PISA 2018

Programme for International Student Assessment

THAILAND

Country Report

World Bank

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EXECUTIVE SUMMARY

Thailand has participated in the Programme for International Student Assessment (PISA) since its launch in 2000. PISA assesses skill and knowledge of 15-year-old students in reading, math, and science, and collects information on students' attitudes and home background, learning experience, and school contexts. In 2018, the main domain assessed by PISA was reading literacy.

Thailand in PISA 2018

In PISA 2018, Thailand ranked 68th in reading out of the 79 PISA-participating countries and economies, 59th in mathematics and 55th in science, ahead of only Indonesia and the Philippines in the East Asia and Pacific (EAP) Region. Furthermore, it is worrisome that its performance has been declining over time. Given the impact of school closures due to the COVID-19 pandemic, it is expected that these trends will be exacerbated considerably.

The report analyzes primarily the results in PISA 2018 and performance trends over time. This report presents an in-depth discussion on the four prosperity outcomes of educational attainment, namely: educational attainment; academic achievement; student well-being; and attitudes towards school and learning. These four outcomes are then discussed in relation to five foundations for success in Thailand. Based on these findings, the report highlights three important areas which policymakers and educators can address: (a) enhancing school inclusion; (b) strengthening teaching quality; and (c) making effective use of learning times. The unprecedented educational disruptions brought by the COVID-19 pandemic pose an urgent need to build these foundations for success in the country.

Education outcomes at age 15

Learning outcomes. Thailand's reading performance shows an increasingly negative trajectory, while scores in math and science have stagnated. In 2018, around 60 percent of students scored below the minimum proficiency level in reading. More than half (53 percent) were unable to attain the minimum proficiency level in math, while 44 percent failed to reach basic proficiency in science. Inequities in education outcomes are revealed by disparities in performance across sociodemographic characteristics like gender (in favor of girls), socioeconomic status (in favor of advantaged students), school ownership types (in favor of students in private independent schools), school community types (in favor of students in urban school communities), and language (in favor of those speaking the language of the test at home).

Educational attainment. Educational enrollment in Thailand has not improved since 2006. In PISA 2018, only 72 percent of 15-year-old students were covered by PISA, indicating a large proportion of youth who were not in school. Around 21 percent of students were behind track (i.e., below the expected grade of Grade 10). Grade-age mismatch, which can occur due to issues like grade repetition and late entry to schooling, was particularly prevalent among socioeconomically disadvantaged students and boys. These issues in attainment are critical, as they can result in poorer learning outcomes. Grade 10 students who repeated a grade at least once scored at least 48 points lower in reading than their peers who had not repeated a grade.

Foundations for education success

Resources. Investments in key financial, human, and digital learning resources were particularly low in disadvantaged schools, private government-dependent schools, and rural schools. The cumulative spending per student in Thailand (USD 27,271 in PPP) was less than one-third that of the average cumulative expenditure per student across OECD countries, but even with this level of investment Thailand does less well than expected. Student-teacher ratios were relatively high in urban school communities; however, shortage of education staff was perceived to a greater extent by principals in rural schools than in urban schools. This observation may seem contradictory at first, but is very common in Thailand where there is a large network of small schools with tiny classes. Even though the student-teacher ratios in these schools seem low, but too few teachers are spread too thinly over too many small classrooms and many of these schools even have fewer teachers than the number of classes. In terms of teacher qualification, teachers with full certification and advanced educational degrees were less often found in private government-dependent schools and rural school communities.

Schools primarily serving disadvantaged children and schools in the rural areas are also generally much more lacking in material resources and physical infrastructure. The study concludes that the inequality in educational personnel and resource allocation exists everywhere. However, the extent of the difference between the advantaged and disadvantaged in Thailand is much more pronounced than those observed among OECD and EAP countries.

Digital learning resources, in particular, have important implications amidst school closures brought about by the spread of the coronavirus disease (COVID-19). Though 77 percent of principals agreed that an effective online learning support platform is available in their schools, great variations are observed by school socioeconomic status. The availability of an effective online learning support platform is available to only 51 percent of students in disadvantaged schools, as compared to 89 percent of those in advantaged schools. Similarly, while 93 percent of principals in advantaged schools agree or strongly agree that effective professional resources for teachers to learn how to use digital devices are available, only 57 percent reported the same in disadvantaged schools.

The inequity in access to digital learning resources has another dimension. While close to 90 percent of advantaged students have a computer they can use for school work at home, only 20 percent of disadvantaged students have access to the same. Similarly, though internet access is available at home for nearly every advantaged student, a link to the internet at home is available to only 61 percent of disadvantaged students. In times where school operations are disrupted, such as in the current COVID-19 crisis, if remote learning becomes the only option and schools rely mainly on digital learning modes, students from socioeconomically disadvantaged backgrounds and rural communities risk falling even further behind their advantaged peers.

Quality instruction. Adaptive instruction[1] and classroom disciplinary climate are key aspects of quality instruction that make a difference in students' reading performance. Students in Thailand

[1] PISA asks students the extent to which they agree with the following statements about their language-of-instruction teachers: "The teacher adapts the lesson to my class's needs and knowledge"; "The teacher provides individual help when a student has difficulties understanding a topic or task"; and "The teacher changes the structure

perceived their teachers' ability to provide adaptive instruction and classroom disciplinary climate more positively than did the average student across OECD countries. However, aspects of classroom disciplinary climate, specifically in providing an environment where students can work well, have worsened since 2009. Adaptive instruction appeared to be weaker in disadvantaged schools and urban schools, while disciplinary climate was observed to be much worse in disadvantaged schools compared to advantaged schools.

Regarding quality assurance,[2] private independent schools scored the highest by far, followed by private government-dependent schools, and public schools. Schools in urban areas and socioeconomically advantaged schools also score higher on this measure than disadvantaged schools and rural schools respectively.

Learning time. Despite relatively longer learning hours per week than most other countries, learning outcomes in Thailand have remained low. Teacher absenteeism was not perceived to be a contributor to loss of learning time; however, high levels of student absenteeism was. Student absenteeism in Thailand was more prevalent than on average across the OECD and among countries in the East Asia and Pacific region. Nearly 40 percent of students in Thailand reported skipping a day of school in the two weeks prior to the PISA assessment. Student absenteeism was more frequently observed among boys and socioeconomically disadvantaged students. Skipping school and arriving late for school are found to be negatively associated with reading performance and the effects are considerable. Students are less likely to skip school when they are less frequently bullied, have a positive disciplinary classroom climate, value school more strongly, and receive greater emotional support from their parents.

The late entry into primary school is found to significantly increase the probability of primary grade repetition, and hence increase the loss of learning time. Late school entry and grade repetition are key reasons why students are falling behind track. The problem is found to accumulate as once a student has repeated a grade at the primary level, there is a more than 50 percent chance that he/she will again repeat a grade at the lower secondary level. Late school entry and grade repetition are found to massively affect learning outcome and students from socioeconomically disadvantaged background are more disproportionately prone to both. The detrimental effect on students' reading performance from the loss of learning time is also found to increase exponentially. Specifically, a student who started primary school at the age of 7 years is expected to score 6.3 points lower on reading compared to an otherwise identical student who started school at the correct age of 6 years. The negative effect increases to 19 points if school entry is delayed by 2 years, and then to a massive 47.4 points (equivalent to more than one and a half years of formal schooling) if entry is delayed by 3 or more years. As school operations are disrupted by the COVID-19 pandemic, the government needs to take urgent actions to minimize the loss of learning time by ensuring students' enrollment at right age and keeping students in school.

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of the lesson on a topic that most students find difficult to understand." Students' responses were combined to create the index of adaptive instruction.

[2] The quality assurance and improvements index summarizes principals' responses to whether "the following arrangements aimed at quality assurance and improvements exist in their school": "Internal evaluation/Self-evaluation"; "Written specification of student performance standards"; "Seeking written feedback from students (e.g. regarding lessons, teachers or resources); and "Teacher mentoring."

Inclusive learning environments. Students in Thailand reported a relatively weaker sense of belonging at school and higher exposure to bullying than did the average student across OECD countries. Moreover, between 2015 and 2018, students' sense of belonging has weakened while exposure to bullying has increased. Students with a stronger sense of belonging and less exposure to bullying, i.e., girls and socioeconomically advantaged students, tend to perform better in reading. Disadvantaged students who feel socially connected to school are also more likely to perform in the top 20 percent (i.e., be academically resilient).

Family support. Parents' emotional support was associated with better reading scores and appeared to play a protective role against underperformance among disadvantaged students. In contrast, parental involvement at school, though present in high levels in Thailand, appeared to be unrelated to student performance in reading. It should be noted, however, that students in Thailand perceived weaker levels of emotional support from their parents as compared to the OECD average. Within the country, parents' emotional support was reported to a weaker extent among boys, disadvantaged students, students in private government-dependent schools, and students in rural school communities.

Building foundations for education success in Thailand

Findings from PISA 2018 highlight three important areas which policymakers and educators can address: (a) enhancing school inclusion; (b) strengthening teaching quality; and (c) making effective use of learning time.

Enhancing school inclusion

When students are provided a learning environment that is safe and welcoming, they are more likely to perform well in school. To support learning outcomes, policymakers and educators must pay increased attention to creating inclusive learning environments. School principals and teachers should be equipped with tools and mechanisms to assess their current school climates. Continuing professional development on school and classroom management and student support should strengthen their abilities to recognize and respond to students' needs and emotions, including identifying and appropriately addressing bullying acts. Schools, in collaboration with key stakeholders, should develop and implement comprehensive bullying prevention policies. Ensuring students feel safe and welcomed in school will be especially critical in students' transition back to the classroom once mandatory school closures brought by the COVID-19 outbreak have been lifted. Indeed, teachers and school staff need to address online bullying as part of this strategy.

Strengthening teaching quality

To strengthen teacher quality in all schools, targeted training, equitable teacher deployment, and appropriate teacher selection should be addressed. Continuing professional development on subject knowledge and pedagogy should include targeted training on teachers' abilities to perform adaptive instruction and classroom management. In addition to providing training, policymakers

and school administrators should ensure that aspects of the school context in which teachers operate, such as class sizes and the availability of material resources, can support the implementation of teacher strategies. Teacher deployment should be made more efficient and equitable so that all schools, especially high-need ones such as those in rural areas, have sufficient number of higher-qualified and experienced teachers. This will require revising the existing staff entitlement allocation formulae, improving information management systems, and providing stronger incentives for qualified teachers to be deployed to high-need schools. Teacher selection in schools should ensure that all students, regardless of program orientation, acquire the necessary skills and competencies.

Making effective use of learning time

Relatively long learning time has not resulted in better learning outcomes. To ensure that instructional time is allotted and used effectively, a thorough review of the current curriculum may need to be conducted. To make efficient use of learning time, teachers must be well-equipped to create a more conducive environment with positive disciplinary climates, handle classroom disruptions, provide adequate support to students' individual needs, and minimize student absenteeism. It is also important that schools engage parents in providing stronger emotional support to students. Preventing loss of learning time is especially critical amidst school closures brought by the COVID-19 crisis as the available face-to-face learning time is likely to be reduced considerably. In addition to making face-to-face learning time more effective, policymakers should be developing viable alternative modalities for remote learning to sustain as much learning time as possible.

CHAPTER 1: Attainment and achievement outcomes at age 15 in Thailand

Thailand has participated in the Programme for International Student Assessment (PISA) since its launch in 2000. PISA is the OECD's benchmarking tool to assess skills and knowledge of 15-year-olds[3] in reading, math, and science. In the 2018 cycle, PISA focused on reading literacy as the main domain of assessment. This chapter discusses what Thailand's PISA results reveal about outcomes in educational attainment and academic achievement in the country.

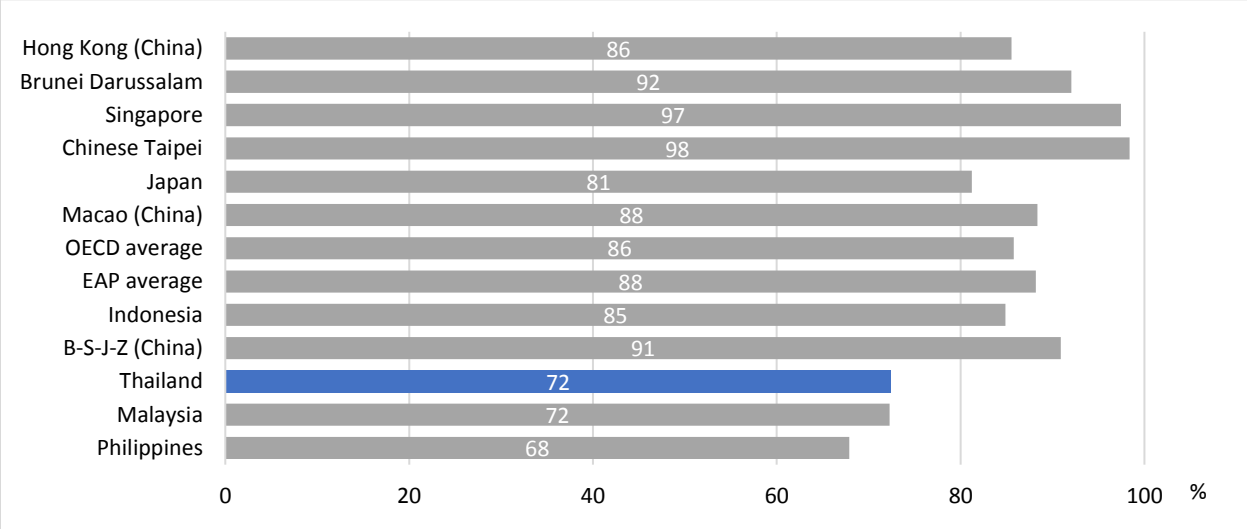
Enrollment and attainment at age 15 in Thailand

This section presents findings on enrollment and attainment outcomes in Thailand based on the country's PISA 2018 results, including comparisons against other countries in the East Asia and Pacific (EAP) region and the OECD average.

Proportion of 15-year-olds represented by PISA 2018

Less than three-quarters of Thailand's 15-year-olds are represented by PISA, reflecting a large proportion of youth who are not in school. Figure 1.1 presents the coverage of the 15-year-old population in Thailand against that of other countries, after taking account school- and student-level exclusions. The coverage of 15-year-olds in Thailand was among the lowest in the EAP region and has remained stagnant between 71 and 73 percent since the PISA 2006 cycle.

*Figure 1.1.**Coverage of 15-year-old population in the Thailand***



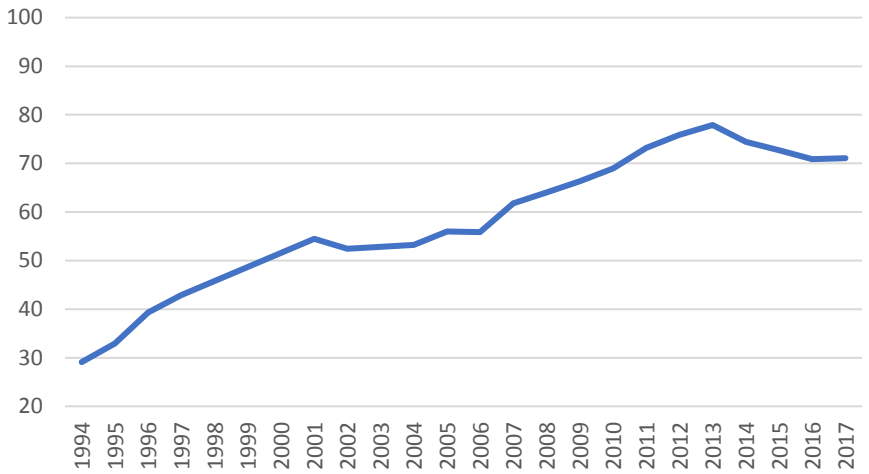
Source: OECD PISA 2018 database.

The stagnant trend in coverage is consistent with Thailand's upper secondary gross enrolment rate, which improved throughout 1994 to 2013. Since 2013, however, upper secondary gross enrolment has fallen quite sharply, and has remained stagnant after 2016 (Figure 1.2). The recent fall in upper

[3] To be eligible for participation in PISA, test-takers must be currently enrolled in school, must be between 15 years 3 months and 16 years 2 months at the time of assessment, and must have completed at least six years of formal schooling.

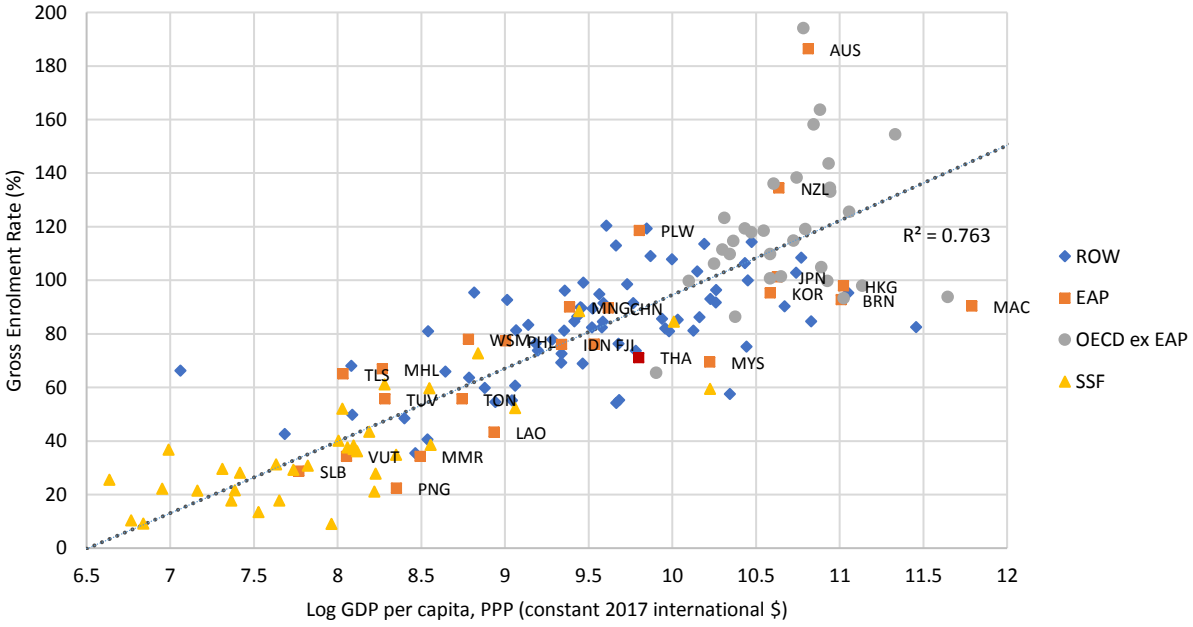
secondary enrolment is particularly concerning as Figure 1.3 shows that at Thailand's level of economic development (measure using per capita GDP), the country's level of gross enrolment in upper secondary school should be around 89 percent. The actual gross enrolment rate of 71 percent is substantially lower than the expected rate.

Figure 1.2. ***Upper Secondary Gross Enrolment Trend in Thailand***



Source: World Bank Edstats (1994-2012) and Office of the Education Council, Thailand (2013-2017)

Figure 1.3. ***Upper Secondary Gross Enrolment Trend in Thailand***



Source: World Development Indicators, World Bank Edstats, and Office of the Education Council, Thailand

Distribution of PISA students across grades

The modal or most common grade for 15-year-old students in Thailand is Grade 10. The theoretical starting age for primary education in Thailand is 6 years old. At age 15, students are on track when they are in Grade 10 or beginning Grade 11 at the upper secondary level. In Thailand, 79 percent were either on or ahead of track, indicating that majority of students are not falling behind or repeating grades. About 21 percent of students were behind track, nearly all of whom were enrolled in Grade 9. Table summarizes the PISA student sample in Thailand by grade, gender, school community type, and school ownership.

Table 1.1. ***PISA student sample in Thailand***

Student characteristics		Unweighted number of students	Weighted number of students[4]	Percentage of students
Grade				
Lower secondary	Grade 7	13	1,187	0.2
	Grade 8	67	4,251	0.7
	Grade 9	1,806	114,779	19.9
Upper secondary	Grade 10	6,485	441,169	76.6
	Grade 11	262	14,328	2.5
	Grade 12	0	0	0
Gender				
Male		3,940	269,479	46.8
Female		4,693	306,233	53.2
School community type*				
Urban		2,876	200,494	34.8
Rural		5,757	375,219	65.2
School ownership**				
Private independent		546	42,880	7.4
Private government-dependent		522	49,148	8.5
Public		7,565	483,685	84.0

Source: OECD PISA 2018 database.

Notes: *School community type is categorized as "urban" if the school is in a city with more than 100,000 people.
** School ownership is categorized as private independent if the school receives less than 50 percent of core funding from government agencies, and private government-dependent if the school receives more than 50 percent of the same.

