

1 Resilient education systems

This chapter identifies resilient education systems – those that weathered the disruptions related to the COVID-19 pandemic and are better prepared to ensure that learning continues even in adverse circumstances. It also discusses practices and policies in five specific areas that are common to resilient systems: learning during and from school closures; life at school and support from home; students' pathways through school; investments in education; and school governance. Each of these will be examined more closely in the following chapters.

For Australia*, Canada*, Denmark*, Hong Kong (China)*, Ireland*, Jamaica*, Latvia*, the Netherlands*, New Zealand*, Panama*, the United Kingdom* and the United States*, caution is advised when interpreting estimates because one or more PISA sampling standards were not met (see Reader's Guide, Annexes A2 and A4).

By 2023, four years after the beginning of the COVID-19 pandemic, most countries had adapted to life with the virus. The health situation had stabilised, and most countries around the world had lifted public health and social-distancing measures (WHO, 2023^[1]; WHO, 2023^[2]). There was a concurrent push to move beyond the pandemic and resume life “as normal” in what many called “the post-COVID era”.

Yet, the pandemic had taken a major toll on many sectors, including education. Now that the crisis phase has passed, policy makers and schools need to know where students stand in their learning and well-being to be able to provide remedial measures for those students who fell behind in their learning or suffered emotionally or physically from the pandemic. This is key to avoiding long-term damage to students’ well-being and productivity, and to ensure equity in education. Similarly, updated information on the resources available and the general climate in schools after the pandemic can help education systems plan for the future.

What the data tell us

- Four education systems, namely Japan, Korea, Lithuania and Chinese Taipei, could be considered “resilient” with regard to mathematics performance, equity and well-being. Twenty-one other education systems were resilient in one or two of the three aspects considered.
- Between 2018 and 2022 trends in students’ sense of belonging at school were mixed, with equal proportions of countries/economies showing stable, improving or deteriorating trends. Of the 47 education systems with improving or stable trends, only 20 maintained or attained a level of students’ sense of belonging at school that was at or above the OECD average.
- Disadvantaged students in 2022 were more likely than their advantaged peers to report feeling that they have fewer opportunities to form close bonds at and with school. However, PISA 2022 results suggest that systems offering greater fairness in learning opportunities also offer greater fairness in social opportunities.
- Education systems that were resilient in mathematics performance differed in certain policies, practices and characteristics compared to other countries/economies, including in their response to COVID-19, in parental support and school climate, and in their approaches to selecting and grouping students, and to governing and allocating resources to schools.

This volume focuses on resilience: the ability to recover quickly, or even grow, from adversity (OECD, 2021^[3]). COVID-19 was a stress test for resilience in education, as it showed whether systems, schools and students around the globe were able to adapt to sudden and profound changes in how students are taught and how they learn. The 2022 round of the OECD Programme for International Student Assessment (PISA) was conducted during or right after the crisis phase of the COVID-19 pandemic. PISA 2022 provides information on how education systems, schools, teachers and students across countries responded to this global challenge.

This chapter identifies resilient education systems, while Chapters 2 through 6 explore policies, practices and characteristics of learning environments that are common to some of the education systems that coped better than others during and after the pandemic, including in their responses to school closures (Bertling et al., 2020^[4]). Insights drawn from the data can help education systems bolster their resilience and rethink learning and teaching. Given that it is all but inevitable that education can and will continue to be affected by disruptions both global, such as pandemics and climate change, and local, including earthquakes, floods and war, education systems need to build their capacity to withstand adversity.

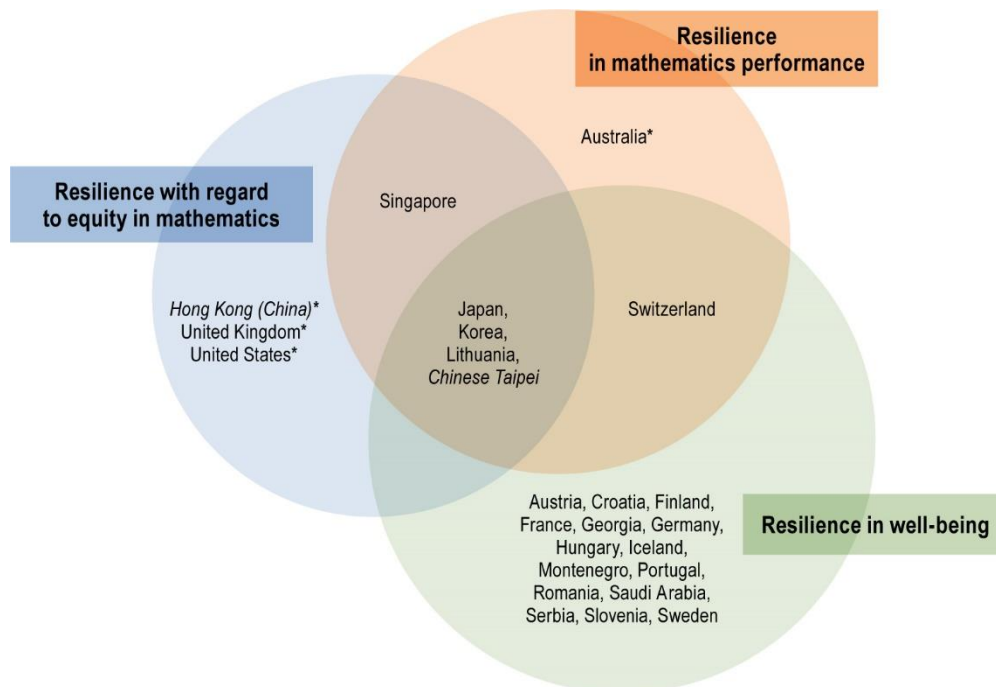
What PISA 2022 tells us about the resilience of education systems

Education systems that were resilient in 2022

This volume identifies four overall resilient education systems among the 81 countries/economies that participated in PISA 2022 (see Figure II.1.1). Japan, Korea, Lithuania and Chinese Taipei performed well, were equitable and students reported a sense of belonging at school that was at or above the OECD average in 2022. In addition, these systems showed no deterioration in these aspects between 2018 and 2022 (i.e. they were resistant; see Box II.1.1). Twenty-one education systems were resilient in one or two of the three aspects considered.

