0.6 standard deviations. Furthermore, inequality increased both within and between schools, rising by 7% for mathematics and 8% for Dutch language scores (Maldonado & De Witte, 2022).<sup>4</sup> A separate analysis using the same dataset examined the effect of additional school closure days on test results. The findings indicated that extended closures negatively affected Dutch language scores, while mathematics scores remained unaffected. Specifically, five additional days of school closure were associated with a 10% reduction of a standard deviation in Dutch language scores (Chénier et al., 2021).

Between June 2020 and June 2021, school averages for Dutch and French (as a foreign language) continued to decline, while deficits in mathematics, science, and social science scores remained unchanged (Gambi & De Witte, 2024b). Overall, this indicates no evidence of a catch-up between cohorts in these subjects one year after schools were closed due to COVID-19 measures.<sup>5</sup> However, summer schools seem to have mitigated part of the learning loss (see section “Impact Analysis of Policy Interventions” for further details).

Finally, four years after the pandemic, the findings of Gambi and De Witte (2025) confirm the overall negative trend in average student achievement observed in previous years (Figure 8.1 (adapted from Gambi & De Witte, 2025, p. 47)). In particular, both content domains of the Dutch language – “reading comprehension” and “listening” – show a significant, further decline in 2024 compared to the 2023 estimates. While some catch-up in learning between cohorts was observed in 2023 (Gambi & De Witte, 2024a) – when the changes in performance nearly returned to 2021 estimates in all domains except “listening” – a renewed decline in most subjects is evident in 2024. For Grade 6, relative to the pre-pandemic year 2019, the 2024 changes in test scores fall approximately midway between the negative changes observed in 2022 and 2023. Beyond the average impact, it is notable that high-performing students (p75–p95), who experienced a particularly sharp decline in test scores in 2022, are now performing at levels comparable to previous years. Furthermore, the negative changes in 2024 in Dutch language performance for both Grade 4 and Grade 6

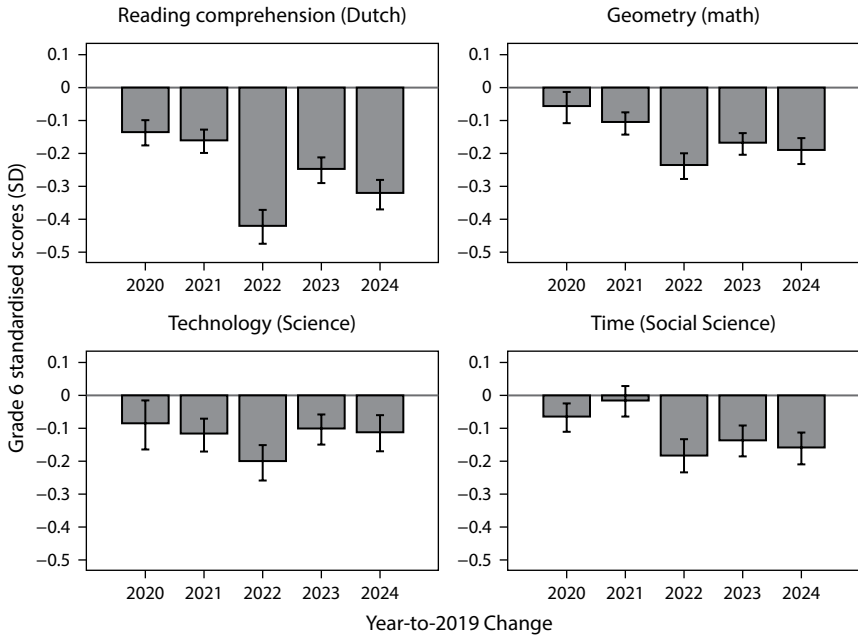


Figure 8.1 Main results by subject domain (2019–2024 sample)

Source: Adapted from Gambi and De Witte (2025).

disproportionately affect schools with a higher proportion of students who do not speak Dutch at home – findings consistent with the latest insights from PIRLS and TIMSS (Mullis et al., 2023; Verhelst et al., 2024).

### Education policy reforms

In this section, strongly based on De Witte and Gambi (2024) and OECD (2023a), we provide a detailed analysis of national recovery policy measures and reforms implemented across the three language-based communities to support students returning to face-to-face learning after the COVID-19 school closures. During the first wave of the pandemic, the federal, regional, and community governments adopted a collaborative strategy, implementing comparable schedules of social restrictions and progressively escalating measures in response to rising case numbers across the three regions and communities. However, as restrictions were gradually lifted, regional and community policies began to diverge from those at the federal level (Desson et al., 2020). As a result, this section clearly distinguishes the policy measures implemented by each language-based community, organised across the three main areas of focus: digitalisation, mental health support, and learning recovery. These

initiatives highlight Belgium's commitment to building a more resilient, inclusive, and digitally equipped education system in response to the challenges posed by the pandemic.

### ***Digitalisation strategies***

First, regarding digitalisation, pre-pandemic studies on the use of ICT resources in Belgian schools revealed varying levels of adoption by teachers and highlighted a significant number of students across all three communities who lacked access to laptops at home (Agence du Numérique, 2018; Heymans et al., 2018). For this reason, additional funding was devoted to providing vulnerable students with laptops and to expanding internet connectivity.

In the Flemish Community, under the “Digisprong” strategy funded by NextGenerationEU, EUR 353 million was allocated in 2021 and 2022 to advance digital education. This funding included EUR 15 million for shared devices in primary schools (EUR 25 per student up to fourth grade) and EUR 45 million for personal devices (EUR 290 per student in fifth and sixth grades). Secondary schools received EUR 232 million for individual devices (EUR 510 per student), while special education and dual-learning institutions were allocated EUR 10 million (EUR 552 per student). An additional EUR 50 million was earmarked for ICT infrastructure improvements (EUR 42 per student).

In the French-speaking community, under the latest “Stratégie numérique pour l'éducation” digital education strategy, secondary schools were provided with EUR 500 per computer to supply laptops for at least 5% of their students. Furthermore, government support was offered to students in grades 3–7 to acquire computers, either through purchase or rental options from approved providers identified by their schools. The subsidy included EUR 75 for purchases, EUR 25 annually for a three-year rental, or EUR 18.75 annually for a four-year rental (Duroisin et al., 2021). Additionally, funding was allocated for extra teaching staff, equivalent to 0.25 full-time positions per 100 students (De Witte & Smet, 2021).

In the German-speaking community, the government committed to providing laptops to all teachers who expressed interest, as well as to every secondary school student. The distribution process started in the first quarter of 2022 for students in the first two years of secondary education, continued with students in years 3 and 4 by the third quarter of 2022 and was expected to be completed by the third quarter of 2023 for the remaining students. Additionally, efforts were made to enhance ICT capacity by recruiting extra personnel to provide support. By September 2021, each secondary school in the German-speaking community had a dedicated staff member responsible for ICT support (OECD, 2022b).

### ***Mental health and well-being support initiatives***

Secondly, regarding mental health support, both the Flemish and French-speaking communities allocated additional resources to enhance their student counselling centres (CLB and CPMS, respectively). This response came in light of concerning findings from studies conducted in both communities on the mental health of students during the COVID-19 pandemic (Baudoin et al., 2020; De Man et al., 2021; Mazrekaj & De Witte, 2024), as well as the role of personality traits in how students coped with school closures (Iterbeke & De Witte, 2020). Specifically, the Flemish community invested EUR 27 million to bolster the Centre for Student Counselling (Centrum voor leerlingenbegeleiding (CLB)), which provides various support services such as career guidance, socio-emotional development, preventive healthcare, and tutoring to students in Flemish schools, while the French-speaking community allocated EUR 9 million to strengthen the Centres for Psychological, Medical, and Social Services (CPMS) (Fédération Wallonie-Bruxelles, 2021).

### ***Reforms and policy measures for student learning recovery***

Finally, in an effort to support student learning recovery, a range of interventions were implemented across all three language communities. In the Flemish community, EUR 21.8 million was allocated to support summer schools held during the summers of 2020 and 2021 (De Witte & Smet, 2021), with additional funding of EUR 10 million for summer schools in 2022 (Beheydt, 2022) (see section, “Impact Analysis of Policy Interventions,” for more details on the rollout and impact of the summer schools). Furthermore, in response to the pandemic, the Together against School Dropout action plan (2016) was revised (OECD, 2022b). The updated plan introduced a transition pathway initiative (2022) designed to offer career guidance and job-related training to students in vocational and technical secondary education to ease their transition into the workforce. It also included a new monitoring action to track early school-leavers’ outcomes, socio-economic backgrounds, and academic progress (OECD, 2022b). Additionally, funding was allocated to hire and train teachers and provide counselling and support services for students. Furthermore, through the additional Education Support Fund (Bijspng), EUR 85 million were allocated for the 2021–2022 school year to provide extra support to schools through additional teaching hours, focusing on eliminating learning deficits especially for vulnerable students in both mainstream and special needs primary and secondary education. Finally, to enhance its monitoring and information infrastructure, the Flemish Community recently introduced a digital standardised student assessment, the “Vlaamse Toetsen,” to be taken by all students in Flemish-speaking schools. Starting in the 2023–2024 school year, these assessments will be administered annually on a census basis in Dutch and mathematics.

In the French-speaking community, to counteract the rise in educational inequality caused by the “summer slide” – the loss of learning during the summer break – and the effects of the COVID-19 closures, a reform of the school calendar was introduced in 2022. Beginning in the 2022/2023 academic year, the school year in the French community now starts on the last Monday of August (previously 1 September) and ends on the first Friday of July, rather than 30 June. As a result, the summer holidays were shortened by two weeks, while the autumn and carnival holidays were extended to two weeks.

In the German-speaking community, a new monitoring system is being developed as part of its broader “Vision 2040” strategy, which will include the creation of a student information system (OECD, 2023a).

### **Impact analysis of policy interventions**

The effectiveness of education recovery policies implemented in Belgium following the COVID-19 pandemic remains largely unassessed due to limited data availability. As noted by the OECD (2023), it is therefore challenging to determine the precise impact of these policies (see section “Education policy reforms in Belgium,” for more details on policy interventions) on the quality of Belgian education. However, recent findings from the PISA 2022 reveal a significant decline in student performance across OECD countries, including Belgium, indicating that recovery measures may not have fully addressed the learning losses. Similarly, the latest releases of PIRLS and TIMSS also show a continued decline in student performance in Belgium (Mullis et al., 2023; von Davier et al., 2024), while Gambi and De Witte (2025) show that average student achievement levels remain significantly below pre-pandemic levels even four years after school closures. To the best of the authors’ knowledge, among the learning recovery policies in Belgium, only the summer schools<sup>6</sup> organised in the Flemish Community have been subject to detailed qualitative and quantitative evaluation. The findings from these evaluations (Bellens et al., 2024; Gambi & De Witte, 2024b; Verachtert et al., 2020) and from De Witte and Gambi (2024) form the basis of this section.

Summer schools were introduced in the Flemish community in July–August 2020 as part of a series of learning recovery measures to address the negative effects of the COVID-19 school closures. They have since been re-organised annually, including in 2024. Fully subsidised and organised by municipalities, schools or other education institutions, the summer schools focused on two subjects: the Dutch language and mathematics, with remedial or preparatory goals organised in small classes. Student participation was voluntary, with the summer school lasting at least ten full days or twenty half days. Initially aimed at low-SES students to mitigate the “summer slide,” the target expanded in subsequent years to include a wider audience, with participation increasing from 7,521 in 2020 to about 12,000 in 2023 (2024 data pending). The summer schools

primarily served primary school students and were held across Flanders and the Brussels region. Local partners, including student guidance centres and social welfare organisations, played a key role in encouraging participation (Verachtert et al., 2020). In 2020 and 2021, the focus was on addressing learning deficits and inequalities caused by the COVID-19 school closures. By 2023, the emphasis shifted to addressing language deficits and improving language skills (Bellens et al., 2024), as a consequence of the negative trends observed in international assessments (PIRLS and PISA) and standardised test scores from the Flemish Catholic school network (see section “Impact of the Pandemic by Relying on National Administrative Data,” for an overview).

A qualitative assessment of the summer schools, conducted annually since 2020 using record data and stakeholder interviews (e.g., parents, students, and coordinators), highlighted key features – such as the small classes, capped at 14 students, the high satisfaction levels among teachers and parents, and the challenges encountered in recruiting suitable staff and maintaining student attendance (Bellens et al., 2024; Verachtert et al., 2020). While these qualitative assessments of the summer schools provided valuable descriptive insights, they did not investigate the link between summer school participation and academic performance. To address this gap, quantitative studies by Gambi and De Witte (2023, 2024b) investigated the relationship between attending summer schools in 2020 and 2021 and standardised tests in the subsequent school years (2021 and 2022, respectively), highlighting that summer schools were primarily organised in the most disadvantaged areas, where learning deficits were most pronounced in the aftermath of the pandemic.

Results showed that, in postcode areas where a summer school took place, between-cohorts learning deficits in Dutch and mathematics had decreased by June 2021, whereas deficits worsened in postcode areas without a summer school. Further analysis in 2022 revealed that schools participating in summer schools during both 2020 and 2021 experienced smaller declines in Dutch test scores compared to those without summer schools, while mathematics scores in these schools had returned to 2019 levels (Gambi & De Witte, 2023, 2024b).

Investigating the effect of summer schools beyond the mean, Gambi and De Witte (2023) found that that students in the lowest-performing percentiles (25–35) and highest percentiles (65–100) in schools with summer programs showed more stable or improved test scores compared to their peers in schools without such programs, where test scores dropped more significantly. This indicates that summer schools helped mitigate learning deficits, particularly for at-risk students, and also benefited higher-performing students. Furthermore, as the summer schools in 2020 aimed to compensate for the lack of parental support in learning, they were expected to have a greater impact in schools with a higher proportion of students with low-educated mothers. As shown in the marginal effect analysis in Figure 8.2 (adapted from Gambi & De Witte, 2024b, p. 10), in postcode areas with summer schools (left panel), further learning deficits in both

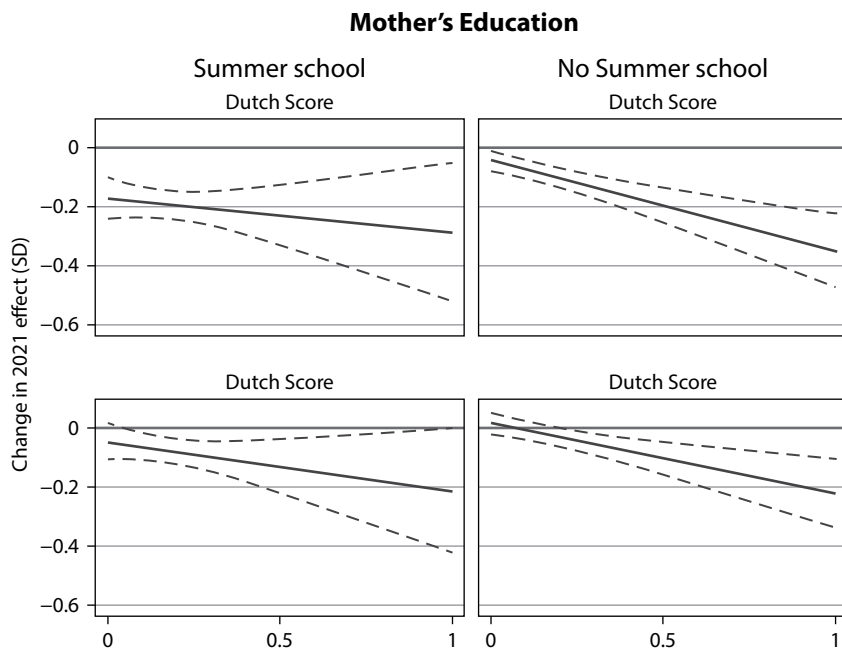


Figure 8.2 Marginal effects by the share of low-educated mothers in the school population

Source: Adapted from [Gambi and De Witte \(2024b\)](#).