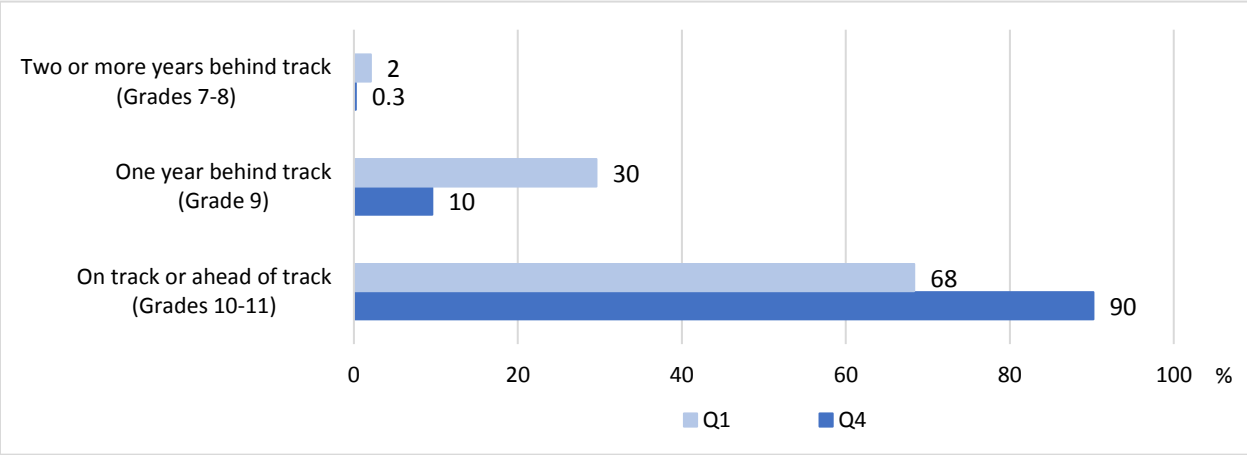
The prevalence of grade-age mismatch was higher among socioeconomically disadvantaged students than advantaged students, and among boys than girls. About 24 percent of boys, as opposed to 18 percent of girls, fell behind track (i.e., enrolled in Grades 9 or lower). Between socioeconomically advantaged and disadvantaged students, the prevalence of grade-age mismatch was even more pronounced. Students who fell behind track tended to come from more disadvantaged background, scoring lower on PISA's index of economic, social, and cultural status (ESCS)[5]. Nearly 32 percent of socioeconomically disadvantaged students (i.e., at the bottom ESCS

[4] Sampling weights control the proportional contribution of each participating unit to the overall population estimate. Students selected to participate in PISA received sampling weights to ensure that each participating student appropriately represents the correct number of students in the full PISA population. Further details on survey weighting are found in the PISA 2018 Technical Report: http://www.oecd.org/pisa/data/pisa2018technicalreport/.

[5] In PISA, a student's socioeconomic status is estimated 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. A student's ESCS is derived from three variables related to family background: parents' highest level of education, parents' occupational status, and home possessions (OECD 2019b).

quartile), as compared to 10 percent of advantaged students (i.e., at the top ESCS quartile), were behind track. These high rates of grade-age mismatch signify that issues of dropout, late entry, and grade repetition are particularly critical issues among boys and students from poorer backgrounds in Thailand.

Figure 1.4. ***Educational attainment at age 15, by socioeconomic status***

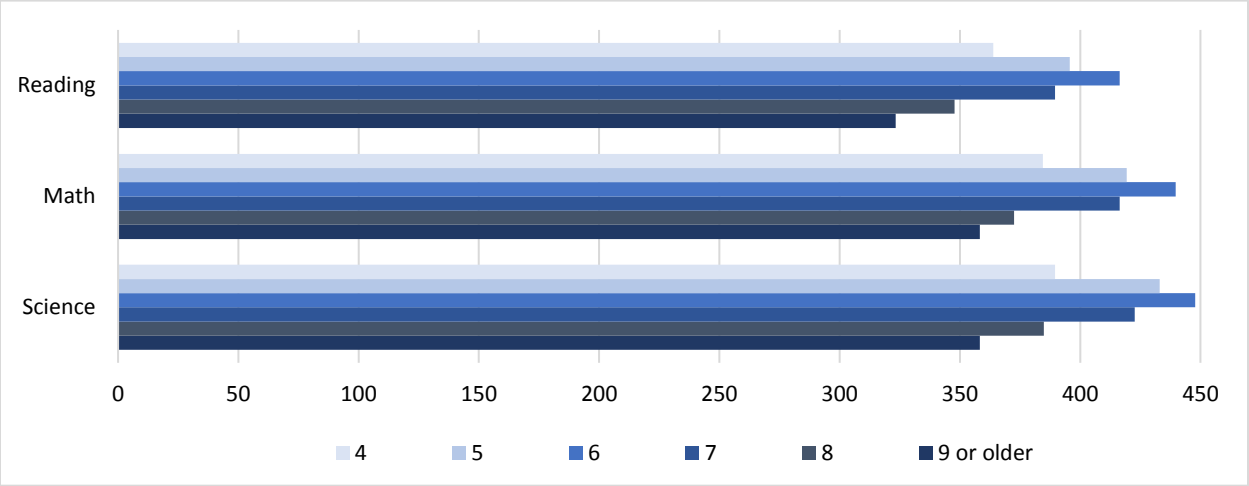


Source: OECD PISA 2018 database.

One reason that students might be behind track is late entry into primary schooling. Most 15-year-olds who were in Grades 7 or 8 when they sat for PISA entered the elementary level late at ages 7 or older. Figure 1.5 shows that, on average, these students also tended to perform worse than those who began elementary schooling at 6 years old. The later students entered elementary school, the more likely they were to score lower on reading, math, and science as compared to those who entered at the right age. As late starters have been in school for a shorter period, their learning hours have been shorter and hence may be more likely to underperform.

Grade-age mismatch can occur when students enter primary schooling at the wrong age, which appears to affect student performance. Across all three PISA subjects, mean scores were highest for students who entered primary schooling at the right age or 6 years old (Figure 1.5). Students who entered primary schooling earlier or later than 6 years old tended to score worse than those who started at the right age.

Figure 1.5. ***Mean PISA scores, by age of entry into primary schooling***

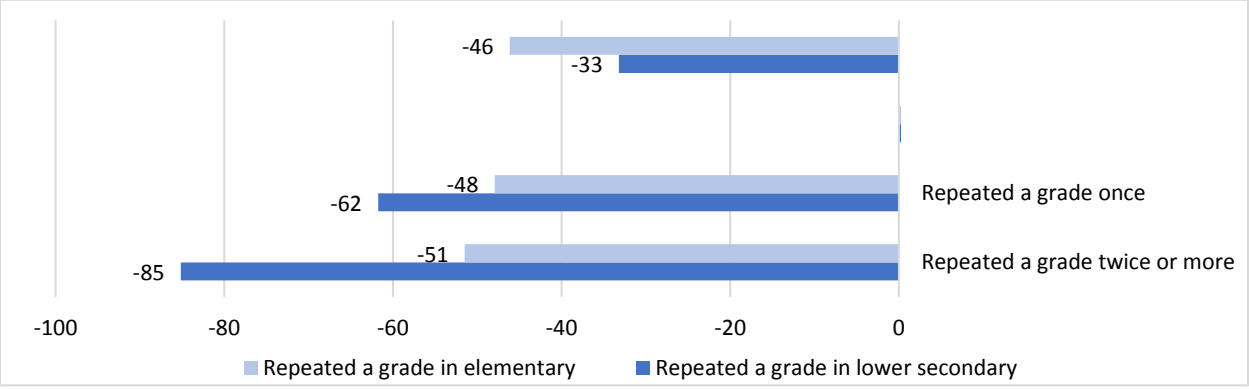


Source: OECD PISA 2018 database.

Grade-age mismatch can also occur when students repeat a grade. A small number of students in Thailand reported having repeated a grade at least once in the elementary (5 percent), lower secondary (3 percent), or upper secondary (3 percent) levels. The proportion of boys (10 percent) who repeated a grade was more than twice that of girls (4 percent). The incidence of grade repetition was only slightly higher among students in rural areas (8 percent) than in urban areas (5 percent), and among disadvantaged (7 percent) than advantaged students (4 percent).

Students who repeated a grade at least once tended to perform worse in reading than non-repeaters. Students who reported repeating a grade at least once scored about 60 score points lower than those who did not repeat a grade. Among students in Grades 10, those who repeated a grade at least once in the elementary level tended to score at least 48 points lower in reading than non-repeaters. Those who repeated a grade at least once in the lower secondary level scored about 62 points lower, on average, than non-repeaters. The difference increases to as much as 85 score points when students repeat a lower secondary grade twice or more (Figure 1.6).

Figure 1.6. ***Differences in mean reading scores among Grade 10 students, by occurrence of repetition***



Source: OECD PISA 2018 database.
Note: Bars represent the difference in average reading scores, relative to those who never repeated a grade.

Student achievement in Thailand

In PISA 2018, Thailand ranked 68th in reading out of the 79 PISA-participating countries and economies, 59th in mathematics and 55th in science, ahead of only Indonesia and the Philippines in the EAP. Students in Thailand scored lower than the OECD average in reading, math, and science. For each of these subjects, a smaller proportion of students in Thailand than on average across OECD countries achieved a minimum level of proficiency (Level 2 or higher).

More than a third (35 percent) of Thailand's students failed to reach basic proficiency levels in all three PISA subjects. Table presents the shares of top-performing (i.e., those who reached Level 5 or 6) and low-achieving (i.e., those who fell below Level 2) students in Thailand, in comparison with that of EAP countries and the OECD average. Only a small share of students in Thailand (3 percent) attained Level 5 or 6 in at least one PISA subject; this proportion of high achievers is about three times smaller than that of the OECD average. The share of low achievers in Thailand is higher than that observed both across the OECD and the EAP region, on average.

Table 1.2. ***Shares of top-performing and low-achieving students***

	Mean score in PISA 2018			**Top-performing and low-achieving students**	
	Reading	**Mathematics**	**Science**	**Share of top performers in at least one subject (Level 5 or 6)**	**Share of low achievers in all three subjects (below Level 2)**
	Mean	**Mean**	**Mean**	**%**	**%**
B-S-J-Z (China)	555	591	590	49.3	1.1
Singapore	549	569	551	43.3	4.1
Macao (China)	525	558	544	32.8	2.3
Hong Kong (China)	524	551	517	32.3	5.3
Korea	514	526	519	26.6	7.5
Japan	504	527	529	23.3	6.4
Chinese Taipei	503	531	516	26.0	9.0
OECD average	487	489	489	15.7	13.4
EAP average	467	490	484	20.3	21.6
Malaysia	415	440	438	2.7	27.8
Brunei Darussalam	408	430	431	4.3	37.6
Thailand	**393**	**419**	**426**	**2.7**	**34.6**
Indonesia	371	379	396	0.6	51.7
Philippines	340	353	357	0.2	71.8

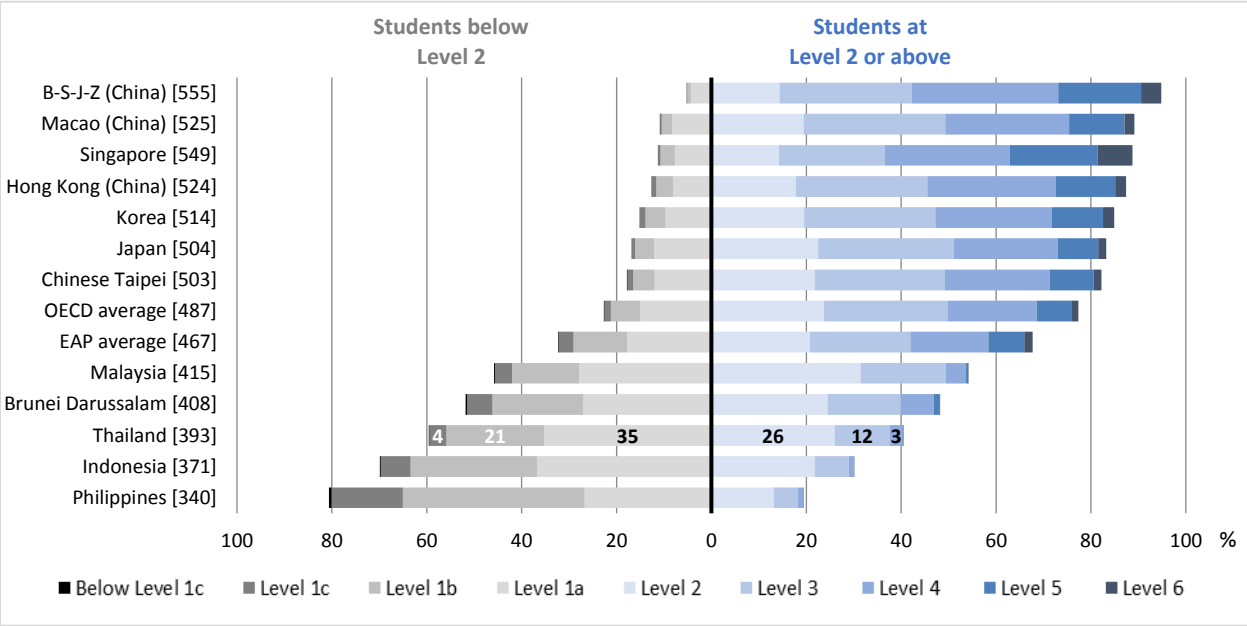
Source: OECD PISA 2018 database.

Reading performance

A majority of Thailand's students (60 percent) performed below the minimum proficiency level of Level 2. Figure 1.7 shows the distribution of Thailand's students across the eight levels of reading proficiency, in comparison with that of other EAP countries and the OECD average. In Thailand, the average student performance in reading (393 score points) was significantly lower than that of the OECD average (487 score points). Thailand's mean reading score was over one and a half standard deviations lower than that of high-performing countries and economies like

Beijing, Shanghai, Jiangsu, and Zhejiang (B-S-J-Z) (China) (555 score points), Macao (China) (525 score points), and Singapore (549 score points), and only about one-half of a standard deviation higher than that of neighboring low-performing countries like the Philippines (340 score points).

Figure 1.7. ***Students' proficiency in reading***



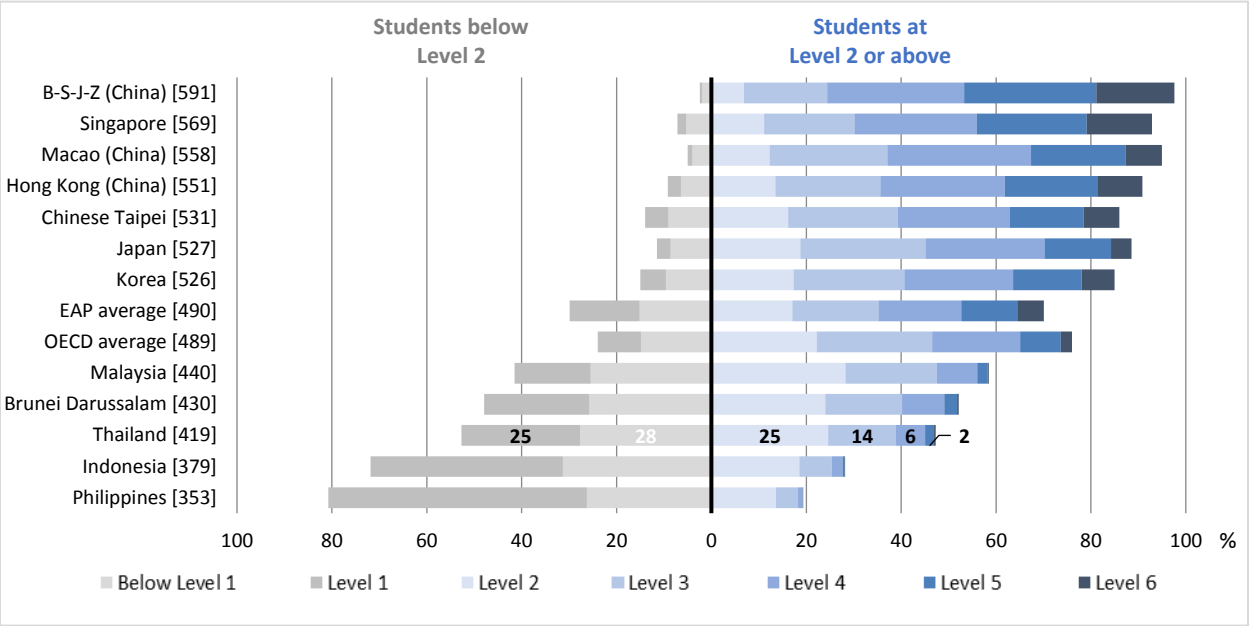
Source: OECD PISA 2018 database.
Notes: Mean reading scores for each country are indicated within brackets [ ].
Percentages may not add up to 100% due to rounding.

About 40 percent of students in Thailand, as compared to 77 percent on average across OECD countries and 68 percent on average across the EAP region, attained at least a minimum proficiency level in reading. In Thailand, about 26 percent of students reached Level 2 proficiency, 12 percent attained Level 3 proficiency, and 3 percent achieved Level 4 proficiency. Only a very small share (less than 0.2 percent) of students were high performers, or at Levels 5 or 6. By contrast, on average across the OECD and the EAP region, about 9 percent of students were high performers. Proficiency at Levels 5 and 6 indicates students are able to perform more difficult tasks such as dealing with abstract or counterintuitive concepts, comprehending lengthy texts, and generating inferences.

Math performance

A little over half (53 percent) of students in Thailand, as opposed to less than 30 percent of students on average both across the EAP and the OECD, failed to reach the minimum proficiency level in math (Figure 1.8). Thailand's mean student performance in math (419 score points) was significantly lower than that of the OECD average (489 score points), and at least one and a half standard deviations lower than the mean scores of Singapore (569 score points) and B-S-J-Z (China) (591 score points).

Figure 1.8. ***Students' proficiency in math***



Source: OECD PISA 2018 database.
Notes: Mean reading scores for each country are indicated within brackets [ ].
Percentages may not add up to 100% due to rounding.

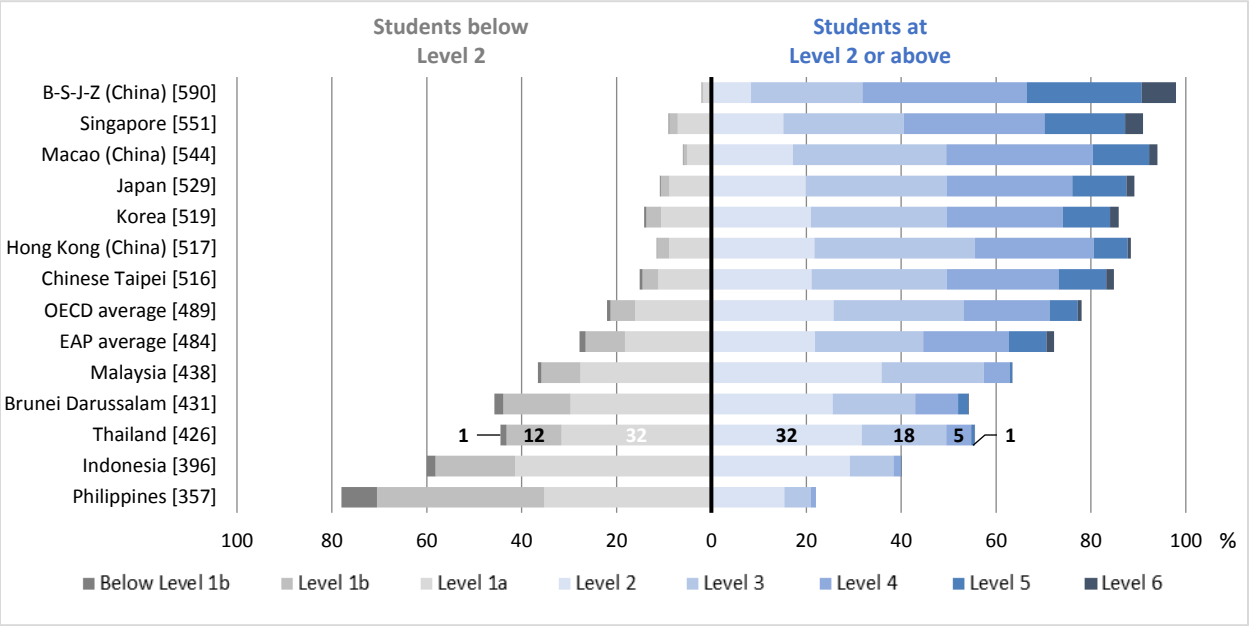
Less than half (47 percent) of students in Thailand were able to achieve at least the minimum level of proficiency in math. By contrast, about 70 percent of students on average across the EAP region scored at or above Level 2. In high-performing countries and economies like B-S-J-Z (China), Macao (China), Singapore, and Hong Kong (China), more than 90 percent of students have attained minimum proficiency in math.