Fifteen education systems (Austria, Croatia, Finland, France, Georgia, Germany, Hungary, Iceland, Montenegro, Portugal, Romania, Saudi Arabia, Serbia, Slovenia and Sweden) were resilient in well-being. Students' sense of belonging was at or above the OECD average with no negative short-term trend since 2018. Australia* was resilient in mathematics, showing high performance in mathematics (i.e. above the OECD average) with no negative short-term trend, while Switzerland was resilient in both mathematics and students' well-being. Hong Kong (China)*, the United Kingdom*, the United States* were considered resilient in equity because they were socio-economically fair (the variance unexplained by students' socio-economic status as well as students' average mathematics performance were at or above the OECD average) in 2022 and advantaged and disadvantaged students maintained their level of performance between 2018 and 2022. Singapore was resilient in mathematics and in equity, meaning it showed high performance and socio-economical fairness (the latter at the OECD average in 2022). Between 2018 and 2022, the performance of advantaged students in Singapore improved while the performance of disadvantaged students remained stable.¹

Figure II.1.1. Resilient education systems



Note: Fifteen countries/economies were missing data for one or more aspects of resilience: Cambodia, Costa Rica, El Salvador, Guatemala, Israel, Jamaica*, Kosovo, Mongolia, North Macedonia, the Palestinian Authority, Paraguay, Spain, Ukrainian regions (18 of 27), Uzbekistan and Viet Nam (see Table II.1).

Source: OECD, PISA 2022 Database.

Box II.1.1. How PISA examines resilience of education systems

Two perspectives on resilience: Strength and preparedness, and resistance

PISA 2022 examined the resilience of education systems from two different angles: how resistant to disruptions systems were shown to be during the pandemic (*resistance*); and how strong and prepared they are for future challenges of a similar nature (*strength and preparedness*).

The analysis of *systems' resistance* aimed to identify systems that bounced back from the pandemic and recovered or gained strength by looking at short-term trends. Data, collected in 2022 when most of the participating countries/economies had lifted social-distancing and health measures, and schools returned to “normal”, are compared to pre-COVID data collected in 2018.

The analysis also considers *systems' strength and preparedness* in 2022, since maintaining low levels of performance, equity and well-being from before to after the COVID-19 pandemic cannot be interpreted as a sign of a system's resilience. To succeed and be prepared for future challenges, an education system needs to perform at an adequate level.

Three aspects of resilience: Performance in mathematics, equity and well-being

This analysis focused on three aspects of resilience: performance, equity and well-being. Since mathematics was the main subject assessed in PISA 2022, students' performance and performance trends in the subject were examined. For equity, socio-economic fairness in 2022 and short-term trends in socio-economic parity were examined. To determine *socio-economic fairness*, the proportion of the variation in student performance that was unrelated to students' socio-economic status was considered along with a country's/economy's average performance. Considering both is necessary in order to exclude countries where all students, advantaged and disadvantaged, performed poorly. In education systems with high levels of equity, all students fulfil their potential regardless of their background. *Socio-economic parity* was determined by examining indicators of whether the performance of advantaged and disadvantaged students improved or at least remained stable between 2018 and 2022 (see Annex A1).

The analysis also included well-being, specifically if students, in 2022, felt they belonged at school and whether education systems maintained or improved students' sense of belonging at school between 2018 and 2022 (OECD, 2019^[5]).

In PISA 2022 an education system was resilient in:

- **mathematics** if students' average performance in mathematics was stable or improved between 2018 and 2022 and was at or above the OECD average in 2022.
- **equity** if the variation in performance unexplained by students' socio-economic status and average performance were at or above the OECD average in 2022 (socio-economic fairness); and if the performance of disadvantaged and advantaged students remained stable or improved between 2018 and 2022 (trends in socio-economic parity).
- **well-being** if students' average sense of belonging at school was stable or improved between 2018 and 2022 and was at or above the OECD average in 2022.

Note: Annex A1 provides details about each of the measures, including the definition of socio-economic advantage and disadvantage.

Education systems that resisted overall negative trends

While only a few systems could be considered resilient, several other systems showed a remarkable capacity to bounce back from the COVID-19 disruptions.

Less than half of the participating education systems improved or maintained their performance

Between 2018 and 2022, mathematics performance deteriorated by almost 15 score points, on average across OECD countries – an unprecedented decline following a stable trend between 2015 and 2018; and until 2018, changes in performance over consecutive PISA assessments had never exceeded 4 score points (see (OECD, forthcoming^[6]) for more information on performance and trends). While this decline was observed in over half of the PISA-participating countries/economies, seven countries/economies, namely Brunei Darussalam, Cambodia, the Dominican Republic, Guatemala, Paraguay, Saudi Arabia and Chinese Taipei, managed to improve their performance by over 10 score points. However, of these, only Chinese Taipei scored above the OECD average in mathematics in 2022 (547 points compared to the OECD average of 472 points). Twenty-four other countries/economies maintained their 2018 performance level, but only Australia*, Japan, Korea, Singapore and Switzerland did so at a high level, with scores ranging from 487 to 575 points. Lithuania maintained its performance at the OECD average level over the period.

These systems may have been able to adapt quickly to pandemic-related upheavals, may have had protective policies and practices in place, or may have used remedial measures to recover rapidly from the disruptions related to COVID-19. In other words, these systems were resistant. Of course, there may be other reasons why these systems maintained or improved their performance over the period (see Box II.1.2).

Box II.1.2. Alternative explanations for stable or improving trends in mathematics performance

The stable or improving trends in mathematics performance observed in some systems may be a sign of resistance to COVID-19 disruptions but there could be other explanations for these results. Differences in the severity and duration of the pandemic and pandemic-related measures imposed in the country/economy as well as unequal access to resources to combat the pandemic (e.g. access to vaccines or testing equipment, preparedness of the healthcare system), over which education systems had no control, may have had an impact on performance trends. These differences are likely to vary by countries'/economies' per capita GDP. Figure II.1.2 shows that, although all countries were affected by COVID-19 to some extent, the evolution of the pandemic varied widely.

