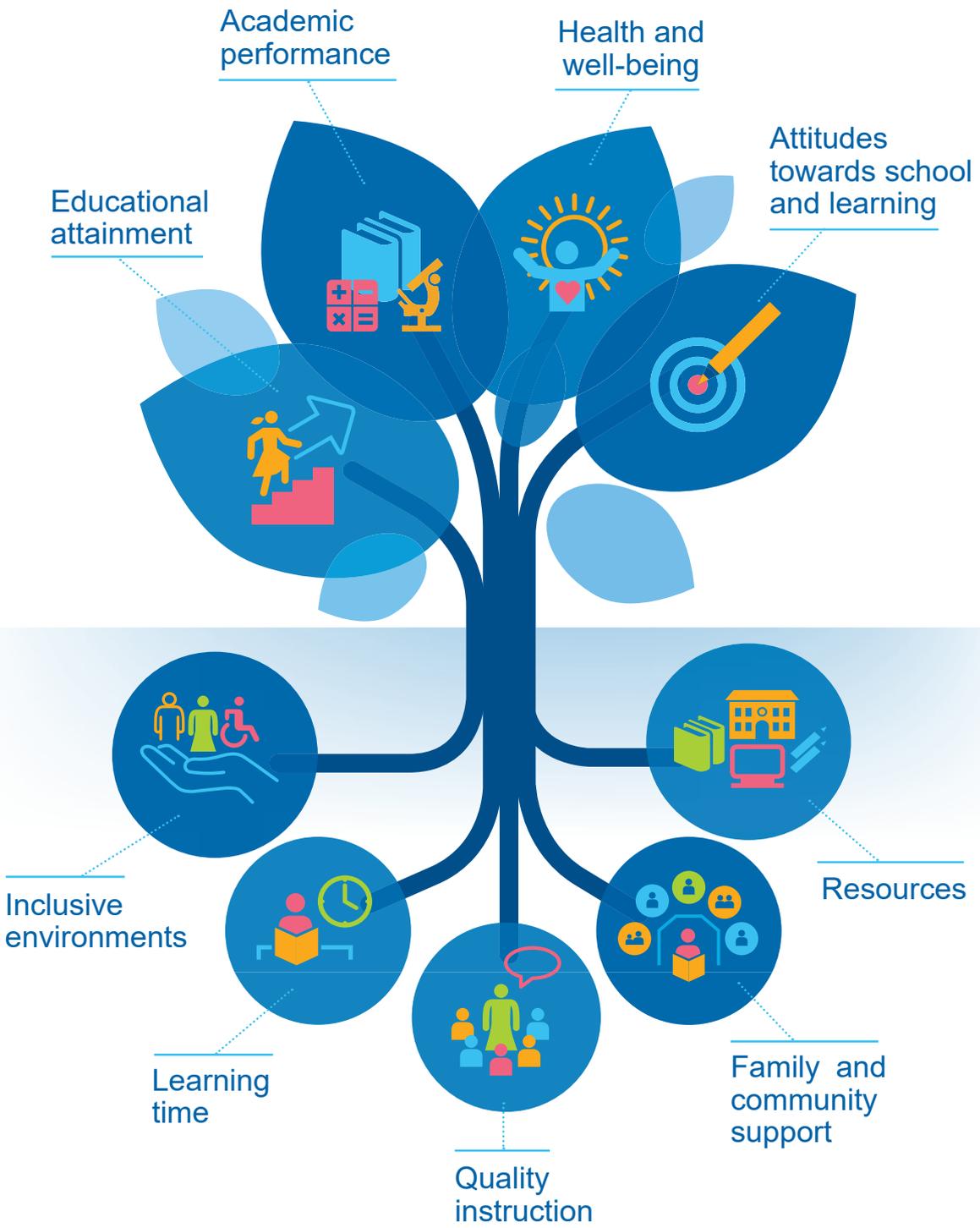




Education in Cambodia

Findings from Cambodia's experience
in PISA for Development





This report was developed by Cambodia jointly with the Organisation for Economic Co-operation and Development (OECD), which assisted in the design of the report and provided input, guidance and assistance in its development. The report is published under the responsibility of Cambodia and does not necessarily represent the official views of the OECD or its Member countries.

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Foreword

The Ministry of Education's purpose is to shape an education system for our country that delivers equitable and excellent outcomes for all of our children and young people. A strong focus on student learning and well-being underpins all our policy and the services we provide.

It is to help us achieve our Ministry's purpose that we joined the OECD's Programme for International Student Assessment for Development, PISA-D. This programme aims to evaluate education systems worldwide by assessing the extent to which 15-year-old students, near the end of their basic education, have acquired key knowledge and skills that are essential for full participation in modern societies. Cambodia's participation in PISA-D demonstrates the importance we place on the educational achievement of our children and young people.

In this report, a team of Ministry of Education officials has collated and analysed the information from our participation in PISA-D so that it can be used to benefit the education sector and, therefore, the children in our education system. This report contributes sound data, information and analysis for work undertaken to support the Government's existing education policies and our education policies, strategies and programmes in the future. The report also brings to bear on our education challenges the experiences of other countries of similar size and economic status, including some from our own region. This opportunity for international comparison and international learning is an extremely valuable aspect of our participation in PISA-D.

The PISA-D assessment focuses on the core school subjects of reading, mathematics and science, and does not just ascertain whether students can reproduce knowledge; it also examines how well students can extrapolate from what they have learned and can apply that knowledge in unfamiliar settings, both in and outside of school. This information about students' capacities in these three domains is combined with background data that enable us to look at the relationships between student achievement and contextual factors, such as students' health and well-being and their socio-economic backgrounds, students' attitudes to school and learning, the learning environment, quality of instruction, school resources, learning time, family and community support.

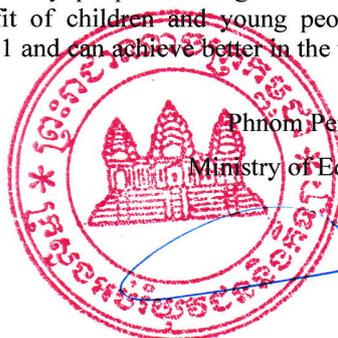
The Ministry of Education, Youth and Sport intends to respond fully to the findings and messages contained in this report and to follow up the suggestions regarding effective interventions that are set out in the report. The effective interventions highlighted in this report include actions designed to:

- establish strong foundations for success and improving educational outcomes;
- improve the allocation of resources in education;
- improve the school environment;
- improve the quality of instruction; and
- strengthen family and community support for education.

Results from PISA-D for Cambodia will be disseminated widely to all stakeholders since success in education relies on many people and organisations across the community working together for the benefit of children and young people, especially to ensure Cambodia is ready for PISA 2021 and can achieve better in the test and fully respond to a global education trend.

Phnom Penh, 03 December 2018

Ministry of Education, Youth and Sport



Dr. HANG CHUON NARON

Preface

The purpose of this publication, the first of its kind in Cambodia, is to present the results of our country's participation in the OECD's Programme for International Student Assessment for Development (PISA-D). PISA-D is a one-off pilot project that aims to make the assessment more accessible and relevant to a wider range of countries. The project is also a contribution to the monitoring of international educational targets related to the Education SDG, adopted by the United Nations General Assembly in 2015 as part of the Agenda for Sustainable Development.

This report describes the results achieved by our students, the resources invested in our education system, and the learning environments in our schools and communities, in ways that allow for comparisons with other countries participating in PISA-D and some countries with similar education contexts. The data and analysis contained in these pages will help our government and our educators identify the main challenges for education policy in Cambodia, and can inform the development of effective strategies and policies to confront them.

Cambodia is one of nine countries that partnered with the OECD through the "PISA for Development" initiative, whose aim is to make PISA more accessible and relevant to middle- and low-income countries like ours. An important enhancement in this initiative concerned the PISA assessment instruments themselves, which were re-designed to capture a wider range of performance levels and social contexts, but on the same scales as those used in the regular PISA assessment. We have also benefited from the capacity development that has been built into the PISA for Development project and this will be utilised by us in future cycles of PISA as well as in our own national assessments.

Cambodia's participation in PISA for Development would not have been possible without the strong collaboration between Cambodia's Ministry of Education, Youth and Sport, the OECD and Korea Institute for Curriculum and Evaluation (KICE) and the financial support from Secondary Education Improvement Project (SEIP). Our Cambodia PISA-D team has committed their time and energy to this work with high professionalism to successfully produce such a high quality report.

Education Quality Assurance Department

Acknowledgements

This PISA-D national report is a result of collaborative work between the Ministry of Education, Youth and Sport (MoEYS) of Cambodia, the Korea Institute for Curriculum and Evaluation (KICE) and the OECD. The report was prepared by Dr. Heng Kreng, a PISA-D National Consultant and Lead Analyst, jointly with Mr. Chuong Chantha and Mr. Tol Pagna of the Education Quality Assurance Department (EQAD), Ministry of Education, Youth and Sport (MoEYS) of Cambodia, under the supervision of Michael Ward, OECD PISA-D Project Coordinator and with a technical assistance from Francesco AVVISATI, Guillaume BOUSQUET, Nicolas MIRANDA, Kelly MAKOWIECKI and H el ene GUILLOU. Francesco AVVISATI and Guillaume BOUSQUET provided the technical assistance on analyzing the data and producing tables and figures for the report. Nicolas MIRANDA helped the team to produce system-level data for analyzing resources invested in education in Cambodia and in other PISA-D participating countries; Kelly MAKOWIECKI and H el ene GUILLOU provided support on the infographics of the report's cover, executive summary and chapter overviews. The Learning Bar and Education Testing Service (ETS), as the international contractors, developed and quality-checked contextual questionnaires and cognitive assessment booklets and their data, respectively.

This report was greatly indebted to H.E Dr. Academician Hang Chuon Naron, Minister of MoEYS and to H.E Dr. Academician Nath Bunroeun, Secretary of State of MoEYS, who relentlessly provided advice and guidance on the implementation of PISA-D for Cambodia. Their full support to Cambodia's participation in PISA-D made this national report a reality and has marked a significant milestone for Cambodia in the PISA context.

Many thanks also go to EQAD leaders and staff, especially to Education Quality Assurance Office, for their strong commitment in all the logistical and technical work. Mr. Ung Chinna, Director of EQAD, and Mr. Sar Sarin, Chief of Education Quality Assurance Office, both were the key actors in the entire implementation process, including, but not limited to, international meetings, communications and other planning.

South Korea through KICE, as a peer learning country for Cambodia in PISA-D, provided both technical and financial support mainly through in-country capacity building activities. KICE extensively shared with us Korean experiences in the use of PISA results to improve the Korean education system, which is a key input to the policy section of this report.

The World Bank Cambodia, under the Secondary Education Improvement Project (SEIP), provided financial assistance on international and national costs to secure PISA-D can reach this stage and further, particularly in the use of its results after the official launching for strengthening education quality in Cambodia.

The report also lends credence to all the technical departments of MoEYS, Provincial Offices of Education (PoEs), school principals of 170 sampled schools and test administrators who actively and collaboratively supported the PISA-D operation process. They all contributed to Cambodia's success in the first ever participation in such a prestigious international student assessment led by OECD, bringing Cambodia to a new standard of student assessment practices.

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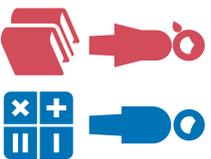
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List of Abbreviations

ASEAN	The Association of Southeast Asian Nations
B-S-J-G (China)	Beijing-Shanghai-Jiangsu-Guangdong (China)
CFS	Child Friendly School
DTMT	District Training and Monitoring Team
EFA	Education for All
EGMA	Early Grade Mathematic Assessment
EGRA	Early Grade Reading Assessment
ESCS	Economic, social and cultural status
GDP	Gross Domestic Product
HBSC	Health Behaviour in School-aged Children
ICT	Information and communications technology
LLECE	Latin American Laboratory for Assessment of the Quality of Education
LUP	Leadership Upgrading Program
MoEYS	The Ministry of Education, Youth and Sport
NGS	New Generation School
NIS	National Institute of Statistics
OECD	The Organisation for Economic Co-operation and Development
PISA	Programme for International Student Assessment
PISA-D	Programme for International Student Assessment for Development
RGC	Royal Government of Cambodia
SDG	Sustainable Development Goals
SEIP	Secondary Education Improvement Project
SSC	School Support Committee
STEM	Science, Technology, Engineering and Mathematics
TEC	Teacher Education College
WHO	World Health Organization



In Cambodia, **8%** of students achieve the **minimum level of proficiency** in reading and **10%** of students achieve the minimum level of proficiency in mathematics.



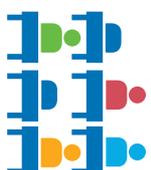
Girls outperform boys in reading by 17 points. Boys and girls perform similarly in mathematics.



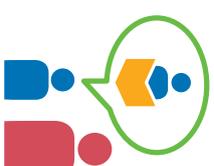
Students of **urban schools** outperform students of **rural schools** in reading with a performance difference of 42 score points, the equivalent of more than a year of schooling.



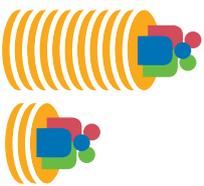
While 96% of students report that they **feel safe at school**, only 70% feel safe on the way home from school. At school, the most frequent threats to safety are theft and physical violence (threats and fights).



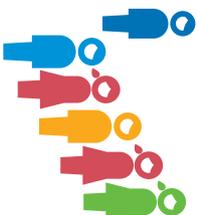
A small proportion of students report having **missed school for more than 3 months in a row** (7.5%) with health problems and household responsibilities being often cited as the reason. Yet, 50% of students report arriving **late at school**.



Only 43% of students report that they regularly **discuss with their parents** how well they are doing at school.



Disadvantaged students are about 4 times more likely than disadvantaged students to attain the baseline level of proficiency in mathematics.



Boys are more than 1.4 times more likely than girls to have **repeated a grade in Cambodia**. Retention is strongly associated with lower levels of student performance.



The percentage of the Cambodia's population that has attained **at least Grade 7** by age 15 in 2017 was 28%. The remaining 72% of 15-year-olds in 2017 were either in grades below 7 or out of school.



Cambodia allocates 2.7% of **GDP** and 18.3% of public **expenditure** to education.



Disadvantaged schools tend to have **fewer teachers** and **less experienced teachers** than advantaged schools.



Rural, disadvantaged and public schools tend to have **school facilities** in worse condition than urban, advantaged and private schools.



In Cambodia, both advantaged and disadvantaged students report **high life satisfaction**...



... but **poor or fair health, especially among disadvantaged students**.



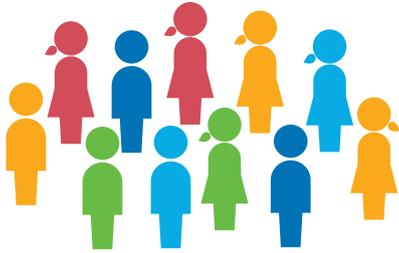
In Cambodia, a large majority of students (94%) feel that they **belong at school**.

The bottom line...

- Reduce grade repetition particularly among boys by supporting those who fall behind.
- Ensure quality learning time by preventing tardiness through strengthening school management and by increasing learning opportunities through supplementing students with extra competency-based practices—homework or tasks—and engaging parents in their learning process.
- Improve resource allocation by strengthening “school standard” and use this as a benchmark for decisions on budgets and human resources to help disadvantaged schools.
- Improve the quality of instruction by increasing teacher education and strengthening the concept- and competency-based curriculum in teacher education and teaching methods (inductive and competency-based teaching).
- Improve universal basic skills among students by investing more in basic education (K-9)—implementing “concept- and competency-based education” and aligning teacher education with classroom teaching and assessment



Cambodia in PISA-D



In December 2017, **5162 students** in 170 schools, representing **370,856 15-year-olds** in Cambodia...



...took a **2-hour test** in reading, mathematics and science.



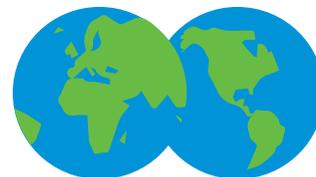
3 questionnaires collect background information on students, teachers and schools to help explain the factors associated with the test scores, especially those related to equity and equality.



Results are a product of the **cumulative effects** of family, community and school resources over the student's life.



In Cambodia, most 15-year-olds are starting upper secondary school at **grade 10**, and some are finishing lower secondary education at **grade 9**.



9 countries participated in **PISA-D** and have results comparable to the **80+** countries that have participated in **PISA**.

Chapter 1

Cambodia in PISA-D

This chapter describes PISA and PISA for Development and also explains how the information collected in the assessment can be used to compare the education system in Cambodia to other countries and drive improvement in students' achievement, attainment, well-being and engagement with learning. The last section of this chapter introduces the framework for the national report and what will be covered in the chapters that follow.

In Cambodia during December 2017 more than 5,000 15-year-old students in 7th grade or above from randomly selected schools across the country took a two-hour test in reading, mathematics and science. These tests were not directly linked to Cambodia's school curriculum – rather, they were competency based and internationally comparable. The tests were designed by the Organisation for Economic Co-operation and Development (OECD) to assess the extent to which students in Cambodia at the end of compulsory education can apply their knowledge to real-life situations and be equipped for full participation in society. In addition to the tests, background questionnaires for students, schools and teachers were completed to provide context which can help Cambodia and the OECD to interpret the results. These tests are part of an international large-scale assessment of student learning which is managed by the OECD and is called the Programme for International Student Assessment or PISA for short.

1.1. Cambodia's participation in PISA-D

PISA-D evaluates students aged between fifteen years and three months and sixteen years and two months at the time of the evaluation, who are studying in 7th grade or above. That means it evaluates students in both lower and upper secondary schools provided that they are within the age range of PISA-D. In Cambodia, the school-age children at grade 1 is 6 years old; without late entry or grade repetition, students in 7th grade are aged 12 years; those in 10th grade are aged 15 years, which is a modal grade in PISA-D. PISA-D is a new program for low- and middle-income countries and economies and to a large extent follows the PISA's assessment format, which is a triennial international survey that aims to evaluate education systems worldwide by testing the skills and knowledge of 15-year-old students. To date, students representing more than 80 economies, including 44 middle-income countries, have participated in PISA since the first round of testing in 2000. PISA assesses the extent to which 15-year-old students, near the end of their compulsory education, have acquired key knowledge and skills that are essential for full participation in modern societies. The assessment focuses on the core school subjects of science, reading and mathematics. Students' proficiency in an innovative domain is also assessed (in 2015, this domain is collaborative problem solving). The assessment does not just ascertain whether students can reproduce knowledge; it also examines how well students can extrapolate from what they have learned and can apply that knowledge in unfamiliar settings, both in and outside of school. This approach reflects the fact that modern economies reward individuals not for what they know, but for what they can do with what they know.

In Cambodia the PISA-D test was administrated in December 2017. As in all countries, the sample of schools was selected by the OECD/international organization in charge of the study, based on a complete list of all schools with eligible students in the country submitted by national authorities, and of complete listings of 15-year-old students in these schools submitted by the school administrators in the selected schools. The data is therefore representative of the entire population of 15-year-old students in the country.

Cambodia has 12,889 schools and 3,077,660 students from K-12, with girls constituting 49.26 %. Of this entire student population, 190,148 children are enrolled in preschools; 2,022,061 are in primary schools (MoEYS, 2017). The number of students in lower and upper secondary schools is, however, considerably smaller. In lower secondary education, only 585,971 students remain in schools; while the upper secondary education comprised merely 279,480 students. High dropout rates during transition to lower and upper secondary education remain a lingering issue in Cambodia's education system.

In each country a sample that is representative of all the 15-year-old student population was selected. Rigorous sampling procedures were implemented in the selection of the samples to ensure the results are comparable, reliable and valid. In Cambodia, the assessed sample consisted of 5,162 students and 4,263 teachers from 170 schools. In each school, 41 students of 15 years were randomly selected, except for small schools where all eligible students were included in the sample. Table 1.1 describes student sample by grade, gender, location, study programme, and special education needs.

Table 1.1. PISA-D student sample in Cambodia

Characteristics	N	%
Grade		
12	113	2.19%
11	851	16.49%
10	1641	31.79%
9	1483	28.73%
8	719	13.93%
7	355	6.88%
Gender		
Male	2434	47.15%
Female	2728	52.85%
Location		
Urban	1384	26.81%
Rural	3778	73.19%
Study Programme		
General education curriculum	5137	99.52%
Complementary programme	25	0.48%
Technical education curriculum	0	0%
Special educational programme	0	0%
Equivalency programme	0	0%
Special educational needs		
Non- special educational needs	5157	99.9%
Functional disability	5	0.1%
Total assessed students	5162	

A limited number of schools and students could be excluded from the assessment. Acceptable exclusions represent less than 5% of the target population and must be justified: schools, for example, might be excluded because they are situated in remote regions and are inaccessible; students might be excluded because of intellectual disability or limited proficiency in the language of the assessment. In Cambodia, 10 language and 29 technical and vocational schools are excluded from the assessment because the mean of instruction for the former is not Khmer language and for the latter because students are not in the assessment window. The percentage of students not covered due to school-level exclusions is 0.58%. When the exclusion of students within participating schools – e.g., because of functional and intellectual disabilities - is also taken into account, the overall exclusion rate is 2.04%.

PISA-D focuses on the skills and knowledge that are essential for full participation in modern societies and assesses 15-year-olds because in most countries these students are near the end of compulsory education. In Cambodia, 156,646 of these students are estimated to

be 15 years old. 16,794 of these students are enrolled in grade 6 and below; 139,852 students are at grade 7 and above.

1.2. What is PISA?

Launched by the OECD in 1997, PISA assesses 15-year-olds' proficiency in reading, mathematics and science and measures students' skills in applying what they have learned in school to real-life situations. PISA cycles have been completed in 2000, 2003, 2006, 2009, 2012 and 2015 and the 2018 cycle is under way. PISA is an on-going programme that offers insights for education policy and practice, and that helps to monitor trends in students' acquisition of knowledge and skills across countries and in different demographic subgroups within each country. Through PISA results, policy makers can gauge the knowledge and skills of students in their own countries in comparison with those in other countries, set policy targets against measurable goals achieved in other education systems, and learn from policies and practices of countries which have demonstrated improvement. This kind of international benchmarking is more relevant now than ever, given that every country in the world has signed up to the Education Sustainable Development Goal (SDG) agenda which is about ensuring that every child and young person achieves at least basic levels of proficiency in reading and mathematics (level 2).

1.2.1. The PISA assessment

The triennial PISA assessment does not just ascertain whether students can reproduce knowledge; it also examines how well students can extrapolate from what they have learnt and can apply that knowledge in unfamiliar settings, both in and outside of school. This approach, which is described in more detail in Chapter 2, reflects the fact that modern economies reward individuals not for what they know, but for what they can do with what they know.

Through questionnaires distributed to students, parents, school principals and teachers, PISA also gathers information about students' home background, their approaches to learning and their learning environments – these questionnaires are described in more detail in Chapters 3, 4 and 5. Combined with the information gathered through the various questionnaires, the PISA assessment provides three main types of outcomes:

- basic indicators that provide a baseline profile of the knowledge and skills of students;
- indicators derived from the questionnaires that show how such skills relate to various demographic, social, economic and educational variables and to broader outcomes of education, such as attainment and well-being;
- starting with a country's second participation in PISA, indicators on trends that show changes in outcome levels and distributions, and in relationships between student-level, school-level and system-level background variables and outcomes.

PISA facilitates international comparison of countries' education systems through the use of common items, used by all participating countries, which are all located on a common measurement scale. PISA scores can be located along specific scales developed for each subject area, designed to show the general competencies tested by PISA. These scales are divided into levels that represent groups of PISA test questions, beginning at Level 1 with questions that require only the most basic skills to complete and increasing in difficulty with each level up to six – see Chapter 2 for the full descriptions of these levels. Once a student's test has been scored, his or her proficiency in reading, mathematics and science can be located on the appropriate scale. For example, a student who lacks the skills needed to correctly complete the easiest questions on a PISA test would be classified as below Level 1, while a student who has these skills would be at a higher level.

In each test subject, the score for each participating country is the average of all student scores in that country. PISA mean scores can be used to rank participating countries according to their performance in reading, mathematics and science. PISA does not give a collective score for all subjects combined; rather it gives a score for each subject area and this can be used to determine rankings by the mean score of each area.

For each subject assessed, PISA reports the results of students on a scale divided into the six “proficiency levels” mentioned above. Assessment tasks of similar difficulty are used to describe each proficiency level in terms of what students know and can do, when their scores fall within the range of a particular level. The performance of an education system in PISA can therefore be described in terms of the knowledge and skills that students have mastered by age 15 and is not represented by a single number or rank. PISA reports for example the proportion of students that can not only read simple and familiar texts and understand them literally, but can also demonstrate, even in the absence of explicit directions, some ability to connect several pieces of information, formulate conclusions that go beyond the explicitly stated information, and connect a text to their personal experience and knowledge (Level 2 reading tasks); or the proportion of students who can work with proportional relationships and engage in basic interpretation and reasoning when solving mathematics problems (Level 3 mathematics tasks).

Furthermore, in order to offer insights for education policy and practice, PISA collects a wealth of contextual information about students, schools, and countries, which can be used to highlight differences in performance and identify the characteristics of students, schools and education systems that perform well under particular circumstances.

PISA is an ongoing programme that, over the longer term, will lead to the development of a body of information for monitoring trends in the knowledge and skills of students in various countries as well as in different demographic subgroups of each country. Policy makers around the world use PISA findings to gauge the knowledge and skills of students in their own country/economy in comparison with those in other participating countries/economies, establish benchmarks for improvements in the education provided and/or in learning outcomes, and understand the relative strengths and weaknesses of their own education systems.

1.2.2. PISA for Development

Over the past two decades, PISA has steadily increased the number of participating countries, from 44 in 2000 to 82 in 2018. As the number of countries joining PISA increases, PISA evolves to successfully cater for a larger and more diverse group of participants. Cambodia decided to join the Programme for the first time when the OECD launched the PISA for Development (PISA-D) project in 2014. This is a one-off pilot project spanning six years that aims to make the assessment more accessible and relevant to a wider range of countries. The project is also a contribution to the monitoring of international educational targets related to the Education SDG, adopted by the United Nations General Assembly in 2015 as part of the Agenda for Sustainable Development. To accomplish its aims, the project sets out to:

- increase the resolution of the PISA tests at the lower end of the student performance distribution;
- incorporate an assessment of out-of-school 14-16-year-olds; and
- include the assessment of factors that contribute to students’ success that are more relevant to middle- and low-income countries, such as a wider range of -social and economic contexts.

The PISA-D test

The PISA-D school-based assessment is a two-hour test that students complete with pencil and paper. The test includes a combination of questions from the domains of reading, mathematics and science. Each student was given one of 12 possible test booklets, which overlap in content. By administering different booklets to different students, PISA-D can measure a wide range of knowledge and skills at the country level, without the need to administer an exceedingly long and complex test to individual students. All test booklets administered in PISA-D contain items that were part of the PISA 2015 instruments, to ensure that results can be reported on the PISA scale and remain comparable to those of countries that participated in PISA 2015.

Each test booklet is completed by a sufficient number of students to make appropriate estimates of the achievement levels on all items by students in each country and in relevant subgroups within a country (such as boys and girls, and students from different social and economic contexts). Just as PISA, however, PISA-D is not designed to estimate the performance of individual students or schools: its results are most valid and reliable when aggregated across a sufficient number of students. Comparability with PISA 2015, which was administered both on paper and on computers, is assured through common items.

While PISA-D has been implemented within the overall PISA framework and in accordance with PISA's technical standards and usual practices, it includes new features and enhancements to make the assessment more accessible and relevant to middle- and low-income countries. With regard to the test, these features and enhancements include:

- an equal treatment of the three major domains tested - reading, mathematics and science – unlike PISA, where one of the domains is given a particular focus in each cycle;
- test instruments that cover a wider range of performance at the lower levels of proficiency, while still providing scores that cover the whole of the PISA framework and are comparable to the main PISA results; and
- modified test instruments that have a reduced reading burden, in recognition of the lower levels of reading literacy capacity in middle- and low-income countries.

Contextual questionnaires

The instruments include contextual questionnaires (students, principals and teachers) which provide a context for the assessment results and a broader picture of educational success. Students respond to the questionnaire after the test in the school-based assessment.

The contextual questionnaires include core items from PISA to facilitate international comparisons, as well as several distinct PISA-D items that are more relevant to middle- and low-income countries. The new items respond to the policy priorities of the countries participating in PISA-D. The PISA-D contextual questionnaires also extend the measurement of student and school resources beyond the scales developed in PISA, to accurately describe situations of poverty and socio-economic disadvantage or of inadequate school buildings and equipment, as they can be found in developing countries.

Capacity building

A further feature unique to PISA-D is the learning and capacity-building opportunities that have been built into each phase of project implementation. In preparing to implement the assessment, PISA-D countries have undergone a capacity needs analysis based on PISA's technical standards and devised a capacity-building plan that is also relevant for strengthening their national assessment systems. The PISA-D countries have also been assisted by the OECD to prepare a project implementation plan that has guided their implementation of the survey and ensured that the necessary human and financial resources were put in place. PISA countries have not benefitted from similar support and the PISA-D

project has served as the basis for a model of support within the core PISA survey which is now being offered more widely to all participating countries from the 2021 cycle onwards.

Participating countries

The PISA-D project has been carried out by the OECD in partnership with Cambodia and eight other countries: Bhutan, Ecuador, Guatemala, Honduras, Paraguay, Panama, Senegal and Zambia.

1.3. Why Cambodia is participating in PISA-D

One of the main reasons Cambodia participated in PISA-D was because of its policy makers’ wish to understand how the performance of students in the country compares, in relation to international benchmarks and to countries facing similar challenges elsewhere, and to identify the factors that are associated with underperformance in order to effectively eliminate it. The PISA-D results contained in this report provide these policy makers with data and evidence that can be used to determine what they can do to improve Cambodia’s education system and, ultimately, ensure that their students obtain the skills needed to succeed in tomorrow’s world and as set out in the Education SDG Framework.

All countries are committed to achieving the key Education SDG target of all children and young people achieving at least minimum levels of proficiency in reading and mathematics by 2030. In Cambodia, this means ensuring all young citizens have the knowledge, skills and capabilities necessary to achieve their full potential, contribute to an increasingly interconnected world, and live a fulfilling life. Enhanced competencies are critical not only for students in Cambodia to improve their quality of life necessary for living in the 21st century or beyond but also for the country to fulfil its economic vision to become an upper-middle income country in 2030 and a high income country in 2050. The commitment to achieving the key Education SDG target is in line with the Cambodia's Industrial Development Policy 2015-2025 (RGC, 2015) and Rectangular Strategy Phase IV (RGC, 2018). These two overarching policies or strategies, despite different at varying degrees, have placed quality, equality and equity in human capital development at the heart of its success and led to many key reforms in Cambodian education to ensure students are equipped with relevant knowledge and skills necessary for supporting the anticipated economic structure in 2030 and 2050 and for engaging in the global labor marketplace.

The current education reforms are the reflection of Cambodia’s endeavor to move towards excellence in education and human capital development to ensure Education SDG target is on track and to achieve success in its economic dream. The reforms embrace 5 main pillars comprising (1) the implementation of Teacher Policy Action Plan, (2) the revision of curriculum, textbooks, and school environment, (3) the implementation of inspection system, (4) the enhancement of student learning assessments (for example, national examinations, national, regional and international student learning assessments), and (5) higher education reform and are elaborated by 15 education agendas as follows:

Table 1.2. Education reform agendas in Cambodia

15 reform agendas	
• Public Financial Management	• Construction and Rehabilitation
• Teacher Deployment	• Evaluation of Higher Education Institution
• Teacher Training Center	• Promotion of Sports Sector

- Teacher Qualification Improvement
- Inspection
- Assessment of Learning Outcomes
- Lower and Upper Secondary Examinations
- Curriculum and Core Textbook
- Implementation of Action Plan on Youth Development
- Technical Education
- New Generation School
- Development of Teacher Career Pathway and School Principal Training

Across all these reform agendas, school-based management and quality of teaching and learning has been placed at the heart of education interventions. The current five-year Secondary Education Improvement Project (SEIP)¹ (2017-2022) is a case in point. The project is mainly designed to improve students' learning outcomes at the lower secondary level to ensure students have fundamental knowledge, skills and capacity to engage in the world of work or to successfully continue their higher education. Understanding school and classroom environments is, thus, critical to student learning and to the success of this project and other education reforms.

In the same vein, Cambodia has a desperate need to innovate schools, its curriculum and teaching and learning to foster modern education for young generations through piloting New Generation Schools (NGS) (MoEYS, 2016a) and implementing STEM (Science, Technology, Engineering and Mathematics) education (MoEYS, 2016b). NGS is considered a 'super' school that promotes effective school management, inquiry-based teaching and collaborative and problem-solving learning environments and that is meant to effectively connect schools, teachers, students and community and to place them at the heart of teaching and learning process. The STEM policy is a new innovation, aiming to strengthen technical and vocational education and one way or another to increase emphasis on these subjects in the academic curriculum. Nonetheless, the success of these innovations remain to be seen given its early phase of implementation. Evidence from PISA-D can shed light on important areas for improvement at class and school levels in line with those innovations.

The participation in PISA-D corroborates many innovations in Cambodia in terms of improved assessment data and evidence for school and system improvement. It presents added-values to the current education reforms and interventions in that it provides additional, reliable yardstick of students' competencies beyond what is contained in the national curriculum and makes student assessment in Cambodia internationally comparable. In essence, PISA-D results and experiences can reflect where Cambodia is and how it moves forward to ensure the vision for 2030 and 2050 and Education SDG can be achieved. Understanding what 15-year-old youth know and can do in the vividly changing socio-economic discourse is the dividend for the country to prepare better for sustainable growth and development.

1.4. Reporting of results

The PISA-D results are published for the first time in this national report which has been produced by Cambodia in collaboration with the OECD. As part of the report production process, the OECD and its contractors have provided inputs to Cambodia to strengthen its capacities for data analysis, interpretation of PISA-D results, report writing and the

¹ see the detail of SEIP at <http://documents.worldbank.org/curated/en/589431492394419103/Cambodia-Secondary-Education-Improvement-Project>

production of tailored communication products to support the dissemination of PISA-D results and policy messages.

This national report and other communication products present Cambodia's results in the context of the countries that participated in PISA 2015 and PISA for Development and include relevant analyses and information based on the policy priorities of Cambodia. This report constitutes a summary of key results and analysis designed to stimulate a constructive debate on improvement, building upon and enriching already existing data and evidence from national, regional or international sources. This national report is the culmination of an engagement and communication strategy that has been implemented by Cambodia over the past three years. This strategy has sought to involve key stakeholders in Cambodia in the survey and the discussion of the results and implications for policy. Stakeholders include pupils, parents, teachers, teacher unions, school principals, academia, civil society, media and central and local government.

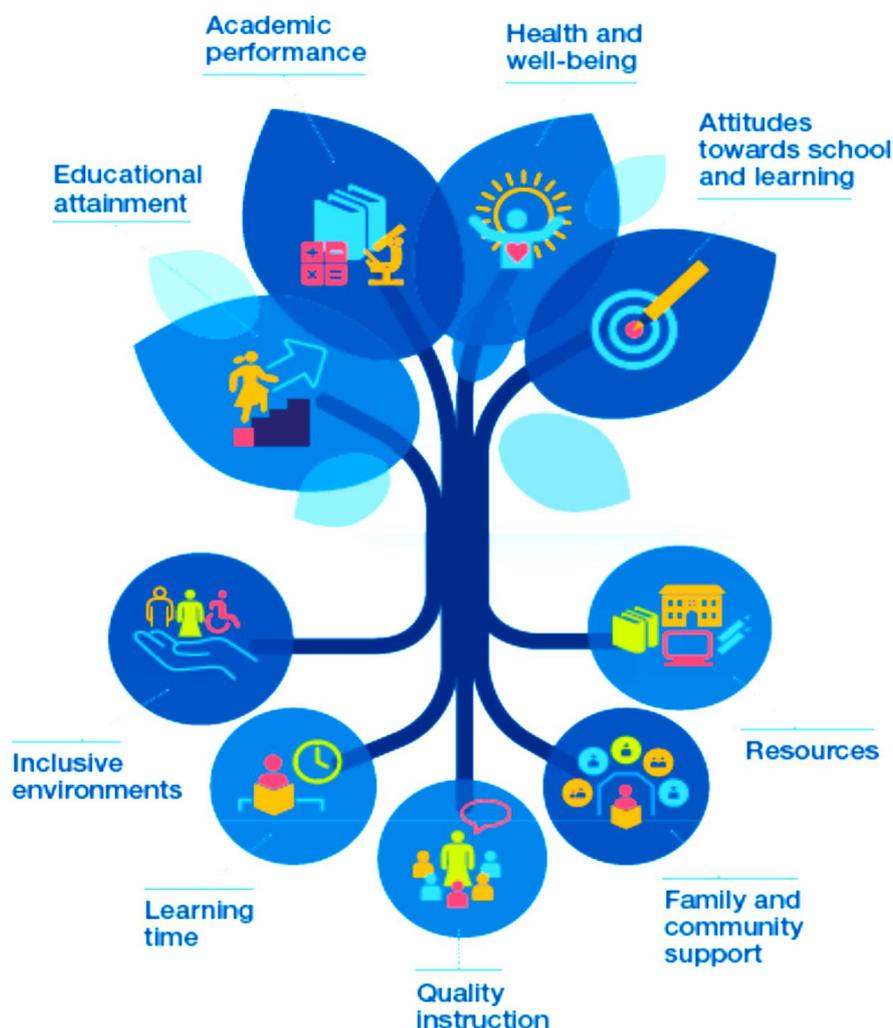
This national report is published in conjunction with the full PISA-D data set and with an interactive web-based tool to explore the dataset. These products are freely accessible on the OECD website (www.oecd.org/pisa) to enable all stakeholders, and in particular independent researchers, to conduct their own analyses and contribute towards a policy dialogue for educational improvement.

1.5. The framework for Cambodia's national report

1.5.1. The analytical framework

PISA-D uses the Education Prosperity model (Willms, 2015) as an overarching analytical framework, while also taking into account the goals of PISA-D, lessons from past PISA cycles and other international studies, recommendations from research literature and the priorities of the participating countries.

Education prosperity is a life-course approach that identifies a key set of outcomes, called "Prosperity Outcomes", for six key stages of development, covering the period from conception to adolescence, and a set of family, institutional and community factors, called "Foundations for Success", which drive these outcomes. When applied to PISA-D, the relevant outcomes and foundations correspond to the fifth stage of the Educational Prosperity framework, late primary and lower secondary (ages 10 to 15). The four Prosperity Outcomes at this stage are educational attainment, academic performance, health and well-being, and attitudes towards school and learning. The model further identifies five Foundations for Success: inclusive environments, quality instruction, learning time, material resources, and family and community support. These elements of the framework are shown in Figure 1.1.

Figure 1.1. PISA-D analytical framework

This report is organised according to the framework discussed above. It distinguishes four core outcomes of education at age 15: student attainment; achievement in key subjects; subjective health and well-being; and attitudes towards school and learning.

Through the measure of proficiency in the PISA-D test, this report provides a rigorous assessment of what students have learned. This measure is based on frameworks for assessing reading, mathematics, and science literacy in PISA, which were enhanced to provide more detail on foundational knowledge and skills in each subject. The link with the PISA scales enables the results to be comparable with international PISA results. In addition, the information collected for sampling operations in PISA provides comparative indicators about the attainment of 15-year-old youth in participating countries. Finally, self-report measures based on questionnaires can be used to indicate the level of health and well-being, as how engaged students are with school and with learning.

The underlying framework also identifies, based on international research, key aspects of the school, family, and community environment and important educational resources that are strongly associated with educational success. The factors are considered to be the foundations for success in any educational system. The presence of these resources and characteristics of the learning environment in the life of 15-year-olds is measured through

questionnaires administered to participating students and children, but also through information collected from teachers, from school principals and from national sources of statistical information.

1.5.2. Quality, Inclusion and Fairness in education

The framework places great emphasis on equality and equity, with equality referring to differences among sub-populations in the distribution of their educational outcomes and equity referring to differences among sub-populations in their access to the resources and schooling processes that affect schooling outcomes.

In particular, the educational outcomes, resources, and opportunities are systematically compared not only with other countries internationally, but also within Cambodia across five demographic factors for assessing equality and equity: gender (boys and girls); socio-economic disadvantage; language minority status, as indicated by the language spoken at home; urban/rural status, as indicated by the school location; and public/private school status as indicated by the school type. The information on gender and on rural/urban status is collected both during sampling operations and in questionnaires, and is therefore available for all students; whereas the remaining background characteristics are reported by students themselves in the questionnaires.

Equity is concerned with fairness. A fair education system is one that minimises the effect of personal and social circumstances that are outside of an individual's control (such as gender, ethnic origin, or family background) on the opportunities to acquire a quality education and, ultimately, on the outcomes that he or she can potentially achieve (Roemer & Trannoy, 2016). In this report, equity in education is discussed with reference to the provision of five key foundations for educational success: inclusive environments, quality instruction, learning time, material resources, and family and community support.

Equity is also concerned with inclusion. Inclusive environments are classrooms, schools, and broader communities that value and support inclusion. "Inclusion is a process of addressing and responding to the diversity of needs of all learners through increasing participation in learning, cultures and communities, and reducing exclusion within and from education. It involves changes and modifications in content, approaches, structures and strategies, with a common vision which covers all children of the appropriate age range and a conviction that it is the responsibility of the regular system to educate all children" (UNESCO, 2005). An inclusive education system ensures that all young people reach at least the minimum level of attainment, achievement, well-being and engagement and that is required for participation in society. While barriers to attainment, achievement and health do not necessarily originate within educational institutions, a focus on inclusion requires that education policies remove these obstacles, where they exist, so that children can pursue what they value in life (Sen, 1999).

Equality and equity are not an attribute of students or schools, but of the system, and are best assessed by comparing countries facing comparable circumstances. International large-scale assessments therefore present a unique advantage in assessing the levels of equity in education. This framework for analysing PISA-D results through the lens of quality, equality and equity, links PISA directly to the Sustainable Development Goals (SDGs) adopted by the United Nations in September 2015. Goal 4 of the SDGs seeks to ensure "inclusive and equitable quality education and promote lifelong learning opportunities for all". More specific targets and indicators spell out what countries need to deliver by 2030; The first target (Target 4.1), for example, urges countries to "ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes".

