7 From data to insights

Results from PISA offer a wealth of data points that can highlight aspects of education policy that merit further investigation and development. This chapter suggests a plan for digging deeper into PISA 2022 data to better understand how policies can be improved to meet the needs of every student.

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

The eighth assessment of PISA was delayed by one year due to the COVID-19 pandemic. Results from that assessment, PISA 2022, show that Singapore scored significantly higher than all other participating countries/economies in mathematics (575 points), reading (543 points) and science (561 points). In mathematics, six East Asian education systems, namely Singapore, Macao (China), Chinese Taipei, Hong Kong (China)*, Japan and Korea (in descending order of average scores) outperformed all other countries/economies. In reading, behind top-performing education system Singapore, Ireland* performed as well as Japan, Korea, Chinese Taipei and Estonia (in descending order of average scores) and better than 75 other countries/economies. In science, the highest-performing countries were the same six East Asian countries/economies, and Estonia and Canada* (Tables I.2.1, I.2.2 and I.2.3).

But PISA 2022 results also show significant deterioration in mathematics and reading performance between 2018 and 2022. During that period mean scores dropped by almost 15 points in mathematics and 10 points in reading, on average across OECD countries. Over half of the countries/economies that can compare PISA 2022 data with PISA 2018 data deteriorated in average mathematics and reading performance (Figure I.5.1).

Beyond score rankings, results from PISA offer policy makers a wealth of data points that can highlight aspects of education that merit further investigation – and that imply that changes to existing policies and practices, or the design and implementation of new ones, may be necessary.

Results from PISA 2022 suggest a plan for digging deeper into the data with the aim of better understanding how education policies can be improved to meet the needs of every student:

Examine why student performance declined so sharply

The steep declines in performance observed between 2018 and 2022 are unprecedented, given that changes in the OECD average over consecutive PISA assessments up to 2018 had never exceeded four score points in mathematics and five score points in reading. These more recent declines are equivalent to around half a year to three-quarters of a year of learning, as 20 score points represents the average annual pace of learning among 15-year-olds in countries/economies that participated in PISA (see Volume I Box I.5.1 for details).

The sharp declines may not be due solely to the pandemic because performance trends vary across subjects...

Between 2018 and 2022, average performance in mathematics and reading deteriorated precipitously while average performance in science did not change significantly, on average across OECD countries. Indeed, in 33 out of 71 countries/economies, science performance remained broadly stable between 2018 and 2022 (Figure I.5.1).

...and across education systems...

During the period, mathematics performance improved in Chinese Taipei, Saudi Arabia, the Dominican Republic, Brunei Darussalam, Cambodia, Paraguay and Guatemala (in descending order) by around 10 to 16 score points. However, in Albania, Jordan, Iceland, Norway and Malaysia (in descending order), mathematics scores dropped by more than 30 points (Figure I.5.1).

Reading performance improved in Brunei Darussalam, Panama*, Chinese Taipei, Qatar, Japan, the Dominican Republic, and Cambodia (in descending order) by around 8 to 21 score points between 2018 and 2022; but in Albania, Iceland and North Macedonia, reading scores declined by more than 30 points during that period.

Science performance improved in 18 countries/economies between 2018 and 2022, including in Kazakhstan, the Dominican Republic, Panama*, Chinese Taipei, Japan, Cambodia and Brunei Darussalam (in descending order), where scores improved by around 15 to 26 points. However, in Albania, North Macedonia, Iceland and Malaysia (in descending order), science scores deteriorated by more than 20 points during the period.

... and performance was already deteriorating before the pandemic...

The deterioration in mathematics performance between 2018 and 2022 followed a decade-and-a-half of stable performance. Trajectories in reading and science performance, however, had already turned negative before 2018, after reaching their highest levels between PISA 2009 and 2012, well before the COVID-19 disruptions (Figure I.6.1).