The performance trends observed between 2018 and 2022 may be linked to other causes that are not directly related to the pandemic. In some cases, stable trends between 2018 and 2022 could be a reflection of an education system's lack of effectiveness or efficiency prior to the pandemic; thus the disruptions and school closures caused by COVID-19 may not have affected learning to a great extent. In other cases, disruptions such as earthquakes or war may have already led to cancelled classes or school closures, which, in turn, led to similar learning losses in the past. In all of these cases, performance would have been maintained, but at low levels. In fact, PISA 2022 data show that three out of four education systems whose performance did not deteriorate over the period had low scores in 2022.

By contrast, some systems showed signs of long-term performance decline even before the pandemic. In these systems, the deterioration in performance between 2018 and 2022 may not be solely due to the pandemic. Nevertheless, as shown in Volume I of the PISA 2022 Results, for many countries/economies, the change in PISA performance observed between 2018 and 2022 deviates significantly from the trends observed over earlier assessments (OECD, forthcoming^[6]). While the context of the 2018-2022 trends is important, countries/economies should be focused on working towards or maintaining a high level of performance. Therefore, PISA 2022 focuses on the actual 2018-2022 trends (i.e. without considering the long-term trends) and also considers the level of performance, equity and well-being attained in 2022 when identifying resilient education systems.

Figure II.1.2. Confirmed COVID-19 cases and deaths



Notes: Only countries and economies with available data are shown.

Deaths are not included in the count of cases. The number of deaths does not take into account the number of deaths recorded in countries/economies during a three-year period under "normal" conditions (unaffected by the COVID-19 pandemic).

Countries and economies are ranked in descending order of the total cumulative COVID-19 cases per million as of 14 June 2023.

Sources: a. WHO.

b. https://github.com/owid/covid-19-data/blob/master/scripts/input/un/population_latest.csv, consulted on 14 June 2023.

While some systems improved equity and students' sense of belonging, few reached high levels

In most of the education systems that showed declines in performance, disadvantaged students performed less well in 2022 than in 2018; in around half of these systems the performance among both disadvantaged and advantaged students deteriorated (see (OECD, forthcoming^[6]) for more information on equity and trends). More important, in around one in three education systems with available data the performance of both disadvantaged and advantaged students remained stable or improved. In fact, only in Argentina, Brunei Darussalam, the Dominican Republic, the Philippines and Saudi Arabia, did the performance of disadvantaged students improve during the period, and by 12 to 27 points. Brunei Darussalam is the only country where both advantaged and disadvantaged students scored higher (by 13 points) in 2022 than in 2018. Despite these remarkable improvements, performance and fairness remained low in 2022. Only eight education systems had stable or improving trends in the performance of advantaged and disadvantaged students and attained an average performance level at (Lithuania and the United States*) or above (Hong Kong (China)*, Japan, Korea, Singapore, Chinese Taipei and the United Kingdom*) the OECD average in 2022. While in Lithuania, Singapore, Chinese Taipei, the United States* socio-economic fairness was at the OECD average level (i.e. the share of variation in students' performance unrelated to students' socio-economic status was around 85%), fairness was above the OECD average level in Hong Kong (China)*, Japan, Korea and the United Kingdom*.

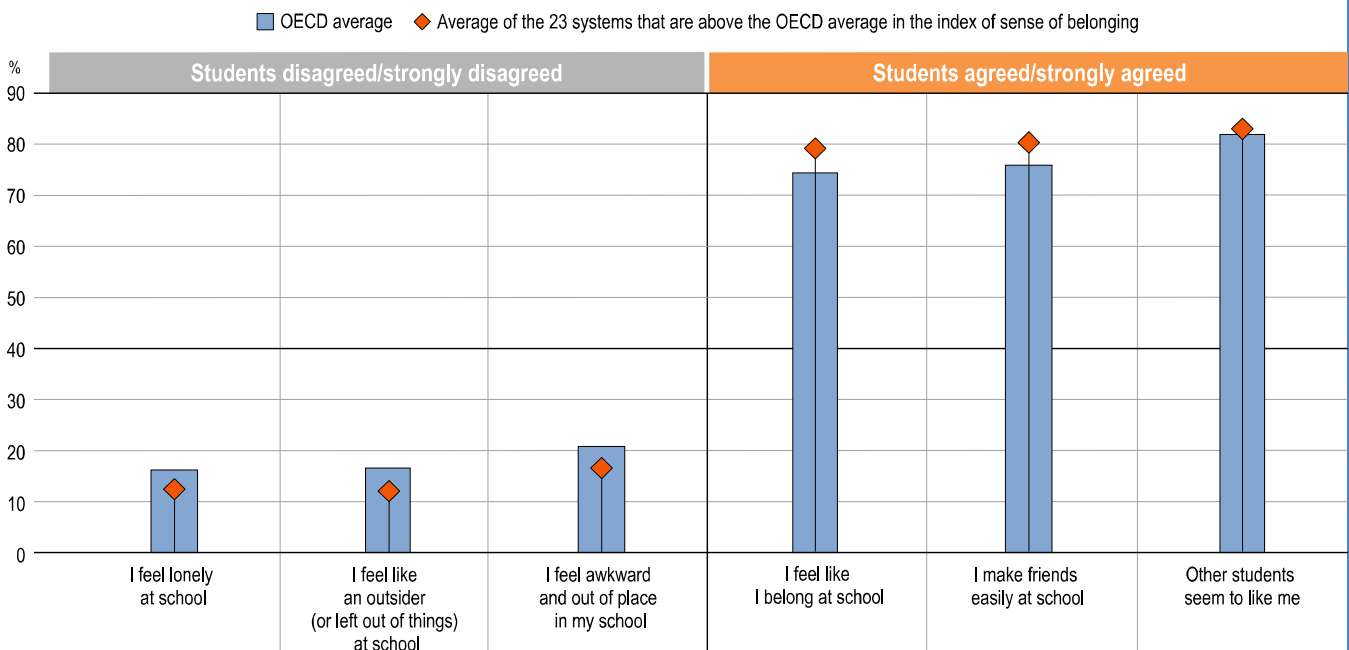
On average across OECD countries, students' sense of belonging at school deteriorated between 2018 and 2022 after a stable trend between 2015 and 2018 (Table II.B1.1.5, (OECD, 2019^[5]). However, the more recent trend across countries/economies is mixed, with equal proportions of countries/economies showing stable, improved or deteriorating trends in students' sense of belonging. Out of the 47 education systems with improving or stable trends, five systems maintained or reached a level of sense of belonging at school similar to the OECD average and 15 systems maintained or attained above-average levels. In systems where students reported an above-average sense of belonging at school, students were less likely to report feeling lonely at school and more likely to report that they make friends easily (Box II.1.3). The four countries/economies with the largest improvement in students' sense of belonging were Japan, Montenegro, Serbia and Slovenia. In all of these countries/economies the share of students who reported feeling connected to school was larger than the average share across OECD countries.