Dutch and math were less pronounced in 2021 in schools with a larger share of low-educated mothers. In contrast, in the absence of summer schools (right panel), accumulating learning deficits were observed in schools with a higher share of low-educated mothers.

The observed positive impact of summer schools likely stem from the intensive support offered in small groups, focused instruction on key skills, and additional learning time, which helped students prepare for the academic year and reduced the burden on teachers. Notably, the benefits extended to the broader classroom environment, enhancing overall performance. Despite these promising findings, further research is needed to examine the mechanisms – such as class size and extra instructional time – and to establish causal relationships ([Gambi & De Witte, 2023, 2024b](#)).

### ***Recommendation for policymakers***

Evidence from Belgium reviewed in this chapter highlights substantial learning deficits in education systems, persisting despite significant investments in

targeted remedial measures. These deficits risk compounding over time, potentially leading to long-term challenges for students. In particular, evidence from the Flemish-speaking community (Gambi & De Witte, 2023, 2024b; OECD, 2023a) underscores the need for ongoing monitoring to enhance the evaluation capacity across all three communities, though it becomes increasingly challenging to separate pandemic-related effects from other factors like, for example, teacher shortages or migration. Despite this, sustaining recovery policy measures remains crucial due to the pivotal role of education in the well-being of our societies. Strategies such as shortening summer holidays and offering additional instruction time have proven effective in addressing learning loss by providing students with continuous engagement and targeted support. These measures are vital for mitigating learning deficits and ensuring long-term educational progress.

## Notes

- 1 In this regard, government actors in all three communities agree that organizing national standardised assessments cannot be a federal responsibility, as curriculum requirements and education policies differ across the three communities (OECD, 2023b).
- 2 Specifically, compared to the Flemish Community and other OECD countries, the French and German-speaking communities have limited data on educational quality and insufficient evaluation capacity at both the central and school levels. Central examinations, if conducted, are non-standardised and available only to schools, hindering national and international comparisons. In particular, the French community administers the *évaluations externes certificatives* in the final years of primary and secondary school (Communauté française de Belgique, 2004) and participates in the European Survey on Language Competences. In the German-speaking community, students participate in the *Diplôme d'études en langue française* and comparative assessments (Vergleichsarbeiten (VERA)) in primary (VERA-3) and secondary education (VERA-8).
- 3 A similar negative trend is evident in many OECD countries, as shown by PISA results, with average performance declining across all tested subjects: mathematics (since 2009) and reading and science (since 2012). The decline in mathematics is three times larger than any previously recorded change (OECD, 2019, 2023c).
- 4 Data from the second-largest school network provider in the Flemish Region, the GO! network, reveal similar findings. The statistics indicate a rise in educational inequality among students, with approximately half of the pupils falling behind in their learning. Notably, this learning gap is classified as very large for 25% of primary school students and 20% of secondary school students (FPB, 2022).
- 5 The catch-up effect refers to schools' score test score averages going back to (i.e. catching up with) pre-COVID-19 levels. In all three studies (Gambi & De Witte, 2023, 2024b; Maldonado & De Witte, 2022), standardised test scores were collected at the individual level from students in grade 6, the final year of primary school. However, for the purpose of conducting a longitudinal analysis, these individual scores were aggregated at the school level. Thus, due to the study design, the researchers did not track the same students over multiple years. Instead, they compared how the average performance of sixth-grade students changed over time.

- 6 The 2022 reform of the school calendar in the French-speaking community, which reduced the summer holidays by two weeks (see section ‘Education Policy Reforms’), could yield benefits comparable to those of the summer schools organised in the Flemish-speaking Community. However, these potential effects have yet to be measured.

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# 9 Academic resilience and policy reform in Canada

*Stefan Merchant and Louis Volante*

## Introduction

Canada is a geographically huge and diverse country. While it is the second-largest country in the world by land area, it ranks 38th by population, giving it a population density of only four people per km<sup>2</sup>. Most Canadians live in the far south of the country, meaning that vast expanses of Canada have extremely low population densities. Thus, schools in Canada can serve large, multicultural cities such as Toronto or remote locations where students travel for hours by road, water, or over snow to attend school. Further adding to this diversity is the fact that there is no national oversight over education. Instead, each of Canada's ten provinces and three territories has responsibility for governing its own education system. They have autonomy over all aspects of their education system and are free to develop their own legislation, curricula, policies, and assessment systems. Hence, there is a collection of thirteen autonomous school systems, rather than a "Canadian" education system per se.

While there is no federal regulation of education in Canada, the provinces and territories cooperate via the Council of Ministers of Education, Canada (CMEC). CMEC organises national and international assessments and facilitates discussions and cooperation among the provinces and territories to allow for some degree of consistency among the education systems. Thus, we see some common elements in Canadian schools across the country. In all jurisdictions, children must complete compulsory schooling, which begins at either age four (Junior Kindergarten) or five (Kindergarten) and terminates in secondary schools in either grade 11 or grade 12, depending on the province or territory. The province of Quebec is Canada's only francophone province and has a unique stage of education between secondary and postsecondary called the College of General and Vocational Education (CEGEP). CEGEP is optional for Quebec students, but almost all students complete CEGEP, which has a duration of either two or three years, depending on the program of study. Canada's three territories have education systems that are very similar to their southern neighbours and use curriculum and policies that are largely borrowed from either British Columbia or Alberta.

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Local control and governance of schools is accomplished by school districts. The number and size of school districts vary considerably due to significant provincial and regional differences in student populations. For example, Canada's most populous province, Ontario, contains more than 70 school districts, while the smallest province, Prince Edward Island (PEI), has only two. The most populous school district in Canada is the Toronto District School Board (TDSB), which serves a population nearing a quarter of a million students. This contrasts with rural school districts such as Nechako Lakes in British Columbia, which is roughly the size of Austria but serves only 3500 students. In all provinces, minority language education is a constitutional right, meaning that students may attend school in English or French. Quebec is the only majority francophone province, while New Brunswick is bilingual. All other provinces and territories are English-language majority, and the vast majority of students attend English-language schools outside of Quebec and New Brunswick.

### **Learning changes wrought by responses to the COVID-19 pandemic**

Global research has amply demonstrated the deleterious effects of responses to the COVID-19 pandemic on learning outcomes. These effects include not only lower student achievement and higher dropout rates (Moscoviz & Evans, 2022; Skar et al., 2022; Volante et al., 2021), but also poorer and deteriorating mental and physical health for children (Boak et al., 2022; Duncan et al., 2023; Kovacs et al., 2022; Michaud et al., 2022; Neville et al., 2022). The negative impacts of responses to the COVID-19 pandemic have been documented across the world, including the United States (Bailey et al., 2021; Dorn et al., 2020), Europe (Depping et al., 2021; Engzell et al., 2021; Giancola & Salmieri, 2024; Maldonado & De Witte, 2021), and Asia (Molato-Gayares et al., 2022).

Adding to the concern of global learning losses is evidence that responses to the pandemic widened achievement gaps for children in disadvantaged circumstances, such as those who come from low socio-economic status (SES) families, are migrants, or have identified learning disabilities (Bartholo et al., 2023; Betthäuser et al., 2023; De Witte & François, 2023; Organisation for Economic Co-operation and Development [OECD], 2020; UNESCO, 2022; Volante et al., 2022). While much has been written about differing impacts of COVID-19 on different groups of students, the evidence itself is nuanced. As an example, Finch et al. (2023) used self-report measures to examine whether students learned as much during the pandemic as before. Data from Denmark, Russia, and Slovenia were included and it was found that students whose native language was not the same as the education system's language were more likely to self-report that they learned less during COVID than before. However, SES was not a predictor of students reporting that they learned less.

In Canada, Gallagher-Mackay et al. (2021) provided various examples of how COVID-19-related changes reduced access to services for students with disabilities or special learning needs. The evidence of disrupted access to programs and resources for students with disabilities during COVID-19 came not just from Canada (Lawrence et al., 2020; Ontario Ministry of Education, 2020) but also in other countries (e.g., Jeste et al., 2020). This limited access to both education and health services caused some disability rights organisations to declare that COVID-19 related changes to schooling were “catastrophic” (Brennan, 2020, p. 7) to students with disabilities. While the evidence of resource and program loss is overwhelming, there is less evidence of learning loss. In trying to explain the lack of evidence of learning loss for students with disabilities, Gallagher-Mackay et al. (2021) noted the general lack of robust data in relation to students with special educational needs and the absence of evidence that special education programs are effective as potential contributing factors. A lack of data has been noted by Whitley et al. (2021), who describe Canadian data as “limited” (p. 1695) and revealing “mixed findings” (p. 1695). Given the lack of Canadian empirical data, Whitley et al. (2021) stated that their “clearest sense of the impact of COVID-19 on vulnerable children comes from the decades of evidence that preceded the pandemic” (p. 1701) and not from studies conducted during the pandemic itself.

## **National administrative data**

### ***PISA Test results***

Unfortunately, Canada has followed global trends with evidence of reduced learning post-pandemic. If we compare results from the 2022 PISA test with those of the 2018 PISA test, Canada had declines in mean scores across the three PISA domains of mathematics, reading, and science. The magnitude of these declines was similar to the declines shown across the OECD as a whole. For instance, Canada’s mean mathematics score went down by 15 points, whereas the average OECD decline was 17 points. For reading, the decline was 13 points compared to the OECD average of 11 points, and for science, the decline was three points, while the mean OECD decline was four points. Prior to the pandemic, Canada was showing declines in mean mathematics PISA scores (Klinger et al., 2016), but these declines averaged four points per PISA administration, so the drop of 15 points between 2018 and 2022 represents a precipitous and unprecedented drop in student performance. Similarly, mean reading scores in Canada have declined by about two points per PISA administration, so the drop of 13 points between 2018 and 2022 represents a marked change from prior patterns of achievement. The three-point decline in science is consistent with the general trend set since 2006, although it should be noted that Canada’s biggest decline in science achievement came between 2015 and 2018,

which is before the pandemic. Despite the declines, Canada's performance on the PISA remains about 30 points above the OECD average in each domain.

While it is clear that PISA scores in Canada have declined post-pandemic, a deeper analysis of achievement gaps paints a more complex picture. As an example, it is well known that socioeconomic status (SES) is associated with achievement. As with all OECD countries, Canadian students in the bottom SES quartile performed worse than those in the top quartile. PISA reading data show that this achievement gap demonstrated a moderate increase from 68 points to 74 points between 2018 and 2022 ([Council of Ministers of Education \[CMEC\], 2018, 2022](#)). The increase in the achievement gap was similar to what was observed across the OECD as a whole, where the gap increased from 89 to 93 points.

However, the reading achievement gap between immigrant and non-immigrant students has not only closed but reversed. In the 2018 writing of PISA, immigrant students scored an average of 3 points lower than Canadian-born students, whereas immigrant students outscored Canadian-born students by an average of 11 points in 2022. In fact, immigrant students outperformed non-immigrant students on all three domains of mathematics, reading, and science in the 2022 administration of PISA. At first glance, the strong performance of immigrant students in Canada is remarkable. However, a closer inspection of the data reveals that first- and second-generation immigrants have different levels of achievement on the PISA tests. Second-generation immigrant students outperformed non-immigrant students by 28 points in reading, while first-generation immigrants had a mean score 7 points lower than non-immigrant students. Similar patterns were found across all three domains. Thus, the "immigrant" students who scored highest on the PISA tests were actually born in Canada, a result that is congruent with previous studies on this topic (see [Volante et al., 2017; 2020](#)). Second-generation immigrant students do not face the same linguistic and cultural barriers as first-generation and so it is expected they would fare better within the Canadian education system than their first-generation immigrant counterparts.

### ***Provincial data***

All Canadian provinces and territories have large-scale assessment programs ([DeLuca et al., 2017; Klinger et al., 2008](#)), but in the interest of brevity we report only a sample here. The four provinces included in this analysis (Ontario, Quebec, British Columbia, and Alberta) are the four most populous provinces in Canada and together they make up 86% of Canada's K-12 student population.

#### *Ontario*

Ontario is Canada's most populous province and conducts large-scale testing of reading, writing, and mathematics in grades 3 and 6, and mathematics only in

grade 9. This testing is conducted by the Educational Quality and Accountability Office (EQAO), which is an organisation that is separate from the Ontario Ministry of Education. Due to a combination of technical issues and shutdowns during the COVID pandemic, EQAO did not collect data in 2020 or 2021. Results from the grades 3 and 6 EQAO tests in both literacy and mathematics show minimal changes in post-pandemic achievement compared to pre-pandemic (Education Quality and Accountability Office [EQAO], 2018, 2022, 2024). At the grade 3 level, we see small declines in literacy achievement, with the percentage of students who met grade level expectations declining by 3% in reading and 5% in writing. This is accompanied by small gains in mathematics, where the percentage of students meeting grade level expectations went up by 3%.

While achievement differences for grades 3 and 6 were minimal, there was a drastic decline in mathematics achievement at the grade 9 level, where the percentage of students meeting grade level expectations declined by 20% post-pandemic. Though it is tempting to claim this is because of the effects of school shutdowns, we do not see the same negative impact at the grades 3 and 6 levels. It is possible that the effects of school shut-downs on mathematics learning are not equal across grades. For instance, it may be that while schools were shut down, key mathematical skills learned in kindergarten and grade 1 (e.g., counting, single-digit addition) were learned at home with parents, while mathematical skills taught in later grades (e.g., fractions, algebra, geometry) are more complex, and so parents were less comfortable providing support for them. Further study would be needed to ascertain if this is a reasonable and correct hypothesis.

Grade 10 students in Ontario are required to write the Ontario Secondary School Literacy Test (OSSLT). This is a test of reading and writing and is designed to measure whether students have achieved the grade 9 curriculum expectations. The OSSLT is a high-stakes test because students must pass either this test or complete an additional literacy course in order to graduate. Grade 10 English students are streamed into either academic or applied English. The academic stream is the higher ability stream and is the more popular of the two options. The applied stream is generally taken by students who struggle with the subject and do not intend to pursue university study. Further, Applied English classes have a high proportion of students with special learning needs (Merchant et al., 2020). Before and after the pandemic, the percentage of Academic English students who passed the OSSLT in their first writing of the test hovered around 90%. The picture is quite different for Applied English students, where pre-pandemic pass rates hovered around 35% and post-pandemic pass rates were around 55%.

This improvement coincides with the introduction of drastic changes in the OSSLT itself. Before the pandemic, the OSSLT was a pencil-and-paper test. During the two-year hiatus, the test was transformed into an online test and the test itself was redesigned using linear test models. Thus, it is difficult to compare

test results from before and after the pandemic. The lack of improvement for Academic stream students may be due to the redesign benefitting lower achieving students but not higher-achieving students, or because there is a ceiling effect in place with the Academic stream students. Other performance data show that in the three post-pandemic sittings of the OSSLT, students with special educational needs had pass rates of 57%, 62%, and 63% from 2022 to 2024. Before the pandemic, the pass rate was 45%, 40%, and 43% in the years 2017 to 2019. It would appear that the changes in test format and design provided for more equitable outcomes for students with special educational needs, but these drastic changes also make it impossible to determine if the increased pass rates are due to genuine improvements in post-pandemic learning.

