

Growing Smarter

*Learning and Equitable Development
in East Asia and Pacific*

WORLD BANK EAST ASIA AND PACIFIC
REGIONAL REPORT

World Bank East Asia and Pacific Regional Report

Growing Smarter

Learning and Equitable
Development in East Asia and Pacific

OVERVIEW

This booklet contains the overview, as well as some front matter, from *Growing Smarter: Learning and Equitable Development in East Asia and Pacific*, doi: 10.1596/978-1-4648-1261-3. A PDF of the final, full-length book, once published, will be available at <https://openknowledge.worldbank.org/>, and print copies can be ordered at <http://Amazon.com>. Please use the final version of the book for citation, reproduction, and adaptation purposes.

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Foreword

Since 1960, economies in the East Asia and Pacific region have had both faster economic growth and greater human capital accumulation than any other. They have made large investments in improving the amount and quality of schooling to promote rapid and continual economic progress. For a handful of the region's economies, success raised both the supply of and demand for skilled labor and transformed many into prosperous and inclusive middle-income societies. Too many countries in the region, however, have fallen short of their economic aspirations and have failed to take advantage of education's promise.

Both groups are eager to learn how they can do better. Understanding the elements of success is a critically important policy priority. Countries wanting to learn so as to fuel economic growth ask themselves, What policies and practices help to promote superior learning outcomes? And, what can governments do to consistently and equitably raise aggregate learning in their national school systems? *Growing Smarter: Learning and Equitable Development in East Asia and Pacific* provides answers to these questions.

The developing world is in the midst of a global learning crisis: in an unacceptably high number of countries, schooling is not

leading to learning. The *World Development Report 2018: Learning to Realize Education's Promise* focuses attention on the typical education system in the developing world—where inequalities in learning outcomes are wide and improvements in systemwide learning are often slow. These two reports complement each other, with the present report centering on policies and practices that have led national education systems in East Asia and Pacific to produce graduates with consistently high learning outcomes, and to do so equitably.

Education holds promise for macroeconomic growth and for individuals' opportunities, especially among the bottom 40 percent of income earners. Knowledge of successful policies and practices is vitally important for the World Bank's Twin Goals of inclusive growth and poverty reduction. *Growing Smarter: Learning and Equitable Development in East Asia and Pacific* focuses on the lessons that have allowed the region's economies not only to avoid learning crises but also to build and maintain high-performing education systems.

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Abbreviations

B-S-J-G	Beijing, Shanghai, Jiangsu, and Guangdong (China)
EGRA	Early Grade Reading Assessment
GDP	gross domestic product
OECD	Organisation for Economic Co-operation and Development
PISA	Programme for International Student Assessment
PPP	purchasing power parity
SABER	Systems Approach for Better Education Results
SAR	special administrative region
TALIS	Teaching and Learning International Survey
TIMSS	Trends in International Mathematics and Science Study

Overview

Introduction

One-quarter of the world's school-age children live in East Asia and Pacific. About 40 percent of the region's students are in school systems that perform well and allow them to learn as much as or more than students anywhere in the world. But tens of millions of others are in school but not learning. Up to 60 percent of students in the region are in poorly performing school systems where performance in key subjects is either low or unknown. Many of these students have learning outcomes that are below basic proficiency levels and are greatly disadvantaged as a result.

The impressive achievements of some low- and middle-income countries in the region show that schooling in resource-constrained contexts can lead to learning for all. The policy lessons from countries that have improved education quality while expanding access are relevant and valuable to low- and middle-income countries—in East Asia and Pacific and elsewhere—to ensure that their students learn. These lessons are all the more relevant given the learning crisis facing many countries in the region and across the globe (box O.1).

Education remains a long-term process of acquiring knowledge, skills, habits, and behaviors. Current labor market conditions require new types of knowledge and

skills, but they do not fundamentally alter the basic need for foundational skills or the processes for acquiring them. Reading is still the foundation for acquiring all other types of knowledge—the cognitive equivalent of the opposable thumb. Students still must master the fundamentals of math, logic, and data analysis. Being able to communicate effectively requires mastery of grammar and vocabulary—and years of practice in oral and written expression. Behavioral skills and the ability to work in teams improve through structured practice and feedback. Resilience and grit remain the glue that supports the ongoing acquisition of skills and their effective application in the workplace.

Policies that promote learning: analytical framework for this report

What policies and practices promote learning in schools? What should a country do if it wants to achieve high and equitable learning outcomes? No single explanation covers all cases, but when countries focus on five policy domains and align 15 elements within them (figure O.1), learning improves most. These policies and practices promote learning by improving the teaching and learning experience in classrooms.

BOX 0.1 Complementing the 2018 *World Development Report* with regional lessons of success

The *World Development Report 2018: Learning to Realize Education's Promise* (WDR 2018) documents the dire state of learning in low- and middle-income countries, noting poor learning outcomes, high inequality, and slow progress (World Bank 2018b). It provides evidence on the myriad ways in which education systems in low- and middle-income countries are failing to ensure that students learn and calls for renewed efforts to assess learning, act on the evidence that assessments provide, and align actors for change.

Several national and subnational education systems in East Asia and Pacific fit the characterization of a learning crisis. But others offer clear examples of performance at the highest international levels—far above their predicted performance given their levels of gross domestic product (GDP) per capita.

This report complements the WDR 2018 in two ways. It focuses on the experiences of countries that

expanded schooling and learning, and it showcases systems that implemented reforms at scale. By examining these experiences, the report provides both diagnosis and detailed prescriptions for improving education systems within the region and across the globe.

The WDR 2018 provides a three-tiered model of the ways in which countries can address the learning crisis: assessing learning, acting on evidence, and aligning actors to make the system work. This report presents a complementary framework that covers five policy areas. It begins with an alignment of institutions, which creates an enabling environment that cuts across the remaining policy areas: effective and equity-minded public spending, selection and support of teachers, preparation of students for learning, and systematic use of assessments to inform instruction.

Institutional alignment

The level of institutional alignment—the coherence of objectives and responsibilities especially as they relate to public spending, teachers, readiness to learn, and assessment—determines how completely and effectively policies are designed, implemented, adjusted, and evaluated. The experience of high-performing education systems in the region underscores the critical role that institutional alignment and sound administrative systems play in delivering good-quality education. Institutional alignment facilitates policy coherence and ensures that policies, goals, and incentives across key domains are in sync, so that education systems achieve their core task of producing graduates with relevant knowledge and skills rather than just credentials. The same reform may succeed in a country where institutional alignment is strong but fail in another where it is weak.

Institutional alignment allows sound administrative systems to develop and deliver the basic inputs and infrastructure needed for schools to function well. It may seem intuitive that all school systems should

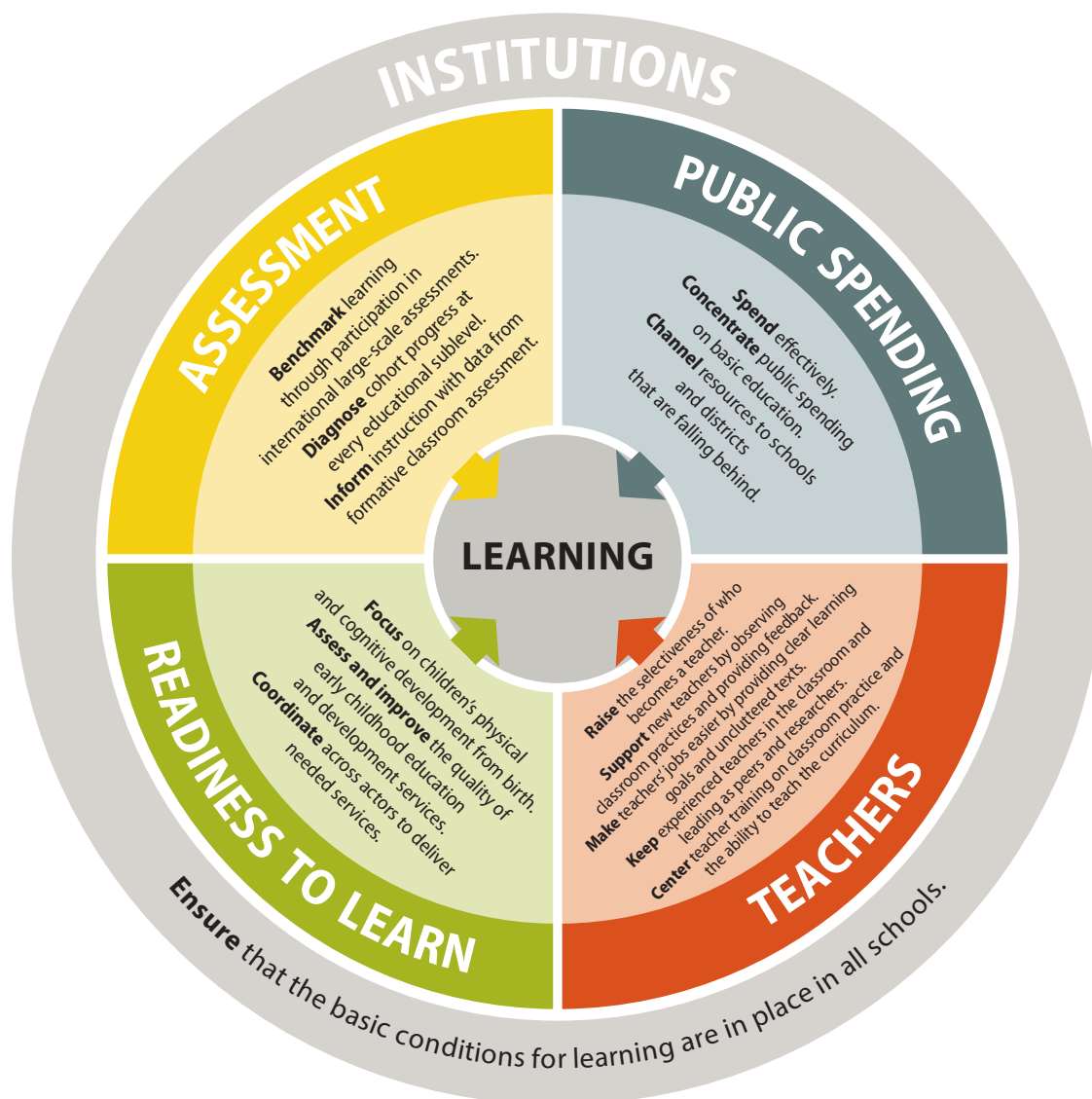
achieve such alignment, but too often inputs do not make it into schools and classrooms. Students who lack a desk or a textbook and teachers who lack a coherent curriculum or a chalkboard cannot be expected to engage in meaningful classroom interactions that produce learning.

When goals and incentives are not aligned, efforts to achieve learning are undermined. By contrast, when different aspects of the education system are in alignment, well-designed reforms that focus on teaching and learning can raise learning outcomes. Progress may sometimes be slow, but East Asia and Pacific provides evidence that success can accrue if reform efforts are sustained.

Public spending

Effective spending means that resources are spent to produce expected outcomes. When fewer resources can produce the same outcomes, the spending is called cost-effective or efficient. In education, effective spending is about outcomes in terms of access, learning, and equity. Top Performing Systems in East

FIGURE 0.1 Five policy domains promote learning



Asia and Pacific all adopted three principles for effective spending of public resources: prioritizing public spending on basic education, managing essential inputs efficiently, and enhancing the equitable distribution of resources.

Teachers

A common theme across high-performing education systems is their investment in and focus on teachers. Over time, systems perform best when they have teachers who are

respected, prepared, selected and advanced in their careers on the basis of merit, have clear learning goals and performance expectations for students, and are supported in their work. Teachers are a core element of East Asia and Pacific's Top Performing Systems, which have established competent, qualified, and motivated teaching forces that promote sustained learning. East Asia and Pacific systems provide many lessons for teacher recruitment, selection, support, retention, and professional development.

Readiness to learn

Readiness to learn, a multifaceted construct, is as much about children's readiness for school as it is about schools' readiness for children. This holistic concept is essential to a student's success not just in primary school but throughout life. This domain encompasses both the supply and the quality of services for children's physical and cognitive development. Strong support for families' efforts to assist in their children's academic and socio-emotional development pays high dividends at low cost. Top Performing Systems in East Asia and Pacific have increasingly focused on children's physical and cognitive development, assessed and improved the quality of the services they offered, and coordinated actors to deliver needed services.