Box II.1.3. Students feel less lonely at school and make friends more easily in education systems where students have a greater sense of belonging at school

Students' sense of belonging at school was at or above the OECD average in 28 education systems; in 23 of those systems students' sense of belonging at school was above the OECD average. In these systems, most students reported feeling socially connected at school. A larger share of students reported feeling that they make friends easily at school (81% as compared to the OECD average of 76%) and that they belong at school (79% as compared to the OECD average of 75%; Figure II.1.3 and Table II.B1.1.1). Moreover, smaller proportions of students reported feeling socially disconnected at school: while one in five students, on average across OECD countries, reported feeling lonely or like an outsider or left out of things at school, only one in ten students so reported in school systems where students' sense of belonging at school was above the OECD average.

Figure II.1.3. Students' sense of belonging at school

Percentage of students who agreed/strongly agreed or disagreed/strongly disagreed with the statements below



Items are ranked in ascending order at the OECD average.

Source: OECD, PISA 2022 Database, Annex B1, Chapter 1.

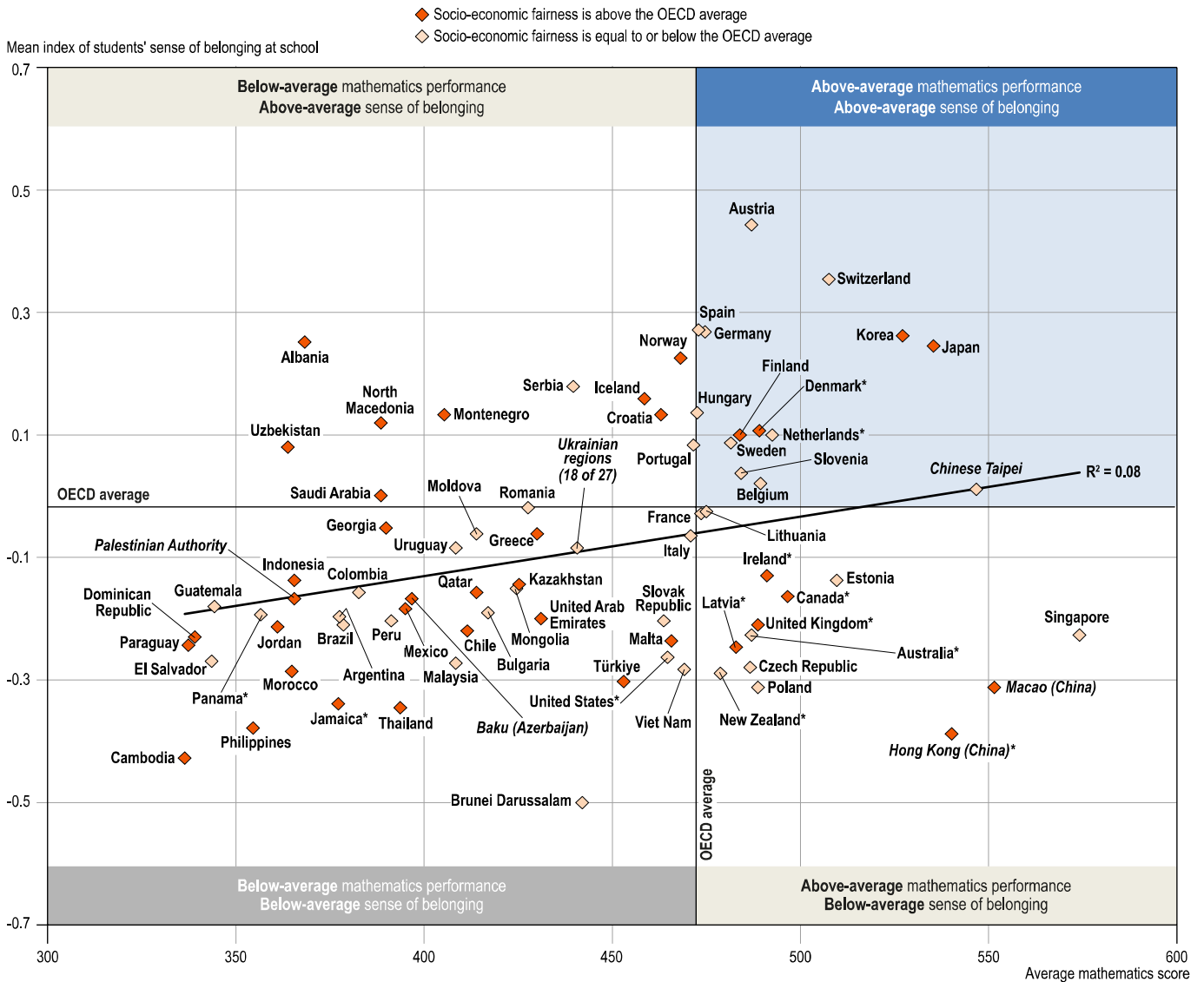
Education systems that combine high performance, equity and well-being

Few systems combine high performance, equity and well-being

It is essential to consider the trio of performance, equity and sense of belonging simultaneously when examining an education system's strength and preparedness for disruption because high performance is not necessarily related to a greater sense of belonging at school, nor is low performance a sign of a weaker sense of belonging at school. Across education systems, students' average performance in mathematics is only moderately related to students' sense of belonging at school, and mostly before accounting for countries'/economies' per capita GDP (Figure II.1.4 and Table II.B1.1.13). This means that the association between performance and sense of belonging at school may

reflect the tendency for wealthier countries/economies to perform better in mathematics and for the students in those countries to feel a greater sense of belonging at school.

