Chapter 3

Boosting education quality in Emerging Asia: Recommendations from PISA 2018

The COVID-19 pandemic has left a majority of students worldwide out of school, even if temporarily. While ensuring continuity of education and learning, countries in the region need to address various challenges to improve the quality of education. Access to education will need to be further improved, while at the same time paying more attention to its quality. Properly trained teachers as well as appropriate teaching strategies and a positive environment are crucial to ensure productive learning. Addressing socio-economic divides in various aspects, including digital infrastructure, as well as gender gaps in students' participation and performance is necessary.

Introduction

The spread of COVID-19 has left a majority of learners across the globe out of school, even if temporarily. While learning has continued in some way or another, the consequences of the school closures have been particularly damaging for vulnerable students. Unfortunately, the type of resources that learning at home requires, such as access to digital resources and a quiet place to study, motivated, supportive and highly skilled parents and teachers, and the ability to learn autonomously, are far from universal. Vulnerable students tend to have fewer of these resources. While the full consequences of the school closures cannot be evaluated without hindsight, the Programme for International Student Assessment (PISA) 2018 results can provide a valuable reference point for education systems.

PISA is a triennial survey of 15-year-old students around the world that assesses the extent to which they have acquired key knowledge and skills essential for full participation in social and economic life. PISA assessments in reading, mathematics, science and innovative domains do not just ascertain whether students near the end of their compulsory education can reproduce what they have learned, they also examine how well students can extrapolate from what they have learned and apply their knowledge in unfamiliar settings, both in and outside of school. In its last cycle, about 600 000 students sat the assessment, representing about 32 million 15-year-olds in the schools of 37 OECD countries and 42 partner countries and economies.

PISA asks students, principals, teachers and parents, questions about students' background and attitudes towards learning, and about key factors that shape their learning in and outside of school; by doing so, PISA can identify the characteristics of students, schools and education systems that perform well.

PISA 2018 assessed the cumulative outcomes of education and learning of children between the ages of 15 years and 3 months and 16 years and 2 months who have been enrolled in an educational institution at grade 7 or above. All such students were eligible to sit the PISA assessment regardless of the type of educational establishment in which they were enrolled or whether they were enrolled in full-time or part-time education. Not all of the students who were eligible to sit the PISA assessment were actually assessed. A two-stage sampling procedure first selected a representative sample of at least 150 schools and, in the second stage, roughly 42 students were selected within those schools. In PISA 2018, a majority of countries and economies assessed between 5 000 and 7 500 students, but in Southeast Asia, Indonesia and Thailand assessed a larger number of students.

The participation of Southeast Asian countries in PISA

Some education systems in Southeast Asia have a long tradition of participation in the PISA assessments, whereas others only started participating in 2018. Indonesia and Thailand have participated in all cycles since PISA first assessed student learning outcomes in 2000; Malaysia and Singapore joined PISA in 2009; Viet Nam took part for the first time in PISA 2012; and Brunei Darussalam and the Philippines did so in PISA 2018 (Table 3.1). Cambodia, for its part, participated in PISA for Development (PISA-D), a project whose goal was to encourage and facilitate PISA participation by interested and motivated low-and middle-income countries (see Box 3.1).

Students in all countries in the region, except in Viet Nam, took the computer-based assessment, which allows education systems to take full advantage of the assessment (Table 3.2).

All countries and economies in PISA participate in the reading, mathematics, and science assessments. In addition, PISA offers the possibility of assessing financial literacy and each cycle explores a new "innovative domain", such as problem solving (PISA 2012),

collaborative problem Solving (PISA 2015) and global competence (PISA 2018). In PISA 2018, Brunei Darussalam, Indonesia, the Philippines, Singapore and Thailand took part in the global competence assessment, and only Indonesia evaluated financial literacy (Table 3.2).

Table 3.1. **Participation of Southeast Asian countries in PISA**

Participation in PISA cycles	Brunei Darussalam	Cambodia	Indonesia	Malaysia	Philippines	Singapore	Thailand	Viet Nam
PISA 2000			X				X	
PISA 2003			X				X	
PISA 2006			X				X	
PISA 2009			X	X		X	X	
PISA 2012			X	X		X	X	X
PISA 2015			X	X		X	X	X
PISA 2018	X		X	X	X	X	X	X
PISA for Development		X						

All countries and economies in PISA 2018 distributed the student and school questionnaires. PISA 2018 also offered countries and economies four optional questionnaires for students (the educational career questionnaire, the information and communication technology (ICT) familiarity questionnaire, the well-being questionnaire, and the financial literacy questionnaire); an optional questionnaire for parents; and an optional questionnaire for teachers (both for reading teachers and for teachers of all other subjects). In the region, Brunei Darussalam and Thailand distributed the educational career questionnaire; Brunei Darussalam, Singapore and Thailand distributed the ICT questionnaire; and Malaysia distributed the teacher questionnaire (Table 3.2).

Box 3.1. **Cambodia's experience in PISA for Development**

PISA for Development (PISA-D) was a one-off pilot project that aimed to make the PISA assessment more accessible and relevant to middle- and low-income countries. The project re-designed the assessment and questionnaire instruments to capture a wider range of performance levels and social contexts. The project was also a contribution to the monitoring of international educational targets related to the Education Sustainable Development Goal (SDG), which was adopted by the United Nations General Assembly in 2015, as part of the Agenda for Sustainable Development.

Nine countries participated in PISA-D. In Cambodia, more than 5 000 students in 170 schools participated in the assessment, representing about 370 000 15-year-olds.

Cambodian students scored significantly below the OECD and ASEAN averages in all three domains (MoEYS, 2018). In comparison with PISA-D countries, the performance in mathematics (325 score points) was similar to the PISA-D average (324 score points), whereas the performance in reading (321 score points) was below the PISA-D average (346 score points). About 8% of students in Cambodia achieved the minimum level of proficiency in reading and 10% of students achieved the minimum level of proficiency in mathematics.

As in many other countries, girls outperformed boys in reading (by 17 score points), and students in urban schools outperformed those in rural schools (by 42 score points) (MoEYS, 2018). In addition, socio-economically advantaged students did considerably better in the assessment than disadvantaged students. For instance, advantaged students were about four times more likely than disadvantaged students to attain the baseline level of proficiency in mathematics.

Source: MoEYS (2018), *Education in Cambodia: Findings from Cambodia's Experience in PISA for Development*, Phnom Penh.

Table 3.2. **Features of the PISA 2018 participation of Southeast Asian countries**

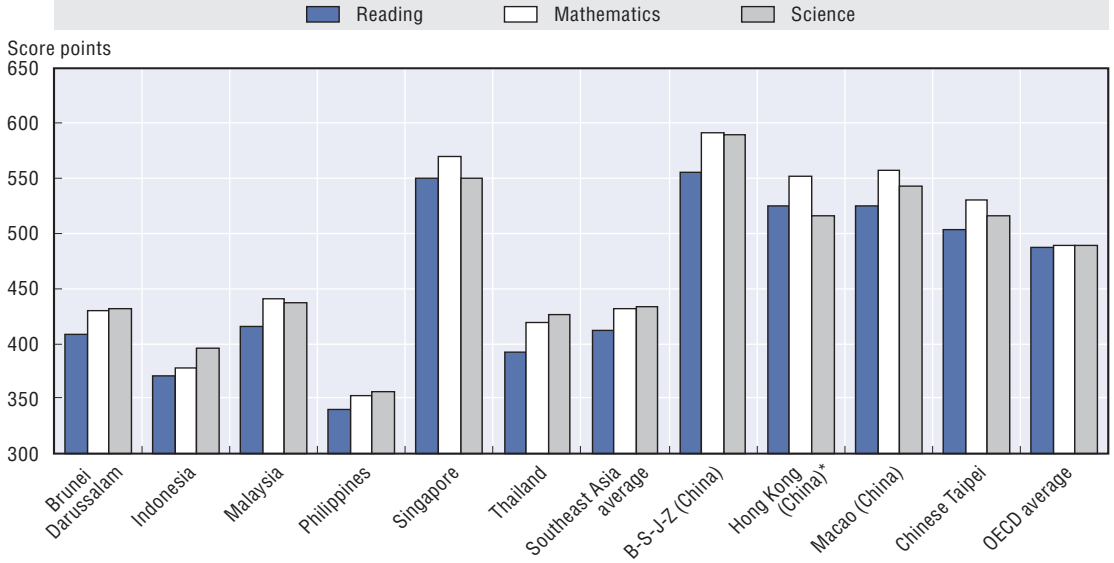
		Brunei Darussalam	Indonesia	Malaysia	Philippines	Singapore	Thailand	Viet Nam
Format of the assessment	Computer	X	X	X	X	X	X	
	Paper							X
Global competence assessment								
Financial literacy assessment and questionnaire			X					
Optional questionnaires	Educational career	X					X	
	ICT[1]	X				X	X	
	Parent							
	Teacher		X					
	Well-being							
Languages of the assessment		English	Indonesian	English Malay	English	English	Thai	Vietnamese

Note: 1. Information and communication technology.
Source: OECD, *PISA 2018 Database*.

Performance in reading, mathematics and science

Students' average performance in reading, mathematics and science is probably the most widely followed indicator from the PISA assessments. This indicator places most of the education systems in Southeast Asia clearly below the OECD average and neighbouring economies such as Beijing, Shanghai, Jiangsu and Zhejiang (B-S-J-Z) (China) and Chinese Taipei (Figure 3.1). On average across Southeast Asian countries, students scored 413 points in reading, 432 points in mathematics and 433 points in science. Countries and economies with a similar performance are mostly located in Latin America and Southeast Europe, such as Bulgaria, Colombia, Romania, Serbia and Uruguay (OECD, 2019c).