Assessment

Because the quality, not just the quantity, of schooling is crucial for growth and

development, countries need to measure learning to ensure that the benefits of education reach all students. It is not enough that children are in the classroom—it is imperative to make certain that they are learning. This domain entails not only using assessments, but also having the right policies and frameworks to support a system of assessments. The Top Performing Systems in East Asia and Pacific have systematically used a mix of assessments and their data to develop their education systems, placing significant value on obtaining and using information about student learning and on employing multiple methods to assess student learning.

No single formula exists for how to achieve success. But high-performing systems share common elements and overlap in key areas in their approaches to and implementation of policies (box O.2). Increased student learning does not immediately follow from the mere presence of any or all of these elements—indeed, their quality and the degree to which they are aligned are critical.

BOX O.2 Elements of policies and practices that promote learning

The success of some education systems in East Asia and Pacific shows that students learn most when efforts focus on five policy domains and align 15 elements. These *domains* and elements are as follows:

Align institutions to ensure basic conditions for learning:

- Ensure that the basic conditions for learning are in place in all schools.

Concentrate effective, equity-minded public spending on basic education:

- Spend effectively.
- Concentrate public spending on basic education.
- Channel resources to schools and districts that are falling behind.

Select and support teachers throughout their careers to allow them to focus on the classroom:

- Raise the selectiveness of who becomes a teacher.
- Support new teachers by observing classroom practices and providing feedback.

- Make teachers' jobs easier by providing clear learning goals and uncluttered texts.
- Keep experienced teachers in the classroom and leading as peers and researchers.
- Center teacher training on classroom practice and the ability to teach the curriculum.

Ensure that children are ready to learn in school:

- Focus on physical and cognitive development from birth.
- Assess and improve the quality of early childhood education and development services.
- Coordinate actors to deliver needed services.

Assess students to diagnose issues and inform instruction:

- Benchmark learning through participation in international large-scale assessments.
- Diagnose cohort progress using national assessments.
- Inform instruction with data from formative classroom assessment.

This overview is structured as follows. The next section analyzes the state of education in East Asia and Pacific and describes performance on international assessments. The sections that follow examine each of the five framework domains, elaborating on the experience of Top Performing Systems and describing the challenges of other countries in the region. The last section discusses how countries can translate these findings into strategies and actions that improve learning.

The state of education in East Asia and Pacific

A quarter of the world's school-age children live in East Asia and Pacific—and most of them are enrolled in school

The 331 million school-age children in East Asia and Pacific represent about a quarter of the world's school-age population. Most school-age children are enrolled in school. At the primary level, the 6 million primary-age children not in school represent just 3 percent of all primary-age students. Out-of-school rates are higher at the secondary level, and some countries have troublingly high secondary-school dropout rates. But the region has made good progress in getting children into school. Just 13 percent of the world's out-of-school children live in East Asia and Pacific.

The largest education system in the region is China's, with 182 million students in basic education (National Bureau of Statistics of China 2016). National systems in five countries (China, Indonesia, Japan, the Philippines, and Vietnam) each enroll more than 10 million students. Ten countries have systems with fewer than 100,000 students. Tuvalu has the fewest students, with just 3,000.

East Asia and Pacific has made considerable progress in preschool enrollment. The region is home to roughly 119 million children of preschool age (3–6 years). In 1980, the gross enrollment rate for preschool was 13 percent; by 2014, it had risen to 76 percent. This is a much faster rate of progress than the global gross enrollment rate in preschools, which rose from 21 to 48 percent over the same period.

Improvements in outcomes for women have also been positive. In 1950, the average woman in the region had completed less than a year of schooling—well below the world average for women of 2.5 years. Six decades later, the population was more than double, and the average attainment of women had increased to 7.4 years of schooling, catching up to the global average for women. Today, girls in most countries in the region enroll and stay in school as long as or longer than most boys and learn as much or more on average.

Education systems fall into four groups

Discussions of education quality sometimes rely on assessment scores as measures of student learning. Of students in East Asia and Pacific, 55 percent are enrolled in countries or regions that have participated in at least one international standardized assessment since 2000. The Programme for International Student Assessment (PISA) of the Organisation for Economic Co-operation and Development (OECD) and the Trends in International Mathematics and Science Study (TIMSS) provide comparable information on learning outcomes in reading, math, and science. Early Grade Reading Assessments (EGRAs) provide information on children's ability to read, but their results are not comparable across countries.

Countries can be divided into four groups (box O.3 and table O.1):

- Top Performing Systems consistently score more than half a standard deviation above the average score for OECD member countries (equivalent to 1.6 years of schooling).
- Above-Average Performing Systems consistently score up to half a standard deviation above the average score for OECD member countries.
- Below-Average Performing Systems consistently score at least half a standard deviation below the OECD average.
- Emerging Systems do not regularly participate in globally comparable standardized tests, but evidence from other sources suggests that learning is very modest.

BOX 0.3 Nomenclature in this report

This report uses several terms with meanings that may not be familiar to some readers. The term *economies* refers to nonstate areas and regions. It includes entities such as Hong Kong SAR, China; Macao SAR, China; Taiwan, China; and the four regions of China that participated in the Organisation for Economic Co-operation and Development's (OECD's) 2015 Programme for International Student Assessment (PISA) exams. *Countries*, by contrast, refers to recognized World Bank member nations.

The terms *Top Performing Systems*, *Above-Average Performing Systems*, and *Below-Average Performing Systems* refer to the education systems of economies and countries that have participated in PISA and the Trends in International Mathematics and Science Study (TIMSS) since 2000 and are

categorized by their scores. The term *Emerging Systems* refers to systems with no globally comparable standardized test scores. These terms are capitalized throughout the report to highlight the specific designations of systems with regard to test scores. When references to performance are not capitalized, they do not refer to this grouping by test score.

China has not participated in PISA as a country. In 2009 and 2012, only the province of Shanghai participated. In 2015, the more economically advanced regions of China—Beijing, Shanghai, Jiangsu, and Guangdong (B-S-J-G)—participated. For convenience, this group is referred to as B-S-J-G (China). The B-S-J-G provinces have only 15 percent of China's pretertiary student population.

TABLE 0.1 Education systems in East Asia and Pacific can be categorized into four performance groups

Group	Economy	Total number of students (millions)	Number of students assessed by PISA/TIMSS ^a (millions)	Number of students assessed by EGRA (millions)	Share of cohort tested ^b
Top Performing Systems (average score = 556)	Hong Kong SAR, China; Japan; Korea, Rep.; Macao SAR, China; Singapore; Taiwan, China	24.1	24.1	—	100
Above-Average Performing Systems (average score = 512)	China, Vietnam	198.7	39.7 ^c	—	20
Below-Average Performing Systems (average score = 406)	Indonesia, Malaysia, Philippines, Thailand	92.3	92.3	21.7	100
Emerging Systems	Brunei Darussalam; Cambodia; Fiji; Kiribati; Lao PDR; Marshall Islands; Micronesia, Fed. Sts.; Mongolia; Myanmar; Palau; Papua New Guinea; Samoa; Solomon Islands; Timor-Leste; Tonga; Tuvalu; Vanuatu	16.3	0.5	5.1	35
Subtotal			156.6	26.8	
Total		331.4	161.7 ^d		48

Sources: OECD 2015; TIMSS 2015; data from World Bank EdStats (World Bank, various years). Data are the latest available data for each economy.

Note: The average score in Organisation for Economic Co-operation and Development countries was 497. — = not available. EGRA = Early Grade Reading Assessment; PISA = Programme for International Student Assessment; TIMSS = Trends in International Mathematics and Science Study.

a. PISA is taken by 15-year-olds (typically grade 10). TIMSS is taken by students in grades 4 and 8.

b. When sample-based tests are used, the share refers to the sample base measured.

c. China as a country has not participated in PISA. Scores are for the more economically advanced regions of Beijing, Shanghai, Jiangsu, and Guangdong, which are home to 15 percent of China's pretertiary student population.

d. This figure combines the number of students tested by PISA/TIMSS with the 5.1 million students tested by EGRA. Countries are not double counted in totals.

About 40 percent of tested students in the region are enrolled in systems that have high learning outcomes

High-quality test data suggest that roughly 64 million students in East Asia and Pacific are learning at high levels, but that 98 million are in systems in crisis (figure O.2). These data are based on a composite constructed average of PISA and TIMSS performance on the nine iterations of these assessments since 2000 (for PISA) and 2003 (for TIMSS).¹ As of these dates, the two tests used a common scoring system (an average of 500 points, with a 100-point standard deviation). For PISA, 30 points is equivalent to one year's worth of learning.

Figure O.3 shows the distribution of test scores. It reveals that students in both developed and developing systems perform well on PISA and TIMSS.

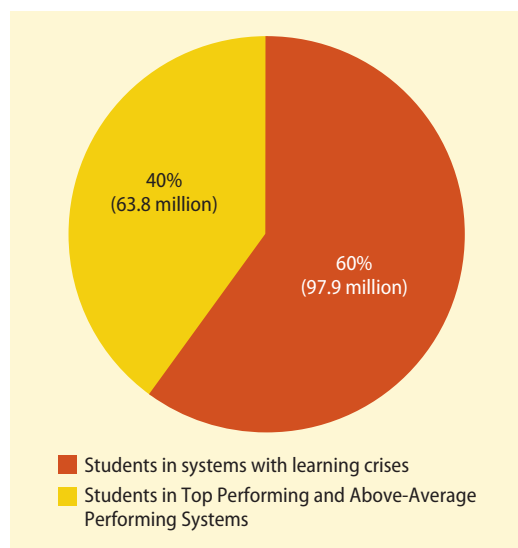
East Asia and Pacific dominates the ranks of top scorers, with 6 of the top 10 and 8 of the top 20 scores since 2000. The Top Performing Systems include seven economies

with an average score above 550 points—equivalent to 1.6 more years of learning than the average OECD member country. These systems enroll 24 million students, or 7 percent of the region's students.

All of the highest scorers are middle- or high-income countries. But some low- and middle-income countries perform well, too. Average performance in Vietnam and in B-S-J-G (China) surpassed OECD member countries (table O.2). These systems enroll about 40 million students, or 12 percent of the region's students.² Their performance is proof of concept that a low- or middle-income country can produce students who learn as much as or more than students from high-income countries.

The average score of students in Below-Average Performing Systems was 106 points lower than that of their low- and middle-income peers in the Above-Average Performing group—a difference equivalent to more than three years of learning. Indonesia, Malaysia, the Philippines, and Thailand form this group. Their 92 million students represent 27 percent of all students in East Asia and Pacific.

FIGURE O.2 Sixty percent of students in East Asia and Pacific are in education systems that are in crisis



Source: Calculations based on a composite constructed average of PISA and TIMSS performance on the nine iterations of these assessments since 2000 (for PISA) and 2003 (for TIMSS).

Note: PISA = Programme for International Student Assessment; TIMSS = Trends in International Mathematics and Science Study.