1.6. Structure of the national report

The remainder of this report is structured as follows:

- Chapters 2 and 3 discuss the learning outcomes at age 15 in Cambodia. For each outcome, the average level, but also the variation in outcomes, including the prevalence of vulnerable youth, the inequality among groups of students and the extent to which family and home resources determine the outcomes will be discussed.
- Chapters 4 and 5 report on whether the foundations for success are present in Cambodia and in all schools, i.e. the extent to which the broader classroom, school and social contexts (learning environment) support good outcomes for all (Chapter 5) and the extent to which resources invested in education – and school material resources in particular – create good conditions for learning (Chapter 4).
- The last chapter (Chapter 6) summarises the findings from PISA-D, relate them to the broader set of evidence about the effectiveness and efficiency of policy interventions, and cast results in comparative perspective to stimulate an evidence-based discussion on policy reform in education.

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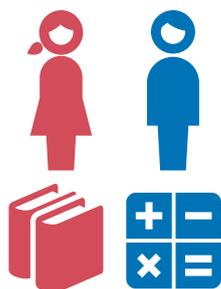
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Achievement and
attainment outcomes
at age 15 in Cambodia



In Cambodia, 8% of students achieve the **minimum level of proficiency** in reading and 10% of students achieve the minimum level of proficiency in mathematics.



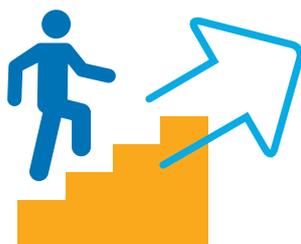
Girls outperform boys in reading by 17 points. Boys and girls perform similarly in mathematics.



Students of **urban schools outperform students of rural schools** in reading with a performance difference of 42 score points, the equivalent of more than a year of schooling.



Advantaged students are about 4 times more likely than disadvantaged students to attain the baseline level of proficiency in mathematics.



The percentage of the Cambodia's population that has attained **at least Grade 7** by age 15 in 2017 was 28%. The remaining 72% of 15-year-olds in 2017 were either in grades below 7 or out of school.



Boys are more than 1.4 times more likely than girls to have **repeated a grade** in Cambodia. Retention is strongly associated with lower levels of student performance.



10% best-performing students in Cambodia are comparable to 10% best-performing students in PISA-D on average in mathematics.



Students who **speak Khmer at home** perform better in reading than students who do not speak Khmer at home with a performance difference of 22 score points.

Chapter 2

Achievement and attainment outcomes at age 15 in Cambodia

This chapter discusses the PISA-D results in Cambodia and what they reveal about the achievement and attainment outcomes in the country. The chapter looks at the enrolment of 15-year-olds in Cambodia and their attainment, paying particular attention to the role of grade repetition. This provides important background for understanding student achievement in reading, mathematics, and science, and for comparing Cambodia's performance with other countries. The chapter then presents the results - in particular, the levels of performance in reading, mathematics and science – and discusses the main indicators of inclusion, focusing on gender and socio-economic disparities as well as variation in performance across schools and between urban and rural areas.

Equipping citizens with the knowledge and skills necessary to achieve their full potential, contribute to an increasingly interconnected world, and ultimately convert better skills into better lives is a central preoccupation of policy makers in Cambodia and around the world. The measures of student proficiency included in PISA and PISA-D were developed to monitor how close countries are to achieving this goal.

Skill requirements and the contexts in which skills are applied evolve fast. For this reason, PISA revises the definitions and frameworks behind each of its literacy measures every nine years, to make sure they remain relevant and future-oriented (see Box 2.1). By paying appropriate attention to the evolving nature of our societies, PISA invites educators and policy makers to consider quality of education as a moving target that can never be considered to have been acquired once and for all. As with previous cycles of PISA, the PISA-D cognitive frameworks and the framework for questionnaires have been reviewed and updated by a network of international experts who have experience with PISA, the relevant domains and the contexts found in middle- and low-income countries.

PISA-D assembles versions of the PISA assessment frameworks for reading, mathematical and scientific literacy that are based on the PISA 2012 and PISA 2015 frameworks but extends these frameworks to allow for more relevant measurement in Cambodia and other middle- and low-income countries. Making the measurement more relevant to Cambodia and these other countries requires more detail in the description of competencies of the most vulnerable students, those with the lowest levels of performance, which in turn requires including items that will enable the observation of these competencies in greater detail. Yet the relevance of PISA-D also depends on comparability with international PISA results: the instrument therefore allows for Cambodia's students to demonstrate the full range of proficiency levels in PISA.

Box 2.1. What does PISA-D measure?

Each round of PISA measures students' proficiency in reading, mathematics and science. Unlike PISA, where one of the domains is given a particular focus in each cycle, PISA-D gives an equal treatment of the three domains.

The frameworks for all three domains emphasise students' capacity to apply knowledge and skills in real-life contexts: students need to demonstrate their capacity to analyse, reason and communicate effectively as they identify, interpret and solve problems in a variety of situations. The broad definitions of the domains used in PISA-D are the same definitions used for PISA 2015:

Reading literacy is defined as an individual's capacity to understand, use, reflect on and engage with written texts, in order to achieve one's goals, to develop one's knowledge and potential, and to participate in society.

Mathematical literacy is defined as an individual's capacity to formulate, employ, and interpret mathematics in a variety of contexts. It includes reasoning mathematically and using mathematical concepts, procedures, facts and tools to describe, explain and predict phenomena. It assists individuals to recognise the role that mathematics plays in the world and to make the well-founded judgments and decisions needed by constructive, engaged and reflective citizens.

Scientific literacy is defined as the ability to engage with science-related issues, and with the ideas of science, as a reflective citizen. A scientifically literate person is willing to engage in reasoned discourse about science and technology which requires the competencies to explain phenomena scientifically, evaluate and design scientific enquiry, and interpret data and evidence scientifically.

Student proficiency in each domain can be interpreted in terms of proficiency levels, with Level 6 being the highest Level on the PISA scales and Level 1 and below the lowest. Level 2 is a particularly important threshold, as this marks the baseline level of proficiency at which students begin to demonstrate the competencies that will enable them to participate effectively and productively in life as continuing students, workers and citizens.

The PISA-D instruments include more items at Level 2 and below than the main PISA test, providing a wider and more fine-grained picture of what 15-year-olds know and can do at these lower levels of performance. The PISA-D instruments also extend the lower end of the scales, by adding new described proficiency levels below Level 2:

- In reading, Level 1c is a newly described proficiency level, corresponding to basic processes, such as literal sentence and passage comprehension.
- In mathematics, proficiency Level 1 was renamed as 1a and two new proficiency levels (1b and 1c) were described, based mainly on the new items included in PISA-D, to better measure basic processes, such as performing a simple calculation and selecting an appropriate strategy from a list.

Source: OECD, 2017a.

PISA-D provides more than an assessment of the quality of students' learning. It selects the participants who take the test through scientific sampling procedures, first choosing the schools to participate, and then selecting students within those schools. In order to be considered eligible for PISA-D and listed in sampling forms, 15-year-olds must therefore be enrolled in school; the PISA-D standards further restrict the target population to those students enrolled in Grade 7 and above. The information PISA-D collects for its sampling

operations therefore also provides comparative indicators about the attainment of 15-year-olds in participating countries.

Furthermore, PISA-D indicators can also be used to assess the equality of outcomes and equity in the provision of human and material resources using the rich information available in the PISA-D database on students' background, such as students' gender, socio-economic status, geographic location (rural or urban), language minority status (language spoken at home), and school type (public/private). Differences in equality and equity can be compared among countries. PISA has put great effort into constructing a comparable indicator of socio-economic status, known as the PISA index of economic, social and cultural status (see Box 2.2) that has been extended for PISA-D, and this has been used in the analysis of Cambodia's PISA-D data.

Box 2.2. Definition of socio-economic status in PISA and PISA-D

Socio-economic status is a broad concept. PISA estimates a student's socio-economic status by using the PISA index of economic, social and cultural status (ESCS), which is derived from several variables related to students' family background: parents' education, parents' occupations, a number of home possessions that indicate the household's material wealth, and the number of books and other educational resources available in the home. The PISA index of economic, social and cultural status is a composite score derived from these indicators. It is constructed to be internationally comparable.

The ESCS index makes it possible to identify advantaged and disadvantaged students and schools within each country. In this report, students are considered socio-economically advantaged if they are among the 25% of students with the highest values on the ESCS index in their country or economy; students are classified as socio-economically disadvantaged if their values on the ESCS index are among the bottom 25% of their country or economy. Following the same logic, schools are classified as socio-economically advantaged, disadvantaged or average within each country or economy based on their students' mean values on the ESCS index.

The ESCS index also makes it possible to identify advantaged or disadvantaged students by global standards. By placing all students on the same ESCS continuum, it is possible to compare the situation of students with similar economic, social and cultural resources across countries. For example, 56.8% of the students assessed by PISA-D in Cambodia are in the lowest 20% of students internationally. The ESCS index used in PISA-D extends the PISA index in order to adequately capture lower levels of education and lower levels of income and wealth, typically found for the majority of students in middle- and low-income countries, while keeping the link with the PISA measure. The PISA-D questionnaires include the long-standing questions used in PISA to assess the highest educational level of the parents, the highest occupational status of parents, and an index of home possessions, which has been extended to ensure it is relevant for middle- and low-income countries. The questionnaires also include new questions designed to capture youth's experience of poverty.

Source: OECD, 2016a; OECD, 2017a

The discussion of PISA-D results for Cambodia in the remaining sections of this chapter starts by comparing the enrolment of 15-year-olds in Cambodia and their attainment, with particular attention to whether students stay "on track" according to their age. This provides important background for the main section in this chapter, which compares student

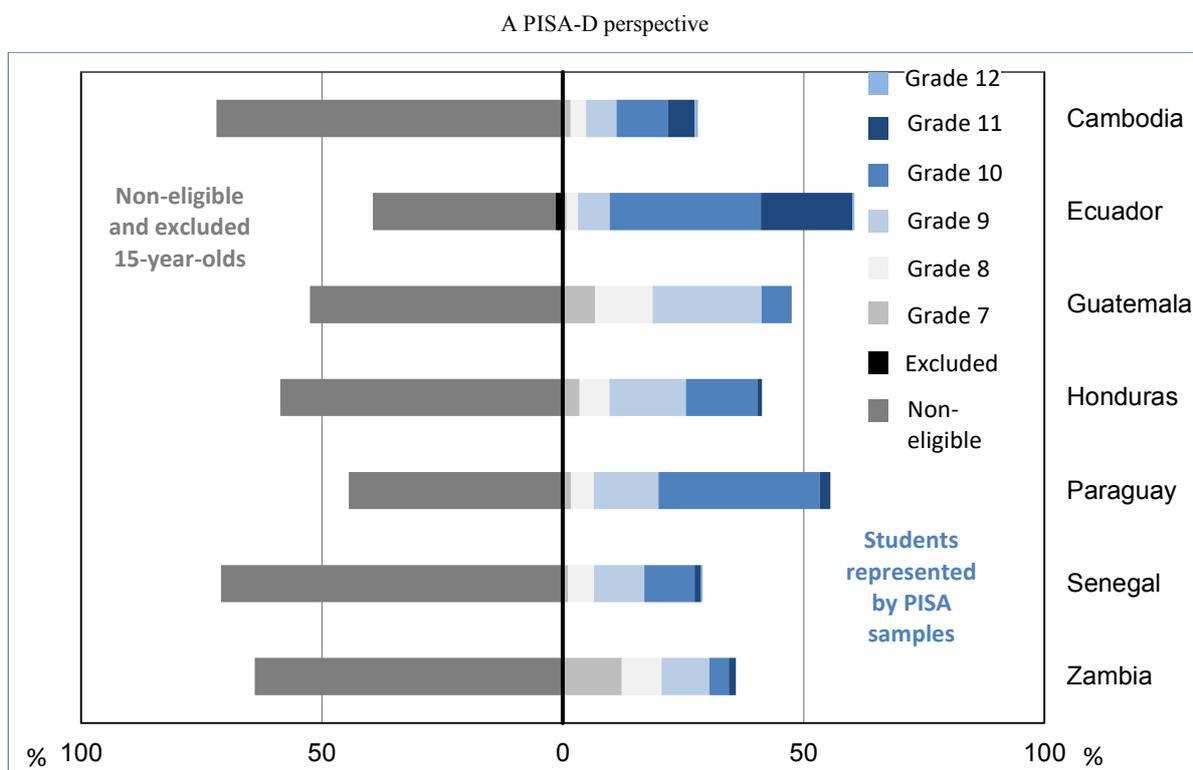
achievement in reading, mathematics and science in Cambodia with other comparable countries. The final section presents the main indicators of equality, focusing on gender, socio-economic disparities, geographic location (rural or urban), language minority status (language spoken at home), and school type (public/private).

2.1. Enrolment and attainment at age 15: a PISA-D perspective

2.1.1. What proportion of Cambodia's 15-year-olds does the PISA-D sample represent?

As in PISA, when the schools and students that would take the test were selected, not all 15-year-old children in the country were included in the lists from which the participants were drawn. As noted above, on top of a birth date in 2002, in order to participate in PISA-D 15-year-olds not only had to be enrolled in school at the time of testing, but also in Grade 7 or higher. Figure 2.1 shows the resulting coverage of the 15-year-old population in Cambodia, in comparison with the OECD and PISA-D averages. This number, known as Coverage Index 3 (OECD, 2017b) is obtained by dividing the number of students represented by the PISA-D sample (participating students, weighted by their sampling weights), by the total number of 15-year-olds estimated from demographic projections. Cambodia's coverage of 28.1% compares to an OECD average of 89% and a PISA-D average of 42.6%. While a small proportion of students in Grade 7 and above may be excluded from PISA and PISA-D because they have disabilities, live in remote areas, or have limited language proficiency, the largest share of non-covered 15-year olds is made up of children who are not in school, or who have been held back in primary school grades. Cambodia's situation is similar to that in Senegal and Zambia where a large share of students aged 15 are out of school or do not reach the secondary education yet.

Figure 2. 1. Educational attainment at age 15 in Cambodia



Source: PISA for Development Database.

In general, this coverage rate in Cambodia is consistent with the enrolment rate that can be computed from the country's administrative sources or household surveys. Apart from the small percentage of enrolled, but excluded students, discrepancies in enrolment figures between official accounts and PISA-D data can have several origins, including 1) differences in the primary source of data (households or schools); 2) differences in the methods used to collect the information (e.g. by asking schools for an overall number or a detailed list of students); 3) differences in definition of the target age; and 4) differences in the timing of collecting the information (PISA-D asks for student lists about one month before the assessment; administrative data may report enrolment as of the beginning of the school year).

Despite the potential for these differences, the enrolment in secondary education in Cambodia is well reflected in the PISA-D data. In other words, the sample that took the test is representative of the 15-year-old students in grade 7th or above of the country. Cambodia has recently expanded its enrolments at the secondary level. Several factors contributed to this expansion by lowering the social, economic or institutional barriers that had kept a large proportion of 15-year-olds out of school. Secondary school expansion across districts and communes throughout the country is a prime example of efforts in lowering these barriers. In the context of education SDG, Cambodia is committed to ensuring that each commune and district has at least a lower secondary school and an upper secondary school, respectively. At the same time, Cambodia has also strengthened support for at-risk families (e.g. in the form of scholarship and promotion programs). Connecting school to the community and to the development partners has also expanded access to education among girls and the minority. Rapid changes in the economy and increased urbanization in the country may also have played a role.

Despite significant progress in Cambodia over recent years, school drop-out rates remain a major preoccupation of policy makers. Globally, research has shown that young adults who have left school without attaining a formal qualification are at high risk of poor employment, suffer worse health conditions, and are over-represented among those committing crimes (Belfield & Levin, 2007; Lochner, 2011; Machin, Marie, & Vujić, 2011).

The level of attainment and participation in education at the age of 15, reflected in coverage rates and in the distribution of PISA-D students across grades, provides important contextual information for interpreting the mean performance and variation among the students assessed in Cambodia. Household surveys often show that children from poor households, ethnic minorities or rural areas face a greater risk of not attending or completing lower secondary education. Typically, as populations that had previously been excluded gain access to higher levels of schooling, a larger proportion of low-performing students will be included in PISA and PISA-D samples.

2.1.2. The distribution of PISA-D students across grades

Figure 2.1 also highlights that 15-year-olds in Cambodia may be found across a relatively wide range of school grades. In Cambodia, students in grade 10 represent 10.6% of the total number of 15-year-old population, whereas students in grades 7-9 (those who are behind track) represent about 11%. The share of students in grades 11 and 12 is about 6.3%. The share of students in grade 10 in Cambodia is larger than that in Zambia and Guatemala and is comparable to that in Honduras and Senegal. But it is three times as low as that in Paraguay and Ecuador. The high share of students at age 15 in grades 9 and 10, relative to the total number of 15-year-old population, is what policy makers aspire to attain as it indicates the effectiveness and efficiency of education policies in a country, showing that more students are not behind track, do not repeat a grade or are not out of school.

Within the PISA-D sample of Cambodia, 5.7% of the participants in 2017 are in Grade 7; and the share of students aged 15 who are in Grade 7 or Grade 8 (17%) is larger than across OECD (5%) and ASEAN (Association of Southeast Asian Nations) countries (6%) on average, but lower than that of PISA-D countries (25%) on average. At the same time, Cambodia also has a sizeable proportion of 15-year-old students in Grade 11 and Grade 12 – one or two years ahead of track – constituting over 20%, the proportion significantly higher than PISA-D, ASEAN and OECD averages. The share of students aged 15 in grade 10 (38%) (PISA and PISA-D modal grade) is comparable to PISA-D average but lower than that of ASEAN and OECD countries. This indicates many students still are behind track in Cambodia. In Cambodia, about 40% of students aged 15 are one or more years behind track, particularly among boys, meaning that at the age 15 they are still in grade 7, 8 or 9.

When compared to the share of students aged 15 in grade 10 in Thailand and Vietnam, Cambodia significantly lags behind its neighbors, with the former embracing 73% and the latter 86%. The share of students in this modal grade is also lower than those of Indonesia and other lower-middle income countries on average.

The variation in attainment among Cambodia's 15-year-old students also constitutes an important context for interpreting PISA-D results. By focusing on students of comparable age across countries, PISA-D enables the fair comparison of the skills of students who are about to enter adult life. However, it must be understood that these students might be at different points in their educational career, both across countries and within countries, and that the variation in PISA-D results therefore reflects, in part, the variety of educational trajectories of participating students.

2.1.3. Education attainment at age 15 by gender

As Cambodia has made basic education compulsory in recent years, attaining secondary education has become increasingly the norm for both boys and girls. More young women than ever before in Cambodia are participating in formal education and enrolling in higher education. The data² from Ministry of Education, Youth and Sport show that, as of 2016, 43% of girls are able to attend lower secondary school compared to only 35% of boys; more girls than boys are also able to attend the upper secondary school (20% vs. 17%) and tertiary education (24% vs. 17%)³.

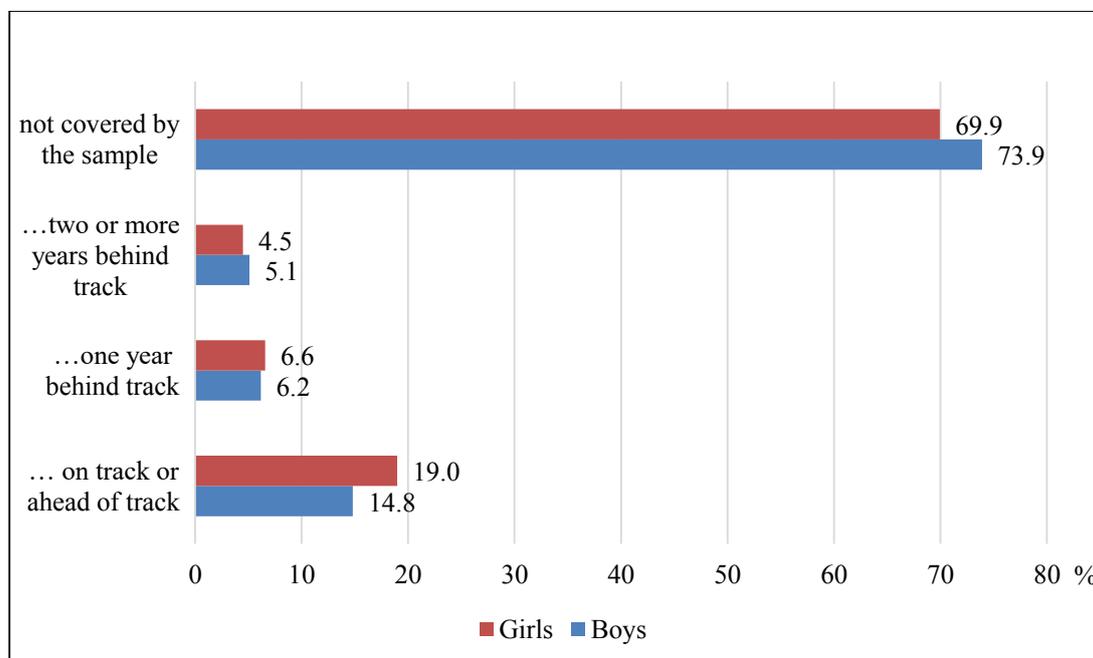
PISA-D data also reflect the higher attainment rates of girls compared to boys. In Cambodia, the percentage of 15-years-old students participating in PISA-D in 2017 was 28%. Assuming that the total population of 15-year-olds is composed of equal proportions of boys and girls, the percentage of 15-year-olds covered by the PISA-D sample for boys was 26% and for girls 30%.

Figure 2. 2 shows that, in Cambodia's total number of 15 years-old population, girls (19%) are more likely on track than boys (15%). In contrast, boys tend to be two or more years behind track than girls. Boys are also more likely than girls to be not covered by the PISA-D sample, meaning that boys are more likely than girls to be out of school or to delay their schooling.

In the PISA-D data, more participating female students (63%) than the participating male students (57%) are on track or ahead of track; the proportion of male students who are at least one year behind track is much higher than that of female students. This difference indicates that grade repetition, late entry and early drop-out are particularly critical issues among boys in Cambodia.

Figure 2. 2. Educational attainment at age 15 in Cambodia, by gender

A PISA-D perspective



Source: PISA for Development Database.

² MoEYS (2010/11-2015/16), *Education Indicators and Statistics*

³ *Cambodia Socio-Economic Survey 2014*

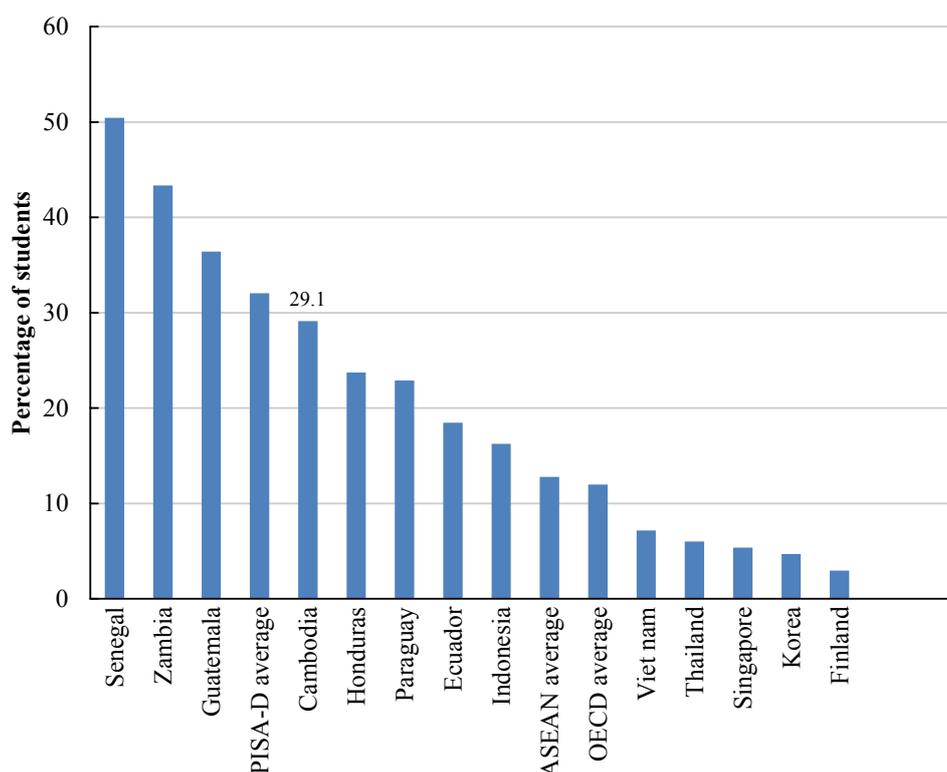
2.1.4. Grade repetition in Cambodia

At age 15, students in Cambodia who are “on track” in their progress are typically in grade 10. However, many students fall behind for various reasons. One of the important factors is grade repetition in lower grades.

In Cambodia 29% of students report having repeated a grade at least once in primary, lower secondary or upper secondary school, a comparable percentage to PISA-D on average but a higher percentage than across the OECD (12%) and ASEAN (13%) countries on average (Figure 2.3). Cambodia, in particular, has a significantly higher repetition rate than that of Indonesia (16%), Thailand (6%) and Vietnam (7%), while the high-performers, Singapore, South Korea and Finland, have 5% or less of grade repetition in their education systems. While in theory, students might also be delayed in their schooling career without formally repeating a grade, e.g. because of sickness or because they are required to help out in the family business or to care after a family member, in practice, in all countries covered by PISA variation in grade levels is strongly associated with the experience of grade repetition (OECD, 2016b): students who are behind track are most likely to report having repeated a grade.

Figure 2. 3. Grade repetition rate of Cambodia and others

Percentage of students who had repeated a grade in primary, lower secondary or upper secondary school



Source: PISA 2015 and PISA for Development Databases.

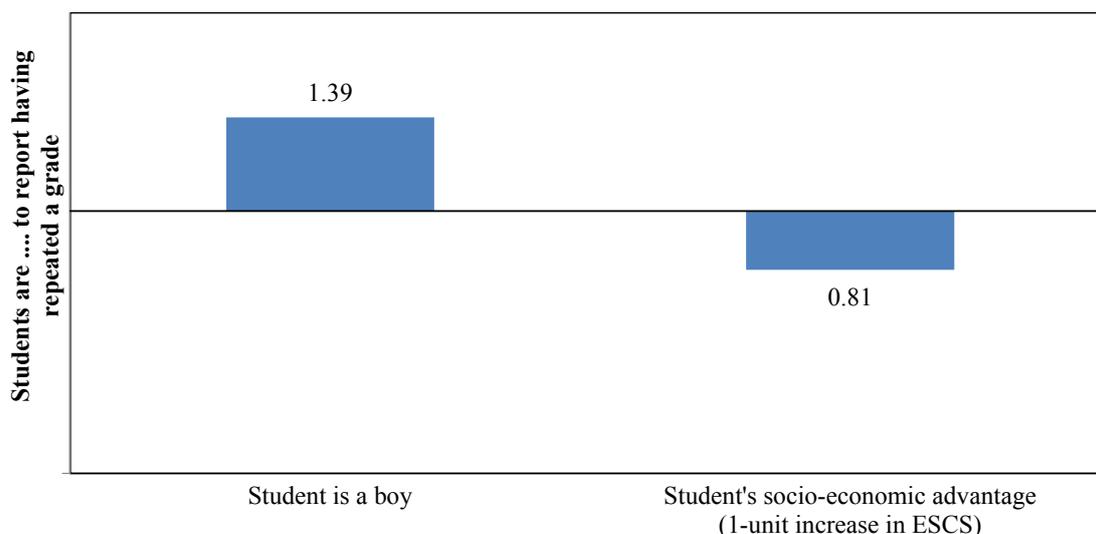
Grade repetition can be a costly policy, as it generally requires greater expenditure on education and delays students' entry into the labour market (OECD, 2013). In theory, repeating a grade gives students time to “catch up” with their peers if teachers believe they are not yet ready for more advanced coursework. If the curriculum is cumulative and further learning depends on a solid understanding of what has been previously learned, then

promoting students regardless of their mastery of the content might place low-performing students in an increasingly difficult position at higher grades. If the practice is widespread, it might compromise performance in the school or school system as a whole.

But reviews of research encompassing different disciplines, countries and time periods have mainly found negative effects of grade repetition on academic achievement (Jimerson, 2001). Because grade repetition represents a visible marker of underperformance, it can stigmatize children. Students who have repeated a grade often also show more negative behavior and attitudes towards school (Finn, 1989; Gottfredson, Fink, & Graham, 1994) and are more likely to drop out of school (Jacob & Lefgren, 2004; Manacorda, 2012). In addition, any positive short-term effects of grade repetition appear to decline over time (Allen et al., 2009).

What is more, the risk of grade repetition is much higher for some students. Many people would agree that performance, behavior and motivation are legitimate reasons for deciding which students repeat a grade; and the data clearly show these associations. What is more troubling is that, even after accounting for students' academic performance, behavior and motivation, students from a disadvantaged socio-economic background are more likely than more advantaged students to have repeated a grade in Cambodia; and boys are significantly more likely than girls to have repeated a grade in Cambodia (Figure 2.4). Boys are about 1.4 times more likely than girls to have repeated a grade in Cambodia. Retention is strongly associated with lower levels of student performance.

Figure 2. 4. Students' gender, socio-economic status and grade repetition



Source: PISA for Development Database.

Grade repetition is often unfair and is always costly, both for individual students who suffer from the stigma and for school systems as a whole. In addition, the practice of grade repetition reduces the incentive for teachers to diagnose and address underperformance in their classrooms. In systems where grade repetition is limited, teachers tend to assume greater responsibility for students' learning.

2.2. Student achievement in Cambodia

The easiest way to summarize student performance and compare countries' relative standing is through the mean performance of students in each country and domain assessed by PISA and PISA-D. But PISA and PISA-D also describe student performance by levels of proficiency (see Figures 2.5, 2.6 and 2.7); in particular, in each subject they identify a baseline level of performance (called Level 2) – this level is also regarded as the minimum level of proficiency in reading and mathematics expected at the end of lower secondary school, as measured for Education SDG monitoring against Target 4.1. In all three PISA core subjects, the baseline level is the level at which students are able to tackle tasks that require, at least, a minimal ability and disposition to think autonomously.

Figure 2. 5. PISA-D Reading proficiency levels

Level	Lower score limit	Characteristics of tasks
6	698	Tasks at this level typically require the reader to make multiple inferences, comparisons and contrasts that are both detailed and precise. They require demonstration of a full and detailed understanding of one or more texts and may involve integrating information from more than one text. Tasks may require the reader to deal with unfamiliar ideas, in the presence of prominent competing information, and to generate abstract categories for interpretations. <i>Reflect and evaluate</i> tasks may require the reader to hypothesise about or critically evaluate a complex text on an unfamiliar topic, taking into account multiple criteria or perspectives, and applying sophisticated understandings from beyond the text. A salient condition for <i>access and retrieve</i> tasks at this level is precision of analysis and fine attention to detail that is inconspicuous in the texts.
5	626	Tasks at this level that involve retrieving information require the reader to locate and organise several pieces of deeply embedded information, inferring which information in the text is relevant. Reflective tasks require critical evaluation or hypothesis, drawing on specialised knowledge. Both interpretative and reflective tasks require a full and detailed understanding of a text whose content or form is unfamiliar. For all processes of reading, tasks at this level typically involve dealing with concepts that are contrary to expectations.
4	553	Tasks at this level that involve retrieving information require the reader to locate and organise several pieces of embedded information. Some tasks at this level require interpreting the meaning of nuances of language in a section of text by taking into account the text as a whole. Other interpretative tasks require understanding and applying categories in an unfamiliar context. Reflective tasks at this level require readers to use formal or public knowledge to hypothesise about or critically evaluate a text. Readers must demonstrate an accurate understanding of long or complex texts whose content or form may be unfamiliar.
3	480	Tasks at this level require the reader to locate, and in some cases recognise the relationship between, several pieces of information that must meet multiple conditions. Interpretative tasks at this level require the reader to integrate several parts of a text in order to identify a main idea, understand a relationship or construe the meaning of a word or phrase. They need to take into account many features in comparing, contrasting or categorising. Often the required information is not prominent or there is much competing information; or there are other text obstacles, such as ideas that are contrary to expectation or negatively worded. Reflective tasks at this level may require connections, comparisons, and explanations, or they may require the reader to evaluate a feature of the text. Some reflective tasks require readers to demonstrate a fine understanding of the text in relation to familiar, everyday knowledge. Other tasks do not require detailed text comprehension but require the reader to draw on less common knowledge.
2	407	Some tasks at this level require the reader to locate one or more pieces of information, which may need to be inferred and may need to meet several conditions. Others require recognising the main idea in a text, understanding relationships, or construing meaning within a limited part of the text when the information is not prominent and the reader must make low level inferences. Tasks at this level may involve comparisons or contrasts based on a single feature in the text. Typical reflective tasks at this level require readers to make a comparison or several connections between the text and outside knowledge, by drawing on personal experience and attitudes.
1a	335	Tasks at this level require the reader to understand the literal meaning of sentences or short passages. Most tasks require the reader to locate one or more independent pieces of information; to recognise the main theme or author's purpose in a text about a familiar topic, or to make a simple connection between information in the text and common, everyday knowledge. The reader is directed to consider relevant factors in the task and in the text. In tasks requiring interpretation, the reader may need to make simple connections between adjacent pieces of information.
1b	262	Tasks at this level require the reader to understand the literal meaning of sentences within single short passages. Some tasks require students to locate a piece of explicitly stated information in a single given text. The reader is explicitly directed to consider relevant factors in the task and in the text. Most texts at level 1b are short and they typically contain limited competing information.
1c	189	Tasks at this level require the reader to understand the literal meaning of individual written words and phrases within sentences or very short, syntactically simple passages with familiar contexts. Some tasks require students to locate a single word or phrase in a short list or text based on literal matching cues. Texts at level 1c are short and they include little if any competing information. Texts support students with a familiar structure, explicit pointers to the information, repetition and illustration.

Descriptors 2 through 6 are the same as those used in PISA 2012 and 2015. Descriptors 1a and 1b have been revised for better alignment with the new descriptor for Level 1c.

Figure 2. 6. PISA-D Mathematics proficiency levels

Level	Lower score limit	Descriptor
6	669	At Level 6, students can conceptualise, generalise and utilise information based on their investigations and modelling of complex problem situations, and can use their knowledge in relatively non-standard contexts. They can link different information sources and representations and flexibly translate among them. Students at this level are capable of advanced mathematical thinking and reasoning. These students can apply this insight and understanding, along with a mastery of symbolic and formal mathematical operations and relationships, to develop new approaches and strategies for attacking novel situations. Students at this level can reflect on their actions, and can formulate and precisely communicate their actions and reflections regarding their findings, interpretations, arguments and the appropriateness of these to the original situation.
5	607	At Level 5, students can develop and work with models for complex situations, identifying constraints and specifying assumptions. They can select, compare and evaluate appropriate problem-solving strategies for dealing with complex problems related to these models. Students at this level can work strategically using broad, well-developed thinking and reasoning skills, appropriate linked representations, symbolic and formal characterisations, and insight pertaining to these situations. They begin to reflect on their work and can formulate and communicate their interpretations and reasoning.
4	545	At Level 4, students can work effectively with explicit models for complex concrete situations that may involve constraints or call for making assumptions. They can select and integrate different representations, including symbolic, linking them directly to aspects of real-world situations. Students at this level can utilise their limited range of skills and can reason with some insight, in straightforward contexts. They can construct and communicate explanations and arguments based on their interpretations, arguments and
3	482	At Level 3, students can execute clearly described procedures, including those that require sequential decisions. Their interpretations are sufficiently sound to be a base for building a simple model or for selecting and applying simple problem-solving strategies. Students at this level can interpret and use representations based on different information sources and reason directly from them. They typically show some ability to handle percentages, fractions and decimal numbers, and to work with proportional relationships. Their solutions reflect that they have engaged in basic interpretation and reasoning.
2	420	At Level 2, students can interpret and recognise situations in contexts that require no more than direct inference. They can extract relevant information from a single source and make use of a single representational mode. Students at this level can employ basic algorithms, formulae, procedures or conventions to solve problems involving whole numbers. They are capable of making literal interpretations of the results.
1a	358	At Level 1a, students can answer questions involving familiar contexts where all relevant information is present and the questions are clearly defined. They are able to identify information and to carry out routine procedures according to direct instructions in explicit situations. They can perform actions that are almost always obvious and follow immediately from the given stimuli.
1b	295	At Level 1b, students can respond to questions involving easy to understand contexts where all relevant information is clearly given in a simple representation (for example tabular or graphic) and defined in a short syntactically simple text. They are able to follow clearly prescribed instructions.
1c	236	At Level 1c, students can respond to questions involving easy to understand contexts where all relevant information is clearly given in a simple, familiar format (for example a small table or picture) and defined in a very short syntactically simple text. They are able to follow a clear instruction describing a single step or operation.

Descriptors 2 through 6 are the same as those used in PISA 2012, and level 1 was renamed Level 1a.

Figure 2. 7. PISA-D Science proficiency levels

Level	Lower score limit	Descriptor
6	708	At Level 6, students can draw on a range of inter-related scientific ideas and concepts from the physical, life and earth and space sciences and use content, procedural and epistemic knowledge in order to offer explanatory hypotheses of novel scientific phenomena, events and processes or to make predictions. In interpreting data and evidence, they are able to discriminate between relevant and irrelevant information and can draw on knowledge external to the normal school curriculum. They can distinguish between arguments that are based on scientific evidence and theory and those based on other considerations. Level 6 students can evaluate competing designs of complex experiments, field studies or simulations and justify their choices.
5	633	At Level 5, students can use abstract scientific ideas or concepts to explain unfamiliar and more complex phenomena, events and processes involving multiple causal links. They are able to apply more sophisticated epistemic knowledge to evaluate alternative experimental designs and justify their choices and use theoretical knowledge to interpret information or make predictions. Level 5 students can evaluate ways of exploring a given question scientifically and identify limitations in interpretations of data sets including sources and the effects of uncertainty in scientific data.
4	559	At Level 4, students can use more complex or more abstract content knowledge, which is either provided or recalled, to construct explanations of more complex or less familiar events and processes. They can conduct experiments involving two or more independent variables in a constrained context. They are able to justify an experimental design, drawing on elements of procedural and epistemic knowledge. Level 4 students can interpret data drawn from a moderately complex data set or less familiar context, draw appropriate conclusions that go beyond the data and provide justifications for their choices.
3	484	At Level 3, students can draw upon moderately complex content knowledge to identify or construct explanations of familiar phenomena. In less familiar or more complex situations, they can construct explanations with relevant cueing or support. They can draw on elements of procedural or epistemic knowledge to carry out a simple experiment in a constrained context. Level 3 students are able to distinguish between scientific and non-scientific issues and identify the evidence supporting a scientific claim.
2	410	At Level 2, students are able to draw on scientific content knowledge or procedural knowledge to identify an appropriate scientific explanation, interpret data, and identify the question being addressed in a simple experimental design. They can use basic or everyday scientific knowledge to identify a valid conclusion from a simple data set. Level 2 students demonstrate basic epistemic knowledge by being able to identify questions that could be investigated scientifically.
1a	335	At Level 1a, students are able to draw on basic scientific content or procedural knowledge to recognise or identify explanations of simple scientific phenomenon presented using scientific language. With support, they can undertake structured scientific enquiries with no more than two variables. They are able to identify simple causal or correlational relationships and interpret graphical and visual data that require a low level of cognitive demand. Level 1a students can select the best scientific explanation for given data in familiar personal, local and global contexts. When presented with multiple factors of varying complexity requiring a low level of content knowledge or cognitive demand, students can select the best scientific explanations or procedures in a question in most but not all instances.
1b	260	At Level 1b, students can draw on everyday scientific knowledge to recognise aspects of familiar or simple phenomena presented using minimal scientific language. They are able to identify simple patterns in data, recognise basic scientific terms, identify the real-world features represented by simple models, and follow explicit instructions to carry out a scientific procedure.
1c	186	At Level 1c, students can recall an element of everyday scientific information or observations of common macroscopic phenomena to identify a correct scientific explanation or conclusion which has been communicated using non-technical or non-academic language and supported by illustrations.

Descriptors 3 through 6 are the same as those used in PISA 2015, while descriptors 2,1a and 1b have been revised for a better progression in knowledge from 1c. The PISA-D test did not include items at Level 1c; the report therefore does not distinguish between performance at Level 1c and “below Level 1c”, but reports them together as “Below Level 1b”.

In reading, the baseline level of skills is defined as the level at which students can not only read simple and familiar texts and understand them literally, but also demonstrate, even in the absence of explicit directions, some ability to connect several pieces of information, draw inferences that go beyond the explicitly stated information, and connect a text to their personal experience and knowledge.

In mathematics, the baseline level of skills is defined as the level at which students can not only carry out routine procedures, such as an arithmetic operation, in situations where all the

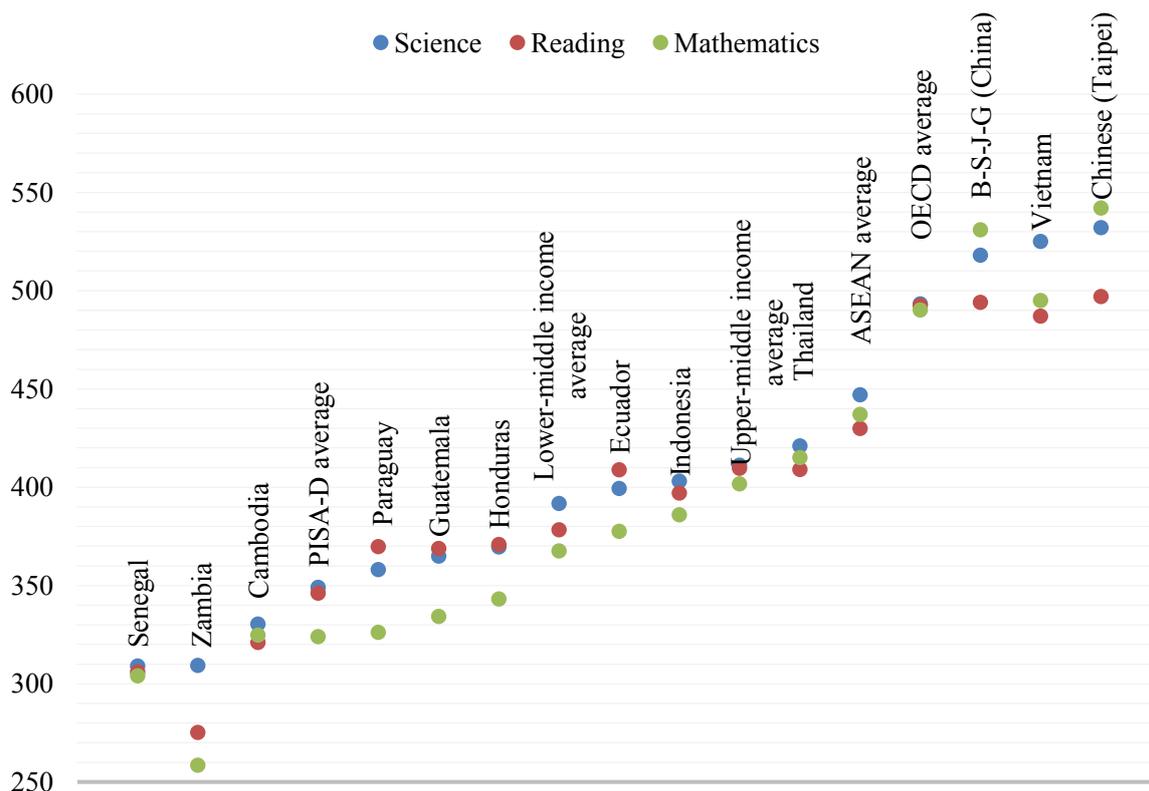
instructions are given to them, but can also interpret and recognise how a (simple) situation (e.g. comparing the total distance across two alternative routes, or converting prices into a different currency) can be represented mathematically.