About 2 percent of students in Thailand were high achievers in math, scoring at Levels 5 or 6 on the scale. This share of high achievers was about 11 percent on average across OECD countries and about 29 percent on average across the EAP region, where some of the largest proportions of high achievers in math were observed. Students reaching Levels 5 and 6 proficiencies are able to select, compare, and evaluate appropriate problem-solving strategies for dealing with complex situations.

Science performance

Though majority (56 percent) of students in Thailand were able to attain at least Level 2 proficiency in science, this share of students reaching minimum proficiency was still lower than that of the EAP average of 72 percent and OECD average of 78 percent. As with reading and math, Thailand's mean score in science (426 score points) was significantly lower than the OECD average (489 score points), and at least one standard deviation lower than high-performing countries and economies like B-S-J-Z (China) (590 score points) and Singapore (551 score points).

Figure 1.9. ***Students' proficiency in science***



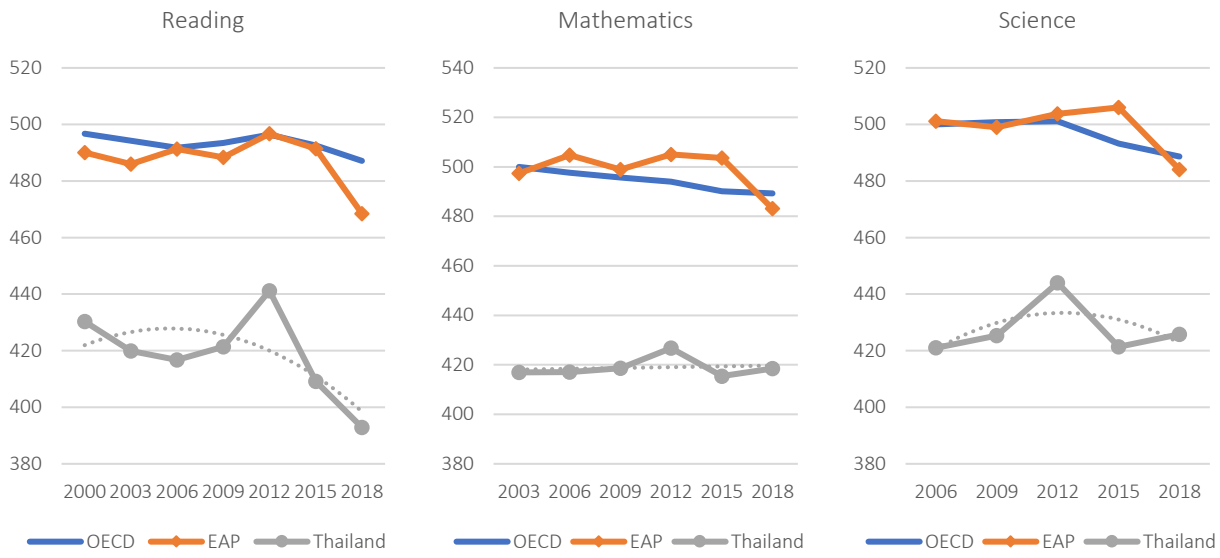
Source: OECD PISA 2018 database.
Notes: Mean reading scores for each country are indicated within brackets [ ].
Percentages may not add up to 100% due to rounding.

A small share of students in Thailand (less than 1 percent) were to performers in science, achieving Levels 5 or 6. These students are able to apply scientific ideas and concepts to a wide variety of contexts, including unfamiliar and complex ones. This share of high achievers is smaller than that observed on average across OECD countries (7 percent) and EAP countries (9 percent).

Trends in performance (see Box B1)

Long-term trends (i.e., between earliest PISA assessment and PISA 2018) show an increasingly negative trajectory in average reading performance, as well as a stagnation of scores in math and science, in Thailand (Figure 1.10). Reading was the focus in the 2000 and 2009 PISA cycles, math in the 2003 and 2012 cycles, and science in the 2006 and 2015 cycles. Between PISA 2000 and PISA 2018, Thailand has shown an increasingly negative trend in reading performance. In 2018, the country's mean performance in reading was lower than in all previous PISA cycles. The decline in mean reading scores between 2015 and 2018 was 16 score points, which was among the largest drops observed in all participating countries and economies. Mean scores in math remained stable between 2003 and 2018. Performance in science has also appeared stable between 2006 and 2018, with the exception of the PISA 2012 score which differed significantly from the PISA 2018 score; its hump-shaped trajectory indicates more negative science performance over more recent years.

Figure 1.10. ***Trends in reading, math, and science***



Source: OECD PISA 2018 database.
Note: Following OECD guidelines, "In all subjects, the most reliable way to establish a trend in students' performance is to compare all available results between the first full assessment of each subject and 2018." Hence, the figures above show the first full assessment of each subject (2003 for math and 2006 for science) as the starting point for future comparisons (see Box B1 for more detailed discussion).

The negative trend in reading performance is the result of a significant increase in the proportion of low-achieving students (i.e., below Level 2) between PISA 2009 and PISA 2018. In PISA 2018, about 60 percent of students in Thailand performed below Level 2; this proportion of low-achieving students was about 17 percentage points higher than observed in PISA 2009. While the share of low performers significantly increased between 2009 and 2018, the proportion of high-achieving students (i.e., Levels 5 or 6) did not change during the same period. Additionally, no significant changes in the shares of low- and high-achievers in math between PISA 2003 and PISA 2018, and in science between PISA 2006 and PISA 2018, were observed.

Box B1: Comparing reading, mathematics and science performance across PISA cycles

Comparisons of performance: Difference between two assessments and average three-year trend

To evaluate the evolution of performance, analyses in OECD (2019a) report the change in performance between two cycles and the average three-year trend in performance. When five or more data points are available, curvilinear trend trajectories are also estimated.

First, comparisons between two assessment cycles can be done between years when the main domain subject was the same. Hence, the results of PISA 2018 in which reading literacy was the main domain can be compared with those of PISA 2009 and PISA 2000 when the reading was also the main domain.

Second, we may compare three-year average trends. The three-year average trend is a more robust measure of a country's/economy's progress in education outcomes as it is based on information available from all assessments. It is thus less sensitive to abnormal measurements that may alter comparisons based on only two assessments. The average three-year trend is calculated as the best-fitting line throughout a country's / economy's participation in PISA.

How comparable are the PISA 2018 computer- and paper-based tests?

In 2018, the vast majority of participating countries, including Thailand selected a computer-based assessment. Paper-based tests were offered to countries that were not ready, or did not have the resources, to transition to a computer-based assessment. The paper-based tests comprise a subset of the tasks included in the computer-based version of the tests, all of which were developed in earlier cycles of PISA. No task that was newly developed for PISA 2015 or PISA 2018 was included in the paper-based instruments; consequently, the new aspects of the science and reading frameworks were not reflected in the paper-based tests.

To reflect how students and societies now commonly access, use and communicate information, starting with the 2015 assessment cycle, the PISA test was delivered mainly on computers. Existing tasks were adapted for delivery on screen; new tasks (initially only in science, then, for PISA 2018, also in reading) were developed that made use of the affordances of computer-based testing and that reflected the new situations in which students apply their science or reading skills in real life.

In order to ensure comparability of results between the computer-delivered tasks and the paper-based tasks that were used in previous PISA assessments (and are still in use in countries that use paper instruments), for the test items common to the two administration modes, the invariance of item characteristics was investigated using statistical procedures. These included model-fit indices to identify measurement invariance (see Annex A6 in OECD (2019)), and a randomized mode-effect study in the PISA 2015 field trial that compared students' responses to paper-based and computer-delivered versions of the same tasks across equivalent international samples. For the majority of items, the results supported the use of common difficulty and discrimination parameters across the two modes of assessment. For some items, however, the computer-delivered version was found to have a different relationship with student proficiency from the corresponding original paper version. Such tasks had different difficulty parameters (and sometimes different discrimination parameters) in countries that delivered the test on computer. In effect, this partial invariance approach both accounts for and corrects the potential effect of mode differences on test scores.

Source: OECD (2019a).

Equity in education outcomes

To examine issues of equity in education outcomes in Thailand, this section examines variations in PISA performance related to students' characteristics, including gender, socioeconomic status, school community type, and other demographic subgroups.

Gender

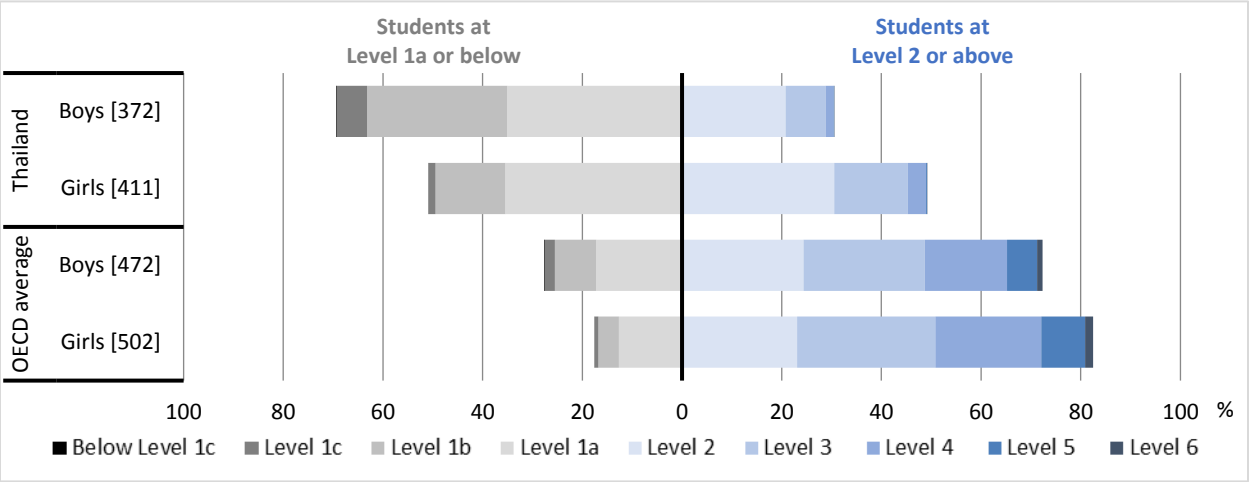
In Thailand, the mean reading performance among girls (411 score points) was significantly higher than among boys (372 score points). Across all PISA-participating countries and economies, girls significantly outperformed boys in reading. Thailand's gender gap in reading (39 score points) was wider than the OECD average gender gap (30 score points) and the widest among all EAP countries. The gender gap observed in Thailand in 2018 was similar to that observed in 2009. Compared to 2009, when reading was also the major domain assessed by PISA, the share of students scoring below Level 2 proficiency in 2018 significantly increased by 14 percentage points for boys and by 18 percentage points for girls.

The gender gap in math (16 score points), though narrower than in reading, was also significant in favor of girls. On average across OECD countries, boys tended to significantly outperform girls in math by 5 score points. The opposite was true in Thailand, where girls' mean math performance (426 score points) was significantly higher than that of boys (410 score points). Compared to 2012, when math was the main domain assessed by PISA, the share of students scoring below Level 2 proficiency in 2018 increased marginally by 3 percentage points for both boys and girls.

The gender gap in science (20 score points), in favor of girls, was much higher than that observed on average across OECD countries (2 score points). As with reading and math, girls' science performance (435 score points) was significantly higher than that of boys (415 score points). This gender gap in science was widest among all EAP countries and economies, where nearly all gender gaps were less than 10 score points. Compared to 2015, when science was the major PISA domain, the share of students scoring below Level 2 proficiency in 2018 remained unchanged for boys but decreased significantly by 5 percentage points for girls.

In 2018, a larger proportion of girls than boys were able to reach at least minimum proficiency in all three subjects. In reading, more than a third (35 percent) of girls and boys in Thailand performed at Level 1a (Figure 1.11). By contrast, on average across the OECD, the largest share of girls was found in Level 3, while the largest share of boys was evenly split between Levels 2 and 3. In Thailand, the proportion of boys (28 percent) performing at Level 1b was twice that of girls (14 percent). Whereas only 1 percent of girls performed at Level 1c or lower, about 6 percent of boys scored at these lowest proficiency levels.

Figure 1.11. ***Students' proficiency in reading, by gender***



Source: OECD PISA 2018 database.
Note: Mean scores are indicated within brackets [ ].

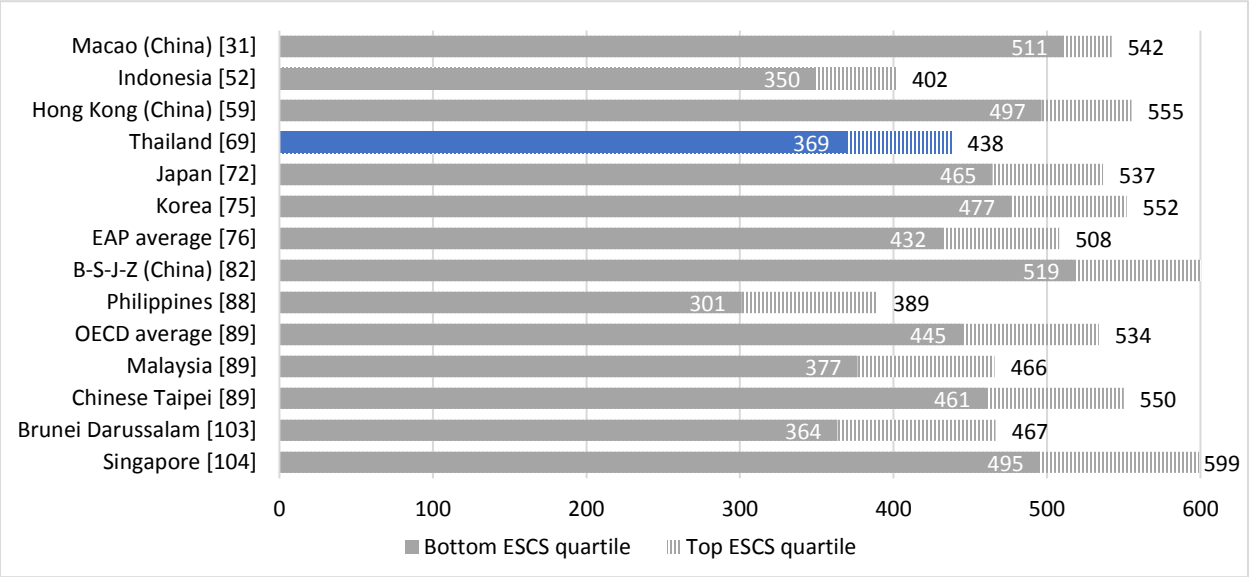
Socioeconomic status

PISA estimates a student's socioeconomic status by the economic, social, and cultural status (ESCS) index, a composite measure that combines into a single score the financial, social, cultural, and human capital resources available to students. A student's ESCS is derived from three variables related to family background: parents' highest level of education, parents' occupational status, and home possessions. Students are considered socioeconomically disadvantaged if they belong to the bottom quartile of the ESCS index in their country, and socioeconomically advantaged if they fall within the top quartile (OECD 2019b).

In Thailand, in common with all countries and economies, mean scores in reading, math, and science tended to increase with each ESCS quartile. Socioeconomically advantaged students in Thailand outperformed their disadvantaged peers by 69 score points in reading performance. Mean reading scores of both advantaged and disadvantaged students decreased significantly from 2009 to 2018, and the socioeconomic gap in performance has remained unchanged during the same period.

The disparity in performance between top and bottom ESCS quartiles observed in Thailand was lower than on average across the OECD and the EAP region (Figure 1.12). Disadvantaged students in Thailand scored at least one-fifth of standard deviation higher than their counterparts in Indonesia and the Philippines, but scored nearly one standard deviation lower than those in high-performing education systems like Japan, Chinese Taipei, and Korea. Advantaged students in Thailand also scored about one standard deviation lower than their counterparts in high-performing countries and economies like Singapore, Hong Kong (China), Macao (China), and B-S-J-Z (China). In these education systems, even the least advantaged students tended to score at least a half standard deviation higher than the most advantaged students in Thailand.

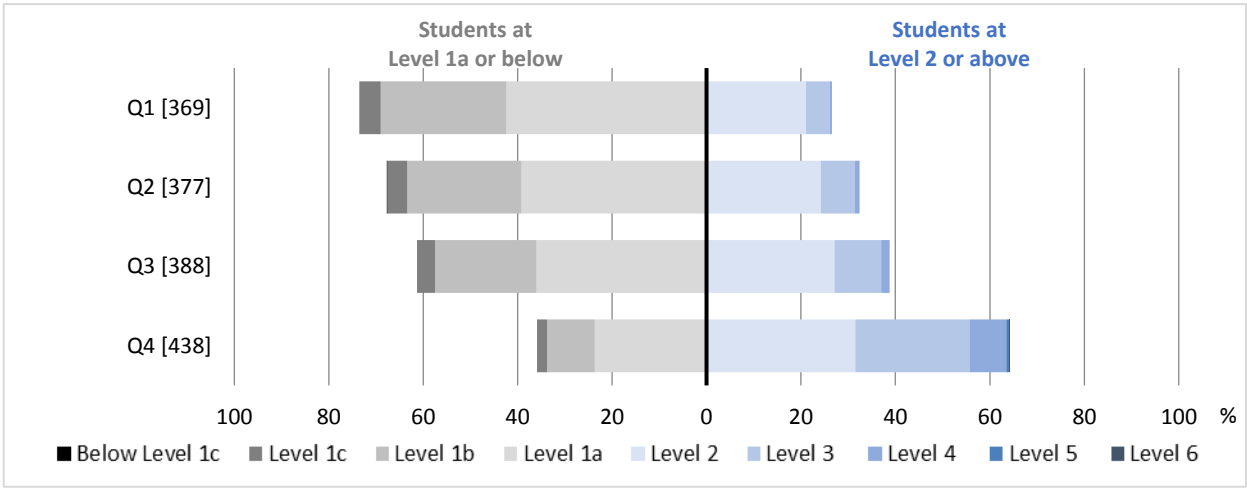
Figure 1.12. ***Difference in mean reading scores between top and bottom ESCS quartiles***



Source: OECD PISA 2018 database.
Note: Achievement gap between top and bottom ESCS quartiles in each country are indicated within brackets [ ].

The proportions of those attaining minimum proficiency in reading, science, and math rose with each ESCS quartile. As presented in Figure 1.13, the proportion of disadvantaged students (74 percent) who failed to reach minimum levels of proficiency in reading was twice that of advantaged students (36 percent). About 40 percent of disadvantaged students, as compared to 24 percent of advantaged students, could only perform at Level 1a. While a third (33 percent) of advantaged students performed at Level 3 or higher, only 5 percent of disadvantaged students achieved the same.

Figure 1.13. ***Students' proficiency in reading, by ESCS quartile***



Source: OECD PISA 2018 database.
Note: Mean scores are indicated within brackets [ ].

In PISA, the relationship between students' socioeconomic status and their performance is typically examined through its slope and strength. The slope is equivalent to the score-point

difference in reading performance associated with a one-unit increase in ESCS. In Thailand, milder slopes were observed in reading, math, and science, indicating that socioeconomic status was associated with smaller differences in mean performance than across OECD countries on average. Similar to the OECD average, socioeconomic status accounted for 12 percent of variation in reading performance. A slightly weaker relationship between ESCS and performance in both science and math were observed. Socioeconomic status explained 11 percent of math performance, as opposed to the OECD average of 14 percent, and 12 percent of science performance, as compared to the OECD average of 13 percent.

Disadvantaged students were significantly more likely than their advantaged peers to underperform. The most disadvantaged students (i.e., at the bottom ESCS quartile) were 2.3 times more likely than non-disadvantaged students (i.e., in the three other ESCS quartiles) not to reach the minimum level of proficiency in reading. When compared to the most advantaged students at the top ESCS quartile, students at the bottom quartile were five times more likely to score below Level 2 in reading. Disadvantaged students' odds of low performance in Thailand were comparable to that observed on average across OECD countries.