The following countries/economies were already showing a decline in mean performance prior to 2018. These negative trends were often confirmed and reinforced between 2018 and 2022 (Figure I.5.3):

- Belgium, Canada*, the Czech Republic, Finland, France, Hungary, Iceland, the Netherlands*, New Zealand* and the Slovak Republic in mathematics performance
- Costa Rica, Finland, Iceland, the Netherlands*, the Slovak Republic, Sweden and Thailand in reading performance
- Belgium, Finland, Germany, Greece, Iceland, Kosovo, the Netherlands* and Slovenia in science performance.

...which suggests that there are other structural reasons for the decline.

Provide all students with opportunities to fulfil their potential regardless of their backgrounds, and tailor policies to education systems' particular contexts

In 70% of PISA-participating education systems the gap in mathematics performance related to socio-economic status did not change between 2018 and 2022 – mainly because both advantaged and disadvantaged students' performance deteriorated during the period.

The gap in mathematics performance related to socio-economic status did not change between 2018 and 2022 in 48 out of the 68 countries/economies with available PISA data. This gap widened on average across OECD countries and in 13 countries/economies; it narrowed in 7 countries/economies (Argentina, Brazil, Chile, Moldova, the Philippines, Saudi Arabia and the United Arab Emirates). Of these latter countries, only in Argentina, the Philippines and Saudi Arabia did the gap narrow because of improvements in disadvantaged students' performance. In three other countries, advantaged students' performance deteriorated (Table I.5.3).

Many education systems became more inclusive of marginalised populations over the past decade.

Many countries/economies, including Cambodia, Colombia, Costa Rica, Indonesia, Morocco, Paraguay and Romania, made significant progress towards the goal of universal secondary education over the past decade. While in four of these countries average PISA scores appeared to decline, in fact they improved or remained stable after accounting for the expansion of secondary education to previously marginalised populations (Figure I.6.7).

PISA results show that education systems can both attain higher overall performance and minimise the impact of students' socio-economic status on their performance.

Education systems in Canada*, Denmark*, Finland, Hong Kong (China)*, Ireland*, Japan, Korea, Latvia*, Macao (China) and the United Kingdom* are highly equitable. They have achieved high levels of socio-economic fairness at the same time as a large share of their 15-year-old students have attained at least basic proficiency in mathematics, reading and science (Figure I.4.20).

Results from PISA can indicate which type of policy, universal or targeted, is more likely to have a strong impact on a particular education system.

PISA results can indicate whether policies should be targeted to low-performing or socio-economically disadvantaged students or both. They can also help policy makers determine whether students or schools should be targeted (Box I.4.3).

In Japan, Lithuania, the Netherlands*, Poland, Slovenia and Chinese Taipei, performance-targeted policies aimed at improving the scores of the lowest performers, regardless of their socio-economic status, could be implemented initially at the school level. Conversely, Australia*, Canada*, Korea, New Zealand* and Sweden could implement such policies by focusing first on individual students.

If the aim is to reduce inequalities in education by providing additional resources, support or assistance to disadvantaged students and schools, targeting disadvantaged schools is likely to have a greater impact in Bulgaria, Colombia, Malaysia, Mongolia, Panama*, Peru and Uruguay. The only exception is Portugal, where disadvantaged students, rather than schools, could be targeted first.

In Austria, Belgium, the Czech Republic, France, Hungary, Israel, Romania and the Slovak Republic a mix of targeted policies that provides adapted resources and support to address both low achievement and disadvantage may be more effective when targeting schools. Only in Singapore and Switzerland are students from disadvantaged backgrounds more evenly distributed across schools than the OECD average.

Study resilient systems where learning, equity and well-being were maintained and promoted despite pandemic-related disruptions

Four education systems, namely Japan, Korea, Lithuania and Chinese Taipei, are identified as resilient education systems...