Figure 3.1. **Performance in reading, mathematics and science**
Score points



Note: * PISA 2018 data did not meet the PISA technical standards but were accepted as largely comparable.
Source: OECD, *PISA 2018 Database*, Tables I.B1.4, I.B1.5 and I.B1.6.
StatLink https://doi.org/10.1787/888934161425

However, Southeast Asia's average hides wide differences among school systems. With average scores at least half a standard deviation above the OECD average, Singapore was

one of the top-performing school systems in PISA 2018. Malaysia was the second highest-performing country in the region, followed closely by Brunei Darussalam and Thailand, and then by Indonesia and the Philippines.

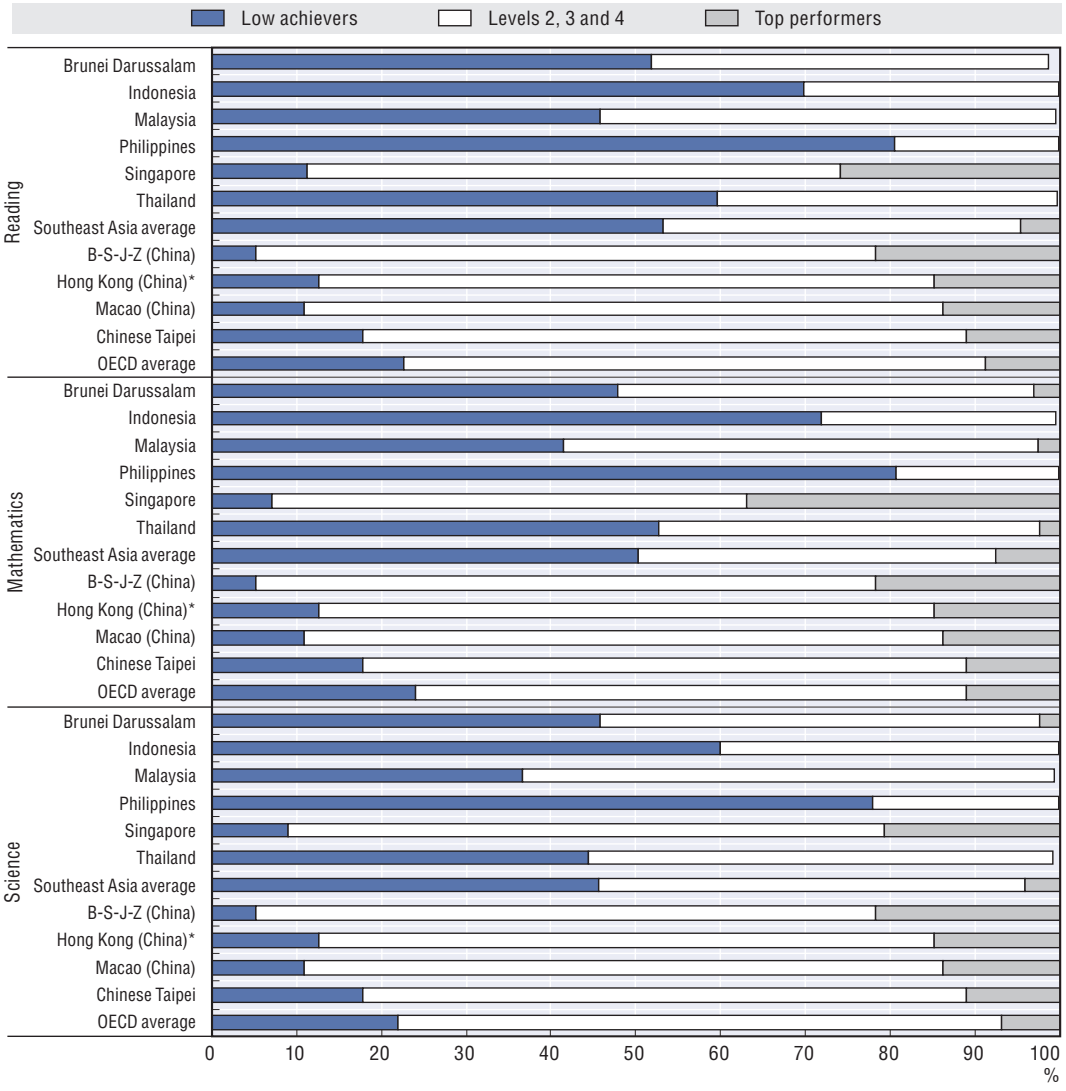
However, PISA average scores need to be interpreted in context. For one thing, when interpreting PISA results with regard to the overall population of 15-year-olds, sample coverage must be taken into consideration. In this regard, the share of the 15-year-old age cohort covered by PISA 2018 (Coverage Index 3, see [OECD, 2019c] for more details) in the region is somewhat lower than the share of 15-year-olds covered across OECD countries (OECD, 2019c). With under 70% of 15-year-olds covered, the Philippines and Viet Nam had the lowest coverage rate in the region, followed by Malaysia and Thailand. In Indonesia, about 85% of 15-year-olds were covered by the PISA sample, a laudable improvement from previous cycles – for instance, only 46% of 15-year-olds were covered by the PISA 2000 sample. Finally, in Brunei Darussalam and Singapore, PISA results were representative of more than 95% of 15-year-olds. In general, low coverage can be mainly attributed to 15-year-olds who were no longer in the school system or were still enrolled in primary school and, to a lesser extent, to student exclusions from the test and dropout during the school year. Since these students are more likely to be academically weaker than those who remain (Spaull and Taylor, 2015), one should expect the relative standing of countries with a higher coverage of 15-year-olds, such as Brunei Darussalam and Singapore, to improve in the PISA rankings had all countries and economies covered the same proportion of 15-year-olds.

PISA 2018 results also need to be interpreted in light of the economic development of countries and economies. In fact, national income accounted for 44% of the difference in average reading scores (OECD, 2019c). Since school systems located in wealthier countries tend to score higher on PISA, one should expect the relative standing of Southeast Asia (except in Brunei Darussalam and Singapore) to improve had all countries and economies enjoyed the same per capita GDP. This is particularly the case for Indonesia and Thailand whose per capita GDP is amongst the lowest of all PISA-participating countries and economies. Along the same lines, accounting for students' socio-economic status shows that the average reading scores of the majority of school systems in the region improve significantly (OECD, 2019d). Indonesia's mean score in reading would jump from 371 to 401 score points, Thailand's from 393 to 423 score points, Malaysia's from 415 to 440 score points, Brunei's from 408 to 419 score points, and the largest improvement – from 340 to 383 score points – would be observed in the Philippines. By contrast, Singapore's reading performance would drop from 549 to 543 score points.

As in previous cycles, the reading scale for PISA 2018 was divided into a range of proficiency levels whose descriptors have been updated to reflect new aspects of reading that were assessed for the first time, such as assessing the quality and credibility of information and managing conflict among texts. In addition, PISA 2018 added easier items (Level 1c) that can better describe the capabilities of low-achieving students. The descriptors of the eight reading proficiency levels – Levels 1c, 1b, 1a, 2, 3, 4, 5 and 6, in ascending order of proficiency – can be found in Table I.5.1, OECD (2019c). Level 2 is considered the baseline level of proficiency, or the level at which students begin to demonstrate the skills that will enable them to fully participate in modern societies. At this level, students can identify the main idea in a text of moderate length; locate one or more pieces of information based on multiple, and partly implicit, criteria; reflect on simple visual features and the overall purpose of texts; and compare claims and evaluate the reasons supporting them based on short, explicit statements. According to this measure, approximately 47% of students across Southeast Asia scored above the baseline level of proficiency in reading, ranging from 19% in the Philippines to 89% in Singapore (Figure 3.2). In comparison, 77% of students across OECD countries, 82% in Chinese Taipei and 95% in B-S-J-Z (China) scored above this baseline level. Better results were observed for mathematics and science, where on average 50% and 54% of students, respectively, across Southeast Asian economies scored above the baseline level of proficiency.

Students who perform well on one section of the reading assessment also tend to perform well on other sections. However, students in some school systems perform relatively better on some areas of the assessments than on others, which may reflect differences in emphasis in the curriculum and teaching. For instance, regarding the main cognitive processes required to solve items (locating information; understanding; and evaluating and reflecting), Singaporean students scored relatively higher in the evaluating and reflecting process subscale; Malaysian and Indonesian students scored relatively lower on the understanding process subscale; students in Brunei Darussalam and Indonesia did relatively better on items that required students to locate information; and Thai students did relatively better on the understanding process subscale (OECD, 2019c). As regards the number of text sources required to construct the correct answer to items (single source or multiple source), Singaporean and Indonesian students scored relatively higher on the single source-text subscale, students in the Philippines did better on multiple texts, whereas students in all other countries in the region scored similarly on both subscales.

Figure 3.2. **Proficiency levels in reading, mathematics and science**



Note: * PISA 2018 data did not meet the PISA technical standards but were accepted as largely comparable.
Source: OECD, *PISA 2018 Database*, Tables I.B1.1, I.B1.2 and I.B1.3.
StatLink https://doi.org/10.1787/888934161444

Students' performance in mathematics and science is particularly important in the context of digitalisation and ICT-related training and studies. Demand for ICT skills is growing in the region, and those who have these skills are earning higher wages. Good performance in science, technology, engineering and mathematics (STEM) will therefore be needed in Emerging Asian countries to ensure their ability to integrate the global economy, especially in the digital era (Box 3.2).