Social segregation

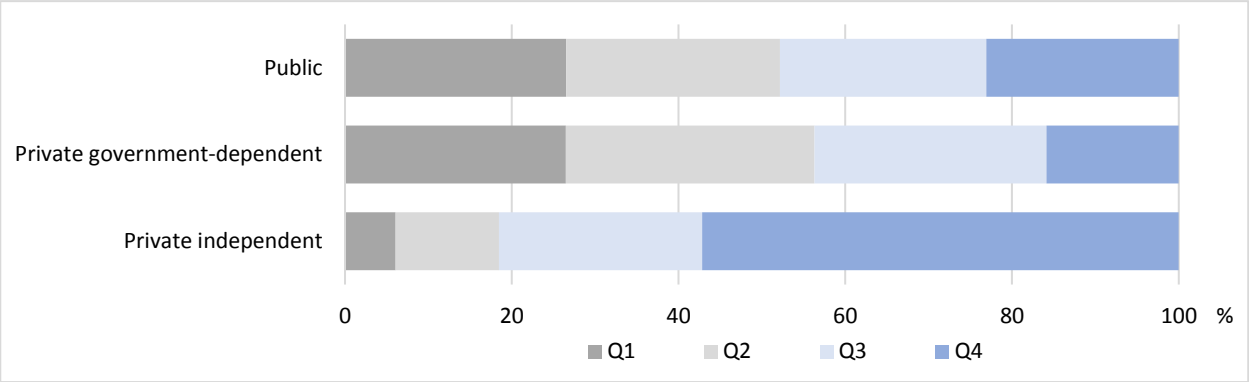
PISA's isolation indices of low- and high-achieving students indicate whether students are clustered into schools based on their academic performance. Low-performing students in Thailand were clustered in certain schools to the same extent as the OECD average. The concentration of high-performing students in certain schools, however, was much greater than the concentration of low achievers. This may be due to the explicit tracking of top students into the best schools; in Thailand, 84 percent of students belong to schools where principals reported that a student's academic record, including placement tests, are always used as a criterion for admission to school.

Disadvantaged students in Thailand are isolated from high achievers to a greater extent than on average across OECD countries. In Thailand, disadvantaged students were more commonly concentrated in schools with only a small share of high achievers, and have a lower likelihood of attending the same school as top performers. A typical disadvantaged student in Thailand has only a 14 percent chance of being enrolled in the same school as high-achieving peers.

School ownership

Among the different school ownership types, public schools and private government-dependent schools tended to have higher concentrations of socioeconomically disadvantaged students than private independent schools (Figure 1.14). The socioeconomic composition of public schools was nearly equal in proportions across all ESCS quartiles. By contrast, private independent schools tended to have a much higher proportion of students from the top ESCS quartile. In private independent schools, more than half (57 percent) belonged to the top quartile, while only 6 percent belonged to the bottom quartile. Among the three school ownership types, students in private government-dependent schools tended to be more socioeconomically disadvantaged than those in private independent schools and, to a lesser extent, those in public schools.

Figure 1.14. ***Distribution of students across school ownership types, by ESCS quartile***



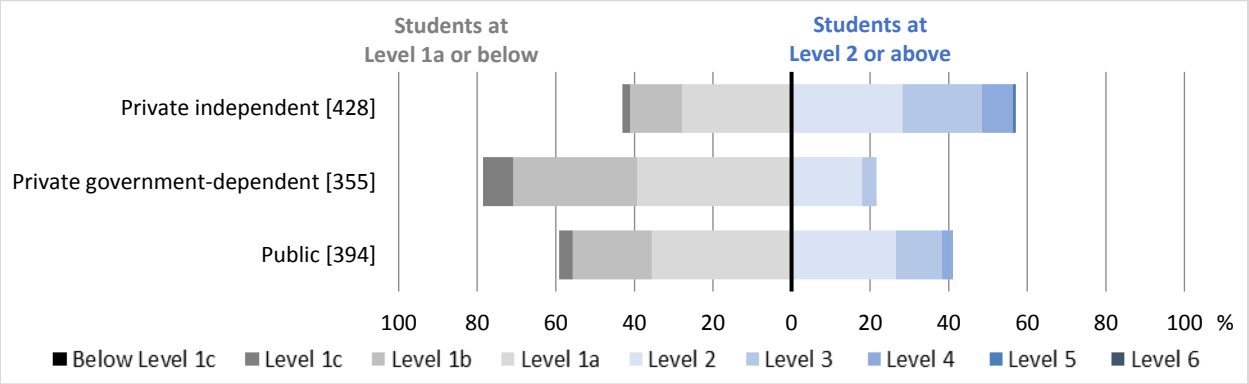
Source: OECD PISA 2018 database.

A majority of total annual funding in private government-dependent schools comes from government sources. In private independent schools, only a little over a quarter (26 percent) of total funding comes from government sources, while majority (68 percent) of funding comes from student fees. In public schools and private government-dependent schools, at least three-quarters of total funding comes from government sources. In public schools, 75 percent of funding comes from government sources and 19 percent from student fees. Government sources comprise a slightly higher proportion in private government-dependent schools' budget. The breakdown for total funding in private government-dependent schools is: 79 percent from government sources; 16 percent from student fees; 3 percent from benefactors, donations, sponsorships, parent fundraising; and 2 percent from other sources.

Across school ownership types, mean scores in all three PISA subjects were highest for students in private independent schools, and lowest for those in private government-dependent schools. Students in private independent schools (428 score points) tended to score about one-third of a standard deviation higher than those in public schools (394 score points) and nearly three-fourths of a standard deviation higher than those in private government-dependent schools (355 score points).

More than three-fourths (78 percent) of students in private government-dependent schools, as compared to 43 percent in private independent schools and 59 percent in public schools, failed to reach the minimum proficiency level in reading (Figure 1.15). While less than 4 percent of students in private independent schools and in public schools scored at Level 1c or below, about 8 percent of students in private government-dependent schools performed at these lowest levels of proficiency. The proportion of students in private independent schools who performed at Level 3 or higher (29 percent) was twice as large as that in public schools (14 percent) and seven times that in private government-dependent schools (4 percent).

Figure 1.15. ***Students' proficiency in reading, by school ownership type***



Source: OECD PISA 2018 database.

Notes: Mean scores are indicated within brackets [ ].
Private independent schools are those that receive less than 50 percent of core funding from government agencies. Private government-dependent schools are those that receive more than 50 percent of the same.

After controlling for ESCS, differences in reading performance became narrower between students in private independent schools and in public schools, but remained wide between those in private independent schools and in private government-dependent schools. After accounting for ESCS, the advantage of students in private independent schools over those in public schools narrowed to 12 points. However, the performance gap was still large at 46 points between students in private independent schools and those in private government-dependent schools.

Half of students in private government-dependent schools, as opposed to a 22 percent of students in public and in private independent schools, are enrolled in vocational programs. Students enrolled in vocational programs tended to perform significantly worse than those enrolled in general or modular programs. One reason that private government-dependent schools are more likely to underperform is that, with a larger proportion of students pursuing vocational education, these schools may focus on providing learners with skills in specialized fields, rather than general education. Private government-dependent schools may need to place greater priority on general education, including strengthening the recruitment of not just teachers with expertise in specific areas, but also qualified general education teachers.

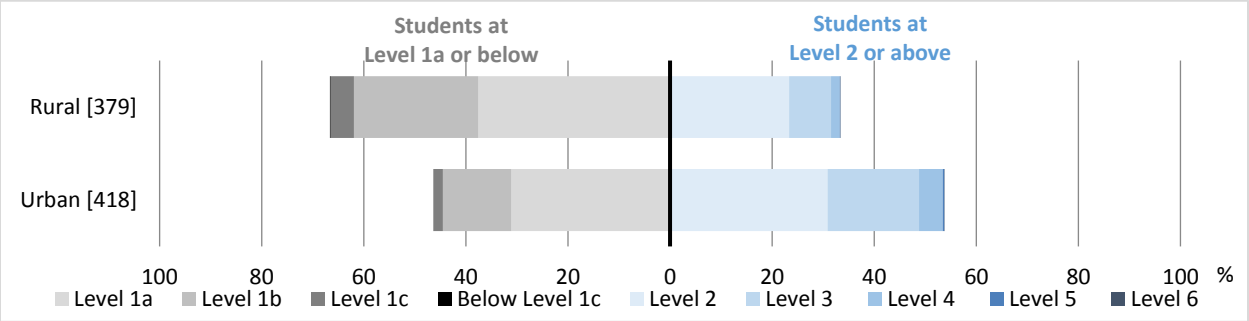
School community type

Students in urban school communities tended to outperform those in rural school communities across all PISA subjects. In reading, students attending schools in rural communities scored about 39 points lower, on average, than their counterparts in schools in urban communities. After controlling for ESCS, the performance gap narrowed to 25 score points, in favor of students in urban school communities.

About two-thirds (67 percent) of students in rural school communities, as compared to less than half (46 percent) of those in urban school communities, performed below the minimum level of proficiency in reading (Figure 1.16). Whereas 16 percent of students in urban areas scored at Level 1b or lower, almost a third (29 percent) of students in rural areas performed at these levels. Only

one in ten students (9.4 percent) in rural school communities, as compared to nearly one in four students (22 percent) in urban school communities, were able to perform at Level 3 or higher.

Figure 1.16. ***Students' proficiency in reading, by school community type***



Source: OECD PISA 2018 database.
Notes: Mean scores are indicated within brackets [ ].
School community type is categorized as "urban" if located in a city with more than 100,000 people.

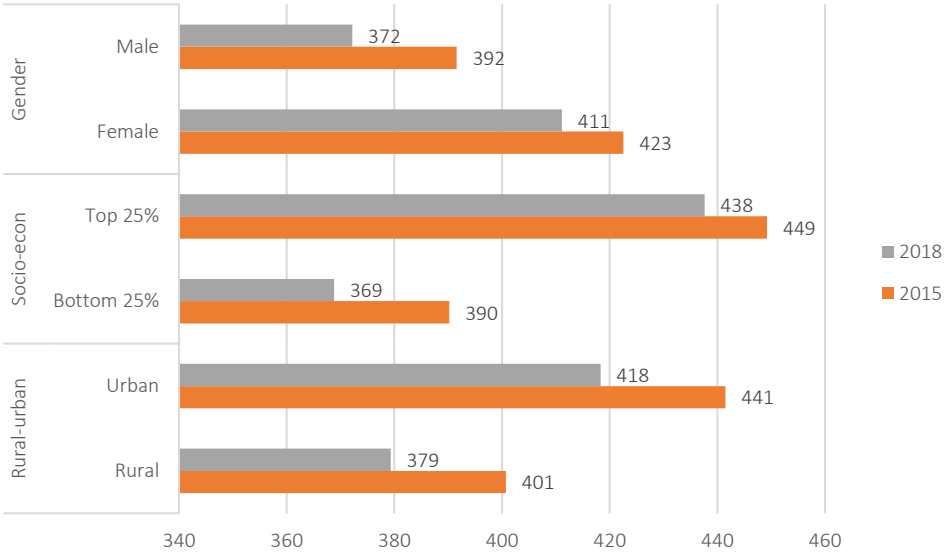
Language

There is a wide gap in student performance between students who speak the language of the test at home and those who speak a different language at home: yet, there are no policies to provide remedial support to ethnic minorities. In Thailand, nearly all students (97 percent) in Thailand reported that they speak the language of the test (i.e. Thai) at home. They tended to score higher in reading, math, and science by 37-41 score points than their peers who speak a different language at home. About 59 percent of students who speak the language of the test at home, as compared to 77 percent of students who speak a different language at home, scored below minimum proficiency in reading. While 15 percent of those who speak Thai at home performed at Level 3 or higher, only 7 percent of students speaking another language at home achieved the same.

Trends in equity of performance

It should be noted that student learning outcome inequality (in the PISA performance) in Thailand has widened across all dimensions over the 2015-2018 period. Figure 1.17 shows that the gap in reading performance between female and male students has widened from 31 points in 2015 to 39 points in 2018. Similarly, the performance gap between students from the top 25 percent in the socioeconomic status index and the bottom 25 percent has widened from 59 to 69 points over the same period. On the other hand, the urban-rural performance gap has declined slightly from 41 to 39 points from 2015. However, the gap has widened from 37 points in 2012. All measures of inequality have widened in mathematics and science during 2015 to 2018.

Figure 1.17. ***Learning Outcome Inequality for Reading***



Source: OECD PISA 2018 database.

CHAPTER 2: Foundations for education success in Thailand

Education outcomes are driven by five key factors or foundations for success[6], namely: resources, quality instruction, learning time, inclusive learning environments, and family support. This chapter discusses the extent to which these five foundations for education success are present in Thailand, how they vary across demographic subgroups in the country, and how they affect student learning. The chapter then goes on to revisit the potentially very important issue of grade repetition, which was brought to attention in the preceding chapter. In particular, the relationships between wrong age entry into primary schooling, grade repetition, and student reading performance will be formally investigated.

Resources invested in Thailand education

This section examines key resources invested in education in Thailand: financial, human, educational materials (including digital learning resources), and physical infrastructure. Digital learning resources, in particular, have important implications amidst school closures brought about by the spread of the coronavirus disease (COVID-19).

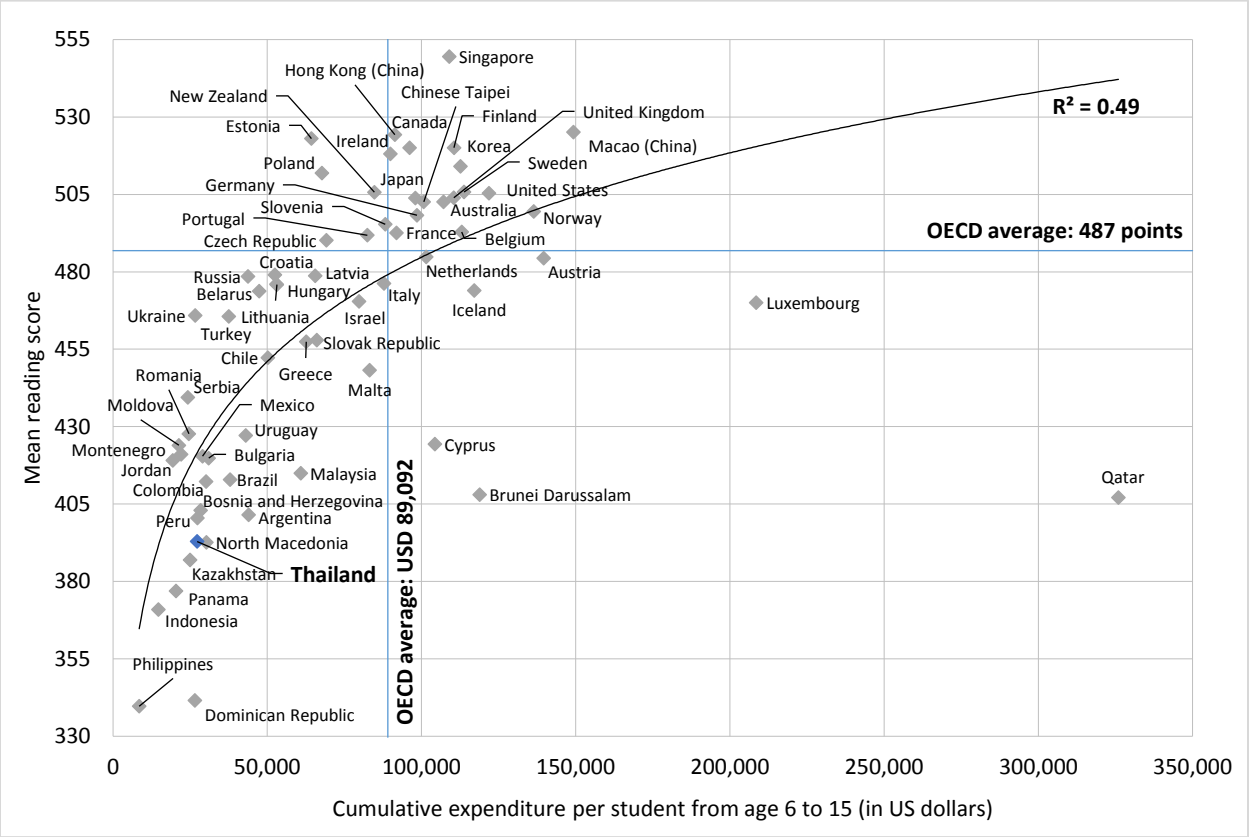
Financial resources

Countries with higher national income tended to score higher in PISA. About 44 percent of variation in countries' and economies' mean scores in reading was related to national income, as measured by per capita gross domestic product (GDP) (OECD 2019a). Thailand underperformed in reading compared to other countries with similar levels of economic development. Countries like Brazil, Costa Rica, and Serbia scored at least one-fifth of a standard deviation higher in reading than Thailand, despite having lower per capita GDP.

Cumulative spending per student, which is associated with performance up to a certain spending level, was lower in Thailand than on average across OECD countries. Figure 2.1 examines countries' cumulative spending per student from the age of six up to the age of 15 years (from Grade 1 – 9) with mean student performance in reading. Average reading scores and per student spending are strongly and positively associated, but only up to around USD 50,000 (after accounting for purchasing power parities [PPP]). Above this threshold, education spending is much less related to reading performance. Expenditure per student accounts for about 49 percent of the variation in mean reading performance between countries and economies. The cumulative spending per student in Thailand of USD 27,271 was less than one-third that of the average cumulative expenditure per student across OECD countries. However, it should be noted that the cumulative spending per student data for Thailand is from 2013, which is the latest available figure from the UNESCO Institute for Statistics. It is very likely that actual per student spending for Thailand is higher than the USD 27,271 shown in Figure 2.1.

[6] The five foundations for success discussed in this report are based on the Educational Prosperity framework, which discusses key factors ("Foundations for Success") that drive a set of outcomes ("Prosperity Outcomes") for each stage of development (Willms 2018).

Figure 2.1. ***Mean reading performance and cumulative spending on education per student in USD PPP***



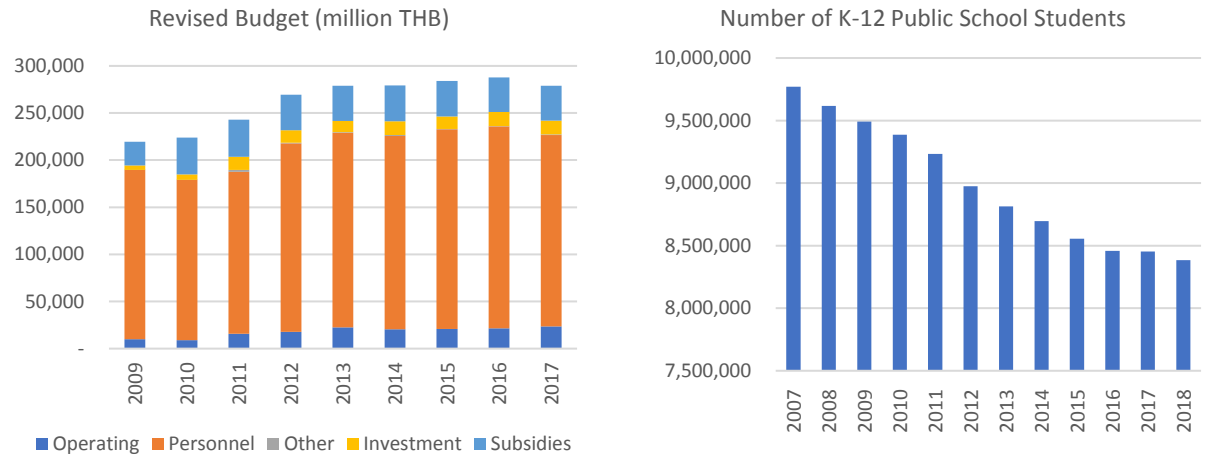
Source: OECD PISA 2018 database.

To see this, consider the left hand chart in Figure 2.2, which shows that the Office of the Basic Education Commission's (OBEC) annual budget has stabilized in recent years, but the number of public school students has been declining continuously due to falling birthrate[7] (right-hand chart). Even though OBEC's total education budget in 2017 is practically the same as that for 2013, the total number of public school students has fallen by as much as 4 percent over the period. This suggests that per student public expenditure has continued to rise after 2013.

More concerning is the observation that from 2009 to 2017, OBEC's inflation-adjusted total budget increased by as much as 27 percent, while the number of students declined by 11 percent. The sharp increase in real per-student spending yielded no improvement in student learning. In fact, as discussed in the previous chapter, student performance in the PISA assessments has actually worsened from 2009.

[7] Most of Thailand's public-school students are in schools which are under the supervision of OBEC. The latest 2018 data show that around 80 percent of students in the K-12 public school system are enrolled in OBEC schools. Private schools, on the other hand, enroll around 2.38 million K-12 students, equivalent to 22 percent of total K-12 students in Thailand. These private schools are supervised by the Office of the Permanent Secretary, Ministry of Education.

Figure 2.2. ***Office of the Basic Education Commission Revised Budget (in constant 2010 THB) and Number of K-12 Students in Thai Public Schools***



Source: Ministry of Education, Thailand.