### *Quebec*

Students in Quebec write province-wide, standardised tests as final examinations at the end of their grade 11 year (final year of high school in Quebec before attending CEGEP). These examinations were suspended in 2020 and 2021 because of COVID-related restrictions. For writing, the pass rate held steady at about 78% from 2016 to 2019. The pass rate declined to 70% when the exams restarted in 2022, while the most recent (2024) pass rate was 71%. For reading, the 2016 to 2019 data showed a steady increase in the pass rate from 90% to 95%, dropping back to 90% in 2022. As of 2024, it was at 91%. Mathematics achievement was not as stable as writing or reading before the COVID pandemic with pass rates varying from 62% to 78% between 2015 and 2019. When the mathematics examinations were resumed in 2022, the pass rate was 73% and rose to 78% in 2024 (Quebec Ministère d'Éducation, 2024).

The lack of change in mathematics achievement in Quebec is an interesting finding. Mathematics is a mandatory subject in all grade levels in Quebec, so it is not the case that students who struggle with mathematics select themselves out of the course, bolstering results. Because the mathematics exams are written in grade 11, the students who wrote them in 2022 through 2024 would have missed in-person mathematics instruction in early high school. This instruction is key for later success in the subject and so it would appear that Quebec's approach to mathematics instruction was effective during the pandemic. This hypothesis is consistent with the fact that Quebec students outperformed those in all other provinces in the 2022 PISA mathematics test. It is also interesting to note that achievement in the French writing tests declined post-pandemic. The trends shown in Quebec are the direct opposite of the trends shown in Ontario and British Columbia. A direct comparison between these two provinces and Quebec is not possible because the Quebec exams are written in grade 11 at the end of mandatory high school, while the EQAO tests in Ontario and the FSA tests in British Columbia are mostly written by students in elementary school or in the first year of secondary school.

British Columbia

British Columbia conducts large-scale testing of literacy and numeracy in grades 4 and 7 through tests called the Foundational Skills Assessments (FSA). Results from these tests suggest the school closures brought about by the COVID-19 pandemic produced clear declines in learning in numeracy, but not in literacy (Statistics Canada, n.d.a). Figure 9.1 shows the FSA numeracy scores from 2014 to 2024 for students in grades 4 and 7. If all students are included, the scores are relatively stable from 2014 to 2020, with a trend of a slight decline. There is a marked increase in achievement in 2021 (marked by a vertical dashed line on the graph). This increase is likely due to two changes made to the FSA tests that year. The first change was that students wrote the test in February or March of that school year, whereas the FSA tests are normally written in October or November. The later writing date in 2021 meant that students had an additional five months of instruction before writing the FSA in 2021, compared to other years. The second change was a revamp of the curriculum, which resulted in changes to the FSA test content. The British Columbia Ministry of Education did not conduct any test equating procedures for the FSA test results, and so direct comparisons of scores before and after 2021 are not possible. However, regardless of whether we look at pre- or post-2021 data, we see declines in numeracy achievement on the FSA numeracy test for both grades 4 and 7 (except for the years 2020 and 2021). The results for Indigenous students and for students with disabilities are separated out to examine if these groups experienced greater learning losses than the general student population. The data presented here do not support that hypothesis, as the decline in scores for Indigenous students and students with disabilities is slightly less than for the general student

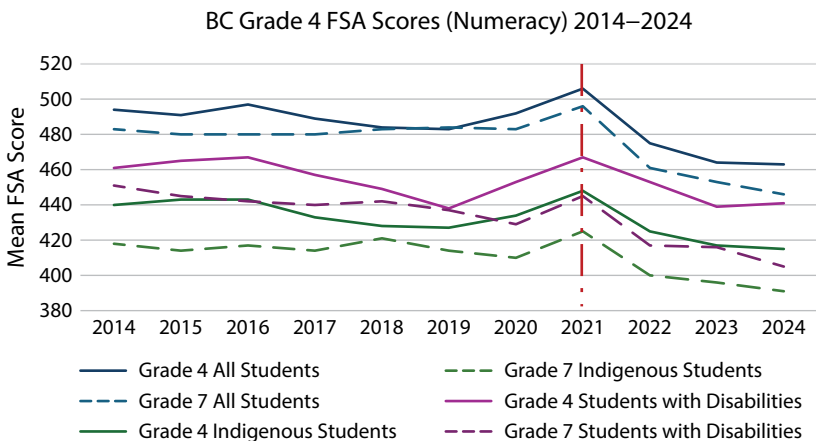
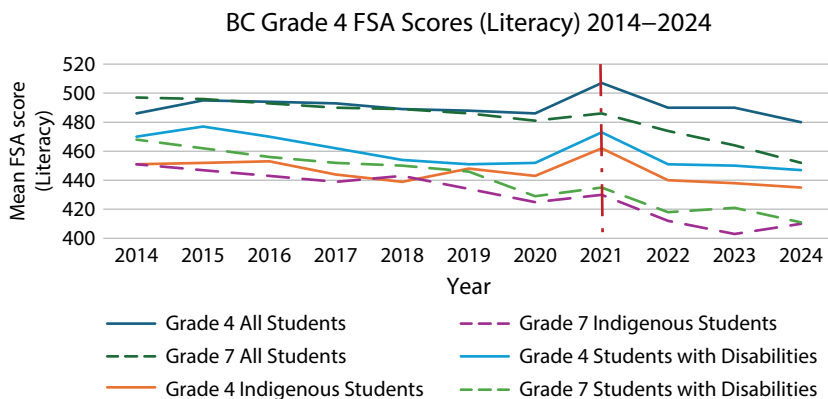


Figure 9.1 Grade 4 and 7 numeracy achievement in British Columbia 2014–2024



*Figure 9.2* Grade 4 and 7 literacy achievement in British Columbia 2014–2024

population. What is noteworthy is that before the pandemic, FSA scores were declining faster for Indigenous students and students with disabilities than for the general student population.

If we examine the data for literacy achievement over time, there are similar trends and results as for numeracy ([Figure 9.2](#)). We see a long-term downward trend in FSA scores with a positive bump in 2021 (marked by a vertical dashed line on the graph). As with the numeracy data, this 2021 change is likely due to changes in the timing and content of the FSA tests. Again, the British Columbia Ministry of Education did not conduct test equating, so scores before and after 2021 are not directly comparable. The downward trends in literacy scores do not appear to take on a steeper slope after COVID than before, and so there is no evidence to support the hypothesis that measures taken during the COVID-19 pandemic (e.g., shifting from in-person schooling to online learning) accelerated declines in literacy achievement. As with the numeracy data, it does not appear that declines in mean FSA scores were more severe for Indigenous students or students with disabilities than for the general student population. However, there was a pre-pandemic decline in FSA literacy scores for both Indigenous students and students with disabilities. This decline was observed in both grades 4 and 7. Thus, while we cannot claim that pandemic-era policies and changes to schooling created greater learning losses for Indigenous students and students with disabilities, we note these students were experiencing more rapid declines in FSA scores before the pandemic than what was shown by the general student population. The findings from British Columbia are generally consistent with those from Ontario with small declines in literacy achievement and larger declines in mathematics achievement.

Table 9.1 Percentage of students meeting grade level expectations by subject in Alberta

	<i>English</i>	<i>French</i>	<i>Mathematics</i>	<i>Science</i>	<i>Social Studies</i>
<i>Grade 6</i>					
2019	83%	88%	73%	78%	76%
2022	76%	77%	64%	72%	68%
2023	76%	78%	65%	67%	66%
<i>Grade 9</i>					
2019	75%	83%	60%	75%	69%
2022	70%	74%	53%	68%	61%
2023	71%	76%	54%	66%	58%

### *Alberta*

Alberta conducts large-scale testing in grades 6 and 9 across the province. What distinguishes Alberta's testing program from other provinces is their inclusion of subject areas beyond literacy and mathematics. Alberta students write standardised tests in English language arts, French, mathematics, science, and social studies. Similar to Ontario, test scores are reported as the percentage of students who are meeting grade level expectations. As shown in [Table 9.1](#), the proportion of students who meet grade level expectations on Alberta's standardised tests is lower post-pandemic than pre-pandemic ([Alberta Ministry of Education, 2024](#)). This drop occurs across all subject areas and there is no evidence of learning recovery in the 2023 results when they are compared to the 2022 results.

### **Non-cognitive outcomes**

Data on non-cognitive outcomes are less abundant than academic achievement data, but they do exist. The [Ontario Public School Boards' Association \(2021\)](#) published a study of students' perceptions of online learning that included survey items related to mental health and resilience. While this study was limited to a single province, over 10,000 completed surveys were submitted by students in grades 6 to 12. This large sample allowed for comparisons between different demographic groups. The survey results showed that students struggled with peer interactions, especially when asynchronous models of teaching and learning were used, and that different groups had different reactions to online learning. In particular, East and South Asian students reported more positive attitudes and better learning experiences with online learning than Black, Caucasian, and Indigenous students. Gender differences were more nuanced as boys had a larger spread of responses than girls, and so a higher proportion of boys than girls reported that online learning worked very well for them, while at the same time, more boys than girls reported that online learning did not work at all well for them. The survey results also indicated that grade 5 and 6 students had more

positive attitudes towards online learning than grade 11 and 12 students. In total, only 18% of the respondents agreed that online learning resulted in improved learning for them. For non-cognitive skills and experiences, the data were even more worrying. Only 3% of respondents said that peer interactions worked well in online environments, while 5% said it was easy to maintain focus in online learning environments, and 5% said online learning environments worked well for developing their organisational skills. One qualitative survey item asked students to write in a text box what could be done to improve the quality of online learning, and the most common response (18% of respondents) was to abandon online learning entirely.

### **Education policy reforms**

Canada's provinces touted large increases in education spending during the pandemic. During the two years of the pandemic, total government spending on schools increased by 15.6% ([Statistics Canada, n.d.b](#)). However, because of population increases, the spending per student remained relatively constant during this time. Still, it is clear that most provincial ministries of education were aware that policies, resources, and actions were needed to address learning losses incurred during the pandemic. Policy reactions to address these learning losses were varied and reflect the decentralised nature of Canada's education systems. New policies, curricula, assessments, and resources were implemented in different manners and measures as Canadian students returned to in-person learning in their schools. In our description of the policy responses, we rely on the triarchic framework put forth by [Volante et al. \(2024\)](#) that positions academic resilience (and associated policies) as going beyond subject area learning and academic achievement to include students' mental health and physical well-being.

### ***Policies related to curriculum, pedagogy, and assessment***

One surprising finding from [Volante et al.'s \(2024\)](#) pan-Canadian study was that four provinces did not enact any new policies, assessments, or curricula to support students and educators as they emerged from the pandemic. Of the remaining six provinces, Volante et al. found that policies tended to focus on academic achievement and subject area learning with less emphasis on student mental and physical health. This focus manifested itself in several ways, one of which was the use of large-scale assessments. Provinces such as Alberta, British Columbia, and Ontario reinstated large-scale testing programs that had been suspended during the pandemic. Alongside the reinstatement of existing testing programs, there was the introduction of new, early screening tools in Alberta, Manitoba, Ontario, New Brunswick, and Nova Scotia. These tools focused on literacy in early schooling (kindergarten to grade 3). While these policy documents do not specifically state that the screening tools are in response to learning losses incurred during

the pandemic, the timing of their implementation suggests this is the case, as do comments included in press releases (e.g., [Ontario Ministry of Education, 2022](#)).

Another prominent policy response was the introduction of new resources to support student learning such as e-tutoring services. Free e-tutoring services were offered to students in Alberta, Ontario, and Quebec (these three provinces comprise over 70% of Canada's population) with a focus on mathematics and literacy. Other student supports included purchasing additional technology for students to use (Newfoundland and Labrador, Nova Scotia, Quebec, Yukon), hiring additional teachers or educational assistants (Newfoundland and Labrador, Nova Scotia), and summer learning programs (Ontario).

In post-pandemic policies, provinces placed increased emphasis on foundational skills – in particular, reading. This focus was evidenced not only by the implementation of large-scale testing programs mentioned above, but by the development of resources for teachers such as British Columbia's "Learning Pathways: A Guide for Teachers," Manitoba's "Framework for Learning," and Saskatchewan's "Interim Provincial Education Plan." These resources provided teachers with instructional strategies for teaching reading, and like Nova Scotia's "Six Pillars of Effective Reading Instruction," reflected a purported shift towards a more scientific approach to teaching reading.

#### ***Policies related to physical well-being***

Research on Canadian children's physical activity during the pandemic paint a dire picture. [Moore et al. \(2020\)](#) reported that only 5% of younger learners (ages 5 to 11 years) were getting their daily recommended amount of physical activity. For teenagers, the data were even worse, with fewer than 1% of Canadian teens getting their recommended amount of daily physical activity. Despite these troubling findings, only five of the ten Canadian provinces implemented policies aimed at improving students' physical health and well-being. Two of these policies were the introduction of a new physical education curricula in Alberta and Manitoba, while the others were non-binding guidelines and advice on how to promote physical activity and healthy eating in schools. As an example, Nova Scotia implemented a new physical activity framework in 2022 and created an online resource to support educators in promoting physical activity ([Nova Scotia Ministry of Education, 2022](#)). One outlier in this data set was Nunavut, which is a sparsely populated territory in the Arctic. Nunavut implemented an oral health program in which all children 13 and under could register for free dental care with their schools. It is the only Canadian jurisdiction with such a policy.

#### ***Policies related to mental health***

As with physical health, there is strong evidence that the pandemic negatively affected students' mental health ([Browne et al., 2021](#); [Cost et al., 2022](#)) and that

those effects remain in place post-pandemic (Park et al., 2024). Policy responses to mental health challenges were more robust than to physical health and well-being. Nine of the 10 provinces and all 3 territories implemented mental health policies and supports, with Canada's least populous province (Prince Edward Island) being the outlier. As expected, these policies varied across jurisdictions. Four provinces (Alberta, Manitoba, Ontario, and Saskatchewan) mandated mental health training for all teachers, while British Columbia continued with online mental health initiatives implemented during the pandemic. Both British Columbia and New Brunswick created partnerships between the ministries of education and the ministries of health to provide support in schools such as addiction counselling and trauma-informed practice.

Nunavut's education system has a strong focus on fostering and advancing Indigenous culture and language. Thus, teachers in Nunavut were encouraged to use Inuit principles of community and support in their teaching as outlined in policy documents created before the pandemic (Nunavut Department of Education, 2007). Both Manitoba and Saskatchewan linked mental health issues to reduced attendance in schools and so created action plans to promote attendance. Ontario took a different approach and offered recognition that student absences may be a part of students prioritising their mental health and self-care.

### **Impact analysis of policy interventions**

Both international and provincial level data show that pandemic-initiated changes in Canada's schools led to learning losses. This is observed across age groups, demographic groups, and subject areas. What is less clear is whether policies enacted since the pandemic have been effective in helping to ameliorate the deficits in student learning caused by COVID. Measuring the impacts of educational policies is also complicated by numerous other social policies and factors that are in place. As an example, the number of children living in low-income households decreased during COVID, likely due to government payments during COVID. Post-pandemic, these payments have stopped, and the number of students living in low-income households has increased by 56% (Statistics Canada, n.d.c). There are no previous examples in Canadian history of large numbers of households being temporarily lifted out of poverty through government payments and then dropped back into poverty less than two years later. Thus, it is impossible to know if the massive increase in children in low-income households since 2020 had a negative impact on student learning, mental health, and physical well-being, or if these negative impacts were already in place because of their experiences in low-income households before the pandemic.