In science, the baseline level of proficiency corresponds to the level at which students can draw on their knowledge of basic science content and procedures to interpret data, identify the question being addressed in a simple experiment, or identify whether a conclusion is valid based on the data provided.

Several other levels of proficiency have been described, to assist in the interpretation of PISA-D scores. Full descriptions can be found in Figure 2.5, Figure 2.6 and Figure 2.7. Comparing the proportion of students below and above the baseline levels of proficiency and the proportion who reach the highest levels of proficiency, makes it possible not only to gauge the average achievement level (indicated by Cambodia’s mean scores), but also the capacity of the Cambodia education system to nurture excellence and to ensure minimum standards. The latter is an aspect of inclusiveness, i.e. of Cambodia education system’s success in guaranteeing children’s capabilities to pursue what they value in life.

2.2.1. Performance in reading, mathematics and science

Figure 2. 8. Snapshot of performance in reading, mathematics and science



Source: PISA 2015 and PISA for Development Databases.

Figure 2.8 shows the average performance of Cambodia’s students across the three domains, in comparison to the OECD and ASEAN averages, as well as their relative standing among the countries and economies with valid and comparable results in PISA 2015 or PISA-D.

Three main observations emerge from this figure and from the comparisons of Cambodia's mean performance with other countries in the three subjects:

- First, Cambodia scores significantly below the OECD and ASEAN averages in all three domains. This is, however, not the case in the PISA-D context: in Cambodia student performance in mathematics (325 score points) is similar to the PISA-D average (324 score points).
- Second, when comparing Cambodia's performance to more comparable countries (i.e., those that are either geographically close to the country or have a similar Gross National Income) we found the following significant differences – students aged 15 in Cambodia were more likely to have higher performances in all domains than those in Zambia and Senegal. However, when compared within the ASEAN context, students aged 15 in Cambodia tended to have significantly lower performance than those in Indonesia, Thailand and Vietnam.
- Third, in Cambodia, student performance in reading (321 score points) is significantly below PISA-D average (346 score points). Reading appeared to be the weakest of the three PISA-D subjects. Across OECD and ASEAN countries, higher performances in mathematics and science tended to be strongly associated with the higher performance in reading, reflecting that improving reading literacy among students is key to student performance in other subjects.

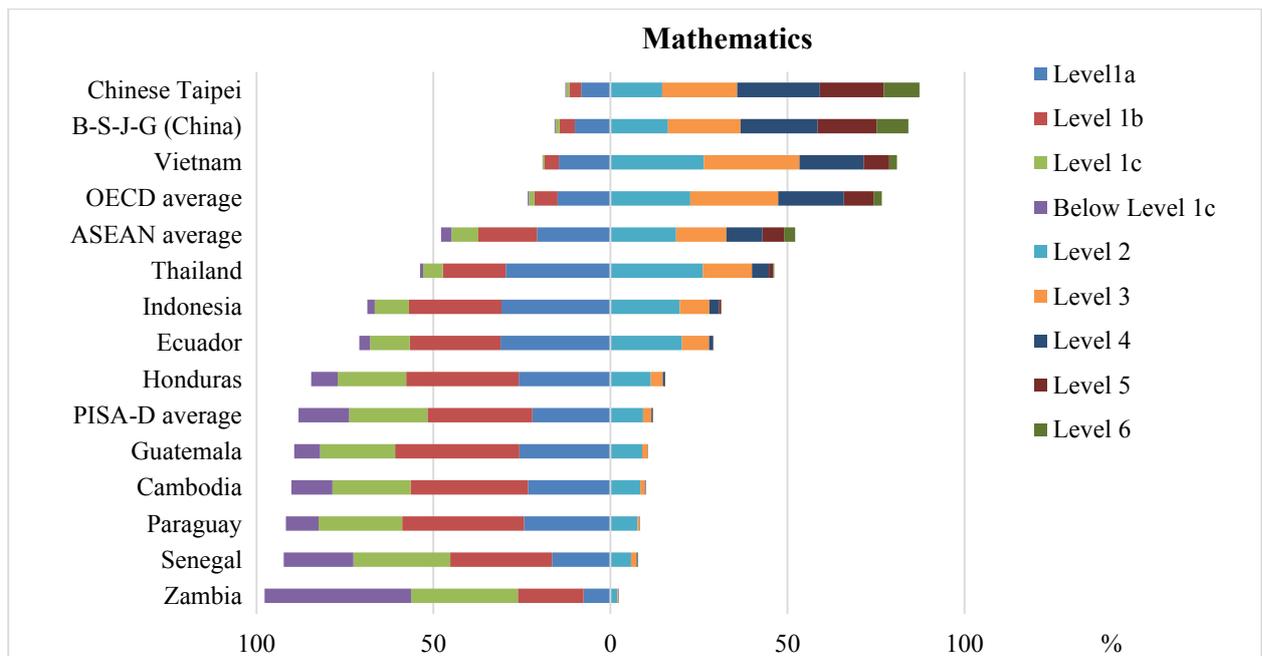
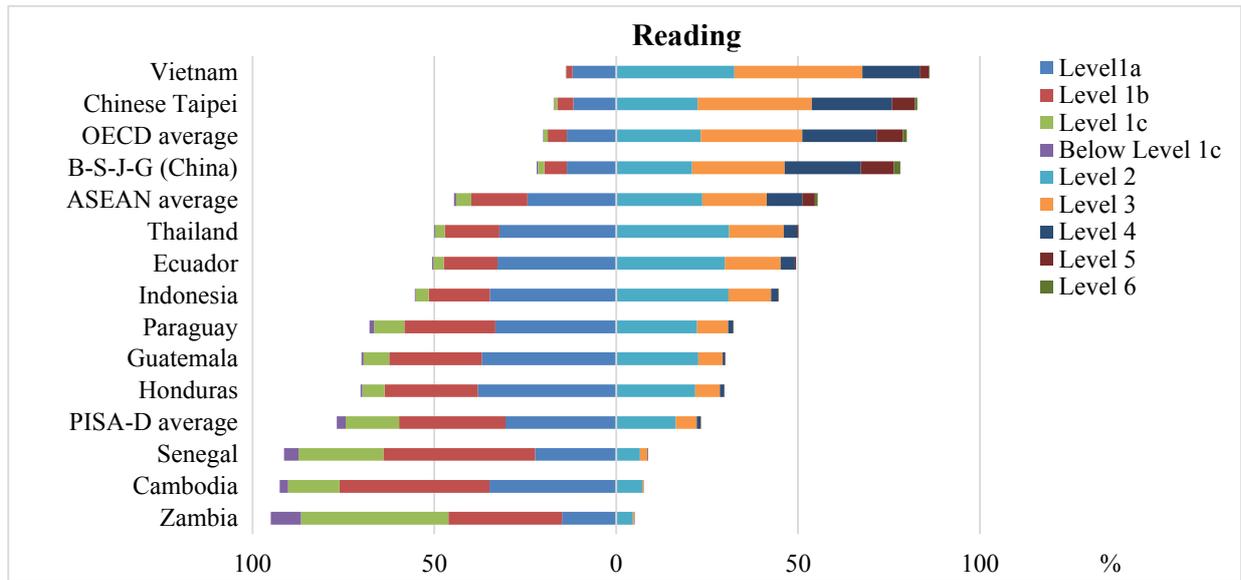
As noted above, an important indicator for monitoring countries' progress towards achieving Target 4.1 of SDG Goal 4 is the proportion of 15-year-olds who have achieved at least minimum proficiency levels in reading and mathematics. The baseline levels of proficiency, defined above, can be used to monitor countries' success.

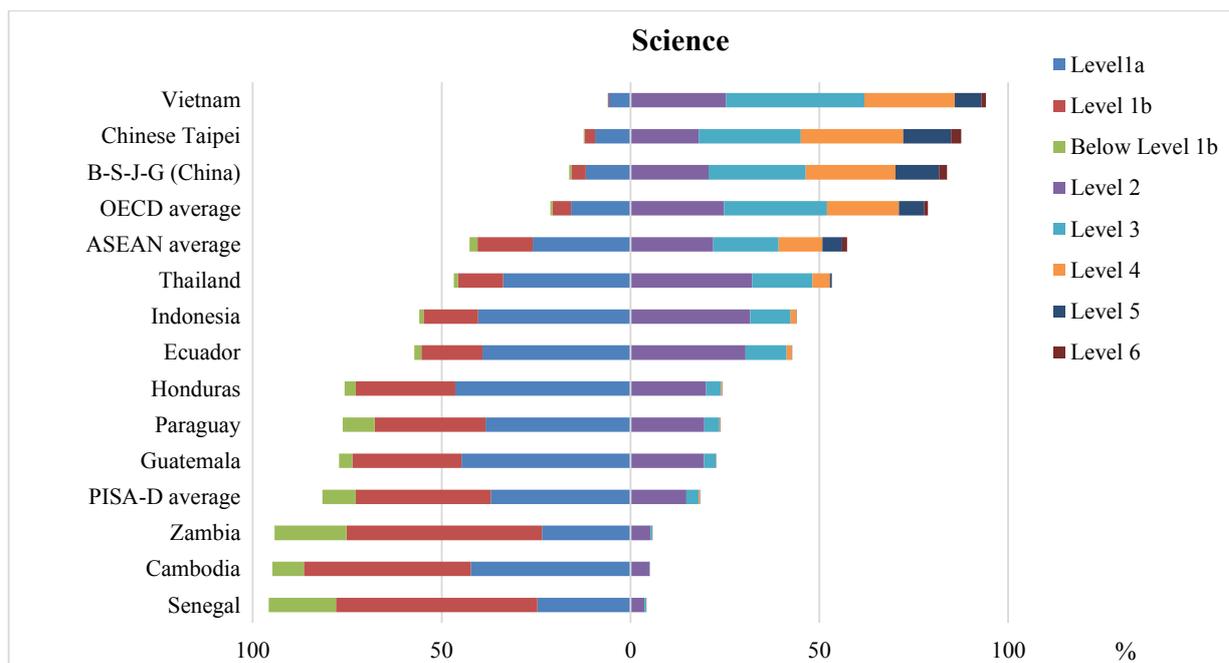
Cambodia has a high share of students performing below the baseline level of proficiency in reading and mathematics, as well as in science, and a low share of high-performing students reaching the highest levels of proficiency in at least one subject. Figure 2. 9 presents the share of students above the baseline in each subject in Cambodia in comparison with the OECD, PISA-D and ASEAN averages. In particular, it highlights that in Cambodia there is a high proportion of students who perform below the baseline in all the three domains (92% in reading, 90% in mathematics and 95% in science).

While many students do not reach the baseline levels of proficiency, it should also be borne in mind that not all 15-year-olds in Cambodia are "students"; as in other middle- and low-income countries, many 15-year-olds are not eligible to participate in PISA because these young people have dropped out of school, never attended school, or are in grade 6 and below (see Figure 2.1)

When the proportion of students who reach the baseline level is expressed as a share of the total 15-year-old population (assuming that the 15-year-olds not eligible to participate in school-based PISA assessment would not have reached the baseline level of performance if they sat the PISA test), only 2.1% of 15-year-olds in Cambodia can be said to reach a baseline level of performance in reading; 2.7% of 15-year-olds reach the baseline level of performance in mathematics; and 1.4% the baseline level of performance in science.

Figure 2. 9. Students' proficiency in reading, mathematics and science





Source: PISA 2015 and PISA for Development Databases.

Note: B-S-J-G (China) refers to Beijing-Shanghai-Jiangsu-Guangdong (China).

Less than 2% of 15-year-old students in Cambodia demonstrated high levels of knowledge and skills (at level 3 or above), which is the average competency level across OECD countries. Students at these levels are able to locate, recognize, connect, interpret and compare/contrast different elements of texts and its relationships to identify main ideas and reflect on the meaning of texts in less familiar and/or unfamiliar contexts. In mathematics and science, in addition to the ability to apply content knowledge, students at these levels can interpret and reason with some insight in straightforward contexts and to communicate evidence to support mathematical and scientific claims. These levels of knowledge and skills are important attributes for future citizens and workers and the challenges for Cambodia are to increase the share of high performing students and, of course, to reduce the socio-economic disparities among low/top performers.

The 10% best-performing students in Cambodia are comparable to the 10% best performing students in the PISA-D countries in mathematics but have significantly lower performance than the 10% best performing students in ASEAN countries, let alone those in the OECD. The performance gap between the 10% best-performing students in Cambodia and those in ASEAN countries is 124 score points, equivalent of more than 4 years of schooling. This shows that Cambodia's education system needs to focus more on student's competence from the low grades in order to compete with the students in ASEAN countries or beyond.

2.2.2. Low performers in reading

Using PISA-D data we can describe the (limited) skills of low-performing students in particular, and thereby highlight with accuracy how far Cambodia is from ensuring that schools are places of learning for all students.

Students who perform at Level 1a in reading can retrieve one or more independent pieces of information that are explicitly stated, identify the main theme or the author's intent in a text about a familiar topic, or make a simple connection by reflecting on the relationship between information in the text and common, everyday knowledge. The required information in the

text is usually prominent and there is little, if any, competing information. The student is explicitly directed to the relevant factors to consider. This level identifies students who perform below the baseline in reading, but not too far from it (OECD, 2017a). Among low-performing students, these students are the closest to achieving the baseline level.

Across OECD countries, an average of 14% of students can solve Level 1a tasks in reading, but cannot solve tasks located above this level. Some 6.5% of students do not even attain Level 1a. Level 1a is the highest level of proficiency for about 35% of students in Cambodia (Figure 2.9).

Some students perform even below Level 1a, however. At Level 1b, students can solve only the easiest text comprehension tasks included in the PISA-D assessment, such as retrieving a single piece of explicitly stated information, e.g. from the title of a simple, familiar text or from a simple list (OECD, 2017a). In Cambodia, Level 1b is the modal proficiency level of students, meaning that a greater share of students performs at Level 1b than at any other proficiency level in PISA-D. The share of students who are at best proficient at Level 1b is 41% in Cambodia.

Students who perform below Level 1b, at Level 1c, can only engage at best in basic reading processes. They can demonstrate their command of some sub-skills, or building blocks, of reading literacy, such as literal sentence or passage comprehension, but are unable to integrate and apply these skills to longer texts or to make simple inferences (see Box 2.3).

In Cambodia, 14% of 15-year-old students enrolled in grade 7 and above performed at Level 1c in PISA-D, and 2% performed below this level.

Box 2.3. How PISA-D measures basic components of reading literacy

PISA-D included additional item types in the PISA reading assessment in order to assess the extent to which students understand the literal and inferential meaning of words, sentences and passages.

Two types of tasks were defined: sentence processing and passage comprehension.

The sentence processing tasks assess the ability to comprehend written sentences of varying lengths. In the PISA-D assessment, students see a set of sentences and must decide for each of the sentences if they make sense (“yes”) or do not make sense (“no”) with respect to general knowledge about the real world (as in the first item shown below), or the internal logic of the sentence itself (as in the second item).

Sample task 1

Directions: Circle YES if the sentence makes sense. Circle NO if the sentence does not make sense.

The red car had a flat tyre.	YES	NO
Airplanes are made of dogs.	YES	NO

Sample task 1 was developed for illustration purposes, and was not included in the assessment.

Passage comprehension tasks assess the ability to understand the literal meaning or “gist” of connected text and to make simple inferences across sentences in the text. In the PISA-D assessment, students see a paragraph from which certain words are purposefully deleted. The task is for the test-taker to complete the missing words by choosing one among three proposed options to complete the text. Sample item 2 below shows an example of a passage comprehension task with multiple items embedded within it.

*Sample task 2***PASSAGE COMPREHENSION**

In items assessing passage comprehension, respondents are asked to read a passage in which they are required at certain points to select the word that makes sense from the two alternatives provided.

To the editor: Yesterday, it was announced that the cost of riding the bus will increase. The price will go up by twenty percent starting next wife/month. As someone who rides the bus every day, I am upset by this foot/increase. I understand that the cost of gasoline/student has risen. I also understand that riders have to pay a fair price/snake for bus service. I am willing to pay a little more because I rely on the bus to get to object/ work. But an increase/uncle of twenty percent is too much.

This increase is especially difficult to accept when you see the city's plans to build a new sports stadium. The government will spend millions on this project even though we already have a science/stadium. If we delay the stadium, some of that money can be used to offset the increase in bus fares/views. Then, in a few years, we can decide if we really do need a new sports cloth/arena. Please let the city council know you care about this issue by attending the next public meeting/frames.

Sample item 2 assesses passage comprehension and likely corresponds to the upper limit of Level 1c (close to an easy Level 1b task) on the PISA scale.

Source: PISA for Development Reading Framework (OECD, 2018).

2.2.3. Low performers in mathematics

Students who perform at Level 1 in mathematics can answer mathematics questions involving familiar contexts where all the relevant information is present and the questions are clearly defined. They are able to carry out routine procedures – such as an arithmetic operation – according to direct instructions, in explicit situations (OECD, 2017a).

Students who perform below Level 1 may be able to perform direct and straightforward mathematical tasks such as reading a single value from a simple chart or table, where the labels used in the chart or table match the words in the question; but they are typically unable to do arithmetic calculations that do not use whole numbers or if they are not given clear and well-defined instructions (OECD, 2017a).

Figure 2.9 highlights the severe difficulty of many students in Cambodia in situations that require mathematical problem-solving ability. 90% of students in Cambodia do not reach the baseline level of performance in mathematics.

Among low-performing students, 23% of students perform at Level 1a, and are only able to perform routine tasks in well-defined situations, where the required action is almost always obvious. But 67% of students perform even below this Level, at Levels 1b or 1c or below Level 1c.

Level 1b is the highest level of proficiency in mathematics attained by about 33% of students in Cambodia. These students can follow clearly prescribed instructions given in a syntactically simple text and sometimes perform the first step of a two-step solution of a mathematical problem.

At Level 1c, students can only understand mathematics questions involving simple, everyday contexts where all relevant information is clearly given and defined in a very short syntactically simple text. They are able to follow a single clearly prescribed instruction to perform a single step or operation. 23% of 15-year-old students in Cambodia are only proficient at Level 1c, and 11% perform below Level 1c.

2.2.4. Low performers in science

Students who perform at Level 1a in science can use common content and procedural knowledge to recognize or identify explanations of simple scientific phenomena. With support, they can undertake a scientific enquiry with no more than two variables (e.g. an input and an output variable). They can identify simple causal or correlational relationships and interpret graphical and visual data that require a low level of cognitive ability. Students at Level 1a can select the best scientific explanation for given data in familiar contexts (OECD, 2017a).

Across OECD countries, 16% of students perform at Level 1a, and only 5.5% of students perform below it. In Cambodia, in contrast, 42% attained Level 1a and 53% performed at Level 1b or below.

Students who perform at Level 1b in science can use common content knowledge to recognize aspects of simple scientific phenomena. They can identify simple patterns in data, recognize basic scientific terms and follow explicit instructions to carry out a scientific procedure (OECD, 2017a). Across OECD countries, 4.9% of students performed at Level 1b, and only 0.6% of students performed below it. In Cambodia, in contrast, 44% attained Level 1b, and 8% of students performed below it.

2.3. Equality of performance in reading, mathematics and science

Inclusion and fairness in education requires that all children have access to educational opportunities that lead to effective learning outcomes, irrespective of their gender, their ethnicity, or their parents' wealth, education or occupation. Thanks to detailed information about the background of participating students, PISA-D can measure inclusion and fairness among the student population; however, this represents only a partial description of inclusion and fairness in education – equity within the system. Full analysis would also require information about those 15-year-olds who are not covered by PISA-D samples – equity in access to the system.

2.3.1. Gender gaps in performance

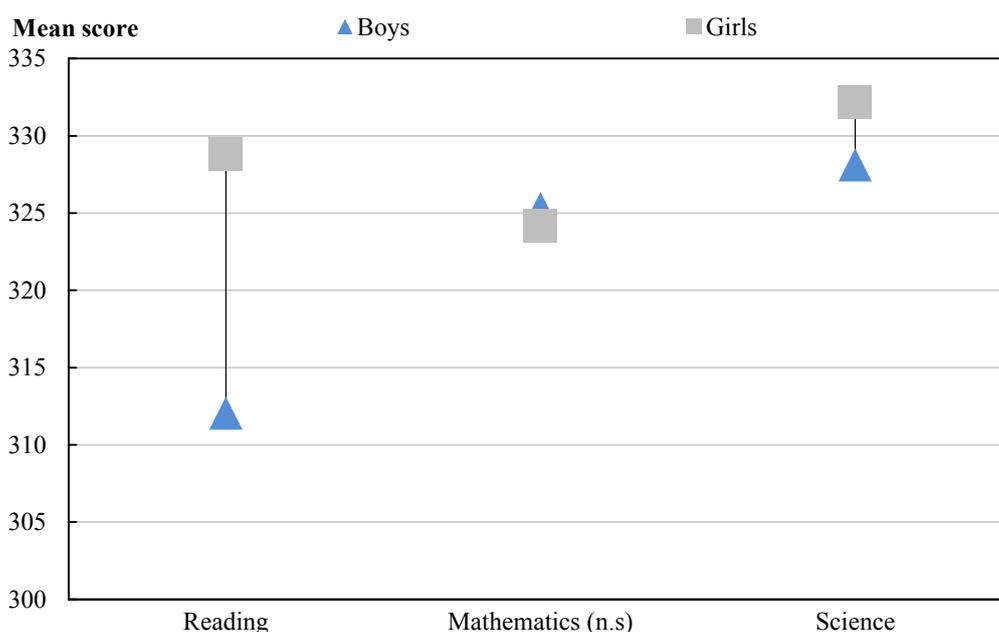
Figure 2.10 presents a summary of the differences between boys' and girls' performance in PISA-D in Cambodia. In common with all countries that participated in PISA 2015 and PISA-D (except Senegal), in Cambodia boys' average reading performance is lower than the average performance of girls by 17 score points. However, in Cambodia, the gap is smaller than that observed across OECD (27 score points), ASEAN (23 score points) and lower-middle income countries (28 score points). The gender gap in reading performance in Cambodia is larger than across the PISA-D countries, particularly in comparison with that in Ecuador (8 score points), Honduras (12 score points) and Senegal (1 score point).

In mathematics, on the other hand, boys outperformed girls by 8 and 10 score points on average for OECD and PISA-D countries, respectively. In common with ASEAN countries (Thailand, Vietnam and Indonesia,), in Cambodia, boys and girls performed similarly, reflecting low gender inequality in mathematics performance. But the fact that both boys

and girls had low performance in this subject in turn suggests a grave concern over the quality of mathematic teaching and learning.

In science, girls outperformed boys by 4 score points on average; this small gap is similarly found in ASEAN and lower-middle income countries. The opposite is true for OECD and PISA-D countries, where boys report higher performance than girls in this subject. However, across OECD and PISA-D countries, gender gaps in science performance are not substantial compared to what has been observed in reading performance.

Figure 2. 10. Gender differences in reading, mathematics and science performance



Source: PISA for Development Database.

Overall, in Cambodia, girls are significantly better than boys in reading; girls are also slightly better than boys in science. In mathematics, gender does not appear to play a significant role in student performance. These performance differences in favour of girls reinforce the attainment differences observed earlier in this chapter, and may reflect past efforts to promote the education of girls in the context of the opening of Cambodia to the global economy.

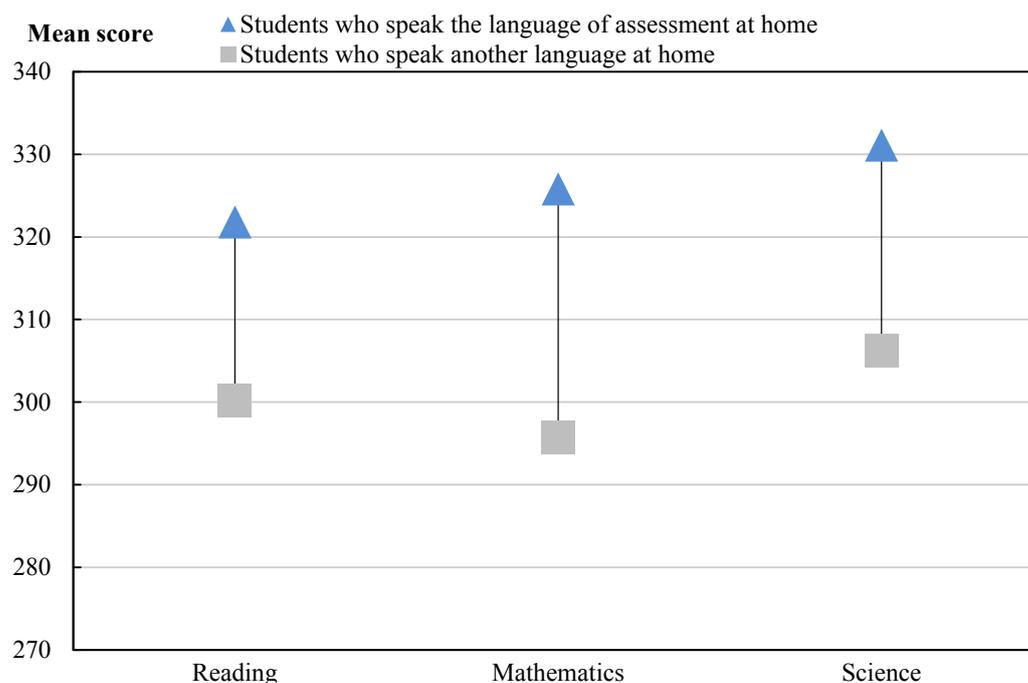
2.3.2. Achievement by language spoken at home and language of instruction

Speaking a different language at home from the language of assessment is one of the barriers to learning that students must try to overcome. In Cambodia, where the language of instruction in grades 7 and above is Khmer, 2.2% of students assessed in PISA-D reported speaking a different language at home such as French, Chinese and English. Meanwhile, about 1% of students assessed in PISA-D reported that their teachers used a different language in instruction.

In Cambodia, using a mainstream language at home and in instruction appears to benefit students in the mean performances of all the three domains. Students who speak Khmer at home perform better in reading than students who do not speak Khmer at home with a performance difference of 22 score points. Promoting the mainstream language at home and

in the classroom instruction matters to student performances in tasks that require extensive reading as those in PISA-D. However, given the small sample of students speaking a different language at home and of other languages used as the medium of instruction, comparability of such differences should be taken with caution.

Figure 2. 11. Score-point difference in reading, mathematics and science, by whether students speak the language of assessment at home



Source: PISA for Development Database.

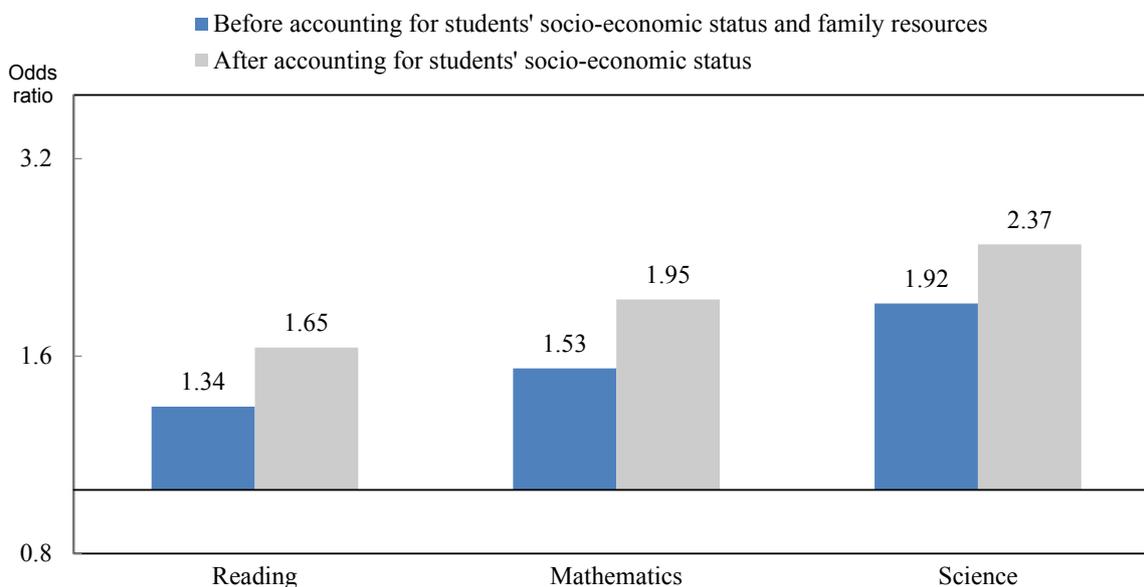
On average across OECD countries, the odds of low performance in reading and mathematics among students who speak a different language at home are more than twice as high (odds ratio of 2.3) as the odds among students who speak the same language, before accounting for other student-related variables, including socio-economic status and immigrant background. After accounting for these characteristics, language-minority students in OECD countries still have 1.4 times higher odds of underachieving than students who speak the language of instruction at home. Yet, the specific association varies from country to country.

In Cambodia, speaking a different language at home increased the likelihood of low performance in mathematics even after accounting for the socio-economic status variable. Students who do not speak Khmer language at home were 1.53 times more likely to perform below the baseline in mathematics. The increased likelihood of getting the performance below the baseline was also found in reading and science performance. Overall, speaking a different language at home in Cambodia does not clearly constitute substantial added values to student performance in reading, mathematics and science.

Due to exclusion of remote schools in Cambodia's sample, speaking a different language at home does not necessarily denote the language minority but rather the presence of other foreign languages. Speaking a different language at home represents a luxury of learning another language and the opportunity to acquire diverse learning strategies necessary for

coping with different and lengthy tasks. Nonetheless, the fact that those students are more likely to perform below par indicates that attention to Khmer language might be in question.

Figure 2. 12. Likelihood of low performance in reading, mathematics and science, by whether the students speak the language of assessment at home



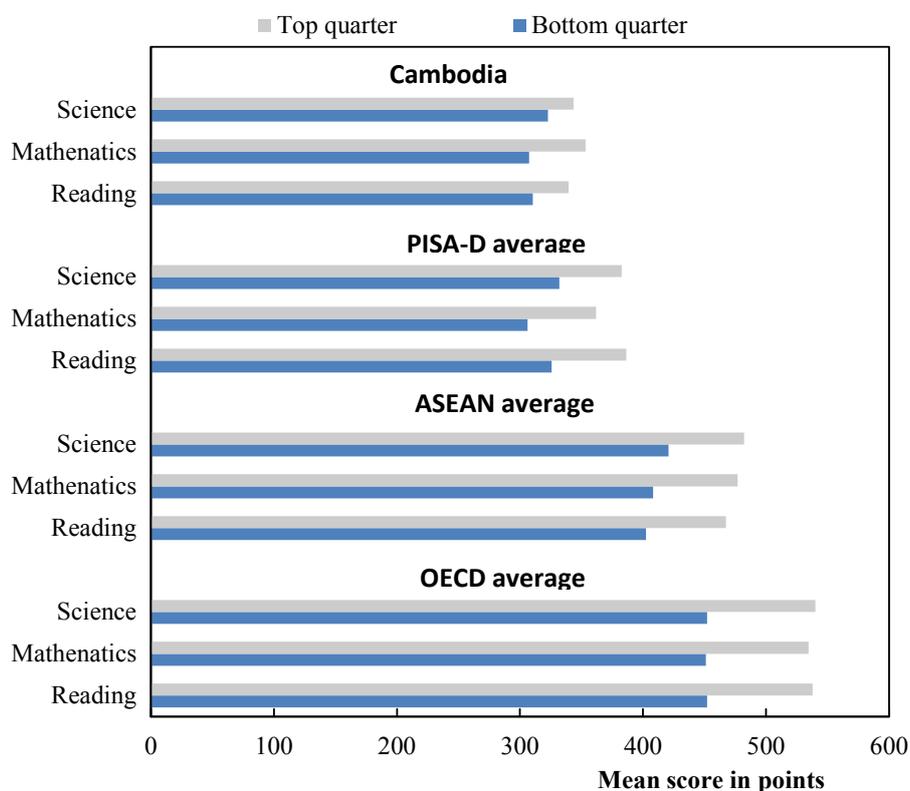
Source: PISA for Development Database.

2.3.3. Socio-economic inequalities in performance

The equity of education systems with respect to students from different socio-economic backgrounds can be examined through different statistical aspects of the relationship between students' performance in PISA-D and a students' socio-economic status. To simplify the exposition, and because this relationship is very similar for all domains assessed in PISA-D, this chapter only examines the relationship between reading and mathematics performance and the PISA-D index of economic, social and cultural status (see Box 2.2).

Three aspects of the relationship between socio-economic status and performance deserve particular attention: the *level*, the *slope* and the *strength* of the relationship. The level indicates whether the performance of students in a particular country or education system is higher or lower than that of students in other countries facing similar socio-economic conditions. The slope indicates to what extent students with more advantaged socio-economic backgrounds perform better than disadvantaged students, within each country on average. The strength indicates how small the chances are for disadvantaged students to perform as well as more advantaged students. Policies that promote equity and inclusion in education are expected to "raise and level" this relationship – i.e. to result in *higher levels*, but *milder slopes* and *weaker relationships*. Box 2.4 and Figure 2.15 show the average relationship between socio-economic status and performance across OECD countries, and illustrate the level, the slope and the strength graphically.

Figure 2. 13. Main indicators of socio-economic inequalities in education



Source: PISA 2015 and PISA for Development Databases.

Figure 2.13 shows the main indicators of socio-economic inequalities in reading, mathematics and science performance for Cambodia.

The mean reading, mathematics and science performance of students at different levels of the PISA-D index of economic, social and cultural status shows that students in Cambodia tend to do worse than students across OECD countries and in benchmarking ASEAN countries with similar socio-economic resources such as Indonesia, Thailand and Vietnam. In Cambodia, the performance of the country’s most disadvantaged students is below that of similarly disadvantaged students across OECD and ASEAN countries. The mathematics performance is, however, comparable to that of similarly disadvantaged students across the PISA-D countries. When examining the mean performance differences at the highest end of the socio-economic status, the most advantaged students in Cambodia systematically perform below similarly advantaged students across OECD, ASEAN and PISA-D countries. In fact, the reading performance of Cambodia’s students lies below the performance achieved by similar students in OECD and ASEAN countries at all levels of socio-economic status.

When examining the inequality in learning outcomes through the slope and the strength of the relationship between mean performance and socio-economic status, Cambodia stood out as having relatively mild slopes, meaning that socio-economic status was associated with smaller differences in mean performance than across OECD, ASEAN and even PISA-D countries on average. At the same time, the relationship between socio-economic status and performance was weaker than on average across those countries. The explained variances in student performance across the three domains stood between 4% and 7%, while the OECD and ASEAN countries witnessed at least 10% of explained variance in student performance

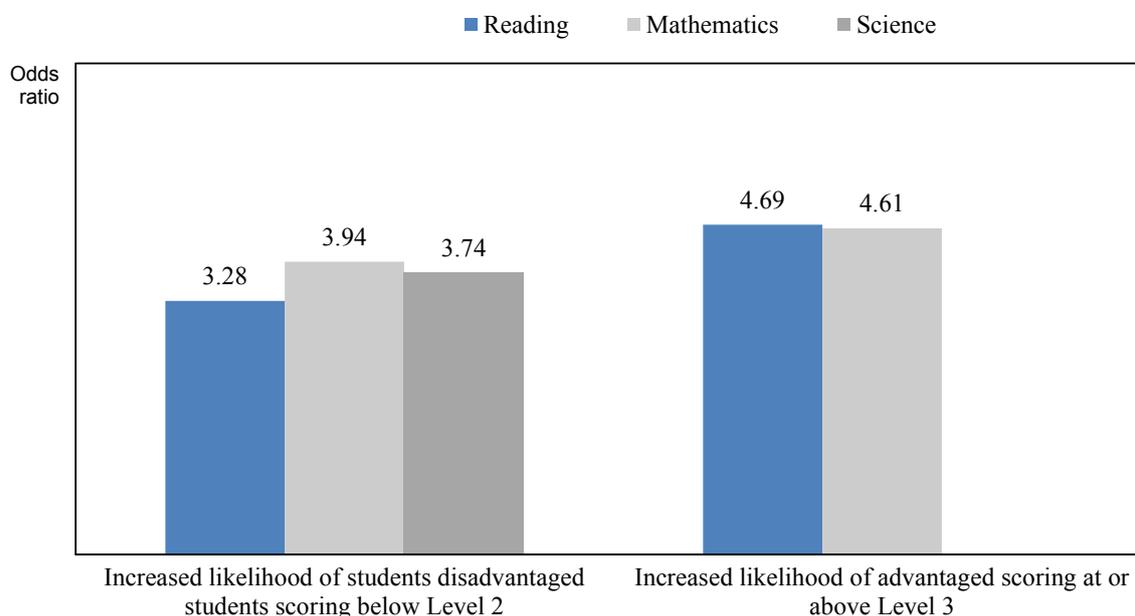
as a result of socio-economic status gaps among 15-year-old students. The weak relationship and mild slope implies that the outcomes of advantaged and disadvantaged students did not differ as much in Cambodia as in other countries, even though the chances of achieving good outcomes remained relatively low for disadvantaged students, compared to their more advantaged peers.

Indeed, when examining the gaps between the highest and the lowest achievers across different levels of socio-economic status, Cambodia showed a steeper relationship with socio-economic status for high performance than low performance. This indicates that socio-economic status dampens disadvantaged students' chances of achieving at high levels to a greater extent than it protects advantaged students from relatively low levels of performance (OECD, 2016a).

As a consequence, the chances of Cambodia's students achieving a baseline level of performance in reading or mathematics were generally much lower for disadvantaged students than the rest. Figure 2.14 compares the odds of reaching a baseline level of performance for the 25% of students with the lowest socio-economic status in Cambodia to the odds for the remaining 75% of students. In Cambodia, the 25% most disadvantaged students are more than 3 times more likely to perform below the baseline in all domains. As a consequence, low socio-economic status dampens students' opportunity to perform as high as students with high socio-economic status.

Figure 2. 14. Likelihood of low performance among disadvantaged students, relative to non-disadvantaged students

Increased likelihood of disadvantaged students scoring below Level 2, and increased likelihood of advantaged students scoring at or above Level 3

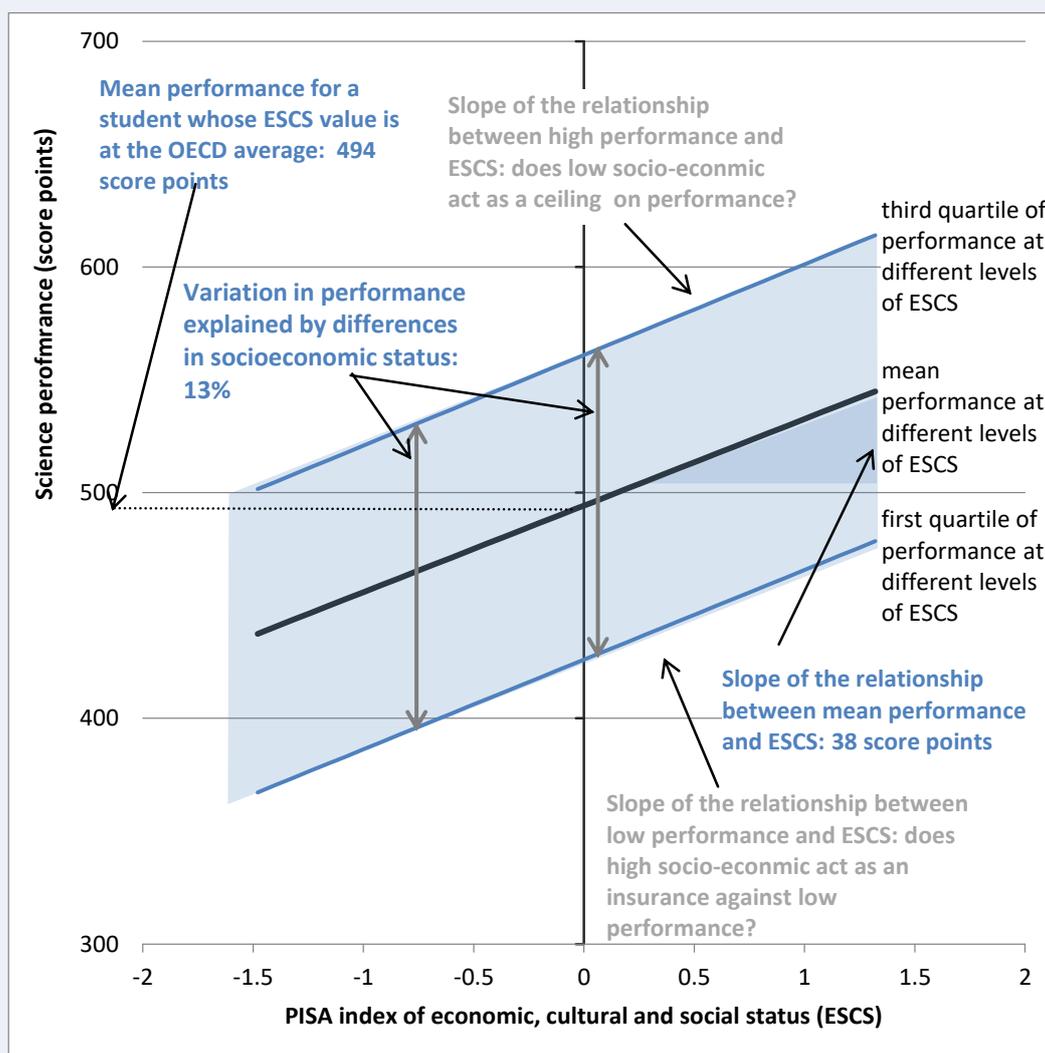


Source: PISA for Development Database.

Box 2.4. A graphical representation of the indicators of socio-economic inclusion and fairness

Figure 2.15 shows the relationship between the PISA-D index of economic, social and cultural status for OECD countries on average, and highlights the various indicators of socio-economic inclusion and fairness that are examined in this chapter.