Human resources

Higher student-teacher ratios were observed among schools in urban than in rural communities. The average class size in Thailand was 36 students, which is higher than the OECD average class size of 25 students, while the average student-teacher ratio of 14 in Thailand was higher than the OECD average of 12. In Thailand, disadvantaged schools (i.e., in the bottom quartile of school average ESCS) tend to have much smaller class sizes, but similar student-teacher ratios to advantaged schools (i.e., in the top quartile of school average ESCS). Across school ownership types, student-teacher ratios tend to be similar in public and private schools.

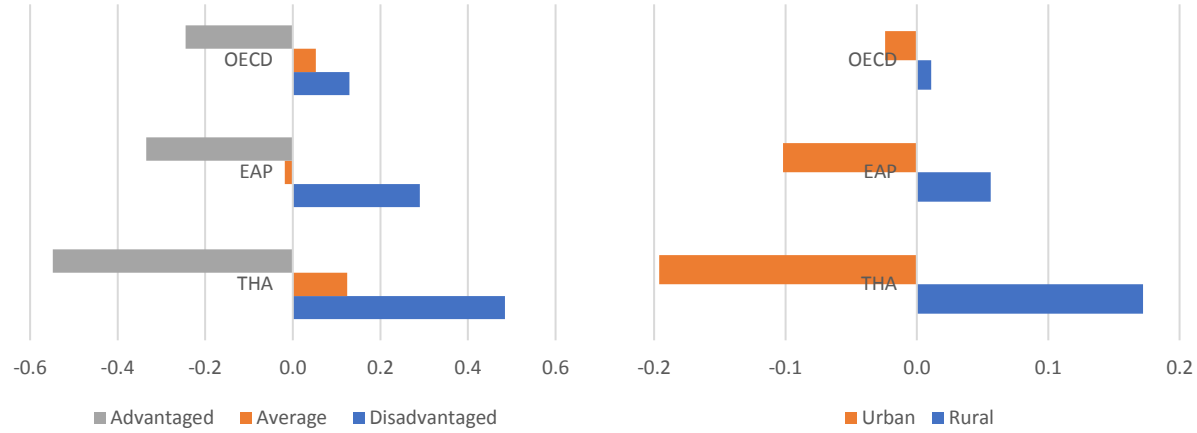
Interestingly, although rural schools have lower student-teacher ratios than urban schools (18.9 in rural and 21.1 in urban schools), principals of the former perceived lack of and inadequately qualified educational staff to hinder the schools' capacity to provide instruction to a greater extent than those in urban school communities. Similarly, while disadvantaged schools have similar student-teacher ratios to advantaged schools and much smaller average class size (30.7 in disadvantaged and 40.5 in advantaged schools), their principals perceived the lack of and inadequately qualified educational staff to hinder the school's capacity to provide instruction to a greater extent than those in advantaged schools. This observation may seem contradictory at first, but is very common in Thailand where there is a large network of small schools with tiny classes. Even though the student-teacher ratios in these schools seem low, but too few teachers are spread too thinly over too many small classrooms and many of these schools even have fewer teachers than the number of classes. This situation is discussed in greater depth in Annex 2A of this chapter.

A "Shortage of Educational Staff Index" is constructed to shed some light on the severity of educational staff in Thai schools. The index is based on principals' responses to four specific questions. Specifically, PISA asked principals whether the schools' capacity to provide instruction is hindered by: "A lack of teaching staff", "Inadequate or poorly qualified teaching staff", "A lack of assisting staff", and "Inadequate or poorly qualified assisting staff." For each question, the principals had to select one response from "Not at all", "Very little", "To some extent", and "A

lot." The answers to the four questions are then given scores and combined to construct the index, which has been normalized so that OECD schools have a mean of zero and a unit variance.[8]

The resulting "Shortage of educational staff index" is computed for advantaged, average, and disadvantaged schools in the OECD, EAP, and Thailand and the results are presented on the left hand chart in Figure 2.3. It is not surprising to observe that inequality in staffing (in both quantity and quality dimensions) exists everywhere. The extent of the mean difference between the advantaged and disadvantaged schools within the OECD is less than 0.4 SD, while the corresponding measure for the EAP is slightly above 0.6 SD.[9] The inequality measure for Thailand, on the other hand, is greater than 1 SD, indicating a far higher level of inequality across schools with different characteristics. The same exercise done for urban and rural schools yields similar conclusion (right hand chart in Figure 2.3).

Figure 2.3. ***Shortage of Educational Staff Index – PISA 2018***



Source: World Bank staff calculations based on OECD PISA 2018 database.

The severity of educational staff shortage discussed in this section signals the need to improve teacher allocation across both urban schools, where student-teacher ratios are high, and rural schools, where shortages of educational staff are perceived to hinder the school's capacity to provide quality instruction. Concretely, the government will need to revise the staff entitlement allocation formulae defined by the Teacher Civil Service and Educational Personnel Commission (TEPC) which currently penalizes small disadvantaged schools (see discussion in Annex 2A), improve the delivery of accurate and timely information needed to make decisions on teacher deployment, and provide incentives for teachers to be deployed to high-need areas.

Regarding teacher qualification, more highly educated teachers were more commonly found in public schools than in private schools, and in urban schools than in rural schools. On average

[8] Scores of 1 to 4, in ascending order, are assigned to the "Not at all" response up to the "A lot" response. It should be noted that it makes econometric sense for our regression analysis later on in this chapter to construct a single index based on these four questions, since the four indicators are strongly and positively correlated. Including all four regressors would very likely induce multicollinearity problem in or regression model. Principal components analysis (PCA) is employed to construct the index (using the first principal component) from the original four indicators. Higher value of the index indicates greater staff shortage.

[9] The difference in the index values between advantaged and disadvantaged (or urban and rural) schools.

across the OECD, about 44 percent of teachers had at least a master's degree, which is almost twice the share of teachers (23 percent) in Thailand who meet this qualification. The share of teachers with at least a master's degree did not vary between advantaged and disadvantaged schools. The proportions of teachers with at least a master's degree were higher in public schools (36 percent) than in private government-dependent (3 percent) and private independent schools (14 percent). The proportion of teachers with these qualifications was twice as large in urban school communities (49 percent) than in rural school communities (22 percent), reinforcing the need for more equitable deployment of teacher qualification, including providing stronger incentives for quality teachers to be deployed to high-need schools. This finding is consistent with World Bank (2020), which finds that higher-qualified and experienced teachers and school managers are seen to gravitate towards larger urban schools. Teacher shortage, both in terms of quantity and quality, is much more acute among the small rural schools serving socio-economically disadvantaged students.

Furthermore, about 69 percent of teachers in Thailand, as compared to 86 percent of teachers on average across OECD countries, were fully certified. Disadvantaged schools and public schools tended to have a larger proportion of teachers who are fully certified than did advantaged schools and private schools. Nearly all of teachers in disadvantaged schools (97 percent) were fully certified, as compared to 89 percent of advantaged schools. Larger differences were observed across school types. While almost all teachers in public schools (97 percent) were fully certified, about 80 percent of teachers in private independent schools and 21 percent of teachers in private government-dependent schools were fully certified. The relatively large proportion of fully certified teachers in disadvantaged and public schools does not seem to be related to higher performance partly because those schools tend to lack the total number of teachers. Other factors to be explored include the credibility of teacher certification and differences in qualifications among fully-certified teachers.

Learning materials and school infrastructure

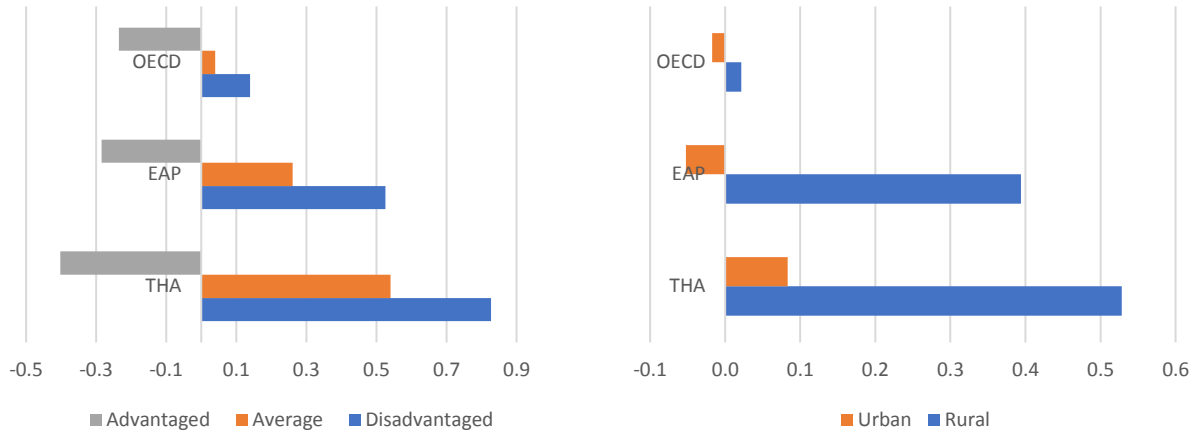
In addition to the four questions on shortages of human resources, school principals were also asked whether their schools' capacity to provide instruction is hindered by: "A lack of educational material"[10], "Inadequate or poor quality educational material", "A lack of physical infrastructure",[11] and "Inadequate or poor quality physical infrastructure." Again, for each question, the principals had to select one response from "Not at all", "Very little", "To some extent", and "A lot." The answers to these four questions were then given scores and combined to construct a "Shortage of educational material index", which we normalized so that the OECD schools have a mean of zero and a unit variance.

Once again, the "Shortage of educational material index" is computed for: advantaged, average, and disadvantaged schools; as well as urban and rural schools in the OECD, EAP, and Thailand and the results are presented in Figure 2.4. Similar to the findings on the "Shortage of educational staff index," we observe that Thai schools are more severely hindered in this dimension compared to international peers. Once again, schools primarily serving disadvantaged children and schools in the rural areas are generally much more lacking in material resources and physical infrastructure

[10] Including textbooks, IT equipment, library or laboratory material.
[11] Including building, grounds, heating/cooling, lighting and acoustic systems.

than advantaged schools and schools in the urban areas. Furthermore, the resource allocation inequality can be seen to be much worse than that observed in the OECD and other EAP countries.

Figure 2.4. ***Shortage of Educational Material Index – PISA 2018***



Source: World Bank staff calculations based on OECD PISA 2018 database.

The level of under-resourcing for Thailand's disadvantaged and rural schools, both in terms of human resource and of learning materials and physical infrastructure, was found to be severe. Moreover, schools lacking educational staff are also likely to be lacking in educational materials and physical infrastructure, as is indicated by a very high correlation coefficient between the "Shortage of educational staff index" and the "Shortage of educational material index" of 0.61 for schools in Thailand (and 0.52 for schools in all of the PISA 2018 countries/economies).

A single "Shortage of educational resources index" can also be calculated based on the original eight variables making up the "Shortage of educational staff" and the "Shortage of educational material" indices.[12] The index is again normalized so that OECD schools have a mean of zero and a unit variance.

After controlling for a rich set of student background characteristics and a number of other indices, it is estimated that a one standard deviation (OECD scale) increase in the Shortage of educational resources index is associated with a 4.8 points decline in the PISA reading performance of Thai students (see Table B.2.2 in Annex 2B). Even though the estimated effect is not statistically significant at conventional levels (with a p-value of just over 0.1) under a two-tailed test of significance, it is, however, statistically significant under a one-tailed test.[13] This empirical evidences established in this section thus suggest that Thailand should urgently embark on addressing the challenges of chronic teacher and other educational resource misallocations in order to raise the standard of education provision and reduce student learning outcome inequality.

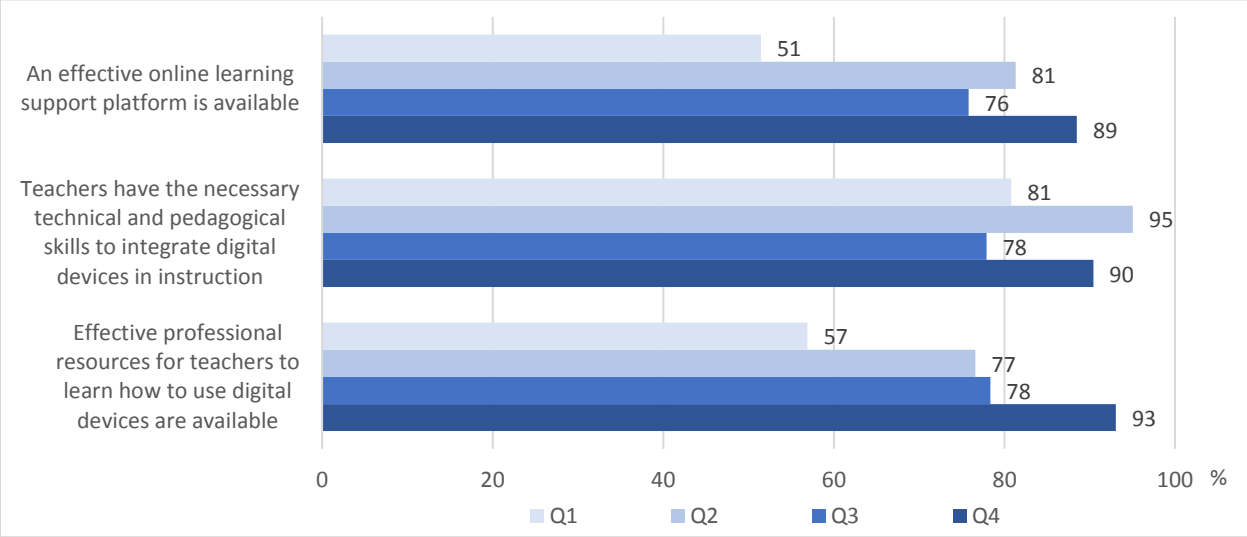
[12] Particularly, the "Shortage of educational resources index" is derived from the first principal component of the original eight variables. The index explains as much as 52.4 percent of the total variations in these variables.
[13] The same regression model estimated using data from all PISA participating countries (denoted by "World" in Table B.2.2. in Annex 2B), however, yields a highly statistically significant coefficient for "Shortage of educational resources index" of -6.5.

Digital learning resources

A specific component making up the educational materials is of particular interest currently due to the spread of the coronavirus (COVID-19). As part of governments' response to the pandemic, about 1.6 billion students across over 160 countries have seen their schools closed by early April 2020 (World Bank, 2020(2)). To help mitigate loss of learning, many education systems are pursuing remote learning options to cope with the crisis. This section explores Thailand's readiness for digital learning as revealed by principals' responses on the capacity of digital use in their schools, and students' responses on their access to the Internet and digital devices at home.

About 77 percent of students are in schools where principals agree or strongly agree that an effective online learning support platform is available, with variations observed by school characteristics. The availability of an effective online learning support platform is available to only 51 percent of students in disadvantaged schools, as compared to 89 percent of those in advantaged schools (Figure 2.5). Across school ownership types, about 74 percent of students in public schools and 80 percent of students in private government-dependent schools, as compared to all students in private schools, have principals who agree or strongly agree that an effective online learning support platform is available.

Figure 2.5. ***Schools' preparedness for digital learning, by school ESCS quartile***



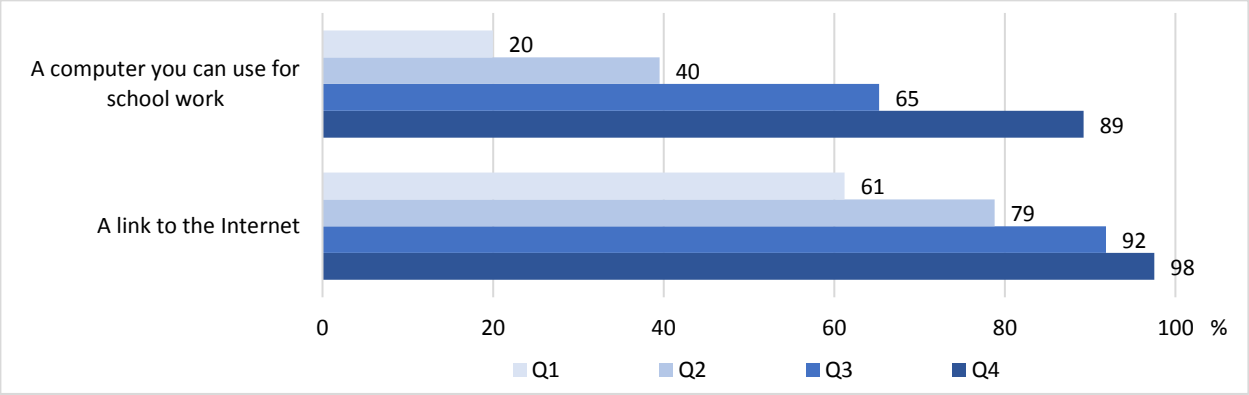
Source: OECD PISA 2018 database.
Notes: Responses are based on principals' reports. Quartiles are based on schools' average ESCS.

Most principals in Thailand seem to agree that teachers have the necessary skills and support for digital learning. About 76 percent of students were in schools where principals agree or strongly agree that teachers have the necessary technical and pedagogical skills to integrate digital devices in instruction. About 86 percent of students were in schools where principals agree or strongly agree that effective professional resources for teachers to learn how to use digital devices are available. These proportions on teacher preparedness for digital learning are higher than observed on average across OECD countries. The availability of these resources, however, was higher in advantaged schools than in disadvantaged schools, as well as in private independent schools than in public and private government-dependent schools.

Most students lack access to the necessary tools for online learning, although most principals report that schools and teachers are equipped to implement digital learning. Only 53 percent of students reported having a computer at home that they can use for school work, and this share is among the lowest in all PISA-participating countries and economies. Access to internet connectivity, however, appears to be more broadly available; about 82 percent of students reported having a link to the internet at home.[14]

Students in urban school communities and socioeconomically advantaged students are more likely to have access to digital learning resources at home. While 70 percent of students in urban school communities have a computer at home, only 45 percent of students in rural school communities reported the same. A smaller gap was observed in internet access, with 89 percent of students in urban school communities, as opposed to 79 percent of students in rural school communities, reporting having a link to the internet at home. When examined by socioeconomic status, access to these digital learning resources were more limited among disadvantaged students (Figure 2.6). While close to 90 percent of advantaged students have a computer at home, only 20 percent of disadvantaged students have access to the same. Similarly, though internet access is available at home for nearly every advantaged student, a link to the internet at home is available to only 61 percent of disadvantaged students.

Figure 2.6. ***Availability of digital resources in students' homes, by ESCS quartile***



Source: OECD PISA 2018 database.

With inequities in access to digital learning resources, online learning can potentially amplify existing learning gaps across socioeconomic groups and community types. If remote learning options rely solely on digital learning modes, students from socioeconomically disadvantaged backgrounds and rural communities may fall even further behind. In times where school operations are disrupted, such as in the current COVID-19 crisis, policymakers should explore alternative and offline remote learning options to ensure continuity of learning for all students.

[14] The survey however did not ask questions about the affordability of internet use or the speed of connection if, for example, a student were to take all or most of their classes online.

Quality instruction

The regression results in Table B.2.2 in Annex 2B indicates that adaptive instruction, disciplinary climate, and quality assurance and improvements are important determinants of reading performance in Thailand. A one standard deviation increase in each of the three indices is associated with an increase of 2.13, 5.85, and 6.06 score points respectively in student reading performance in Thailand. Furthermore, all of the estimated coefficients are found to be statistically significant at conventional levels.[15] The following sections discuss findings on adaptive instruction, disciplinary climate, and quality assurance and improvements in Thailand.

Adaptive instruction (PISA-constructed index)

The average student in Thailand perceived their teachers to be more adaptive than did the average student across OECD countries. PISA asks students the extent to which they agree with the following statements about their language-of-instruction teachers: "The teacher adapts the lesson to my class's needs and knowledge"; "The teacher provides individual help when a student has difficulties understanding a topic or task"; and "The teacher changes the structure of the lesson on a topic that most students find difficult to understand." Students' responses were combined to create the index of adaptive instruction.

The extent to which adaptive instruction was perceived by students varied by student and school characteristics. Adaptive instruction was perceived to a greater extent among girls than boys and among advantaged students than disadvantaged students. Variations also appeared across school characteristics. Students in advantaged schools, as compared to those in disadvantaged schools, as well as students in rural school communities, as compared to those in urban school communities, perceived their teachers to be significantly more adaptive. No significant differences in adaptive instruction were observed among students across school ownership types.

Teachers' adaptive instruction was also positively associated with students' enjoyment of reading. After accounting for students' and schools' socioeconomic status, a one-unit increase in the index of adaptive instruction was associated with an increase of 0.11 of a unit (where one unit is equivalent to a standard deviation across OECD countries) in the index of students' enjoyment of reading. Adaptive instruction remained positively associated with reading enjoyment, even after accounting for students' reading performance and other teaching practices.