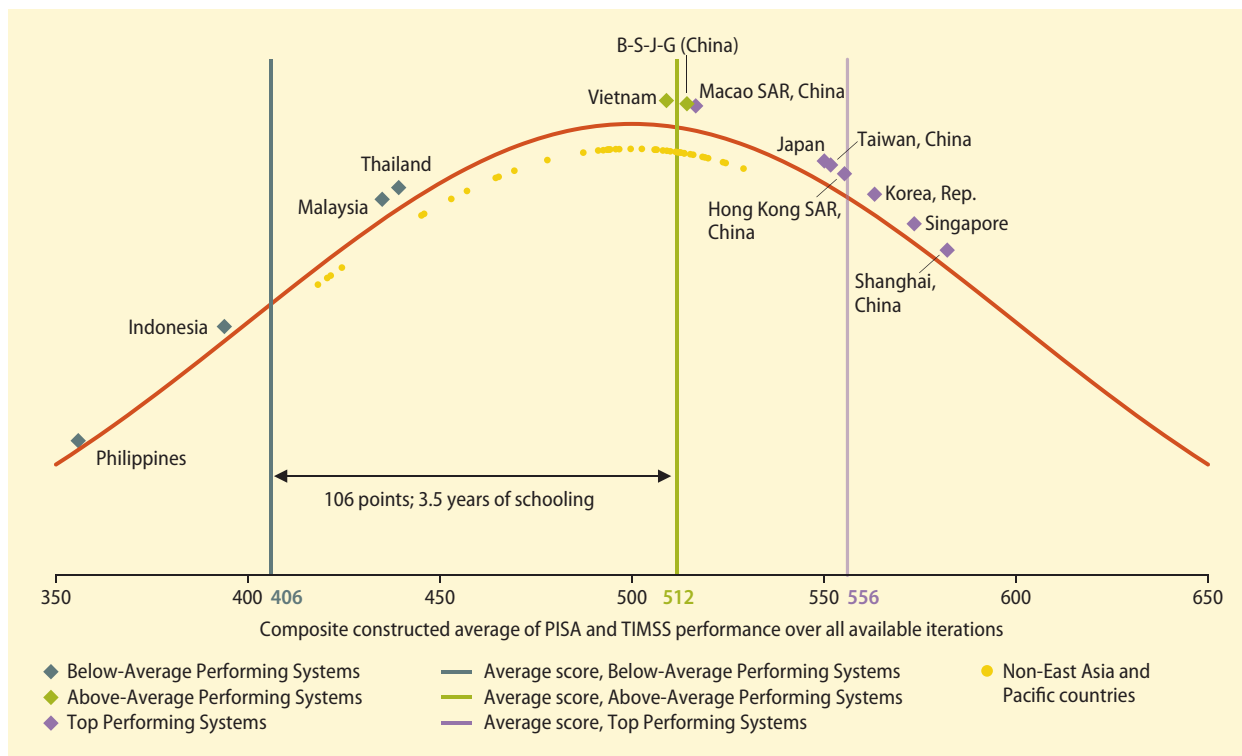
A disproportionate share of students who perform at the highest PISA levels are from East Asia and Pacific

Only 1 of 20 test takers attains the two highest proficiency levels on PISA. Students from East Asia and Pacific represent 34 percent of test takers, but 48 percent of students who reach the two highest levels of proficiency in science and 40 percent of students who do so in math. Vietnam and B-S-J-G (China) combined have slightly fewer students than the United States, but twice as many top math performers (figure O.4).

Learning outcomes in East Asia and Pacific are distributed across income quintiles more evenly than they are in the OECD

Students in every income quintile in Top Performing Systems and Above-Average Performing Systems score better than their

FIGURE O.3 Students in China and Vietnam are among the top performers in developing East Asia and Pacific



Sources: Calculations based on PISA and TIMSS scores on nine assessments since 2000 (for PISA) and 2003 (for TIMSS).
 Note: B-S-J-G (China) = Beijing, Shanghai, Jiangsu, and Guangdong (China); PISA = Programme for International Student Assessment; TIMSS = Trends in International Mathematics and Science Study. Figure shows composite constructed average performance score with mean of 500 points and standard deviation of 100 points. The Philippines has only participated in TIMSS.

TABLE O.2 PISA scores on science in East Asia and Pacific are higher than predicted based on per capita income

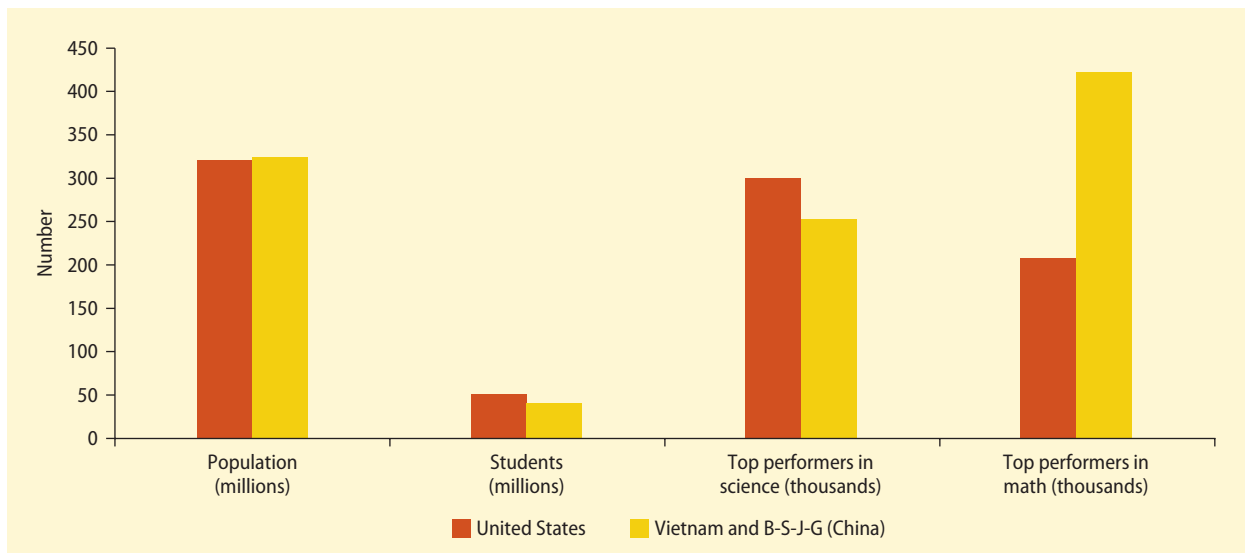
Economy	GDP per capita in 2015 or latest (2011 international dollars)	Mean PISA science score in 2015		Difference between actual and predicted	
		Actual	Prediction based on income	Score	Equivalent years of schooling
Japan	35,804	538	479	59	2.0
Korea, Rep.	34,387	516	477	39	1.3
Singapore	80,192	556	516	40	1.3
B-S-J-G (China)	22,037	518	457	61	2.0
Vietnam	5,668	525	394	131	4.4
Indonesia	10,385	403	422	-19	-0.6
Thailand	15,345	421	440	-19	-0.6
Malaysia	25,308	443	463	-20	-0.7

Source: OECD 2016–17.
 Note: B-S-J-G (China) = Beijing, Shanghai, Jiangsu, and Guangdong (China); GDP = gross domestic product; PISA = Programme for International Student Assessment. The Philippines is not included because the country has not participated in PISA.

counterparts in the OECD in math and science. For Vietnam and B-S-J-G (China), this achievement is remarkable, given their lower incomes and scarcer resources for education.

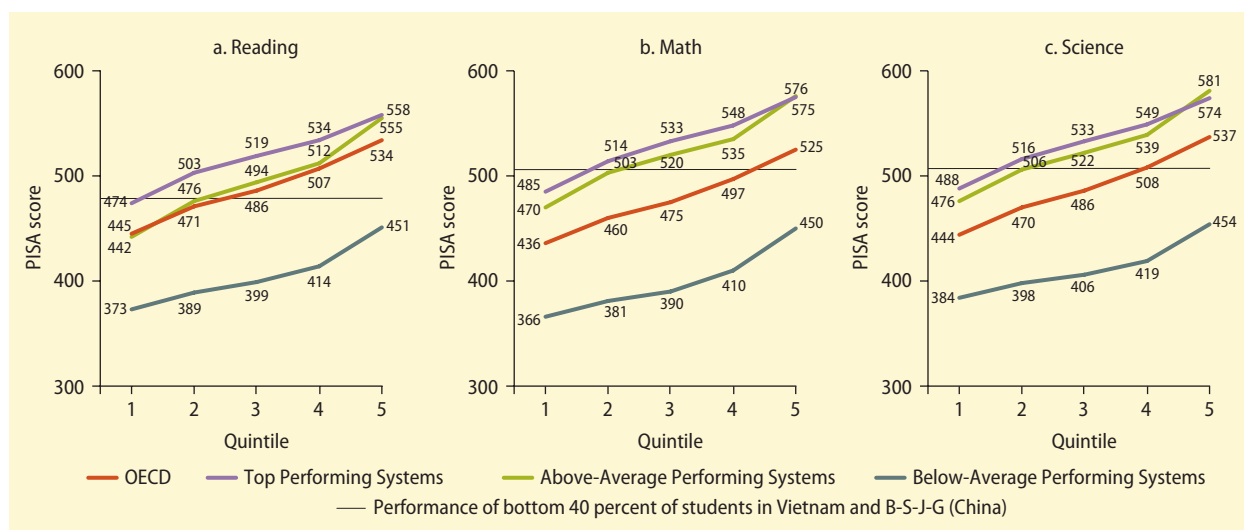
Students from the second-lowest income quintile scored above 500 on the 2015 math and science assessments (figure O.5). These results indicate that, for many students in East Asia

FIGURE O.4 Vietnam and Beijing, Shanghai, Jiangsu, and Guangdong (China) have more top performers than the United States on PISA math assessments



Source: OECD 2016–17.
 Note: B-S-J-G (China) = Beijing, Shanghai, Jiangsu, and Guangdong (China); PISA = Programme for International Student Assessment.

FIGURE O.5 In Vietnam and Beijing, Shanghai, Jiangsu, and Guangdong (China), even poor students learn more than their OECD counterparts



Source: OECD 2016–17.
 Note: The economies included in Top-Performing Systems, Above-Average Performing Systems, and Below-Average Performing Systems are listed in table O.1. OECD = Organisation for Economic Co-operation and Development; PISA = Programme for International Student Assessment.

and Pacific, poverty is not educational destiny. The quality of policies and practices and what happens in school—rather than spending or students’ socioeconomic background—determine how much students learn.

High PISA subscores belie the myth of rote learning

Casual observers and stylized facts have sometimes conspired to attribute the region’s high

scores to overreliance on rote learning and a lack of deep understanding of what is learned. The empirical evidence shows these assertions to be false. The three PISA subscores in math measure the ability to recognize and set up problems, perform mathematical operations, and interpret the meaning and significance of results. Vietnam scored above the OECD average on all three subscores in 2012. These scores indicate mastery of a full range of superior math abilities for complex problems. They are incompatible with rote learning without conceptual understanding.

Roughly 60 percent of students in East Asia and Pacific are in systems facing a learning crisis

The 92 million students in Below-Average Performing Systems have both low scores and low measured levels of learning. Students in the 90th percentile in these countries struggle to score as high as students in the 10th percentile in China and Vietnam. The distribution of scores does not overlap with that of countries in the Top Performing Systems. In the worst cases, scores are little better than would be obtained by random guessing.

Early Grade Reading Assessments indicate serious learning challenges in Emerging Systems

Information on countries that do not participate in international tests can be gleaned from the results of reading assessments conducted in early grades, usually first to third grade. EGRA scores are not comparable across countries, but the number of students who cannot read a single word at a given age provides a general picture of educational performance in the early primary years. In Cambodia, Timor-Leste, and Vanuatu, more than 30 percent of second graders cannot read a single word.

Differences in performance emerge after students enter primary school

PISA performance at age 15 represents the accumulation of high-quality schooling over many years rather than rote learning or test-taking skills. Data from the Young Lives initiative, which closely follows cohorts from birth through secondary school, show that when they start primary school, Vietnamese children have cognitive skills and abilities that are similar to peers in three comparator countries. By third grade, however, Vietnamese students are way ahead of their low- and middle-income peers in math. At ages 10 and 12, the average Vietnamese student performs better than all but the top students in Ethiopia, India, and Peru.

Continuous improvement of performance has accompanied “progressive universalism”

A recurring theme among top performers is continuous improvement, a trend that is evident from internationally comparable standardized tests. Altinok, Diebolt, and Demeulemeester (2014) calculate long-term trends on quality of schooling for 24 mostly high-income economies with sufficient data. The three highest average annual growth rates of achievement belong to East Asian economies: Singapore (0.98 percent); the Republic of Korea (0.90 percent); and Hong Kong SAR, China (0.55 percent). All of these rates are three to six times the average rate of improvement (0.165 percent). Japan improved at about the average rate. Thailand’s scores declined at an average annual rate of 0.26 percent. Box O.4 details the region’s successes in sustaining economic growth and in improving educational outcomes.