Of the 81 countries/economies that participated in PISA 2022, only Japan, Korea, Lithuania and Chinese Taipei showed overall resilience: they performed well, were equitable, their students reported a sense of belonging at school that was as strong as or stronger than the OECD average in 2022, and they showed no deterioration in any of these aspects between 2018 and 2022 (Figure II.1.1).

...while 21 education systems were resilient in one or two of the three aspects considered: performance, equity and students' well-being.

Singapore was resilient in both mathematics performance and equity, but not in well-being (with a focus here on students' sense of belonging at school). Switzerland was resilient in both mathematics performance and students' well-being, but not in equity. Australia* was resilient in mathematics performance, but not in equity or in well-being. Hong Kong (China), the United Kingdom* and the United States* were considered resilient in equity, but not in mathematics performance or in well-being. Austria, Croatia, Finland, France, Georgia, Germany, Hungary, Iceland, Montenegro, Portugal, Romania, Saudi Arabia, Serbia, Slovenia and Sweden were resilient in well-being but not in mathematics performance or in equity.

Ten actions related to resilience:

1. Keeping schools open longer for more students

PISA 2022 data show that systems that spared more students from longer school closures scored higher while their students enjoyed a greater sense of belonging at school.

PISA 2022 student-reported data show that systems that spared more students from longer closures (longer than three months) tended to score higher in mathematics (Figure II.2.2). These systems also showed stable or improving trends between 2018 and 2022 in their students' sense of belonging at school (Figure II.2.3).

PISA 2022 asked students whether their school building was closed to students for more than a month in total (some schools closed and reopened multiple times during the period) in the previous three years due to COVID-19. In most countries/economies, schools were closed for several months because of the pandemic (Table II.B1.2.1). On average across OECD countries, fewer than one in two students reported that their school was closed for less than three months. In fact, only one in three countries/economies with available data avoided longer school closures for a majority of their students. In Iceland, Japan, Korea, Sweden, Switzerland and Chinese Taipei more than three out of four students indicated that their school was closed for less than three months, while in Brazil, Ireland*, Jamaica* and Latvia* only one out of four students or fewer who responded to the question reported so.

Keeping schools open longer, for more students, seems to be important – but insufficient – for maintaining students' learning during disruptions; how learning is organised during school closures also matters. In situations where schools have to be closed, education systems and schools have to ensure that instruction can continue in remote mode in order to avoid severe learning losses. Remote education forces students to learn more autonomously which, in turn, requires them to draw on their self-directed learning skills. Promoting the acquisition of these skills in school is not only beneficial to individual students, it is also an investment in the resilience of education systems.

2. Preparing students for autonomous learning

When remote learning runs smoothly, students and education systems benefit.

Education systems in which students encountered fewer problems during remote learning tended to score higher in mathematics than other systems, on average (Table II.B1.2.45). In addition, these systems saw improvements in their students' sense of belonging at school between 2018 and 2022, pre- to post-COVID (Table II.B1.2.46).

However, remote learning left many students struggling to motivate themselves. PISA 2022 results show that, on average across OECD countries, almost one in two students indicated that they had problems at least once a week motivating themselves to do schoolwork. In Australia* and the United Kingdom*, six out of ten students reported that they frequently had difficulty motivating themselves to do schoolwork while learning remotely – more than double the share of students in Guatemala, Iceland, Indonesia, Kazakhstan, Korea, Moldova and Chinese Taipei who so reported. Once motivated, however, students seemed to be well-equipped for learning: at least three out of four students reported that they never or only a few times had problems with access to a digital device when they needed one, with Internet access, with finding a quiet place to study, with time to study because of household responsibilities or with finding someone who could help them with schoolwork (Figure II.2.13 and Table II.B1.2.30).

Students were more confident about using digital technology for remote learning than about taking responsibility for their own learning.