Box 3.2. **Preparing students for the digital era**

To be internationally competitive in the digital era, a skilled labour force is essential. According to the *Economic Outlook for Southeast Asia, China and India 2020* (OECD, 2019a), Cambodia, Indonesia, and Thailand are all currently facing skilled labour shortages, which will remain high in 2021. Participants in the labour market will be required to expand and adapt their skills rapidly in response to the digital era. Schools need to focus more on STEM skills and literacy if students are going to achieve this goal. ICT and new technologies are changing the way societies interact, produce and create. Curriculum adjustments should be made in consultation with industry experts, so that training and the skills acquired reflect both current and future expected trends and industry demands.

Technical and vocational education and training (TVET) and lifelong learning play an important role in making digital education more inclusive. TVET programmes provide a mixture of theoretical and practical training that can prepare workers to meet industry demands. Southeast Asian countries typically begin offering TVET training as an alternative to general education at some point during secondary school. However, challenges remain since TVET is often viewed as a less desirable educational pathway than university or even a pathway of last resort for weaker students. These attitudes are reflected in the considerably lower proportion of students enrolled in TVET versus general education in Emerging Asian countries. Arrangements for transferring TVET credits to general education or visible efforts by prestigious employers to hire TVET graduates may help to enhance the public image of TVET training. Furthermore, TVET training typically requires many of the same literacy, numeracy, scientific, and technical skills necessary for general education options despite its perception as being an "easier" or less desirable option. Improving the image of TVET, while allowing for streamlined transfers to higher education, would be needed to maximise its role in providing digital and ICT skills and thus help prepare students and workers for the digital era.

Improvement in ICT infrastructure is required to support digital education, enhance TVET and lifelong learning programmes, which would also further leverage online education. Robust online training would provide the dynamism necessary for lifelong learning alongside paid work, rather than confining learning to an unemployed (or minimally employed) academic period. Continual upgrading of ICT skills while participating in the labour force would also protect workers against redundancy and obsolescence.

Source: OECD (2019a), *Economic Outlook for Southeast Asia, China and India 2020: Rethinking Education for the Digital Era*, OECD Publishing, Paris, https://doi.org/10.1787/1ba6cde0-en.

Trends in performance

PISA not only takes a snapshot of an education system's performance at a given moment; as a long-term study dating back to 2000, PISA gives education systems an opportunity to see how their performance has evolved over the course of almost two decades. The first full assessment of each subject sets the scale and starting point for future comparisons. For reading results, it is possible to compare trends starting from 2000; mathematics was

the major domain for the first time in 2003, and science in 2006. Comparing PISA 2018 performance with previous cycles is possible in only four countries in the region: Indonesia, Malaysia, Singapore and Thailand.

Indonesia has seen no significant long-term changes in students' performance in reading, mathematics and science (OECD, 2019c). In reading, Indonesia belongs to the group of countries with a hump-shaped trajectory, with performance improving during the first years, and becoming more negative over more recent years. However, given that Indonesia is the country where the coverage has improved the most since its first participation (from 46% to 85% of 15-year-olds covered by the PISA sample), a stable performance over the years is an encouraging achievement. Indonesia's case shows that making an education system more inclusive does not necessarily work against the quality of the school system.

Malaysia has significantly improved in mathematics and science throughout its participation in PISA, but shows no significant change in reading (OECD, 2019c). Unlike in Indonesia, the share of 15-year-olds covered by the PISA sample has decreased somewhat in PISA 2018 – 72% of students compared to 78% in 2009.

Since Thailand's first participation in PISA, mathematics and science performance have remained stable, whereas the average reading performance has dipped (OECD, 2019c). In reading, Thailand belongs to the group of countries with an increasingly negative trajectory, together with Korea and the Netherlands.

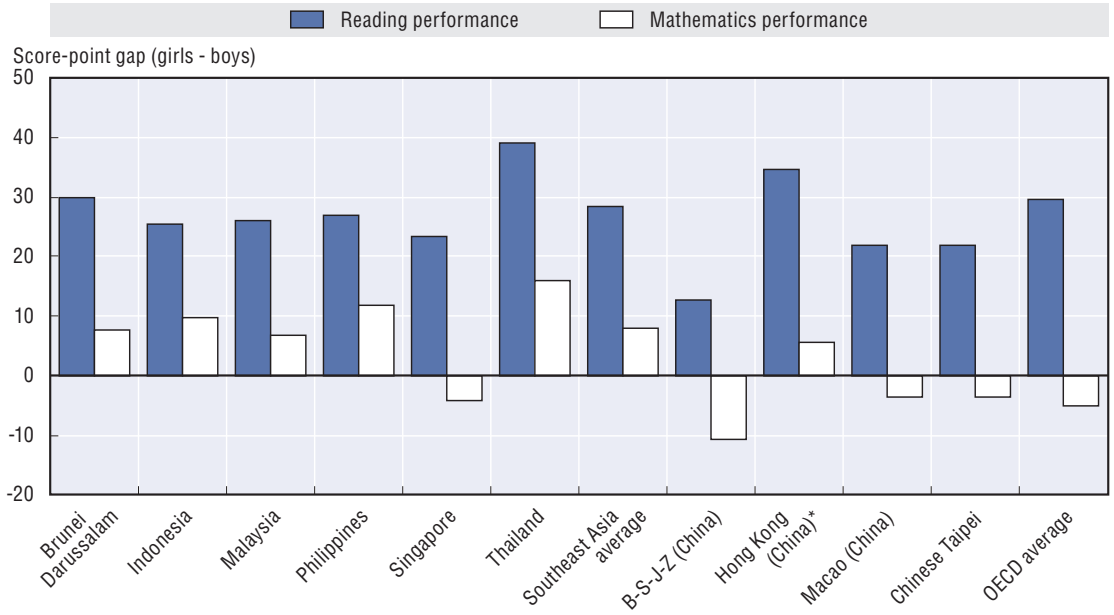
Despite already being a top-performing education system in its first participation, Singapore has improved its performance in reading and science even further (OECD, 2019c). Interestingly, not all students have improved in the same way: those at the top (90th percentile) of the performance distribution saw their reading performance increase by almost 10 score points, whereas those at the bottom (10th percentile) scored similarly in 2009 and 2018.

Gender difference in performance and attitudes

In recent decades, PISA results have consistently found that girls outperform boys in reading and, to a lesser extent, that boys outperform girls in mathematics, on average across all participating countries and economies (OECD, 2019d). Gender disparities in achievement are a matter of considerable concern, as they may have long-term consequences for girls' and boys' personal and professional future. Boys who lag behind and lack basic proficiency in reading may face serious difficulties in their further education, in the labour market and in everyday life. Equally, the under-representation of girls amongst top performers in science and mathematics can at least partly explain the persistent gender gap in careers in science, technology, engineering and mathematics (STEM) fields, which are often amongst the highest-paying occupations. Over the past few decades, many countries have made significant progress in narrowing, and even closing, the gender gap in educational attainment (OECD, 2019d). Gender-related disparities in achievement thus appear to be neither innate nor inevitable.

Even if girls outperformed boys in reading in every PISA-participating school system, the magnitude, pervasiveness and practical significance of the gender gap in student performance would vary across countries. On average across Southeast Asian countries, the gender gap was 28 score points, similar to the gender gap observed across OECD countries (30 score points) (Figure 3.3). The gender gap across Southeast Asian countries varied little (between 23 and 30 score points), except in Thailand where the gender gap stood at 39 score points. Interestingly, one of the narrowest gender gaps among all PISA-participating countries and economies was observed in B-S-J-Z (China) where girls outperformed boys by only 13 points.

Figure 3.3. **Gender gaps in reading and mathematics performance**
Score point gap (girls - boys)



Note: * PISA 2018 data did not meet the PISA technical standards but were accepted as largely comparable.
Source: OECD, *PISA 2018 Database*, Tables II.B1.7.1 and II.B1.7.3.
StatLink https://doi.org/10.1787/888934161463

In mathematics, boys outperformed girls in about half of PISA-participating countries and economies, whereas girls outperformed boys only in a handful of school systems. On average across Southeast Asian countries, girls also outperformed boys in mathematics, by about 8 score points, whereas, on average across OECD countries, boys outperformed girls by 5 score points (Figure 3.3). The gender gaps among Southeast Asian countries ranged between 8 and 16 score points in favour of girls, except in Singapore where boys and girls performed similarly. By contrast, in B-S-J-Z (China) boys outperformed girls by almost 11 score points.

In Southeast Asian countries, just like in most other PISA-participating school systems, the variation in performance amongst boys was larger than amongst girls (OECD, 2019d). In reading, this finding results in boys being clearly overrepresented amongst low-achieving students, but not being underrepresented amongst top-performing students. The only exception was Singapore where boys were overrepresented amongst low-achieving students, and underrepresented amongst top-performing students. In mathematics, the larger variation in performance amongst boys often results in boys being overrepresented amongst top-performing students, but not being underrepresented amongst low-achieving students. This was the case, for instance, on average across OECD countries, in B-S-J-Z (China) and in Singapore, but not in all other Southeast Asian countries.

Gender gaps extend to other areas with regard to reading outcomes, such as reading enjoyment. PISA asked students to report whether they agree with the following statements about reading: "I read only if I have to"; "Reading is one of my favourite hobbies"; "I like talking about books with other people"; "For me, reading is a waste of time"; and "I read only to get information that I need". These items were combined to create the index of enjoyment of reading whose average is 0 and standard deviation is 1 across OECD countries. Positive values in the index mean that students enjoy reading more than the

average student across OECD countries. According to this index, in all PISA-participating countries and economies, girls reported that they enjoyed reading to a greater extent than boys (OECD, 2019d). However, the gender gap in reading enjoyment is comparatively small in Southeast Asian countries. Whereas a 0.60 gender gap exists on average across OECD countries, the gender gap ranges from 0.16 in Indonesia to 0.58 in Brunei Darussalam. In fact, Indonesia, Thailand and Viet Nam were amongst the six countries with the narrowest gender gaps in reading enjoyment, together with B-S-J-Z (China), Japan and Korea.