BOX 0.4 Education and the extraordinary record of growth in East Asia and Pacific

Continuous robust economic growth has made East Asia and Pacific a high- and middle-income region. Since 1960, East Asia and Pacific has grown faster and sustained high growth longer than any other world region (figure BO.4.1). Progress has been remarkable, especially among the region’s low- and middle-income economies, which grew at more than twice the world average in 1960–2015 (7.2 vs. 3.5 percent). Even excluding China’s spectacular growth, low- and middle-income countries in East Asia and Pacific grew more than 2 percentage points faster than the world average for nearly half a century. In 1970–2010, growth among low- and middle-income countries in East Asia and Pacific was almost twice the world average (5.9 vs. 3.1 percent). No other low- or middle-income region comes close to matching this record of steady and rapid long-term growth.

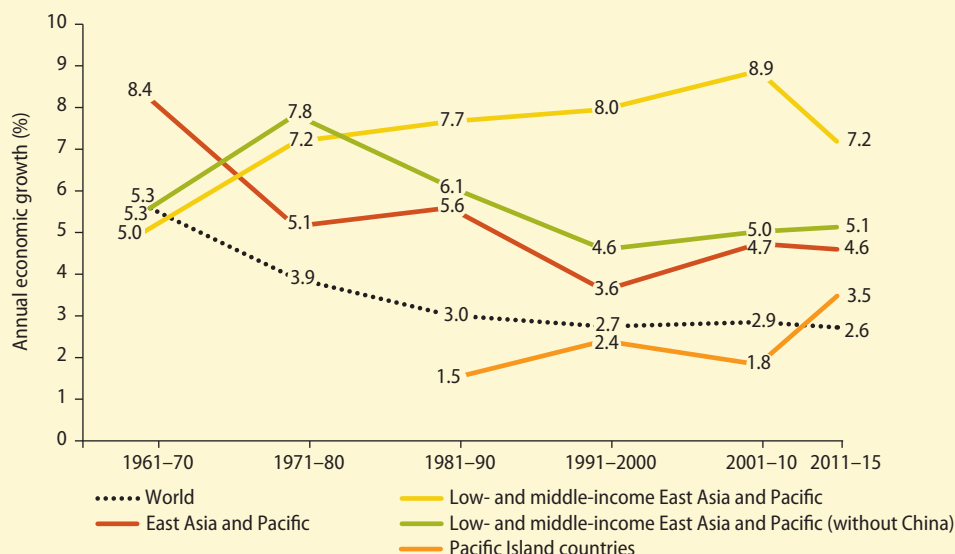
In some cases, growth transformed countries from poor agricultural societies to modern knowledge economies. Their success deeply shaped the core advice from economists and policy makers on how to achieve prosperity. Nine of the 13 economies studied by the Commission on Equitable and Sustainable Growth (the Growth Commission) were in East

Asia and Pacific. This stellar growth raised per capita income by a factor of at least 10. The East Asia and Pacific region’s economy in 2015 was 10 times larger than it would have been if it had grown at average world rates since 1960. Today, these economies account for 30 percent of global output (up from just 7 percent in 1990).

As recently as 1991, two-thirds of East Asians worked in agriculture, most as low-income smallholders; by 2012, that figure had dropped to one-third. Rising formal employment, wages, and productivity have made the “typical East Asian” an educated urban dweller rather than a farmer with little schooling.

Countries pursued a broad set of complementary policies to accelerate growth, with education at the forefront. To sustain high growth rates, governments insulated technocratic policy makers from politics and allowed a set of policies to be consistently pursued. Policy makers tried to reduce inequality, first by boosting rural incomes and then by promoting educational opportunity and outcomes. Policies also improved labor force abilities and skills, mostly through increased schooling, and made education

FIGURE BO.4.1 Growth in East Asia and Pacific has exceeded global averages for decades, 1961–2015



Source: World Development Indicators (World Bank, various years).

Note: Figures are based on real gross domestic product (GDP) in U.S. dollars. Base year is 2010. Low- and middle-income East Asia and Pacific includes all countries and economies in the region except Japan, the Republic of Korea, and Singapore. Pacific Island countries include Fiji, Kiribati, the Marshall Islands, the Federated States of Micronesia, Nauru, Palau, Papua New Guinea, Samoa, the Solomon Islands, Tonga, Tuvalu, and Vanuatu.

box continues next page

BOX 0.4 Education and the extraordinary record of growth in East Asia and Pacific (continued)

broadly relevant to current and expected future economic challenges. Governments also sequenced reforms and took action for the next phase before the benefits of the current phase were exhausted.

Some countries went from rural agricultural societies to high-tech knowledge economies. Japan, the Republic of Korea, and Singapore set their education policy goals within a larger framework that sought to eliminate technology gaps with the world's most advanced countries. Their goal was to create domestic capacity to produce knowledge and technology that was new to the world. Long-term increases in productivity depend on continuously improving and applying new technologies, which in turn increases demand for more highly skilled workers. Once countries imparted basic skills to one cohort of workers and put them successfully to work, they raised the skills bar for the next cohort.

Education raised productivity among farmers and promoted structural transformation. Investments in education paid off at all education and income levels, not just for people who worked in high-tech jobs and industries. Countries pursued policies in agriculture to create environments for the poorest and most vulnerable to lift their income by raising their productivity. Rural dwellers with education—even when limited to a few years of primary school—consistently outproduced and outearned their less educated neighbors.

Poverty rates dropped substantially as jobs and income-earning opportunities grew. Growth has been accompanied by unprecedented drops in poverty rates and the near elimination of extreme poverty in many countries. In 1981, as many as four of five people in East Asia and Pacific lived on less than the extreme poverty threshold of US\$1.90 a day purchasing power parity (PPP). In 2017, fewer than 2 percent of people lived in extreme poverty, and three of five were economically secure. Still, gains are fragile, and further progress is needed to consolidate them. Even though national poverty rates have declined sharply, many people risk slipping back into poverty.

Educational attainment increased dramatically to converge with the global average. In 1950, the average adult in East Asia and Pacific had only 1.3 years of schooling—less than half the prevailing world average of 2.9 years. By 2010, average attainment was more than six times higher than it had been and converged on the world average, which had risen to eight

years. This increase in average schooling occurred as the population more than doubled.

Trends in attainment continue to climb, with more and more students completing secondary school and proceeding to tertiary studies. Schools today provide twice as many students with more than six times as much instruction. For 40 percent of the region's students, this expansion was accompanied by high levels of learning. For the remaining 60 percent, the systems in which they study still struggle to ensure that more schooling equals more learning.

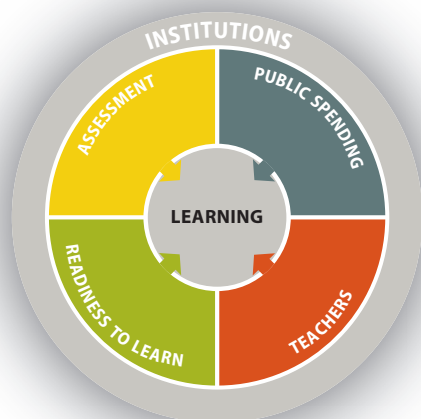
Demand for educated workers has increased more rapidly than supply. Income and the ability to earn it are the keys to poverty reduction. Nowhere has this been truer than in East Asia and Pacific over the past several decades. Much of the value of education lies in its ability to make workers more productive, raising their incomes. As educated workers become more numerous and common, their wages will fall if all other things remain equal. But all other things have not remained equal. Amid the massive increases in educational attainment, the demand for educated workers has risen more rapidly than the supply. Wage premiums have remained stable or risen, even though many more educated workers are seeking work.

The legacy of equitable growth is now under threat. Since 1990, Gini coefficients and other measures of inequality have shown a growing gap between rich and poor. In countries such as China and Indonesia, distorted access to high-quality education is driving inequality. Additional efforts to make high-quality education available to everyone will help to stem and reverse rising inequality.

Policies of “progressive universalism” were key to ensuring equitable distribution of educational opportunities at the outset. If investments in education do not keep pace with demand, technological change promotes inequality, as income accrues to a small group of highly skilled workers. Economies were able to reduce inequality while they grew rapidly partly because of the equitable distribution of basic educational opportunities. Policies of progressive universalism—focusing on primary and lower-secondary education for all—were a key means of ensuring that skills grew in response to increased demand.

Sources: Barro and Lee 2013; Dollar and Kraay 2002; World Bank 2014; World Bank 2018a.

Align institutions to ensure basic conditions for learning



The experience of high-performing education systems in East Asia and Pacific underscores the critical role of institutional alignment and sound administrative systems at a variety of levels to implement policies and reforms that ultimately raise learning outcomes in schools. Institutional alignment is a critical component of ensuring that policies across domains are synchronized and then implemented, adjusted, evaluated, and revised to foster continuous improvement. From ensuring safe, adequate physical space for students to developing curricula with a framework for learning, institutional alignment can be a key determinant of how much the ideas that underpin policies are translated into reality for teachers and students in classrooms. Students who lack desks or textbooks or teachers whose training is unrelated to the demands of delivering the curriculum cannot reasonably be expected to engage in meaningful classroom interactions that produce learning.

Political support for investment in education should be anchored on jobs and social mobility

High-performing economies in East Asia and Pacific had great success in creating industries that offered employment at scale and thus

were able to accelerate the structural transformation of their economies, but they also had few social safety nets. Secure employment in the modern industrial sector served as both a ladder for social mobility and a cushion against the lack of government-provided social safety nets. Policies offered a vision in which parents saw their children securing jobs after completing increasing years of school. Initial successes in employment of graduates in these newly created industries reinforced both the demand for schooling and the value parents placed on achievement for their children.

Sound administrative systems start by putting in place the basic conditions for learning

Research shows a positive and statistically significant relationship between basic inputs such as blackboards, libraries, and school infrastructure (including walls, ceilings, and roofs) and learning outcomes.

Experience in the region indicates that a single national curriculum was critical to the success of the Top Performing Systems. These curricula generally focused on a clear and unambiguous set of learning goals. Unified curricula were part of the trend of simplifying the educational endeavor, especially when capacity was low, allowing these systems to focus on a narrower set of goals.

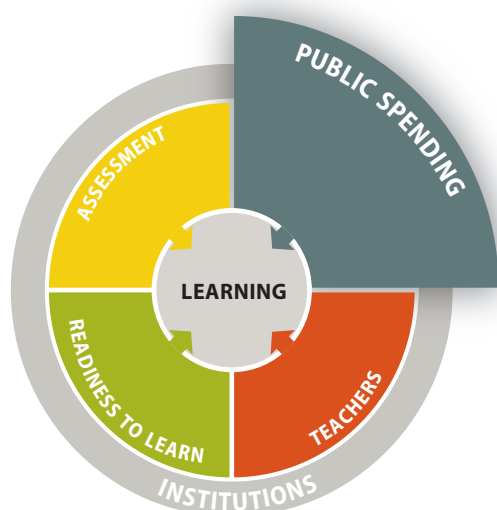
Just as governments exercised firm control over the curriculum and dictated qualification standards for teachers, many mandated a single set of textbooks, which some experts believe helps to ensure that the prescribed curriculum is implemented across the system. This approach better fulfills the promise of equity and quality in education when teacher competency is low and the capacity to train teachers is limited.

Strong institutions allowed systems to expand access and improve quality

Korea and Singapore established goals for compulsory education in the 1950s and 1960s, respectively. They took no more than five years to achieve universal primary education.

For Korea, evidence of progressive universalism is apparent in its sequential expansion of first primary and then junior-secondary school. China and Vietnam launched similar goals almost a decade apart and fulfilled them in 2000. Public spending signified the state's desire to ensure that basic education was provided broadly and was high quality.

Concentrate effective, equity-minded public spending on basic education



Across the region, countries that spent educational resources effectively concentrated on three key tasks: prioritizing basic education, managing essential inputs, and spending to promote equity. They also recognized that the quality of spending, rather than the quantity, has the greatest impact on learning. They therefore avoided setting artificial or arbitrary targets for allocating a certain share of GDP or public expenditure to education.

Public spending on education does not correlate with learning

Public spending on education as a share of GDP varies widely, worldwide and within East Asia and Pacific. No clear patterns

emerge among the four groups of countries, although historically the region's high-performing countries spent a large share of government resources on basic education. Public spending per student continued to grow in real terms, even as it moderated as a share of GDP and government spending.