The complex nature of evaluating policy implementations is evident in other areas as well. For instance, there was no change in high school graduation rates during the pandemic (Statistics Canada, n.d.d). While this could indicate that learning losses during the pandemic were not severe for students in their last two

years of schooling, there is other evidence that suggests that drawing such a conclusion is premature. As mentioned earlier, most provinces halted standardised testing programs during the pandemic – including tests needed for graduation. Because these tests can serve as gatekeepers, it is possible that some students who may not have graduated due to poor performance on standardised tests were able to graduate in the absence of such tests. Alongside the cancellation of standardised testing, some provinces (e.g., Ontario) instituted directives in 2020 in which students were not allowed to fail a course if their previous grades were above a passing standard. Thus, students who were passing the early parts of a course were not allowed to fail the entire course – regardless of their performance in later parts of the course. Assessment and policy changes were accompanied by concerns of grade inflation during COVID (Crawley, 2023)<sup>1</sup>, which were also observed in other countries due to the pandemic (see OECD, 2023). Grade inflation could have some benefits, as learning losses may not have been accompanied by other negative consequences, such as failure of a course, lower report card grades, not graduating, and reduced post-secondary opportunities. However, grade inflation can also mask genuine problems with learning and academic achievement and give students and parents an inaccurate impression of a student’s ability to meet curriculum expectations. Longitudinal studies of post-secondary student cohorts, whose secondary education was disrupted by COVID, may reveal the extent to which grade inflation has impacted their current studies.

The evidence presented here suggests that students with special educational needs and Indigenous students did not experience greater learning losses than the general student population. We offer this conclusion with some caution, as our Indigenous data came from a single province, and the special educational needs data comes from only two provinces. As noted earlier in the chapter, finding high-quality, empirical data related to Indigenous or other racialised student groups and students with special educational needs can be challenging. The absence of evidence that Indigenous students and students with special educational needs were not unduly affected by pandemic era policies runs counter to the sentiments expressed by special education advocates (e.g., Lawrence et al., 2020; Whitley et al., 2021) but without higher quality data that includes all provinces, we are hesitant to state that our findings in two or three provinces can be extrapolated to the entire country.

## **Conclusion**

Canada’s schoolchildren, like those in many other countries, suffered learning losses during the pandemic. Empirical results demonstrate that post-pandemic policies such as the reinstatement of testing programs, free tutoring services, and curriculum changes have not yet led to a significant learning recovery. Results from both PISA tests and large-scale provincial testing programs show

that current achievement levels are still well below pre-pandemic levels. We did not find consistent evidence that immigrant students, Indigenous students, or students with special educational needs suffered greater learning losses than the general student population, but there is also no evidence that achievement gaps have closed. It appears the drastic changes in schooling brought about by the COVID-19 pandemic were not unduly harmful to historically disadvantaged students, nor were they leveraged to close learning gaps. The persistent, post-pandemic lower achievement (as measured by large-scale assessments) is a clear source of concern. Are these long-lasting effects due only to learning losses incurred during the pandemic, or has the pandemic created systemic changes that have led to lower quality learning (e.g., lower academic standards)? We have offered some areas of future inquiry to help address these queries, which is an ongoing topic of vital concern for policymakers across Canada.

## Note

- 1 Pandemic related grade inflation concerns are not unique to Canada. <https://www.act.org/content/dam/act/unsecured/documents/2022/R2134-Grade-Inflation-Continues-to-Grow-in-the-Past-Decade-Final-Accessible.pdf>

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# 10 Academic resilience and policy reform in Japan

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## **Introduction**

This chapter examines how Japan addressed the impact of the COVID-19 pandemic on its education system, focusing on both immediate responses and long-term implications. It begins by outlining Japan's centralised education system, with its standardised curriculum and governance under the Ministry of Education (MOE), and how this structure shaped the nation's response to the pandemic. Drawing on international and national assessments, such as the Programme for International Student Assessment (PISA) and Japan's national assessment, the chapter highlights that overall learning loss was minimal, though cross-sectional data provide limited insights into regional and demographic variations. To address these gaps, findings from panel data studies are presented, revealing more nuanced impacts, including regional disparities and differences among student attributes. The chapter also explores the policy measures introduced during the pandemic, which, rather than focusing solely on mitigating learning loss, aimed to leverage the crisis to advance digital education through initiatives like the accelerated GIGA School Initiative. Finally, using a year fixed-effects regression analysis at the prefectural level, the chapter evaluates the effectiveness of these digitalisation-focused policies, offering a comprehensive understanding of how Japan's education system adapted to the challenges of the pandemic.

## ***Overview of Japan's school system***

After the defeat in World War, Japan's education was reorganised to follow the American style to some extent. The K-12 consists of six-three-three; six years of elementary school, three years of junior high school, and three years of high school. Only elementary and junior high schools are mandatory. Whether public or private, all schools must comply with the School Education Act. Schools that are defined in Article 1 of the School Education Act are called Article 1 schools, whereas other kinds of schools (typically, international schools) are called non-Article 1 schools. The School Education Act stipulates categories

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of schools, who can establish different kinds of schools, goals of education at each level, etc. Article 1: Schools must use textbooks authorised by the MOE and provide classes that satisfy the national curriculum. It stipulates themes, topics, and content that students must learn. The curriculum is supposed to be a minimum standard, and schools may choose to teach content more advanced than that. Since it has a legally binding power, the educational contents provided by schools are standardised, and the quality of student learning is somewhat controlled.

While principals have enjoyed greater autonomy in recent years, schools remain a part of a horizontal, bureaucratic structure, with the MOE at the top. The MOE covers one-third of the payment to teachers in public elementary and junior high schools (while local governments supply the rest). Besides the financial power, the MOE can exercise legal power over Boards of Education through ‘instruction.’ Boards of Education, on the other hand, manage human resources. In other words, they have the power to decide which teacher is to be placed in each school. In short, the hierarchical structure, running from the MOE through Boards of Education to schools, helps to maintain the minimum standard of Japan’s education, while limiting the autonomy of local actors, particularly schools. Additionally, in order to become full-time teachers in public schools, university graduates must first complete certain credits, train as student teachers, and complete qualifying exams. As of 2024, value-added payment systems are not in place. No attempt to link teacher salary with student performance has been successful or welcomed.

### ***Response to the pandemic***

Even in coping with the COVID-19 pandemic, this centralised structure shaped how the government and schools responded to the crisis. The MOE promptly provided policies and guidelines on how to deal with the pandemic, which schools followed in a rather uniform way. On 28 January 2020, the government of Japan classified COVID-19 as a designated infectious disease, which requires specific medical treatments, epidemiological investigation, and outbreak control. As the number of infected steadily increased, the government closed elementary, junior high, and high schools across the nation from March 2. This was initiated by then Prime Minister Abe, rather than the MOE, which expected schools to remain open. The impact of this school closure was likely to be relatively small because it coincided with spring break.

Following the school closures, as the crisis deepened, a state of emergency was declared in April, continuing until May. While schools began to open in June, many schools, particularly in major cities, took measures to shorten in-class hours to reduce contact between students. In addition, there were many schools that divided classes into two groups and introduced staggered hours for

attendance. Meanwhile, in less impacted regions, schools returned to normal with a regular attendance of students, commonly earlier than June.

The data gathered for the PISA by the Organisation for Economic Co-operation and Development (OECD) correspond to the description above. The average period of school closure was 1.7 months (OECD, 2023b). The mode for the period of closure falls in the category of “more than 1 month and up to three months,” constituting 35.8% (OECD, 2023b). Surprisingly, as many as 28.7% answered that there was no closure for more than a week (OECD, 2023b). It is possible that schools in rural areas or well-equipped private schools remained open throughout the pandemic.

In July and August, schools replaced parts of their summer break with additional classes to make up for the delay in covering the contents stipulated in the national curriculum. By the beginning of the second semester in September, most schools had succeeded in catching up and returned to normal. The number of daily infected cases began to resurge around November, followed by the declaration of the state of emergency in January 2021. Despite that, schools did not close this time. Throughout the period of the pandemic up until 2025, schools were never ordered again to shut down.

### ***Recovery policies***

The case of Japan may be characterised by the lack of explicit recovery policies, for better or worse. As described earlier, the school closure period was relatively short for most of the schools. Hence, the MOE did not problematise the learning loss. To some extent, it is true that students did not suffer from learning loss. The results of national and international assessments provide some evidence (as shown later). However, it is important to note that these data focus mainly on cognitive outcomes.

While learning loss did not serve as a major policy issue, the pandemic led to the government’s awareness of Japan’s delay in the digitisation of education and its risk of widening disparities in student learning. For example, some public schools had been implementing online education even before the pandemic, and some private schools were able to purchase devices necessary for online education right after the temporary closure. On the other hand, most of the public elementary and junior high schools relied mainly on physical materials, resulting in a gap between public and private schools, as well as among public schools.

To address this gap, the MOE announced the acceleration of the Global and Innovation Gateway for All (hereinafter, GIGA) School Initiative, to complete the distribution of PC/Tablet devices to all elementary and junior high school students by March 2021. The original timeline of the initiative was to complete this distribution within four years, starting from the fiscal year 2020.

In 2023, the MOE issued the plan for post-COVID-19 education. This consists of three pillars: Digitisation, paying attention to each individual, and

strengthening the cooperation between schools and communities. At the same time, it emphasises the student's well-being and the negative impact of the pandemic on it. As addressed in the policies, it is crucial to deal with learning in both cognitive and non-cognitive aspects. In this chapter, I analyse how recovery policies addressed problems in student learning and identify the effectiveness of those policies.

## **National administrative data**

### *Overview of the results in international and national assessments*

What has been the impact of the pandemic on students in Japan? Both the international and national assessments show that Japan's education system has been resilient to the negative impact of the pandemic (e.g., [OECD, 2023a](#)). While both data are cross-sectional, the performance patterns help trace the long-term impact. Below, I draw on the results of the PISA and the National Assessment of Educational Progress and Learning (hereinafter, national assessment). PISA surveys 15-year-olds every three years in math, science, and literacy. It utilises the two-stage stratified sampling method so that the data represent the population. While it is based on cross-sectional observations, it is designed according to Item Response Theory (IRT) to facilitate comparison across years. In the case of Japan, the performance trend is flat ([National Institute for Educational Policy Research \[NIER\], 2023](#)). Between 2015 and 2022, three surveys were conducted in 2015, 2018, and 2022 (one year delayed due to the pandemic). Math scores demonstrated no significant changes through this period (NIER, 2023). For science and literacy, scores in 2015 and 2022 showed no significant differences, although those in 2018 were statistically lower than in 2022 ([NIER, 2023](#)). This result is impressive, given that the OECD average showed the downward trend over the same period ([NIER, 2023](#)). In fact, the OECD report identified Japan as one of the four resilient education systems, based on test scores, sense of belonging to schools, and small impact of economic, social, and cultural status ([OECD, 2023a](#)).

While the national assessment is administered to sixth graders in elementary schools and third graders in junior high schools, the result of the national assessment conforms to that of the PISA, with the focus on 15-year-olds. Japan's national assessment is constructed to examine if students have mastered themes and topics registered in the national curriculum and, in that sense, differs from typical assessments such as the PISA, measuring universal student competencies ([Kawaguchi, 2018](#)). Test questions change every year, and themes and topics are revised when the national curriculum is updated. Yet, the assessment contains questions that do not change over time. Those questions are designed following the IRT to enable comparison over time. The limitation is, however, that those questions are not included in the assessment every year, but only in 2016 and

2021. According to the NIER (2022, p. 9), there was no statistically significant difference in language between the two data points, with a slight increase observed in math. Unlike the PISA, the national assessment does not collect data on SES. Kawaguchi et al. (2019) and Asakawa et al. (2024) collaborated with the Boards of Education and succeeded in matching the assessment data with other kinds of surveys, allowing them to analyse the relationship between SES and student performance. Not surprisingly, a gap by SES does exist and widens across grades (Asakawa et al., 2024; Kawaguchi et al., 2019). However, their studies are limited in the sense that they only used regional data, not the nationwide administrative data. In addition, it is important to note that only 30–40% of private schools participate in the national assessment.

### *Analyses utilising panel data*

In Japan, access to the administrative data is restricted. Even with permission, the data do not contain important information such as households' SES. By working closely with the Boards of Education, however, a few studies succeeded in analysing the panel data and identifying the impact of the pandemic. These studies provide mixed results. Asakawa and Ohtake (2022) analysed the data of students from grades 4 to 6 of elementary schools in Nara City. Using the score at the previous semester before the school closure as a benchmark, they traced the change in math scores at four data points: (i) during school closure, (ii) 3, (iii) 7, and (iv) ten months after the closure. They used grade 6 students as of 2019 who did not experience school closure as a control group. Students experienced a 0.14 SD decrease during the closure, and recovered by 0.08 SD decrease after three months in July. After that, however, students overcame the learning loss, obtaining a 0.26 SD increase after seven months in December, and a 0.30 SD increase after ten months in March 2021 in comparison to the control group. In Nara City, therefore, the learning loss only persisted for a few months after the school closure, and a long-term impact was not observed.

Contrary to the result above, the study by Asakawa et al. (2024) implies the negative COVID impact persisted and indeed worsened over time. They used the data on performance tests and household surveys in collaboration with the Board of Education in Amagasaki City. Students from the first to eighth years in public elementary and junior high schools took the tests in math and Japanese language. They aimed to identify the negative impact of the school closure in both mid-term (seven months after the closure) and long-term (19 months). For the mid-term impact, they compared the change in growth between two periods without and with the closure, 2018–2019 and 2019–2020. To determine the long-term impact, they compared the changes for two years. This way, both the control and treatment groups contain the closure. By removing the effect estimated in the analysis of the mid-term impact, however, they traced how the closure affected students in the long run. For math, students experienced a 0.13 SD

decrease after seven months and a 0.25 SD decrease after 19 months. For language, no effect was identified after seven months, and a 0.11 SD decrease after 19 months. In other words, students faced worsening learning losses as time progressed after the closure.

In the study above, the researchers attempted to unpack differentials in impact by attribute, such as grade, quartile in performance, SES, and gender. SES and gender were not significant factors (Asakawa et al., 2024). There was also no difference in performance patterns in math scores by grade (Asakawa et al., 2024). For language, however, more negative impacts were observed for lower graders (Asakawa et al., 2024). By quartile, students in lower quartiles had more negative impacts for both math and language (Asakawa et al., 2024).

These studies tell two contrasting stories. On one hand, students lost as much as 0.25 SD in math scores after 19 months. On the other hand, students' achievement recovered as early as seven months after the closure, marking a 0.26 SD increase in comparison to the control group. Across Japan, it is possible that schools in some cities were able to combat against learning losses in a relatively short period, whereas others failed to do so and faced persisting and worsening learning losses. The studies do not explain why such differences exist. The quality of teachers might make a difference. The SES of households in the area could also play a key role. Combining all these different scenarios, what the international and national assessment results imply is that overall, there is no significant learning loss at the national level.

### ***The pandemic and non-cognitive outcomes in Japan***

Non-cognitive skills are often contrasted with cognitive skills and refer to the personal attributes not typically captured by IQ or achievement tests (Kautz et al., 2014, p. 13). These encompass a wide range of traits and characteristics, including personality dimensions like the Big Five (openness, conscientiousness, extraversion, agreeableness, and neuroticism), grit, resilience, and other socio-emotional skills (Rammstedt et al., 2024). Despite the growing recognition of their importance in shaping academic, social, and economic outcomes, research on the impact of the COVID-19 pandemic on non-cognitive outcomes among students in Japan remains limited, partly because of the limitations of available data. Existing studies provide a fragmented understanding, focusing on areas such as students' sense of social connectedness, willingness to study, mental health outcomes like suicide rates, and incidents of school bullying, which I summarise below. Despite the limited scope, these studies offer valuable insights into how the pandemic has affected various aspects of student well-being and behaviour, highlighting the need for a more comprehensive exploration of non-cognitive dimensions in the Japanese educational context.