Figure II.1.4. Sense of belonging, and performance and equity in mathematics



Notes: Socio-economic fairness is measured by the percentage of variation in student performance that is not accounted for by differences in students' socio-economic status. For further information on socio-economic fairness, please refer to PISA 2022 results, Volume I, Chapter 4. Source: OECD, PISA 2022 Database, Annex B1, Chapter 1; and Volume I, Annex B1, Chapter 4.

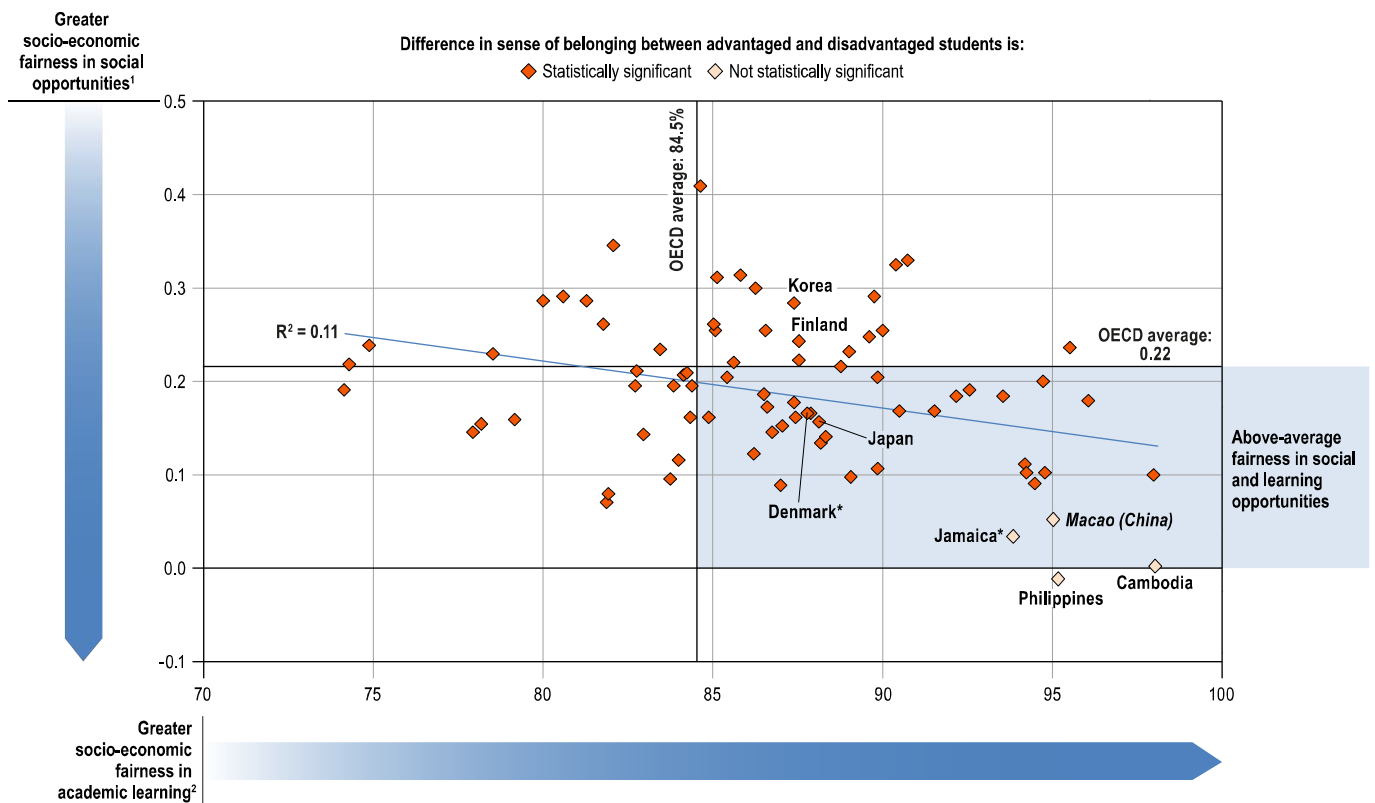
Equally important, better performance is no guarantee of greater equity (OECD, forthcoming^[6]); and greater equity in performance does not necessarily lead to a stronger sense of belonging at school. In fact, systems' socio-economic fairness and students' average sense of belonging at school were found to be unrelated (Table II.B1.1.13). Nonetheless, Denmark*, Finland, Japan and Korea achieved all three: above OECD average performance, fairness and sense of belonging at school (Figure II.1.4).

Systems offering greater fairness in learning opportunities also offer greater fairness in social opportunities

On average across OECD countries disadvantaged students' sense of belonging at school deteriorated between 2018 and 2022, while advantaged students' sense of belonging remained stable. However, in most education systems, the sense of belonging among these two groups of students developed in similar directions during the period (Table II.B1.1.7), such that disadvantaged students in 2022 were more likely than their advantaged peers to report feeling that they have fewer opportunities to form close bonds at and with school (Table II.B1.1.2).

PISA 2022 results show that disadvantaged students' sense of belonging at school was more similar to that of their advantaged peers in those education systems that were more socio-economically fair (Figure II.1.5 and Table II.B1.1.13). Equally important, socio-economic differences in sense of belonging at school shrank in those systems where the performance of disadvantaged students improved. The results suggest that working towards socio-economic fairness in learning opportunities may help establish fairness in social opportunities at school as well, or vice versa.

Figure II.1.5. Performance in mathematics and sense of belonging at school, by students' socio-economic status



1. Socio-economic fairness in social opportunities is measured by the percentage-point difference in sense of belonging between socio-economically advantaged and disadvantaged students. Smaller differences indicate greater fairness in social opportunities.

2. Socio-economic fairness in academic learning is measured by the percentage of variation in student performance that is not accounted for by differences in students' socio-economic status. Higher percentages indicate greater fairness in academic learning.