Solid initial public investment among high-performing economies ensured strong foundations for education systems later. Singapore spent almost a third of its national budget on education in 1952. This share declined steadily as income rose. It now stands at just over a fifth. In Korea, education accounted for 14.3 percent of the total budget in 1963; spending grew to 20.4 percent by 2000 before falling to 12.8 percent in 2013 (OECD 2016b; Wong 2017). In Japan, 14.5 percent of government expenditure went to education in 1955. Spending stayed at that level for much of the next 30 years, before declining to 8.1–9.3 percent in 2009–13, one of the lowest rates among OECD countries (OECD 2016a; Wong 2017).

High-performing economies prioritized public spending on basic education

High-performing economies in East Asia and Pacific sequenced their investment focus from basic to tertiary education over time. Jimenez, Nguyen, and Patrinos (2012) argue that countries that aim to build strong human capital for economic growth should prioritize spending public resources on basic education to deliver good-quality and universally available education at that level before devoting more spending to higher levels of education.

As the economies of the Top Performing Systems grew and demand for highly skilled workers rose, they directed increasing shares of education spending to higher levels of education. Their central control of the education budget enabled them to ensure sustained investments and often provided direct input into how resources were spent. This influence helped to keep schools and districts accountable for results.

Historically, most wealthier countries used to allocate more to lower levels of education. However, Vietnam still prioritizes public investment in primary and secondary education more than the Top Performing Systems do. China also prioritizes investment in primary, vocational, and preschool education (OECD 2016c).

Even as they increased spending on higher levels of education, high-performing economies continued raising per student spending on primary and secondary education in absolute terms to enhance the quality of education at those levels. Korea and Singapore doubled real spending per student on basic education, and absolute spending per student rose in Japan between 2000 and 2013. In Japan and Korea—where tertiary education is largely privately financed—public per student spending on tertiary education has never exceeded spending for basic education.

High performers managed essential inputs efficiently

High-performing East Asia and Pacific systems manage two essential financial inputs efficiently: spending on teachers and spending on school infrastructure. They allocate enough resources to attract and retain the best staff, with salaries and benefits that appropriately reward experienced teachers with proven classroom performance.

Singapore adjusts salaries for teachers frequently, offers other compensation, and links bonuses to performance appraisals. In Korea, teachers with more than 15 years of experience outearn their peers in many private sector jobs. In both Japan and Korea, teachers with more than 15 years of experience (and whose performance has been routinely assessed) enjoy salaries that are, respectively, 125 and 140 percent of per capita GDP—far higher than the OECD average of 107 percent. The high reward for experience is a likely reason for the extremely low annual teacher attrition rates in high-performing economies in East Asia

and Pacific—less than 3 percent on average, against 6 percent in most Western European countries and 8 percent in the United States (Wong 2017).

Teachers' salaries correlate with student performance in economies with per capita GDP above US\$20,000 a year. Vietnam has been a much better performer in PISA than Thailand, where teachers are better paid than in Vietnam. In Indonesia, to meet the 2002 constitutional mandate to allocate 20 percent of the government budget to education, teacher salaries increased sharply over the last decade, but without observable gains in learning outcomes (World Bank 2013). In Malaysia, teachers earn more than twice as much as GDP per capita, but student performance is worse than in Thailand, where teachers earn 25 percent more than GDP per capita.

Class sizes in high-performing systems tend to be larger than the global average, but student-teacher ratios are not higher than the corresponding OECD average. Countries that lowered student-teacher ratios well below OECD averages did not enjoy improved student performance. Since 2000, both Indonesia and Malaysia have reduced their ratios by more than 50 percent—to below the OECD average of 16 students per teacher in secondary school—without improving learning outcomes.

A lack of basic school facilities remains a challenge throughout East Asia and Pacific, except among its top performers. Reasons for poor school conditions may include insufficient public spending on school infrastructure, limited access to water and electricity in rural areas, and difficult and costly construction conditions. Many schools in Indonesia and the Philippines do not meet basic standards for sanitation facilities, desks, chairs, or sufficient space per student.³ In the Lao People's Democratic Republic, only 32 percent of schools have handwashing facilities and only 29 percent have working electricity (light) in classrooms (Demas, Khan, and Arcia, forthcoming). Rural schools in Thailand that serve the most disadvantaged

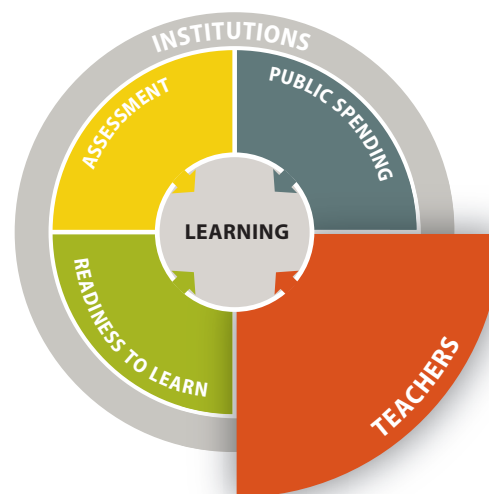
students fall dramatically short of having the adequate facilities and conditions that urban schools have (World Bank 2015).

Top Performing Systems spent to promote equity

In the East Asia and Pacific region's Top Performing Systems, the central government plays a key role in equalizing education funding across the country. In Japan, the central government subsidizes prefectures (equivalent to states or provinces) to equalize public resources. For nine-year compulsory education, prefectures fund two-thirds of the cost of teachers' salaries, and the central government subsidizes the remaining third, to help to equalize the quality of teachers across municipalities and schools. Disadvantaged schools have the same share of qualified teachers as advantaged schools and more teachers per student. At the upper-secondary level, students from low-income families are exempt from tuition fees for public schools; they receive financial support to pay tuition fees for private schools and scholarships to cover financial obligations other than tuition costs, such as school trips and textbooks. In Singapore, the government provides merit-based scholarships and other financial assistance for all students as well as tuition subsidies for students from low- and middle-income families to attend independent schools (National Center on Education and the Economy, n.d.).

Of the Above-Average Performing Systems, Vietnam allocates more spending per capita to geographically disadvantaged provinces and districts and pays teachers serving in disadvantaged areas higher salaries than teachers in cities, through various types of allowances. In China, reducing inequalities in education is a government priority. The government has gradually integrated the compulsory education funding guarantee in rural areas. By 2010, 97 percent of the total educational investment in rural compulsory education came from the government budget (OECD 2016c).

Select and support teachers throughout their careers to allow them to focus on the classroom



At the heart of high-performing education systems is coherence in the recruitment, development, and support of teachers. Policies and practices start from the premise that teaching is a difficult but learnable skill. Recruitment and selection of talented individuals are considered the beginning of a process in which new teachers learn their craft. Observation, collaboration, and feedback are integral parts of career-long professional development centered on acquiring and refining pedagogical and content knowledge to improve continuously the quality of instruction. Career advancement depends, among other things, on evaluation of teaching performance. Career paths allow teachers to be promoted and increase their salaries while remaining in the classroom. Curricula and textbooks align in ways that enhance a teacher's ability to deliver high-quality instruction.

Top Performing Systems are more selective in recruiting and retaining teachers

As universal access to basic education has become the norm, low- and middle-income

countries have had to increase massively the size of their school systems and the number of teachers. Despite the need for more teachers, effective systems raised selectivity, making salaries and working conditions attractive, so that talented individuals would apply. Candidates are usually screened and filtered both when selected into preservice teacher training programs and when hired.

In Japan, only 14 percent of all applicants to education programs are accepted, and only about 30–40 percent of graduates are hired (Center on International Education and Benchmarking, n.d.). As a result, newly hired teachers represent only 5 percent of the applicant pool. In Singapore, the government recruits the top third of graduates of universities and polytechnic schools to become teachers (Tan and Wong 2007). In Korea, teacher education programs admit only the top 10 percent of high school graduates, and only 1 in 20 passes the arduous exams to become a teacher (Ferrerias, Kessel, and Kim 2015). In Taiwan, China, teacher education programs are highly competitive. Typically, only the top third of applicants ranked by performance on high school and university entrance exams are selected.

Low pay and delayed or irregular payments to teachers make teaching less attractive elsewhere in East Asia and Pacific, discouraging talented applicants. In the Philippines, monthly pay for a secondary teacher is less than US\$400 (Ager 2014). In Lao PDR, preliminary results of a World Bank survey find that 53 percent of teachers report delays in receiving their salary at least once a year (Demas, Khan, and Arcia, forthcoming).

Indonesia took steps to raise the quality of teachers by doubling salaries as part of its 2005 teacher reform. The higher salaries led to a fourfold increase in enrollment in teacher education programs and increased the average national exam scores of entrants (de Ree and others 2017). Indonesia did not systematically link increased pay to observed teaching performance, however, or put in place other elements of successful teacher development.

Teachers regularly collaborate with others and receive feedback on their performance

Teaching is a “closed-door” profession in many OECD countries, where 40 percent of teachers never teach alongside another teacher, observe another teacher, or receive feedback. Top Performing Systems—and increasingly Above-Average Performing Systems—treat the classroom as a public space and make teacher observation and feedback routine quality-promotion activities. Special attention to observation is part of teachers’ induction into the profession—the time when it is most critical to refine, improve, or correct teaching practices.

Japan’s induction period is designed around observation, with many demonstration lessons conducted in front of panels for evaluation and feedback. Shanghai schools have lesson observation rooms where lessons can be videotaped and demonstrations conducted with an audience.

Collaboration and teamwork are required of teachers from induction onward. In Shanghai, teachers are not promoted unless they can prove that they work collaboratively; mentors are not promoted unless they can show that their mentees improve. Teachers are given ample time for these collaborative activities. They teach only 10–12 hours a week, less than half the U.S. average of 27 hours (Liang, Kidwai, and Zhang 2016).

Surveys of teacher professionalism indicate that East Asia and Pacific economies score high on collaborative peer networks (OECD 2014). On the Teaching and Learning International Survey (TALIS) teacher professionalism index of 37 education systems, 4 of 5 Asian participants scored near the top in 2013. The peer network index is based on opportunities for the exchange of information and support needed to maintain high standards of teaching. It includes participating in induction, mentoring, networking with other teachers, and receiving feedback from direct observations.

Top Performing Systems establish clear learning goals and provide uncluttered texts

Countries with fewer content standards and topics in their textbooks tend to have higher international assessment scores. The United States covers all 79 of the TIMSS science topics in its content standards. In contrast, Korea covers only 8, Japan covers 19, and Hong Kong SAR, China, covers 22. Textbooks cover 78 topics in the United States, 37 in Korea, and 17 in Japan (Liang, Kidwai, and Zhang 2016). Having fewer topics suggests a narrower focus and deeper study of topics, which could lead to much deeper understanding.

A streamlined curriculum allows for uncluttered, focused textbooks. Chinese textbooks are typical for the region. They tend to be thin, narrowly focused on specific topics, and significantly more demanding than textbooks in the United Kingdom (Qin 2017). Normal practice is for students to cover all textbook content, making study more efficient and allowing students to master topics. The mastery approach is believed to have been important in propelling students in Hong Kong SAR, China; Shanghai; and Singapore to the top of the PISA rankings (Qin 2017).

Teachers have adequate time for lesson preparation

Time spent in class is only one part of a teacher's job. Teachers also prepare lessons, grade homework, write tests, and provide after-hours support to students. A large proportion of time spent in class provides less opportunity for other activities.

In Top Performing Systems, a surprisingly small proportion of total working hours is spent in class. In Japan, for example, teachers spend only 18 hours a week teaching on average, although they have the highest total working hours (53 hours a week). With nearly two-thirds of their working time spent outside of class, they spend much more time on lesson preparation and other quality-enhancing

activities to make in-class time much more effective.

Teachers have adequate time for professional development, which centers on improving instructional practice

Case study research on successful education systems (such as Ontario, Canada; Finland; Japan; Korea; and Singapore) suggests that high-performing systems devote considerable time to activities related to instructional improvement, especially analysis of instructional practice (Darling-Hammond 2010; Darling-Hammond and Rothman 2011; Levin 2008). These systems also tend to devote a smaller share of teachers' time to contact with students and more time to on-site (in-service) professional development and research on the effectiveness of various teaching strategies. In Japan, for example, teachers devote about 40 percent of their working time to these types of activities; in Ontario, they spend 30 percent of their time on them (Darling-Hammond and Rothman 2011).

Centering teacher professional development on the analysis of instructional practice is most effective when embedded in a support system that also incorporates active learning and on-the-job collaboration, uses models of effective practice, provides coaching and expert support, offers opportunities for feedback and reflection, and is of sustained duration.