Figure 2. 15. Students' socio-economic status and science performance across OECD countries



The black curve in the middle represents the average performance observed at different levels of socio-economic status. By comparing the vertical position of the curve across countries, e.g. at a value of zero on the PISA index of economic, social and cultural status (the international average), it is possible to identify differences in performance, after taking account of students' socio-economic status; this constitutes an indicator of inclusion.

The slope of this curve indicates how much, on average, the performance of students with higher socio-economic status lies above that of students with lower socio-economic status. The slope thus indicates the extent of inequality

attributable to socio-economic status. Steep slopes indicate greater inequality, while more gradual slopes indicate less inequality. The slope of this curve may also change across the continuum of socio-economic status, indicating that certain levels of socio-economic status are more related to performance differences than others. In this section, however, we focus on the average slope as an indicator of equity.

The blue curves above and below the black curve, on the other hand, represent the area within which the 50% of the students who score closest to the average can be found, for any level of socio-economic status: they correspond to the highest quartile and lowest quartile of performance for different levels of socio-economic status. An important indicator of equity is related to both the slope of the average relationship and the distance between these two lines: for a given slope, the closer the two blue lines are to each other, the stronger the relationship between socio-economic status and performance. Technically, the strength of the relationship is measured by the share of variation in performance that is explained by the PISA index of economic, social and cultural status. If the relationship between social background and performance is weak, then factors other than socio-economic status are likely to have greater bearing on student achievement. By contrast, when the relationship is strong, socio-economic status is highly predictive of the performance that students can achieve in a system.

Just as the slope may vary at different levels of socio-economic status, so may the distance between the upper and lower quartile. When the upper curve has a steeper slope than the lower curve, this may indicate that socio-economic disadvantage acts mainly as a ceiling on students' achievement, but that socio-economic advantage is no insurance against low achievement. If, on the contrary, the upper curve is less steep than the lower curve, and the variation in outcomes diminishes with socio-economic status, this may indicate that socio-economic advantage represents mainly an insurance against poor outcomes (relative to the country average), but that a significant fraction of disadvantaged students achieve at high levels despite their disadvantage.

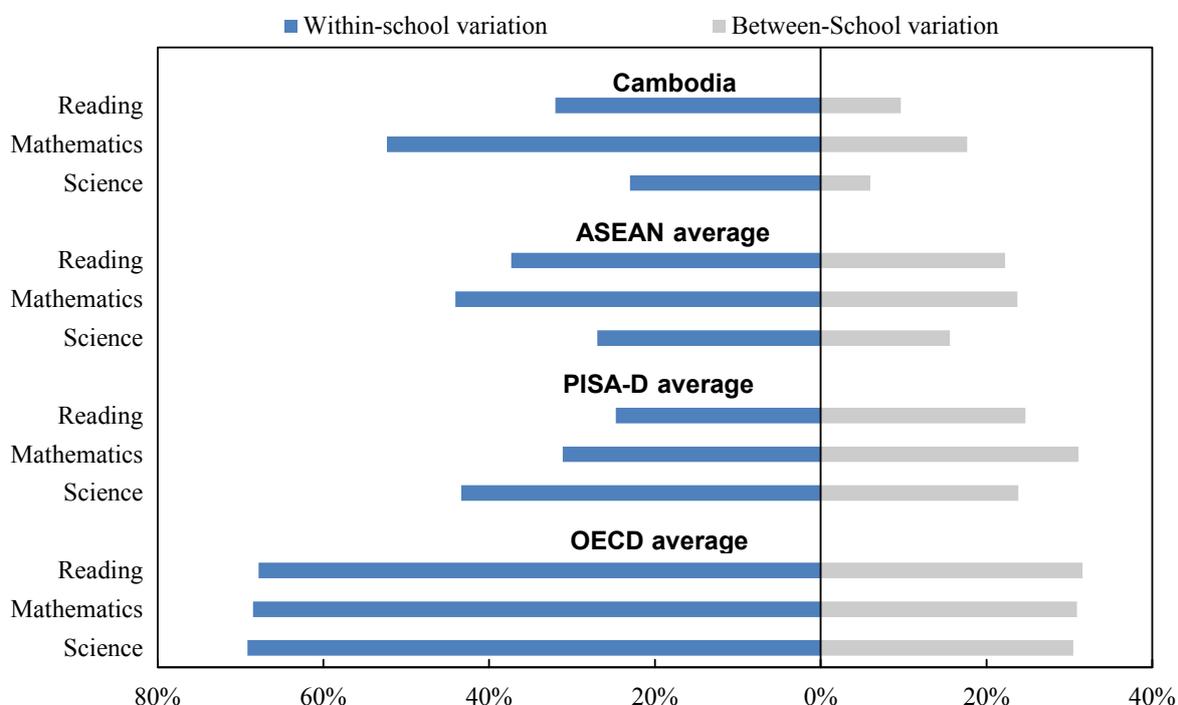
2.3.4. Variation in performance among schools and between urban and rural areas and between public and private schools

Ensuring consistently high standards across schools is a formidable challenge for any school system. Some performance differences between schools may be related to the socio-economic composition of the school's student population or other characteristics of the student body. When there are strong disparities in the home and community resources available to different schools, they face an unequal task in ensuring that all students have the same opportunities for success. Such disparities may be related to residential segregation, based on income or on cultural or ethnic background; they can also be related to the design of school systems and system-level education policies, such as differences in the degree of autonomy granted to schools, and to policies emphasizing greater competition for students among schools and greater school choice (Hsieh & Urquiola, 2006; Söderström & Uusitalo, 2010).

Figure 2.16 represents the variation in student performance in reading, mathematics and science between and within schools in Cambodia compared to the OECD averages in PISA 2015 and the averages for ASEAN and PISA-D countries. The overall length of the bar represents the total variation in Cambodia as a proportion of the OECD average level of variation in performance. The light part of the bar represents the proportion of those

differences that is observed between schools, and the dark part of the bar represents the proportion observed within schools.

Figure 2.16. Variation in performances between and within schools



Source: PISA 2015 and PISA for Development Databases.

Figure 2.16 shows that Cambodia is characterized by lower amount of overall variation in students' results than OECD countries, especially in science. The low amount of overall variation compared to the OECD countries indicates smaller differences in student achievement. On the one hand, this reflects less inequality in student performance in Cambodia; on the other hand, given the low student performance across all the three domains, it can be interpreted that opportunity to get quality education is not as high as that in other countries such as in ASEAN and OECD countries.

The figure, however, shows a contrasting picture that in Cambodia the variation is largely due to differences in performance within schools. Differences in performance between schools account for about 20% of the total variance of student performance in mathematics and even much lower proportion in reading and science, while in OECD countries, between-school variation is substantially larger, constituting more than 30%. In fact, it is often sufficient to know what school students attend to form a relatively accurate prediction of their performance levels. Comprehensive education systems – those which do not sort students by programme or school based on ability – often tend to have small between-school variations in performance. In the case of Cambodia, the low between-school variation may reflect the greater homogeneity of school characteristics in Cambodia in terms of language of instruction and resources coupled with the absence of a selection system and school stratification. Selection occurs mainly through drop-out, rather than through tracking. Also, while the public-private school divide, the school type variable, is likely to contribute to differences in performance, there is only a small share of students in private schools (3%). As a consequence, it is legitimate that the variation in student performances between schools

was not as large as that in countries with a sorting system and other diversifying factors in place.

A large proportion of the between-school differences in performance is related to socio-economic disadvantage; whereas within each school, socio-economic advantage or disadvantage only has a minor association with performance. This has important implications for how to target resources in order to improve equity in the system: in particular, by compensating schools, rather than students, for socio-economic disadvantage,

The between-school differences observed in Cambodia also reflect, in part, a divide between schools in urban and rural regions. Household survey data from low- and middle-income countries consistently show that children from rural areas (see Box 2.5 for a description of how PISA defines urban and rural schools) are significantly less likely to make the transition from primary to lower secondary school and from lower to upper secondary school, and are more likely to be delayed in their progression through the grade levels (UNESCO, 2015). In many regions, therefore, opportunities to participate in education remain unequally distributed, depending on students' locations. Chapters 4 and 5 will look more closely at how learning environments and school resources differ between urban and rural areas; this section reports the differences in learning outcomes observed across regions within Cambodia.

Box 2.5. How PISA defines urban and rural schools

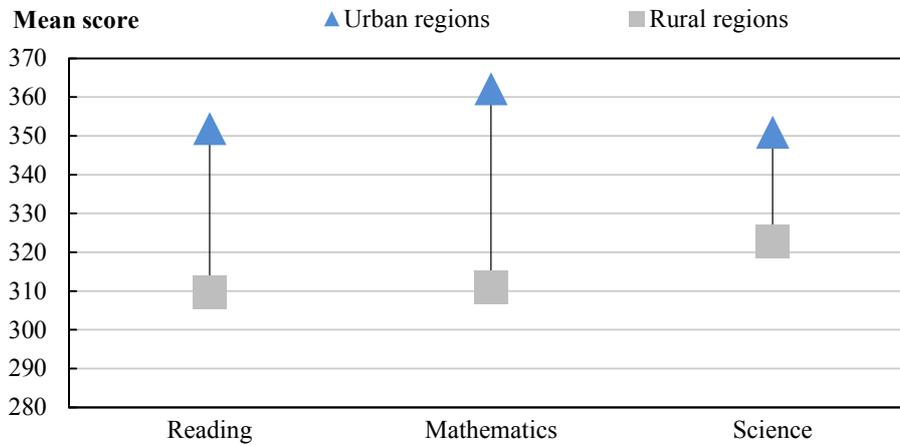
PISA-D collected information on students' urbanicity in two ways. First, all countries participating in PISA-D included this among the stratification variables for drawing school samples. This ensures that school samples are representative not only of the country as a whole, but also separately of schools in rural and urban areas of the country. In addition, PISA-D asked school principals which of the following definitions best describes the community in which their school is located:

- A village, hamlet or rural area (fewer than 3 000 people)
- A small town (3 000 to about 15 000 people)
- A town (15 000 to about 100 000 people)
- A city (100 000 to about 1 000 000 people)
- A large city (with over 1 000 000 people)

Rural schools are those where the principal answered "a village, hamlet or rural area", whereas urban schools are those where the principal answered either "a city" or "a large city".

In Cambodia we can see a significant difference between the performance of students in urban and rural schools. Students in urban schools outperformed those in rural schools in all the three domains, and the differences remained significant even after accounting for differences in students' family resources. The largest differences were observed in mathematics and reading performance. Students in urban schools outperformed students in rural schools in reading and mathematics with a performance difference of 42 and 51 score points respectively, the equivalent of more than a year of schooling, meaning that students in rural schools were likely to have lower abilities than the grade they were in. If they were, for example, in grade 10, their abilities were likely equivalent to those of grade 9 students or even below that. This reflects persistent inequality in learning between the two regions.

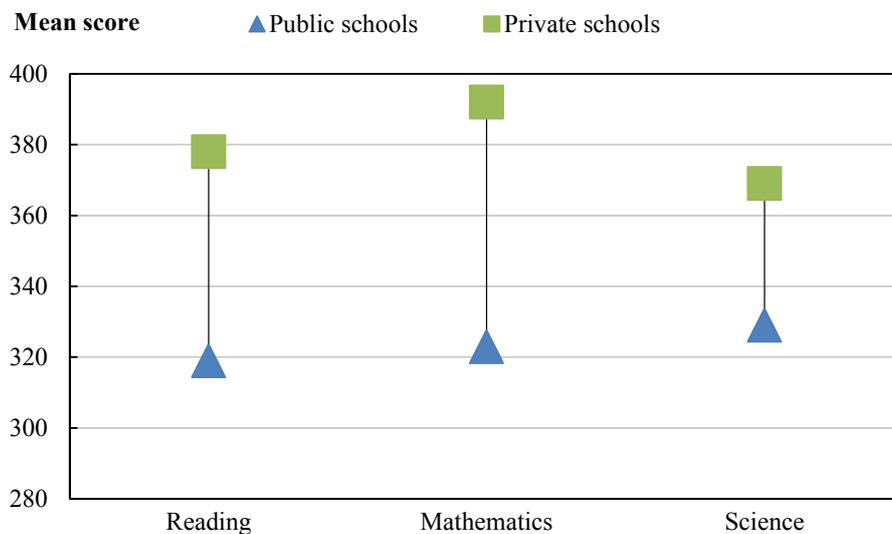
Figure 2. 17. Score-point difference in reading, mathematics and science between rural and urban schools



Source: PISA for Development Database.

When comparing student performance between public and private schools, we can see a large gap in favor of students in private schools in Cambodia, particularly in mathematics and reading performance. The performance difference was equivalent of about two years of schooling, meaning that the abilities of grade 10 students in public schools, for example, could merely match those of grade 8 students in private schools. This gap was, however, largely reduced after accounting for students' socio-economic status. This suggests that socio-economically advantaged students represent a higher share in private schools than in public schools. But the fact that on average students in private schools have yet to achieve the level 2 of proficiency indicates that there is a significant room for improvement in curriculum, teaching and learning at private schools to match what is globally anticipated for 15-years-old students in Cambodia at the end of their secondary education.

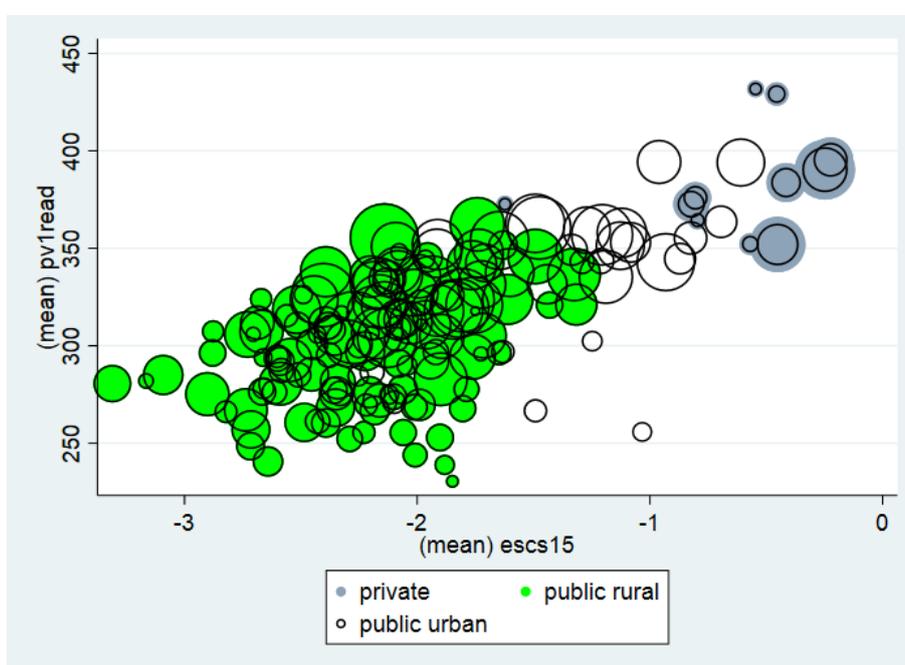
Figure 2. 18. Score-point difference in reading, mathematics and science between public and private schools



Source: PISA for Development Database.

The public-private school divide reflects a major quality concern in the public school system, especially among those in rural regions, which are often under-resourced and under-staffed. Figure 2.19 shows that the variation in student performance was also observed between rural and urban public schools, with the latter more likely to outperform the former. Such a performance difference was significantly associated with students' socio-economic backgrounds. Urban public schools were more likely to have students with higher socio-economic status than rural public schools, reflecting the disadvantaged conditions of the latter which should merit greater attention. Across the socio-economic scale, private schools tend to have the more advantaged students. This reflects the inequity in access to education among students in Cambodia, with those from high socio-economic background more likely to receive better education.

Figure 2.19. The relationship between reading performance and school profile



Source: PISA for Development Database.

Note:

A set of released items, such as reading components, will be included to illustrate student performance on particular tasks and show what PISA-D items look like.

References

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Health, well-being, and
attitudes toward school and
learning at age 15 in Cambodia



In Cambodia, 64% of students report that they are both **satisfied with life** and in **good health**.



98% of students agree that **trying hard at school** will help them **get a good job**.



In Cambodia, both advantaged and disadvantaged students report **high life satisfaction**...



... but **poor or fair health**, especially among disadvantaged students.



Girls are more likely than boys to report **feeling sad or depressed** at least once a week (46% of girls so reported, compared to only 37% of boys).



34% of students report **feeling hungry**, because there was not enough food, at least once over a 1-month period.

Chapter 3

Health, well-being and attitudes toward school and learning at age 15 in Cambodia

This chapter describes the health, well-being and attitudes toward school and learning of 15-year-old students in Cambodia. It identifies for each outcome a vulnerable population with poor health and well-being or negative attitudes towards school and learning, and summarises the relationship with the achievement outcomes that are discussed in Chapter 2.

Broadly speaking, well-being can be defined as the *functioning* and *capabilities* that are required to live a happy and fulfilling life (OECD, 2017, p. 61). While well-being is in part a cultural construction, some aspects of well-being are universally accepted; these comprise, in particular, a physical dimension (good health), an emotional dimension, in addition to the material (wealth and the satisfaction of primary needs), cognitive and social dimensions. The term well-being is also used more narrowly, to refer to the subjective valuations that people make regarding their lives (Diener, 2007).

Some conceptualisations of well-being, including the one used in the PISA 2015 framework, refer to a psychological dimension of well-being that encompasses both the emotional elements and a sense of purpose in life that for adolescents includes engagement with school and the goals and ambitions they have for their future. Therefore, though the PISA-D framework considers attitudes towards school and learning as an independent outcome, which is separate from the health and well-being outcome, for the purposes of this chapter it will be treated as part of the psychological dimension of well-being.

This chapter is concerned with the physical and psychological well-being of 15-year-olds in Cambodia, and with the relationship of these dimensions of well-being with poverty (an indicator of the material well-being of their families) and with their academic achievement (as indicators of cognitive well-being, and predictor of future material well-being). Each of the distinct dimensions of well-being constitutes a separate outcome, but can also be considered as an enabling condition with respect to the other dimensions, and ultimately with students' overall quality of life.

The indicators of physical and psychological well-being used in this chapter are all based on self-reports: by asking 15-year-olds about their feelings and their thoughts about life and school, PISA-D gives adolescents an opportunity to express themselves as individuals. This choice also signals that, while it is very important to invest in the future of children and adolescents (and therefore in their learning), it is at least equally important to pay attention to their present well-being and to promote their healthy development “here and now”. At any stage of life, well-being is, in fact, a dynamic state: the assessment of well-being must be sensitive to both the current state and achievements (“*functioning*”) and to the freedom they have (“*capabilities*”) to pursue what they value in life (Sen, 1999); and the present well-being is the cumulative result of many influences over the course of life.

PISA-D includes, in particular, overall (subjective) evaluations of adolescents' health and life satisfaction. In addition, because of its educational focus and policy orientation, it highlights those aspects of psychological well-being which are more closely related to the experiences in school: the emotional well-being of students is captured by questions that focus on school-related anxiety; while adolescents' sense of purpose is indicated in particular by their attitudes towards school and learning (e.g. “trying hard at school will help me get a good job”). The PISA-D measures of health, psychological well-being, and of valuing school outcomes are described in detail in Box 3.1.

By age 15, adolescents have spent a considerable amount of time in the classroom: following lessons, socializing with classmates, and interacting with teachers and other staff members. What happens in school is therefore important to understanding whether students enjoy good physical and mental health, how happy and satisfied they are with different aspects of their life and their attitudes towards school and learning. At the same time, their health and well-being at age 15 as well as their attitudes towards school and learning are the cumulative result of several influences over their life-course: of their genetic disposition and the early influences on their physical and cognitive development, of the direct influence of their past health and well-being on their current state, of their exposure to environments that promote their healthy development and of their access to the required resources in their families, in their communities, and at school. While this chapter highlights some of the associations between health and well-being outcomes and contemporary school and

education-related factors, this focus does not deny the importance of other factors in shaping the health and well-being of 15-year-olds.

The chapter includes only limited comparisons with other countries, in contrast to Chapter 2, and focuses on differences within Cambodia (e.g. between boys and girls) and on the relationship between these prosperity outcomes and the achievement outcomes discussed in the previous chapter. The absence of cross-country comparisons is only in part a consequence of data limitations (the absence of comparable data for countries that participated in PISA 2015): rather, it is related to the subjective nature of the reporting scales and to the resulting uncertainty in the validity of comparisons (Box 3.1).

Box 3.1. How PISA-D measures health, well-being, and attitudes towards school and learning

PISA-D offers a set of health and well-being indicators for adolescents that cover both subjective evaluations of life-satisfaction and general health, the experience of negative events and emotions (e.g. disease, hunger, and anxiety) and the positive attitudes and sense of purpose that promote healthy development. Most of the PISA-D data on health and well-being are based on students' self-reports, and thus give adolescents the opportunity to express how they feel, what they think of their lives and of school and learning.

Health

The main measure of physical well-being is self-rated health. Students were asked to report a subjective rating of their health on a scale ranging from 0 to 10 ("In general, would you say your health is..."); the scale was accompanied by five descriptors ("poor", "fair", "good", "very good", "excellent"), with the labels for "poor" and excellent placed at the extremes of the scale, and "good" around the value of 5. Students who reported values between 0 and 4 are considered to report that their health is "poor" or "fair" and are described as having vulnerable health. This measure is not available for countries that participated in earlier cycles of PISA.

In addition, the assessment of students' physical well-being is also supported by questions about the experience of health-related problems such as sickness, hunger, anxiety, depression, pain and disease; and by reports of a physical or sensory disability. These measures are described in greater detail when they are first introduced in this chapter.

Psychological well-being

The main measure of psychological well-being is based on a general life-satisfaction scale. The PISA-D questionnaire asked students to rate their life on a scale from 0 to 10, where 0 means the worst possible life and 10 means the best possible life. The same measure was used also in PISA 2015. Similar to the PISA 2015 report (OECD, 2017), in this chapter, students who reported values between 0 and 4 on the life satisfaction scale are described as "not satisfied with life" (and vulnerable), students who report values of 5 or 6 as "moderately satisfied", students who report values of 7 or 8 as "satisfied", and students who report values of 9 or 10 as "very satisfied".

In addition, the PISA-D questionnaire also contained questions about the experience of negative affective states (anxiety and depression). These measures are described in greater detail when they are first introduced in this chapter. Self-reported measures of life satisfaction are considered more stable indicators of subjective well-being than reports of positive or negative affective states (Gilman R. , et al., 2008).

Valuing school outcomes

Positive attitudes towards school and learning constitute an aspect of psychological well-being that receives particular attention in PISA-D, due to their implications for education policy. If students adhere to school values and find purpose and meaning in what they do at school, this can promote student engagement and participation in lifelong learning.

The "valuing school outcomes" scale was built from students' level of agreement (measured on a four-point scale from "strongly disagree" to "strongly agree") with the statements:

- School has helped give me confidence to make decisions.
- School has taught me things which could be useful in a job.
- Trying hard at school will help me get a good job.
- Trying hard at school will help me get into a good university.
- I enjoy getting good grades
- Trying hard at school is important.

This question was not included in PISA 2015, but was part of the PISA 2012 questionnaire, allowing for some limited international comparisons. In PISA-D, a summary scale from 0 to 10 (“index of attitudes towards school – valuing school outcomes”) was built to facilitate comparisons among students. The scale of this index was fixed so that a value of 0 corresponds to students who strongly disagreed with all statements and a value of 10 corresponds to students who strongly agreed with all statements, indicating the most positive attitudes towards school and learning. Students who score below 5 on this index can be considered to have negative attitudes towards schooling: these students “disagreed” or “strongly disagreed” more frequently than they “agreed” or “strongly agreed” with six statements reflecting positive attitudes towards school and learning.

Box 3.2. Can subjective health and well-being be compared across countries?

Some caution is needed in interpreting the PISA-D data on health, well-being and attitudes towards school and learning. Despite the careful process followed for developing, translating, adapting and selecting the questions included in questionnaires and for analysing the responses of students, full comparability across countries and subpopulations cannot be guaranteed.

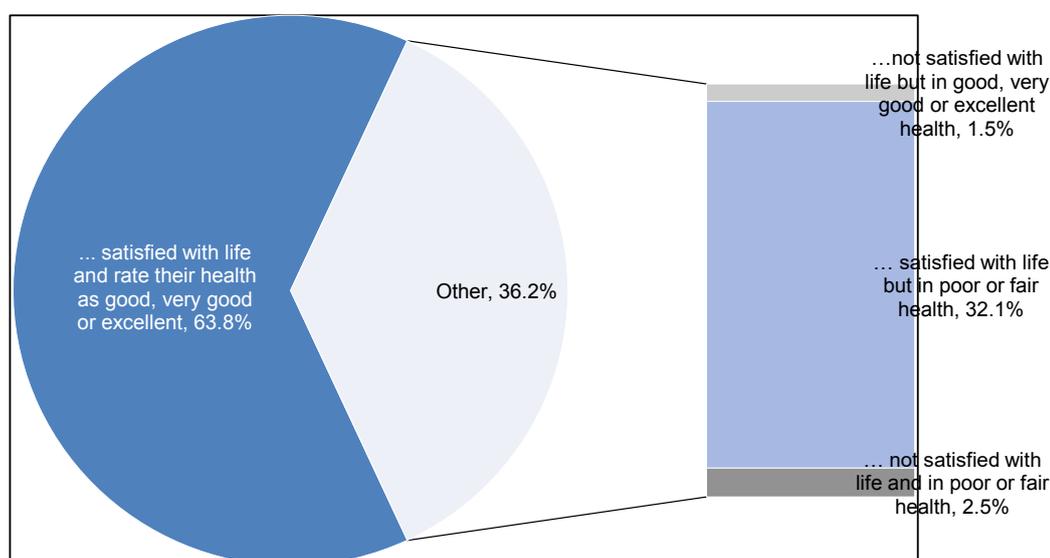
The PISA-D questionnaires use student self-reports to derive measures of health, well-being and attitudes towards school and learning. Self-reported responses are informative and useful, but they are susceptible to three possible biases: social desirability, i.e. the tendency to respond in a manner that is more acceptable in one’s own social and cultural context (Edwards, 1953); reference-group bias, i.e. the influence of an implicit comparison group that is known to the respondent only when reporting values on a subjective scale; and response-style biases, such as the tendency to use, or to avoid, extreme responses. These biases can operate differently in different cultural contexts, thus limiting the cross-country comparability of responses (van Hemert, Poortinga, & van de Vijver, 2007). In addition, when comparing the responses given in different languages, subtle differences in the nuances of translations may introduce additional uncertainty in the comparisons; such uncertainty is particularly difficult to identify and delimit for outcomes that are measured by a single question or by a handful of questions only, as documented in the forthcoming technical report.

Comparisons within and across countries are also affected by response rates, which may differ across groups of respondents. In order to fully represent the distribution of academic achievement in the population, PISA-D uses non-response adjustments and assigns imputed values (i.e. values estimated from a model, based on known information about the respondent) for reading, mathematics and science proficiency estimates; self-reported outcomes based on questionnaire measures however remain affected by non-response, e.g. if low-achieving students find it hard to complete the questionnaire. The overall level of missing data in Cambodia due to non-response to the student questionnaire is 1.1% for self-rated health, 0.8% for life satisfaction, and 3.1% for the *index of attitudes towards school – valuing school outcomes*.

3.1. Levels of health, life satisfaction and emotional well-being among 15-year-olds

This section analyses the levels of health and well-being reported by 15-year-old students. Figure 3.1 provides a summary of the main measures of health and well-being in Cambodia. The percentage of 15-year-olds satisfied with life and in good health in Cambodia is 64%; an additional 32% of students report being satisfied with life, but only report a poor or fair health; while 1.5% of students report good, very good or excellent health, but low levels of life satisfaction; 2.5% of students report being not satisfied with life and rate their health as poor or fair.

Figure 3. 1. 15-year-old students' self-reported health and life satisfaction



Source: PISA for Development database.

3.1.1. Self-rated health and the experience of health problems

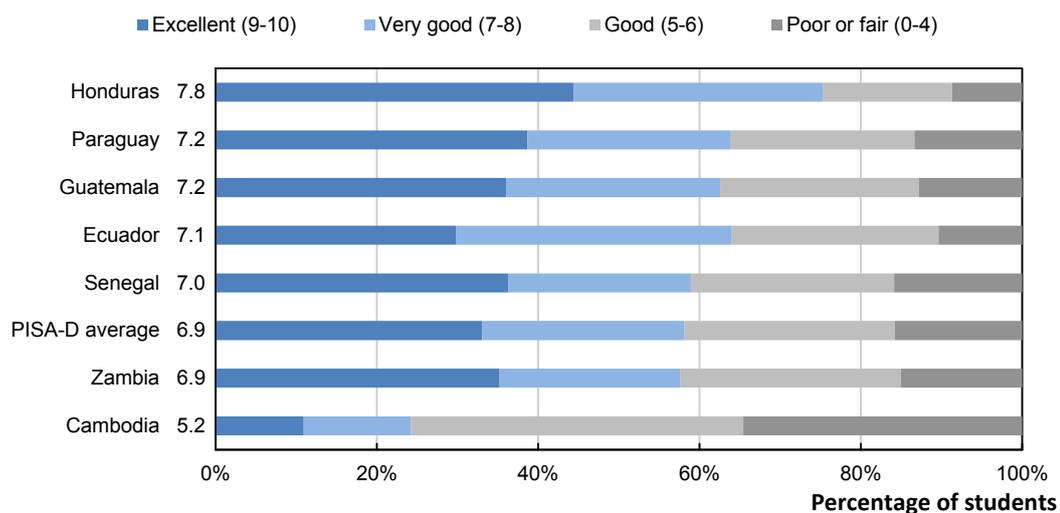
Children's physical health is the key element of physical well-being. It is particularly important for education policy in middle- and low-income countries, as children's health in these countries is more often compromised in ways that affect their educational outcomes – due to hunger; physical and emotional abuse; chronic illnesses such as asthma, bronchitis, diabetes or epilepsy; and acute illnesses that cause children to miss school and fall behind.

The main indicator of health in PISA-D is a subjective indicator of general health (self-rated health). Among adolescents, self-rated health is influenced not only to the presence or absence of chronic disease or disability, but also by a more general understanding of self (Inchley, et al., 2016, p. 71). Empirical studies have shown that self-rated health is an independent predictor of future morbidity and mortality even after controlling for other factors (Idler & Benyamini, 1997).

PISA-D asks 15-year-olds to report their overall perception of their health and to report specific health problems they experienced during the past year. On average, 35% of

students in Cambodia reported their health to be “poor” or “fair” (corresponding to values of 0, 1, 2, 3 or 4 on the 0-to-10 self-rated health scale); 41% of students rated their health as good (5 or 6) , 13% as very good (7 or 8) and 11% as excellent (9 or 10) (Figure 3.2). Across PISA-D countries, self-rated health among 15-year-old students in Cambodia appeared the lowest on average. This low rating may reflect the fact that students in Cambodia may have experienced specific health problems during the course of their study but it may have been unknown by school.

Figure 3. 2. Self-rated health among 15-year-old students



Note: Students rated their health on a 0-to-10 scale.
Countries and economies are ranked in descending order of the percentage of students who rated their health as Excellent.
Source: PISA for Development Database.

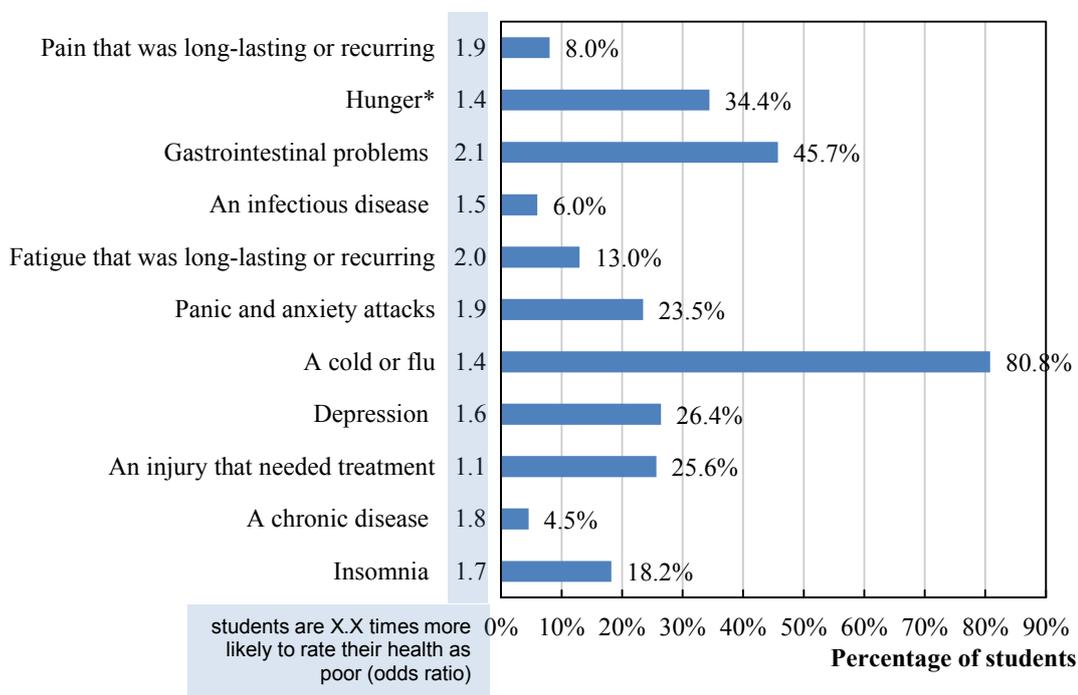
Students who reported poor health were more likely to also report that they were affected by a health problem currently or during the past year. Figure 3.3 shows the percentages of students reporting a health problem, and how the likelihood of reporting “poor” or “fair” health is related to these.

In Cambodia, poor health seemed to be significantly associated with such health problems as gastrointestinal problems, anxiety and depression, chronic disease, or long-lasting fatigue or pain, insomnia and a cold or flu. Students who reported having experienced gastrointestinal problems, panic and anxiety attacks or long-lasting fatigue or pain were about two times more likely than those who did not report so to rate their health as poor.

The important role of nutrition in learning has been well established and the intake of the required amount of food contributes positively to the levels of concentration and commitment to learning among students. Food insecurity is therefore a major threat to students’ health and well-being. In Cambodia, 34% of students reported that they had been hungry at least once a week during the past 30 days because there was not enough food, and 6% said they were hungry almost every day. Students who reported so were about 1.4 times more likely than those who did not to rate their health as poor.

Figure 3. 3. Health problems among 15-year-old students

Percentage of students who reported the following health problems over the year prior to the PISA-D test



* "Hunger" represents the percentage of students who reported being hungry, because there was not enough food, at least about once a week over the 30 days prior to the PISA test.

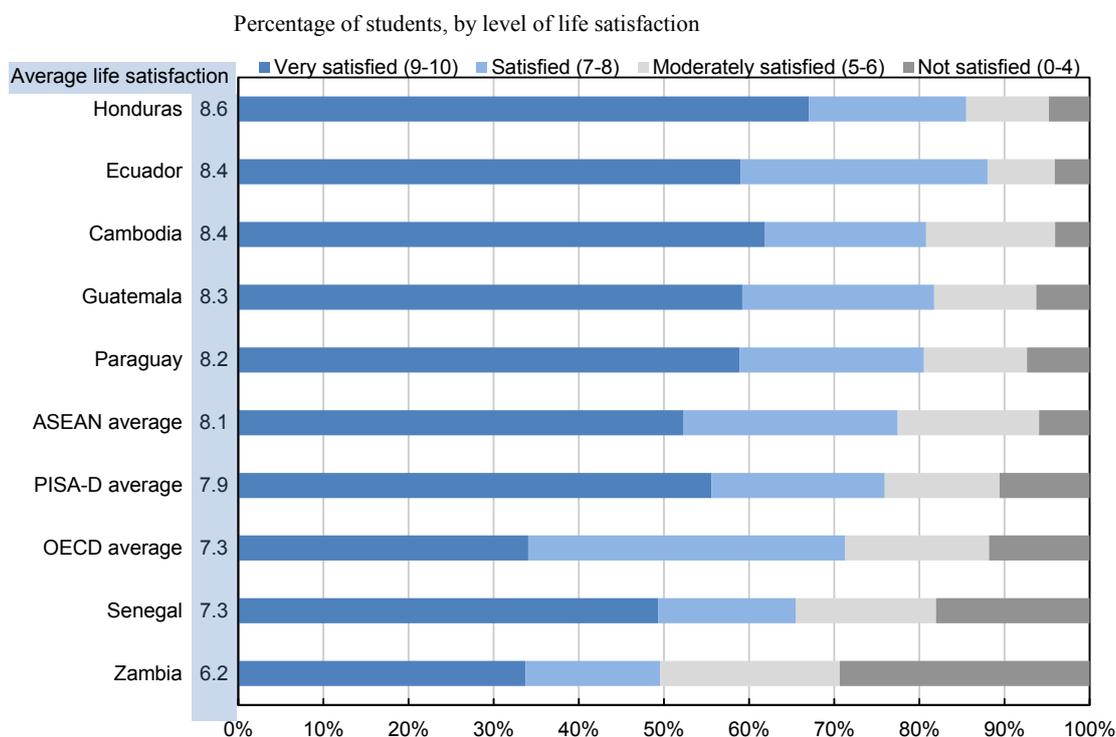
Source: PISA for Development Database.

Students with a physical disability were also more likely to report their overall health as only poor or fair. “Disability” in PISA-D refers to a visual, hearing or physical impairment, or to a chronic disease, which limits the ability of 15-year-olds to fully participate in school activities. With regard to disability, about 10% of students reported they often got so sick they cannot play, work or go to school. Other common problems included, small and large motor skills (7% reported a physical disability that makes it difficult to grasp small objects like a pencil or scissors, and 7% reported a physical disability that makes it difficult to walk or use stairs), seeing (6%), and hearing (4%). Of these problems, hearing seemed to be strongly associated with poor health. Students who reported having a hearing problem, tended to rate their health as poor than those who did not report so (odd ratio = 1.6). This indicates that hearing can be a particular problem associated with students’ school health.

3.1.2. Life satisfaction and emotional well-being

How satisfied with life are adolescents? In Cambodia and on average, 15-year-old students are satisfied with the life they are living: they report a level of 8.4 on a scale of life satisfaction that ranges from 0 to 10 (Figure 3.4). This high satisfaction level reflects the extent to which 15-year-old students in Cambodia cast their positive view towards the state of life in the current educational and social discourse where access to education and to public facilities and services is being improved amidst the country’s stable economic growth over the last few decades.

Figure 3. 4. Life satisfaction among 15-year-old students



Note: Students rated their life satisfaction on a 0-to-10 scale. Countries and economies are ranked in descending order of the percentage of students who reported being very satisfied with life.
 Source: PISA for Development Database.

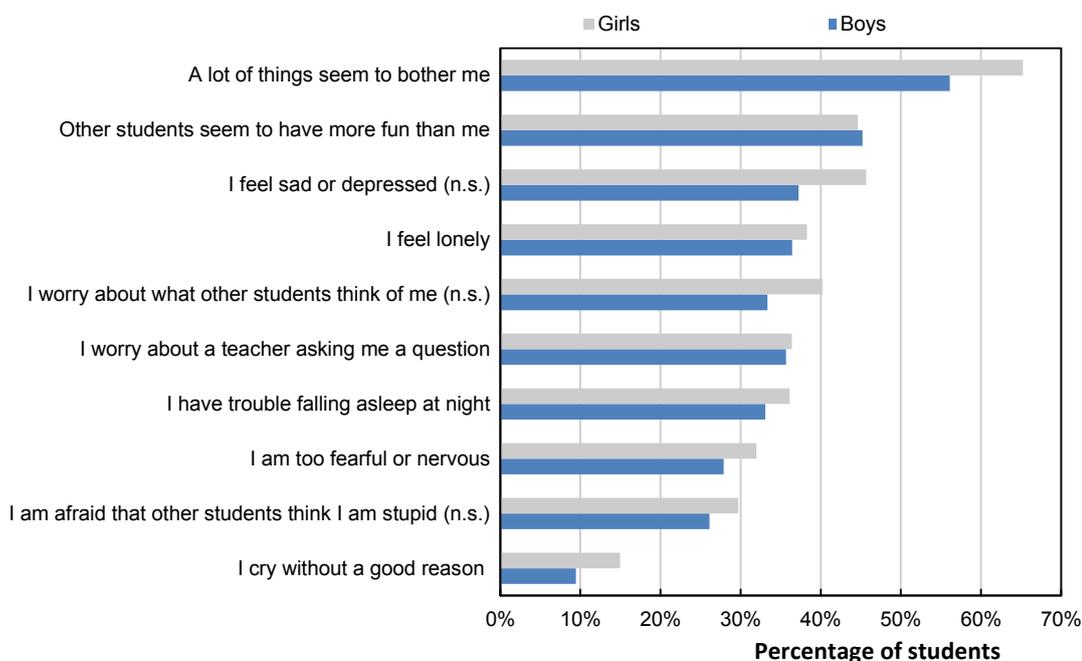
Much of the thinking around the link between education and the quality of students’ lives has focused on mental health problems that children might manifest at school. Teenagers are particularly at risk of psychological disorders, because adolescence is a period of intense emotional upheaval (Gilman and Huebner, 2003). Common psychological disorders include anxiety and depression; while the origins of such disorders are often complex, the increasing academic demands that adolescents encounter as they progress through schooling, the pressure to get higher marks, and concerns about receiving poor grades are some of the sources of stress most often cited by school-age children and adolescents.

PISA-D asked students to report whether and how often they experienced feelings that constitute symptoms of anxiety or depression (“never or almost never”, “about once a week”, “2 or 3 times a week”, “almost every day”). Feelings related to anxiety disorders include “I am too fearful or nervous”, “I am afraid that other students think I am stupid”, “I worry about a teacher asking me a question”, and “I worry about what other students think of me”. Feelings related to depression disorders include “I cry without a good reason”, “I feel lonely”, “Other students seem to have more fun than me”, “I feel sad or depressed”, “I have trouble falling asleep at night”, and “a lot of things seem to bother me”. A scale were derived from students’ reports about feelings of depression, with higher values indicating more and more frequent feelings of depression; as this does not constitute a clinical diagnosis.

Figure 3.5 shows, for each feeling of anxiety or depression, the percentage of students who reported its occurrence “about once a week” or more frequently.

Figure 3. 5. Snapshot of students’ broader feelings of anxiety and depression

Percentage of boys and girls who reported having the following feelings about once a week or more often:



Notes: Feelings of anxiety and depression are sorted in descending order of their incidence among 15-year-old students.

(n.s.) indicates that the gender difference in the incidence of a particular feeling of anxiety and depression is not statistically significant.