Note: Each dot represents a PISA-participating country/economy.

Source: OECD, PISA 2022 Database, Annex B1, Chapter 1.

Nevertheless, no system achieved absolute fairness in both mathematics performance and students' sense of belonging at school (Tables II.B.1 and II.B1.1.2). For example, Cambodia, Jamaica*, the Philippines and Macao

(China) were the only systems where disadvantaged students reported feeling as socially connected at school as their advantaged peers. However, the average sense of belonging among all students in these systems was below the OECD average, and performance in mathematics was also below the OECD average except for Macao (China). In Denmark*, Finland, Japan, Korea by contrast, students' average sense of belonging at school and performance in mathematics were above the OECD average. These systems are also fair in terms of performance, but disadvantaged students were less likely than their advantaged peers to report that they feel socially connected at school.

Components of resilience

This volume identifies several “components of resilience”. These policies, practices and school characteristics are shown to be related to the resistance and strength of education systems, as discussed in detail in the remaining chapters (see Box II.1.1 for details). Thus, they may be key to promoting learning, equity and well-being in schools, even in challenging circumstances.

Resilient systems differ in certain school policies, practices and characteristics

Table II.1.1 shows that the seven education systems that were resilient in mathematics (the systems in the orange circle in Figure II.1.1 differ in school policies, practices and characteristics compared to other countries/economies. For instance, in their response to COVID-19, all resilient systems avoided longer school closures (longer than three months) for a majority of their students, while one in two students attended a school that was closed for a longer period, on average across all education systems. When schools had to be closed, students in these systems (except Australia*) faced fewer obstacles to remote learning than students on average did (e.g. fewer problems with access to digital devices, or finding someone who could help with school work).

Students in most resilient systems also benefitted from more parental support and a school climate that is more favourable to students' learning and well-being, such as safer schools and greater discipline in classes. For example, less than 4% of students in Japan reported that, in most or every lesson, they become distracted by fellow students' use of digital devices in mathematics lessons, while in most other countries, 25% of students so reported (Table II.B1.3.9). Teachers in most resilient systems also continued to inform parents about their children's progress, to ensure that parents stayed involved in their child's learning.

Resilient systems also differed in their approach to selecting and grouping students. In most of the resilient systems, especially those that ensured that equity remained stable or improved, students are tracked into different educational programmes after the age of 14, the average age for tracking across countries/economies. Students are also less likely to have repeated a grade.

Resilient systems also seem to have invested into a solid foundation for student learning and well-being in schools, providing better qualified staff and high-quality digital resources for their students. Most resilient systems also increased peer-to-peer tutoring in school more than did all education systems on average. For instance, in Lithuania four out of five students were tutored by peers in 2022 while in 2018 only three out of five students were (an increase of 15 percentage points) (Table II.B1.5.82). Resilient systems also stood out in their approach to school governance, relying more strongly on internal evaluation and self-evaluation as a quality-assurance mechanism and more on schools to shape the curriculum (e.g. deciding on courses, course content and learning materials).

Table II.1.1. Key characteristics of the school environment in resilient education systems

	OECD average	Overall average	Japan	Chinese Taipei	Korea	Lithuania	Singapore	Switzerland	Australia*
Chapter 2: How learning continued when schools were closed									
Percentage of students whose school building was closed for less than three months because of COVID-19	49%	49%	84%	90%	79%	67%	m	76%	53%
Problems with remote learning (mean index) ¹	-0.01	0.14	-0.65	-0.56	-0.44	-0.12	m	-0.19	0.19
Chapter 3: Life at school and support from home									
Disciplinary climate in mathematics (mean index) ¹	0.02	0.04	1.09	0.34	0.84	0.21	0.22	0.11	-0.24
School safety risks (mean index) ¹	0.01	0.04	m	-0.35	-0.41	-0.14	-0.15	-0.05	m
Change in the percentage of students in schools where teachers initiated discussions on child's progress with most parents ²	-7.6% dif.	-5.3% dif.	-5.6% dif.	-0.9% dif.	-2.8% dif.	-7.3% dif.	0.3% dif.	-19.6% dif.	-5.2% dif.
Chapter 4: Selecting and grouping students									
Age at first selection into different education programmes	14.3	14.5	15	15	15	14	12	12	16 ⁴
Percentage of students who had repeated a grade at least once in primary, lower and/or upper secondary school ³	9%	11%	0%	1%	3%	2%	4%	13%	5%
Chapter 5: Investments in a solid foundation for learning and well-being									
Percentage of students in schools with adequate and qualified teaching staff	0.7	0.8	0.6	0.8	0.8	1.0	0.9	0.8	0.7
Percentage of students in schools with adequate and high-quality digital resources	0.8	0.6	0.5	0.9	0.7	0.9	1.0	0.9	0.9
Change in the percentage of students with peer-to-peer tutoring in school ²	3.1% dif.	2.3% dif.	25.5% dif.	-3.3% dif.	7.3% dif.	15.0% dif.	7.8% dif.	6.6% dif.	-2.4% dif.
Chapter 6: Governing education systems									
Percentage of students in schools that use internal evaluation/self-evaluation as a quality-assurance mechanism	95%	97%	99%	98%	100%	100%	99%	85%	98%
School responsibility for curriculum (mean index) ¹	2.43	1.99	4.45	2.95	2.39	2.17	2.18	1.23	3.38

1. Higher values in these indices indicate a better disciplinary climate, more problems with remote learning, more school safety risks and greater responsibility of schools for the curriculum. More information on how the indices were built, including the statements that were included, can be found in Annex A1.

2. The questions on grade repetition were not distributed in Japan and Norway. The share of grade repeaters has been set to zero in agreement with countries since there is a policy of automatic grade progression and more than 99.5% of students were enrolled in the same grade level.

3. Information on age at first selection comes from PISA 2018.

Source: OECD, PISA 2022 Database.