The first group of studies focuses on the impact of the COVID-19 pandemic on children's social relationships. Moriguchi et al. (2020) conducted an online

survey with 425 parents of children aged four–nine years during the state of emergency in 2020, followed by a second survey six months later. Parents were asked to assess changes in their children’s socio-emotional behaviour and perceived psychological distance in two key relationships: between parents and their children, and between their children and friends. The findings revealed that during the state of emergency, psychological distance between parents and their children decreased, reflecting closer relationships. Conversely, the psychological distance between children and their friends increased, indicating a sense of social isolation caused by the school closure. Six months later, as schools reopened and daily routines began to normalise, these changes reversed – parent–child proximity decreased while peer relationships began to recover.

Using the same data, supplemented by an additional follow-up survey conducted nine months after schools reopened, [Hagihara et al. \(2022\)](#) explored these dynamics further. They examined both socio-emotional behaviour and perceived proximity over time. As measures for socio-emotional behaviour, the authors used the questionnaire, including the five categories: Peer problems, prosocial behaviour, conduct problems, emotional symptoms, and hyperactivity. For perceived proximity, children were asked how close they felt to others. Their analysis showed no significant changes in children’s socio-emotional behaviour across the three survey periods, suggesting that the school closures did not have a lasting impact on this aspect. In terms of perceived proximity, the significant shifts observed between the first and second surveys diminished by the third survey (four months after the second), indicating that the initial disruptions in social relationships were mitigated as time passed. These findings suggest that while the school closure during the pandemic may have temporarily disrupted children’s social relationships, these effects were transient, with recovery occurring over time. Furthermore, the studies indicate that the closure had a more pronounced impact on the dynamics of social connections than on socio-emotional behaviour itself.

A second area of focus is the impact of the COVID-19 pandemic on student attitudes toward proactive learning, specifically in mathematics. As mentioned earlier, [Asakawa and Ohtake \(2022\)](#) conducted a detailed analysis using a matched dataset from Nara City to examine changes in these attitudes. They evaluated students’ responses to ten questions related to their feelings about math, such as whether they like the subject, ask questions in math classes, and so on. Their findings revealed a mixed picture: while student attitudes toward math showed some improvement six months after the closure, 20–30% of students were still negatively affected. This suggests that, unlike test scores, the pandemic’s negative effects on students’ attitudes toward proactive learning in math persisted for a longer period. Additionally, their sub-sample analysis uncovered an important relationship between living conditions and students’ attitudes, particularly for those in the lower performance quantiles. Students with lower math achievement were more significantly influenced by their living conditions,

which affected their non-cognitive aspects, particularly their attitudes toward learning math.

Third, youth suicide is a grave issue that, while not directly related to non-cognitive skills, could reflect the severe impact of the pandemic on students' mental health. Since the onset of COVID-19 in 2020, the number of suicides among schoolchildren in Japan has reached alarming levels, with record highs reported in 2020 (499 cases) and 2022 (514 cases) (Kibi, 2024). The figure remained similarly high in 2023, with 513 reported cases (Kibi, 2024). Given the declining population of children in Japan, this upward trend in youth suicide is particularly concerning and serves as a warning sign of deeper systemic issues.

Takaku et al. (2024) shed light on one potential factor contributing to this rise: the cancellation of school excursions, a traditional and highly anticipated activity for many students. Their study found that this cancellation significantly increased the risk of depressive symptoms among schoolchildren. Through the subsample analysis, they identified that girls and children without extracurricular activities were disproportionately affected by the cancellation of school excursions. While schools prioritised academic recovery measures to mitigate learning loss (as detailed later), such efforts inadvertently led to the erosion of social interactions, ultimately harming students' mental well-being.

While school bullying is as critical an issue as youth suicide, there is a noticeable gap in research systematically analysing its relationship with the COVID-19 pandemic in Japan. In the context of Canada, Vaillancourt et al. (2021) reported that the rate of bullying decreased during the pandemic, likely due to reduced in-person interactions. However, in Japan, the number of reported school bullying cases has been steadily increasing since 2020, reaching a record high of over 730,000 cases in 2023 (Fujii, 2024). This rising trend is alarming, especially since bullying is recognised as a significant risk factor for youth suicide (Fujikawa et al., 2016). The lack of research addressing how pandemic-related experiences, such as school closures or social distancing measures (e.g., wearing masks), may have contributed to deviant behaviours like bullying highlights an urgent area for future investigation. It is crucial to understand the mechanisms through which these behaviours emerge or intensify in the post-pandemic context to develop effective interventions. Without systematic studies exploring bullying as an outcome of the pandemic in Japan, this issue remains an open question that demands further academic attention and policy focus.

Research on the impact of the COVID-19 pandemic on students' non-cognitive outcomes remains limited, with most studies offering fragmented insights rather than comprehensive analyses. Nonetheless, existing evidence suggests that the pandemic's effects on non-cognitive aspects, such as mental health and social behaviour, are not negligible and just as complex as its impact on cognitive outcomes. For instance, youth suicide rates among schoolchildren reached a record high in 2020 and remained elevated in subsequent years. Similarly, cases of school bullying have steadily increased since

2020, highlighting the pandemic's disruptive influence on social dynamics. These concerning trends call for systematic research to better understand how the pandemic has shaped these outcomes, particularly in relation to the social and educational environment. Additionally, there is a pressing need to explore the differential impact of socioeconomic disparities, as students from disadvantaged backgrounds may face heightened challenges in coping with the pandemic's effects, further exacerbating inequities in non-cognitive development.

## **Education policy reforms**

### ***Digital learning models in the post-COVID era***

The COVID-19 pandemic and subsequent school closure revealed the digital divide in schools. Under the closure, some schools smoothly transitioned to online education, whereas many (particularly public) schools struggled to provide education. In some instances, teachers carried and distributed printed handouts to each household. Since July 2020, a government council with the focus on education, called the Council for Implementing Education Rebuilding (CIER), began discussing policy ideas for the post-COVID education. In June 2021, the Council issued a white paper titled, "About the New Mode of Learning in the Post-COVID Era" (CIER, 2021). This report consists of four chapters. The first shows measures for primary and secondary education, while the second focuses on higher education. In the third chapter, it discusses how to strengthen the collaboration between schools and communities. In the fourth chapter, it envisions the data-driven education and presents the necessary measures to achieve it. Due to the disparity in ICT utilisation, the report emphasises how to address it through the support of internet fees (CIER, 2021, p. 6). At the same time, it proposes to enrich ICT environments (CIER, 2021, pp. 3–12) and improve teachers' skills in digital education (CIER, 2021, pp. 13–17) so that they can continue to offer education even when the pandemic worsens.

This policy aligns well with the ongoing reform called the GIGA school policy. The GIGA School Policy is a transformative education initiative by the Japanese government aiming to integrate ICT (Information and Communication Technology) into schools and to ensure equal access to quality education. Launched in 2019 and accelerated during the COVID-19 pandemic, the policy provides each elementary and junior high school student with a personal digital device and equips schools with high-speed internet infrastructure. This initiative seeks to bridge the digital divide, promote personalised learning, and foster digital literacy, enabling students to thrive in the 21st-century knowledge economy. Additional efforts include creating digital learning content, training teachers to use ICT tools effectively, and implementing strong privacy and cybersecurity measures.

The GIGA School Policy aligns with Japan's vision of Society 5.0, aiming to nurture global-minded and tech-savvy individuals. While it succeeded in expanding digital access, challenges remain, including disparities in home internet access, teacher preparedness, and the long-term sustainability of devices and infrastructure. Despite these hurdles, the policy marks a significant step in modernising Japan's education system, fostering creativity, problem-solving, and adaptability among students, and ensuring the system can better respond to emergencies like pandemics or natural disasters.

In other words, the policy promoting new learning models in the post-COVID era builds on the GIGA school initiative and aims to expand its impact. While it may be too soon to criticise the adoption of this policy, given the unprecedented challenges faced by policymakers, its effectiveness depended on how frequently school closures occurred. In reality, schools closed only once in 2020 and have remained open since. As the policy was designed primarily to enhance digital education and prepare for potential future closures, it might not now be particularly effective in addressing the learning loss caused by the 2020 school closure.

#### ***Grassroots efforts: Individual schools and boards of education***

Instead of being a groundbreaking educational reform, more promising efforts came from individual schools and/or Boards of Education. According to the survey by the MOE (MEXT, 2020, p. 5), public junior high schools took (or were planning to take when asked) the following measures after resuming: re-considering events (95%), shortening summer/winter breaks (94%), utilising ICT (68%), focusing on key topics in classes (68%), reorganising the time table (55%), implementing remedial education (23%), opening classes on Saturdays (17%), and reorganising school curriculum for the upcoming year (12%). Possibly, policymakers were well aware of these grassroots efforts and tackled the areas where schools were not yet able to touch upon.

However, it is difficult to estimate the impact of these efforts because most of the schools implemented one of these efforts, but they did not record precisely what measures they took and how much they did for each. Bessho et al. (2019) estimated the impact of remedial education using an instrumental variable. According to their analysis, remedial education indeed had positive effects (0.13 SD) on Japanese language test scores (no statistically significant effect on math scores). Oikawa et al. (2022) analysed the impact of class closures not because of COVID-19 but of influenza epidemics in the past. They found that the negative impact of the closures was not significant after two years in City X and pointed out that remedial education offered in City X may have mitigated the negative impact of the closures. While these studies have accumulated evidence of the effectiveness of grassroots efforts, no studies have been conducted to ascertain the effectiveness during the COVID-19 pandemic, mainly because of the lack of data.

### ***Focusing on student well-being***

The post-COVID-19 learning models, as outlined in the council's white paper, place a strong emphasis on student well-being, marking a significant shift in Japan's educational priorities. Historically, well-being has often been overlooked in schools and educational policy (CIER, 2021, pp. 1–2). The white paper acknowledges this neglect and advocates for the need to include the holistic development of students with a focus on well-being. This was further reinforced in the MOE's Fourth Basic Plan for Education, introduced in 2023, which explicitly highlights well-being as a central goal of educational reforms (MEXT, 2023).

In alignment with this policy shift, a few questions related to well-being were added to the national survey on students. Although the survey's scope remains limited and does not yet capture the comprehensive nature of student well-being, this inclusion represents a promising step forward. By beginning to collect data on well-being, the education system is laying the groundwork for evidence-based policies that address broader aspects of student development. At the same time, this will help researchers examine the pandemic's impact on students' non-cognitive aspects. The report issued using these data signals an important recognition of the need to systematically monitor and evaluate student well-being, paving the way for future studies and policy initiatives (Uchida & Okuda, 2024). However, more comprehensive efforts will be required to fully understand and address the diverse factors that contribute to student well-being in schools.

## **Impact analysis of policy interventions**

### ***Impact of the digital education policy on student learning***

In this section, I examine the impact of ICT-related policies on student learning outcomes, particularly focusing on their influence on test scores. While the previous section explored the broader context of educational interventions and argued that ICT-related policies may not be as effective as other measures, such as remedial education, this section narrows the focus due to the limitations of available data. Specifically, I analyse the impact of ICT policies using longitudinal data at the prefectural level.

To carry out this analysis, I employed a fixed-effects regression model, which accounts for unobserved, time-invariant characteristics within prefectures that could influence educational outcomes. This method ensures that the estimated impact of ICT policies is not confounded by factors such as socioeconomic conditions, cultural differences, or historical variations across prefectures that remain constant over time. By focusing on changes within each prefecture, the analysis isolates the effect of ICT-related policies on test scores.

The analysis builds on the methodology of Fukai (2021), who examined the broader relationship between ICT-related educational policies and student

performance. However, I introduce several modifications to adapt the analysis to the specific context of junior high school students. These modifications include adjustments to the set of control variables, reflecting the unique characteristics of this student population, and a targeted focus on junior high school test scores as the primary outcome of interest. By concentrating on prefectural-level data and employing a rigorous fixed-effects approach, this section aims to explore the effectiveness of ICT initiatives in improving student learning outcomes.

***Methods: Analysis plan, datasets, and variables***

In Japan, national assessments of Japanese language and mathematics are conducted annually for sixth-grade elementary school students and third-grade junior high school students. Prefectural averages of these test scores are publicly available, providing a consistent measure of student academic performance. In this study, the test scores in mathematics and Japanese language serve as the primary dependent variables, while the key independent variables include ICT-related metrics, such as the number of devices per student and technology adoption in schools.

To address potential year-specific influences—such as changes in test difficulty or national policy shifts—the model includes year fixed effects. This approach controls for variations common across all prefectures over time, allowing the analysis to focus on within-prefecture changes. By combining ICT-related variables with detailed controls and fixed effects, this study aims to assess the impact of ICT policies on student learning outcomes while accounting for broader contextual factors.

To analyse the role of ICT in education, I incorporated three key variables derived from national surveys that align with the goals of Japan's GIGA School Policy. The first variable is the number of students per computer, which reflects the policy's primary objective of achieving a one-to-one ratio between students and devices. This indicator is central to understanding the policy's implementation and its direct impact on accessibility. The second variable is the percentage of teachers participating in ICT training programs designed to integrate technology into classroom teaching. This metric captures the effort to equip educators with the skills needed to effectively use ICT tools in their pedagogy. The third variable is the proportion of teachers expressing confidence in their ability to use ICT in teaching. This measure reflects a critical aspect of teacher readiness and aligns with the policy recommendations from the council to deepen the impact of the GIGA School Policy by enhancing teacher engagement with technology. While Fukai's (2021) study examined similar indicators using data available up to 2018, this analysis extends the dataset to cover the period up to 2022, allowing for a more comprehensive assessment of recent policy impacts.

In terms of control variables, I accounted for several factors at the prefectural, household, and school levels. Prefectural controls included government

spending and spending on education, both expressed in logarithmic form to account for skewed distributions and better reflect proportional differences. Household-level controls included the average income of households in each prefecture, also logged for consistency. At the school level, I included the number of staff and the number of schools in each prefecture as proxies for educational resources. While these school-level controls contribute less explanatory power compared to other variables, they are included to address data availability limitations and ensure the model captures at least some aspects of school resource allocation. Despite these constraints, this framework provides a robust foundation for analysing the relationships between ICT integration, teacher readiness, and student outcomes.

### ***Results: Impact of the digital education policies***

The findings from the year-fixed effects regression model provide important insights into the relationship between ICT-related variables and student test scores. Initially, when the year-fixed effects were excluded, the number of students per device appeared to be a significant predictor of test scores ( $\alpha = .05$ ). However, once year-fixed effects were incorporated into the model to account for year-level variations such as test difficulty or other external factors, this variable lost its statistical significance for both Japanese language and math scores. This change indicates that the observed initial significance may have been driven by year-specific effects rather than a direct impact of the ICT policy.

Additionally, the analysis shows that the rate of teachers participating in ICT training is not a significant predictor of student performance in either subject. Interestingly, while teachers' confidence in using ICT does show a statistically significant relationship with Japanese language scores, the coefficient is negative, suggesting an unexpected association where higher confidence is correlated with lower scores. Taken together, these findings raise questions about the effectiveness of the GIGA school policy and subsequent council recommendations in improving student learning outcomes, at least as measured by test scores. These results suggest that other factors beyond ICT infrastructure and teacher training may play a more critical role in driving academic performance.