Gender gaps also exist in other learning outcomes. Boys tend to display more competitive attitudes than girls, while girls tend to report greater motivation and perseverance, but also greater fear of failure (OECD, 2019d; OECD, 2019e). In relation to some of these findings, Southeast Asia was no exception. In all Southeast Asian countries, and especially in Malaysia, the Philippines and Thailand, girls reported greater motivation to master tasks than boys did. In all countries in the region, most notably in Brunei Darussalam and Singapore, girls expressed greater fear of failure than boys did. In other aspects, however, Southeast Asian countries were an exception. Brunei Darussalam, Indonesia and Malaysia were some of the few school systems where girls reported more competitive attitudes than boys did.

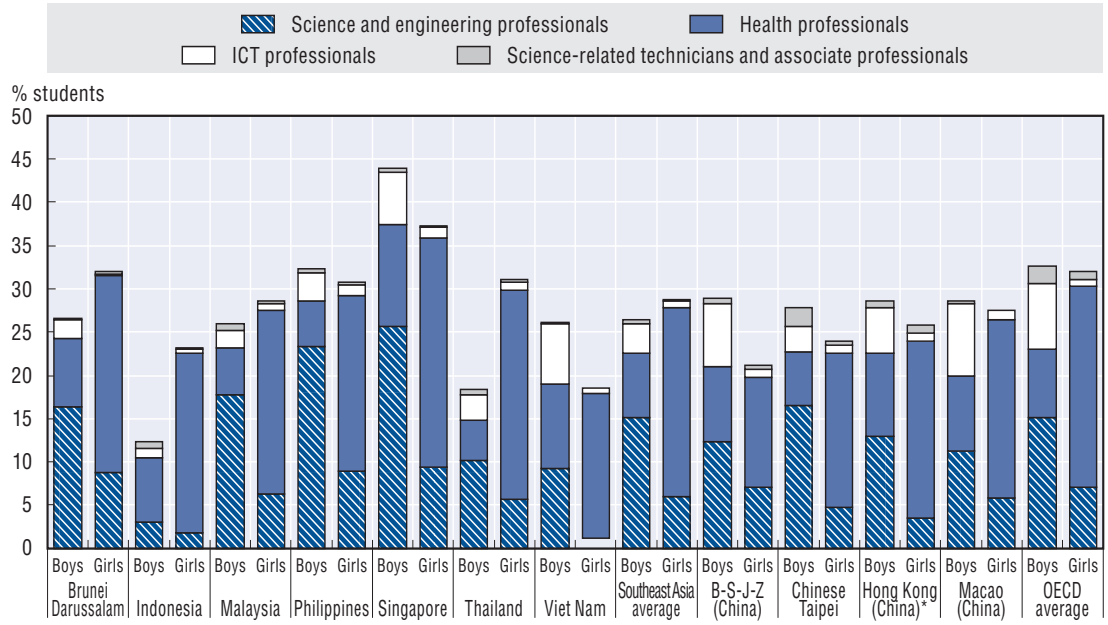
In most countries, men are underrepresented in "nurturing" roles, such as those in the healthcare, elementary education and domestic sectors, whereas women are under-represented in high-status roles, such as leadership positions (Croft, Schmader and Block, 2015), and in the science, technology, engineering and mathematics (STEM) fields. Promoting more equal representation of men and women in different occupations is not only a way to reduce the gender gap in the labour market and improve gender equality, it is also a prerequisite for meeting the many challenges facing societies around the world. STEM jobs contribute to innovation and productivity growth; shortages of workers for these jobs are damaging to society.

PISA 2018 asked students about the level of education they expect to complete and what occupation they expect to be working in when they are around 30 years old. For the latter question, students could enter any job title or description in an open-entry field; their answers were classified according to the International Standard Classification of Occupations (ISCO-08). One may thus identify, for instance, "science and engineering professional" and "health professional" from amongst the career they cite.

On average across OECD countries in 2018, around 15% of boys, but just 7% of girls, reported that they expect to work as science and engineering professionals when they are around 30 (Figure 3.4). In Southeast Asian countries too, more boys than girls expected to work in science and engineering occupations, but the gap varied considerably across countries. The largest gaps were reported in Malaysia, the Philippines and Singapore, whereas the narrowest gaps were observed in Indonesia and Thailand. The gaps were even larger with regard to the health sector, but this time in favour of girls. With a difference of between 13 and 20 percentage points in favour of girls, except in Viet Nam, the gender gap stands at a similar level to the 15 percentage points difference observed on average across OECD countries.

Figure 3.4. **Career expectations, by gender**

Percentage of students



Note: * PISA 2018 data did not meet the PISA technical standards but were accepted as largely comparable.
Source: OECD, *PISA 2018 Database*, Table II.B1.8.19.
StatLink https://doi.org/10.1787/888934161482

Gender difference in students' participation in ICT-related training and studies, including science and engineering, as well as in expectation of a future career, is to some extent related to the challenge of the gender digital divide facing the region (Box 3.3).

Box 3.3. **The gender digital divide in Emerging Asia**

Women still continue to face challenges with access to ICT in Emerging Asian countries, despite the efforts by policy makers to improve the situation. Women lag behind men in Internet access and usage, and continue to hold a lower proportion of places in academic and training programmes in STEM, TVET, or other ICT-related fields. Even in areas where women represent a majority of the students in higher education, they most often choose different career paths (OECD, 2019a).

Thus, it is important for countries to implement strategies to promote ICT as a career path that is open to and suitable for women and girls. Currently, some existing programmes in the region already encourage women and girls to gain exposure to ICT career opportunities and learn necessary technical skills. For instance, these initiatives may prepare girls to launch a start-up, whether or not they directly relate to ICT (e.g. India's *WeTech Afterschool programme*), or to improve the benefits of agriculture (e.g. Thailand). Thailand's *Agritech Using ICT training programme* helps women, youth, and other small rural landholders make educated agricultural decisions, including the integration of the latest agricultural technologies. The programme also includes entrepreneurship and digital skills training, so farmers can market and sell their produce effectively. Given the success of such programming, expansion to other countries should be a goal.

Source: OECD (2019a), *Economic Outlook for Southeast Asia, China and India 2020: Rethinking Education for the Digital Era*, OECD Publishing, Paris, https://doi.org/10.1787/1ba6cde0-en.

The socio-economic divide: Performance, attitudes and school resources

Many modern societies suffer from rising inequality and low social mobility (OECD, 2018). Rising inequality and low social mobility not only threaten long-term growth (Cingano, 2014), but more fundamentally endanger social cohesion. Long-standing research finds that the most reliable predictor of a child's future success at school – and, in many cases, of access to well-paid and high-status occupations – is his or her family.

Children from low-income and low-educated families usually face many barriers to learning. A lower socio-economic and cultural status often translates into fewer educational resources, such as books, games and interactive learning materials at home, but also into a less stimulating home environment and weaker psychological support (Evans et al., 2010; Sirin, 2005; Thomson, 2018). However, results from previous rounds of PISA suggest that school systems may be able to help mitigate the impact of families' socio-economic status on their child's life outcomes (OECD, 2019d). Schools can channel resources to disadvantaged children and thus help create a more equitable distribution of learning opportunities and outcomes (Downey and Condron, 2016).

In PISA, a student's socio-economic status is measured by the PISA index of economic, social and cultural status (ESCS), a composite measure that combines into a single score the financial, social, cultural and human capital resources available to students. In PISA 2018, the three components that make up the index (parents' education, parents' occupation and the index of home possessions) were weighted equally. Looking at the relationship between the PISA index of economic, social and cultural status, and reading performance, one can observe that in all PISA-participating countries and economies a positive association exists (OECD, 2019d). As Figure 3.5 shows, this association is particularly strong in some Southeast Asian countries, including Brunei Darussalam (16% of variance explained), Malaysia (16%) and the Philippines (18%). By contrast, the equity in reading performance in Singapore (13% of variance explained) and Thailand (12%) is similar to that observed across OECD countries (12%) and B-S-J-Z (China) (13%). With only 8% of variance in reading performance explained by students' socio-economic status, only Indonesia exhibited better equity outcomes than OECD countries in the region.