Source: PISA for Development Database

On average, 36% of students in Cambodia reported that they often (i.e. “about once a week” or more frequently) worried about a teacher asking them a question and 61% of students reported a lot of things seem to bother them. Similarly, 37% of students reported feeling lonely at least once a week or more; 42% of students also reported feeling sad or depressed, especially among girls. The students who reported the highest levels of feelings of depression also rated their life satisfaction as significantly lower than those with the lowest levels of feeling of depression. Anxiety and depression seemed to affect the emotional well-being of one third of 15-year-old students in Cambodia, especially among girls.

The relationship between feelings of anxiety and depression and low life satisfaction shows that students’ subjective well-being can be severely affected by mental health and behavioural problems, which may have a school-related component to them. At the same time, school approaches that aim only to address mental health and behavioural problems might not devote enough attention to creating the conditions in which children and adolescents can flourish. Helping students find greater satisfaction with their lives, rather than just responding when students exhibit behaviours associated with dissatisfaction with life, can sustain the psychological, social and cognitive development of all students (Suldo & Huebner, 2006).

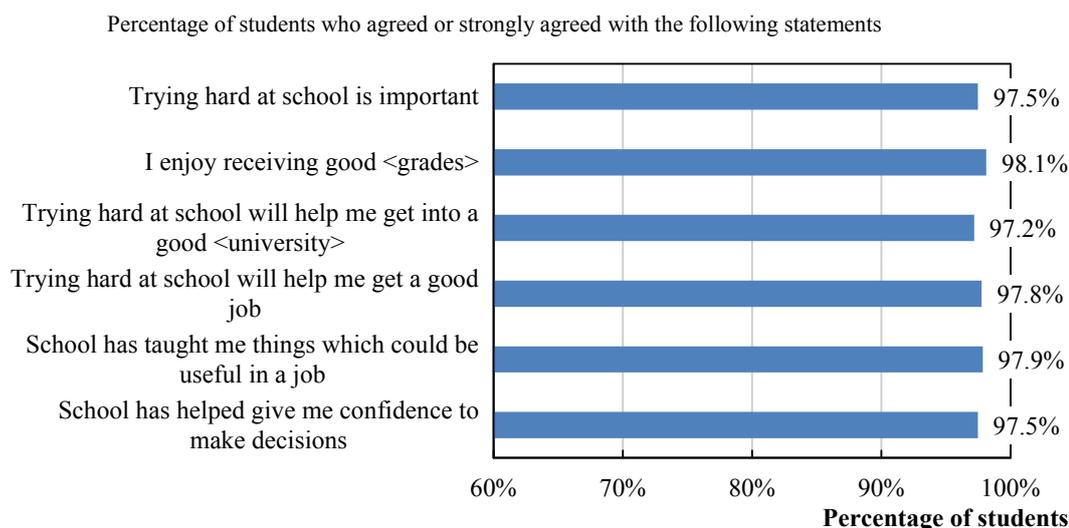
3.1.3. Attitudes towards school and learning at age 15

School is central to the daily life of many youths in Cambodia. Successful students often view schooling as essential to their future well-being, and this attitude is then reflected in their participation in academic pursuits.

PISA-D measured students' beliefs about the value of schooling and learning. The questionnaire included both questions about their attitudes towards school activities (whether, for example, students enjoy receiving good grades) and questions about their attitudes towards the outcomes of school and learning (whether, for example, students believe that school has given them the confidence to make decisions).

Most of the students who took the PISA-D test in Cambodia in 2017 held positive views about school and what they had learned. For example, 97.5% of students believed that trying hard at school is important and 97.9% believed that school has taught them things which could be useful in a job. Similar positive views are also evident among students in Cambodia towards the importance of school and learning to building their confidence in decision making, in getting a good job, in getting a good university and in getting good grades.

Figure 3. 6. Attitudes towards school and learning at age 15



Source: PISA for Development Database.

Student responses to questions about their attitudes towards school and learning were also used to create the index of attitudes towards school. The scale of this index was fixed so that a value of 0 corresponds to students who strongly disagreed with all statements and a value of 10 corresponds to students who strongly agreed with all statements, indicating the most positive attitudes towards school and learning. Students who score below 5 on this index can be considered to have negative attitudes towards schooling: these students “disagreed” or “strongly disagreed” more frequently than they “agreed” or “strongly agreed” with six statements reflecting positive attitudes towards school and learning. On average across Cambodia, only 18% of students held negative views, the number comparable to that in PISA-D countries on average. In PISA-D countries, Zambia (32%) and Senegal (21%) appeared to have the most students holding negative views towards school and learning.

The index usefully summarises students' answers when the attitudes towards school and learning are compared across schools, between boys and girls, or across groups of students defined by their family background.

3.2. How life satisfaction and attitudes towards school and learning compare with students in other countries

The measure of self-rated health and the supporting health-related questions are new to PISA, and therefore only comparisons with other countries participating in PISA-D in 2017 are possible. In contrast, international comparisons with a wider set of countries are possible for life satisfaction and student attitudes towards school and learning.

3.2.1. International differences in life satisfaction

Comparing average levels of subjective well-being across countries is challenging. Variations in students' reports of life satisfaction or happiness across countries might be influenced by cultural interpretations of what defines a happy life, and by differences in how life experiences are integrated into judgements of life satisfaction (Diener, Oishi, & Lucas, 2003; Park, Peterson, & Ruch, 2009; Proctor, Alex Linley, & Maltby, 2009). Research, for instance, has documented cultural differences in how people think about "happiness", a construct that is closely related to life satisfaction. In some languages, including Chinese, Estonian, French, German, Japanese, Korean, Norwegian and Russian, happiness is closely associated with luck, while in others, notably Italian, Portuguese and Spanish, definitions of happiness focus on the realisation of one's desires, wishes and goals (Oishi, 2010). Differences in self-presentation can also play an important role. In some cultures, for example, it might not be desirable to say that you are happy, while in others it might be highly desirable to say so.

The most meaningful comparisons are therefore with countries that share a common language and whose cultures are closely related. Compared to students in Asia who took PISA 2015 assessment such as Thailand, Chinese Taipei, Macao (China), Hong Kong (China), Japan and Korea, students in Cambodia reported a higher level of life satisfaction, even above the OECD average (OECD, 2017). Life satisfaction in Cambodia as reported by 15-year-old students also matched that in the PISA-D participating countries from the Latin America.

3.2.2. How student attitudes in Cambodia compare with other countries

The last time PISA included questions about general attitudes towards school and learning was in 2012; comparisons with most countries are therefore only possible with students who participated in that year. For Cambodia, the most meaningful comparisons are with students in the same region such as those in Thailand, Vietnam, Indonesia Singapore and Malaysia.

In PISA 2012, students in Thailand, Vietnam, Indonesia Singapore and Malaysia tended to report a high level of positive attitudes towards both learning activities and outcomes (see results in PISA 2012 Results, Volume III, Table III.2.5a etc.). Attitudes to school and learning among students in these Southeast Asian countries have been significantly positive even comparable to that of the OECD average.

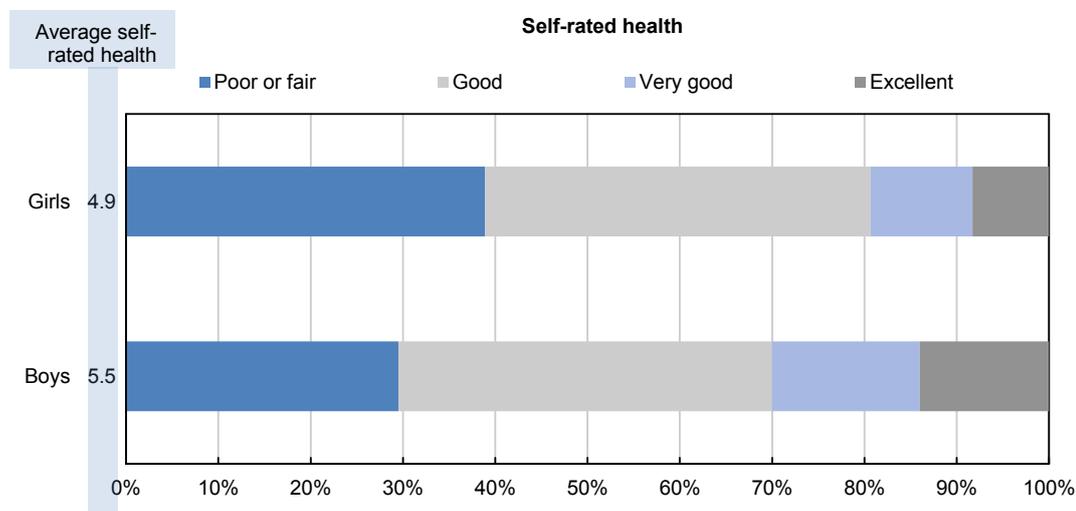
3.3. Differences in health, well-being and student attitudes within Cambodia

Students' health, well-being and attitudes towards school can be influenced by their teachers, their peers and the atmosphere at school; but they are also influenced by their parents and local communities and by the wide range of individual differences and environmental factors that shape the development of children and adolescents over the life course. This section analyses the variation in students' self-reported health and well-being within Cambodia, focusing in particular on inequalities related to demographic and socio-economic factors. The following section will analyse the role of schools in shaping students' health, well-being, and attitudes.

3.3.1. Gender differences in health, well-being and student attitudes towards school and learning

PISA-D shows a significant difference between boys' and girls' physical well-being, with girls generally having greater likelihoods of reporting poor health compared to boys. Among 15-year-old students in Cambodia, girls were significantly more likely than boys (39%, compared to 30%) to rate their health as only "poor" or "fair", compared to boys. Similar differences between boys and girls were also found in other countries that participated in PISA-D, and had been previously observed in many European countries that participate in the "Health Behaviour in School-aged Children" (HBSC) study (WHO, 2017). In the HBSC study such differences were shown to increase between the ages of 11 and 15.

Figure 3. 7. Gender differences in self-rated health

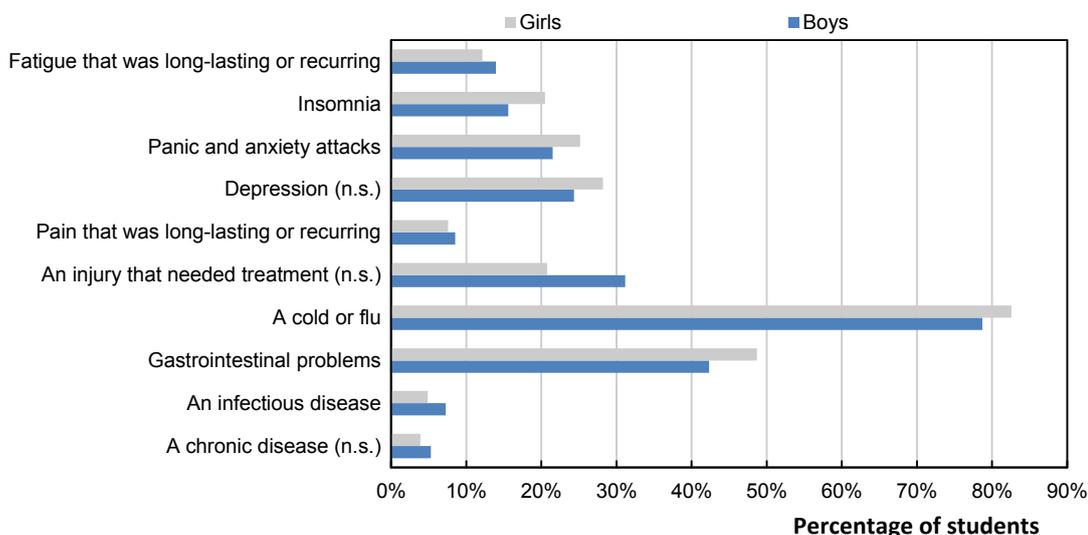


Source: PISA for Development Database.

PISA-D data also show that girls tended to be more affected by feelings of anxiety and depression, which could reveal mental health problems. Gastrointestinal and cold or flu problems are also more common among girls. Other health problems, including hunger, affect boys and girls similarly (Figure 3.8).

Figure 3. 8. Health problems among boys and girls

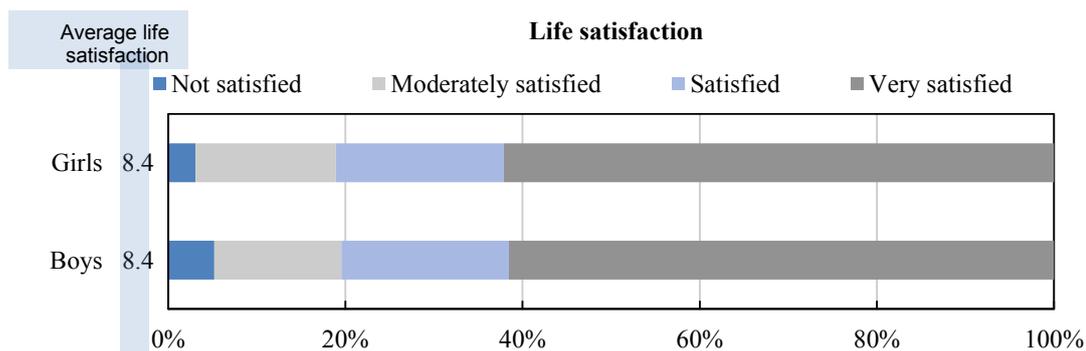
Percentage of students who reported the following health problems over the year prior to the PISA-D test:



Notes: Health problems are sorted in descending order of their incidence among 15-year-old students. (n.s.) indicates that the gender difference in the incidence of a particular feeling of anxiety and depression is not statistically significant. Source: PISA for Development Database.

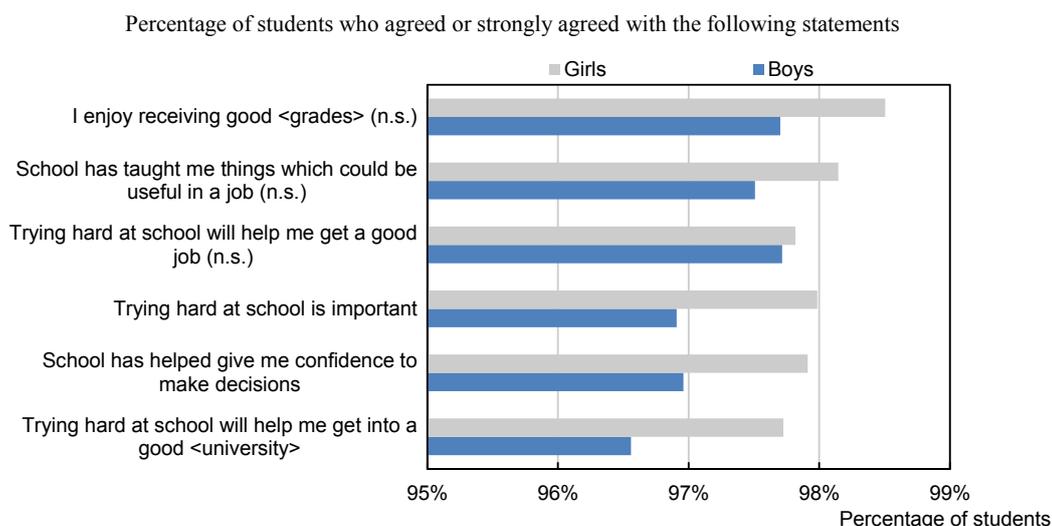
In Cambodia, girls were more likely than boys to report high levels of life satisfaction (a level of 9 or 10 on the scale), and less likely to report low levels of life satisfaction (a level of 0, 1, 2, 3 or 4). However, as in most countries that participated in in PISA-D and PISA, gender generally does not seem to play a major role in shaping people’s evaluation of their own lives (OECD, 2013).

Figure 3. 9. Gender differences in life satisfaction



Source: PISA for Development Database.

While general health tends to be lower among girls, compared to boys, attitudes towards school were often more positive among girls. Just as what was observed in most countries that participated in PISA when the question was last asked in 2012 (OECD, 2013), girls in Cambodia appeared to value school activities and what they learn at school more than boys do (Figure 3.10). This suggests a stronger desire to learn among girls than boys.

Figure 3. 10. Valuing school outcomes, by gender

Note: (n.s.) indicates that the gender difference in the incidence of a particular valuing outcome is not statistically significant.

Source: PISA for Development Database.

3.3.2. Socio-economic differences in health, well-being and student attitudes towards school and learning

Across all countries that participated in PISA 2015 or in PISA-D, there is no evident relationship between adolescents' life satisfaction and per capita GDP or similar measures of economic development. This finding is markedly different from what is observed among adults, who tend to report greater satisfaction with life if they live in higher-income countries (Deaton, 2008; Helliwell, Layard, & Sachs, 2018). In fact, countries where students reported the highest levels of life satisfaction in PISA are not necessarily those where adults were most satisfied with their life (among the countries with available data, the correlation between students' life satisfaction, as measured by PISA, and the life satisfaction reported by adults in the Gallup survey is only 0.2 (OECD, 2017, p. Table III.3.12). This might indicate that 15-year-olds adopt different reference groups and prioritise different needs when forming their subjective evaluations of life satisfaction, compared to adults.

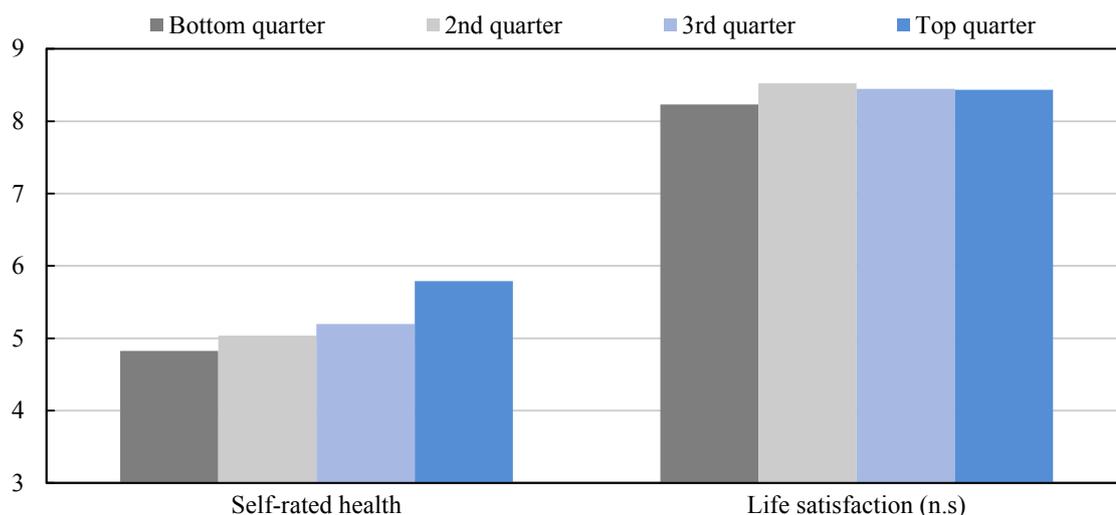
While we find no evident relationship between adolescents' life satisfaction and per capita GDP, the socio-economic status of the individual does affect life satisfaction. Differences in life satisfaction related to socio-economic status are marked in the majority of PISA-participating countries and economies. On average across OECD countries, disadvantaged students rate themselves around 0.4 points lower than advantaged students on the 10-point life satisfaction scale. Differences greater than 0.6 point between advantaged and disadvantaged students are observed in the Czech Republic, Estonia, Hungary, Iceland, Latvia, Tunisia, the United Arab Emirates and the United States. Only in Brazil and Colombia did disadvantaged students report higher life satisfaction than advantaged students.

In Cambodia, life satisfaction appeared not to be strongly associated with socio-economic status of students, with disadvantaged students reporting themselves only 0.20 points lower than advantaged students on the 0-to-10 life-satisfaction scale (Figure 3.11). Students who can be considered "poor" or "severely poor", based on their household possessions, were likely to report similar levels of life satisfaction compared to the remaining students.

Differences are observed in self-rated health: disadvantaged students reported themselves 0.97 points lower than advantaged students on the 0-to-10 health scale. Students who can be considered “poor” or “severely poor”, based on their household possessions, are at much higher risk of reporting their health as “poor or fair”.

Figure 3. 11. Socio-economic differences in self-rated health and life satisfaction

Average rating on the 10-point scale, by quarters of the PISA index of economic, social and cultural status



Source: PISA for Development Database.

In many countries, socio-economically advantaged students tend to report more positive attitudes towards school and learning than socio-economically disadvantaged students (OECD, 2013). In particular, in Thailand, Vietnam and Indonesia, socio-economically advantaged students reported a similar level of positive attitudes compared to that of OECD average.

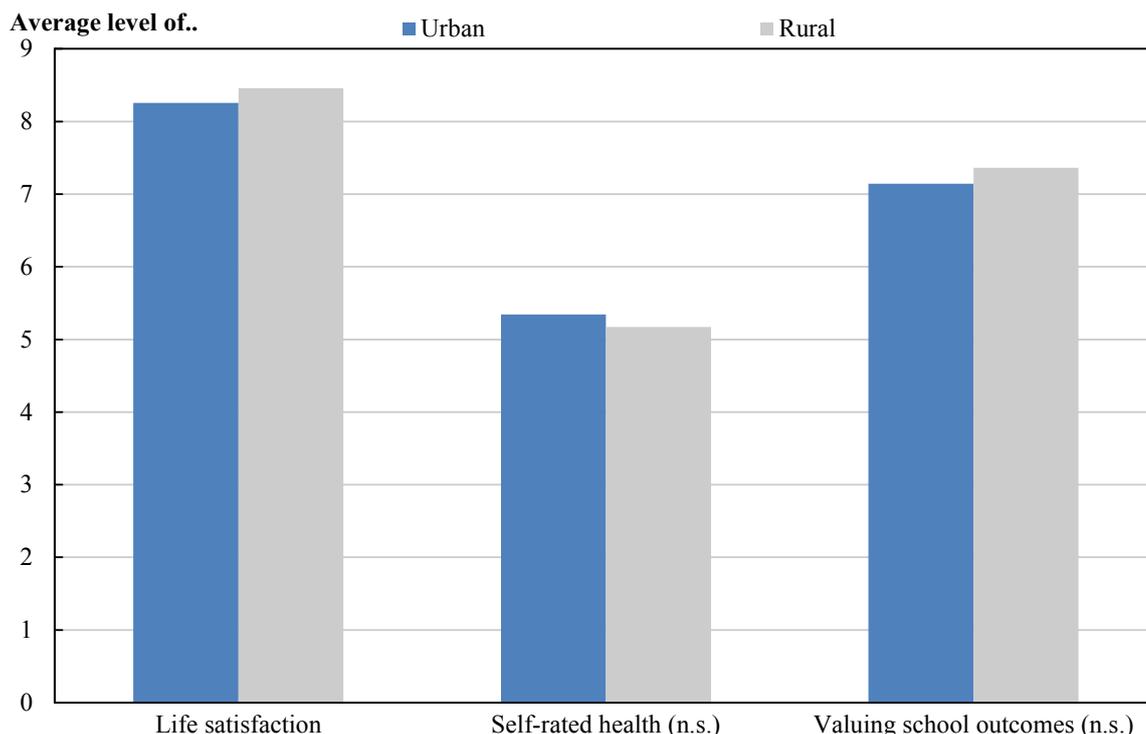
In Cambodia, the difference between socio-economically advantaged and disadvantaged students seemed negligible, with both groups reportedly having positive attitudes towards school and learning. The index of attitudes towards school and learning tended not to be associated with the socio-economic status of students. This result is not only unique for Cambodia but also for PISA-D countries, reflecting the fact that schooling might be viewed as a luxury although students are not actually learning.

3.3.3. Rural-urban in health, well-being and student attitudes towards school and learning

Within Cambodia, there were no significant differences in self-reported health and student attitudes towards school and learning between rural and urban regions. While rural students were generally considered the disadvantaged group in terms of access to education and resources, value given to school and learning was as high as that of students in urban regions, reflecting a positive change in the value of schooling among rural students in Cambodia. The difference between students in rural and urban regions in life satisfaction was, however, statistically significant, with rural students reporting a higher level of life

satisfaction. To the extent possible, this indicates more positive views of life among students in rural regions of Cambodia. The lack of pressure on or competition in learning might be a factor given the fact schooling does not translate into learning as evident in Cambodia's poor performances in PISA-D.

Figure 3. 12. Rural-urban differences in self-rated health, life satisfaction, and valuing school outcomes



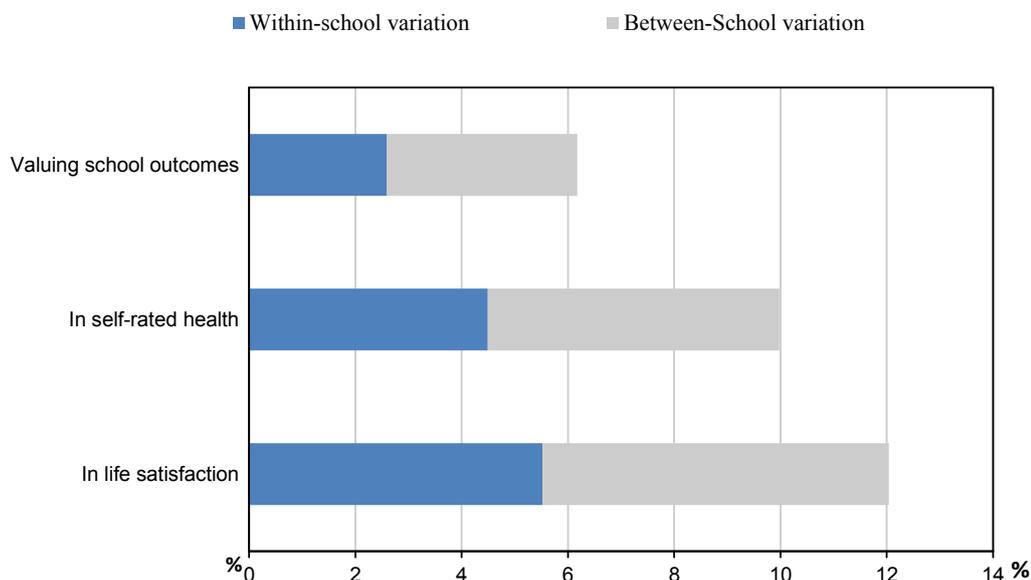
Note: (n.s.) indicates the urban-rural difference is non-significant.

Source: PISA for Development Database.

3.4. Between-school differences in health, well-being and in student attitudes towards school and learning

All outcomes measured by PISA-D are the cumulative result of many influences over the life-course: the role individual differences at birth, and the influence of parents, local communities, and peers on children's development should not be under-estimated. And while schools have a primary responsibility for students' achievement in reading, mathematics, and science, and for helping students develop positive attitudes towards school and learning, many other institutions play an even bigger role in ensuring that children stay healthy and are happy.

Figure 3. 13. Variation, between schools, in self-rated health, life satisfaction, and valuing school outcomes



Source: PISA for Development Database.

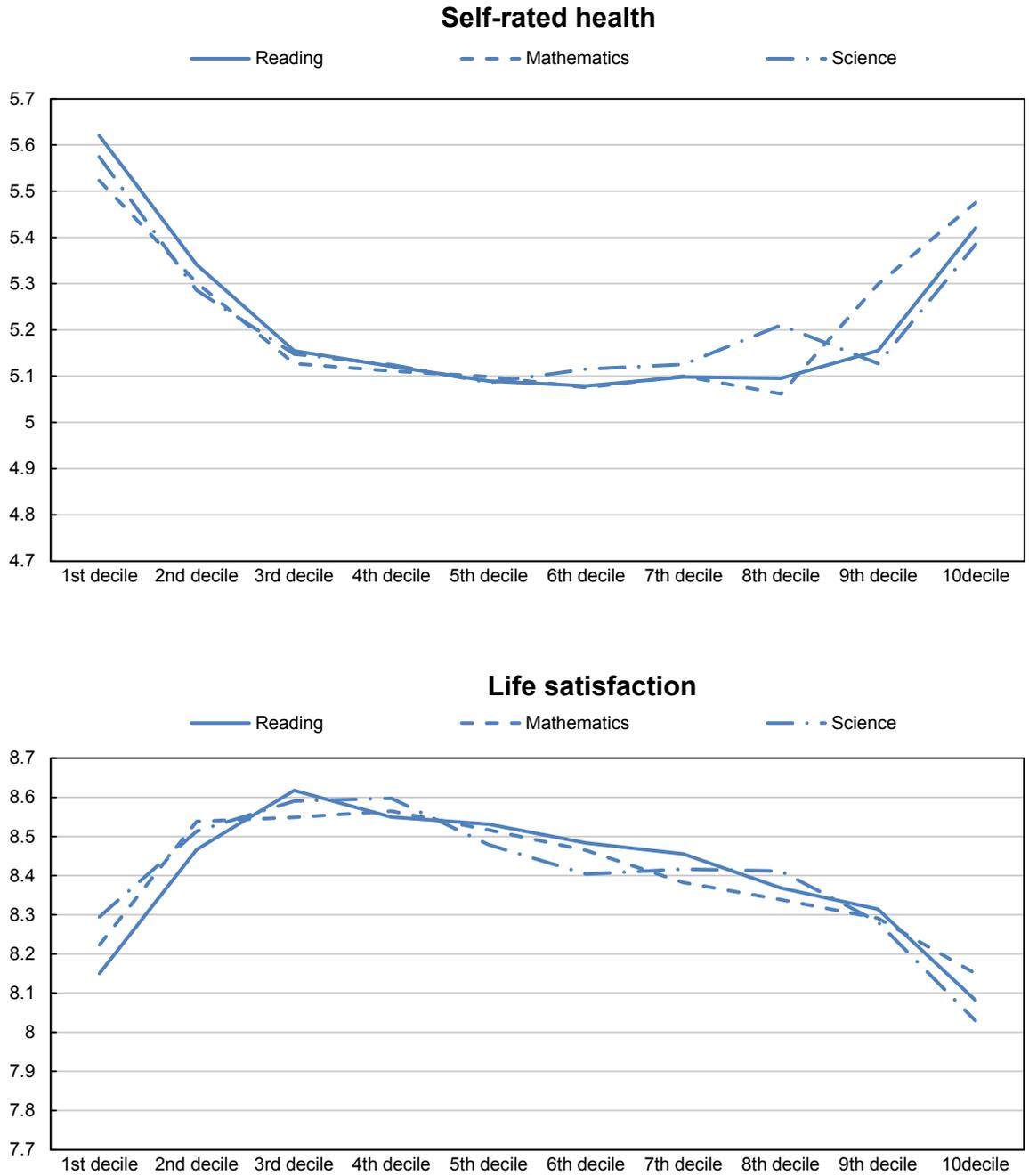
Figure 3. 13 separates the overall variation in students’ self-rated health and life satisfaction, as well as in students’ attitudes toward school and learning, into a between-school and a within-school component.

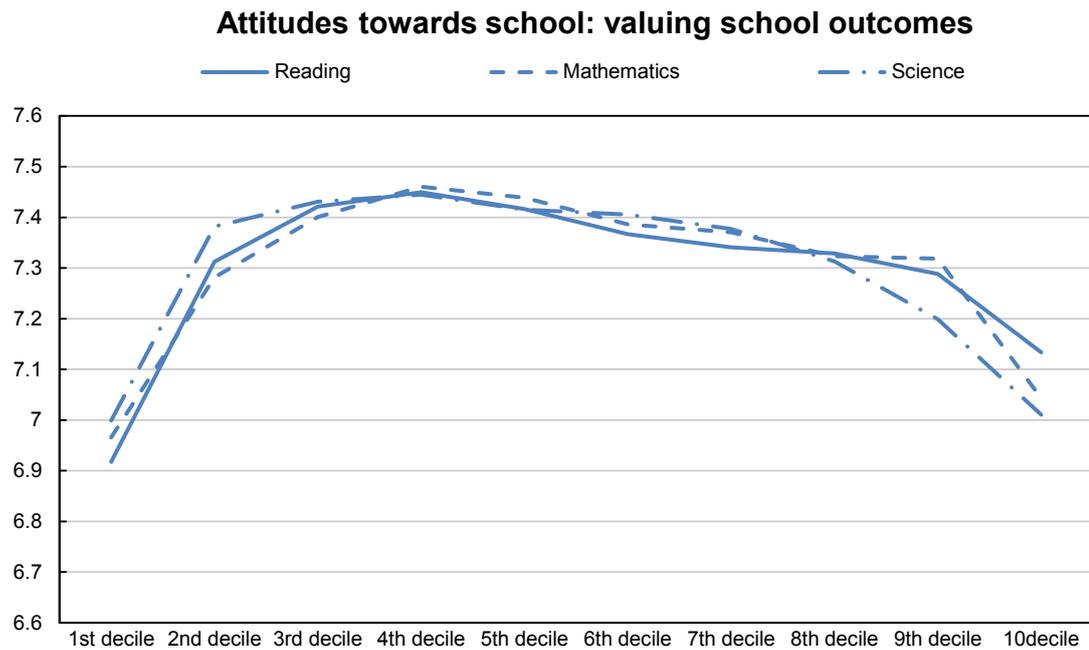
Figure 3.13 immediately reveals that students’ self-rated health and life satisfaction, as well as students’ attitudes toward school and learning vary much more between schools than at the individual level. This may reflect the influence of the school contexts on students’ self-report.

3.5. How health, well-being and student attitudes are related to educational achievement and attainment in Cambodia

Health, well-being and valuing school and learning constitute important outcomes in their own right. In Cambodia, students’ self-rated health, life-satisfaction and their attitudes towards school are, in general, only weakly related with educational achievement (Figure 3.14). This implies that while physical and psychological well-beings as well as attitudes toward school and learning are important to student success, the presence of these factors can be just the preconditions of learning, but not the substitute for learning.

Figure 3. 14. Self-rated health, life satisfaction, and attitudes towards school, by achievement decile





Source: PISA for Development Database.

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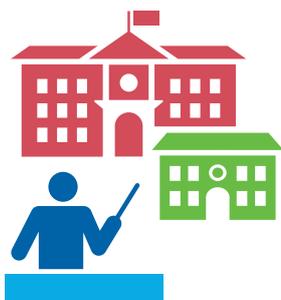
Foundations for success
in Cambodia: Resources invested
in education



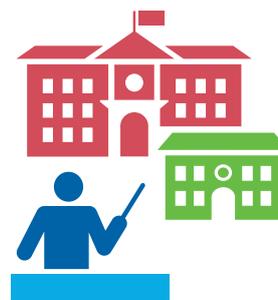
Cambodia allocates 2.7% of **GDP** and 18.3% of **public expenditure** to education.



25% of students are in schools where there are more than 33 **students per teacher**.



Disadvantaged schools tend to have **fewer** and **less experienced teachers**, than advantaged schools.



Rural, disadvantaged and public schools tend to have **fewer** and **less qualified teachers** than urban, advantaged and private schools.



Rural, disadvantaged and public schools tend to have **school facilities** in worse condition than urban, advantaged and private schools.



Rural, disadvantaged and public schools tend to have fewer **instructional materials** than urban, advantaged and private schools.

Chapter 4

Foundations for success in Cambodia: Resources invested in education

This chapter examines the resources invested in education in Cambodia and makes comparisons with other PISA and PISA-D participating countries and economies. The chapter also looks at how these resources are allocated across schools. The relationship between educational resources, including financial, material and human resources, and student performance is also analysed.

4.1. How resources invested in education compare with other countries

This chapter analyses in detail how the resources invested in education in Cambodia are distributed across schools, and how they are related to student outcomes. It starts by describing expenditure on education across education systems, how it has changed over the course of PISA cycles and more generally over the past two decades, and its relationship with student performance. It then describes how this expenditure trickles down to the school system in PISA and PISA-D participating countries, including Cambodia. The chapter does this by focusing on the availability and quality of the material resources (educational material, computers and school size); and human resources (teachers' salaries, initial training, qualifications and professional development; student-teacher ratios and class size). Given the correlational, not causal, nature of the analyses, the chapter only suggests avenues that policy makers in Cambodia may explore to allocate resources more fairly and efficiently.

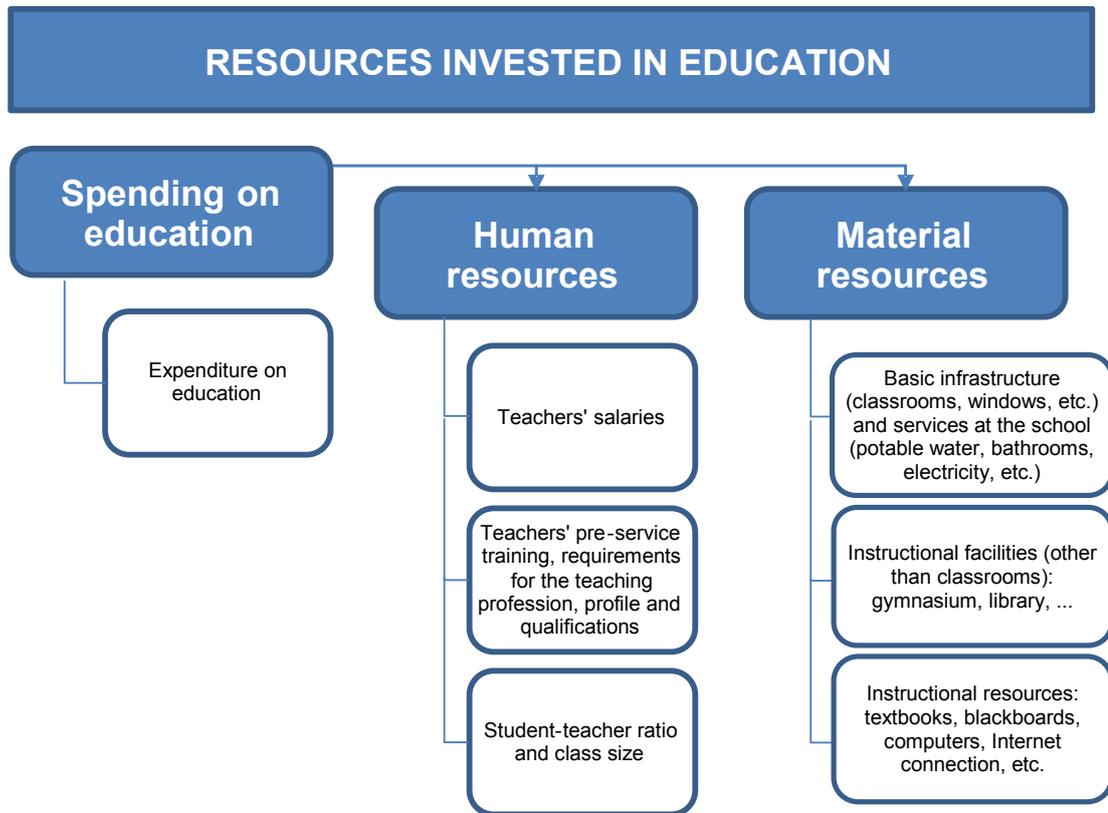
4.1.1. Financial resources

Policy makers must constantly balance expenditure on education with expenditure for many other public services, particularly in the face of fiscal constraints. Yet despite the competing demands for resources and the recent economic crisis, expenditure on education has increased over the past few years in almost all countries with the majority of school funding originating at the central government level. Between 2005 and 2013, expenditure per primary, secondary and post-secondary non-tertiary student increased by 6%, on average across OECD countries with data available for both 2005 and 2013 (OECD, 2016)

Globally, public education expenditure was 14.1% of total public expenditure in 2014, and in 2015, the median global public education expenditure was 4.7% of gross domestic product (GDP) (UNESCO, 2017)- these amounts are considered to be insufficient for all countries to achieve the Education Sustainable Development Goal (SDG). In the context of the Education SDG processes being led by UNESCO, efforts are being made to increase education's share of national budgets in all countries from an average of 14% to 15%-20% between now and 2030 – on average, developing countries need to reach or exceed the upper end of this benchmark if they are to achieve the education SDG. These increases would require low-income countries to raise their total investment in education (from all sources) to at least 6% of GDP by 2030. Currently, public education expenditure in Cambodia is 18.3% of total public expenditure and this equates to 2.7% of the country's gross domestic product (GDP).

Financial resources in education can be allocated to salaries paid to teachers, administrators and support staff; maintenance or construction costs of buildings and infrastructure; and operational costs, such as transportation and meals for students.

Figure 4. 1. Resources invested in education as covered in PISA-D



Expenditures per pupil versus per-capita GDP

In 2013, the average cumulative expenditure by educational institutions per student between the ages of 6 and 15 exceeded the equivalent of USD 100,000¹ in Austria, Belgium, Denmark, Finland, Iceland, Luxembourg, Malta, Norway, Singapore, Sweden, Switzerland, the United Kingdom and the United States. In Luxembourg, cumulative expenditure per student exceeded USD 180,000. By contrast, in Colombia, the Dominican Republic, Georgia, Kazakhstan and Peru, cumulative expenditure per student over this age period totalled less than USD 25,000. In Cambodia, cumulative expenditure per student over this age period totalled USD 3,087, an amount that is far lower than those of PISA-D countries, especially compared to those of Ecuador and Paraguay. In Thailand, cumulative expenditure per student exceeded USD 25,000; the top-performing Singapore outstandingly spent more than USD 130,000 per student. The low per-student expenditure in Cambodia suggests that support to and opportunity for learning as well as other innovations require more than state funding. More resources invested in education are key to improving the current education discourse.

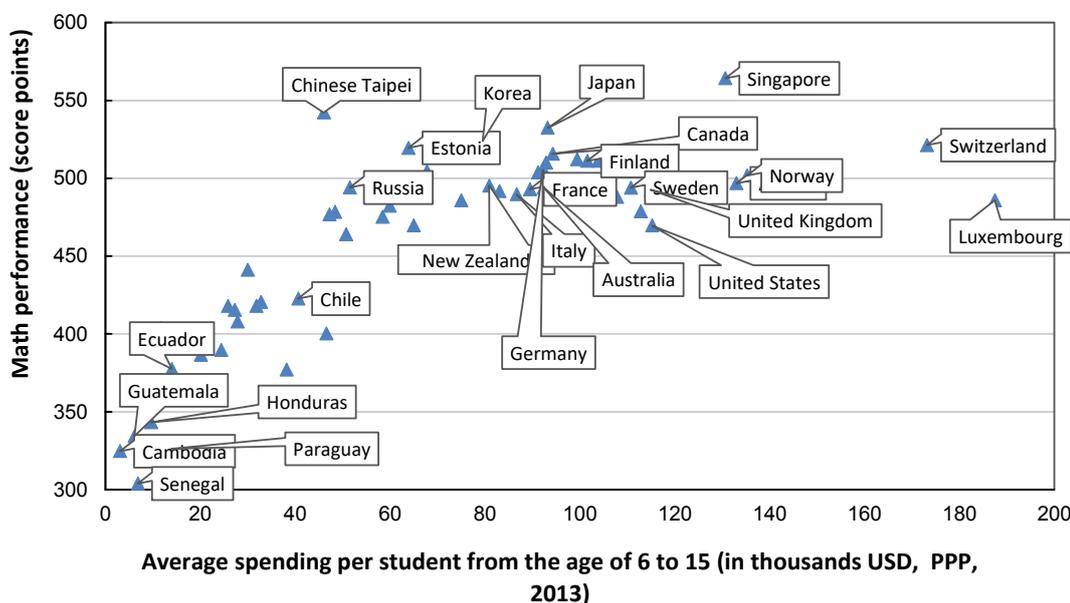
As would be expected, spending on education and per capita GDP are highly correlated. School systems with greater total expenditure on education tend to be those with higher per capita GDP.