Given the importance of adaptive instruction to reading outcomes, teacher training on these skills should be strengthened, particularly for disadvantaged schools and urban schools, where teachers' adaptive instruction is perceived to be weaker. Enhancing adaptive instruction in schools will entail not just strengthening teachers' pedagogical skills, but also ensuring the school environment has adequate material and human resources to support the implementation of adaptive instruction.

[15] Although "Quality assurance index" is not statistically significant under a two-tailed test (p-value of 0.171), it is significant at the 10 percent level under a one-tailed test of significance.

Disciplinary climate (PISA-constructed index)

The average student in Thailand perceived their classroom disciplinary climate to be more positive than did the average student across OECD countries. The disciplinary climate index summarizes students' responses to how often the following happened in their language-of-instruction lessons: "Students don't listen to what the teacher says"; "There is noise and disorder"; "The teacher has to wait for a long time for students to quiet down"; "Students cannot work well"; and "Students don't start working for a long time after the lesson begins".

Between 2009 and 2018, Thailand's disciplinary climate has shown improvements in the occurrence of noise and disorder and in starting work on time, but has regressed in providing an environment where students can work well. The proportion of students who reported that there is never or hardly ever any noise and disorder in their classrooms grew by 2 percentage points from 2009 to 2018. Similarly, the share of students reporting that "students don't start working for a long time after the lesson begins" never or hardly ever happens increased by 3 percentage points during the same period. However, the proportion of students who reported that "students cannot work well" never or hardly ever happens decreased by 5 percentage points from 2009 to 2018, indicating that classroom disciplinary climates have become less conducive to student learning.

Similar to the gender differences observed on average across OECD countries, girls reported a significantly better disciplinary climate than did boys (and remember that girls have higher learning achievement across all subjects). Across school types, students in private government-dependent schools tended to report lower disciplinary climates than did those in public schools. Students in schools in rural areas perceived their classroom to have slightly more positive disciplinary climate than did those in schools in urban areas. Disciplinary climate is much more positive in advantaged schools compared to disadvantaged schools.

To improve disciplinary climate, teachers should be provided ongoing targeted training on classroom management. Classroom disciplinary climates in Thailand have worsened in terms of fostering a learning environment where students can work well. Continuous professional development for teachers should focus on approaches to recognizing and addressing behavioral problems, creating classrooms conducive to learning, and managing overall classroom discipline and order. The provision of teacher training on classroom management appears to be especially important for those in private government-dependent schools and urban school communities.

Quality assurance and improvements

The quality assurance and improvements index is our own construct, which summarizes principals' responses to whether "the following arrangements aimed at quality assurance and improvements exist in their school": "Internal evaluation/Self-evaluation"; "Written specification of student performance standards"; "Seeking written feedback from students (e.g. regarding lessons, teachers or resources); and "Teacher mentoring." For each question, the principals had to select one response from "No", "Yes, this is mandatory, e.g. based on district or ministry policies", and "Yes, based on school initiative." The answers to the four questions are then assigned scores[16] and

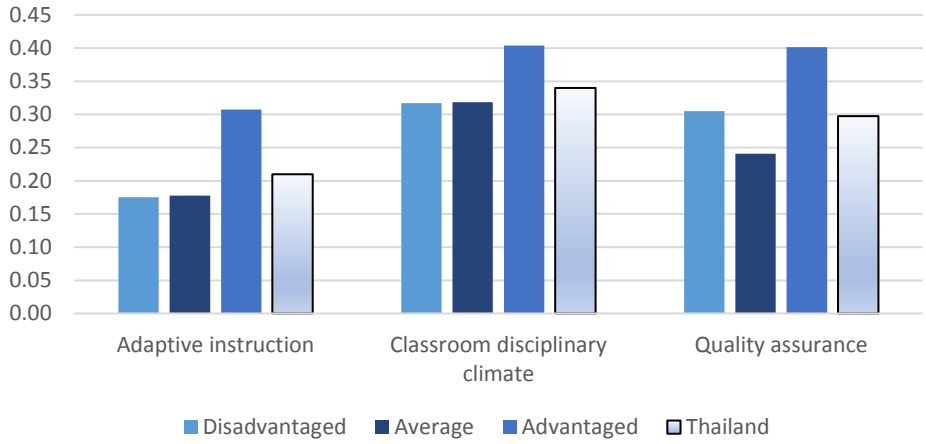
[16] Scores of 1 to 3, in ascending order, are assigned to the "No" response up to the "Yes, based on school initiative" response.

combined to construct the "Quality assurance index," which was then normalized so that OECD schools have a mean of zero and a unit variance.

Across school types, private independent schools scored the highest by far (0.78), followed by private government-dependent schools (0.45), and public schools (0.24). Schools in urban areas and socioeconomically advantaged schools also score higher on this measure than disadvantaged schools and rural schools respectively.

The three indices for quality instruction across school socioeconomic statuses, as well as for Thailand are depicted graphically below in Figure 2.7. The positive and statistically significant effects of all three indices (especially for quality assurance in schools) on students' reading performance, as well as the lower scores obtained for disadvantaged schools mean that Thailand has room to further improve student learning and reduce performance inequality by enhancing the quality of instruction in disadvantaged schools.

Figure 2.7. ***Quality of Instruction Indices – PISA 2018***



Source: World Bank staff calculations based on OECD PISA 2018 database.

Inclusive environments

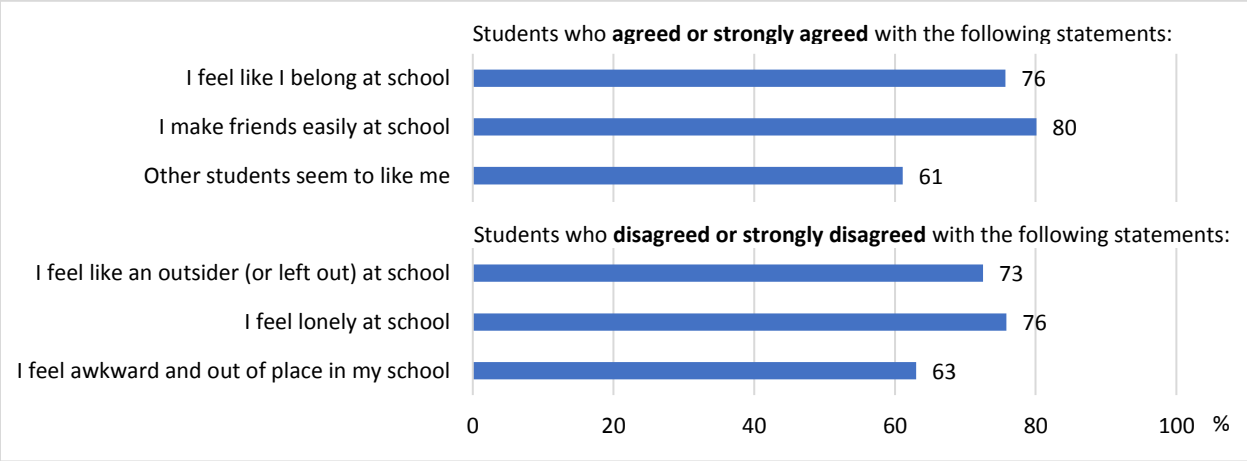
In line with SDG 4 on quality education, education systems are working towards creating non-violent, inclusive, and effective learning environments. In inclusive environments, learners have a strong sense of social connectedness and safety in schools. PISA examines these feelings of belonging at school and feelings of safety in school among students.

Feelings of belonging (PISA-constructed index)

Students in Thailand reported a weaker sense of belonging at school than did students in OECD countries, on average. PISA measures students' sense of belonging at school by asking students the extent to which they agree with statements such as: "I feel like an outsider (or excluded) at school"; "I make friends easily at school"; and "I feel awkward and out of place in my school". A total of six items were combined to create the index of sense of belonging.

Though most students feel they belong and make friends easily at school, still many reported feeling lonely or like outsiders at school (Figure 2.8). More than 60 percent of students agreed or strongly agreed that they belong at school, make friends easily at school, or are liked by others. However, at least a quarter of the students also feel left out, lonely, or awkward in their schools.

Figure 2.8. ***Sense of belonging at school among students***



Source: OECD PISA 2018 database.

Students' feelings of sense of belonging at school generally weakened between 2015 and 2018. The proportions of students who agreed or strongly agreed that they make friends easily at school and feel like they belong at school decreased significantly decreased by at least 2 percent from 2015 to 2018. The proportions of those who disagreed or strongly disagreed that they feel left out, awkward, and lonely at school shrank by 8, 5, and 6 percent, respectively.

A greater sense of belonging was observed by student and school characteristics. Girls tended to report a stronger sense of belonging than did boys. As observed in all other PISA-participating countries and economies, socioeconomically advantaged students in Thailand reported a greater sense of belonging than their disadvantaged peers. Across school ownership types, students in private independent schools reported a similar level of belonging to peers in public schools, but a stronger sense of belonging than those in private government-dependent schools.

A stronger sense of belonging at school was associated with greater academic resilience. PISA defines academically resilient students as those who, despite socioeconomic disadvantage, are able to achieve high levels of academic performance (OECD 2019b). Academically resilient students are those who belong to the bottom ESCS quartile in their country yet score at the top quartile of reading performance in their country. Significantly larger proportions of academically resilient students than non-resilient students reported that they do not feel like outsiders or left out at school.

The econometric analysis shown in Table B.2.2 in Annex 2B indicates that a one standard deviation increase in the "Sense of belonging index" is associated with a 8.14-point increase in reading performance. The estimated effect is also highly statistically significant at the 1 percent level.

Feelings of safety

The average student in Thailand is more exposed to bullying than the average student in OECD countries. To examine feelings of safety at school, PISA looks at students' exposure to bullying. PISA asks students how often during the 12 months prior to the PISA test they had experienced situations such as: "Other students left me out of things on purpose"; "Other students made fun of me"; and "I was threatened by other students". PISA classifies students as "frequently bullied" if they were among the 10 percent of students with the highest values in the index across all countries and economies with available data. PISA also classified schools based on the concentration of frequently bullied students (OECD 2019c).

The prevalence of certain bullying acts increased significantly in Thailand between 2015 and 2018. The proportion of students reporting that they were threatened by other students or that other students had spread nasty rumors about them increased by 3 percentage points from 2015 to 2018. The shares of students reporting that students took away or destroyed things that belonged to them or that they got hit or pushed by other students grew by 4 percentage points during the same period.

About 27 percent of students in Thailand, as compared to 23 percent of students on average across the OECD, reported being bullied at least a few times a month. While a further 13 percent of students in Thailand, as compared to 8 percent of students across OECD countries, were frequently bullied. Half (50 percent) of Thailand's students reported never or almost never experiencing any type of bullying act in school. Among the different types of bullying acts, the most commonly occurring one was "Other students made fun of me". About one in five (19 percent) of students reported that other students made fun of them at least a few times a month.

Exposure to bullying was higher among boys than girls and among disadvantaged than advantaged students. About 29 percent of disadvantaged students, as compared to 21 percent of advantaged students, reported being bullied at least a few times a month. Larger differences in exposure to bullying were observed by gender. While 21 percent of girls reported being bullied at least a few times a month, 34 percent of boys reported the same.

Exposure to bullying is negatively associated with reading performance. As shown in Table B.2.2 in Annex 2B, a one standard deviation increase in the "Exposure to bullying index" is associated with a decrease of 8.8 score points in reading performance and the estimated coefficient is highly significant statistically.

Given the association between bullying and learning outcomes, policymakers and educators should pay increased attention to preventing and responding to bullying incidents in schools. Professional development for teachers and school heads should strengthen early detection of bullying and the different forms it may take. Schools should also provide a mechanism for students to disclose incidents of bullying, take appropriate and immediate actions against bullying acts, and engage all education stakeholders (e.g., parents, school staff, students) in bullying prevention. These changes should also recognize that bullying can happen online as well as face-to-face.

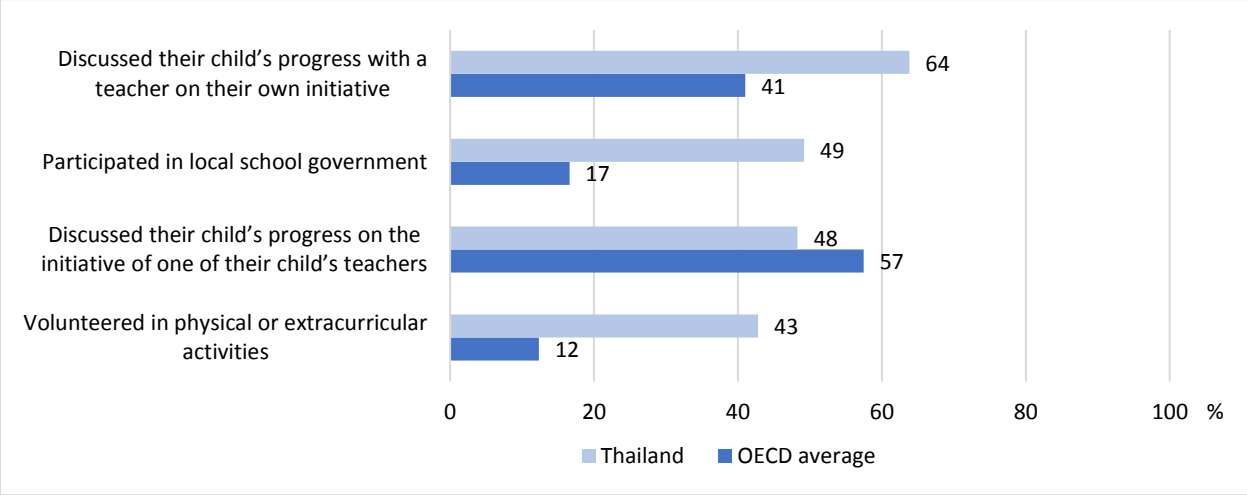
Family support

In addition to factors in the school environment, aspects of the home environment can also affect learning outcomes. To examine these family-related factors in learning, PISA looks at the extent to which parents are involved in school-related activities, as reported by principals, and the extent to which parents provide emotional support to their children, as reported by students.

Parental involvement in school-related activities

Higher levels of parental involvement at school were observed in Thailand than in OECD countries, on average. More than forty percent of parents in Thailand participated in each of these school-related activities (Figure 2.9). Levels of parental involvement in Thailand have remained unchanged since 2015.

Figure 2.9. ***Proportion of parents who participated in school-related activities***



Source: OECD PISA 2018 database.

Note: Bars represent the proportion of students' parents who participated in school-related activities in the previous academic year, as reported by school principals.

Differences in parents' participation were observed for certain activities. Discussing their child's progress with a teacher on their own initiative was more frequently observed among parents in urban school communities than those in rural communities, as well as parents in private independent schools than in public and private government-dependent schools. Parents in private independent schools tended to discuss their child's progress with a teacher on a teacher's initiative more often than did those in public schools. Parents in private independent schools were also more involved in extracurricular activities than those in public and private government-dependent schools.

Again, principals' answers on the four questions pertaining to parental participation in school-related activities during the previous academic year were transformed using PCA into a single "Parental involvement in school-related activities index," which was then normalized so that OECD schools have a mean of zero and a unit variance. As shown in Table B.2.2 in Annex 2B, a one standard deviation increase in the index is associated with an increase of 2.7 score points in

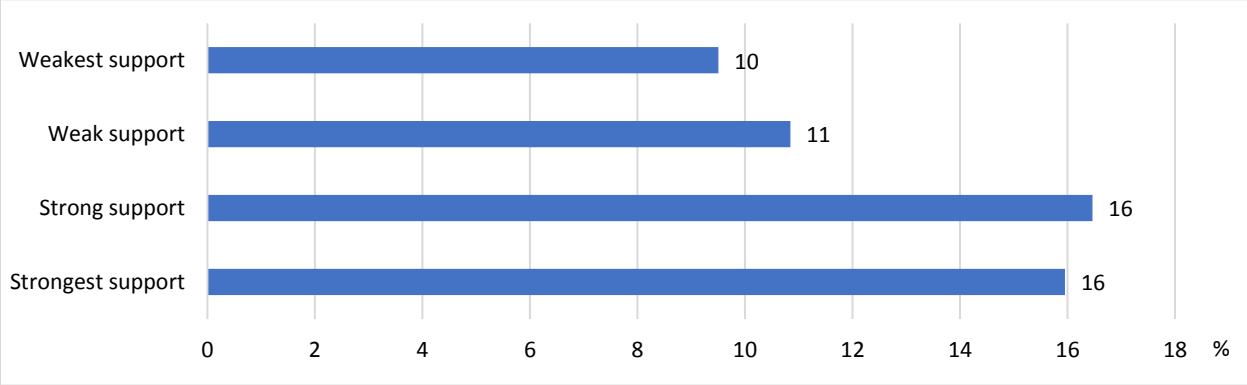
reading performance. The estimated coefficient is not statistically significant at conventional levels under a two-tailed test of significance, with a p-value of 0.179. However, it is significant at the 10 percent level under a one-tailed test of statistical significance.

Parents' emotional support (PISA-constructed index)

The average student in Thailand perceived weaker emotional support from his or her parents than did the average student across OECD countries. The level of parents' emotional support varied by student and school characteristics. Stronger emotional support was observed among girls than boys, as well as among advantaged than disadvantaged students. Students in private independent schools also reported higher levels of parental emotional support than their peers in private government-dependent schools. Greater parental emotional support was likewise reported by students in urban school communities as compared to those in rural school communities.

Students who perceived greater emotional support from their parents were more likely to perform better in reading and be more academically resilient. As shown in Table B.2.2. in Annex 2B, a one standard deviation increase in the "Parents' emotional support index" is associated with an increase of 7.5 score points in reading performance, ceteris paribus. Parents' emotional support also appears to protect against underperformance among disadvantaged students (Figure 2.10). Shares of academically resilient students increased as students reported receiving more parental emotional support. Among students who reported receiving the strongest support from their parents (i.e., at the top quartile of the parents' emotional support index), 16 percent were academically resilient.

Figure 2.10. ***Proportion of academically resilient students, by level of parents' emotional support***



Source: OECD PISA 2018 database.

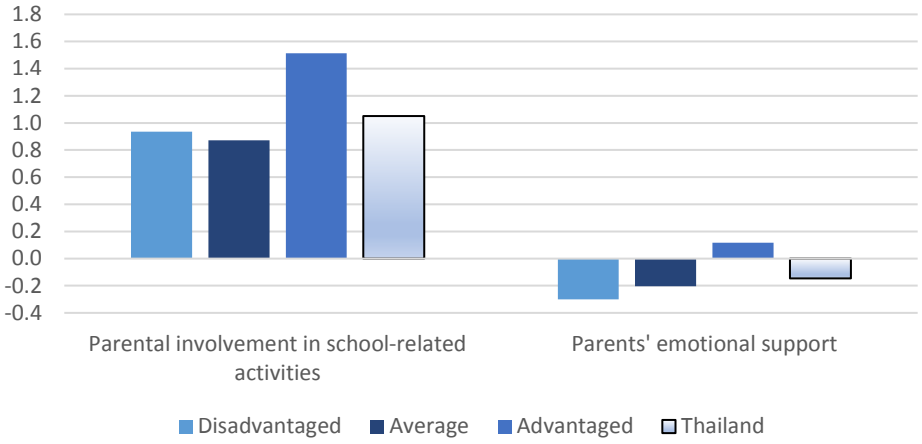
Notes: Academically resilient students are defined as students who belong to the bottom ESCS quartile and who score at the top quartile of reading performance. The levels of parents' emotional support correspond to the quartiles on the parental emotional support index, with "weakest support" referring to the bottom quartile and "strongest support" referring to the top quartile.

Even more so than participating in school-based activities, providing adequate emotional support is one way that parents can help foster learning outcomes in their children. Schools can take an active role in encouraging more emotional support among parents by raising awareness on the academic benefits of emotional support, especially for families from disadvantaged backgrounds. Encouraging parents to demonstrate strong emotional support has become especially important in

recent times, as parents spend increased time at home with their children due to the COVID-19 outbreak.

The two indices for family support across school socioeconomic statuses, as well as for Thailand are depicted graphically below in Figure 2.11, which suggests another avenue where Thailand has room to improve student learning and reduce performance outcome inequality.

Figure 2.11. ***Family Support Indices – PISA 2018***



Source: World Bank staff calculations based on OECD PISA 2018 database.