PISA 2022 also explored whether education systems prepared students for autonomous learning by asking students to report on their confidence in their capacity for self-directed learning. Overall, students reported feeling more confident about using digital technology for learning remotely during school closures than they felt about taking responsibility for their own learning (Table II.B1.2.5). For instance, on average across OECD countries, about three out of four students reported that they feel confident or very confident about using a learning-management system,

a school learning platform or a video communication program, and about finding learning resources on line on their own (Figure II.2.5). Only six out of ten students reported feeling equally confident about motivating themselves to do schoolwork and focusing on it without reminders.

These results suggest that providing students with the skills to use technological tools for learning is not enough; students also need to learn how to assume responsibility for their learning. Some education systems implemented a new programme to enhance students' skills in and attitudes towards self-directed learning. See Box II.7.1 for an example in Singapore.

Teachers could play a key role in enhancing students' confidence in their capacity for self-directed learning.

In education systems where students reported that their teachers were available when they needed help, students tended to be more confident that they could learn independently and remotely if their school has to close again in the future. On average across OECD countries, students who had a more positive experience with remote learning – for example, students who agreed or strongly agreed that their teachers were available when they needed help – scored higher in mathematics and reported feeling more confident about learning independently if their school has to close again in the future (Figure II.2.11 and Table II.B1.2.47).

Box II.7.1. Blended Learning in secondary and pre-university schools in Singapore

As part of Blended Learning, regular Home-Based Learning (HBL) Days have been implemented in all secondary schools and pre-university institutions since the end of 2022. This programme aims to help students become self-directed, independent and passionate learners. Regular HBL Days provide students with more opportunities to learn curricular content in a self-directed manner, using both digital and non-digital methods of learning. HBL Days also include time set aside for student-initiated learning, where students can pursue their own interests and learn outside the curriculum – such as learning a foreign language, or studying financial literacy or programming.

Schools schedule about two HBL days a month as part of the school schedule. This accounts for about 10% of curriculum time in an academic year. HBL Days are less structured than a typical day in a classroom, allowing students to learn curricular content in a self-paced manner. Around four to five hours are allocated to the curriculum and at least one hour is dedicated to student-initiated learning. Schools determine the subjects and topics covered on HBL Days and customise the support for student-initiated learning based on their students' interests and needs. For example, for students who need more guidance on their student-initiated learning, schools can suggest activities or provide resources at the start, before reducing this scaffold over time.

Educational technology platforms and resources, such as those in the Singapore Student Learning Space, the national online learning platform, and personal learning devices that have been rolled out for all secondary school students under the National Digital Literacy Programme, support the implementation of Blended Learning. Students who require additional learning support or who do not have a home environment that is conducive to learning can return to school on HBL Days where they will be supervised by school personnel but will still have the opportunity to learn and organise their schedule independently.

Source: (Ministry of Education, Singapore, 2020[1]; Ministry of Education, Singapore, 2022[2])

3. Building strong foundations for learning and well-being for all students

No system provided all of its students with the solid foundations needed for learning and well-being, such as food security…

On average across OECD countries, 8.2% of students reported that they had not eaten at least once a week in the previous 30 days because there was not enough money to buy food. Some OECD countries have some of the smallest proportions (less than 3%) of these students, notably Portugal (2.6%), Finland (2.7%) and the Netherlands* (2.8%). However, in some OECD countries the proportion of students who suffer from food insecurity exceeds 10%, including Türkiye (19.3%), New Zealand* (14.1%), Colombia (13.3%), Chile (13.1%), the United States* (13%), Lithuania (11%) and the United Kingdom* (10.5%) (Figure I.4.6).

...and feelings of safety.

Overall, students feel safe at school, particularly in their classrooms. However, PISA 2022 results suggest that education systems could consider improving safety on the routes students travel to or from school, or in places outside of the classroom, such as hallways, cafeterias or restrooms (Figure I.3.9 and Table II.B1.3.17). Around 10% of students disagreed or strongly disagreed that they feel safe in these places, on average across OECD countries. In Jamaica*, Moldova and Morocco, 25% of students reported feeling unsafe outside the classroom, and in Baku (Azerbaijan), Jamaica* and Moldova, more than 15% of students reported feeling unsafe even in their classroom. However, in many systems, including Belgium, Croatia, Ireland*, Korea, the Netherlands*, Portugal, Serbia, Singapore, Switzerland and Chinese Taipei, less than 5% of students reported feeling unsafe in their classroom or in other places in the school.