Expenditure per student and performance in PISA and PISA-D

A first glance at PISA results gives the impression that students in high-income countries and economies – and countries/economies that can and do spend more on education – perform better. High-income countries and economies (defined here as those with a per capita GDP above USD 20,000) have more resources to spend on education. These countries and economies cumulatively spend USD 89,262 on each student from age 6 to 15, on average, while countries that are not considered to be in that group spend USD 21,307, on average. Students in high-income countries and economies score 111 points higher in mathematics, on average, than students in countries whose per capita GDP is below the USD 20,000 benchmark, including Cambodia.

Yet the relationship among a country's/economy's income per capita, its level of expenditure on education per student, and its PISA score is far more complex (Baker, Goesling, & LeTendre, 2002; OECD, 2012) (Figure 4.2). Among the countries and economies whose cumulative expenditure per student is under USD 50,000 (the level of spending in 18 countries), higher expenditure on education is significantly associated with higher PISA scores. But this is not the case among countries and economies whose cumulative expenditure is greater than USD 50,000, which include most OECD countries. It seems that for this latter group of countries and economies, factors other than the level of investment in education are better predictors of student performance. Among the former group of countries and economies, systems whose cumulative expenditure per student is USD 10,000 higher than other systems score an average of 32 points higher in the PISA mathematics assessment.

Figure 4. 2. Spending per student from the age of 6 to 15 and mathematics performance



Source: PISA 2015 and PISA for Development Databases.

However, among those countries and economies whose cumulative expenditure per student is more than USD 50,000, the relationship between spending per student and performance is no longer observed. Among these countries and economies, it is common to find some

with substantially different levels of spending per student yet similar mathematics scores. For example, South Korea and Switzerland score similarly in mathematics but the cumulative expenditure per student in Switzerland is more than two times greater than that in Korea. Similarly, although countries and economies might have similar levels of expenditure on education, they can perform very differently. For example, while Australia and Japan both spend roughly USD 90, 000 per student from the age of 6 to 15, Australia's mathematic score in PISA 2015 is 494 points and Finland's score is 532 points.

The fact that the relationship between spending per student and learning outcomes is no longer increasing, at the typical levels of expenditure observed in the countries and economies with larger education budgets, suggests that excellence in education requires more than money. How resources are allocated is just as important as the amount of resources available to be allocated. This evidence also holds true in countries whose cumulative expenditure per student still is low (for example, among PISA-D countries). While PISA-D countries have different levels of spending per student, more than 85% of students in these countries similarly score below the baseline level (level 2) in mathematics. Low spending per student appears a constraint to development and innovation at school. The differences in spending yet similar student performance, however, highlight that although increasing expenditure in education is currently in need in these countries to ensure schools are better resourced and to create a supportive learning environment for students, how resources are allocated and used to promote teaching and learning in particular is what policy makers and schools need to attend to.

4.1.2. Human resources

Teachers are an essential resource for learning; but not every teacher attribute is related to student outcomes in the same way. Previous studies have shown, for instance, that teachers' knowledge of the subject they teach and the quality of their instruction have a measureable impact on student performance - stronger than their level of education, experience, qualifications, work status or salaries (Allison-Jones & Hirt, 2004; Hanushek & Rivkin, 2006; Hanushek, Piopiunik, & Wiederhold, 2014; Lockheed, Komenan, Lockheed, & Komenan, 1988; Metzler & Woessmann, 2012; Palardy & Rumberger, 2008). The type and quality of the training teachers receive, and the requirements to enter and progress through the teaching profession, shape the quality of the teaching force. Attracting, developing and retaining effective teachers are priorities for public policy (Barber & Mourshed, 2007).

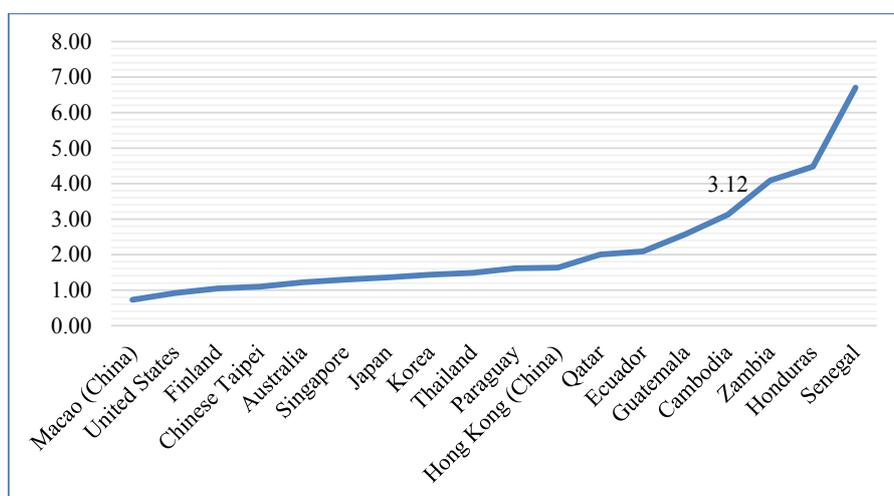
The quantity and quality of human resources

Teachers' salaries represent the largest single share of expenditure on education (OECD, 2016). School systems differ not only in how much they pay teachers, but in the structure of their pay scales. On average, the salaries of teachers with minimum training and 15 years of experience in OECD countries exceed the per capita GDP in their country by 10% for lower secondary school teachers and by 16% for upper secondary school teachers.

Relative to their country's national income, lower and upper secondary school teachers in Colombia, the Dominican Republic, Germany, Hong Kong (China), Mexico, Qatar, Turkey and the United Arab Emirates earn the most. In these countries/economies, annual earnings of lower secondary school teachers with minimum training and 15 years of experience range between 152% and 217% of per capita GDP, while annual earnings of upper secondary school teachers with the same qualifications range between 152% and 256% of per capita GDP. By contrast, in the Czech Republic, FYROM, Kazakhstan, Lithuania and the Slovak Republic, annual earnings for lower and upper secondary school teachers are less than 60% of per capita GDP. In Cambodia, the annual earning of lower secondary school teachers with minimum training and 15 years of experience represents about 312% of per capita GDP

(Figure 4.3). The high ratio of teachers' annual salary and per capita GDP suggests that teachers still are better paid than most members of the population on average. However, the low per capita GDP of USD 3, 275 (converted using PPPs) in Cambodia means comparatively Cambodia's teacher salary remains low. In Singapore and Thailand, for example, the annual earnings of lower secondary school teachers with minimum training and 15 years of experience range between 130% and 148% of per capita GDP. However, given the high per capita GDP in those countries, the teaching profession is considered one of the most highly paid professions. Teacher salary in Cambodia is similar to those in Zambia and Senegal.

Figure 4.3. Ratio of annual earnings of lower secondary school teachers with minimum training and 15 years of experience and per capita GDP



Source: PISA for Development Database.

Class size and student-teacher ratios

Class size can affect learning in various ways. Large classes may limit the time and attention teachers can devote to individual students, rather than to the whole class; they may also be more prone to disturbances from noisy and disruptive students. As a result, teachers might have to adopt different pedagogical styles to compensate, and these, in turn, might affect learning. For instance, an often-mentioned benefit of smaller classes is that teachers can dedicate greater attention to individual students, especially to those who need academic support the most. PISA 2015 findings show that, on average across OECD countries, in schools with smaller classes, students were more likely to report that their teachers adapt their lessons to students' needs and knowledge, provide individual help to struggling students, and change the structure of the lesson if students find it difficult to follow.

Some studies, particularly those based on the Tennessee STAR experiment, which assigned students randomly to larger or smaller classes, show that smaller classes can improve student outcomes and might be more beneficial for disadvantaged and minority students (Dynarski, Hyman, & Schanzenbach, 2013). Chetty et al. (2010) even find long-term effects on college attendance, home ownership and savings. However, other research shows no impact of class size on student performance (Wößmann & West, 2006). For instance, no long-term gains in earnings were observed among students in the Tennessee STAR experiment who attended smaller classes (Chetty, et al., 2010); and large classes are found in many Asian countries where average student performance in PISA is high. But given the relatively high cost of

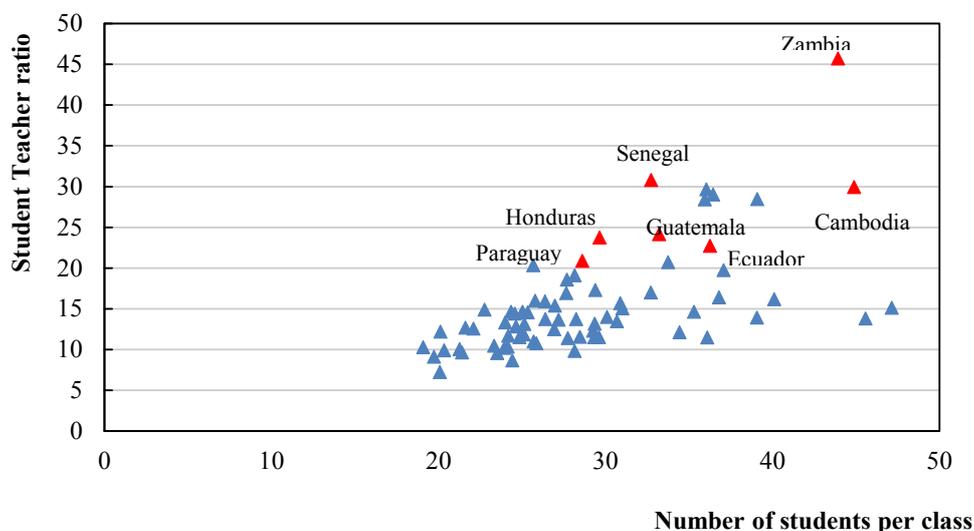
reducing class size, the decision to do so or not should ultimately depend on how much it improves student outcomes compared to other, less expensive, policy interventions (Fredriksson, Öckert, & Oosterbeek, 2012).

PISA-D and PISA 2015 asked school principals to report the average size of language-of-instruction classes in the national modal grade for 15-year-olds. It also asked the total number of teachers and students in their schools, from which the student teacher ratio was computed. According to school principals, on average across OECD countries, there are 26 students per language-of-instruction class. In B-S-J-G (China), Turkey and Viet Nam, there are 40 or more students per class, while in Belgium, Finland, Iceland, Malta and Switzerland, there are 20 or fewer students. In Cambodia there are 45 students on average per language of instruction class, while in the majority of PISA-D countries the class size is centred around 30-35. The large class size in Cambodia is more commonly observed in public schools (45 students) than in private schools (32 students). The class size difference is, however, not found between urban and rural schools.

Across OECD countries, the average student attends a school where there are 13 students for every teacher. Student-teacher ratios range from almost 30 students per teacher in Brazil, Colombia, the Dominican Republic and Mexico, to fewer than 10 students per teacher in Albania, Belgium, Greece, Hungary, Iceland, Luxembourg, Malta and Poland. In Cambodia the average student attends a school where there are 30 students for every teacher. This high ratio is more likely found in public and rural schools. The student-teacher ratios in urban and private schools are about twice as low as those in public and rural ones. This large difference implies teacher allocation and workload remains not well-balanced in Cambodia.

The comparison of student-teacher ratios and class size can provide a measure of the spare teacher resource capacity within schools. Across education systems, there is a positive association between class size and student-teacher ratios; but there are several education systems, such as those in B-S-J-G (China), CABA (Argentina), Georgia, Japan and Singapore, that have both large classes and low or average student-teacher ratios. Teachers in these systems may, as a result, have more time to prepare for their classes and for other school responsibilities besides teaching. By contrast, there are also some education systems with small or average classes and high student-teacher ratios, such as those in Germany, Ireland, the Netherlands, New Zealand, the Russian Federation, the United Kingdom and the United States. Cambodia is a country that has large class size and high student-teacher ratios. This is attributable to the lack of school buildings or classes and teachers in some schools, particularly rural, as staffing the rural schools is a challenge (Tandon & Fukao, 2015).

Figure 4. 4. Relationship between class size and student-teacher ratio



Note: Each triangle represents a country/economy participating in PISA or in PISA for Development.
Source: PISA 2015 and PISA for Development Databases.

Requirements to enter the teaching profession

System-level data show that competitive examinations are required to enter pre-service teacher training in Cambodia for primary education and secondary education – this is the same picture as 20 other education systems in PISA for primary education and in 19 for secondary education. In some countries, even though competitive examinations are not required for pre-service teacher training, a leaving certificate or the results of exams taken by all students at the end of secondary education are used for admission into teacher education programmes. Pre-service teacher training is longest in Germany and Luxembourg, where such training for lower and upper secondary school teachers lasts 6 to 7 years.

Figure 4. 5. Selected pre-service training requirements for lower secondary teachers in public institutions

	No examination to enter pre-service training	Competitive examination to enter pre-service training
Relatively short duration of pre-service training programme (less than 4.5 years)	Guatemala Argentina Australia Denmark Dominican Republic England (UK) FYROM	Cambodia Ecuador Honduras Paraguay Senegal Zambia Brazil
Relatively long duration of pre-service training programme (more than 4.5 years)	Estonia Hungary Ireland Qatar Spain Sweden	Croatia Czech Republic Finland Hong Kong (China) Portugal Peru

Note: Data refer to 2013.
Source: PISA 2015 and PISA for Development Databases.

In Cambodia, the duration of training programmes across teacher education levels do not vary substantially. Pre-service teacher training for pre-primary education, primary education and lower secondary education is only 2 years, while the training for upper-secondary education takes a rather short period of one year. Given the shortage of teachers following the collapse of Khmer Rouge, the entry requirement for the pre-service teacher training for lower secondary education or below requires only 12-years education, while the entry requirement for upper secondary teacher training needs 16-years education. The low entry point and short training duration affect educational attainment levels of teachers considerably. By and large, the current pre-service teacher training enables teachers to attain at most the bachelor's degree or even lower. This training structure lags behind most of the Latin American peers who participated in PISA-D.

However, with the current teacher reform, pre-service teacher training for primary and secondary teachers is mandated for four years, aiming to increase their educational attainment level to a bachelor's degree. While this reform still is in its inception phase, it has the potential to put Cambodia on par with Thailand where all teachers hold at least a bachelor's degree to be able to teach in the K-12 education system.

Teacher data shows that there is limited professional development to compensate for low teacher qualification in Cambodia. About 27% of teachers reported having attended further education programmes. One out of three reported having attended courses or workshops on teaching methods and on their subject matter; whereas only some 12% of teachers experienced visiting other schools to learn about teaching and learning conditions. With a short pre-service teacher training and the current requirements to enter the teaching profession, the quality of teaching force in Cambodia needs to be compensated by relevant professional training activities. But this is not the case for now.

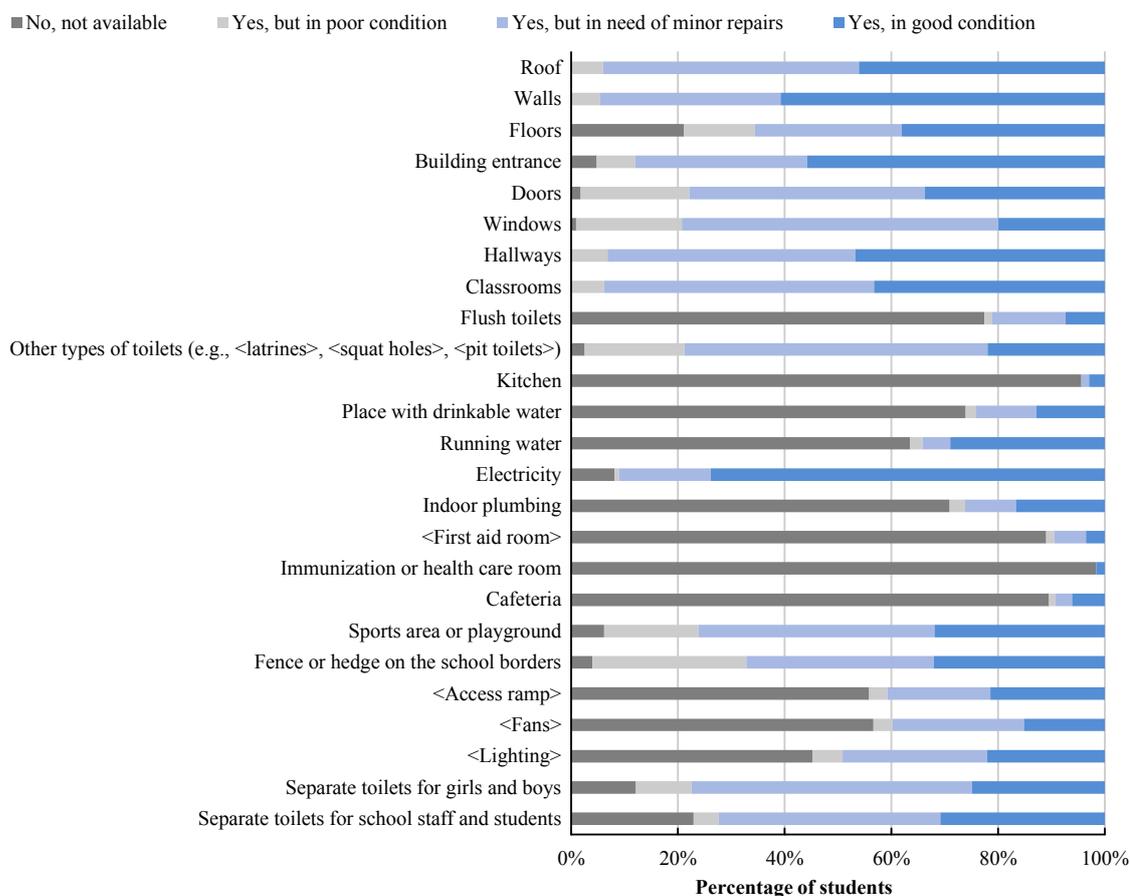
4.1.3. Material and instructional resources

While after a certain point, the quality of school buildings and of instructional resources does no longer make a difference in students' outcomes, studies based on the Latin American Laboratory for Assessment of the Quality of Education (LLECE) data (Murillo & Román, 2011) and (Willms & Somer, 2001) suggest that in middle- and low-income countries school resources have substantial effects, even after taking into account the socio-economic characteristics of students.

PISA-D asked school principals to report on the availability and condition of basic infrastructure (roof, windows, doors, etc.) and services (potable water, sewage services, toilets, electricity) at the school. Teachers, in turn were asked about the availability and condition of instructional facilities (such as a school library, gymnasium, an art and music room) and of instructional resources, from very basic materials such as textbooks and blackboards, through to computers for students and teachers. Finally, both teachers and school principals were asked about the availability of textbooks.

In Cambodia, according to school principals, school infrastructure is in poor condition, with many schools, for example, not having access to running and drinkable water, having doors and windows in poor condition or in need of minor repairs, not having access ramp and having electricity but not used to the full extent. This is characterized by an index of 4 out of a 10-point scale developed for cross-PISA-D country comparison. The same holds true for the school instructional resources. The teacher data show that, in many schools, instructional resources are generally in poor condition/not adequate or in need of repair such as writing board, a wall chart, map or diagram, school library, workbook, teacher guide and reference books for teachers. There are even fewer advanced instructional resources, with many schools, for example, not having science lab, rooms for student guidance and counselling, teacher staff room, education resource center and ICT-related materials.

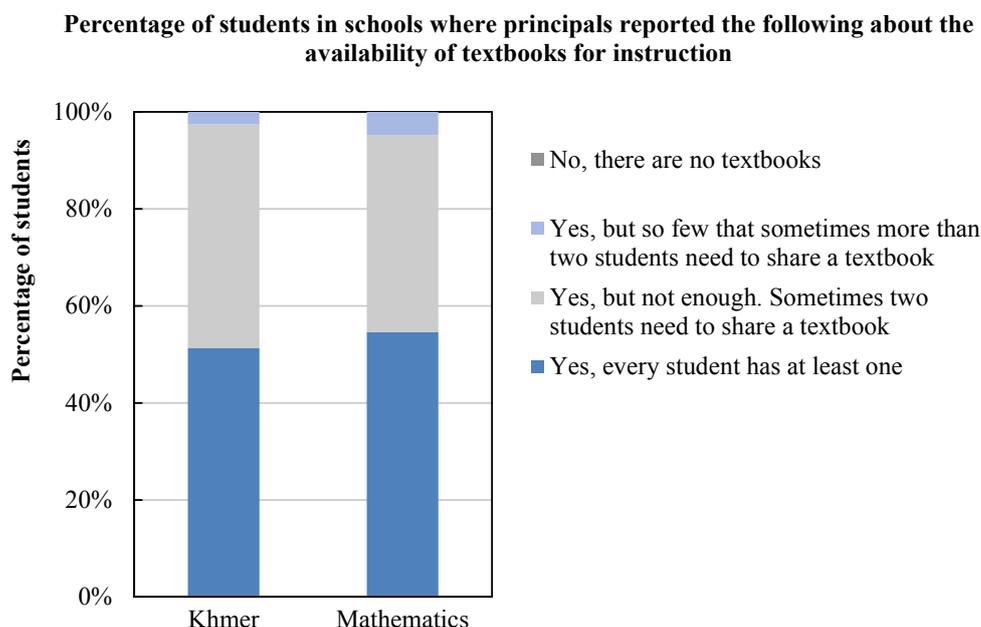
Figure 4. 6. Physical condition of school infrastructure



Source: PISA for Development Database.

The resource allocation within Cambodia appears strongly related to the socio-economic profile of schools, with urban, private and more advantaged schools, systematically having more resources as well as more experienced teachers. Students with these school advantages tend to achieve a higher level of performance in all the three domains.

In addition, almost half of students are in schools where school principals reported that there are not enough textbooks for every student. In mathematics, 55% of students are in schools where there is one textbook available for every student; at the other end, 45% of students are in schools where principals reported that two or more students need to share mathematics textbooks as there are not sufficient textbooks for every student to use. The situation is similar for Khmer textbooks (Figure 4.7).

Figure 4. 7. Availability of textbooks in Khmer and mathematics

Source: PISA for Development Database.

4.2. How resources vary among schools within Cambodia

4.2.1. Variation in class size, student-teacher ratios and teacher experience between schools

Creating smaller classes, or assigning more teachers for an equivalent number of students, is often a deliberate policy response to the high concentration of student disadvantage in some schools. The availability of teacher resources can also vary due to the combined effect of the population density in a particular area and of the structure of the school offer in the same area. For example, in many countries rural schools – i.e. schools located in scarcely populated areas – have smaller classes and smaller student-teacher ratios, because a minimum number of teachers is required per school, even if the number of students is small.

School principals in Cambodia, and in other countries that participated in PISA and in PISA-D, were asked to report the average size of classes in the typical grade attended by 15-year-old students (grade 10 in Cambodia). According to principals, 9.9% of 15-year-old students are in schools where the average number of students per class is less than 20 students, 3.9% in schools with between 21 and 30 students per class, 8.3% in schools with between 31 and 40 students per class, and 77.9% in schools with more than 41 students per class. And while the average number of students per teacher is 30, 25% of students are in schools where the student-teacher ratio is 18.5 or less, and 25% in schools where the student-teacher ratio is 32.5 or more. Not only the quantity of teachers, but also their characteristics may vary across schools in ways that are not random. In particular, in many countries, teachers who are assigned to remote schools or to schools that concentrate high levels of student disadvantage transfer to another school or drop out of the profession more than on average, and novice teachers with little experience are hired in these schools to replace them; as a consequence, start-of-career teachers are often found more often in schools with difficult working conditions than in others (OECD, 2018). In Cambodia too, novice teachers (12%), i.e. teachers with less than 5 years of experience in the profession, are not uniformly spread across all schools. Novice teachers appear more concentrated in public schools (12%) than

in private ones (5.3%) and more in rural schools (14%) than in urban schools (4.9%). The higher concentration of novice teachers is also found in schools with most socio-economically disadvantaged students (20%) compared to 4.2% observed in schools with the most socio-economically advantaged schools.

In general, schools with smaller class sizes have larger student-teacher ratios as more teachers are required in order to reduce the number of students per class. But this is not the case for Cambodia. The linear correlation shows that there is no clear or a weak relationship between class size, student-teacher ratio and teachers' teaching experience. This reflects the fact that student and teacher assignments are not systematically tailored in line with varying conditions of schools.

4.2.2. Variation in material and instructional resources of schools

School buildings also vary significantly across schools in Cambodia. To analyse the variation in material and instructional resources across schools, two indices were developed in PISA for development.

The index of school material resources varies between 0 (indicating the lack of all basic infrastructure elements and services listed in Figure 4.6) and 10 (indicating that these elements are present and in good condition. Intermediate values indicate the availability of material resources to a varying degree. For example, a school in relatively poor state, with no flush toilets, no roof or a roof that is in poor condition, no place with drinkable water, no lighting and no fans, would typically have an index value between 1.1 and 2.6 (depending on what other elements are present or not). A school with all the above elements (a roof, flush toilets, lighting or fans) in good condition, would typically have an index value comprised between 5.4 and 7.2. Finally, a school that has these elements, but in need of minor repairs, would have an index values of about 4 (between 3.9 and 4.3, in most cases).

Similarly, the index of instructional resources varies between 0 (indicating the lack of all instructional facilities and resources) and 10 (indicating that all these elements are present and in good condition. Intermediate values indicate the availability of instructional resources to a varying degree. For example, schools whose teachers report the availability of, at best, only very basic instructional resources (no wall chart, map or diagram, no gym, no teacher staff room and no computers for students or for teachers) would typically have index values comprised between 2.9 and 3.7. Schools whose teachers, in contrast, report that many instructional resources are available (including computers for students and for teachers, an Internet connection that is in good condition or at worst in need of minor repairs and a teacher staff room that is in good condition) would correspond to index values between 5.3 and 6.4. Finally, schools whose teachers report that basic resources (including chairs and desks for students and a wall chart, map or diagram) are available and at worst in need of minor repairs, but more advanced resources (such as an Internet connection for students) are not available or at best in poor condition, would typically have index values between 4.2 and 4.9.

The average level of material resources for schools in Cambodia corresponds to an index value of 4.1 on the 10-point scale, while the average level of instructional resources for schools in Cambodia corresponds to an index value of 4.1 on the 10-point scale. The 25% of schools (weighted by their student population) with the worst material resources have, on average, a value of 3.2 on the 10-point-scale of material resources, while the 25% of schools with the best material resources have, on average, a value of 5.3 on the 10-point scale. Similarly, the 25% of schools with the worst instructional resources (according to teachers' reports) have, on average, a value of 3.5 on the 10-point scale, while the 25% of schools with the best instructional resources have, on average, a value of 4.8. Among countries participating in PISA-D, these values correspond to one of the lowest level of material and instructional resources.

This report also classifies schools in 5 categories of material and instructional resources (extremely low level, severely low level, low level, moderate level and high level of resources). According to these categories, in Cambodia, 6.8% of 15-year-old students are in schools with a high level of these basic resources; 18% are in schools with a moderate level of resources, 24% are in schools with a low level of resources, 20% are in schools with a severely low level of resources and 31% are in schools with an extremely low level of resources.

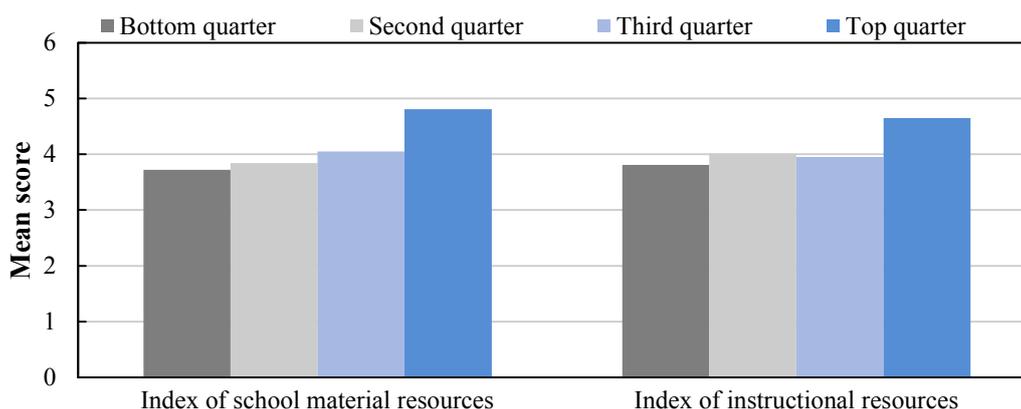
In Cambodia, 18% of 15-year-old students are in schools where teachers, on average, report a high level of instructional resources; 22% are in schools where teachers report a moderate level of resources, 27% are in schools with a low level of resources, 28% are in schools with a severely low level of resources and 5.2% are in schools with an extremely low level of resources.

4.3. Equity in the provision of material, instructional and human resources across schools

The variation in the provision of material, instructional and teacher resources across schools is not only significant, but also systematically related to geographic and socio-economic differences.

In particular, disadvantaged schools in Cambodia, and schools in rural areas in particular, tend to have poorer material and instructional resources; Some of these differences may be driven by private schools (which tend to be located more frequently in urban areas, and concentrate some of the most advantaged students): their material and instructional resources are considerably better than those of public schools. The difference in school material and instructional resources are similarly pronounced between the most advantaged and the most disadvantaged schools in Cambodia. On average, more school material and instructional resources are allocated to advantaged schools.

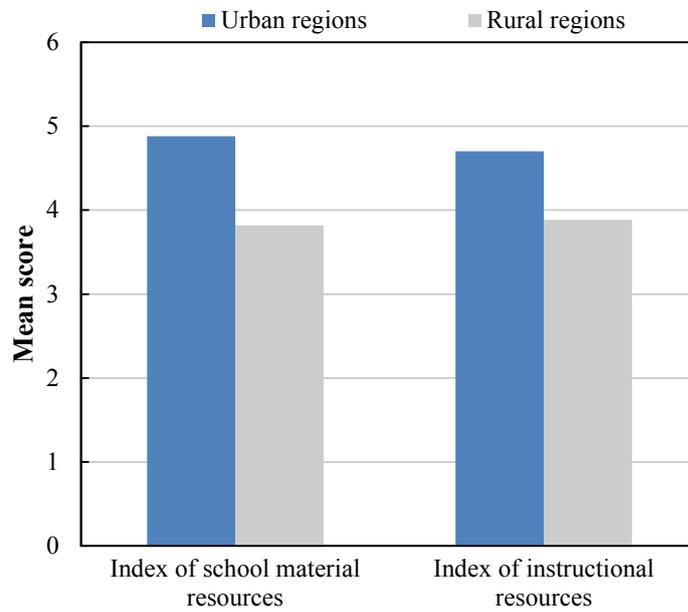
Figure 4. 8. Variation in material and instructional resources, by school socio-economic profile



Note: All differences between top and bottom quarter are significant.

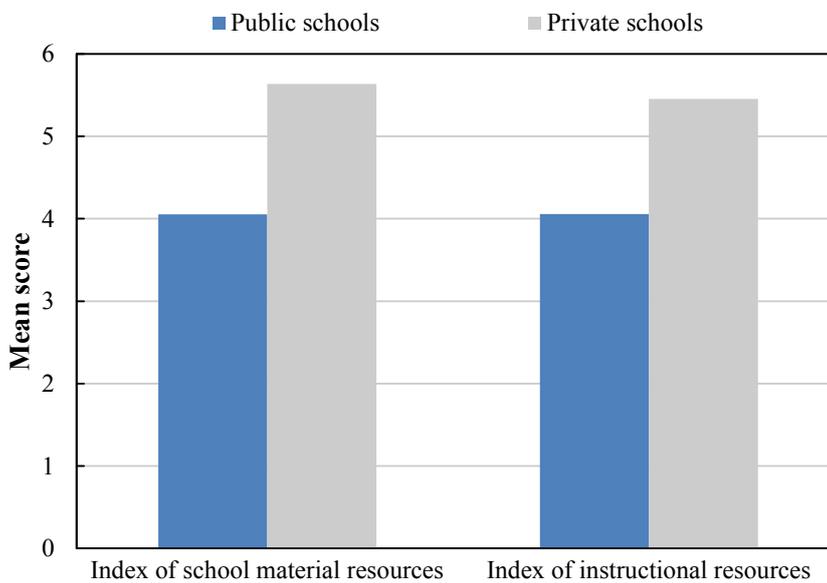
Source: PISA for Development Database.

Figure 4. 9. Variation in material resources, by region



Note: All differences between urban and rural regions are significant.
Source: PISA for Development Database.

Figure 4. 10. Variation in material resources, by school type

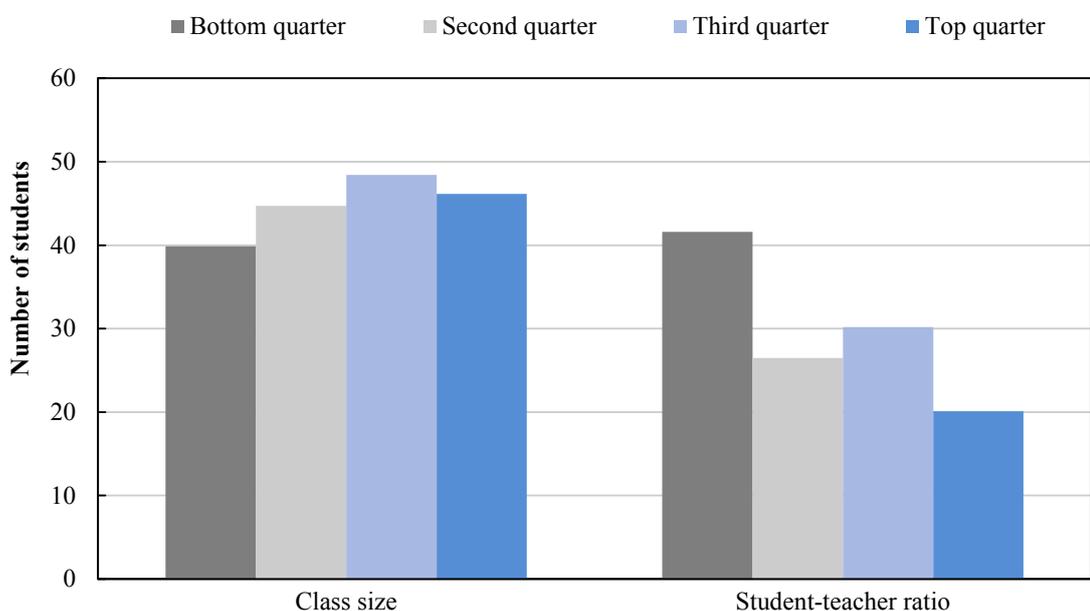


Note: The differences between public and private school for the indicator are significant.
Source: PISA for Development Database.

The socio-economic profile of children who attend the school also has a strong association with the number and quality of teachers the school. In Cambodia, there are 40 students per

class in the schools in the bottom quarter of school socio-economic profile, while there were 46 students per class in the schools of the top quarter of school socio-economic profile. This makes for a significant difference of more than 6 students per class between socio-economically advantaged and disadvantaged schools. In contrast, there are fewer students per teacher in advantaged schools (20) than in disadvantaged schools (42). This means that schools that operate in more disadvantaged areas tend to have more teachers per student, compensating, in part, for the lack of material resources of families and schools.

Figure 4. 11. Variation in class size and student-teacher ratios, by school socio-economic profile



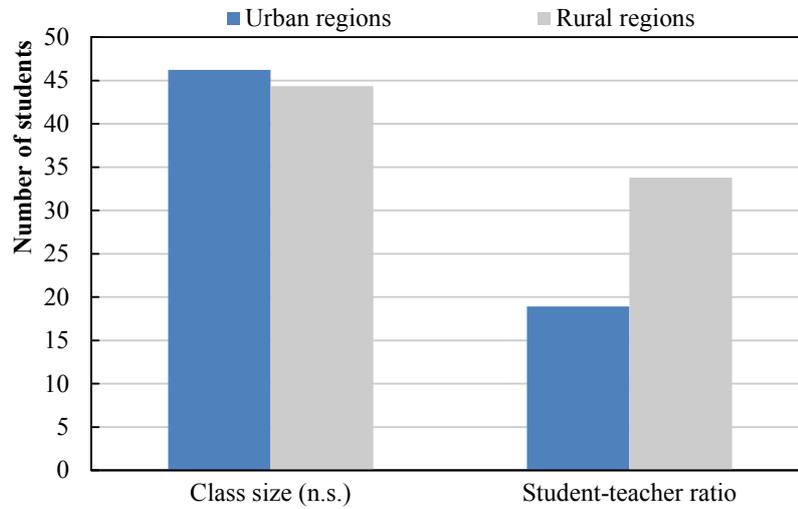
Note: All differences between top and bottom quarter are significant.

Source: PISA for Development Database.

Across other countries that participate in PISA, more teacher resources are allocated to disadvantaged schools, on average. But some countries and economies that compensate for school disadvantage through more teachers may unintentionally do so at the cost of teachers' quality – e.g. because high-need schools concentrate on a disproportionate number of novice teachers, who have not yet become proficient in their teaching. In Cambodia, schools in the bottom quarter by their socio-economic profile – which together represent 25% of all students – have 22% of teachers with less than 5 years of experience, while schools in the top quarter by their socio-economic profile only have 5% of teachers with less than 5 years of experience.

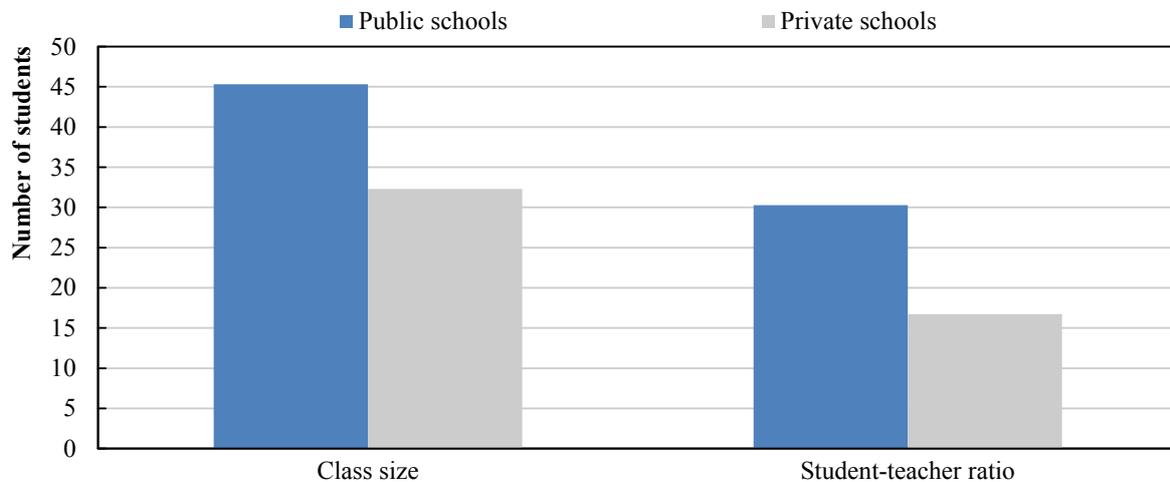
Class size in urban and rural schools tend to be not significantly different; Urban schools, however, tend to have fewer students per teachers than schools located in rural areas. In turn, public schools tend to have more students per class and teachers than private schools, indicating a more disadvantaged learning condition for the former.

Figure 4. 12. Variation in class size and student-teacher ratios, by region



Note: (n.s.) indicates the difference between urban and rural regions for the indicator is non-significant
Source: PISA for Development Database.

Figure 4. 13. Variation in class size and student-teacher ratios, by school type



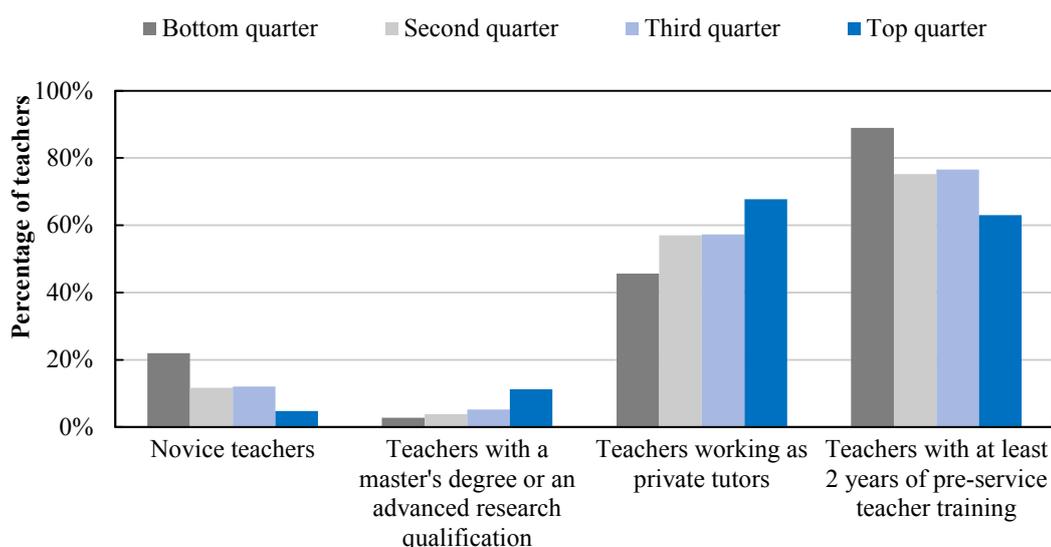
Note: All the difference between public and private schools for the indicator are significant.
Source: PISA for Development Database.

Private schools in Cambodia, which concentrate many of the most affluent students, are typically better resourced than public schools. When only public schools are considered, PISA-D data show, however, that access to school material and instructional resources remains inequitable, and varies significantly between the most advantaged and the most disadvantaged public schools, with more resources allocated to the former. This indicates while in general public schools are less resourced, some public schools are even more poorly resourced than the average public schools.

Finally, the average socio-economic status of students in the school, the schools' location and its sector (public or private) are also systematically related to the type of teachers that teach in the school.

In particular, teachers in socio-economically advantaged schools (Figure 4.14) are significantly more likely to have graduated from tertiary education (rather than holding secondary or post-secondary education as their highest level of education) and tend to be significantly more experienced than teachers in the most disadvantaged schools, which concentrate a large proportion of novice teachers with less than 5 years of experience in the profession. However, they are significantly less likely to have completed at least two years of pre-service teacher training than teachers in the most disadvantaged schools and are significantly more likely to work, also, as private tutors outside of school.