Learning time

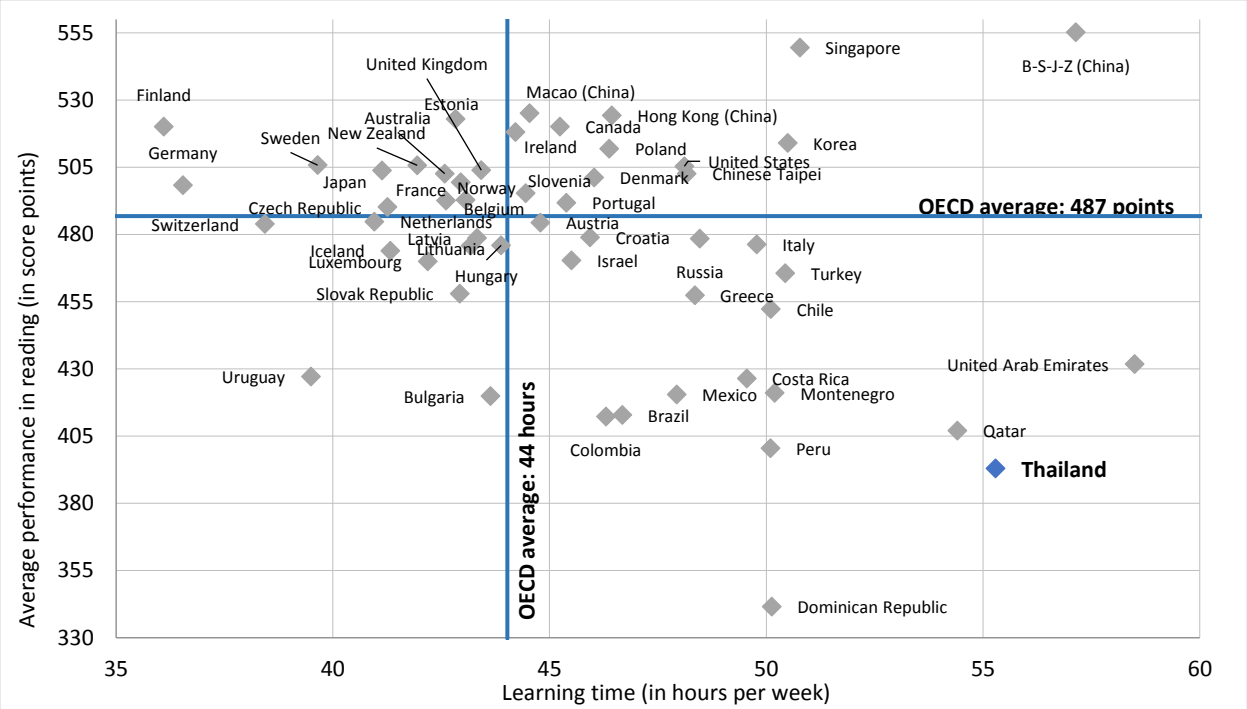
Despite relatively longer learning hours per week than most other countries, learning outcomes in Thailand remained low. Using PISA 2015[17] data on learning time, OECD (2019a) analyzed total learning time per week against reading performance across PISA countries and economies. On average across the OECD, total learning time was about 44 hours per week. Compared to most other education systems, Thailand appeared to devote more time to learning (55 hours per week). However, more learning time did not necessarily translate to better learning outcomes. Countries like Finland, Germany, and Japan reported considerably fewer learning hours per week than did Thailand, yet had significantly higher mean reading scores.

Assuming a reasonable amount of learning time is provided, what matters more is how the allocated instructional time is used. Instructional time should be maximized to both broaden and deepen students' understanding, which will depend highly on the curriculum. Thailand's curriculum has undergone reforms in 2001 and 2008, shifting from a content-based approach with an emphasis on rote learning to a modern standards-based approach focusing on what students should be able to know and do (OECD/UNESCO 2016). This shift is common across many countries and is expected to lead to improvements in learning outcomes of the type measured by PISA. Given that the intended learning time has not resulted in improvements in student outcomes, a review of the current curriculum may need to be conducted. That review may look at whether

[17] In their analysis, OECD (2019a) used PISA 2015 data as a proxy for the time investment of PISA 2018 students, as PISA 2018 did not collect information on out-of-school learning time.

the curriculum prioritizes a strong learning core; successful East Asian countries tend to have a comparatively narrow curriculum which enables students to attain a strong conceptual grasp of the content and thereby apply that knowledge in new contexts and under different circumstances (World Bank 2018). The review should also look at the curriculum that is actually taught in schools, compared to the official, written curriculum; and whether the textbooks and other learning materials help teachers and students develop the analytical and conceptual competences they need. The curriculum should be reviewed to see whether it is pitched at the right level – the high proportion of students who fail to reach the minimum PISA threshold could indicate that the curriculum is pitched too high for these students and is leaving them behind.

Figure 2.12. ***Reading performance and total learning time per week***



Source: OECD PISA 2019a, p. 67.

Notes: Learning time is based on reports by 15-year-old students in the same country/economy in response to the PISA 2015 questionnaire. For Beijing-Shanghai-Jiangsu-Zhejiang (China) (labelled as B-J-S-Z [China] on the chart), data on learning time amongst students from Beijing-Shanghai-Jiangsu-Guangdong (China) were used.

Issues such as teacher absenteeism and student absenteeism can disrupt the intended learning time per week. The next sections look at measures of learning time based on principals' reports on teacher absenteeism and the extent to which it hinders student learning, as well as students' self-reports on absenteeism and tardiness.

Teacher absenteeism

The vast majority (96 percent) of principals in Thailand perceived teacher absenteeism to hinder student learning only very little or not at all. Only 1 percent of students in Thailand attended schools where principals reported that teacher absenteeism hinders learning a lot. About 13 percent of students were enrolled in schools where principals reported that teacher absenteeism hinders learning to some extent, while about 42 percent were in schools where principals viewed teacher

absenteeism impedes learning very little. More than half (54 percent) of students were in schools where principals reported that teacher absenteeism did not hinder learning at all. No differences were observed in the perceptions of teacher absenteeism across school ownership and school community types.

Student absenteeism and tardiness

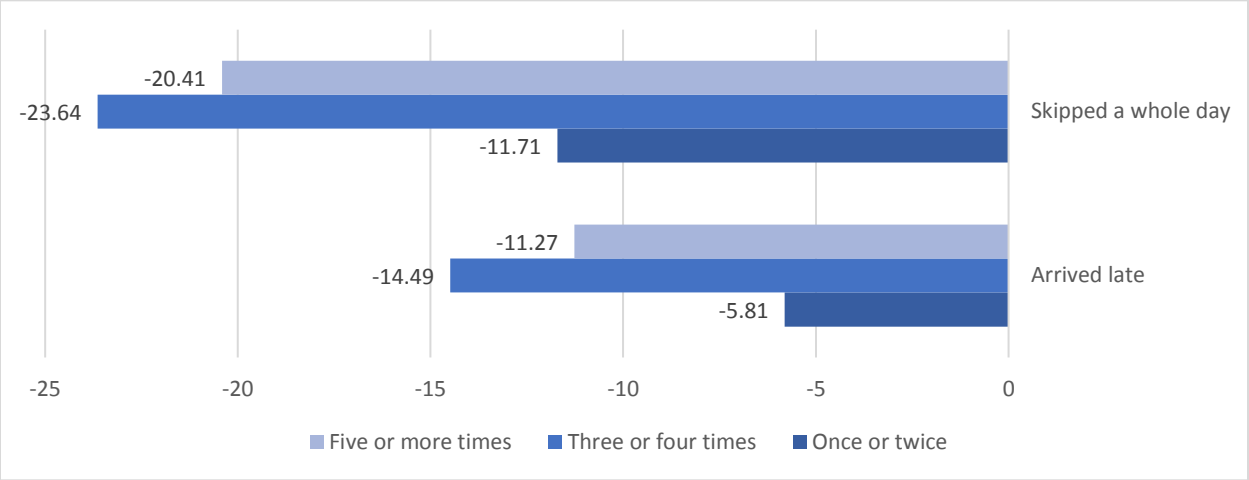
The prevalence of student absenteeism in Thailand was higher than on average across OECD countries and highest among all EAP countries. About 39 percent of students in Thailand, as compared to only 21 percent of students on average across OECD countries, had skipped a day of school at least once in the two weeks prior to the PISA test. While at least 90 percent of students in the majority of countries and economies in the EAP had never skipped a day of school, only 61 percent of students in Thailand reported the same. About 44 percent of students in Thailand, as compared to 48 percent on average across the OECD, reported arriving late for school at least once in the two weeks prior to the PISA test.

Student absenteeism and lateness in Thailand have worsened since 2015. In PISA 2015, about 31 percent of students reported skipping a day of school at least once and about 36 percent arrived late for school at least once in the two weeks prior to the PISA test. The proportions of students skipping school and arriving late increased significantly by 7 and 8 percent, respectively, in PISA 2018. In contrast, on average across the OECD, the increase in the proportion of students who had skipped a day of school or arrived late at least once from 2015 to 2018 was 1 and 3 percent, respectively.

Student absenteeism was more frequently observed among boys and disadvantaged students. About 42 percent of boys, as opposed to 36 percent of girls, reported they had skipped at least one day of school. Boys were also more likely to be late for school, with about half (50 percent) of boys and 38 percent of girls reporting arriving late for school at least once. Socioeconomic differences are observed in absenteeism but not in lateness. About 41 percent of disadvantaged students, as compared to 34 percent of advantaged students, reported skipping a whole day of school at least once in the two weeks prior to the PISA test.

After accounting for students' and schools' socioeconomic profiles (see Table B.2.3 in Annex 2B), skipping school and arriving late for school are negatively associated with reading performance. Students who skipped school once or twice in the two weeks prior to the PISA test scored 11.7 points lower than those who had not skipped school during the same period. Skipping a whole day of school five or more times was associated with a decrease of 20.4 score points in reading. Students who arrived late once or twice scored about 5.8 points lower than those who were never late; this gap increases to 14.5 score points when students are late three or four times (see Figure 2.13).

Figure 2.13. ***Marginal effects of student absenteeism and lateness on reading performance***



Source: World Bank estimates using OECD PISA 2018 database.
Note: Bars represent the score-point change in reading associated with students' responses, relative to those who responded "never", ceteris paribus.

Student outcomes can also be affected for those whose schoolmates skip school or are often late. Students in schools with the lowest incidence of student truancy (i.e., at the bottom quartile of the distribution) scored an average of 420 points in reading, while those enrolled in schools with the highest incidence (i.e., at the top quartile of the distribution) scored an average of 362 points. Decreases in scores are also seen when schoolmates are late for school. Students scored 5 points lower for every 10 percentage-point increase in the number of schoolmates who had arrived late for school in the two weeks prior to the PISA test.

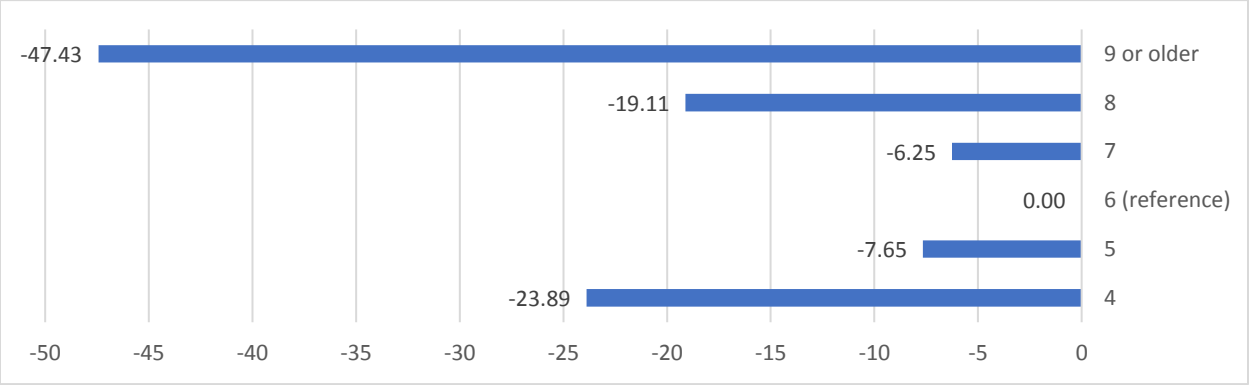
Certain factors in the home and school environment can increase the likelihood that students skip school. After accounting for the socioeconomic profiles of students and schools, students were less likely to have skipped a day of school at least once in the two weeks prior to the PISA test when they have less frequent exposure to bullying, have a more positive classroom disciplinary climate, and value school more strongly. Students who receive more emotional support from their parents are also less likely to skip school. These key factors in the school and home environment present important points of consideration for policymakers and educators in developing interventions to address student absenteeism.

Primary school starting age and grade repetition

Chapter 1 established that students who fell behind track tended to come from a more socioeconomically disadvantaged background. Almost one-third of socioeconomically disadvantaged students were behind track, as compared to 10 percent of advantaged students. Key reasons that students might be behind track are late entry into primary schooling and grade repetition. This section investigates the effects of age of entry into primary school and grade repetition on student learning, as well as how the two key reasons behind the grade-age mismatch might be related.

First, we analyze the impacts on student reading performance. After accounting for differences in students' socioeconomic background, school resources and school community type (see "Primary starting age" column in Table B.2.4 in Annex 2B), we find that starting primary school at the wrong age (the right age means the age of 6 years old, which is the reference age in the regression model) is negatively associated with reading performance. For instance, Figure 2.14 shows that a student who started primary school at the age of 7 years is expected to score 6.3 points lower on reading compared to an otherwise identical student who started school at the correct age. The negative effect expands to a massive 47.4 points (equivalent to more than one and a half years of formal schooling) if the starting age is 9 years or older. All of the estimated coefficients are also statistically significant at conventional levels.

Figure 2.14. ***Marginal Effects of Primary School Starting Age on Reading Performance***



Source: World Bank estimates based on OECD PISA 2018 database.

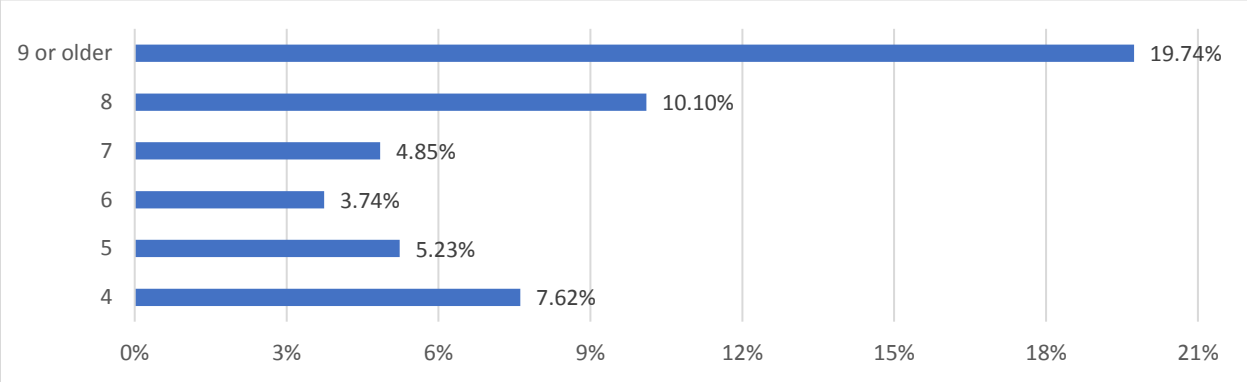
The negative marginal effect of grade repetition at the primary level, on the other hand, is equivalent to more than a year's worth of formal schooling (-37.9 points in reading). As shown in "Grade repetition" column in Table B.2.4., the estimated effect is highly statistically significant. However, it is interesting to see that repeating a grade at the lower secondary level, ceteris paribus, has no significant effect on the reading score. This may be due to the very small presence of students who have repeated a grade only in the lower secondary school of just 0.8 percent of the total number of students. By contrast, the share of students who have repeated a grade only in the primary school and the share of students who have repeated grades in both primary and lower secondary levels are much larger, at 2.26 and 2.34 percent respectively.

The "Both" column in Table B.2.4. includes both the primary school starting age and the grade repetition variables into the same regression equation. Remarkably, we find that the magnitudes of the estimated coefficients on the variables are hardly diminished. In other words, starting school at the wrong age and grade repetition have statistically independent effects on student reading performance. For example, a student who started primary school at age 9 years or older and went on to repeat a grade at the primary level is expected to lose more than 2 years' worth of learning (-73 points on the reading score), compared to an otherwise identical student who has started primary school at the right age and has not repeated a grade.

It is reasonable to expect that starting primary school at the wrong age and grade repetition are themselves related. To formally investigate the relationship between the two, we estimate a logit model of grade repetition on primary school starting age, while controlling for student family

background characteristics. The resulting estimates are presented in Table B.2.5. in Annex 2B and the estimated average marginal effects of primary school starting age on grade repetition at the primary level are presented graphically in Figure 2.15.

Figure 2.15. ***Average Marginal Effects of Primary School Starting Age on Grade Repetition at the Primary Level***



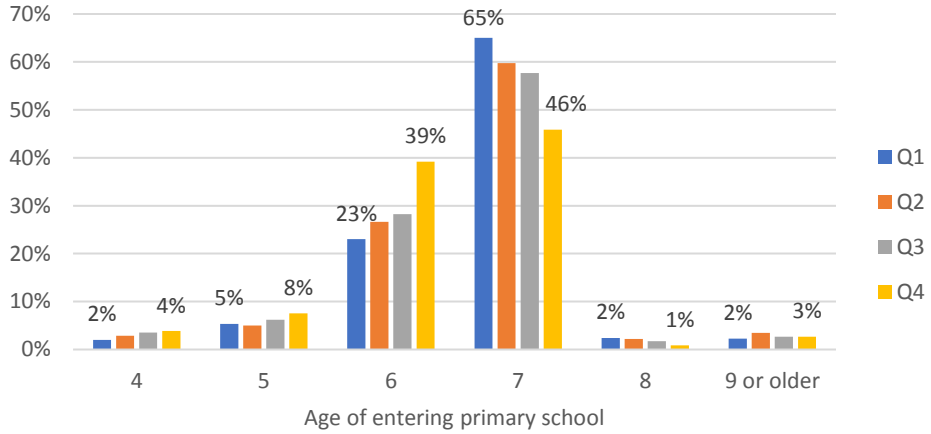
Source: World Bank estimates based on OECD PISA 2018 database.

From Figure 2.15, it can be seen that a student who started primary school at age 6 (the correct age) has a 3.74 percent chance of repeating a grade at the primary level, ceteris paribus. Had the student entered one year later, the probability of repeating a primary grade would increase to 4.85 percent. The probability of grade repetition increases massively to 10.1 and 19.74 percent if the age of school entry goes up to 8 and 9 years or older.

Another interesting finding is that, if a student had repeated a grade at the primary level, there is a 51 percent chance that the student will again repeat a grade once he/she gets to the lower secondary level. On the other hand, the chance of repeating a grade at the lower secondary level for those students who had not repeated a grade at the primary level is only 0.8 percent.

The inequality in primary school starting age is clearly depicted in Figure 2.16, where the shares of students entering school at different ages are plotted for students from the four socioeconomic quartiles. However, it should be noted from Figures 2.14 and 2.15 that both the adverse impacts on student learning and grade repetition really jump up when primary school entry age deviates from 6 years old by 2 years or more. At the aggregate level, around 7.7 percent of Thailand's 15-year-old students were classified in this group. Nevertheless, the impact of entering primary school later (earlier) than the correct age by one year is still expected to result in a significant fall in reading performance by 6.25 (7.65) score points. Therefore, addressing this inequality dimension will likely result in a reduction in the performance gap between socioeconomic groups.

Figure 2.16. ***Primary School Starting Age by Socioeconomic Quartile***



Source: OECD PISA 2018 database.

Annex 2A

The ineffective and inequitable allocation of educational personnel across the Thai basic education system can be better understood by analyzing the current personnel allocation rule. Personnel administration of all public school teachers and educational personnel in Thailand is under the supervision of the Teacher Civil Service and Educational Personnel Commission (TEPC). TEPC, a central government agency under the Ministry of Education, established criteria for educational personnel deployment for all public schools. The allocation formulae are explained in detail in World Bank (2020) for five main types of OBEC schools. These are:

1. Type 1: Schools with 120 or less enrolled students, which have Preschool-Primary 6 or Primary 1-Primary 6 grades
2. Type 2: Schools with more than 120 enrolled students, which have Preschool-Primary 6 or Primary 1-Primary 6 grades
3. Type 3: Schools with 120 or less enrolled students, which have Preschool-Secondary 3/Secondary 6 or Primary 1-Secondary 3/Secondary 6 grades
4. Type 4: Schools with more than 120 enrolled students, with Preschool-Secondary 3/Secondary 6 or Primary 1-Secondary 3/Secondary 6 grades
5. Type 5: Secondary schools with only secondary grades

Clearly, the PISA target schools are Types 3, 4, and 5, which offer secondary grades. World Bank (2020) explains why the current TEPC personnel allocation rules have the effect that the vast majority of small schools with less than 120 enrolled students (Type 1 and Type 3 schools) have far too few teachers to deliver quality education.