These principles inform teacher professional development in Top and Above-Average Performing Systems in East Asia and Pacific more than they do in other countries in the region or the rest of the world. This type of integrated support is at its apex in Shanghai, where "teaching-research groups" promote continuous improvement of instructional practice. These groups form a professional development network consisting of same-subject teachers at the school, district, and provincial levels. In larger schools, the groups are often divided by grade. Each group

has a leader, who is responsible for organizing activities and introducing novice teachers to the learning community. The “teacher-as-researcher” model builds on Japan’s “lesson study” approach as a vehicle to improve instructional practice.

Career paths allow experienced teachers to stay in the classroom

Efforts to develop experienced, effective teachers pay dividends if those teachers remain in the profession, delivering instruction and mentoring peers. High-performing East Asia and Pacific economies have developed career paths that allow teachers to advance in their careers and remain as classroom teachers. In other countries, promotion, advancement, and higher pay are likely to come through moving to administrative positions and leaving the classroom. Japan and Singapore have separate career tracks for teachers, so that the best do not leave the classroom. In Shanghai, teachers have opportunities to advance professionally throughout their teaching career through a five-level ranking system. Under

this system, schools regularly evaluate teachers for promotion to a higher rank, accompanied by a salary increase, based on their years of service and teaching performance. This policy helps to ensure maximum benefit from the investment in teachers’ career-long professional development.

Coherent policies and practices make teachers’ jobs easier

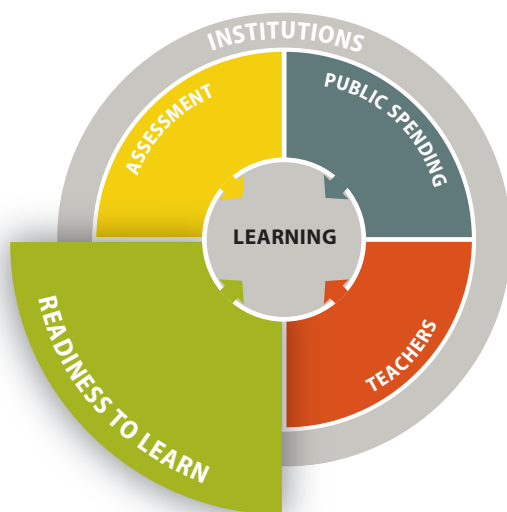
Policies and practices that center on promoting improved instruction help to develop effective teachers (table O.3). Selectivity in recruitment is followed by induction periods in which observation, collaboration, and feedback are routine. Systems promote professional collaboration around continuous improvement and require observation and positive evaluation of teaching practice for career advancement. Curricular alignment, uncluttered teaching materials, and adequate preparation time allow teachers to focus on execution in the classroom. Specific career paths recognize excellence in teaching and reward it with increased pay and prestige,

TABLE O.3 A coherent system covers all aspects of the teacher career cycle

Goal	Instrument
Attraction and selectivity	<ul style="list-style-type: none"> • Good pay • Effective filtering • Mechanisms to increase the attractiveness of teaching as a profession
Good preservice	<ul style="list-style-type: none"> • Government control and quality assurance • Filtering at various stages
Smooth induction	<ul style="list-style-type: none"> • Open doors • Mentoring and extensive support • Time and space for learning
Continuous improvement	<ul style="list-style-type: none"> • Teacher support networks • Teamwork and collaboration • Lesson study • Culture of continuous improvement
Career development	<ul style="list-style-type: none"> • Promotion policy • Multiple career pathways, including pathways that allow promotion while leaving good teachers in the classroom
Making teaching easier	<ul style="list-style-type: none"> • System coherence • Aligned, streamlined curriculum and textbooks • Adequate nonclass time

while encouraging the best and most experienced teachers to remain in the profession. A professional, supported teacher can work well when she or he knows precisely what parts of the curriculum students know and where they are struggling.

Ensure that children are ready to learn in school



Intellectual, social, and emotional development early in life all affect how well children perform academically in primary school and get along with their peers and teachers. Governments in high-performing school systems help to support children’s readiness to learn.

Parents are also critical to learning readiness. They are their children’s first teachers and supporters. They provide proper nutrition, health care, and a supportive, nurturing environment. Parents can support their children’s readiness for primary school by sending them to preprimary programs, providing emotional support, and creating a stimulating learning environment at home.

Investments in readiness to learn appear to generate lasting returns

High-performing systems in the region appear to have focused on children’s physical and cognitive development, assessed and improved the quality of the services they

offer, and coordinated across actors to deliver needed services. Their efforts to universalize preschool progressively appear to have borne fruit. Throughout the region, children who had access to early childhood education and development services posted higher PISA test scores than children who had no such access—even after controlling for socioeconomic differences (OECD 2013–14).

Nutritional challenges will impede efforts to improve readiness to learn

Efforts to improve readiness in East Asia and Pacific are beset by nutritional challenges in several countries. In a third of the region’s countries, stunting remains highly prevalent, despite decades of improvement (figure O.6). Evidence from many countries shows that stimulation of a child is consistently and significantly beneficial to child development and school readiness. Inadequate nutrition undermines efforts to provide stimulation.

Gaps in readiness to learn manifest early and can linger if unaddressed

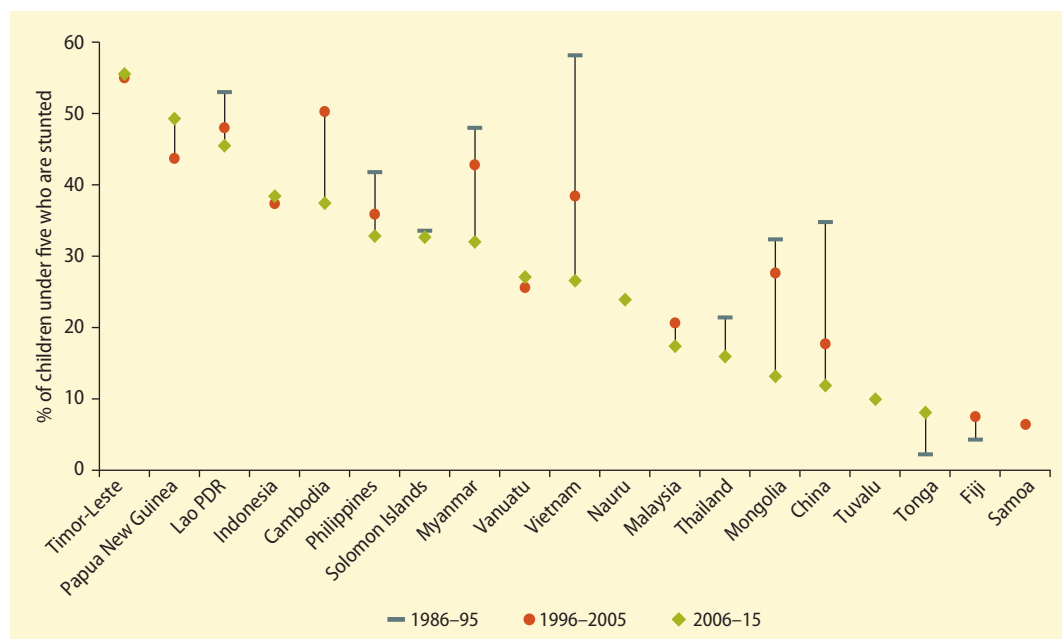
Gaps in children’s readiness to learn manifest themselves early. If unaddressed, they can affect children’s cognitive and noncognitive skills over the long term.

There are large cross-country differences in young children’s ability to read, as measured by EGRA. In every country in the Emerging Systems group, the majority of students do not meet national standards—and many cannot read any words at all. Even in countries where “zero-word” rates are relatively low, reading fluency is not very high and a large portion of students are still struggling with basic subtasks.

EGRA data cover different languages, making comparability a challenge, and they do not cover all students in some countries. But the overall message is still clear. In many systems throughout the region, most children arrive at school unready to learn. By second grade, too many of these children are still unable to read a single word.

If students are not ready to “read to learn” going into early grades of primary school,

FIGURE 0.6 Stunting remains prevalent in many countries in East Asia and Pacific, despite decades of improvement, 1986–2015



Sources: Estimates by the World Health Organization, United Nations Children's Fund, and the World Bank.

there is little chance that they will attain a high level of functional literacy by the time they complete primary school. When examined alongside EGRA data, PISA results suggest that the countries with low early reading ability also have low functional literacy (conceptualized as the inability to comprehend the main message in grade-appropriate texts in late primary school). If students do not learn to read fluently in the early grades, there is little hope that they will develop the skills to succeed on tests like PISA or, more important, in a professional workplace.

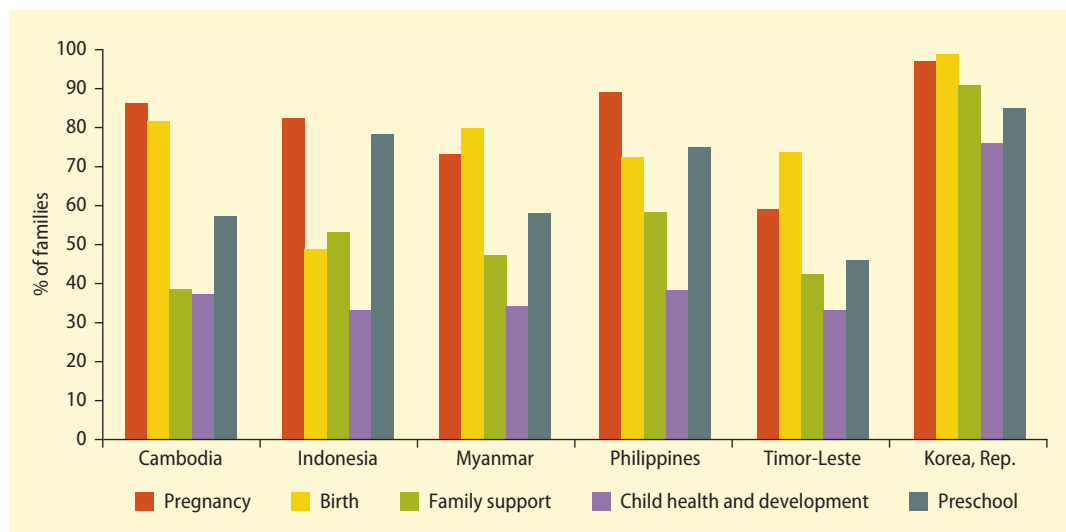
Low- and middle-income countries in the region lack key packages of services

Despite growing evidence of the efficacy of early childhood education and development programs, some education systems still do not deliver key packages of services. Governments in parts of the region with Below-Average Performing or Emerging Systems are supporting readiness to learn in a variety of ways, but disparities in coverage across five key packages are wide (figure O.7).

Most countries provide broad service coverage during pregnancy and birth, but there is a large drop-off in coverage rates for services for families and children before preschool age. Coverage of services for family support and for child health and development tends to be low even in countries where preschool coverage rates are high. In contrast, coverage of all of these service packages is high in Korea.

Just how important are interventions aimed at parents? Research from across the globe, including East Asia and Pacific, suggests that both parenting practices and children's participation in preschool services are very important for children's development. Both have the potential to increase young children's exposure to developmental essentials such as opportunities for stimulating play, rich language experiences, and practice in developing executive function skills.

The stimulation young children receive at home is often a foundation for the formal stimulation they receive in preschools, yet many new parents lack the information and tools they need to enrich their children.

FIGURE O.7 Families do not have consistent service coverage between pregnancy and preschool

Sources: Data from Demographic and Health Surveys. Preschool attendance data were supplemented by the World Bank EdStats database (World Bank, various years).

Note: As described in Denboba and others (2014), *pregnancy* includes at least four care visits, iron supplementation, and diet counseling during pregnancy. *Birth* includes doctor or nurse present at delivery and breastfeeding. *Family support* includes mother having completed at least primary education, last birth interval greater than two years and last pregnancy desired, at least three types of stimulating activities at home, health care facility not too far and visit within 12 months, vitamin A and iron supplementation in last six months, and safe water source and improved sanitation. *Child health and development* includes at least three types of food besides breast milk from six months on; zinc supplement in case of diarrhea; children with weight, height, and height-weight ratio less than two standard deviations below the mean; and access to deworming medicine. *Preschool* measures enrollment in preprimary education. No data were available on non-breast milk nutrition for the Philippines. Only Cambodia had information on the provision of diet counseling during pregnancy and availability of deworming medicine.