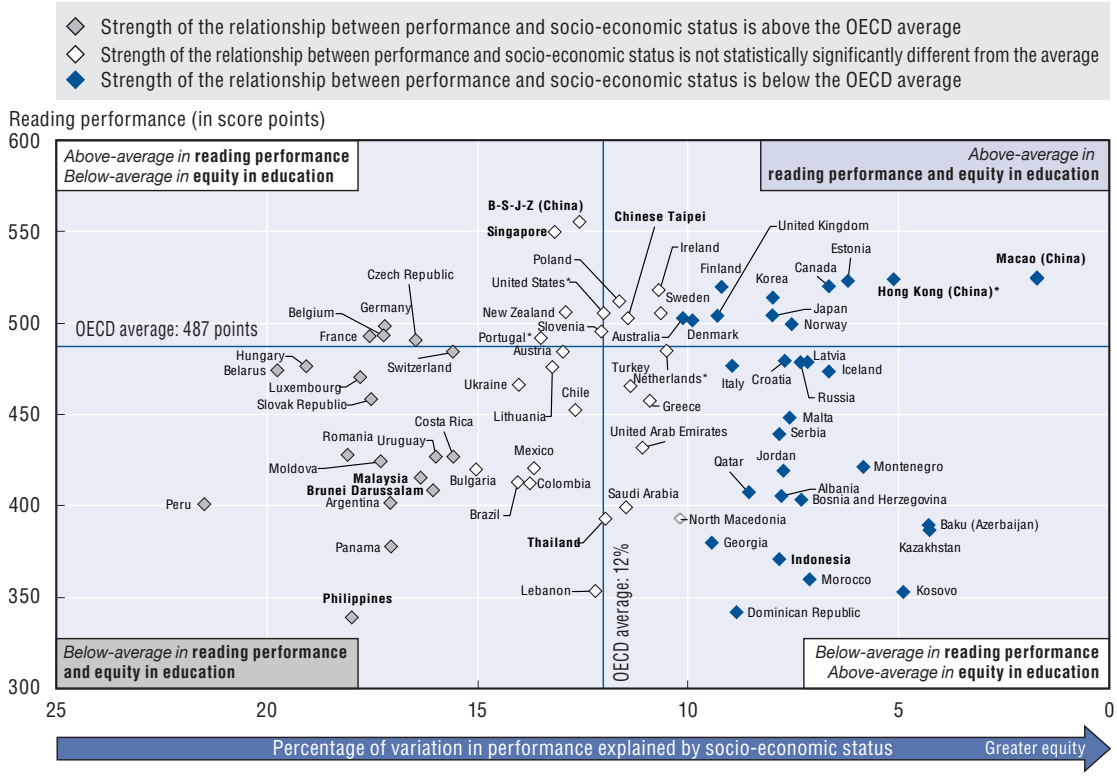
PISA consistently finds that some education systems manage to attain both academic excellence and equity (OECD, 2019d). Figure 3.5 shows that amongst the 25 school systems that scored above the OECD average in reading, about half of them exhibited positive equity outcomes. These include school systems like Australia, Canada, Estonia, Finland, Japan, Korea, Norway and the United Kingdom. Unfortunately, no education system in Southeast Asia attains both academic excellence and equity, and some of them (Brunei Darussalam, Malaysia and the Philippines) scored in the least desirable quadrant, where both academic performance and equity are below the OECD average.

How exposed are disadvantaged students to high-achieving students? PISA 2018 used the isolation index – i.e. the likelihood that a representative student of one group attends a school that enrols another group of students, ranging from 0 (no segregation) to 1 (full segregation) – to measure the exposure of disadvantaged students to high-achieving students.[1] According to this measure, disadvantaged students in most Southeast Asian countries, and especially in the Philippines and Thailand, had fewer opportunities to interact with high-achieving students than the average student across OECD countries (OECD, 2019d).

In spite of the challenges they face, some disadvantaged students exhibit a remarkable capacity to reach adequate levels of academic achievement and social adjustment (Martin and Marsh, 2006). PISA refers to this capacity as academic resilience, which is operationalised as students who are in the bottom quarter of the PISA index of economic,

social and cultural status (ESCS) in their own country/economy, but who score in the top quarter of reading performance in that country/economy. Academically resilient, students achieve educational excellence by national standards despite their socio-economic disadvantage. In Brunei Darussalam, Malaysia, the Philippines and Singapore, less than 10% of disadvantaged students were academically resilient, compared to 11% on average across OECD countries, 12% in B-S-J-Z (China) and almost 20% in Macao (China) (Figure 3.6). By contrast, in Thailand and Indonesia as many as 13% and 14% were academically resilient, respectively.

Figure 3.5. **Strength of the socio-economic gradient and reading performance**



Notes: * PISA 2018 data did not meet the PISA technical standards but were accepted as largely comparable. Socio-economic status is measured by the PISA index of economic, social and cultural status.

Source: OECD, *PISA 2018 Database*, Table II.B1.2.3.

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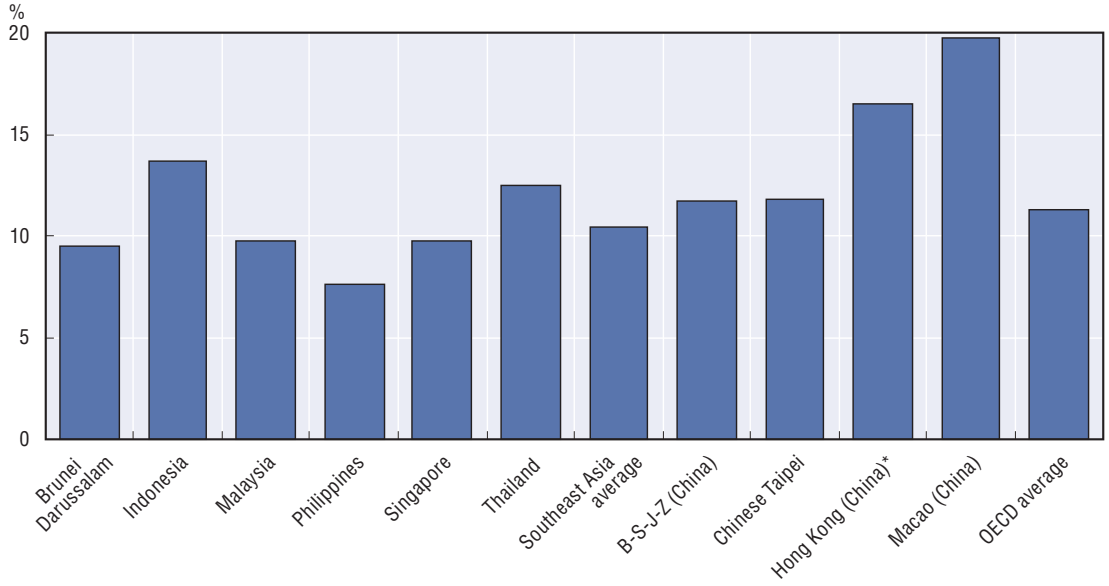
Socio-economically advantaged and disadvantaged students differ in attitudes and well-being indicators too. For instance, on average across OECD countries, advantaged students were more likely to feel satisfied with their lives, enjoy a greater sense of belonging at school and report higher levels of self-confidence, whereas disadvantaged students were more likely to report being bullied and to have skipped school (OECD, 2019e). Across Southeast Asian countries similar results were observed, but with notable exceptions. For instance, in Malaysia and Viet Nam, advantaged and disadvantaged students experienced similar levels of bullying, and Indonesia was one of three countries where bullying was more frequent amongst advantaged students. In Brunei Darussalam, Indonesia and Malaysia, no socio-economic gap existed in student truancy, whereas in the Philippines this gap was twice as large as the one observed on average across OECD countries. In Indonesia, no significant difference existed in sense of belonging at school between advantaged and disadvantaged students. As regards life satisfaction, no socio-

economic gap existed in Indonesia, Thailand and Viet Nam. Regarding self-confidence, the Philippines had one of the largest socio-economic gaps (in favour of advantaged students) across all PISA-participating countries and economies.

Figure 3.6. **Academic resilience in reading**

Percentage of disadvantaged students who scored in the top quarter of reading performance in their own country



Note: * PISA 2018 data did not meet the PISA technical standards but were accepted as largely comparable.
Source: OECD, *PISA 2018 Database*, Table II.B1.3.1.
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Disadvantaged students face considerable barriers to navigating and succeeding academically, many of which relate to their home environment but some are also linked to the high concentration of disadvantaged students in certain schools. These schools, for instance, may find difficulties in attracting, and especially retaining, the most effective and experienced teachers. According to the most recent OECD Teaching and Learning International Survey (TALIS), conducted in 2018, in most countries, teachers with only a few years of experience tend to work in schools that have higher concentrations of disadvantaged students (OECD, 2019f). Some school systems may partially compensate for this challenge by providing additional material and human resources to the most disadvantaged schools, or offering incentives to the best teachers to work and stay in the schools where they are most needed.

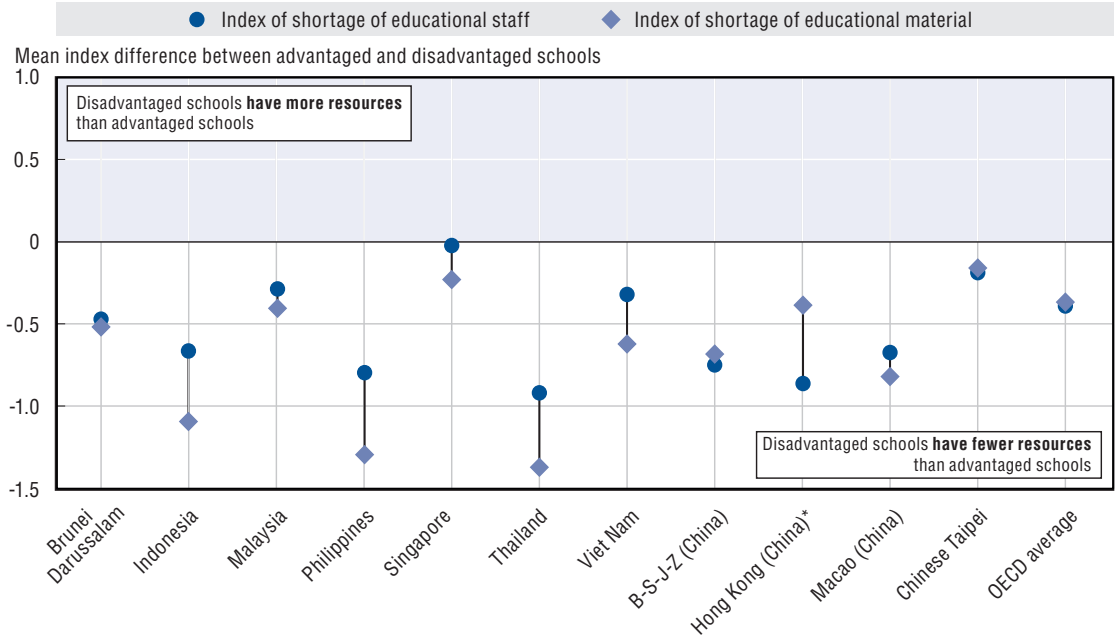
PISA 2018 measured the allocation of material and human resources to schools by asking school principals the extent ("not at all", "very little", "to some extent", "a lot") to which their capacity to provide instruction in their schools was hindered by a lack of the following resources (or if they were of insufficient quality): teaching staff, assisting staff, educational material and physical infrastructure. Both shortage of education material" and "education staff" were constructed based on school principals' responses to this question. The socio-economic gaps in these indices suggest that some school systems in Southeast Asia can do a better job at compensating disadvantaged schools (Figure 3.7). For instance, Thailand, the Philippines and, to a lesser extent, Indonesia were amongst the education systems in PISA 2018 with the largest gaps in both material and human resources between advantaged and disadvantaged schools. By contrast, in Brunei Darussalam, the socio-economic gap in these resources was just above those observed on