Education systems can address food security and safety through various policies. In Finland, school meals are an integral part of the national core curriculum. National legislation guarantees students, from pre-primary through upper secondary education, the right to free meals on school days (Finnish National Agency for Education, 2023[3]). In Ireland, the School Meals Programme provides funding for the provision of needs-based meals for students and children in schools and organisations (Ireland Department of Social Protection, 2022[4]). In Portugal, the School without Bullying, School without Violence plan (2019) emphasises a whole-community approach to combatting bullying and school violence, with actions aimed at teachers, parents, students and other stakeholders. Schools define an action plan involving strategies and activities that raise awareness about harmful behaviours and promote early identification (OECD, 2021[5]). In the Flemish Community of Belgium, the *Paraat voor de schoolstraat (Ready for the school street)* policy initiative, aimed at reducing air pollution in school neighbourhoods, prohibits vehicles from driving on streets near schools for set periods of time in the morning or afternoon (Burns and Gottschalk (eds.), 2020[6]).

4. Limiting the distractions caused by using digital devices in class

One in three students becomes distracted while using digital devices at school.

PISA 2022 data show that, on average across OECD countries and in around a third of all education systems, the disciplinary climate improved between 2012 and 2022 (Table II.B1.3.12). However, apart from “traditional” disciplinary problems, around 30% of students, on average across OECD countries, reported that, in most or every mathematics lesson, they get distracted using digital devices (Figure II.3.4 and Table II.B1.3.9). Equally important, around 25% of students indicated that, in most or every lesson, they become distracted by other students who are using digital devices, that the teacher has to wait a long time for students to quiet down, that students cannot work well and that students do not start working for a long time after the lesson begins.

Limiting distractions is important for student performance and well-being.

On average across OECD countries, students who reported that they become distracted in every or most mathematics lessons scored 15 points lower in mathematics than students who reported that this never or almost never happens, after accounting for students' and schools' socio-economic profile (Table II.B1.3.13). A similar pattern was observed in over 80% of education systems with available data. In all countries/economies students who perceive the climate in their mathematics lessons to be less disruptive reported feeling less anxious towards mathematics (Table II.B1.3.16).

Students who frequently use smartphones at school reported that they are likely to become distracted while using digital devices in mathematics lessons.

Relying on students' cell phones at school increases the risk that students use their phones in class for non-educational activities or get distracted by notifications. Students appear to be less distracted when they switch off notifications from social networks and apps on their digital devices during class, when they do not have their digital devices open in class to take notes or search for information, and when they do not feel pressured to be on line and answer messages while in class (Table II.B1.5.44).

Policies that target students' skills and behaviours when using digital devices are critical for limiting distractions.

Many schools have introduced guidelines addressing the problem of distraction when students use digital devices in school. The content and design of such rules, as well as the capacity to enforce them, determine their effectiveness. When a school's written statements or rules are too general, imprecise or lenient, they are unlikely to benefit teaching and learning with digital devices. Schools and teachers also need the time and capacity to enforce such rules. Teachers are probably unable to monitor what their students are doing with their digital devices in class, even when the devices are used as part of the lesson. Indeed, teachers' preparedness in integrating digital devices in instruction bears little relationship with the possibility of students becoming distracted while using digital devices during mathematics class (Figure II.5.9).