Given proper support, parents can help to improve their children's basic literacy.

The lack of key service packages leads to gaps in outcomes. For instance, substantial gaps exist between the ability of children from poor and wealthy families to perform basic functions, such as counting from 1 to 10. These gaps are also apparent in the use of preschool services, with a gap of 65 percentage points in Lao PDR and 54 percentage points in Mongolia. Gaps are similar in access to high-quality care at home. In Cambodia, the gap in access to preschools by the richest and poorest quintiles is 31 percentage points, and the gap in access to high-quality care is 24 percentage points.

The costs of inaction during the early years are high—yet, action is affordable

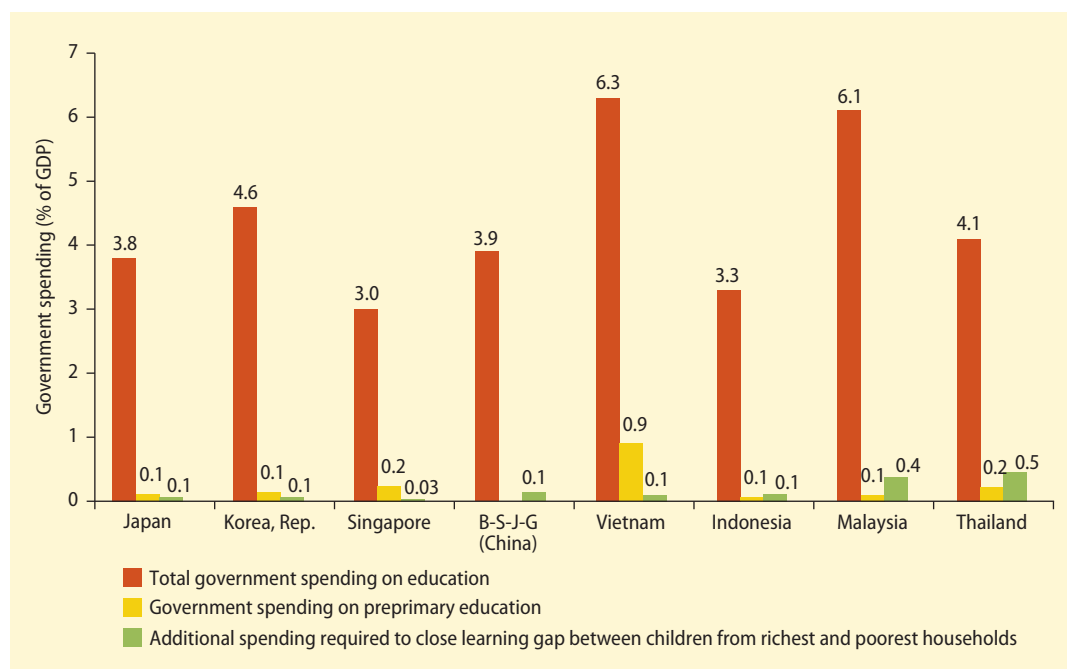
The social and economic costs of inaction during the early years are high. Most governments in the region can afford to close gaps

in achievement between children from the top and bottom wealth quintiles (figure O.8). Closing wealth gaps in access to preschools would cost just a small fraction of total education spending; in most countries, it would cost only a small fraction of spending on preprimary education. Estimates for a few countries—particularly Indonesia, Malaysia, and Thailand—are larger.

Tested and proven solutions exist

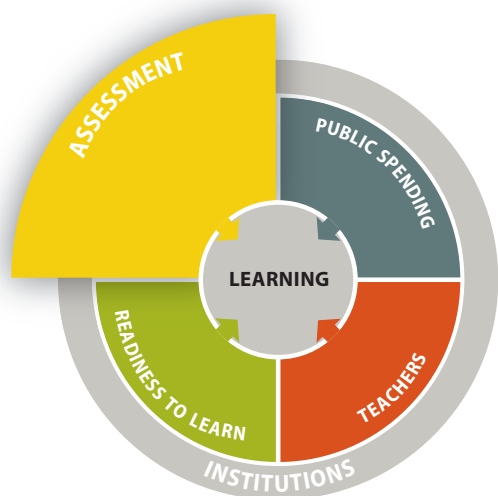
Merely increasing the supply of services focused on children's physical and cognitive development is not the answer. Countries need to assess and improve the quality of these services and coordinate their delivery across actors, if they are to reap the full benefits. A host of proven solutions exists, including center-based community-managed activities that focus on play as learning, home-based programs, reading interventions, and programs that engage parents.

FIGURE 0.8 Closing the achievement gap between socioeconomic groups is affordable



Sources: Authors' calculations based on data from PISA 2015 (OECD 2015), UIS, and World Bank and Government of Vietnam 2017.
 Note: No data available for preprimary spending by B-S-J-G (China). B-S-J-G (China) = Beijing, Shanghai, Jiangsu, and Guangdong (China).

Assess students to diagnose issues and inform instruction



A systemic approach to assessment drives high-quality learning outcomes in the classroom. Efforts to assess student learning in the Top Performing Systems have

been integrated with specific ways of taking action—linked closely with policies and practices relating to teachers, students, and curricula. The mix of assessments varies across countries, but all Top Performing Systems have well-defined ways of feeding the information on student learning outcomes gained from such assessments back into the system to drive quality. At the classroom level, good practice involves training teachers to use such assessments and to incorporate classroom assessment into curricula. At the school level, it involves informing principals' decisions and educational strategies. And at the system level, it involves using assessment data to create a broad commitment to quality and spur policy decisions.

High-stakes exams can be useful—but they can have undesirable effects

Experience in high-performing East Asia and Pacific economies shows the value of

meritocratic, standardized selection exams when coupled with good teachers, a strategic vision, and labor markets that value productive workers. For decades, these exams were an integral part of education strategies and were used to allocate limited learning opportunities in Hong Kong SAR, China; Japan; Korea; Singapore; and Taiwan, China (Wong 2017). Exams played a central role in the push for quality, through mechanisms that indirectly gauged teacher effectiveness and influenced how teachers were trained. Such exams worked well, especially as education resources were developing. At the time, the focus was on cognitive development in basic education and technical and vocational education and training, with considerable absorption into lower-skill production-based factory jobs.

Most countries in the region still use exams for entrance decisions at the secondary level. But many high performers have removed or adapted high-stakes exams at lower levels of education, partly because excessive focus on exams can lead to stress, a shifted or narrowed focus of education, and reduced equity. Korea removed middle school entrance exams in the 1960s, and high school entrance exams in the 1970s, as part of its high school equalization policy. In 2001, Hong Kong SAR, China, removed public assessments after primary school completion. In 2013, Malaysia replaced the high-stakes exam at the end of lower-secondary school with a mix of school-based exams and a centralized exam that included more critical thinking skills. Singapore, however, maintains the primary school-leaving exam at the end of sixth grade.

In response to concerns from parents, Korea introduced test-free semesters as a pilot program at the lower-secondary level in 2013, before expanding the program across the system (OECD 2016b). Taiwan, China, introduced exam-free pathways to secondary school in 2014 (Wong 2017). Shanghai has adopted strategies to reduce the dominance of the *zhongkao* lower-secondary school exam (taken at the end of ninth grade) by increasing the frequency of testing, broadening the domains tested, and reducing the stress and

fear of failing by providing alternate routes to different levels and types of education (Liang, Kidwai, and Zhang 2016). Although these efforts are at early stages and their full impacts are not yet known, they indicate policy makers' attempts at balancing the weight of examinations in a country's assessment system.

Classroom assessments increasingly inform instruction

Practices in the region reveal the importance of using ongoing measurements of learning in the classroom to guide instruction. A regional study by the World Bank in 2012—using a version of its Systems Approach for Better Education Results (SABER) benchmarking tool—finds that almost all countries surveyed have a framework for large-scale, system-level assessment and exam activities, and more than half have such a framework for classroom assessment activities (Jimenez, Nguyen, and Patrinos 2012).⁴ The study also finds that teachers' preservice training increasingly includes techniques for productive use of classroom assessment. The SABER analysis also shows areas where improvements are needed, including monitoring and ensuring the quality of classroom assessment and raising the priority of its use among teachers.

Top Performing Systems include assessments in teacher training programs and provide guidance and monitoring on their use. In Singapore, educational reform included efforts to support assessment in the classroom, including studying teachers' practices and designing a two-year professional development program to support assessment (Ho 2012).

International large-scale assessments have spurred learning-focused reforms

International benchmarking has most value when it leads to the identification of specific areas for improving education quality. In Top Performing Systems and Above-Average Performing Systems, international assessment data have spurred changes. Taiwan, China's

Happy Reading program, launched in 2008, was a response to low performance on PISA 2006. It used PISA microdata as a benchmark to align teaching methods, increase the amount of time allocated for reading instruction, increase resources, and revise teacher development (Driskell 2014). In response to PISA results, Vietnam changed the legal framework for large-scale exams to diversify testing methods, improve item quality, and pave the way for competency-based assessment. Broadening sample-based national diagnostic assessment of reading, math, and Vietnamese was also a key part of curriculum reform. In Japan, PISA has been important in tandem with the national assessment to drive and monitor education reform.

Use of national assessments varies across the region

Top Performing Systems Japan and Korea reintroduced regular large-scale national assessments about a decade ago. Japan reinstated a national assessment in 2007, covering three subject areas (Japanese, math, and science) for students in sixth and ninth grades. Korea reintroduced its national assessment in 2008. It is administered in sixth, ninth, and tenth grades. China rolled out a national assessment in 2015. It assessed fourth and eighth graders in six subjects. Uniquely among the high performers, Singapore uses its system of national examinations as the primary means of assessing the education system.

Other countries use national assessments more sporadically. In Vietnam, fifth graders are assessed intermittently. In Mongolia, the National Assessment of Primary Education, begun in 2004, is administered to fifth-grade students. Lao PDR conducts the National Assessment of Learning Outcomes (in 2006 and 2009 testing fifth-grade students and in 2012 testing third-grade students).

Many school systems use test results to implement targeted programs aimed at raising learning outcomes. Results from PISA 2015 show that the majority of school systems in the region use both teacher-developed

and standardized tests to guide student learning (OECD 2016–17).

Early Grade Reading Assessments are critical for Emerging Systems

International large-scale assessments such as PISA and TIMSS provide helpful information when a national school system has reached a level of performance compatible with the measured outcomes of the test. Where education systems are still emerging, targeted assessments of foundational skills provide more relevant information. EGRAs and Early Grade Math Assessments gauge student progress in early primary school.

EGRAs provide a snapshot of—and in some cases a wake-up call about—what students are learning. They have spurred systemic changes in teaching methodologies and curricula. In Tonga and Vanuatu, EGRA analysis in 2009 revealed low reading and comprehension. These results informed the Pacific Early Age Readiness and Learning program, to address both school readiness and early grade literacy through a variety of channels, including community-based groups, public awareness, teacher training, and a roadmap for early years to guide implementation of country priorities. Evaluation of the intervention and tracking of literacy gains showed improvements in reading of a half to a full year (Patrinos 2016).

Below-Average Performing and Emerging Systems should ensure that all students master basic reading and math skills. Widespread use of EGRAs and Early Grade Math Assessments to measure learning should be a cornerstone of their efforts to do so.

A map of countries' current systems

The ability of the East Asia and Pacific region's Top Performing Systems to improve both schooling and learning provides valuable lessons for all countries struggling to address the learning crisis. Although these systems followed different paths, all of them aligned and prioritized common elements across five policy domains to promote learning.

Table O.4 maps the current state of the region's economies for these domains and elements. It provides a starting point for countries to take stock of the current situation in each domain and to envision a path forward. Top Performing Systems distinguish themselves not only by achieving alignment across elements but also by sustaining it. Above-Average Performing Systems attempt alignment, but it is not consistent in all domains. Below-Average Performing Systems strive to emulate the success of the rest of the region. They have devised plans for alignment, but implementation is lacking or plans never materialize. Emerging Systems face the greatest challenges. Resources are scarcest, few measures of learning exist, and just getting all students in school has been difficult.