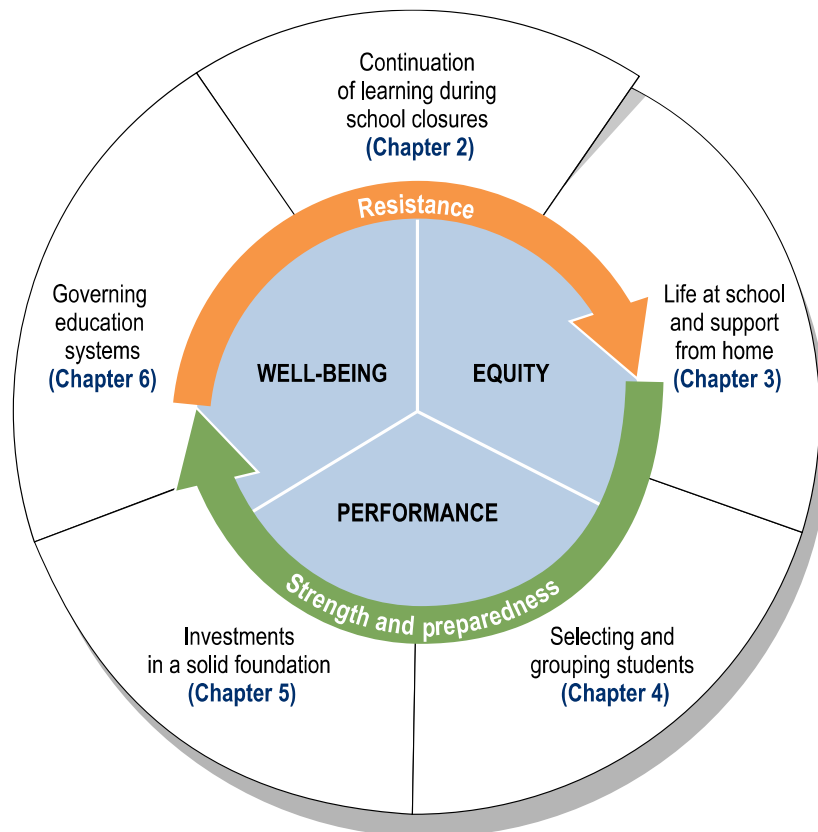
Various school policies, practices and characteristics are related to systems' resilience and students' learning and well-being

The remaining chapters of this volume discuss in greater detail important differences in policies and practices across education systems and schools, and how they are related to systems' resilience, and students' learning and well-being (see Figure II.1.6). Drawing on past PISA reports (OECD, 2016^[7]; OECD, 2013^[8]; OECD, 2016^[9]; OECD, 2017^[10]; OECD, 2020^[11]) the volume focuses on five areas:

- **Continuing learning when schools are closed (Chapter 2)** – school closures due to COVID-19; how students learned and their impressions and feelings about learning remotely; how systems and schools supported students' learning and well-being; whether students acquired the skills to learn independently; and whether schools built their capacities to support learning remotely in the event of future school closures.
- **Life at school and support from home (Chapter 3)** – student truancy and lateness after school reopening; whether schools team up with parents and provide a safe environment for learning that minimises bullying; teacher support and the disciplinary climate in mathematics lessons.
- **Selecting and grouping students (Chapter 4)** – attendance at pre-primary education; the structure of grades and programmes that students must complete in order to graduate from school (i.e. vertical stratification); how students are grouped and selected into different curricular programmes, schools and ability groups (i.e. horizontal stratification).

- **Investments in a solid foundation for learning and well-being (Chapter 5)** – resources invested in education systems (education expenditure per student, education staff and educational material, including digital devices) and how they are related to student outcomes; how students allocate their time, at and outside of school, for learning and leisure activities, using digital devices or not.
- **Governing education systems (Chapter 6)** – how responsibilities for education are shared among stakeholders; how public and private organisations are involved in the administration and funding of schools; the degree of school choice and school competition in the system; the policies and practices through which education systems ensure that learning standards are met, such as through student assessments, teacher and principal appraisals, and school evaluations.

Figure II.1.6. Aspects and areas of resilience in education examined in this volume



In addition to students' sense of belonging at school, which is closely related to their life at school and school policies (Box II.1.4), other indicators of subjective well-being were examined, including students' beliefs about their abilities (e.g. confidence in their capacity for self-directed learning), their feelings (e.g. mathematics anxiety) and their overall satisfaction with life.

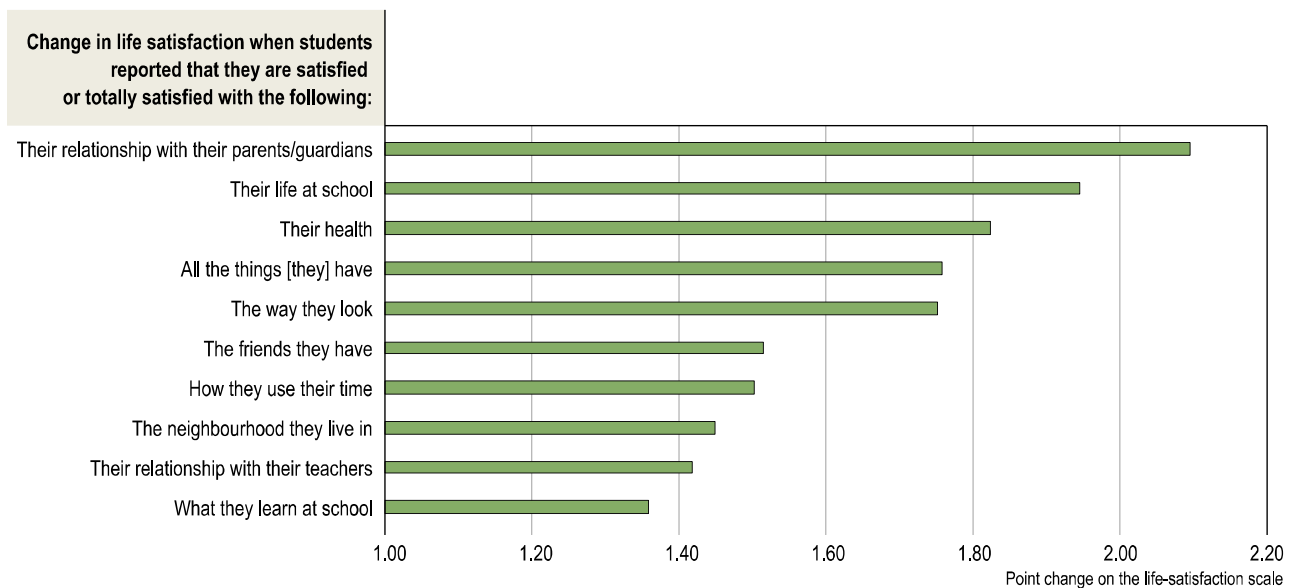
Box II.1.4. The role of school life and relationships in students' satisfaction with life

The importance of having close and diverse relationships with peers and adults for students' overall life satisfaction is also reflected when analysing different aspects of their lives. In 13 countries/economies² that distributed the well-being questionnaire, students were asked how satisfied they were with different aspects of their lives.