Students are less likely to report being distracted by using digital devices in mathematics lessons when the use of cell phones on school premises is banned. At first glance, cell phone bans would appear to be a useful policy. However, further research is needed to fully understand the effectiveness and impact of such bans. On average across OECD countries, 30% of students in schools where the use of cell phones is banned reported using a smartphone several times a day, and 21% reported using one every day or almost every day at school (Table II.B1.5.39). These data show that cell phone bans are not always effectively enforced. PISA 2022 results also show that, in some countries/economies, when cell phones are banned at their school, students are less likely to turn off their notifications from social networks and apps on their digital devices when going to sleep at night (Table II.B1.5.45). This finding suggests that students in schools with cell phone bans might not have adequate opportunities to develop self-directed strategies for using cell phones.

Moderate use of digital devices in school is related to higher performance; but the relationship differs greatly according to the purpose of use.

Students who spend up to one hour per day on digital devices for learning activities in school scored 24 points higher in mathematics than students who spend no time on such devices, on average across OECD countries. Even after accounting for students' and schools' socio-economic profile, the former group of students scored 14 points higher. This positive relationship is observed in over half of the education systems with available data. However, the relationship becomes negative when students spend more than one hour per day on digital devices for learning in school (Table II.B1.5.66).

Students who spend up to one hour per day on digital devices for leisure activities scored 20 points higher in mathematics than students who spend no time on such devices. The difference in performance amounts to 10 points

even after accounting for students' and schools' socio-economic profile. This positive relationship is observed in around half of the education systems with available data (Table II.B1.5.67). However, students who spend more than an hour per day on digital devices for leisure activities scored lower in mathematics.

These findings suggest that moderate use of digital devices is not intrinsically harmful and can even be positively associated with performance. It is the overuse and/or misuse of digital devices that is negatively associated with performance. Results from PISA 2022 confirm the need for better guidelines on how to use digital devices at school.

5. Strengthening school-family partnerships and keeping parents involved in students' learning

In many education systems parental involvement in students' learning decreased.

PISA trend data collected from school principals show that the percentage of parents who were involved in school activities decreased substantially between 2018 and 2022 in many countries/economies, especially the share of parents involved in learning-related activities (Figure II.3.15 and Table II.B1.3.67). On average across OECD countries, the share of students in schools where most parents discussed their child's progress with a teacher on their own initiative or on the initiative of one of their child's teachers shrank by ten and eight percentage points, respectively. Only in a few countries/economies did parents become more involved during the period: in Macao (China), Mexico and Romania, parents were more involved in parent-initiated discussions with teachers in 2022 than in 2018; in Brunei Darussalam, the Dominican Republic, Georgia, Qatar, Saudi Arabia and the United Arab Emirates, more parents in 2022 than in 2018 were involved in teacher-initiated discussions.

Education systems with more positive trends in parental involvement showed stable or improved performance, especially among disadvantaged students.

The education systems in which the share of parents who discussed their child's progress with a teacher on their own initiative shrank less between 2018 and 2022 showed more stable or improved mathematics performance (Figure II.3.16), especially among disadvantaged students (Table II.B1.3.77).

Students who were supported at home had more positive attitudes towards school and learning.

In all countries/economies, students who enjoy more support from their families reported a greater sense of belonging at school and life satisfaction, and more confidence in their capacity for self-directed learning (Table II.B1.3.75). In most countries/economies, these students also reported feeling less anxious towards mathematics.

Students thrive when their families take an active interest in them and their learning.

Higher-performing students reported that their family regularly ("about once or twice a week" or "every day or almost every day") eats the main meal together, spends time just talking with them, or asks them what they did in school that day. These students scored 16 to 28 points higher in mathematics than students who reported that their family does not do those things regularly, on average across OECD countries and after accounting for students' and schools' socio-economic profile (Table II.B1.3.72).

Students' responses to the question about whether their parents or someone from the family asks what they did in school that day show one of the greatest variations across education systems. In Australia*, Colombia, Croatia, Denmark, Germany, Hungary, Italy, Ireland*, the Netherlands*, New Zealand*, Portugal, Sweden and the United Kingdom*, at least 80% of students reported that their parents or someone in their family asks what they did in school that day about once or twice a week. In Hong Kong (China)*, Macao (China) and Thailand, only around 50% of students reported that this occurs regularly (Figure II.3.18).