Figure 4. 14. Variation in teacher quality, by school socio-economic profile

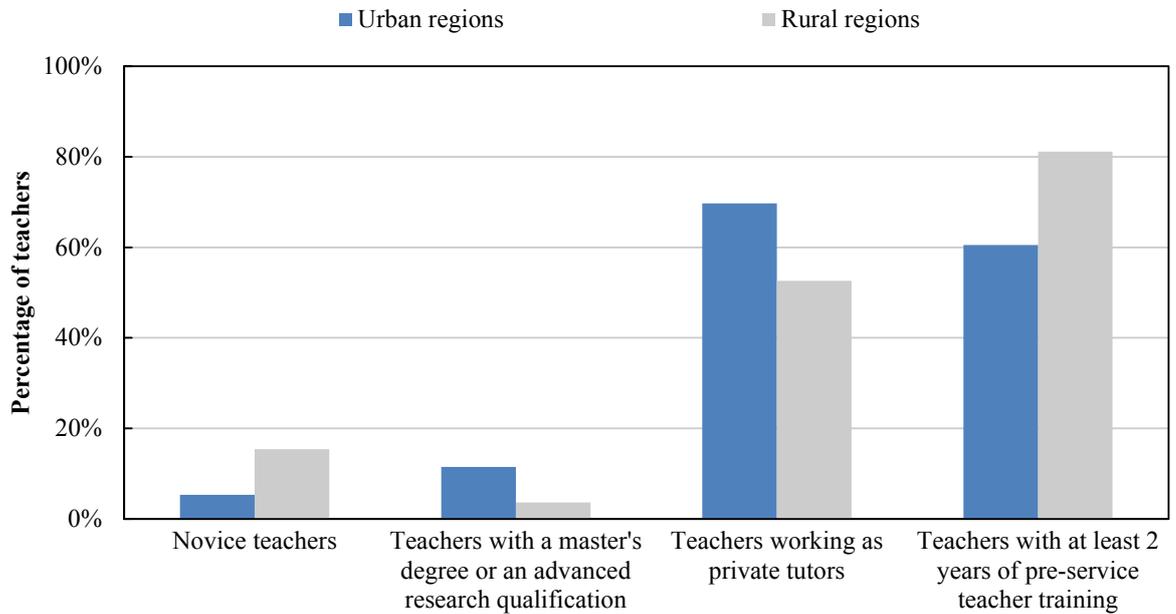


Note: All differences between top and bottom quarter are significant.

Source: PISA for Development Database.

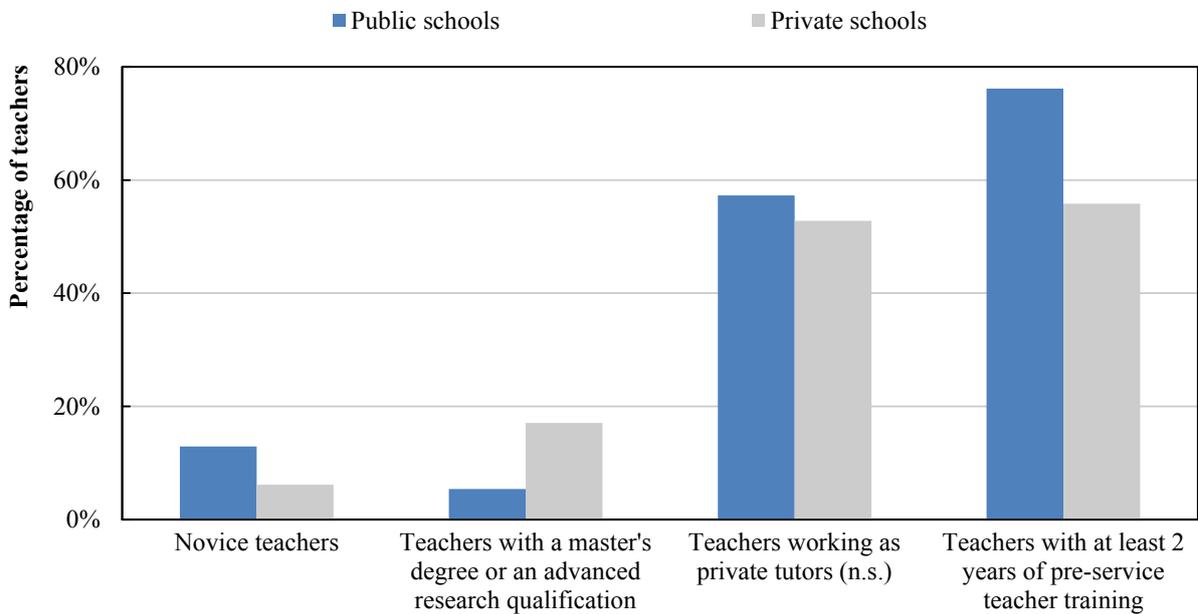
The same characteristics of teachers in socio-economically advantaged schools are also found in urban and private schools (Figure 4.15 and Figure 4.16). In particular, while the number of teachers per student in rural schools is larger than that in urban schools, these schools concentrate a higher number of novice teachers (15%), and teachers, on average, remain fewer years in rural schools (average seniority: 10 years) than in urban schools (average seniority: 12 years).

Figure 4. 15. Variation in teacher quality, by region



Note: All the differences between urban and rural regions for the indicator are significant
Source: PISA for Development Database.

Figure 4. 16. Variation in teacher quality, by school type



Note: (n.s.) indicates the differences between public and private regions for the indicator is non-significant
Source: PISA for Development Database.

4.4. Research on the effects of financial, material, instructional and human resources

Despite the widely accepted idea that more resources improve student performance, previous research on education has generally shown that, once an adequate level of resources is reached, additional resources may not necessarily contribute to better learning outcomes (Burtless, 1996; Nannyonjo, 2007; Nicoletti & Rabe, 2012; OECD, 2013; OECD, 2016; Suryadarma, 2012; Wei, Clifton, & Roberts, 2011). This implies that governments, schools and families should also focus on how educational resources are distributed and used, and which resources actually improve student learning, as well as on how much is spent on education.

Each additional dollar can only be spent once, so countries need to decide whether to invest in salary increases, more instruction time for students, more professional development for teachers, improved educational resources or school infrastructure. Equally important, countries need to decide how to distribute resources across schools, and how to align additional resources with socio-economic circumstances and other needs. Some research, for instance, suggests that increasing the educational resources available to disadvantaged students and schools offers good returns, both for student achievement (Bressoux, Kramarz, & Prost, 2009; Lavy, 2012; Henry, Fortner, & Thompson, 2010; Schanzenbach, 2007; Willms J. D., 2006) and in redressing inequalities in education (Henry, Fortner, & Thompson, 2010). PISA also shows that in high-performing education systems, resources tend to be allocated more equitably between socio-economically advantaged and disadvantaged schools (OECD, 2016). PISA shows that countries differ widely in where they choose to invest their spending on education, so it is worth comparing policies and practices in this area.

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Note:

¹All amounts are expressed in US Dollars (USD), converted using purchasing-power parities (PPPs).



Foundations
for success in Cambodia:
The school and community
environment



In Cambodia, a large majority of students (94%) feel that they **belong at school**.



While 96% of students report that they **feel safe at school**, only 70% feel safe on the way home from school. At school, the most frequent threats to safety are theft and physical violence (threats and fights).



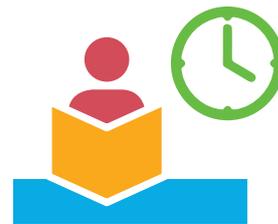
A small proportion of students report having **missed school for more than 3 months in a row** (7.5%), with health problems (their own or those of family members) and household responsibilities being often cited as the reason.



Most of the 15-year-old students in Cambodia reported **positive views about their teachers**: 87% felt that their teachers are interested in their well-being.



61% of students are in schools where more than one in five students reported that a **teacher did not come for class** during the two weeks prior to the PISA test.



Quality and quantity of instruction is impaired due to a poor **climate of discipline in the classroom** but in Cambodia only 12% of students report that students don't start working for a long time after the lesson begins.



50% of students reported that they had **arrived late for school** at least once in the two weeks prior to the test.



36% of students are in schools that organise remedial classes at school to **help students who lack basic reading skills**.



Only 43% of students report that they regularly **discuss with their parents** how well they are doing at school.

Chapter 5

Foundations for success in Cambodia: The school and community environment

This chapter analyses four aspects of the school, family and community environment in which 15-year-olds grow and learn: their inclusive nature, the time devoted to learning, the quality of instruction in school, and the support children and schools receive from families and local communities. The chapter describes, in particular, how the presence of these foundations for educational success varies between students and schools in Cambodia.

To what extent do children in Cambodia find the key drivers of educational success within the schools they attend and within the families and communities in which they grow up? This question lies at the heart of this chapter and will be answered through an exploration of four key aspects or drivers of educational success, namely: the inclusiveness of schools; the time devoted to learning in schools; the quality of instruction in schools; and the level of support children and schools receive from families and local communities. As noted in Chapter 1, PISA-D describes these drivers as “foundations for success”, and focuses on those drivers that are most closely associated with the development of children between the ages of 10 and 15. This chapter follows on from Chapter 4 which reported on the extent to which resources invested in education – instructional, material and teacher resources in particular – create good conditions for learning, and focuses in particular on the extent students learn in an environment that supports good outcomes for all.

The aspects of the learning environment analysed in this chapter are: *inclusive environments*, and in particular how children’s learning and well-being are fostered by supportive peer relationships and by feelings of safety; *learning time*, and in particular to what extent adolescents miss out on opportunities to learn due to truancy, teacher absenteeism, or other disruptions to the intended instruction and curriculum; *quality instruction*, and especially how successful teachers are in keeping an orderly discipline in the classroom and in promoting learning through structured teaching and supportive teacher-student relationships; and *family and community support*, or how the connections between schools, families and local communities create an environment in which children thrive.

The School, Teacher and Student questionnaires provide enough information to build many measures related with each aspect of the learning environment. Due to space restrictions, in each case only those measures that were considered to be most relevant to Cambodia were chosen to be included in this report.

5.1. Inclusive environments

Inclusive environments are classrooms, schools and broader communities that value and support inclusion. Inclusion, in general, “is a process of addressing and responding to the diversity of needs of all learners through increasing participation in learning, cultures and communities, and reducing exclusion within and from education. It involves changes and modifications in content, approaches, structures and strategies, with a common vision which covers all children of the appropriate age range and a conviction that it is the responsibility of the regular system to educate all children” (UNESCO, 2005, p. 13).

The PISA-D measures of inclusive environments focus on the extent to which adolescents themselves feel welcomed and safe at school, and, based on UNESCO’s (UNESCO, 2009) policy guidelines, on the attitudes of teachers and principals towards students with disabilities and towards the diversity of learners more generally. The measures that have been selected to be included in this report are detailed in Box 5.1.

The main measure of inclusive environments is referred to as “students’ sense of belonging at school”, and reflects students’ perceptions of an inclusive school climate. It also constitutes an important indicator of students’ social well-being. This section reports on student’s sense of belonging at school. It shows that students in Cambodia who do not feel safe at school have a low sense of belonging. This association, together with findings from a larger body of research, provides evidence in support of certain interventions to improve inclusion in schools. The section also shows how a strong sense of belonging to school supports student learning, their engagement with school and learning, and their subjective well-being.

Box 5.1. The measures of inclusive environments used in this report

The PISA-D measures of inclusive environments used in this report are based on student, teacher and principal responses to the following questions.

Student questionnaire

Students were asked to report, on a four-point scale with the answering categories “strongly agree”, “agree”, “disagree”, and “strongly disagree”, their agreement with the following statements:

- I feel like an outsider (or left out of things) at school;
- I make friends easily at school;
- I feel like I belong at school;
- I feel awkward and out of place in my school;
- Other students seem to like me;
- I feel lonely at school.

Students’ responses to these questions were used to construct the index of sense of belonging that is comparable to the corresponding PISA 2015 index. The scale values range between -3.4 and 2.8, and, as in PISA 2015, the value of 0 corresponds to the average value of the index across OECD countries, and the standard deviation across OECD countries was set equal to 1. A value above 1 on this index typically corresponds to students who agree or strongly agree with all positive indicators of sense of belonging, and disagree or strongly disagree with all negative indicators of sense of belonging. Values above -0.5 typically correspond to students who agree (or strongly agree) with a majority of the positive indicators of sense of belonging and disagree (or strongly disagree) with a majority of the negative indicators of sense of belonging. Values below -2 indicate the lowest levels of sense of belonging, reached by students who disagree (or strongly disagree) with all positive indicators of sense of belonging, and agree (or strongly disagree) with all negative indicators of sense of belonging.

Teacher questionnaire

Teachers in schools attended by 15-year-olds in Cambodia were asked to report, on a four-point scale with the answering categories “strongly agree”, “agree”, “disagree”, and “strongly disagree”, their agreement with the following statements:

- Teachers should try to teach the curriculum, even to students who do not have the basic reading and numeracy skills.
- Students with disabilities should be taught in <special schools>.
- Teachers waste their time trying to support teen mothers to remain in school.
- Students who lag behind should be placed in special classes.

Teachers who disagreed with these statements displayed their willingness to address and respond to the diversity of needs of all learners and reduce exclusion within and from education. Teachers were also asked about their agreement with the following statements:

- Teachers should adjust the curriculum to the cultural diversity in their classes
- Teachers should be able to teach classes with students with differing levels of ability.

In this case, a positive attitude towards inclusion is reflected in teachers’ agreement with these statements.

School questionnaire

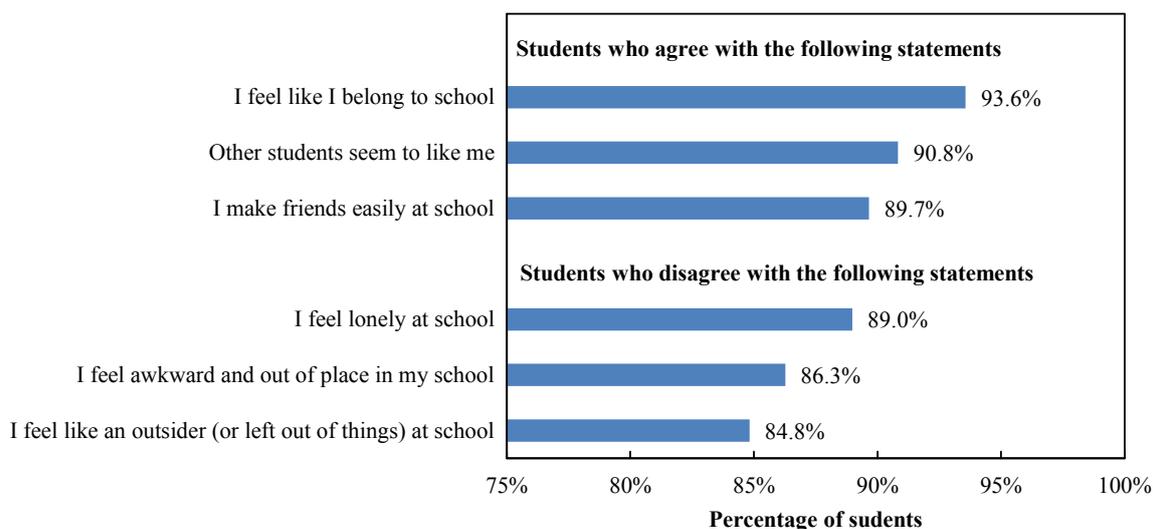
Similarly, school administrators in schools attended by 15-year-olds in Cambodia were asked to report, on a four-point scale with the answering categories “strongly agree”, “agree”, “disagree”, and “strongly disagree”, their agreement with the following statements:

- Teachers should try to teach the curriculum, even to students who do not have the basic reading and numeracy skills.
- Students with disabilities should be taught in <special schools>.
- We need more special classes for students who lag behind.
- Teachers are able to teach classes with students with differing levels of ability.

5.1.1. Sense of belonging at school among 15-year-old students

A sense of belonging is defined as feeling accepted and liked by the rest of the group, feeling connected to others and feeling like a member of a community (Baumeister & Leary, 1995; Maslow, 1943). Human beings in general – and teenagers in particular – desire strong social ties and value acceptance, care and support from others. In school, a sense of belonging gives student’s feelings of security, identity and community, which, in turn, support academic, psychological and social development.

In Cambodia, a large majority of students (93.6%) feel that they belong at school, and only 11% reported feeling lonely at school. On average, students reported a strong sense of belonging at school and positive relationships with their peers across all six statements that were included in the PISA-D questionnaire to measure these aspects (Figure 5.1). However, within Cambodia a minority of students also reported negative relationships with their peers and feeling lonely at school, particularly among boys, rural students and students from low socio-economic status. This implies that while in general students feel accepted and liked by the rest of the groups at school, the lower sense of belonging among students with disadvantaged backgrounds suggests that extra attention to this group is needed to bridge the sense of belonging gap and to promote the equality of schooling and learning experiences. The PISA-D data showed that, across countries and economies, a lower sense of belonging at school was both associated with lower levels of life satisfaction and with poorer performance in reading, mathematics and science. The gaps in life satisfaction and student performance are even wider between the bottom and top quarter of the index of sense of belonging at school.

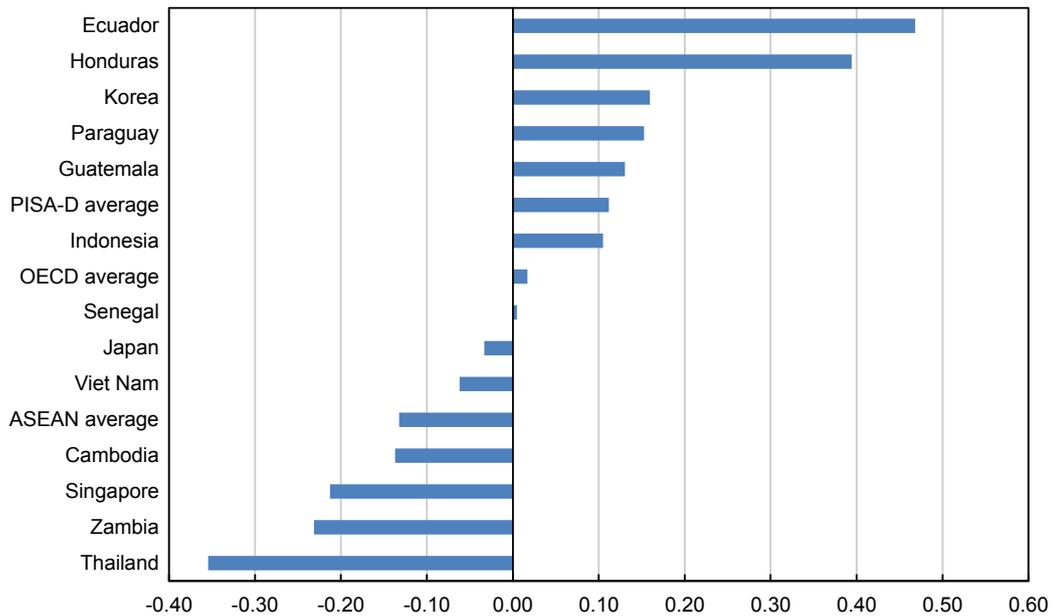
Figure 5. 1. Sense of belonging at school among students in Cambodia

Source: PISA for Development Database.

5.1.2. How students' sense of belonging compares internationally

Students in Cambodia have a strong sense of belonging at school compared to students in other countries, particularly within the ASEAN context (Figure 5.2). This is reflected by an index value close to zero on the international scale of sense of belonging (see Box 5.1). To reiterate, values above -0.5 typically correspond to students who agree (or strongly agree) with a majority of the positive indicators of sense of belonging and disagree (or strongly disagree) with a majority of the negative indicators of sense of belonging. This finding stems from a comparison of the findings of Cambodia's PISA-D results with other PISA participating countries. While the PISA-D measure of sense of belonging was also used in PISA 2015 (as well as in earlier cycles of PISA), comparisons of students' self-reported sense of belonging across countries are subject to the same uncertainty as the well-being indicators discussed in Chapter 3, due, in particular, to the subjective nature of the indicators and to possible reporting biases (see Box 3.2).

Figure 5. 2. How students’ sense of belonging compares internationally



Source: PISA 2015 and PISA for Development Databases.

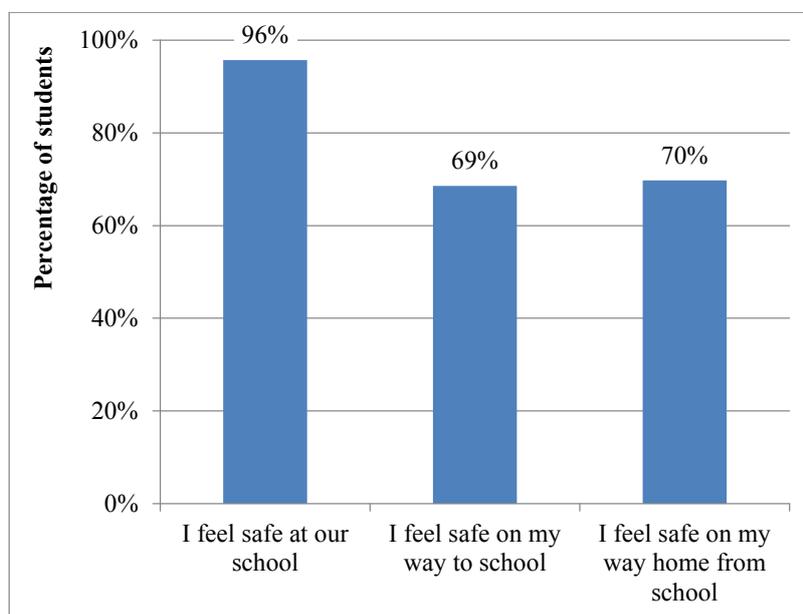
5.1.3. Threats to inclusion: sexual harassments and violence at school

According to the classical theory on the “hierarchy of needs” (Maslow, 1943), the human need for social belonging can only be met if more basic needs for safety and security are also fulfilled. Feeling safe at school is a pre-condition for forming positive relationships with peers and therefore for a strong sense of belonging at school. In this section, school safety is discussed with respect to general feelings of safety (“I feel safe at school/on my way to school/on my way home from school”), as well as with respect to students’ exposure to specific threats to their safety and security (sexual harassment and school violence).

A large majority of students (95.7%) in Cambodia reported feeling safe at school (Figure 5.3). However, fewer students reported feeling safe on the way to school (69%) or on the way home from school (70%). Feelings of unsafety on the way to and from school, in particular, were more frequent among girls than boys. More than 30% of girls reported feeling unsafe commuting to and from school. Feelings of unsafety affected students in many ways, especially their sense of belonging at school. The data showed that the average sense of belonging among students who reported feeling unsafe at school was significantly lower than among students who did not report so.

Figure 5. 3. Feelings of safety at school among students in Cambodia

Percentage of students who agreed or strongly agreed with the following statements:



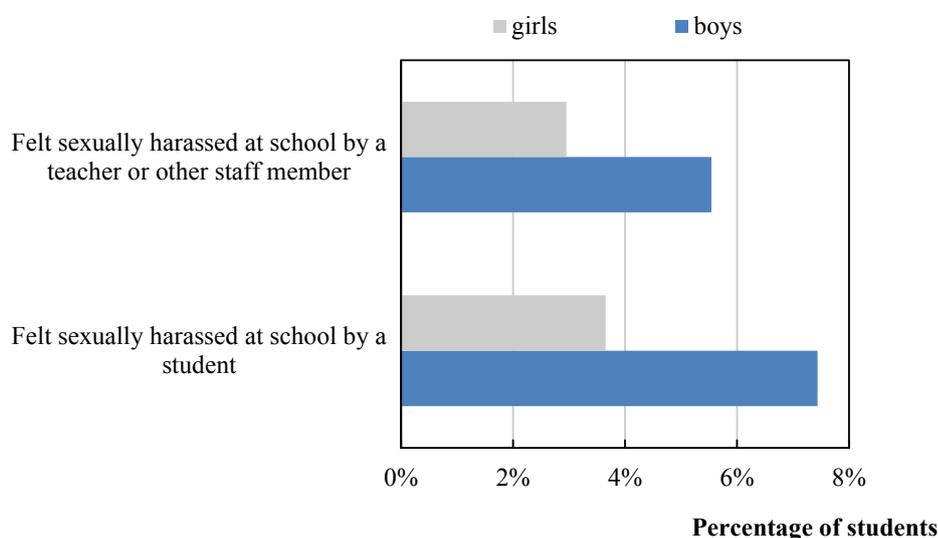
Source: PISA for Development Databases.

Sexual harassment is a specific threat to students' safety defined in this report as any unwanted or inappropriate language or touching of a sexual nature that makes the student feel upset, hurt or angry. It can be verbal, such as comments about the student's body, sexual remarks, or the spreading of rumours about a person. It can be physical, such as touching, rubbing, pinching or hugging in a sexual way. It can be a request for a sexual favour in return for something else. It can happen to both boys and girls.

In Cambodia, 5.4% of students (3.7% among girls vs. 7.4% among boys) reported that in the four weeks prior to the assessment they had felt sexually harassed at school by a student. Also, 4.2% of students (3% among girls vs. 5.5% among boys) reported that in the 4 weeks prior to the assessment they had felt sexually harassed at school by a teacher. It is a surprise that sexual harassment appeared not particularly an issue in Cambodia and that boys reported more sexual harassment at school than girls. However, sexual harassment is a broad term subject to the same uncertainty as well-beings and is culturally-bound. Sexual harassment may be narrowly defined or perceived in Cambodia. In addition, boys aged 15 years old, given their physical development, may tend to discuss sexual behaviors more broadly than girls, which may (un)voluntarily offend their peers; in contrast, culturally in Cambodia girls are expected to be "polite and proper"; talking about sexual behaviors is not common.

Figure 5.4. Sexual harassment at school among students in Cambodia

Percentage of students reporting having felt sexually harassed in the past 4 weeks:



Source: PISA for Development Databases.

Violence in or around schools is also a threat to an inclusive environment. The consequences of school violence are grave, as extreme cases have led to the loss of human lives. Other effects of school violence include vandalism and loss of property – especially school facilities, poor human capital development, increase in crime rate, erosion of cultural values and bad reputation for schools as well as societies.

PISA-D asked students whether any of the following happened in the four weeks prior to the assessment:

- I was in a physical fight on school property
- I stayed away home from school because I felt unsafe
- Our school was vandalised
- I gave money to someone at school because they have threatened to hurt me
- I witnessed a fight on school property in which someone got hurt
- I saw gangs in and around the school
- I heard a student threaten to hurt another student
- Someone stole something of mine at school
- I saw a student carrying a gun or knife at school

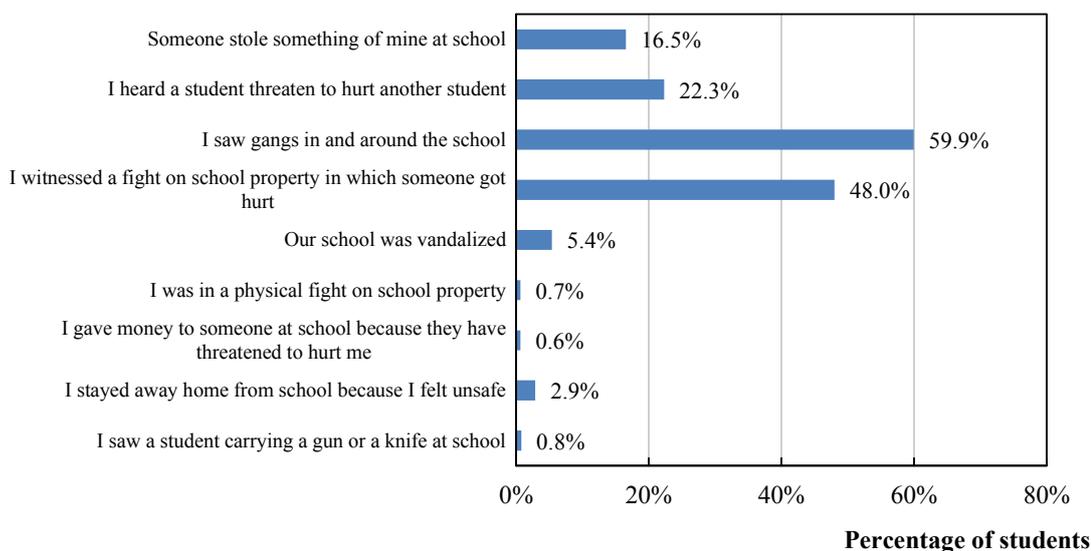
The students' responses to these items were simply 'yes' or 'no'. Overall, 43% of students in Cambodia reported that there was at least one safety issue in or around their school in the four weeks prior to the assessment. Fighting, gang-related activities and stealing of something of others (e.g., study materials) were the most common among other school safety indicators. These school problems were also commonly found in the PISA-D countries. However, Cambodia witnessed more issues regarding fighting and gang-related activities in and around school than those countries; whereas stealing something of others at school was less common in Cambodia than in the other PISA-D countries, particularly Senegal and Zambia.

In total, about 50% of 15-year-old students in Cambodia were in schools where one or more students surveyed in PISA-D reported an episode of fighting which someone got

hurt and the presence of gang in or around school in the four weeks prior to the assessment.

Figure 5. 5. Student exposure to violence in or around school

Percentage of students in schools where more than 20% of students reported having experienced the school safety issue within the last 4 weeks



Source: PISA for Development Databases.

As the questions on school violence were not included in prior PISA questionnaires, these percentages can only be compared to those observed in other countries that participated in PISA-D. Such comparisons revealed that violence in school in the form of fighting and gang was a particularly significant threat to an inclusive environment in Cambodia; whereas vandalism and stealing of something at school was a more particular threat to an inclusive environment in most PISA-D countries, especially Zambia and Senegal.

5.1.4. Principals' and teachers' attitudes towards inclusion

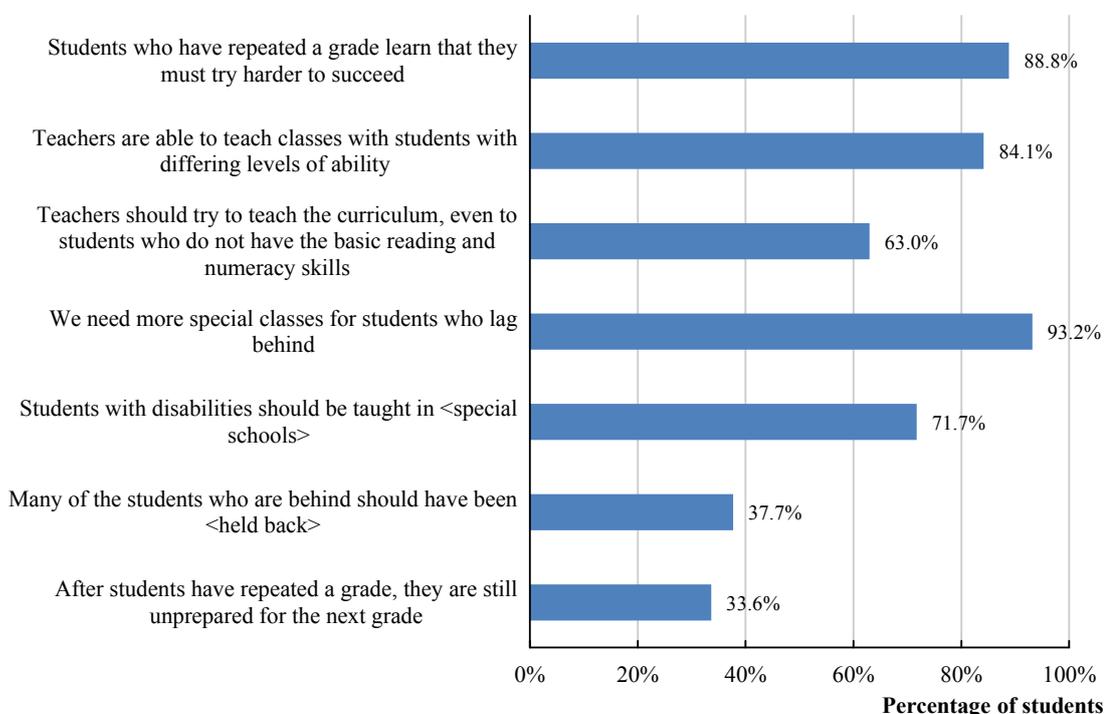
An important aspect of inclusive education is ensuring that educators are prepared and willing to address the diversity of learners, and particularly to respond to the special needs of students with disabilities and of students with learning difficulties; and that they see it as their responsibility to educate all children, rather than to tell children apart and exclude some from the benefit of a regular education that leads to a minimum level of proficiency in core subjects. PISA-D used the questionnaires for teachers and principals to measure teachers' attitudes and beliefs with respect to inclusion in education.

On average across Cambodia, 63% of 15-year-olds were in schools whose principals agreed or strongly agreed that teachers should try to teach the curriculum, even to students who do not have the basic reading and numeracy skills; similarly large shares of 15-year-olds had principals that reported that teachers are able to teach classes with students with differing levels of ability (84%). Surprisingly, about one third of students were in schools where school principals reported grade repetition is necessary for

students at their schools and 34% were in schools where repeated students were still unprepared for the next grade.

Figure 5. 6. Principal attitudes towards inclusion

Percentage of students in schools whose principals agreed or strongly agreed with the following statements:

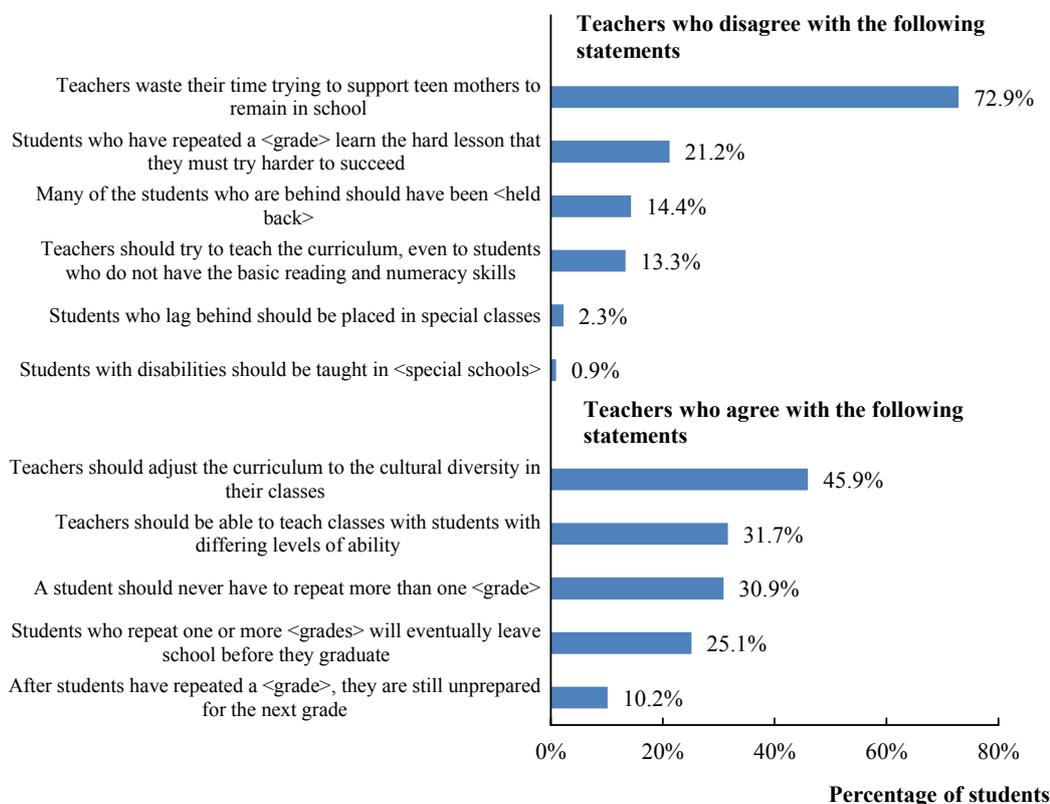


Source: PISA for Development Databases.

At the same time, a substantial number of 15-year-olds were in schools whose principals expressed views that were in contrast with the goal of promoting inclusiveness in education: for example, they agreed or strongly agreed that students with disabilities should be taught in special schools (72%); or that more special classes are needed for students who lag behind (93.2%).

Figure 5. 7. Teacher attitudes towards inclusion

Percentage of students in schools where more than 2 out of 3 teachers (dis)agreed or strongly (dis)agreed with the following statements



Source: PISA for Development Databases.

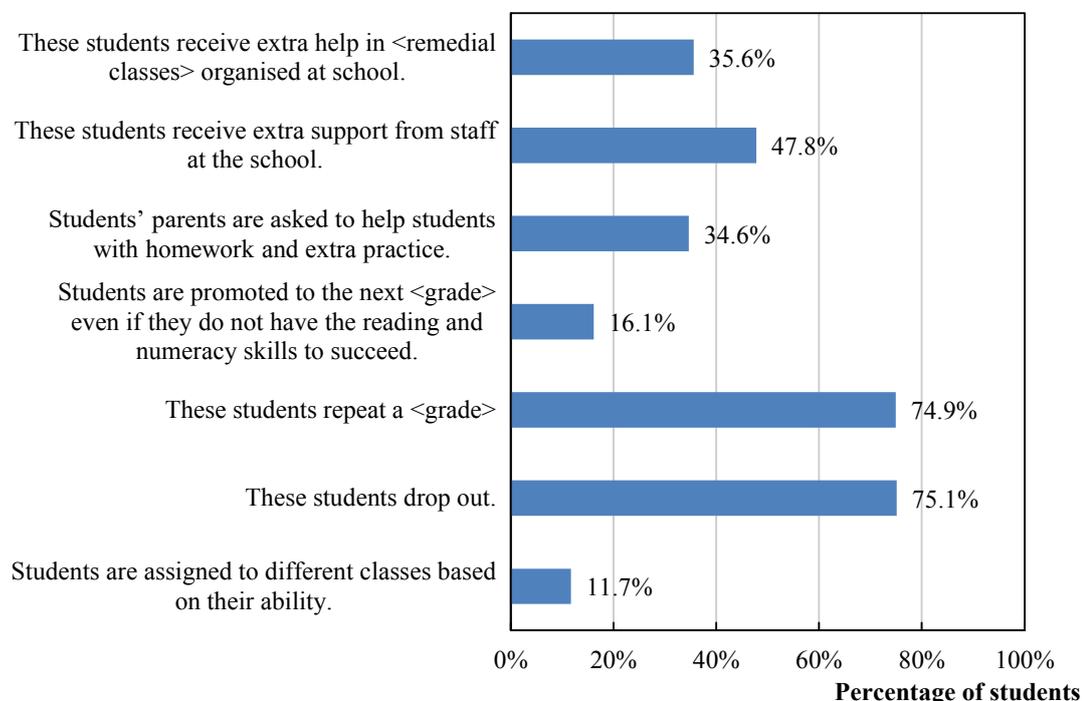
Similarly, on average across Cambodia, 87% of 15-year-old students were in schools where most (more than 2 out of 3) teachers agreed or strongly agreed that teachers should try to teach the curriculum, even to students who do not have the basic reading and numeracy skills; and about one third of 15-year-olds were in schools where teachers agreed that teachers should be able to teach classes with students with differing levels of ability (32%) and almost half of the students were in schools where teachers agreed that teachers should adjust the curriculum to the cultural diversity in their classes (46%), thereby displaying some dubious attitudes towards inclusion.

A substantial number of 15-year-olds were in schools where many teachers (more than 2 out of 3) expressed views that were in contrast with the goal of promoting inclusiveness in education: they agreed or strongly agreed that students with disabilities should be taught in special schools (99%); many of the students who are behind should have been held back (85%) or that students who lag behind should be placed in special classes (98%).

Unfortunately, only 36% of students were in schools that organize remedial classes at school to help students who lack basic reading skills (Figure 5.8). More than half of students were not in schools where students who need it receive extra support from staff at the school. The majority of students who lacked the reading or numeracy skills to learn the curriculum were reported to have repeated a class or to have dropped out of school.

Figure 5. 8. Remedial education

Percentage of students in schools where more than 2 out of 3 teachers report that the following happens to students who lack the reading or numeracy skills to learn the curriculum



Source: PISA for Development Databases.

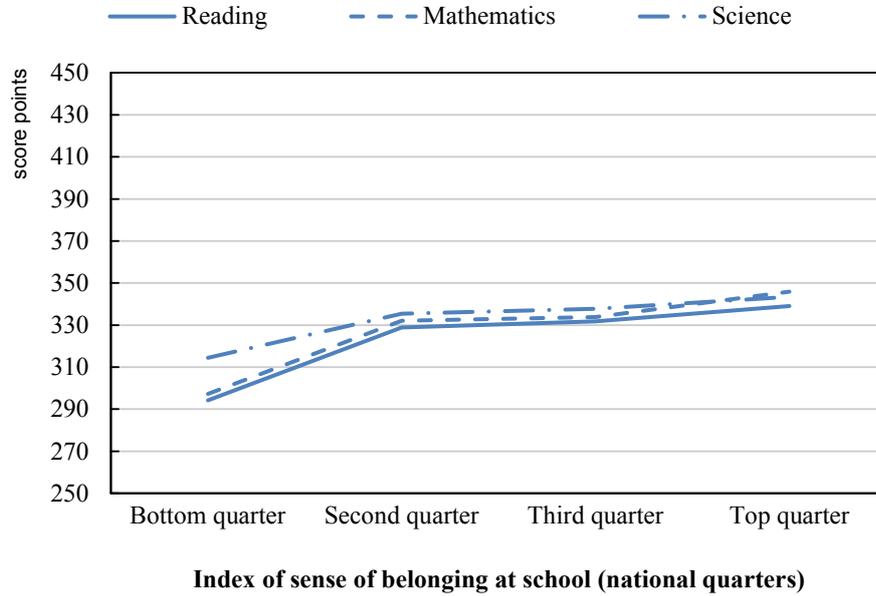
In total, while, the principal and teachers in Cambodia generally shared positive attitudes towards inclusion, a significant number of school principals and teachers also still held a view that grade repetition is necessary for low-ability students; and low-ability students should be placed in special classes, which is in contrast with the goal of promoting inclusiveness in education.

5.1.5. Research on the effects of feelings of inclusion

There are many reasons why policy makers, teachers and parents should care about students' sense of belonging at school. First, there is an association between feelings of belonging at school and academic achievement. Adolescents who feel that they are part of a school community are more likely to perform better academically and be more motivated in school (Battistich, Solomon, Watson, & Schaps, 1997; Goodenow, 1993). Research examining this association generally shows a positive circular relationship: a sense of belonging leads to higher academic achievement, and high academic achievement leads to greater social acceptance and sense of belonging (Wentzel, 1998). In most countries participating in PISA, students who report a strong sense of belonging at school and positive relationships with their peers tend to score above students who report a weaker sense of belonging (Figure 5.9). In Cambodia, too, students who reported a strong sense of belonging at school and positive relationships with their peers tended to score above students who reported a weaker sense of belonging, perhaps because academic achievement is considered socially desirable among teenagers (Ogbu, 2003).