average across OECD countries, and Malaysia, Singapore and Viet Nam exhibited a socio-economic gap only in material resources.

The difference in access and allocation between schools with different socio-economic profiles also appears in ICT infrastructure and tools in some countries in the region (Box 3.4).

Figure 3.7. **Difference in shortage of educational material and staff, by schools' socio-economic profile**

Results based on principals' reports



Notes: * PISA 2018 data did not meet the PISA technical standards but were accepted as largely comparable. Statistically significant differences are shown in a darker tone. The socio-economic profile is measured by the school's average PISA index of economic, social and cultural status (ESCS). For this analysis, the sample is restricted to schools with the modal ISCED level for 15-year-old students.

Source: OECD, *PISA 2018 Database*, Tables II.B1.5.13 and II.B1.5.14.

StatLink https://doi.org/10.1787/888934161539

Box 3.4. **Socio-economic divide in students' ICT access**

ICT access remains an issue for schools in many Emerging Asian countries. This may be due to a lack of access to computers, such as in Indonesia (OECD, 2019a), or Internet access, as seen in Myanmar (OECD, 2019a). Indonesia also experiences a significant socio-economic gap in ICT infrastructure based on the statuses of the communities where schools are located. According to *Students, Computers and Learning: Making the Connection* (OECD, 2015), Indonesia experienced a gap of over 25% in access to computers with an Internet connection between schools with students of high socio-economic backgrounds and those with students of low socio-economic backgrounds. In contrast, the gaps are less than 20% in Viet Nam, 10% in Malaysia and less than 5% in Singapore. The high and low socio-economic backgrounds are defined as students being in the top and bottom quartiles of the PISA index of economic, social, and cultural status (ESCS). Programmes to bridge the divide in Indonesia (e.g. the Jardiknas and SchoolNet programmes) have been successful so far, but the country will need to continue paying close attention to reducing the gap and maintaining stable funding for the programmes (OECD, 2019a).

Box 3.4. **Socio-economic divide in students' ICT access** *(cont.)*

Myanmar has more widespread access issues, as merely 27.4% of primary schools and 59.3% of lower secondary schools have access to electricity, which leads to difficulties in using ICT at school (UNESCO, 2019; OECD, 2020). In addition, less than 1% of primary schools have access to computers or the Internet (UNESCO, 2019). 4G Internet coverage is widespread (with 90% of Myanmar now covered), although using the web in classrooms does not appear to be an urgent priority.

Moreover, digital illiteracy of teachers is a pervasive issue in both of these countries, regardless of ICT access. The uneven classroom use of ICT by teachers remains a challenge in the country, particularly in rural and remote areas. However, efforts have been made to address this issue through various programmes, including the "Universal Service Obligation" in which the government provides training for teachers in remote areas. In Myanmar, what little ICT equipment is available often sits idle, as teachers do not know how to use it. Both Indonesia and Myanmar have programmes working to remedy the issue that must receive continued support.

Source: OECD (2019a), *Economic Outlook for Southeast Asia, China and India 2020: Rethinking Education for the Digital Era*, OECD Publishing, Paris, https://doi.org/10.1787/1ba6cde0-en.

School climate

A positive school climate is hard to define or measure, but easy to recognise. The state of the school's facilities, the tone of the conversations in corridors, the enthusiasm of the school staff and the way students interact during breaks are some of the signs that visitors can interpret quickly and thus broadly assess a school's climate. A safe, supportive and healthy school climate can make a great difference in students' lives. A positive academic environment, for instance, can promote students' scholastic achievement, well-being and self-esteem (Hoge, Smit and Hanson, 1990; MacNeil, Prater and Busch, 2009; Way, Reddy and Rhodes, 2007) and some of these effects persist for years (Hoy, Hannum and Tschannen-Moran, 1998).

The 15-year-old students who sit the PISA assessment may not evaluate their school climate as consciously as adults do, but they certainly feel it. All students appreciate a school environment where bullying is unusual, making friends is relatively simple, and establishing genuine and respectful relationships with teachers is the norm – even if students cannot always put their feelings into words. While PISA 2018 cannot cover all the dimensions of school climate, the student and school questionnaires distributed with the assessment include more than 20 questions directly related to school climate. In this section, the following aspects of school climate will be examined: bullying, disciplinary climate, student truancy and sense of belonging at school.

PISA asked students how often during the 12 months prior to the PISA test they had a series of experiences related to physical, verbal and relational bullying, such as someone making fun of them, getting pushed around or hit by other students, and leaving them out of things on purpose. Combining these statements into a single indicator, "any type of bullying act", shows that students in all Southeast Asian countries were more frequently victimised, on average, compared with students across OECD countries or in B-S-J-Z (China) (Figure 3.8). With more than half of students saying that they had been bullied at least a few times a month, the results for Brunei Darussalam and the Philippines are particularly alarming. Almost as troubling were the results in Indonesia and Malaysia, where 41% and 36% students, respectively, reported being bullied at least a few times a month. As a matter of comparison, the equivalent share across OECD countries, B-S-J-Z (China) and Chinese Taipei was 23%, 18% and 13%, respectively.

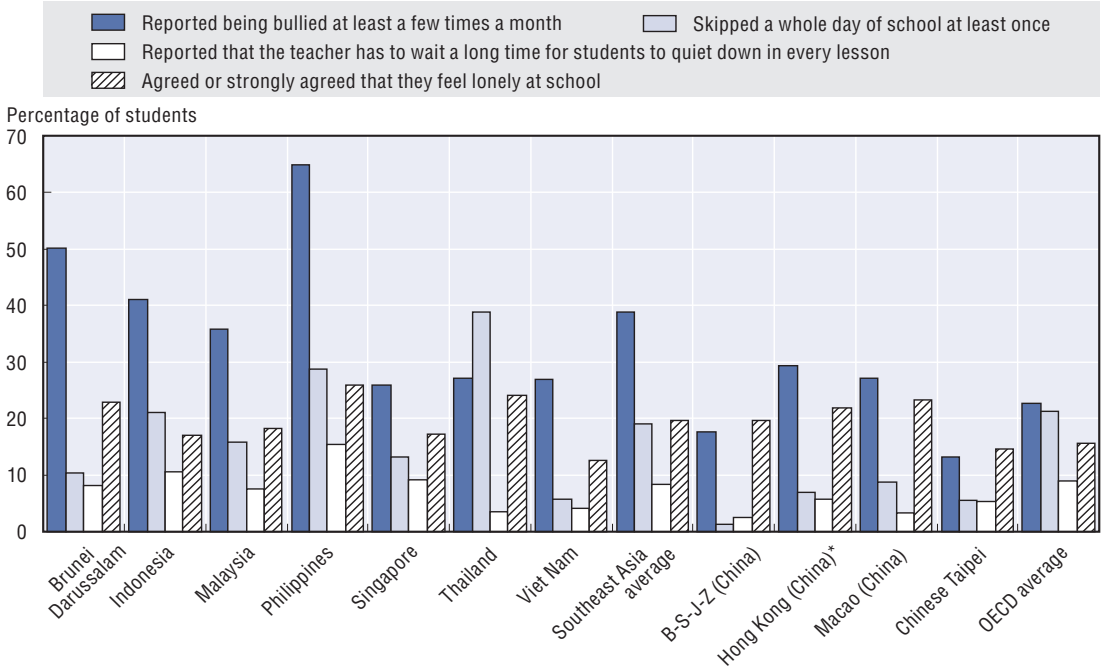
The results are more encouraging regarding the disciplinary climate in language-of-instruction lessons for the region, except maybe in the Philippines (OECD, 2019e). PISA asked students how frequently a series of things happen in their language-of-instruction

lessons, such as students not listening to the teacher, or making noise and creating disorder. The index of disciplinary climate was built using students' responses to this question, according to which Indonesia, Thailand, and especially Viet Nam, exhibited amongst the most positive disciplinary climate in PISA 2018, together with East Asian and East European education systems. For instance, in Viet Nam, about 4% of students reported that, in every language-of-instruction lesson, the teacher has to wait a long time for students to quiet down, compared to 9% on average across OECD countries and 15% of students in the Philippines (Figure 3.8). With values in the index of disciplinary climate to close or just above the OECD average, Brunei Darussalam, Malaysia and Singapore probably do not need to consider the disciplinary climate in schools as an area of special concern (OECD, 2019e).