While there is no doubt as to the importance of parental and family engagement in education, there is an on-going debate on the appropriate balance and nature of their involvement, especially beyond children's early years. PISA

results show that, for adolescents, even seemingly innocuous activities, like sharing a family meal or just talking together, are strongly associated with student performance and well-being.

6. Delaying the age at selection into different education programmes

Early tracking is negatively associated with socio-economic fairness, and is related to the concentration of advantaged/disadvantaged students in schools

PISA 2022 results consistently show that in systems where students are selected into different curricular programmes at an earlier age, there is a stronger association between students' socio-economic profile and their performance (Table II.B1.4.31).

The earlier students are selected into different academic programmes, the greater the isolation of advantaged and disadvantaged students in the education system (Figures II.4.16 and II.4.17). The measures of concentration of advantaged and disadvantaged students in schools gauge the opportunities for social interaction between different groups of students in a school. This is important because classmates and schoolmates can have a strong influence on one another (i.e. peer effects) – for better and for worse. They can motivate each other and help each other overcome learning difficulties; but they can also disrupt instruction, require disproportionate attention from teachers, and be a source of anxiety.

PISA results show that early tracking, the concentration of advantaged and disadvantaged students in schools, and socio-economic fairness in mathematics are related. Although PISA data cannot determine how they are related, they provide insights into some aspects that countries may wish to consider as they aim to provide learning opportunities for all students. It may be worth exploring whether the undesirable consequences of early tracking can be mitigated by: keeping the concentration of advantaged and disadvantaged students in schools at reasonable levels and minimising its impact on student learning; removing the social stigma associated with certain tracks; implementing challenging and rich curricula in all programmes and ensuring they are adequately supported and resourced; introducing flexibility into the system so that students can transfer easily between programmes; and offering pathways to higher education to all students.

7. Providing additional support to struggling students instead of requiring them to repeat a grade

Education systems with more grade repetition tend to show lower average performance in mathematics.

In the group of high-performing and equitable systems, comparatively few students had repeated a grade (Table II.4.2). Across OECD countries, the greater the proportion of grade repeaters in an education system, the lower the average mathematics performance and the stronger the relationship between students' socio-economic profile and their performance in mathematics (Table II.B1.4.31).

Teachers in education systems with automatic grade promotion provide greater support to students.

Students in education systems with automatic grade promotion were more likely than students in education systems without automatic grade promotion to report that their mathematics teachers are supportive, and that they have good relationships with their teachers (when considering the latter, the difference is significant only when comparing OECD countries) (Figure II.4.9).

Greater efforts are needed to ensure that students receive necessary and relevant support from their teachers.

PISA 2022 results suggest that further efforts are needed to ensure that students receive necessary and relevant support from teachers. In half of all countries/economies and on average across OECD countries, teacher support

deteriorated between 2012 and 2022 (Table II.B1.3.4). For instance, the share of students who reported that their teacher gives extra help when students need it in most or every lesson decreased by three percentage points over the period. In 2022, around 70% of students reported that their teacher gives extra help when students need it and, in every or most lessons, continues teaching until students understand, on average across OECD countries; 30% of students reported that their teachers do not do these things (Table II.B1.3.1).

Attendance at pre-primary school seems to reduce the likelihood of repeating a grade later on.

While the cross-sectional nature of PISA data cannot establish causality, PISA 2022 results clearly show that, on average across OECD countries and in a majority of education systems, students who had attended pre-primary school for at least one year were considerably less likely to have repeated a grade at any education level than students who had never attended pre-primary school or who had attended for less than a year, even after accounting for socio-economic factors (Figure II.4.5).