This analysis presents findings that differ from those of Fukai (2021), who highlighted the significant impact of ICT-related variables on student learning outcomes. The discrepancy may be attributed to differences in scope and methodology: Fukai's study combined data from both elementary and junior high school students and was limited to data up to 2018. While direct comparisons are challenging, this analysis casts doubt on the effectiveness of ICT policies, particularly considering that nation-wide school closures occurred only once in 2020. The results raise questions about whether the ICT initiatives were effective in addressing the impacts of school closures (Table 10.1).

Table 10.1 Results of year fixed-effects regression models

	<i>Language</i>	<i>Math</i>
# of students per device	-0.06 (0.09)	0.39 (0.53)
ICT training	0.00 (0.01)	-0.03 (0.03)
Teacher confidence in ICT	-0.05* (0.02)	-0.05 (0.04)
# of school staff	-0.00 (0.00)	-0.00 (0.00)
# of schools	-0.00 (0.00)	0.00 (0.02)
Log (Total spending)	-0.21 (0.28)	1.51 (1.20)
Log (Spending on education)	0.00 (0.46)	-2.39 (2.48)
Log (Average household income)	5.85* (2.18)	1.14 (8.97)
Pref. FE	Yes	Yes
Year FE	Yes	Yes
R-squared	0.42	0.67
Obs.	422	422

Note: \* $p < 0.05$ .

This analysis has three key limitations that should be addressed in future research. First, it does not include the software dimension of ICT, such as the use of digital blackboards or textbooks, due to data limitations. Second, it overlooks variations in the duration of school closures at the prefectural level. While the nation-wide closure happened only in 2020, localised closures at the school or classroom level occurred throughout the post-COVID era and are not accounted for in this study. Third, the analysis was conducted at the prefectural level, which makes it unable to capture school-level differences. Addressing these limitations will require future studies to collect school-level data and incorporate a wider range of factors to provide a more comprehensive understanding of the impact of ICT policies on student learning.

## Conclusion

This chapter explored the impact of the COVID-19 pandemic on Japan's education system, highlighting both its successes and shortcomings. Leveraging its centralised governance, Japan effectively responded to the crisis by keeping schools open, which played a crucial role in minimising learning loss at the national level. However, a deeper examination of the data reveals a more complex narrative. While the government implemented top-down ICT policies, such as the GIGA School Initiative, these measures had limited effectiveness in improving student learning outcomes. Instead, grassroots efforts, such as adjusting school schedules by shortening events or offering remedial education, appear to have played a more significant role in addressing learning loss. Yet these measures were not uniformly applied across regions, leading to persistent learning disparities in certain areas. Moreover, the non-cognitive effects of the pandemic remain underexplored due to a lack of systematic data. Existing

fragmented studies suggest that the pandemic's impact on non-cognitive outcomes, such as mental health and social behaviours, is more enduring than its effect on cognitive performance, with vulnerable groups of students disproportionately affected. These findings underscore the need for future research to better understand the long-term, multifaceted consequences of the pandemic on student learning.

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## **Part III**

# **Future directions in policy and practice for a post-pandemic world**



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# 11 Evaluating the long-term efficacy of policy reforms in the aftermath of the pandemic<sup>1</sup>

*Maxime François and Kristof De Witte*

## Introduction

The COVID-19 pandemic has profoundly disrupted education systems worldwide, leading to unprecedented challenges and long-lasting impacts. As schools closed their doors to prevent the spread of the virus, millions of students were thrust into remote learning environments, often ill-equipped to support their educational needs (De Witte & François, 2023). As earlier chapters in this book illustrated, this abrupt shift not only affected academic performance but also had significant socio-emotional repercussions, particularly for disadvantaged students (Mazrekaj & De Witte, 2023). The immediate effects of these disruptions have been well-documented, revealing substantial learning losses and widening educational inequalities.

However, as we move beyond the immediate crisis, it becomes crucial to evaluate the long-term efficacy of the policy reforms implemented in response to the pandemic. Measuring the long-term impact of policy interventions implemented in response to the COVID-19 pandemic is crucial from both academic and policy perspectives. Academically, it provides a comprehensive understanding of how these interventions have shaped educational outcomes over time, allowing researchers to identify patterns and causal relationships. This is particularly important as the complexity of educational systems implies that numerous confounding factors are influencing the outcomes, making it increasingly difficult to isolate the effects of specific policies as time progresses. From a policy perspective, understanding these long-term impacts is essential for developing strategies that can effectively address the consequences of the

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pandemic on education. Moreover, these interventions often involve significant financial investments (De Witte & Smet, 2021), and understanding their long-term efficacy is essential to justify these costs and ensure that resources are allocated effectively. Evaluating long-term impacts also aligns with the principles of evidence-informed or evidence-based education, which emphasise the use of rigorous data and research to guide policy decisions.

Furthermore, the insights gained from these evaluations can inform future responses to similar crises. The lessons learned can also enhance the resilience and adaptability of education systems to various disruptions. This knowledge is not only applicable to pandemic preparedness but also to broader educational policy, helping to address ongoing challenges such as educational inequality and the integration of technology in learning. By systematically assessing the long-term outcomes of current interventions, policymakers can develop more effective strategies that are grounded in empirical evidence, ultimately leading to more robust and equitable education systems.

This concluding chapter also synthesises the key insights and findings from the preceding eleven chapters, connecting national experiences to unified policy recommendations for educational recovery and resilience. Drawing from diverse educational contexts – ranging from centralised systems like France and Japan, to decentralised ones like Canada and Germany – the chapter identifies common lessons and effective policy practices. By examining similarities and divergences across countries, this chapter highlights essential areas for future investment, including targeted remediation programs, comprehensive assessment frameworks, structured digital integration, teacher professional development, and sustained attention to student well-being, offering strategic guidance for education policymakers in a post-pandemic world.

In this chapter, we first examine the short-term effects of the pandemic on education, drawing on multiple studies that highlight significant learning deficits and socio-emotional challenges. Reviewing the short-term impact is important to understand the importance of targeted interventions. The chapter then delves into the methodologies and data sources that can be used to measure long-term impacts, including difference-in-differences (DiD), synthetic control methods (SCM), regression discontinuity design (RDD), and machine learning (ML) models. Next, we review first evidence on various policy interventions, such as online tutoring programs, mental health support, and financial assistance, highlighting both their successes and challenges. We conclude with the cross-national insights and a set of policy recommendations aimed at enhancing the long-term efficacy of educational reforms.

### **Evidence on the short-term impact**

Before we discuss the measurement of the long-term impacts of the COVID-19 pandemic on education, it is crucial to first understand its short-term effects. By

examining the immediate consequences of the pandemic, we gain insights into the extent of learning losses and socio-emotional challenges faced by students. This understanding is essential for contextualising the policy reforms that were implemented in response to these disruptions. Knowing the short-term impact helps us comprehend the urgency and rationale behind these interventions and highlights the importance of evaluating their long-term efficacy.

Multiple meta-analyses converge on the significant and global negative effects of remote learning on students' education. Among the earliest studies, [Patrinos et al. \(2022\)](#) reported learning deficits averaging 0.17 standard deviations (SD) across 20 countries, while [König and Frey \(2022\)](#) indicated a deficit of 0.18 SD based on articles with robust methodologies. Later research confirmed these results. For instance, [Betthäuser et al. \(2023\)](#) conducted a systematic review covering 15 countries, finding an average learning loss of 0.14 SD points. Similarly, [Di Pietro \(2023\)](#) found an average decrease in learning of around 0.19 SD points. Both studies highlight the long-lasting effects of the health crisis, noting the lack of improvement in test scores one year after the pandemic ended. Additionally, the latest results from the 2022 PISA evaluations indicate continuous learning losses, reporting an average learning deficit of about 0.14 SD points, equivalent to roughly seven months of learning ([Jakubowski et al., 2025](#)).

These meta-analyses also emphasise the multiple sources of heterogeneity underlying these global averages. For instance, [De Witte and François \(2023\)](#) report lower overall learning deficits (0.11 SD points) among some European Union members, highlighting differences between wealthy, developed countries and others ([Carrasco et al., 2021](#); [Di Pietro, 2023](#); [Donnelly & Patrinos, 2020](#)). This suggests disparities in the degree of preparedness to use ICT and remote learning, as well as in the financial resources available to address the health crisis ([De Witte & François, 2023](#); [Schnepf et al., 2024](#)). Differences in the length of school closures naturally imply further heterogeneous effects both between and within countries. Depending on the degree of (de)centralisation, some countries experienced multiple or longer closure periods within their borders, leading to varying levels of impact across regions ([De Witte & François, 2023](#); [Di Pietro, 2023](#); [Schnepf et al., 2024](#)). For instance, in a highly decentralised country like the United States – where considerable autonomy is granted to local authorities (e.g., counties) – substantial regional variation emerged. Notably, counties with higher proportions of Black and Hispanic students, limited broadband access, and elevated unemployment rates experienced significantly longer school closures ([Jack & Oster, 2023](#)). These findings highlight the complex, multi-directional links between school closures, socioeconomic status (SES), and geographical location ([Halloran et al., 2021](#)).<sup>1</sup>

The academic literature indicates that significant disparities exist between students. Socio-Economic Status (SES) stands out as the most important factor of heterogeneity explaining the learning deficits caused by the health crisis. The previously cited studies all reported evidence of larger learning deficits

among students from disadvantaged backgrounds (e.g., immigrants, low-SES, low-parental education level). Additionally, they largely conclude that learning loss was more pronounced in math and science rather than in language studies, as it may have been easier for parents to support language learning than subjects like math or science (Betthäuser et al., 2023). There is less consensus regarding the link between school closure effects and student age: Some authors indicate larger deficits among younger students (De Witte & François, 2023; Jakubowski et al., 2025; König & Frey, 2022; Patrinos et al., 2022), while others find no significant difference (Betthäuser et al., 2023; Di Pietro, 2023; Schnepf et al., 2024).

Beyond academic results, school closures led to significant adverse impacts on mental health. In a meta-analysis, Mazrekaj and De Witte (2023) reviewed multiple studies and identified three main pathways through which COVID-19 affected students' well-being. First, the school environment is a key element of students' socialisation and serves as a source of beneficial peer effects. The switch to remote learning eliminated this positive externality and increased the risk of loneliness among students. These feelings have been associated with negative mental health outcomes and an increased risk of anxiety or depression, with effects that may persist long-term. Additionally, mental health issues seem to affect individuals across all SES levels (Viner et al., 2022). Second, lockdowns closed sports clubs, resulting in a drop in students' physical activity, which has been associated with mental health deterioration (Biddle & Asare, 2011). Lastly, as indicated by Mazrekaj and De Witte (2023), the COVID-19 period corresponded with a decline in the number of reported child abuse cases to police or social services. As most of these reports are carried out by schools, closing them distorts the figures. Specifically, Cabrera-Hernández and Padilla-Romo (2020) found an average drop in child maltreatment reporting of about 29.5%. This means we lack data on children left in the hands of abusive parents for much longer than usual due to confinement.

School closures also contributed to declines in non-cognitive skills. Pena et al. (2024) compared non-cognitive outcomes recorded in the PISA survey from 2012 to 2022 across developed countries in the Americas and Europe. Using linear and fixed effects regressions controlling for time trends, their analysis revealed significant changes in the 2022 cohort of students: A 0.07 SD decline in these students' sense of belonging to school and a 0.14 SD increase in fixed mindset.

Lastly, mental health issues have been linked to further declines in academic outcomes. Using a DiD methodology on primary and secondary school students to measure learning deficits, Arenas and Gortazar (2024) linked these losses to students' reported well-being. Their findings reveal a significant connection between decreases in socio-emotional well-being and the learning deficits observed during the health crisis. Similarly, Pena et al. (2024) identified a connection between non-cognitive skills and educational outcomes following

COVID-19. Students with a high sense of belonging or a growth mindset were the most affected, experiencing average learning deficits equivalent to between half a year and a full year of schooling.

### **Importance of measuring long-term impacts**

The previous section illustrates that short-term consequences of the health crisis are well-documented. However, as time passes, additional interventions and long-term evaluations are necessary to address these effects and monitor the effectiveness of these efforts. This need is particularly pressing for three reasons.

First, affected children are growing older, some are approaching the age when they will leave compulsory education – or already left – making it urgent for governments to act. Without timely intervention, these students may face lasting deficits, with little chance of further support as they will no longer be monitored (Hanushek & Strauss, 2024). In line with this, Oates (2024) hypothesises that the effects of the crisis could last until 2030 in the absence of significant interventions.

Second, drawing on literature from past global crises – whether natural or human-induced – it appears that the impacts of COVID-19 may endure for an extended period or even permanently, regardless of the interventions implemented (Crato & Patrinos, 2024). Specifically, past school closures due to teacher strikes have shown significant long-term negative impacts on multiple aspects of life. For instance, Belot and Webbink (2010) used a DiD method to evaluate the long-term effects of a five-month strike at the compulsory education level. They reported a drop in students' attainment and an average six-month delay in high school graduation, resulting from a higher likelihood of grade repetition. In the longer run, students were less likely to pursue higher education at the university level, opting instead for more vocational tracks. Similar conclusions were reached by Jaume and Willén (2019) through a DiD study conducted in Argentina, where strikes led to an average of 372 lost instructional days between 1983 and 2014. They found significant declines of 3.2% and 1.9% in male and female labour earnings, respectively, among those who experienced teacher strikes during primary education. The cumulative impact of these losses amounts to an overall opportunity cost of \$2.34 billion. Although the context, timing, and nature of these events differ greatly from the COVID-19 crisis, evidence from the 1918 influenza pandemic indicates lasting effects on educational attainment, income, socio-economic status, and health up through the 1980s (Almond, 2006). These findings should serve as a warning, even if the context is a hundred years removed from ours.

Third, the pandemic can still be considered a good starting point for building education systems resilient to any future challenges. Considering that it exacerbated long-term trends that already existed before its arrival, the importance of long-term evaluations is crucial for building strong organisations. Persistent

inequalities and the steady decline in students' academic outcomes – trends that were evident for nearly a decade before the pandemic (De Witte & François, 2023) – cannot and will not be solved in the short term. This further emphasises the need for long-term evaluations.

### **Methodologies to measure long-run impact**

Evaluating the long-term effects of the pandemic on education requires methodologies that can accurately capture nuanced impacts across time and different groups. In this section, we discuss various approaches that are widely used in social science research to assess causal relationships and long-term outcomes.

#### *Difference-in-differences*

DiD is a quasi-experimental approach for estimating the causal effect of a treatment or event by comparing the changes in outcomes over time between treated and untreated groups. The articles by Belot and Webbink (2010) and Jaume and Willén (2019) discussed in the previous section apply this methodology to measure the long-term effects of an educational disruption.

In the context of COVID-19, DiD can be applied to assess the impact of school closures, remote learning, and other pandemic-related interventions on learning outcomes. For instance, Arenas and Gortazar (2024) used a DiD setup to measure the learning deficits resulting from school closures. They analysed the results of two distinct cohorts of 8th-grade students assessed before (in 2019) and after the pandemic (in 2021). The similarity between the two cohorts and the standardised nature of the external assessments enable comparison and support a causal interpretation of their findings.