On average, the best predictors of students' satisfaction with life were how satisfied they were with their relationship with their parents or guardians, their life at school, their health, all the things they have, and the way they look, after accounting for student and school characteristics (see Figure II.1.7). Other aspects of their life, such as the friends they have, how they use their time, the neighbourhood they live in, their relationship with teachers, and what they learn at school are also positively associated with their satisfaction with life. In addition to personal life experiences, cultural differences may also shape how adolescents evaluate their lives. For example, studies that compare adolescents' life satisfaction across cultures find that adolescents in Western countries report higher levels of life satisfaction than those in East-Asian states (Park and Huebner, 2005^[12]). Nonetheless, PISA results show that school is important to students' life satisfaction, and that students in learning environments where they have good relationships with parents, friends and teachers, and enjoy good physical and psychological health, may be more likely to be satisfied with their lives regardless of their socio-economic background.

Figure II.1.7. Life satisfaction and satisfaction with different aspects of life

Average of countries/economies with available data



Notes: All values are statistically significant (see Annex A3).

All linear regression models account for students' and schools' socio-economic profile. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

The scale on life satisfaction ranges from 0 (not at all satisfied) to 10 (completely satisfied).

Source: OECD, PISA 2022 Database, Annex B1, Chapter 1.

Strengthening resilience is a complex endeavor, requiring a panoply of policies as well as strategic planning (Box II.1.5). Rather than exhaustively detailing results for each question in the subsequent chapters, the volume highlights the results that are most relevant for the overarching question of which policies and practices are common to resilient systems and schools. The concluding Chapter 7 provides a synthesis of the main findings and implications for policy and practice on how to strengthen resilience in education systems. PISA assesses where systems are situated in the process of strengthening their capacity to overcome adversity and meet challenges. Resilience does not guarantee faster recovery and adaptation in the future, but it does make those outcomes more likely. Systems could still fail, even if they have invested in strong defences against adversity and disruption.

Box II.1.5. Strategic planning builds on the analyses of trends and scenarios for the future of education

Developing resilience in education involves anticipating future changes and their potential cascading effects to inform present strategies (Burns and Köster, 2016^[13]). For this, the analysis of social, economic and environmental trends is key. However, long-term planning is becoming more difficult because of rising complexity and uncertainty. While demographic trends develop slowly, other trends do not. In recent years, global economic shocks, like the Great Recession, the rapid spread of COVID-19 and the millions of children and young refugees requiring access to education following Russia's aggression against Ukraine, show that, as the interdependence of social and natural systems grows, so do the risks people face. Evolving global trends, such as climate change, Artificial Intelligence (AI) and changing social values, suggest that the future may be different, but no less challenging (OECD, 2022^[14]). For instance, more frequent and extreme weather events will increasingly endanger human health and physical infrastructure (IPCC, 2023^[15]), putting education operations at risk of severe disruption. Similarly, the fast-evolving capabilities of AI and robotics raise questions about the competences students need to develop, and whether current approaches to curriculum, pedagogy and assessment will continue to be fit for purpose (OECD, 2023^[16]).

In an increasingly uncertain environment, policy makers need to consider the changes that could be highly impactful, not just those that seem most probable (OECD, forthcoming^[17]). The discipline of strategic foresight offers several tools to do this, including scanning the horizon for emergent signals of change and building visions of desirable futures to “trace back” the steps that would be needed to realise them. Discussing multiple scenarios, that is, sets of alternative futures, is also useful. Scenario planning recognises that trends are dynamic and interconnected, and often influenced by changes in culture that are seemingly marginal or unlikely at present. Scenarios can reveal desirable futures as well as potential shocks and surprises, both of which can be used to act in the present, stress-testing current strategies and planning for contingencies.

Source: OECD (2022^[14]), Trends Shaping Education 2022, <https://doi.org/10.1787/6ae8771a-en>.

Table II.1.2. The resilience of education systems, schools and students figures and tables

Figure II.1.1	Resilient education systems
Figure II.1.2	Confirmed COVID-19 cases and deaths
Figure II.1.3	Students' sense of belonging at school
Figure II.1.4	Sense of belonging, and performance and equity in mathematics
Figure II.1.5	Performance in mathematics and sense of belonging at school, by students' socio-economic status
Table II.1.1	Key characteristics of the school environment in resilient education systems
Figure II.1.6	Aspects and areas of resilience in education examined in this volume
Figure II.1.7	Life satisfaction and satisfaction with different aspects of life

StatLink  <https://stat.link/zdfqpn>

Notes

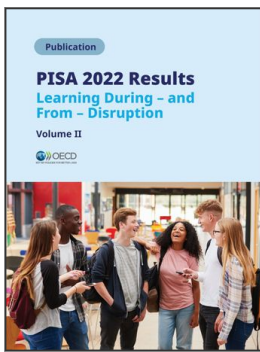
¹ A socio-economically disadvantaged (advantaged) student is a student in the bottom (top) quarter of the PISA index of economic, social and cultural status (ESCS) in his or her own country/economy (see Annex A1).

² The 13 countries/economies that distributed the well-being questionnaire were Brazil, Hong Kong (China)*, Hungary, Ireland*, Macao (China), Mexico, the Netherlands*, New Zealand*, Panama*, Saudi Arabia, Slovenia, Spain and the United Arab Emirates. The average results across these countries may not be representative of the OECD average.

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