Charting the course ahead

Providing learning opportunities is imperative for the millions of children who are out of school—or in school but not learning. Lessons from high performers suggest that countries can improve learning outcomes by focusing on improving their performance in the five policy domains and 15 elements within them shown in figure O.1. These efforts require detailed, ongoing reforms.

No one size fits all for reform agendas, but all systems share some priorities (table O.5):

- Emerging Systems should concentrate efforts on ensuring that basic conditions are in place for learning in all schools and on reviewing spending to ensure that basic education is appropriately prioritized. Emerging Systems should also commit to diagnosing cohort progress, especially of early learners using early grade assessments, and using test results to inform and improve basic reading and math instruction. They should continue to explore the use of regional and international assessments for benchmarking. Second-order challenges include channeling resources for equity and considering how to approach the range of teacher support policies that can improve capacities for the long term. As these policies are developed, Emerging Systems are well served to review the extent to which teacher training and professional development focus on improving the quality of instruction.
- Below-Average Performing Systems should review teacher development policies to ensure that training is prioritizing improved instructional quality while building the institutional capacity for deeper and more comprehensive reforms. Introducing selectivity, observation, collaboration, and feedback while creating incentives and career paths for teachers that reward teaching ability are likely to pay off substantially. Ensuring readiness to learn and broadening early childhood education and development services are also critical. Developing and implementing systemwide national assessments of cohort progress should complement programs for classroom assessment; assessment systems should also include regular use of internationally comparable assessments for benchmarking and system accountability. Consideration should also be given to making teachers' jobs easier, through curriculum and other reforms. Simultaneously raising the attractiveness of teaching as a profession and the accountability of teachers for good classroom performance is key.
- Above-Average Performing Systems should not rest on their accomplishments. Deepening the quality of the teaching force and continuing to monitor equity are in order. But these systems should also endeavor to tie learning to new and emerging needs, which includes introducing teaching and measurement of noncognitive and 21st century skills. Redoubling the commitment to internationally comparable assessment can keep public support for excellence in education high, along with public awareness of achievements. Deepening the availability of high-quality early childhood education and development programs, especially for families who cannot afford them, is another step.

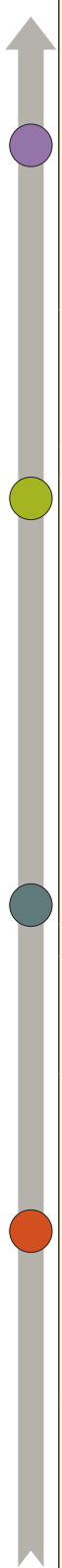
TABLE O.4 The status of policies and practices that promote learning varies within the region

Policy	Practice	Top Performing Systems						Above-Average Performing Systems		Below-Average Performing Systems				Emerging Systems					
		Hong Kong SAR, China	Japan	Korea, Rep.	Macao SAR, China	Singapore	Taiwan, China	B-S-J-G (China)	Vietnam	Indonesia	Malaysia	Philippines	Thailand	Cambodia	Lao PDR	Mongolia	Myanmar	Papua New Guinea	Pacific Island countries
<i>Align institutions to ensure basic conditions for learning.</i>	Ensure that the basic conditions for learning are in place in all schools.	■				■		■	■	■	■	■	■						
<i>Concentrate effective, equity-minded public spending on basic education.</i>	Spend effectively.		■	■		■		■	■	■	■	■		■			■	■	
	Concentrate public spending on basic education.		■	■		■		■	■	■	■	■					■	■	
	Channel resources to schools and districts that are falling behind.		■	■		■		■	■	■	■	■					■	■	
<i>Select and support teachers throughout their careers to allow them to focus on the classroom.</i>	Raise the selectiveness of who becomes a teacher.	■				■		■	■	■	■	■		■			■	■	
	Support new teachers by observing classroom practices and providing feedback.		■	■		■		■	■	■	■	■					■	■	
	Make teachers' jobs easier by providing clear learning goals and uncluttered texts.	■	■			■		■	■	■	■	■	■				■	■	
	Keep experienced teachers in the classroom and leading as peers and researchers.		■	■		■		■		■	■	■	■				■	■	
	Center teacher training on classroom practice and the ability to teach the curriculum.	■				■		■		■	■	■	■				■	■	
<i>Ensure that children are ready to learn in school.</i>	Focus on children's physical and cognitive development from birth.	■				■		■	■	■	■	■					■	■	
	Assess and improve the quality of early childhood education and development services.	■			■	■		■	■	■	■	■	■				■	■	
	Coordinate across actors to deliver needed services.	■			■	■		■	■	■	■	■	■				■	■	
<i>Assess students to diagnose issues and inform instruction.</i>	Benchmark learning through participation in international large-scale assessments.	■				■		■	■	■	■	■	■	■	■	■	■	■	
	Diagnose cohort progress using national assessments.		■	■				■	■	■	■	■	■				■	■	
	Inform instruction with data from formative classroom assessment.						■	■			■	■	■				■	■	

Alignment is successful and sustained.
 Alignment is attempted, but success is inconsistent.
 Alignment plans exist in writing, but there is little or no evidence of implementation, or no such plan exists.
 No data.

Note: B-S-J-G (China) = Beijing, Shanghai, Jiangsu, and Guangdong (China).


TABLE O.5 Concerted policy action and continuity of implementation drive systems improvement



Policy	Action			
	Emerging Systems	Below-Average Performing Systems	Above-Average Performing Systems	Top Performing Systems
Public spending	<p>Prioritize public spending on basic education and ensure high completion of primary and lower-secondary school.</p> <p>Increase starting teacher salaries to attract qualified teachers.</p> <p>Build simple but functional school facilities to increase access to basic education.</p> <p>Provide funding to support disadvantaged students in accessing basic education.</p>	<p>Continue investing in basic education to ensure high completion while expanding access to upper-secondary school and above.</p> <p>Strengthen teacher compensation policies to encourage good performance and retain qualified teachers.</p> <p>Build simple but functional school facilities to ensure access to basic education and increase access to preprimary and upper-secondary education.</p> <p>Help disadvantaged students to access basic education; consider mobilizing the private sector to increase access to preprimary and upper-secondary education.</p>	<p>Continue investing in basic and upper-secondary education while diversifying funding for vocational, technical, and tertiary education.</p> <p>Strengthen teacher career development policies and nonfinancial benefits for teachers to continue improving their quality.</p> <p>Provide remedial measures such as extracurricular activities to enhance learning of disadvantaged students.</p>	
	<p>Start the positive foundational cycle of attracting and ensuring reasonable-quality teachers, while being realistic about the system's capacity to implement quality assurance measures balanced with supply of candidates.</p> <p>Establish teacher networks (with a focus on supporting new, weaker teachers with mentoring and other support), lesson study, and an "open door" culture as key elements of professional development.</p> <p>Establish a basic framework of professional development and how teachers can reasonably be reached.</p> <p>Establish a mentality of teaching to learn with clear learning goals with curriculum and textbooks.</p> <p>Begin creating a cohesive, aligned system that supports teachers and promotes focused, streamlined learning.</p>	<p>Take incremental steps to increase qualifications and quality, establishing greater quality assurance and filtering measures.</p> <p>Deepen teacher networks in which more-advanced teachers provide greater support through mentoring and coaching.</p> <p>Provide more advanced professional development that develops deeper critical thinking techniques.</p> <p>Create tracks of progression and promotion for expert teachers that allow them to remain in the classroom.</p> <p>Evolve system- and teacher-related policies in ways that reform and move all elements forward with alignment.</p> <p>Decrease classroom hours and increase supplementary activities.</p>	<p>Establish rigorous criteria and multiple filtering mechanisms, while ensuring that teaching is attractive in terms of salary, professionalism, and prestige.</p> <p>Leverage high-performing teachers for professional development and support.</p> <p>Provide more autonomy for high-performing teachers.</p> <p>Create a highly developed professional development framework with tailored, individualized approaches.</p> <p>Deepen critical thinking, elaboration, and cognitive activation techniques.</p>	

table continues next page

TABLE O.5 Concerted policy action and continuity of implementation drive systems improvement (continued)



Policy	Action			
	Emerging Systems	Below-Average Performing Systems	Above-Average Performing Systems	Top Performing Systems
Readiness to learn	Develop policies and programs to ensure that both cognitive development and physical health are the focus of early childhood school readiness strategies.	Ensure that clear quality standards exist, are disseminated, and are addressed in an evaluative process.	Engage multiple actors in the development and delivery of integrated early childhood services.	
Assessments	Periodically use early foundational skills assessments to spur policy change and target reforms every five years. Integrate assessment policies into reforms of curricula and teacher development systems.	Implement national assessments for diagnostic purposes. Strengthen systems of assessment (enabling environment, quality control, alignment). Integrate the use of assessment data into teacher development, alongside adequate support and quality monitoring. Link assessment use to equity, examining current practices for tracking and accountability. Use internationally benchmarked assessments to check system performance.	Participate in regular international benchmarking (PISA, TIMSS). Engage in a national dialogue and secure commitment to quality. Disseminate assessment data to stakeholders for accountability. Reflect changing curricular priorities (such as noncognitive skills) in assessment design and methodology and provide support for change or research, guidance, training, quality, monitoring, and so forth.	

Note: PISA = Programme for International Student Assessment; TIMSS = Trends in International Mathematics and Science Study.

Also essential is to ensure that good options exist in the labor market for capitalizing on knowledge and skills acquired in basic and postbasic education. Amid all of these activities, building institutional capacity further cannot be neglected.

- Top Performing Systems provide compelling examples of how the work of producing high learning outcomes in schools is never completed. Looking at how these systems are evolving reveals that promoting creativity and new forms of assessment, ensuring that teachers remain motivated and grow in competency, and learning from other top performers worldwide are core tasks. Their continued efforts demonstrate that conserving and extending existing capacity and expertise are preconditions for staying on top.

Because learning is critical to East Asia and Pacific's strategy for productivity-driven growth, policy makers have continually kept their eyes on the next stage of education development. In today's rapidly changing economies, education systems will need to prepare students for lifelong learning. To draw in all countries and all students across the region, the path ahead will involve keeping pace with rapidly changing circumstances.

Notes

1. The constructed averages provide the best information on the performance of systems as a whole, but they do not provide any information on trends, and the information on all countries is not equally robust.
2. Data from PISA on learning outcomes in China are from only four provinces. However, learning outcomes in the rest of China can be inferred by looking at the distribution of proficiency levels in urban and rural areas of B-S-J-G (China). We use the ratios of urban to rural students at various levels of proficiency in the PISA data to estimate how many urban and rural students across China are at various levels of proficiency. This assumption produces an upper bound on the number of children who might be in a learning crisis. At the lowest levels of proficiency, students are considered functionally illiterate. Using the score threshold
3. For Indonesia, World Bank (2009); for the Philippines, World Bank (2016).
4. SABER is a set of tools that enables countries to evaluate and benchmark education policies across 13 areas, including teachers, early childhood development, school autonomy and accountability, and student assessments (see <http://saber.worldbank.org/>).

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Environmental Benefits Statement

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One-quarter of the world's school-age children live in East Asia and Pacific. During the past 50 years, some economies in the region have successfully transformed themselves by investing in the continuous upgrading of the knowledge, skills, and abilities of their workforce. Through policy foresight, they have produced graduates with new levels of knowledge and skills almost as fast as industries have increased their demand for skilled workers.

Yet the success of these high-performing systems has not been replicated throughout the region. Tens of millions of students are in school but not learning, and as many as 60 percent of students remain in school systems that are struggling to escape from the global learning crisis or in systems where performance is likely poor. Many students in these systems fail to reach basic levels of proficiency in key subjects and are greatly disadvantaged because of it.

Growing Smarter: Learning and Equitable Development in East Asia and Pacific focuses on the experiences of economies in the region that have been able to expand schooling and learning and showcases those that have managed to pursue successful education reforms at scale. By examining these experiences, the report provides both diagnoses and detailed recommendations for improvement not only for education systems within East Asia and Pacific but also for countries across the globe. In East Asia and Pacific, the impressive record of success in education in some low- and middle-income countries is proof of concept that schooling in resource-constrained contexts can lead to learning for all. This report identifies the policies and practices necessary to ensure that students learn and suggests how countries can improve learning outcomes.