In a longer perspective, DiD is an excellent tool for policy evaluation, provided that data are available both before and after the intervention. This method is particularly insightful when coupled with a randomised controlled trial (RCT), i.e., the random assignment of individuals between treatment and control groups. Several studies cited in **Interventions to Measure in the Long-Run** rely on these combined methods to evaluate policy interventions (see, for instance, Gortazar et al., 2024; Zagni & Van Ryzin, 2024; Yang et al., 2023).

#### *Synthetic control methods*

SCM are used when there is only one treated entity, such as a state, province, or country, which has undergone a policy change or intervention. In these cases, traditional methods like DiD are unsuitable due to the absence of a true counterfactual group. Similarly, time series analysis offers limited insight because it fails to account for external shocks during the intervention period. SCM addresses

this by creating the counterfactual state, composed of weighted pre-treatment outcomes from multiple control states, provinces, or countries (Abadie, 2021).

Some studies have applied SCM in the context of the COVID-19 crisis. For instance, Giuliani (2023) and Zhang et al. (2022) examined the effectiveness of school closures on the total number of COVID-19 cases in Italy and the United Kingdom, respectively. They exploited the heterogeneity across provinces in terms of the implementation time of school closures to apply SCM. Zhang et al. (2022) observed a 14% to 20% reduction in infection rates due to school closures, while Giuliani (2023) found that provinces reopening schools earlier during the crisis experienced an average increase of 2,000 infections at the peak, several weeks after reopening. Cabrera-Hernández and Padilla-Romo (2020) used SCM to analyse the effect of school closures on weekly child maltreatment reports, exploiting weekly variations in school closure timing across municipalities. Their findings indicate a drop in reported cases, as discussed previously in this chapter. Breidenbach et al. (2023) also employed SCM, focusing on variations in school closures across German states. They investigated the impact of remote learning on educational inequalities between low- and high-SES students and noted a 1.3% decline in the likelihood of low-SES students transitioning from primary school to high school, compared to their high-SES peers.

To date, SCM has not been applied to measure the outcomes of COVID-19 mitigation policies aimed at improving student achievement following the crisis. However, the above-cited articles underscore SCM's potential for assessing the long-term causal impacts of policy interventions, as long as the context fits the methodology.

### ***Regression discontinuity design***

A RDD leverages cutoff-based eligibility criteria to identify causal effects around a threshold. For COVID-19 research, RDD can be effective when policies are applied based on specific criteria, such as student age, grade level, or regional incidence rates. For instance, in Japan, school closures were implemented for elementary schools, while nursery schools and kindergartens remained open. When this decision took effect on March 2, children aged 89 months and older had to stay home, while those 88 months and younger could still attend school (Takaku and Yokoyama, 2021). This age-based discontinuity enabled researchers to use RDD to examine the effects of these differing statuses on mothers' mental health and various child health indicators. Their findings pointed to the negative impact of lockdowns on non-academic outcomes.

With respect to policy interventions in the aftermath of the pandemic, King (2022) used an RDD to evaluate a summer school program. In this context, 6- to 13-year-old students were eligible for summer school based on scores from an external evaluation, with the focus on the lowest-performing students relative to their grade average. The RDD results did not show any significant improvements

resulting from the summer school, regardless of grade level. King attributed these findings to low attendance among low-SES students, meaning that many students with the highest needs did not receive the intended support. This lack of significant results underscores the challenge of reaching low-SES individuals through this type of intervention and reinforces the concern that will be raised in **Interventions to Measure in the Long-Run** about the need for well-targeted policies.

### *Machine learning models*

ML models, such as random forests (RF) and causal forests (CF), are especially useful for capturing heterogeneity and interactions between characteristics within a sample. RF models enable predictions based on a set of features, revealing heterogeneity across individuals based on demographic, geographic, or socioeconomic factors. CF models focus on how the effects of an intervention, like the COVID-19 pandemic or specific policies, vary and relate to these individual factors. Both methods leverage large datasets to detect such patterns. Additionally, ML methods allow for the relaxation of the linearity constraint inherent to linear regressions, thanks to their non-parametric framework, which further relaxes assumptions on our models.

Several studies have applied RF models in the context of COVID-19. For instance, [Agasisti et al. \(2022\)](#) measured the impact of a financial literacy course conducted during school closures through an RCT. After using a DiD approach to measure the intervention's effect, they applied an RF model to predict students' financial literacy scores based on individual characteristics. They found that course participation, student motivation, and credit card use were significant predictors of financial literacy gains. Similarly, [Cheung et al. \(2024\)](#) used an RF model to identify key resilience factors among low-SES students, who have been shown to experience the most pronounced learning losses during the pandemic. Their findings suggest that resilient students tend to have greater emotional stability, high self-efficacy, ambition, and low truancy levels.

Causal Forest models have also provided valuable insights. [Carlana and La Ferrara \(2021\)](#) used a CF approach to evaluate an online tutoring program implemented during lockdowns for high school students. By examining survey data from students, parents, and tutors, they explored how the program's impact varied across different subgroups. Their results reveal that the tutoring significantly boosted student performance, particularly benefiting disadvantaged students and those with migration backgrounds in terms of well-being.

Nevertheless, ML techniques cover a broad and recent literature, with techniques still at the cutting edge, which explains the scarcity of studies relying on more diversified methods. This section highlights potential paths where CF and RF may be useful for long-term evaluations. For example, RF models could be applied to make long-term predictions about educational or labour outcomes, as demonstrated in the short term by [Qiu et al. \(2024\)](#). As shown by [Cheung et al. \(2024\)](#), RF enables

researchers to better identify individuals most in need of targeted interventions (see **Interventions to Measure in the Long-Run**), while CF can evaluate the heterogeneous impacts of policies designed to mitigate pandemic-related challenges. With the fast-growing literature in ML, further techniques may be developed and considered for long-run evaluation in the near future.

### ***Panel data analysis***

Panel data analysis (PDA) involves tracking the same units (e.g., students, schools, or regions) over multiple time points. This method enables the study of long-term impacts by analysing data points both before and after the pandemic. Additionally, gathering longitudinal data on the individuals composing the sample enables control for time-invariant characteristics at the individual or group level. In long-term evaluations, accounting for such effects allows for more precise findings.

Many studies on the health crisis have effectively used this method. For instance, [Maldonado and De Witte \(2022\)](#) employed PDA to assess the impact of school closures on students' standardised test results. Their sample includes data from 2015 to 2020, enabling comparison before and during the pandemic. Their results show a significant decline in performance due to school closures. In terms of policy evaluation, [Gambi and De Witte \(2021\)](#) used a panel dataset from 2017 to 2021 to evaluate the effectiveness of a targeted summer school intervention. This intervention focused on low-SES neighborhoods, as the summer schools were offered only in disadvantaged areas. The panel data structure allowed for controlling area-specific effects, isolating the intervention's impact. Their findings indicate a strongly significant and positive effect of summer schools on learning outcomes.

More broadly, panel data analyses are well-suited for long-term evaluations. For policy evaluations, they can also be combined with DiD designs, as demonstrated by [Haelermans et al. \(2022\)](#). In this study, the authors used a large dataset of over 200,000 students from 2017 to 2020 across Grades 1 to 6. They applied a DiD method, considering students who experienced school closures as the treated group and using previous cohorts as controls. This approach, similar to that of [Arenas and Gortazar \(2024\)](#), combines the identifying power of DiD with the opportunity to isolate some time-invariant effects for more accurate estimates.

### **Data sources to measure the long-run impact**

Measuring the long-term efficacy of policy reforms requires reliable data sources. Given the broad reach of the pandemic's disruptions, data sources should reflect varied dimensions of impact, including academic performance, socio-emotional development, and disparities among different socioeconomic

groups. Two primary types of data are critical for assessing these long-term outcomes: Survey data and administrative data. Each type offers unique advantages in understanding different aspects of the pandemic's effects and can often be combined to provide a more complete picture.

### ***Survey data***

Survey data are invaluable for capturing subjective experiences and personal perceptions, which are often absent from administrative records. Surveys administered to students, parents, and teachers can provide insight into changes in learning behaviours, mental health, and family dynamics that have persisted since the onset of the pandemic. Additionally, longitudinal survey data allow researchers to track shifts in attitudes and outcomes over time. To be effective for measuring the long-term impact of COVID-19, survey data should meet two conditions: They should be collected at a constant frequency to avoid gaps, and there should be data available from before the pandemic. These points highlight the importance of continuous monitoring, as discussed in **Importance of measuring long-term impacts** and further developed in **Interventions to Measure in the Long-Run**.

One example of survey data is the OECD's Program for International Student Assessment (PISA), conducted every three years and including questions about students' learning environments and well-being. The 2022 PISA survey, which took place shortly after the height of the pandemic, incorporates questions that allow researchers to assess the effects of school closures and remote learning on student performance and engagement. Many of the articles covered so far have relied on this dataset to evaluate learning losses or changes in mental health following the health crisis. Studies by Carlana and La Ferrara (2021), [Cheung et al. \(2024\)](#), and Jakubowski, Gajderowicz, and Patrinos (2024) utilised this resource. The recent book by [Crato and Patrinos \(2025\)](#) also includes numerous articles using PISA data (Patrinos & Crato, 2024; [Hanushek & Strauss, 2024](#); [Oates, 2024](#)).

The National Household Education Survey (NHES) in the United States is another example. It periodically collects data on a range of educational issues, including parental involvement, remote learning experiences, and access to resources. These surveys can be used to evaluate how family engagement and access to educational resources have changed since the pandemic and identify disparities across different socioeconomic groups. For example, [Chin et al. \(2020\)](#) indicated that school closures contributed to significant absenteeism among healthcare workers with dependent children, causing severe disruptions in healthcare systems, particularly in counties where COVID-19 was widespread. [Barnett et al. \(2021\)](#) documented the new challenges faced by families with preschool or primary school students during lockdowns, using surveys of parents' experiences. Overall, few studies have used the NHES dataset to examine the short-run consequences of the health crisis, and policy interventions

or long-run effects remain largely unexplored. Given the valuable information gathered by the survey, further research could investigate long-term family engagement with students who experienced learning deficits during the health crisis, as well as parents' perceptions of policies designed to mitigate learning losses.

### ***Administrative data***

Administrative data refer to information collected by public or private institutions such as schools, governments, states, or private organisations. These data typically provides a rich set of details about individuals within the dataset, though they are not collected solely for research purposes. A key advantage of administrative data are their comprehensive scope, often spanning multiple domains (e.g., geographic, sociological, and economic) and covering large samples (De Witte & Chénier, 2023). A specific form of administrative data is “found data,” which refers to information collected automatically and systematically for administrative tracking and registration purposes within an institution. Such data are ready to use, as they often include extensive details primarily intended for administrative objectives. In contrast, “made data” gathers information for research purposes only, through experimental designs or surveys aimed at evaluating specific features (Rossi, 2024).

Nonetheless, these rich and detailed datasets can be challenging to access. Privacy constraints may restrict public or private institutions from releasing their data solely for research purposes. Therefore, alongside the monitoring concerns already highlighted, data accessibility presents an additional obstacle regarding their availability. Although data collection might be long and difficult, these samples are crucial for evaluating the heterogeneity of policy interventions from various perspectives. Moreover, their comprehensiveness allows researchers to draw externally valid conclusions, whether assessing the effects of the health crisis or evaluating targeted interventions. In particular, administrative data provide the level of detail necessary for effectively implementing targeted policies. Studies using the PISA or NHES datasets are also using administrative data. Additionally, research conducted by Agasisti et al. (2022), Breidenbach et al. (2023), Gambi and De Witte (2022), Haelermans et al. (2022), and King (2022) exploits this data source.

### **Interventions to measure in the long-run**

Before providing a series of evidence-based policy measures, it should be noted that a primary barrier to robust policy interventions is precisely because of the lack of evidence (Schnepf et al., 2024). In the paradigm of evidence-based education, any intervention should be monitored to evaluate its effectiveness. This principle is not specific to post-COVID-19 cases, although it is

particularly relevant. [Schnepf et al. \(2024\)](#) declared that, in general, solutions set up during or just after the health crisis were the products of political discussions rather than responses informed by the education sector's needs or any rigorous scientific processes. As a result, most of these implementations were carried out without gathering data on the interventions themselves and the learning outcomes, making evaluation impossible. In the United States, for example, the high degree of decentralisation in the education system makes it particularly challenging to accurately identify the duration of school closures. [Zviedrite et al. \(2021, 2024\)](#) had to rely on publicly available online information from newspapers to estimate a lower bound of the time spent in remote learning. This heterogeneity complicates the design and implementation of well-targeted recovery policies and similarly obscures the assessment of both the pandemic's impact and the effectiveness of resilience strategies. Likewise, Canada ([Chapter 9](#)) reported significant gaps in data collection, particularly regarding students with disabilities, limiting policymakers' ability to evaluate educational disruptions accurately. Conversely, the Netherlands ([Chapter 7](#)) effectively utilised standardised assessments to precisely track learning outcomes, facilitating targeted interventions based on robust data. Now that the emergency phase is over, it is crucial to collect baseline and post-intervention data on learning outcomes using comparable methods, not only in cases related to COVID-19.

Among the policy measures aimed at mitigating learning loss, tutoring programs and summer schools were the most popular, particularly in developed countries. Most evidence reports positive results (e.g., [Asakawa et al., 2025](#); [Borgonovi & Ferrara, 2022](#); [Depping et al., 2021](#); [Gambi & De Witte, 2021](#)). Nevertheless, as per our earlier concern, tutoring should target populations who need it to maximise efficiency, whether defined by SES, grade level, or regions where closures were longer. Also, [Schnepf et al. \(2024\)](#) note the importance of prioritising time- and cost-effective solutions to address the crisis. In this regard, face-to-face tutoring may be problematic due to cost concerns and logistical challenges in reaching students, teachers, and even finding appropriate spaces.

[Gortazar et al. \(2024\)](#) address these concerns. They conducted an RCT with 12- to 15-year-old students from very low-SES neighbourhoods in a free, fully online tutoring program over eight weeks. The 50-minute sessions occurred three times a week in small groups (2 students – 1 teacher) after school hours, focusing only on mathematics. Their results were positive, as treated students increased their end-of-year math exam scores by 0.26 SD compared to the control group and were 30% more likely to pass their math course than control students. In addition to academic outcomes, [Gortazar et al. \(2024\)](#) examined students' motivation and perseverance at school, finding a 31% higher probability for the treated group to pursue pre-university high school programs after compulsory education. However, the authors did not observe a significant increase in students' self-perceived math skills or intentions to attend university.

While the study's results provide encouraging evidence for targeted interventions benefiting low-SES students more affected by the health crisis, [Gortazar et al. \(2024\)](#) note concerns regarding time and cost-efficiency in scaling up such a solution. On the positive side, the online setup offers key advantages: There is no need to rent a location, reducing implementation costs and allowing more flexibility in scheduling. In fact, tutoring sessions were scheduled through mutual agreement between tutor and students. Furthermore, such a policy continues to use the investments made in ICT during and after COVID-19. As the switch to remote learning required significant hardware investments for disadvantaged populations ([De Witte & Smet, 2021](#)), online tutoring programs capitalise on these investments in a cost-effective way. Finally, [Carlana and La Ferrara \(2021\)](#) used university students as tutors on a voluntary basis and still found significantly positive outcomes in students' educational outcomes. This may also be a cost-effective option worth considering.