The findings on truancy are also encouraging for Southeast Asia. On average across countries in the region, 19% of students reported having skipped a whole day of school, compared to 21% of students on average across OECD countries, but only 1% of students in B-S-J-Z (China) (Figure 3.8). There are large variations across countries in the region. Truancy was comparatively low in Brunei Darussalam, Malaysia, Singapore and Viet Nam; similar to the OECD average in Indonesia; and comparatively high in Thailand and, to a lesser extent, in the Philippines.

Figure 3.8. **Indicators of school climate**

Percentage of students



Note: * PISA 2018 data did not meet the PISA technical standards but were accepted as largely comparable.
Source: OECD, *PISA 2018 Database*, Tables III.B1.2.1, III.B1.3.1, III.B1.4.1 and III.B1.9.1.
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Students in Southeast Asia reported a comparatively weak sense of belonging at school (OECD, 2019e). PISA 2018 asked students how much they agree with a series of statements about their school, including if they feel lonely at school or feel they belong at school. Based on the index of sense of belonging calculated from students' responses to this question, students in all countries in Southeast Asia reported a somewhat weaker sense of belonging at school than the average student across OECD countries. For instance, about 20% of students in the region – ranging from 13% in Viet Nam to 26% in

the Philippines – agreed or strongly agreed that they feel lonely at school, compared to 16% on average across OECD countries (Figure 3.8). However, the findings for other items were more promising. For instance, 81% of students in the region agreed or strongly agreed that they make friends easily at school, compared to 75% of students across OECD countries and 79% in B-S-J-Z (China) (OECD, 2019e).

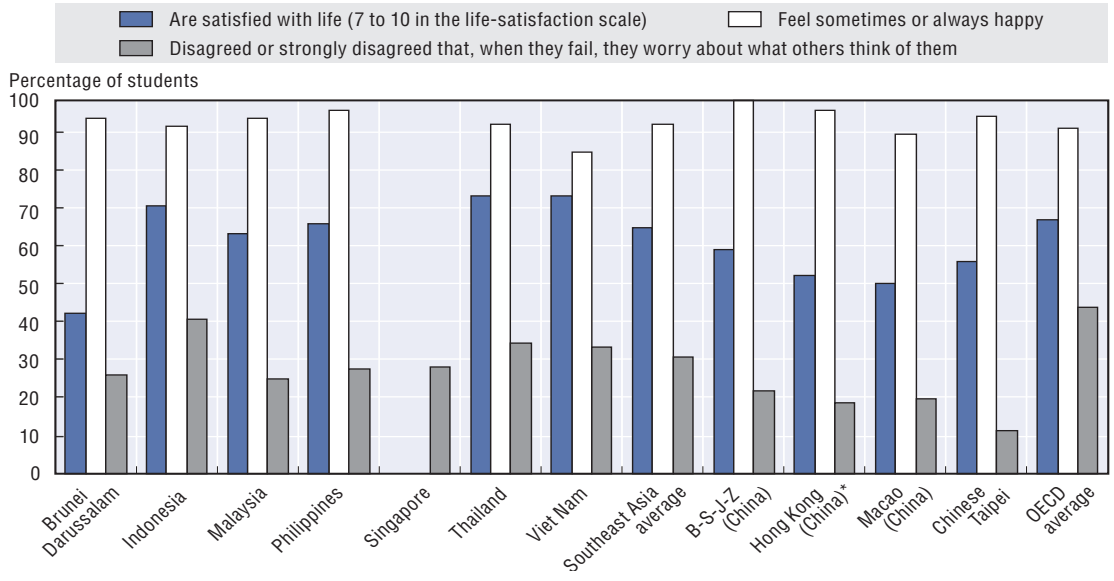
Student well-being

Many of the education systems participating in PISA not only want to know how their students fare academically, but also how they get on with their lives. Indeed, 15-year-old students are in a key transition phase of physical and emotional development, and schools play a major role in how satisfied and happy students are with their lives (Rees and Main, 2015). After all, adolescents spend a large part of their time at school. In this regard, PISA 2018 data show that one of the best predictors of student happiness was how satisfied they were with their life at school (OECD, 2019e). Parents also seem to know this as they overwhelmingly cite school safety, good reputation and a pleasant environment as the most important criteria they consider when choosing a school for their children (OECD, 2015).

Overall, students in the Southeast Asian countries reported satisfactory levels of well-being, though with large variations within the region (Figure 3.9). On average across countries in the region, about 65% of students reported being satisfied with their lives (7-10 in the life-satisfaction scale), compared to 67% across OECD countries and 59% in B-S-J-Z (China). However, in Brunei Darussalam only 42% were satisfied with their lives, the lowest percentage across all PISA-participating countries and economies. About 92% of students on average across Southeast Asian countries – ranging from 85% in Viet Nam to 95% in the Philippines – said they were sometimes or always happy, whereas 91% of students across OECD countries reported they were happy. As for fear of failure, a larger share of students in the region are more afraid of the consequences of failing than on average across OECD countries, and especially in Brunei Darussalam, Malaysia and Singapore (OECD, 2019e). For instance, 73% of students in Singapore were afraid that failing might signal a lack of talent, compared to 55% on average across OECD countries and 53% in B-S-J-Z (China).

Figure 3.9. **Students' well-being**

Percentage of students



Note: * PISA 2018 data did not meet the PISA technical standards but were accepted as largely comparable.
Source: OECD, *PISA 2018 Database*, Tables III.B1.11.1, III.B1.12.1 and III.B1.13.2.
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Teaching strategies

Previous analyses of PISA data have shown that teachers in mathematics and science across the globe vary considerably in what they teach and, more importantly, in how they teach (Echazarra et al., 2016; Mostafa, Echazarra and Guillou, 2018). To determine how language-of-instruction teachers teach, PISA 2018 asked students several questions about the type of strategies their teachers use in their lessons. Their responses to these questions were combined to build six indices about teacher practices. These indices and examples of the questions that compose them are provided in Table 3.3.

Table 3.3. **Indices of teacher practices**

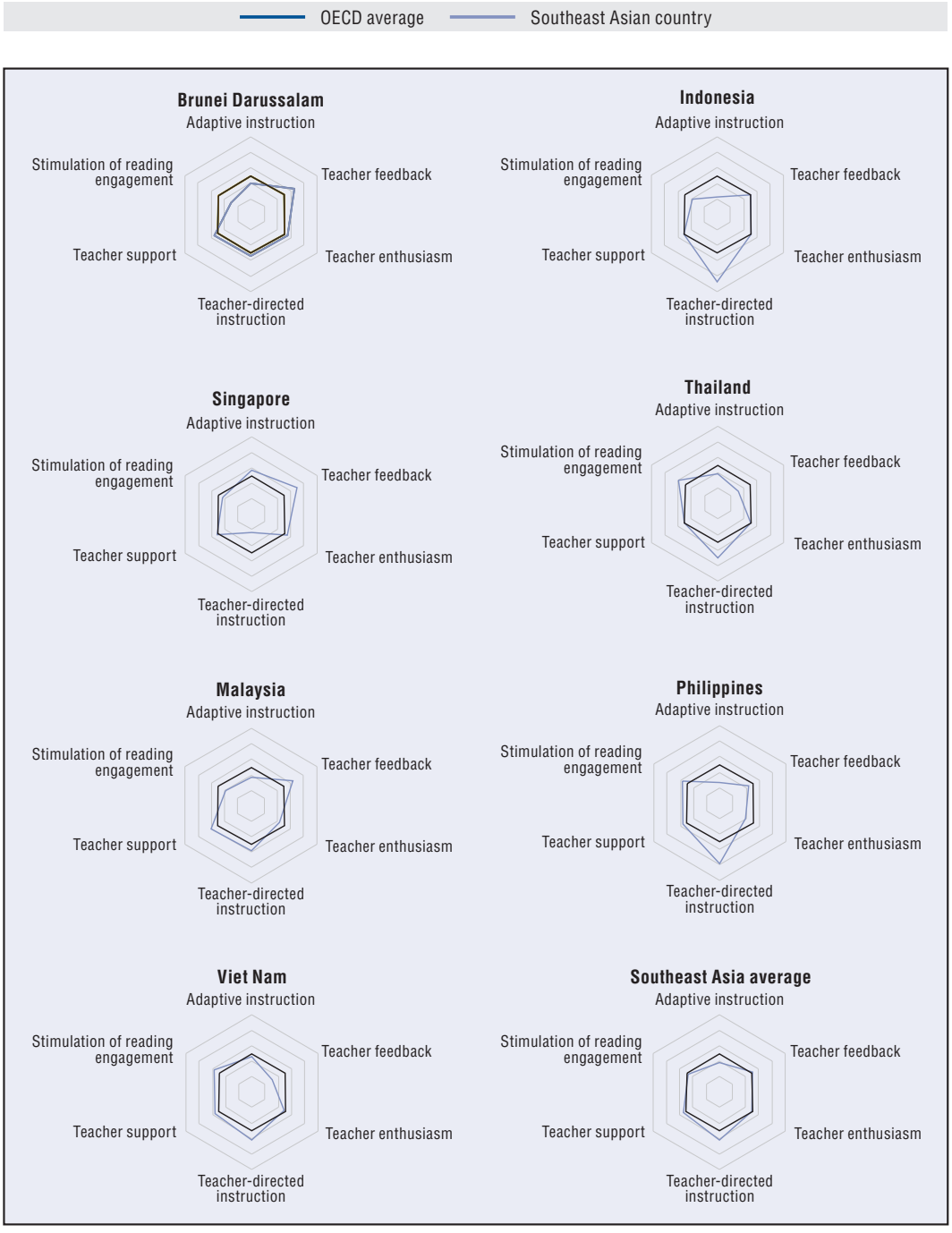
Index name	Student prompt	Example questions
• Teacher enthusiasm	Do you agree ("strongly agree", "agree", "disagree", "strongly disagree") with the following statements about the two language-of-instruction lessons you attended prior to sitting the PISA test	• It was clear to me that the teacher liked teaching us • The enthusiasm of the teacher inspired me
• Teacher support		• The teacher shows an interest in every student's learning • The teacher gives extra help when students need it
• Teacher feedback		• The teacher gives me feedback on my strengths in this subject • The teacher tells me in which areas I can improve
• Teacher-directed instruction	How often ("never or hardly never", "some lessons", "most lessons", "every/all lesson(s)") do the following happen in your language-of-instruction lessons	• The teacher asks questions to check whether we have understood what was taught • The teacher tells us what we have to learn
• Stimulation of reading engagement		• The teacher encourages students to express their opinion about a text • The teacher helps students relate the stories they read to their lives
• Adaptive instruction		• The teacher adapts the lesson to [my] class's needs and knowledge • The teacher changes the structure of the lesson on a topic that most students find difficult to understand