Briefly, consider Table 2.1, which shows that on average, Type 3 schools have 10.88 classes spread across pre-primary through to secondary grades. The Teacher Demand Model, proposed in World Bank (2020) as an alternative to the TEPC formulae,[18] is used to accurately compute the "adequate" allocation of teaching staff to all schools. This allocation formula, represented by "WB," suggests that as many as 16.59 teachers should be allocated to an average Type 3 school. This is almost twice the allocation of 9.5 suggested by the TEPC formula (which allocates less teachers than the total number of classes for small schools!). On the other hand, for the larger Types 4 and 5 schools, the average numbers of teaching staff required per school computed using the TEPC formulae and the WB teacher demand model are not vastly different.

At the aggregate level, the TEPC personnel allocation criteria indicate that there is a current surplus of educational personnel in Type 3 schools, while the WB teacher demand model suggests a large shortfall of almost 50 percent (adequate number of personnel of 15,107, but actual number of only 10,122) – see Table A.2.2. The larger Type 4 group of schools also has an aggregate shortfall, but the magnitude is much smaller. However, when looking at the individual school level, the WB teacher demand model estimates that nearly all of Type 3 schools (826 out of 859); 4,235 out of

[18] The teacher demand model shown here sets the maximum allowable class sizes for pre-primary, primary, and secondary levels 30, 40, and 40 respectively as per TEPC criteria. However, the similarity ends there as the teacher demand model explicitly takes into account the maximum allowable weekly teaching load of 20 hours per week for every teacher, as well as taking into consideration teacher specialization by subject area and schooling stage (see Annex 2.1 in World Bank (2020) for technical details and underlying assumptions).

6,153 Type 4 schools; and only 280 out of 2,353 Type 5 schools are short of personnel. It is interesting to note that the student-personnel ratios for Types 3, 4, and 5 schools are 9.4, 15.4, and 16.6 respectively. The brief analysis given in this section, therefore, makes clear why the low student-teacher ratios and small classes in the smaller schools do not reflect that these schools can offer quality education. Instead, they show that these small schools with few students spread across various grades in half-empty classrooms do not have enough teachers and many of them cannot even teach students across all grades at the same time, unless multi-grade teaching is employed (Lathapipat and Sondergaard, 2015; World Bank, 2018; and World Bank, 2020).

At the system level, the WB teacher demand model estimates that at least 529,732 educational personnel are needed to adequately staff all OBEC schools (Table A.2.2.), a 13.4 percent increase from the current workforce of 467,155. As discussed in World Bank (2020), tackling this educational personnel allocation problem in a cost-efficient manner requires that the vast network of schools is reorganized and that limited educational personnel and other resources are more adequately and equitably redistributed to improve both the quality and equity of the system. The study estimates that as many as 17,120 "Affiliated schools," could be merged into 6,821 "Hub schools," thereby, reducing the total number of OBEC schools from 29,466 to 12,346 without significantly affecting student access. The economies of scale resulting from the merger and the appropriate redistribution of existing teachers were found to completely eliminate the aggregate personnel shortage.

Table A.2.1. Teaching Staff Allocation by School Type – OBEC 2019

	Type 1	Type 2	Type 3	Type 4	Type 5
Preschool	2.069	2.903	2.016	2.494	-
Primary 1	0.972	1.477	0.991	1.256	-
Primary 2	0.975	1.449	0.987	1.235	-
Primary 3	0.975	1.417	0.992	1.208	-
Primary 4	0.979	1.416	0.991	1.207	-
Primary 5	0.975	1.414	0.995	1.200	-
Primary 6	0.977	1.415	0.994	1.206	-
Secondary 1	-	-	0.958	1.183	4.866
Secondary 2	-	-	0.979	1.176	4.832
Secondary 3	-	-	0.971	1.164	4.739
Secondary 4	-	-	0.001	0.033	4.298
Secondary 5	-	-	0.001	0.031	4.219
Secondary 6	-	-	0.001	0.031	4.186
Average #classes in each school	7.92	11.49	10.88	13.42	27.14
Total number of schools	13,805	6,296	859	6,153	2,353
Total number of students	888,100	1,757,790	76,726	1,770,888	2,114,060
Average #teachers required - TEPC	3.71	14.20	9.50	18.75	54.28
Average #teachers required - WB	10.71	15.58	16.59	20.41	45.82

Table A.2.2. Total Educational Personnel Allocation by School Type – OBEC 2019

	Type 1	Type 2	Type 3	Type 4	Type 5	All schools
Total #teachers required - TEPC	51,232	89,382	8,164	115,345	127,720	**391,842**
Total #teachers required – WB	147,803	98,100	14,248	125,599	107,826	**493,576**
Total principals required (=number of schools)	13,805	6,296	859	6,153	2,353	**29,466**
Total deputy principals required - TEPC	-	1,691	-	1,566	3,433	**6,690**
Total personnel required - TEPC	65,037	97,369	9,023	123,064	133,506	**427,998**
Total personnel required – WB	161,608	106,087	15,107	133,318	113,612	**529,732**
Total personnel - actual	**89,998**	**106,793**	**10,122**	**128,518**	**131,684**	467,115
#schools with personnel shortage - TEPC	979	1,901	207	2,392	1,264	**6,743**
#schools with personnel shortage – WB	13,541	3,713	826	4,235	280	**22,595**

Source: World Bank (2020)

Annex 2B

Table B.2.1. presents the mean values of the various indices discussed in this chapter for Thailand, as well as for schools categorized in different socio-economic groups. These indices are included as regressors in the regression analysis presented in this Annex.

Table B.2.1. Mean Values of Selected Indices – Overall and by School Socioeconomic Group

	Thailand	Disadvantaged	Average	Advantaged
Exposure to bullying	0.204	0.378	0.301	-0.151
Sense of belonging	-0.396	-0.476	-0.442	-0.228
Adaptive instruction	0.210	0.175	0.178	0.307
Classroom disciplinary climate	0.340	0.317	0.319	0.404
Quality assurance	0.297	0.305	0.241	0.401
Parental involvement in school-related activities	1.051	0.935	0.872	1.514
Parents' emotional support	-0.146	-0.301	-0.203	0.117
Shortage of educational staff	0.044	0.485	0.125	-0.548
Shortage of educational material	0.373	0.828	0.541	-0.402
Shortage of educational resources	0.271	0.796	0.423	-0.542

A Hierarchical linear regression modeling (HLM) framework is employed to estimate the effects of the indices shown in Table B.2.1. on the PISA 2018 reading performance of Thai students as well as for students in all PISA-participating countries/economies (denoted "World"). For the "World" model, the level 1 units are the individual students, who are nested within school (level 2), which are in turn nested within countries (level 3). The multilevel model specification employed allows the intercepts to vary randomly across groups at each level, while slopes are fixed. For the "Thailand" model, there are 2 levels – individual students nested within schools.

As discussed at in the chapter, Principal components analysis (PCA) has been used to construct the indices shown in Table B.2.1. The method helped to simplify the regression model considerably through data reduction and is effective in dealing with the multicollinearity problem arising from the existence of a large number of initial variables, many of which are highly correlated. Overall, we were able to combine nearly 40 initial variables into just 8 indices, which is much more manageable.

In addition to the indices of interest, the regression models also control for student age, grade, gender, family economic, social, and cultural status, and school community type. The results from the regressions for the "World" and the "Thailand" model are shown below in Table B.2.2.

Table B.2.2. Hierarchical Linear Model Regression of PISA 2018 Reading Scores

	World	Thailand
Sense of belonging index	-1.043	8.143***
	(1.773)	(1.678)
Exposure to bullying index	-7.403***	-8.783***
	(0.916)	(0.770)
Classroom disciplinary climate index	6.197***	5.851***
	(0.860)	(1.372)
Adaptive instruction index	2.763***	2.127*
	(0.589)	(1.239)
Quality assurance index	-0.127	6.062
	(1.867)	(4.432)
Age	-5.502***	-5.953
	(2.126)	(3.990)
Grade	28.532***	16.670***
	(2.732)	(2.811)
Female	13.496***	23.326***
	(1.160)	(1.980)
Economic, social, and cultural status index	14.455***	5.800***
	(2.743)	(2.043)
Economic, social, and cultural status index squared	1.565**	1.410**
	(0.635)	(0.657)
Parents' emotional support index	4.132***	7.499***
	(0.712)	(1.134)
Parental involvement in school-related activities index	1.723**	2.688
	(0.687)	(2.000)
Shortage of educational resources index	-6.463***	-4.807
	(1.032)	(2.923)
Urban	21.519***	24.418***
	(4.101)	(8.881)
Intercept	512.391***	468.842***
	(36.919)	(62.690)
Log between country cluster standard deviation $ln(\sigma_{cnt})$	3.585***	
	(0.095)	
Log between school cluster standard deviation $ln(\sigma_{sch})$	3.668***	3.426***
	(0.038)	(0.091)
Within cluster standard deviation $ln(\sigma_e)$	4.183***	3.909***
	(0.056)	(0.016)
Observations - Countries	72	1
Observations - Schools	13,749	290
Observations - Students	301,369	7,981

*Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1*
Note: The "World" model also includes OECD and EAP fixed effects

Table B.2.3. Hierarchical Linear Model Regression of PISA 2018 Reading Scores on Indicators for Student Truancy and Other Controls

	Arrived late for school		Skipped a whole day of school	
Arrive late for school/Skip a whole day of school1 (Never)				
Once or twice	-5.808**	-2.684	-11.705***	-7.755***
	(2.367)	(2.388)	(2.172)	(2.192)
Three or four times	-14.494***	-8.140**	-23.641***	-15.505***
	(3.166)	(3.231)	(4.026)	(3.783)
Five or more times	-11.270**	-0.018	-20.411***	-8.776
	(4.415)	(4.073)	(5.712)	(5.980)
Sense of belonging index		7.894***		7.886***
		(1.699)		(1.674)
Exposure to bullying index		-8.631***		-8.248***
		(0.768)		(0.759)
Classroom disciplinary climate index		5.425***		4.938***
		(1.371)		(1.402)
Adaptive instruction index		1.980*		2.100*
		(1.197)		(1.197)
Quality assurance index		5.907		5.755
		(4.427)		(4.384)
Age	-7.239*	-6.033	-7.254*	-6.074
	(3.794)	(3.913)	(3.843)	(3.925)
Grade	18.617***	16.884***	18.220***	16.645***
	(2.904)	(2.808)	(2.904)	(2.834)
Female	26.980***	22.927***	26.710***	22.911***
	(1.886)	(1.943)	(1.900)	(1.967)
Economic, social, and cultural status index	6.554***	5.796***	6.647***	5.866***
	(2.031)	(2.059)	(2.014)	(2.058)
Economic, social, and cultural status index squared	1.782***	1.388**	1.876***	1.456**
	(0.671)	(0.659)	(0.666)	(0.661)
Parents' emotional support index	11.189***	7.426***	11.269***	7.472***
	(1.041)	(1.139)	(1.055)	(1.136)
Parental involvement in school-related activities index	1.669	2.73	1.599	2.718
	(2.087)	(1.988)	(2.061)	(1.951)
Shortage of educational resources	-3.811	-4.591	-4.036	-4.730*
	(3.052)	(2.914)	(2.976)	(2.843)
Urban	29.363***	24.294***	29.018***	24.638***
	(10.158)	(8.853)	(9.937)	(8.895)
Intercept	490.270***	472.232***	492.226***	474.692***
	(59.813)	(61.594)	(60.253)	(61.512)

*Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1*

1. In the two weeks prior to the PISA test

Table B.2.4. Hierarchical Linear Model Regressions of PISA 2018 Reading Scores on Primary School Entry Age, Grade Repetition, and Other Controls

	Primary starting age	Grade repetition	Both
Primary school starting age:			
4 years old	-23.886***		-23.318***
	(4.302)		(4.121)
5 years old	-7.654**		-7.403*
	(3.865)		(3.927)
6 years old (reference group)	-		-
	-		-
7 years old	-6.249***		-6.104***
	(2.274)		(2.250)
8 years old	-19.107***		-19.102***
	(6.887)		(7.059)
9 years or older	-47.430***		-36.893***
	(6.014)		(5.884)
Grade repetition at the primary level		-37.912***	-35.808***
		(4.697)	(4.614)
Grade repetition at the lower secondary level		1.605	4.913
		(7.125)	(7.245)
Female	28.209***	29.110***	27.565***
	(2.058)	(2.062)	(2.139)
Economic, social, and cultural status index	7.926***	7.184***	7.288***
	(2.087)	(2.033)	(2.059)
Economic, social, and cultural status index squared	1.741**	1.615**	1.547**
	(0.706)	(0.704)	(0.711)
Parents' emotional support index	11.411***	11.296***	10.862***
	(1.147)	(1.082)	(1.139)
Parental involvement in school-related activities index	2.137	0.949	1.183
	(2.087)	(1.977)	(1.987)
Shortage of educational resources index	-4.318	-4.208	-4.416
	(2.938)	(2.887)	(2.852)
Urban	32.517***	30.661***	29.171***
	(9.757)	(9.377)	(9.379)
Intercept	369.242***	367.260***	375.079***
	(4.937)	(4.121)	(4.562)
Observations - Schools	290	290	290
Observations - Students	8,149	8,204	8,007

*Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1*

Table B.2.5. Logit Model of Grade Repetition at the Primary Level - PISA 2018

	Logit model	Average mfx
Primary school starting age:		
4 years old	0.766**	0.076***
	(0.312)	(0.019)
5 years old	0.357	0.052***
	(0.280)	(0.012)
6 years old (reference group)	-	0.037***
	-	(0.005)
7 years old	0.275*	0.048***
	(0.164)	(0.004)
8 years old	1.086***	0.101***
	(0.348)	(0.028)
9 years or older	1.905***	0.197***
	(0.254)	(0.032)
Female	-0.682***	
	(0.131)	
Economic, social, and cultural status index	-0.226*	
	(0.137)	
Economic, social, and cultural status index squared	-0.04	
	(0.046)	
Parents' emotional support index	-0.407***	
	(0.077)	
Parental involvement in school-related activities index	-0.088**	
	(0.038)	
Urban	-0.411***	
	(0.146)	
Intercept	-3.044***	
	(0.185)	
Observations	8,089	8,089

*Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1*

Note: Only the average marginal effects of the variables of interest are presented

CHAPTER 3: Policy options for Thailand

Thailand's participation in PISA 2018 reveals important insights on educational attainment and achievement outcomes of its 15-year-old students, as well as the extent to which key foundations for education success—resources, quality instruction, learning time, inclusive environments, and family support—are present in the country, how they vary across population subgroups, and how they affect student learning. Another important issue of wrong-age entry into primary schools is also investigated. Based on findings from PISA 2018, policy recommendations to strengthen these foundations and improve education outcomes in Thailand are presented. The recommendations become even more urgent given that the COVID pandemic and the resulting loss of schooling has likely made the challenges in the system to equitable learning outcomes even greater.

To improve education outcomes for all students in Thailand, policymakers and educators can focus on three important areas: (a) enhancing school inclusion; (b) strengthening teacher quality and addressing the poor allocation of educational resources; and (c) making effective use of learning time.

Enhancing school inclusion

To support learning outcomes, policymakers and educators should pay increased attention to making schools inclusive, safe, and welcoming. Between 2015 and 2018, students' sense of belonging has decreased, while their exposure to bullying has increased. These changes in students' perceptions of their learning environment suggest that inclusion in Thailand's schools has weakened. When students feel more socially connected to and safe in school, they are more likely to achieve better learning outcomes.

Systems must be in place for school principals and teachers to assess and properly address their current school climates. Tools and mechanisms can be provided to help educators gauge how students perceive inclusion in their schools. To equip educators with appropriate strategies for school inclusion, ongoing training should include enhancing their abilities to recognize and respond to students' needs and emotions, clearly communicate rules and expectations, and detect and address early signs of bullying. Schools should engage all stakeholders, including parents, school staff, and students, in creating and implementing anti-bullying policies and practices.

Promoting more inclusive learning environments will be especially critical when students return to the classroom once school closures due to the COVID-19 pandemic have been lifted. While schools remain closed, teachers will have the crucial role of not only strengthening their skills in implementing digital learning, but also maintaining positive student-teacher relationships over remote learning modes to sustain students' motivation to learn. Schools must also prepare approaches for welcoming students back to the classroom. Once school closures have been lifted, teachers and school principals will need to demonstrate enhanced sensitivity to students' transition back to school, ensuring all students feel safe, connected, and welcomed in school.

Strengthening teaching quality and addressing the poor allocation of educational resources

Continuing professional development should include targeted training on adaptive instruction and classroom management. That certain aspects of disciplinary climates have significantly worsened reveal teachers' need for more support on classroom management. Teacher training should focus on strengthening teachers' skills in adapting to students' needs and maintaining order and discipline in their classrooms. For teachers to adequately and effectively address students' needs, as well as to successfully manage noise and disorder in their classrooms, policymakers and school administrators must ensure that conditions in school environments are conducive to implementing teacher strategies. Class sizes, for instance, should be limited to an adequate size for teachers to realistically implement differentiated instruction in adapting to learners' individual needs.

Teacher deployment should be strengthened to ensure that all schools have adequate composition of high-quality teachers, as well as enough teachers and other educational personnel for every classroom. The deployment of teachers to high-need areas such as rural schools should be addressed. The collection and reporting of accurate and timely data on actual school needs must be strengthened in order to inform decision-making on teacher deployment. To help make teacher deployment more equitable, stronger incentives can be provided to encourage highly-qualified teachers to be deployed to high-need schools.

Schools primarily serving disadvantaged children and schools in the rural areas are also generally much more lacking in material resources and physical infrastructure and this inequitable resource allocation must be addressed. Digital learning resources, in particular, have important implications amidst school closures brought about by the spread of the COVID-19. With inequities in access to digital learning resources, online learning can potentially amplify existing learning gaps across socioeconomic groups and community types. If remote learning options rely solely on digital learning modes, students from socioeconomically disadvantaged backgrounds and rural communities may fall even further behind. In such time where school operations are disrupted, policymakers should explore alternative and offline remote learning options to ensure continuity of learning for all students.

Making effective use of learning time

Despite relatively longer learning hours per week, learning outcomes have remained low in Thailand. While it is important to ensure that the amount of learning time is adequate, it is equally crucial that teachers are able to use the allocated time efficiently and effectively. Teachers must ensure learning time is not lost to classroom disruptions and adequate support is given to address students' learning needs. This reiterates the importance of providing teacher training to strengthen classroom disciplinary climates and adaptive instruction.

A thorough review of the current curriculum can help make instructional time more effective for learning. A quality curriculum comprises high-quality and relevant content, is appropriately sequenced and progressive, and is balanced in the knowledge and skills students must acquire (IBE-UNESCO 2016). Though Thailand's curriculum has undergone reforms in 2001 and 2008, the low outcomes suggest that students in Thailand are not mastering curriculum content despite long learning hours. Policymakers and curriculum developers should conduct a thorough

evaluation of Thailand's current curriculum, in consultation with stakeholders, to assess whether the curriculum has delivered its intended outcomes. By conducting a review of the curriculum, aspects that must be revised to better support student learning can be identified and addressed.

Increasing inclusion and classroom discipline can help prevent loss of learning time due to repeated student absenteeism. Certain factors in the school environment can lead students to choose to skip school. When students are frequently bullied or when their classrooms have a negative disciplinary climate, students are more likely to repeatedly skip school. Students are less likely to skip school when they have stronger emotional support from their parents. In developing interventions to address student absenteeism, policymakers and educators should consider how aspects of inclusion and discipline in the learning environment, as well as family-school partnerships to curb absenteeism, can be strengthened.

In the context of the COVID-19 pandemic, policymakers should ensure learning time is not lost due to school closures, and that learning continues for all learners. If remote learning models rely solely on online approaches, the inequities in learners' access to digital learning resources can potentially worsen existing learning gaps. Policymakers should thus consider alternative remote learning strategies that provide offline options for learning. Offline modes for distance learning may include the dissemination of printed learning materials to students and the use of mass media such as educational television or radio.

Addressing the problem of incorrect age entry into primary school would also reduce the loss of learning time as wrong age school entry is found to significantly increase the probability of primary grade repetition. The problem is found to accumulate as once a student has repeated a grade at the primary level, there is a more than 50 percent chance that he/she will again repeat a grade at the lower secondary level. Furthermore, both wrong age school entry and grade repetition are found to massively affect learning outcome and students from socioeconomically disadvantaged background are more disproportionately prone to both.

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