Nevertheless, two potential limitations should be considered for future implementations. Since tutoring programs are targeted rather than general, they are often voluntary, meaning parents must choose to enrol their children. (a) A challenge is reaching marginalised youth who would benefit the most from such interventions, as already mentioned in [King \(2022\)](#). [Gortazar et al. \(2024\)](#) addressed this by providing additional support to parents of students identified as in need of treatment to ensure they would enrol their children. For instance, they set up information desks in schools with computers to help parents in the online registration process. These information desks add to the overall cost of the program. (b) In addition, (math) teacher shortages are a common issue in most developed countries ([De Witte et al., 2023](#)). Although independent from the tutoring program, the lack of qualified (math) teachers could hinder large-scale implementation. Still, the fully-online format makes it easier to recruit teachers and enables them to work with disadvantaged neighbourhoods. Alternatively, substantial financial incentives could attract teachers, albeit with reduced cost-effectiveness. Lastly, [Carrasco et al. \(2021\)](#) suggest involving the private sector in our solution. In this case, it could be worth looking for teachers outside the public sector, or university students, as done by [Carlana and La Ferrara \(2021\)](#).

Focusing now on mental health, a growing number of researchers have paid closer attention to mental health issues, even before COVID-19, particularly in higher education (e.g., [Bruffaerts et al., 2018](#); [Kiekens et al., 2016](#); [Mortier et al., 2015](#)). Japan ([Chapter 10](#)), where youth suicide rates significantly increased during the pandemic, underscores the urgent necessity for systematic mental health initiatives. Similarly, Sweden ([Chapter 6](#)) emphasises the importance of maintaining open schools to prevent negative socio-emotional impacts, an approach supported by their stable educational and psychological outcomes. With the rising reports of anxiety and depression among younger children, [Werner-Seidler et al. \(2021\)](#) conducted a meta-analysis of 130 articles and nearly 46,000 participants aged ten to nineteen years. Their paper reviewed

only articles with robust methodologies such as RCTs, evaluating mental health interventions at the school level. Interventions during the health crisis were excluded. The results are not enthusiastic as the study found only limited, albeit positive, average effects of these interventions.

Despite renewed attention following the pandemic's onset, very few studies have rigorously assessed the effects of mental health policies implemented during this period (Mazrekaj and De Witte, 2023). Among the few available studies, Zagni and Van Ryzin (2024) conducted an RCT to evaluate an online tool promoting cooperative learning among 813 middle and high school students. The tool aimed to improve peer cooperation and, consequently, mental health. Findings indicated significant improvements in peer relations, reductions in victimisation, and decreases in mental health issues. Moreover, improvements in mental health and victimisation were significantly predicted by enhanced peer relationships. Similarly, another RCT in China by Yang et al. (2023) conducted during the pandemic reported reduced depression risks among high school students. In this latter intervention, students watched six 10-minute videos related to mental health, followed by discussions led by either a psychologist or teacher. These two interventions are noteworthy from a cost- and time-effectiveness perspective, as they both rely primarily on online methods, making them easier to scale without substantial expenses. Furthermore, it is important to note that these interventions were applied to a targeted population of disadvantaged individuals (1,564 students), which may explain their positive outcomes. Conversely, Werner-Seidler et al. (2021) suggest that the targeted nature of most papers in their meta-analysis was precisely at the root of the lack of findings due to their limited sample sizes. The limited research on this topic leads us to a similar conclusion to that of Werner-Seidler et al. (2021) three years ago: There is an urgent need to document the effects of mental health policies, but there is also ample opportunity to consider and develop new solutions and policies. Lastly, this echoes our previously raised comment on the need for monitoring; mental health policies will not be evaluated if there is no appropriate data collection following them.

Next, food insecurity has been shown to be particularly harmful to children's development, affecting health, education, and non-cognitive skills (Aurino et al., 2019; Howard, 2011; Winicki & Jemison, 2003). Specifically, food insecurity during early childhood – even if followed by improved conditions later – leads to more substantial and persistent detrimental effects on students (Aurino et al., 2019; Howard, 2011). In this context, Perdana et al. (2024) examined a Cash Transfer Program implemented by Cambodian authorities during the health crisis to support low-income households. The program benefited approximately 700,000 households enlisted in a government database of low-SES individuals, providing unconditional transfers from June 2020 to September 2021. Using a regression design and a matching method, the authors estimated the program's treatment effects and found significant increases in food security among poor

households during the pandemic. Furthermore, the study highlighted the importance of targeted interventions, as larger effects were observed among the most disadvantaged households – specifically, female-headed households and those experiencing income losses due to the lockdowns.

### **Cross-National insights: Policy recommendations for building resilient education systems**

The chapters in the book offer valuable insights for international policy learning, showcasing both unique responses and shared challenges. A major shared insight from these national contexts is the necessity of targeted educational interventions aimed explicitly at vulnerable populations. In England ([Chapter 2](#)), the implementation of the National Tutoring Programme and recovery premium funding illustrates promising examples of targeted policy, emphasising personalised academic recovery support. Similarly, France ([Chapter 3](#)) demonstrated the importance of equity-driven digital reforms, such as the “ma classe à la maison” platform and intensive tutoring programs, underscoring the need for structured initiatives that can address both digital and socioeconomic divides – an approach highly applicable to nations facing pronounced educational inequalities, such as Italy ([Chapter 5](#)) and Belgium ([Chapter 8](#)).

Despite their similar educational tracking systems, Italy and Germany exhibited contrasting outcomes due to differences in governance approaches. Italy’s rigid early tracking exacerbated socioeconomic disparities and contributed to significant learning losses among disadvantaged students, suggesting that delaying educational tracking decisions could reduce inequality – a lesson particularly relevant to similarly structured education systems ([Chapter 5](#)). Germany ([Chapter 4](#)), however, despite initial significant learning losses, has shown promise in recovery through its decentralised but coordinated policy approach, emphasising remedial education specifically in mathematics and language. This finding underscores the potential effectiveness of flexible, regionally adapted, yet nationally coordinated policy frameworks, particularly for nations struggling with balancing local autonomy and national standardisation, such as Belgium ([Chapter 8](#)) and Canada ([Chapter 9](#)).

Sweden ([Chapter 6](#)) and Japan ([Chapter 10](#)) offer unique examples where minimal disruption to schooling was a strategic priority. Sweden’s deliberate decision to maintain open elementary schools resulted in minimal academic disruptions and could serve as a model highlighting the importance of prioritising educational continuity. Similarly, Japan’s rapid, centrally managed response mitigated educational disruptions effectively through relatively short school closures, underscoring the importance of centralised guidelines during emergencies. However, Japan’s experience raises critical questions regarding the effectiveness of large-scale ICT-focused policies like the accelerated GIGA School Initiative, suggesting that grassroots measures like remedial instruction

and flexible scheduling might yield more direct improvements in learning outcomes.

The Netherlands (Chapter 7) and Canada (Chapter 9) stress the critical need for robust data systems to monitor educational outcomes systematically. The detailed longitudinal data available in the Netherlands allowed policymakers to track learning losses precisely, informing targeted recovery strategies effectively. In contrast, Canada's experience highlighted significant gaps in data collection, particularly for students with special educational needs, underlining the necessity for improved data collection practices worldwide.

Across these national contexts, there is also a unified recognition of the importance of addressing non-cognitive aspects of student development, including mental health, well-being, and social-emotional learning. Belgium's (Chapter 8) explicit incorporation of mental health support into educational policy demonstrates the value of proactive mental health interventions, a critical strategy for nations observing similarly negative psychological impacts, such as Canada and Japan. The alarming increase in youth suicides in Japan (Chapter 10) signals an urgent need for comprehensive mental health strategies integrated within educational systems globally, reinforcing the necessity for policies to prioritise student well-being alongside academic performance.

Collectively, the experiences of these countries provide several core recommendations for post-pandemic educational policy. These include targeted recovery programs tailored to disadvantaged populations, increased investment in digital infrastructure accompanied by rigorous teacher training, structural reforms to mitigate educational inequities, and the implementation of robust data monitoring systems. Importantly, these reforms must address not only academic recovery but also explicitly prioritise student well-being. Such comprehensive, integrated strategies, informed by international lessons, will be crucial in enhancing global educational resilience, preparing countries more effectively for future disruptions, and ensuring equitable educational outcomes in a post-pandemic world.

## **Conclusion**

This chapter has explored the long-term efficacy of policy reforms implemented in the aftermath of the COVID-19 pandemic, focusing on their impact on education. We began by examining the short-term effects of the pandemic on education, highlighting significant learning losses and socio-emotional challenges. Multiple studies have shown that remote learning and school closures led to substantial deficits in student performance, particularly among disadvantaged groups. The importance of measuring long-term impacts was emphasised, as understanding these effects is crucial for developing effective interventions. Various methodologies, such as DiD, SCM, RDD, and ML models, were discussed as tools to assess these impacts. Additionally, the chapter reviewed different

data sources, including survey and administrative data, which are essential for comprehensive evaluations.

The pandemic has led to significant and persistent learning losses, particularly among disadvantaged students. These losses are evident in both academic performance and socio-emotional well-being. The effects of the pandemic and subsequent policy interventions vary widely across different demographic, geographic, and socioeconomic groups, underscoring the need for targeted interventions. Evidence suggests that targeted interventions, such as online tutoring programs and mental health support, can be effective in mitigating the negative impacts of the pandemic. However, the success of these interventions depends on their design and implementation, particularly in reaching the most disadvantaged students. The lack of robust evidence and data collection has hindered the effective implementation and evaluation of policy interventions. Additionally, logistical challenges, such as teacher shortages and the need for cost-effective solutions, remain significant barriers.

Drawing upon the comprehensive analyses presented in [Chapters 1 to 10](#), several cross-cutting themes emerge as critical considerations for future education policy and practice. The evidence from diverse contexts such as England, France, Germany, Italy, Sweden, the Netherlands, Belgium, Canada, and Japan underscores the necessity of flexible yet coordinated policy frameworks. Countries that adopted structured yet adaptive approaches, such as England's targeted National Tutoring Programme ([Chapter 2](#)), Germany's remedial education strategies ([Chapter 4](#)), and France's systemic digital infrastructure investments ([Chapter 3](#)), provide concrete examples of effectively mitigating pandemic-related educational disruptions.

Comparatively, Japan and Sweden's experiences reveal that maintaining educational continuity through minimal school closures, facilitated by centralised governance and clear guidelines, can significantly reduce adverse impacts on learning and student well-being ([Chapters 6 and 11](#)). Meanwhile, the Netherlands and Belgium highlight the critical role of robust assessment systems and systematic monitoring in promptly addressing learning losses ([Chapters 7 and 8](#)). Such insights are particularly valuable for policymakers striving to build more responsive education systems capable of real-time adjustments during future crises.

Additionally, the experiences of Canada ([Chapter 9](#)) and Italy ([Chapter 5](#)) underscore the urgency of inclusive educational reforms aimed at addressing disparities, particularly among socioeconomically disadvantaged and vulnerable student groups. Policymakers should consider these insights collectively, prioritising structured digital transformation, tailored remedial programs, comprehensive mental health initiatives, and evidence-based interventions that transcend national contexts. Therefore, this integrated cross-national synthesis of pandemic experiences serves as a vital resource for shaping resilient, adaptable,

and equitable education policies, equipping education systems globally to better withstand future disruptions.

To effectively address the long-term educational impacts of the COVID-19 pandemic, several policy recommendations emerge clearly from cross-national experiences presented throughout this volume. First, as discussed above, enhanced data collection and systematic monitoring are imperative. Countries like Canada ([Chapter 9](#)) illustrate significant challenges due to inadequate data systems, particularly for vulnerable populations, emphasising the need for comprehensive data infrastructures. Conversely, the Netherlands ([Chapter 7](#)) demonstrates the clear advantage of robust data systems capable of tracking learning outcomes longitudinally. Establishing comprehensive national assessment and monitoring frameworks – as emphasised in the Netherlands, Germany ([Chapter 4](#)), and Japan ([Chapter 10](#)) – will enable better tracking of educational and socio-emotional development, allowing policy-makers to target resources more effectively and respond proactively to future disruptions.

Second, targeted interventions for disadvantaged students must become a central component of future policies. As the pandemic disproportionately affected students from low socioeconomic backgrounds, nations including England ([Chapter 2](#)), France ([Chapter 3](#)), and Italy ([Chapter 5](#)) implemented targeted remedial programs, tutoring initiatives, and dedicated support to narrow widening educational gaps. These targeted approaches should incorporate not only academic remediation but also mental health and socio-emotional interventions, particularly crucial for vulnerable student populations significantly affected by prolonged school closures, as seen clearly in Belgium ([Chapter 8](#)) and Canada ([Chapter 9](#)). These country-specific interventions and the further evidence discussed earlier in this chapter emphasise the success of targeted programs as well as their effectiveness in addressing entrenched educational inequities.

Third, there is a clear need for purposeful and sustainable utilisation of digital technology in education. The experiences of France ([Chapter 3](#)) and Japan ([Chapter 10](#)), both of which accelerated their digital infrastructure deployment during the pandemic, provide essential insights into effective policy implementation and potential pitfalls. France's centralised and structured approach to digital transformation enabled swift transitions to remote education, significantly mitigating disruption. Additionally, the online tutoring programs demonstrate to a greater extent how technology can be used effectively to reach students without the high costs associated with traditional face-to-face tutoring.

Conversely, Japan's GIGA School Initiative demonstrates that technology investments alone, without addressing digital literacy among teachers and students, are insufficient. These contrasting outcomes highlight the necessity of comprehensive digital literacy programs, reinforced infrastructure, and teacher training to maximise the potential benefits of technological interventions across education systems globally.

Investing in professional development programs for teachers emerges consistently across national contexts as a fundamental priority. Teacher preparedness significantly shaped the quality and effectiveness of education delivery during the pandemic. In Sweden (Chapter 6) and England (Chapter 2), efforts to ensure teacher readiness for remote and hybrid teaching approaches were central to maintaining educational continuity. Future policy should therefore prioritise ongoing, systemic professional development, equipping teachers not only with digital competencies but also skills in identifying and supporting students' mental health and socio-emotional needs, as underscored by challenges identified in Italy (Chapter 5) and Canada (Chapter 9).

Furthermore, addressing structural inequalities through systemic reform is critical. Italy's experiences underscore how early tracking and structural inequities amplified educational disparities during the pandemic, suggesting that reforms delaying tracking decisions could significantly improve educational equity. This lesson is valuable for other OECD countries with similar tracking systems, such as Germany (Chapter 4) and Belgium (Chapter 8). Revisiting structural elements that contribute to persistent inequality must become a policy priority globally.

Lastly, implementing evidence-informed evaluation practices and fostering adaptive policymaking frameworks are essential for responsive educational governance. The hindered implementation of policy interventions caused by insufficient robust evidence and data collection underscores the importance of continuous evaluation and adaptation. Furthermore, Canada's experience (Chapter 9), in particular, reveals the challenges posed by insufficient data on program effectiveness, highlighting the critical importance of rigorous, continuous policy evaluation. Similarly, the decentralised approaches in Germany (Chapter 4) and Belgium (Chapter 8) underline the benefits of aligning local flexibility with coordinated national policy guidance, suggesting that effective policy responses rely heavily on regular monitoring, evaluation, and iterative adjustments based on robust evidence.

In conclusion, the pandemic serves as an invaluable case study highlighting the importance of comprehensive data collection, targeted equity-driven interventions, structured digitalisation strategies, continuous professional development, structural reforms to enhance equity, and adaptive, evidence-based policymaking. Policymakers globally can leverage these insights to enhance the resilience, adaptability, and inclusivity of education systems, thereby preparing them effectively to respond to future crises while ensuring equitable and sustainable educational outcomes.

## Note

- 1 Furthermore, the results of [Jack and Oster \(2023\)](#) are all the more important given that no significant correlation was found between remote learning time and infection rate.

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