All indices have been standardised so that their averages are 0 and standard deviations are 1 across OECD countries. Positive values in the indices mean that students perceived their language-of-instruction teachers to be more enthusiastic, provide greater support or use certain teaching practices more frequently than the average student across OECD countries did. To account for differences in response style across countries and economies, the values of each index have been adjusted using the average response across all indices. These adjusted results are shown in Figure 3.10, which represents the extent to which one teacher practice is more frequently used relative to both other countries and other practices.

On average across Southeast Asian countries, students reported that their language-of-instruction teachers employed teacher-directed instruction more frequently and provided somewhat more support than the average OECD student did (Figure 3.10). By contrast, teachers in the region used adaptive instruction and stimulated reading engagement less frequently than did teachers on average across OECD countries, at least according to students' reports.

All education systems in the region share a comparatively high frequency of teacher-directed instruction and low frequency of adaptive instruction, except for Singapore. In Singapore, the only top-performing school system in the region, teacher-directed practices were relatively infrequent, whereas adaptive instruction, and also teacher feedback, were comparatively common. In many other high-performing systems, teachers also adapt their teaching to students' needs and level of understanding relatively frequently. By contrast, teacher-directed instruction is a common feature of systems with comparatively low average scores on the PISA assessment.

Figure 3.10. **Teaching practices in language-of-instruction lessons**



Source: OECD, *PISA 2018 Database*.
StatLink https://doi.org/10.1787/888934161596

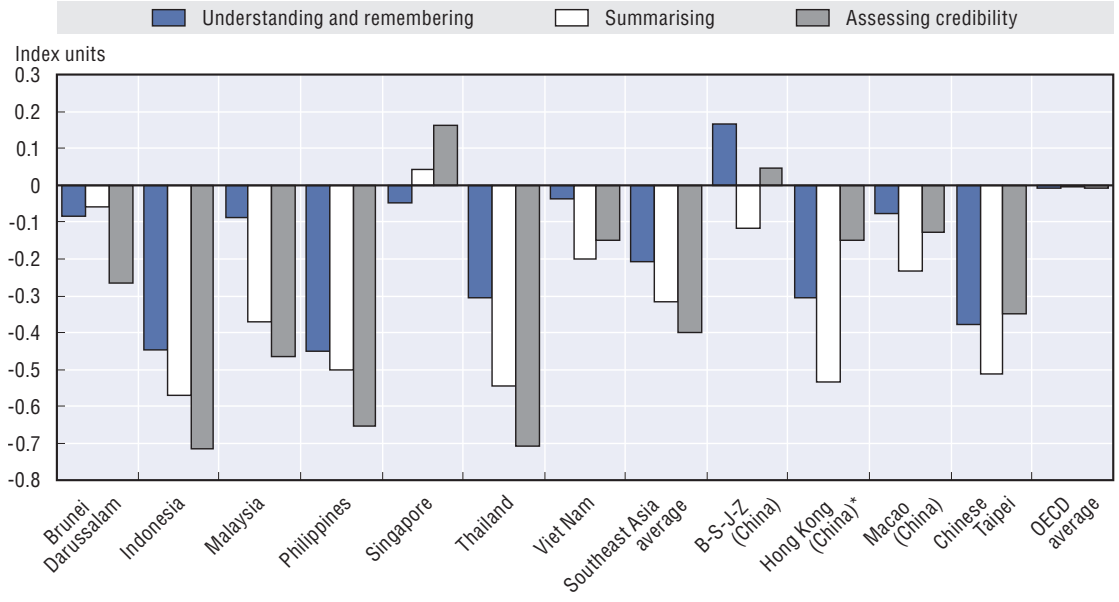
In the region, and always according to students' reports, teacher support was relatively most common in Malaysia; teacher feedback and adaptive instruction were most frequent in Singapore; teacher enthusiasm was most frequently observed in Brunei Darussalam; teacher-directed instruction was most common in Indonesia; and the stimulation of reading engagement was most frequently employed in Thailand.

Another area where the education systems in Southeast Asia can still improve is the meta-cognitive skills of students in reading. Meta-cognitive skills can be defined as the strategies that students use to take charge of their own learning in a meaningful way (Kim, Park and Baek, 2009) or, more concretely, the awareness and ability to use appropriate strategies when processing texts (OECD, 2019b). In reading, these strategies include setting learning goals, adapting one's reading strategies, monitoring and solving comprehension problems, summarising a piece of text and remembering essential information (OECD, 2019b). Meta-cognition is important for students' learning outcomes. Previous studies have shown that students improve their reading skills faster when they are taught meta-cognitive strategies (Artelt, Schiefele and Schneider, 2001; Baker and Beall, 2009) and these strategies may be particularly helpful for students with learning problems (Kim, Park and Baek, 2009).

In PISA 2018, students were asked about the usefulness of a series of strategies, such as underlining, reading aloud, summarising and memorising, for different types of reading tasks (understanding and remembering; summarising; assessing credibility). Their answers were compared to those given by a group of experts, and received a meta-cognitive score accordingly. Higher scores in the index mean that the judgements of students and experts aligned closely – that is, they showed stronger meta-cognitive skills. On this metric, students from all education systems in Southeast Asia, except Singapore, showed weaker meta-cognitive skills than the average student across OECD countries (Figure 3.11). Students in the region appear to struggle most when asked to choose the best strategies for assessing credibility, followed by the strategies for summarising information. Just to give an example, students in the region were considerably more likely than students across OECD countries to say that "clicking on the link to fill out the form" was an appropriate strategy when receiving an email from a well-known mobile phone operator telling them that they had won a smartphone and all they needed to do was fill out an online form to receive it.

Figure 3.11. **Meta-cognitive skills in reading**

Index units



Note: * PISA 2018 data did not meet the PISA technical standards but were accepted as largely comparable.
Source: OECD, *PISA 2018 Database*.
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Some policy recommendations for the education systems in the region

Providing one-size-fits-all recommendations for such a diverse region as Southeast Asia can be challenging, even counterproductive. On one end, Singapore has consistently been one of the top-performing school systems in PISA since its first participation in 2009. Even if its equity outcomes in education could still be improved, the Singaporean education system has been an inspiration for other education systems worldwide. On the other end, in Cambodia, only about one in ten students achieved the minimum level of proficiency in reading, mathematics or science. Given their shared membership in the Association of Southeast Asian Nations (ASEAN), Singapore's neighbours can draw valuable lessons from its education system, which played a key role in its transition from a "Third" to a "First" World economy (Yew, 2012). This would perfectly align with the PISA spirit, which promotes sharing experiences, policies and best practices between education systems, experts and social agents.

Other than learning from neighbouring countries, some general recommendations for the school systems in Southeast Asia could include:

- Keep improving access to education without sacrificing the quality of the school system. Indonesia, for instance, clearly shows that increasing the share of 15-year-olds covered by the PISA sample does not necessarily lead to lower average performance in the PISA assessments.
- Make learning time more productive by building a skilled and dedicated teacher workforce, and encourage teachers to use multiple teaching strategies and types of assessments. In most countries in the region, and especially in Indonesia, the Philippines and Thailand, instruction relies too heavily on teacher-directed strategies. Paying more attention to teachers' digital literacy is also important to support learning, particularly to prepare students for the digital era.
- Address gender differences in students' participation in various training and studies, including those related to science and engineering, to support the efforts in promoting equal representation of men and women in different occupations.
- Create a positive learning environment, where students do not disrupt the flow of instruction and respect other students, teachers support their students and co-operate with colleagues, school principals react swiftly when behavioural and academic problems arise, and parents participate in school activities.
- Invest greater resources in the school system, especially in the countries where education expenditure is low by international standards, like in Malaysia, the Philippines, Thailand and Viet Nam.
- Allocate resources more equitably among schools, especially in Indonesia, the Philippines and Thailand, and provide additional support to disadvantaged schools. Improving access to ICT infrastructure and tools in disadvantaged schools, in particular those in rural and remote areas, is also necessary.

Note

1. Disadvantaged students are in the bottom quarter of the PISA index of economic, social and cultural status in their own country/economy, whereas high-achieving students are those who scored amongst the top 25% of students within their country or economy on the PISA test.

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