The education systems with the strongest negative association between attendance at pre-primary school and grade repetition were Denmark, Greece, Iceland, Israel, Malaysia, Chinese Taipei, Thailand, Singapore and Sweden; the only education system with a positive association was North Macedonia. In Thailand, 15-year-old students who had not attended pre-primary school, or had done so for less than one year, were about 5 times more likely to have repeated a grade than students who had attended for one year or longer.

8. Ensuring adequate, high-quality education staff and material

Principals were more concerned about the shortage of education staff in 2022 than in 2018.

PISA results show that between 2018 and 2022, in more than half of all education systems school principals in 2022 were more likely than their counterparts in 2018 to report that instruction was hindered, to some extent or a lot, by inadequate or poorly qualified teaching staff. This was particularly evident in education systems that saw the proportion of full-time teachers shrink over the period. Yet PISA results also show that between 2018 and 2022, student-teacher ratios and class size decreased slightly, on average across OECD countries, or remained stable in most countries/economies.

It is important for education systems to examine why principals in 2022 perceived a greater shortage of teachers when the number of teachers per student had not necessarily decreased. Other notions or phenomena might be feeding this perception, such as teacher absenteeism, the idea that teachers are not sufficiently qualified, or even changes in the role of teachers, which can, in turn, affect expectations and thus alter the standards against which teacher performance is measured.

By contrast, school principals in 2022 were less likely than their counterparts in 2018 to report a shortage of educational material. However, within education systems the availability of educational material varied across schools.

Education systems need to provide adequate and high-quality educational material and digital devices, and develop guidelines for their use.

PISA 2022 results show that socio-economically disadvantaged schools were more likely than advantaged schools to suffer from shortages of material resources, on average across OECD countries and in 47 education systems (Figure II.5.7). On average across OECD countries and in 41 education systems, advantaged schools were more likely than disadvantaged schools to suffer from a lack of or poor-quality digital resources (Figure II.5.6).

Within each education system, it is important to ensure that all schools, regardless of their socio-economic profile, enjoy adequate and quality educational material and digital resources.

9. Establishing schools as hubs for social interaction

PISA 2022 results show that schools can serve as hubs not only for students' learning but also for their well-being.

In high-performing education systems, schools tend to provide a room where students can do their homework, and school staff offer help with homework (Table II.B1.5.102). This relationship is observed both across OECD countries, and across all countries/economies, even after accounting for per capita GDP. A similar relationship is observed within education systems as well. Students in schools that provide a room to do homework scored 13 points higher in mathematics than students in schools that do not provide such a room, on average across OECD countries. After accounting for students' and schools' socio-economic profile the improvement is smaller (three points), but still significant (Table II.B1.5.87).

Across OECD countries, an increase in the availability of peer-to-peer tutoring is associated with an increase in students' sense of belonging at school. In education systems where more students in 2022 than in 2018 attended schools that offer peer-to-peer tutoring, students' sense of belonging at school strengthened during the period (Table II.B1.5.104).

These results highlight the importance of social interaction for student learning and well-being. Collaboration or co-operation, the key component of teamwork, can be incorporated into curricula to facilitate learning. For example, more than half of the curriculum in Estonia, Kazakhstan and Korea involves collaborative learning (OECD, 2021[7]).

10. Combining school autonomy with quality-assurance mechanisms

Understanding the conditions under which greater school autonomy works in the interests of students is critical for education policy making.

PISA data show that the greater the autonomy granted to schools in an education system, the higher the average mathematics performance; and this is most evident when education authorities and schools had certain quality-assurance mechanisms in place (Figure II.6.1). More specifically, the quality-assurance mechanisms that appear to ensure that greater school autonomy is associated with better academic performance across PISA-participating countries/economies are (in descending order of importance): teacher mentoring arrangements; monitoring teacher practice by having inspectors observe classes; schools' systematic recording of students' test results and graduation rates; internal or self-evaluations; tracking achievement data by an administrative authority; and using mandatory standardised tests at least once a year.

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