Figure 5. 9. Feeling like an outsider at school and performnce in reading, mathematics and science

Score-point difference between top and bottom quarters of the index of sense of belonging at school

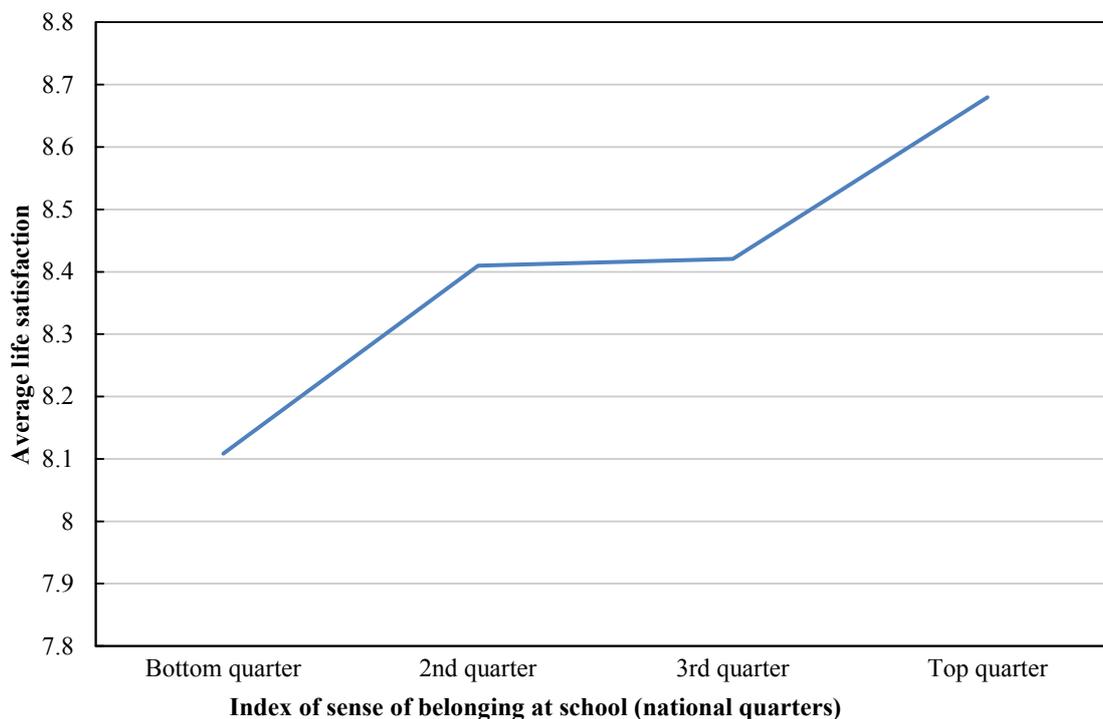


Source: PISA for Development Databases.

Irrespective of its association with academic achievement, a sense of belonging and acceptance at school is important for adolescents’ sense of self-worth and overall satisfaction with life (Juvonen J. , 2006). When children and adolescents feel a connection with school, they are less likely to engage in risky and antisocial behaviour (Catalano, Oesterle, Fleming, & Hawkins, 2004; Hawkins & Weis, 1985). Students with strong and rewarding social ties at school are less likely to drop out of school and never return (Lee & Burkam, 2003), or to engage in substance abuse and truancy (Schulenberg, Bachman, O'Malley, & Johnston, 1994). Furthermore, researchers find that an absence of a feeling of connectedness at school is an antecedent of depression among adolescents (Shochet, Dadds, Ham, & Montague, 2006).

PISA data show for example that there is a strong relationship between the likelihood of reporting low satisfaction with life and feeling like an outsider at school (OECD, 2017, p. 124). Students in Cambodia that reported a strong sense of belonging at school (top 25%) also reported significantly higher life satisfaction compared to students who reported a weak sense of belonging at school (bottom 25%) (Figure 5.10).

Figure 5. 10. Average life satisfaction, by national quarters of the index of sense of belonging at school



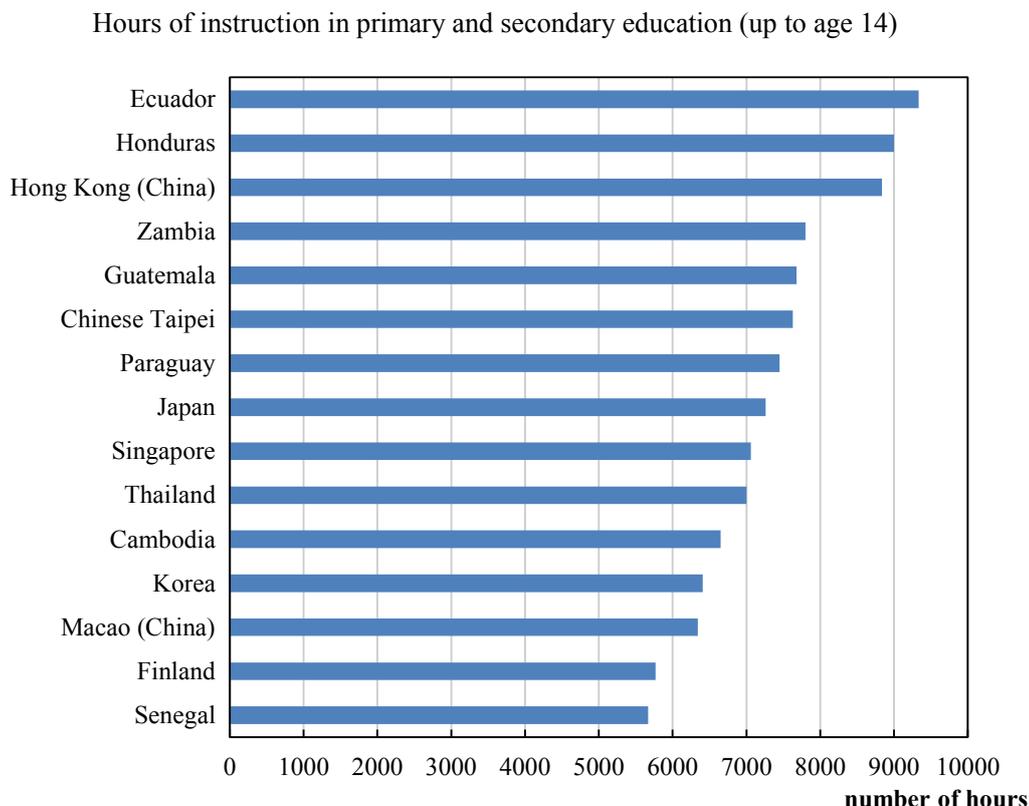
Source: PISA for Development Databases.

5.2. Learning time

That any important learning requires effort and time is a notion so deeply enshrined in school systems and confirmed by abundant research that it almost requires no discussion. In every school system, for example, the curriculum and school programmes not only describe, for the different ages and grade levels, the learning goals and the material that students should be taught, but also the overall amount of time devoted to instruction.

In Cambodia, the total intended instruction time for students up to age 14 - an estimate of the number of hours during which students are taught both compulsory and non-compulsory parts of the curriculum, as per public regulations – is 6,650 hours. This compares to an average, across OECD countries, of 7,677 hours of instruction in primary and secondary education (up to age 14). Most of this instruction time is compulsory (OECD, 2016b, p. Table II.6.53). The total intended instructional time in Cambodia is significantly lower than that observed in most PISA-D countries but seemingly comparable to that in top-performing PISA countries such as Japan, Korea, Macao (China) and Singapore, reflecting the quality learning time, not the quantity, is what really matters. In addition, unlike Cambodia, most top-performing PISA countries, except for Singapore, appears to invest similar instructional time in primary and lower secondary education. Singapore is an exceptional country that invests more instructional time in primary education (about 800 hours per year across grades 1-6) than in lower secondary education, suggesting that building foundational learning skills and culture for students in early grades is key to the success in the next grades. Given the less amount of intended instructional time in the primary school, Cambodia seems to have a trade-off between increasing the instructional time/school day and cultivating strong learning culture within the current limitations. Either way is desirable for student learning.

Figure 5. 11. Total intended instruction time in Cambodia and comparison countries up to age 14



Source: PISA 2015 and PISA for Development Databases.

While this theoretical amount of instruction time is, in the intentions of curriculum planners, sufficient for good learning outcomes, in real schools and classrooms much of it happens to be lost to learning. The actual time that students spend learning may differ from the intended instruction time for a variety of reasons. The most visible causes include student absenteeism, tardiness, and a variety of reasons for which schools may be closed or deviate from the regular curriculum on days that count as instruction days (including teacher absenteeism, strike, natural disasters, etc.). These causes for the loss of learning time in Cambodia are discussed in the present section; the measures of “learning time” included in this report are presented in Box 5.2. Furthermore, even when classes are held and students are present, class time is often lost to learning because of poor discipline, which means that teachers spend time keeping order rather than helping students learn. The extent to which noise and disorder disrupts students’ learning is discussed in the following section on quality instruction.

Box 5.2. Measures of learning time used in this report

The PISA-D measures of learning time used in this report are based on student and principal responses to the following questions.

Student questionnaire

Students were asked to report whether, in the last two weeks at school, any of the following things occurred (“never”, “one or two times”, “three or four times”, “five or more times”):

- [The student] <skipped> a whole school day.
- [The student] <skipped> some classes.
- [The student] arrived late for school.

Students were also asked to report whether, in the last two weeks at school, any of the following things happened (the response options in this question were simply “yes”, “no”):

- One or more classes were cancelled.
- School was cancelled.
- One of my teachers was late for class.
- One of my teachers did not come for class.
- There was a teacher strike.
- My teacher worked at the computer during class time.
- My teacher answered personal calls during class time.
- My teacher attended a meeting during class time.

School questionnaire

Principals, in turn, were asked whether, during the month prior to the PISA-D test, the school was confronted with the following teacher behaviours (the answer categories were “never”, “once or twice”, and “every week”)

- Teachers arriving late at school
- Absenteeism (i.e., unjustified absence)
- Skipping classes

5.2.1. Loss of learning time in Cambodia: student absenteeism, truancy and tardiness

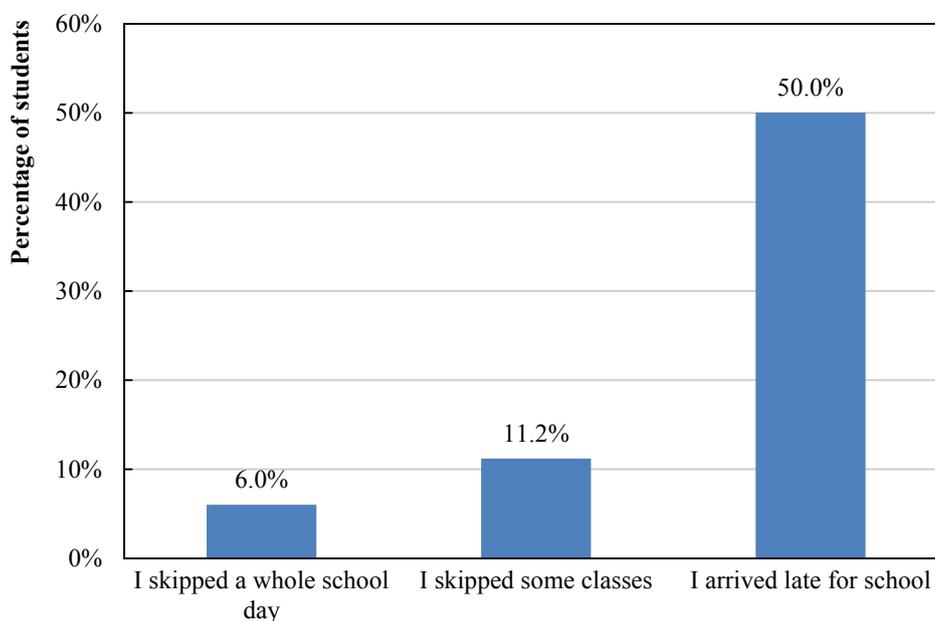
In Cambodia, 6% of students reported that they had skipped at least one day of school in the two weeks prior to the PISA-D test, 11% of students reported that they had skipped a class at least once, and 50% reported that they had arrived late for school at least once. Missing days of school and skipping classes are behaviours that were observed more frequently among boys, while more girls reported being late for school. These behaviours were, however, not likely attributable to students' low socio-economic backgrounds. Missing days of school, skipping classes and being late for school were more commonly found among students from high socio-economic backgrounds. This indicates the loss of learning time at school due to lateness was more observed among the latter. However, the fact that they performed better in all domains than their peers from low socio-economic backgrounds suggests evidence that not only the amount of learning time but also its quality is critical to student performance and that loss of learning time at school

can be compensated by extra opportunities students with economically advantaged backgrounds may have outside of school.

Overall, loss of learning time appears less likely due to absences and truancy than to tardiness. While absences and truancy has a consequence on student learning and chances of dropping out of school in Cambodia, especially among boys in secondary school, being late for school is a common problem in the country. Although its effect remains to be seen, sustained tardiness is a grave concern to the quality of teaching and learning. Meanwhile, it reflects poor school management and the loss of quality of learning time offered by school, especially by teachers.

Figure 5. 12. Students skipping days of school, skipping classes and arriving late for school in Cambodia

Percentage of students reporting that the following occurred at least once in the two weeks prior to the PISA-D test:



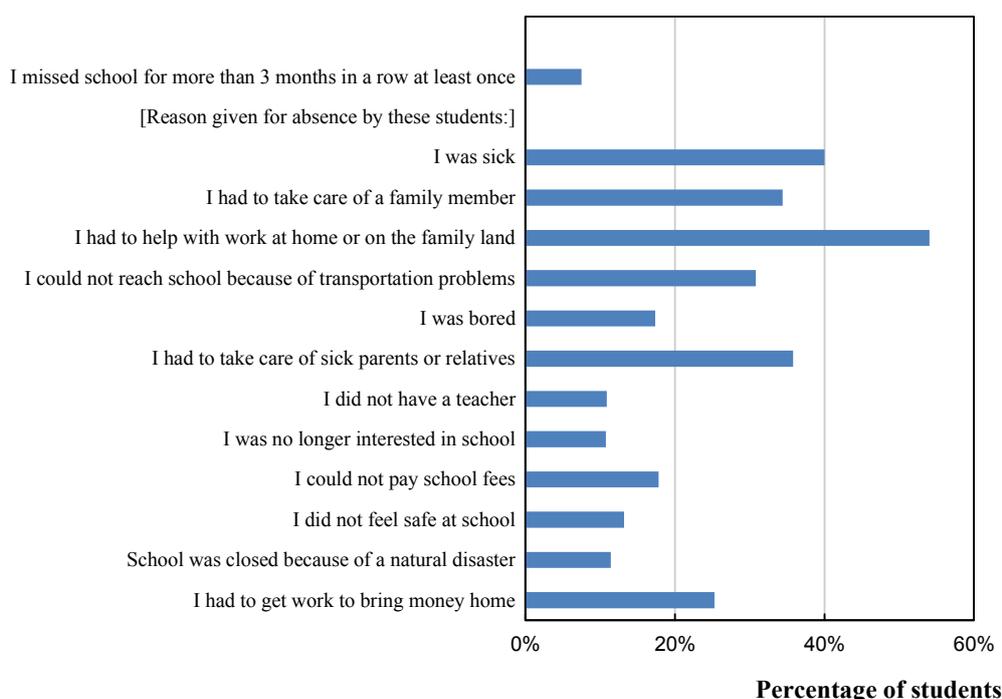
Source: PISA for Development Databases.

In addition to being related to some demographic and socio-economic differences between students, the likelihood of arriving late or missing classes or days of schools also increases as a function of the commuting time between students' home and school. In particular, students who reported living more than 30 minutes away from their school were 1.2 times more likely to arrive late for school. Some 12% of students in Cambodia are in this situation. This suggests the travel time to school can be a significant problem in Cambodia, particularly affecting their learning time and contributing to chances of skipping classes or a whole day.

PISA-D also asked students to report whether, over their entire school career, they had ever missed school for more than three months in a row ("no", "yes, once", or "yes, twice or more"). Some 7.5% of students reported having missed school for more than three months in a row, with the most frequent reasons related to helping family work, being sick and taking care of family members or sick parents/relatives. Some other reasons include working to bring money home, getting bored with school or school closure due

to natural disaster (e.g., flood). On balance, in addition to physical health problems, household responsibilities appear to be the main cause preventing students from fully being at school.

Figure 5. 13. Percentage of students who reported that they had missed school for more than three months in a row and reasons given for absence



Source: PISA for Development Databases.

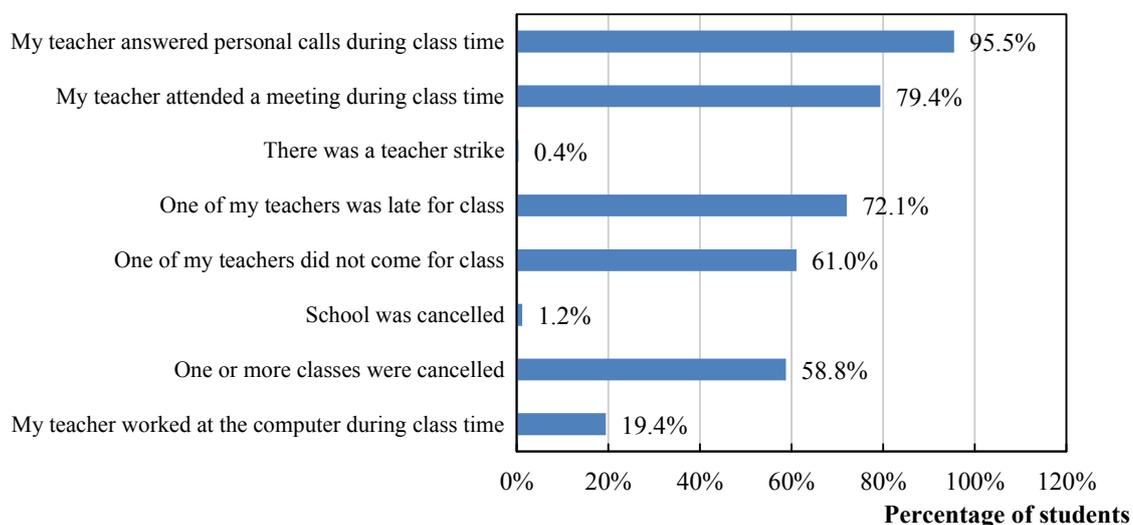
5.2.2. Loss of learning time in Cambodia: teacher absenteeism and effort

High rates of teacher absenteeism are an important problem in many developing countries (Duflo, Hanna, & Ryan, 2012; Glewwe & Muralidharan, 2016; Banerjee & Duflo, 2006). If schools are closed on instructional days, classes are not held, or teachers invest more effort in other tasks than in teaching, the value of education is undermined, students may not learn the curriculum, but also, and teachers fail to demonstrate the importance of effort and perseverance for educational success.

Some 26% of 15-year-old students in Cambodia reported that “one or more classes were cancelled”; in total, at least 59% of 15-year-old students in Cambodia are in schools where more than 20% of students surveyed in PISA-D reported that one or more classes were cancelled during the two weeks prior to the assessment. Most concerning, 61% of students are in schools where more than 20% of students reported that a teacher did not come for a class during the two weeks prior to the PISA-D test. Student reports of days or classes lost, and of teachers that were late or did not come for class, were more frequent in urban schools compared to rural schools. These school problems were, however, not differently found between advantaged and disadvantaged schools.

Figure 5. 14. Teacher absenteeism – student reports

Percentage of students in schools where more than 20% of students reported that the following happened during the two weeks prior to the PISA test

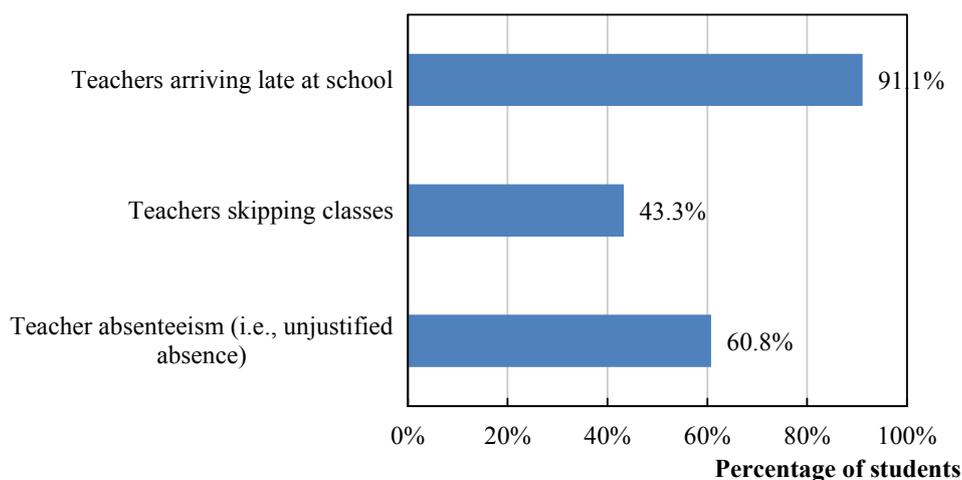


Source: PISA for Development Databases.

PISA-D also asked teachers whether they had been prevented from going to work during the month prior to the assessment. The reasons given by teachers for not going to work ranged from experiencing a physical illness to facing extreme weather or a hazard, such as heavy rain or a fire. The most common reason given by teachers for being prevented from going to work were family-related problems (someone in my family was sick, someone in my family needed care, I had to run errands, there was a death in my family)—95% of 15-year-old students were in schools where a significant fraction of teachers [more than one third] so reported—and own health problem (I experienced a physical illness, I experienced emotional or mental health problems, I had an appointment with a doctor or dentist, I was hospitalized)—89% of 15-year-old students are in schools where a significant fraction of teachers [more than one third] so reported). Commuting problems (there was no public transportation to reach the school, I did not have a mean of transportation to reach the school, there was extreme weather or a hazard) also led to a higher rate of teacher absenteeism—47% of 15-year-old students were in schools where a significant fraction of teachers [more than one third] so reported).

School principals, in turn, were asked whether, during the month prior to the PISA test, the school was confronted with teachers arriving late at school, being absent without justification, or skipping classes (the answer categories were “never”, “once or twice”, and “every week”).

On average, 61% of 15-year-old students were in schools where teacher absenteeism occurred more occasionally (once or twice during the month prior to the PISA-D test). The vast majority of students were also in schools where principals reported teachers arriving late at school, reflecting that most schools in Cambodia that participated in PISA-D had a weak school regulation. The share of students affected by teacher absenteeism and by teachers arriving late for class, according to principal reports, was significantly larger in schools with high concentrations of advantaged students, while the number of days lost due to teacher absenteeism was significantly larger in public schools.

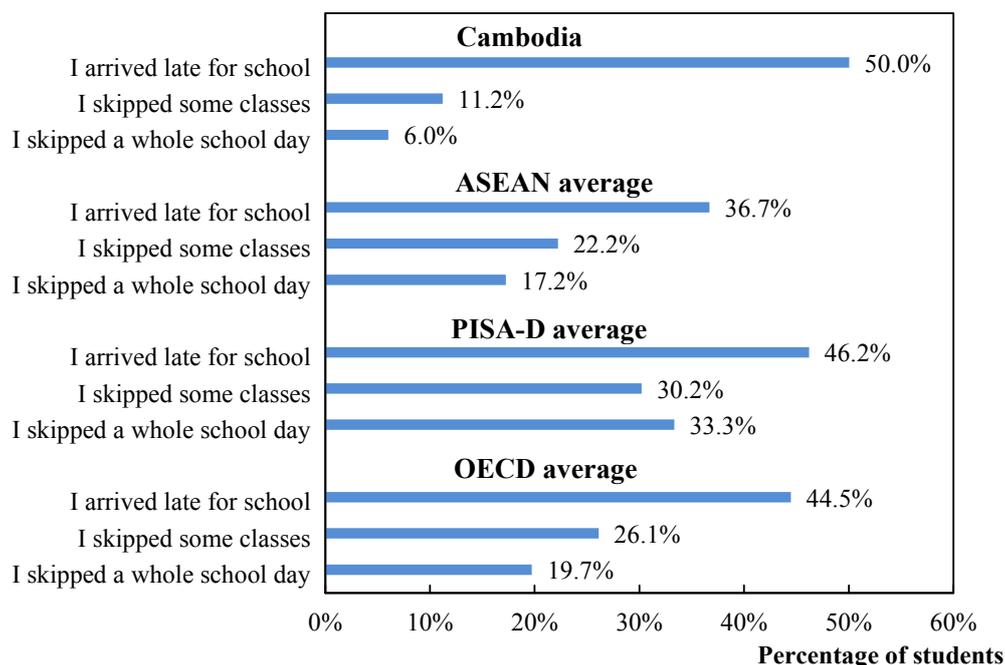
Figure 5. 15. Teacher absenteeism – principal reports

Source: PISA for Development Databases.

5.2.3. How student absenteeism, truancy and tardiness compare internationally

On average across OECD countries, 26% of students said they had skipped classes at least once and 20% reported that they had skipped a whole day of school at least once. In some education systems, however, students skip school relatively frequently. For instance, in the Dominican Republic, Italy, and Uruguay, more than one in two students had skipped a day of school at least once in the two weeks prior to the PISA assessment, and similar numbers had skipped some classes during that period (OECD, 2016b). Arriving late for school is a significant problem in most countries. About half of students across PISA-D, OECD and lower-upper middle countries reported arriving late at school at least once in the two weeks prior to the assessment. In Uruguay, Montenegro and Chile, a higher number of students had been late.

A comparison of students' level of absenteeism and truancy with other countries suggests that these are not a significant problem in Cambodia. Nonetheless, the share of students' tardiness in Cambodia was relatively higher than PISA-D and OECD averages. More students in Cambodia particularly reported being late at school than those in ASEAN countries on average. In Thailand, only 36.1% of students said they had been late once or more times in that period.

Figure 5. 16. How students' absenteeism compares internationally

Source: PISA 2015 and PISA for Development Databases.

5.2.4. How student absenteeism, truancy and tardiness vary among schools within Cambodia

Skipping days of schools, single classes or arriving late for school are all behaviours that appear to be concentrated in particular types of schools. When the number of 15-year-old students who reported these behaviors is compiled across all schools, some 40% of students were found in schools with more than 50% of students who arrived late for school; some 20% were in schools with more than 50% of students who played truant in some classes or for the whole school day, suggesting that student tardiness appears to be a more common problem in some schools.

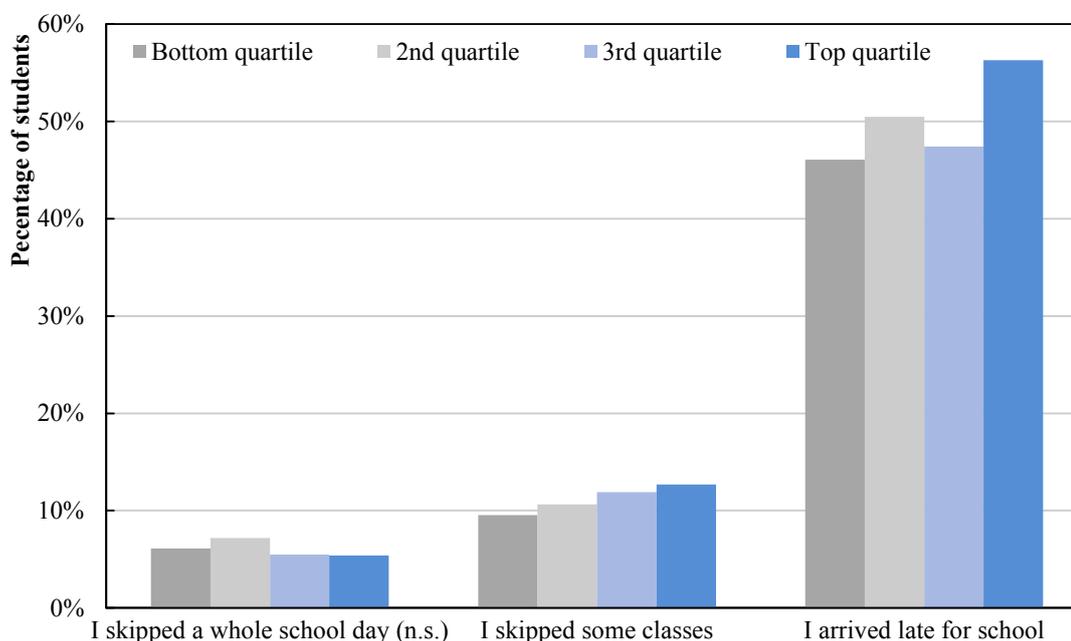
In most countries participating in PISA 2015, skipping a whole day of school is more common in disadvantaged schools than in advantaged schools, while students in rural and urban schools were equally likely to have skipped a day of school, and those in public schools were more likely than students in private schools to have done so.

In the case of Cambodia, skipping a whole day of school was more common in disadvantaged and rural schools; while students in advantaged and urban schools were more likely to skip classes. Skipping a whole day of school and some classes was more commonly found among students in public schools than in private schools. Being late at school was a common behaviour in all types of schools, except in private schools where students were more likely to be late.

Students were also more likely to skip days of school in schools in which some students reported that, over the two weeks prior to the PISA-D test, some classes were cancelled; or in schools where the principal reported that (some) teachers were late for class or absent, without justification, over the month prior to the PISA-D test.

Figure 5. 17. Student absenteeism, truancy and tardiness, by school characteristics (socio-economic status quartiles)

Percentage of students reporting that the following occurred at least once in the two weeks prior to the PISA-D test:



Source: PISA for Development Databases.

5.2.5. Research on the effects of student and teacher absenteeism

Every school day in Cambodia, many students are missing learning opportunities because they skip school or arrive late for school. Regular truancy can have adverse consequences for students: truants are more likely to drop out of school, wind up in poorly paid jobs, have unwanted pregnancies, abuse drugs and alcohol and even become delinquent (Baker, Sigmon, & Nugent, 2001; Meece & Eccles, 2010; Hallfors, et al., 2002; Henry & Huizinga, 2007; Juvonen, Espinoza, & Knifsend, 2012; Office for Standards in Education, 2001). If pervasive, student truancy can also hurt the entire class.

Students who play truant, are absent and arrive late at school frequently need extra assistance, which may negatively affect the flow of instruction, particularly for those students who work closely with truants, who are often asked to help them catch up. Truants might also generate resentment among students who attend class regularly – and sympathy among others who may realise that they too can skip classes (Wilson, Malcolm, Edward, & Davidson, 2008). For these and other reasons, missing days of school may adversely affect the academic performance not only of the truant himself/herself, but also of other students in the same school.

5.3. Quality instruction in the classroom

Teachers are the most important resource in today's schools: in education, teaching is "where the rubber hits the road", and there is hardly any intervention to improve student learning that does not rely on teachers for its proper implementation (Darling-Hammond, et al., 2017). Most goals of school education are achieved – or not – by the way students and teachers interact in classrooms. Improving the effectiveness, efficiency and equity of

schooling depends, in large measure, on ensuring that competent people want to work as teachers, that their teaching is of high quality and that high-quality teaching benefits all students.

While it is widely recognised that the quality of instruction is the most important driver of student success, quality of instruction is also the most difficult foundation of success to define and measure. Many aspects of teacher quality are indeed difficult to observe, and researchers agree that there is no single best way of teaching (OECD, 2009). PISA-D focuses on some of the most visible markers of effective teaching, rather than on more indirect determinants of it. The PISA-D measures of the quality of instruction focus in particular on those aspects that can be easily observed by students, irrespective of their own level of skill.

Virtually all of the contemporary models of effective instruction (Anderson, 2004; Klieme, Pauli, & Reusser, 2009; Coe, Aloisi, Higgins, & Major, 2014) highlight the importance of goal-oriented, structured teaching and conceive teaching as an interpersonal exchange. Goal-oriented, structured teaching refers to the fact that when delivering lessons, teachers are aware of, understand and actively pursue goals that are concerned directly or indirectly with student learning, and are able to achieve clarity and order in large classrooms. The importance of interpersonal exchanges implies that quality instruction is characterised by a supportive, student-oriented classroom climate, which puts learners and their needs at the centre. The PISA-D measures of quality instruction consequently focus on the quality of student-teacher relationships, on the classroom disciplinary climate, and on the clarity and structure achieved by mathematics teachers (Box 5.3).

Box 5.3. PISA-D measures of quality instruction used in this report

The PISA-D measures of learning time used in this report are based on student responses to the following questions.

Student questionnaire

Students were asked to think about the teachers at their school, and to report, on a four-point scale with the answering categories “strongly agree”, “agree”, “disagree”, and “strongly disagree”, their agreement with the following statements, indicating supportive student-teacher relationships

- I get along well with most of my teachers.
- Most of my teachers are interested in my well-being.
- Most of my teachers listen to what I have to say.
- If I need extra help, I will receive it from my teachers.
- Most of my teachers treat me fairly.
- The teachers show an interest in every student's learning.
- The teachers give students an opportunity to express opinions.

Students' answers to these statements were summarised in an index of teacher support, which varies between 0 and 10 (where 10 indicates the highest level of agreement with all statements).

Students were also asked to report their agreement with the following statements, indicating teacher expectations of success for all students:

- Our teachers expect us to work hard.
- Our teachers encourage students to do their best work.
- Our teachers expect us to do our homework on time.
- Students understand what is expected of them for their <courses>.

Students' answers to these statements were summarised in an index of teacher expectations of success which varies between 0 and 10 (where 10 indicates the highest level of agreement with all statements).

To measure the classroom disciplinary climate, students were asked to indicate how often (“every lesson”, “most lessons”, “some lessons”, “never or hardly ever”) the following things happen in their classroom:

- Students don't listen to what the teacher says.
- There is noise and disorder.
- The teacher has to wait a long time for students to quiet down.
- Students cannot work well.
- Students don't start working for a long time after the lesson begins

Students' answers to these statements were summarised in an index of disciplinary climate. The scale values range between -2.9 and 2.3: the scale is aligned with the corresponding scale in the PISA 2015 database, which was set so that a value of 0 corresponds to the average across OECD countries. Values above 1 on this index correspond to students who report that most of these things never happen (with one or two things at most happening only in some lessons); values below 0 on this index correspond to students who report every type of disruption to happen at least in some lessons; values below -1, in turn, typically correspond to students who report that, in most lessons or in every lesson, all kinds of disruptions happen.

Finally, to measure the clarity and structure of teaching, students were asked to report how often the following things happen in their mathematics lessons:

At the beginning of a lesson:

- The teacher explains the purpose of the lesson.
- The teacher reviews what we learned in previous lessons.

During a lesson:

- The teacher shows us how to solve problems.
- The teacher provides examples of successful work.
- The teacher gives clear answers to students' questions.
- The teacher gives a formal lecture on the topic.
- The teacher explains mathematical concepts.
- The teacher gives us work to do at our desk.
- The teacher talks with students about their work.

At the end of the lesson:

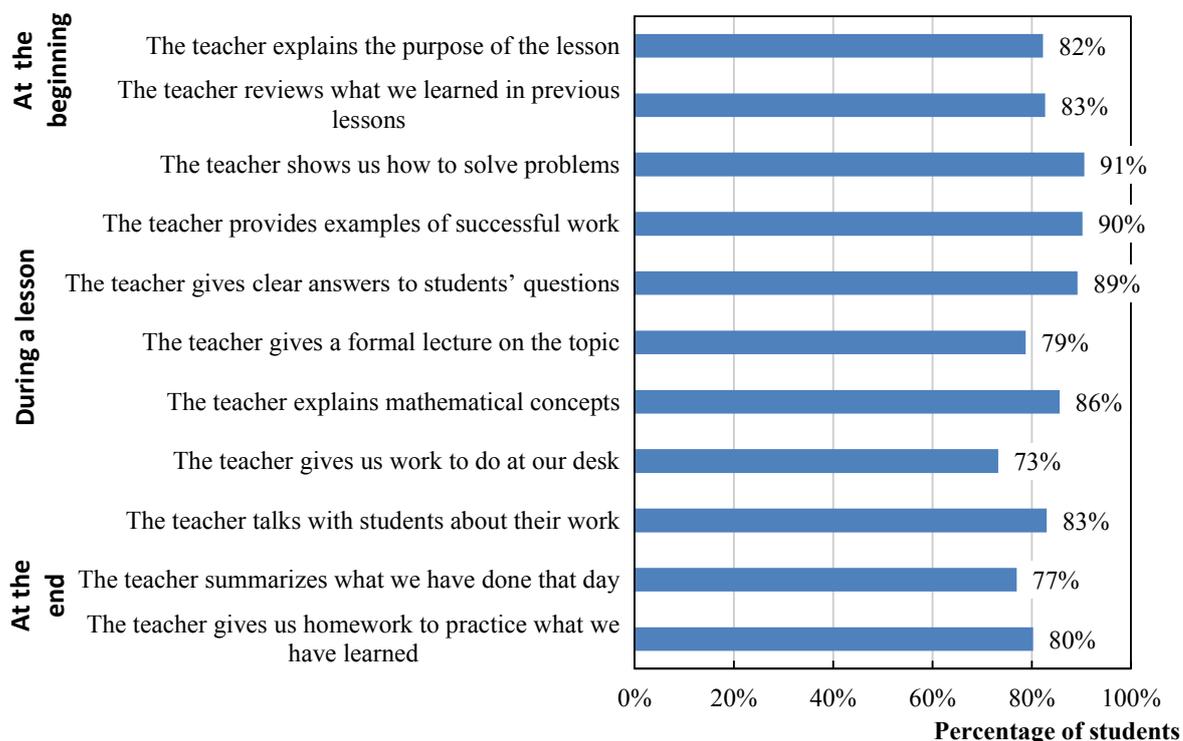
- The teacher summarises what we have done that day.
- The teacher gives us homework to practise what we have learned.

Students' answers to these statements were summarised in an index of structured lessons in mathematics which varies between 0 and 10 (where 10 indicates that all aspects of a structured lesson happen with the highest frequency).

5.3.1. Quality of instruction in mathematics (structured lessons)

Many effective instructional practices are difficult for students to observe and assess; and researchers agree that there is no single, well-defined best way of teaching (OECD, 2009). Nevertheless, the key aspects of "direct instruction" (close monitoring, adequate pacing and classroom management as well as clarity of presentation, well-structured lessons and informative and encouraging feedback) have generally been shown to have a positive impact on student achievement and constitute the most visible aspects of effective teaching (OECD, 2009). In PISA-D, students were asked about the extent to which these aspects were present in their mathematics lessons.

In Cambodia, 82% of students reported that, at the beginning the lesson, their teacher explains the purpose of the lesson; and 83% of students reported that the teacher reviews what they have learned in previous lessons (percentages refer to the share of students who answered "in most lessons" or "in every lesson"). Some 90% of students reported that, during the lesson, their teacher provides examples of successful work and shows how to solve mathematics problems, while 86% and 83% of students reported that teacher frequently explains the mathematical concepts in their lessons and talks with students about their work, respectively. Finally, 77% of students reported that, at the end of the lesson, the teacher summarises what they have done, and 80% of them reported that the teacher gives them homework to practice what they have learned. Apparently, a vast majority of 15 years-old students in Cambodia reported they experienced well organized lessons in mathematics. However, the smaller percentages of students reporting the desired instructional practices at the beginning and the end of the lesson suggest that assessing and reinforcing what students have learnt is not as much focused on as what students are expected to learn (i.e., the new lesson). This to some extent implies that there is some disconnect in the learning process.

Figure 5. 18. Structured lessons in mathematics

Source: PISA for Development Databases.

The various aspects that define a clear and structured mathematics lesson were summarised in an index, such that students who report more frequent practices of structured, direct instruction in their mathematics lessons have larger values on the index. This index can be used to analyse the variation in the quality of instruction among schools in Cambodia (see below).

5.3.2. *Disciplinary climate in the classroom*

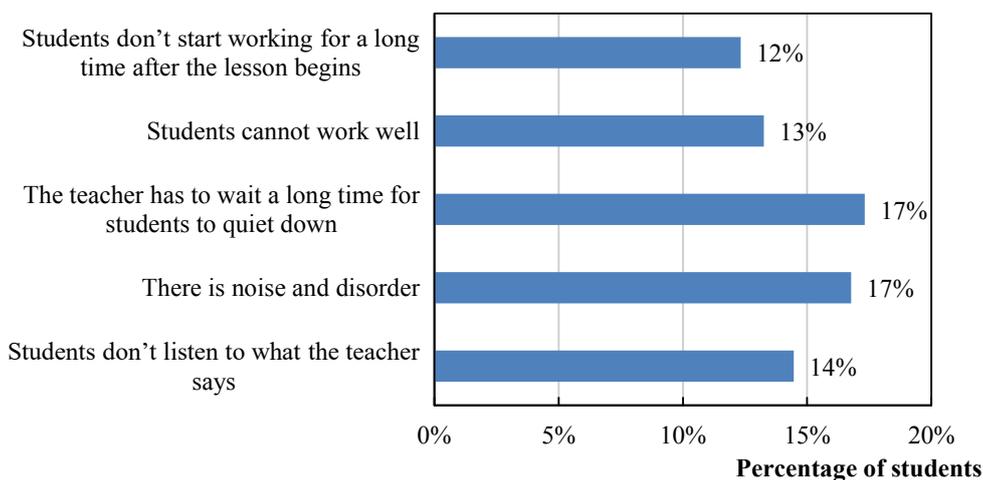
Goal-oriented teaching also requires that teachers create a classroom environment that is conducive to learning. This requires, first and foremost, keeping noise and disorder at bay, and making sure that students can listen to what the teacher (and other students) say and can concentrate on learning tasks. Meaningful and visible learning is more likely to happen in these learning environments (Ma & Willms, 2004).

In Cambodia, the most common disciplinary problems during lessons (among those included in the student questionnaire) are when students do not listen to what the teacher says and when there is noise and disorder in the classroom. For example, about 1% of students in Cambodia reported that, in every or most lessons, students do not listen to the teacher; some 17% of students also reported that there is noise and disorder and that the teacher has to wait a long time for students to quiet down in every or most lessons; and 13% students reported that, in every or most lessons, they cannot work well or have to wait for a long time to do so. Noise and disorder is the most common disciplinary problem in the Cambodian classroom. While less than a quarter of students reported this issue, such lack of disciplinary climate implies there is some poor classroom management as well as poor school management at large. Keeping noise and disorder at bay is, therefore,

a prime task teachers are required to do to create a classroom environment conducive to learning and to prevent loss of teaching and learning time.

Figure 5. 19. The classroom disciplinary climate

Percentage of students reporting that the following things happen "in every lesson" or "in most lessons"



Source: PISA for Development Databases.

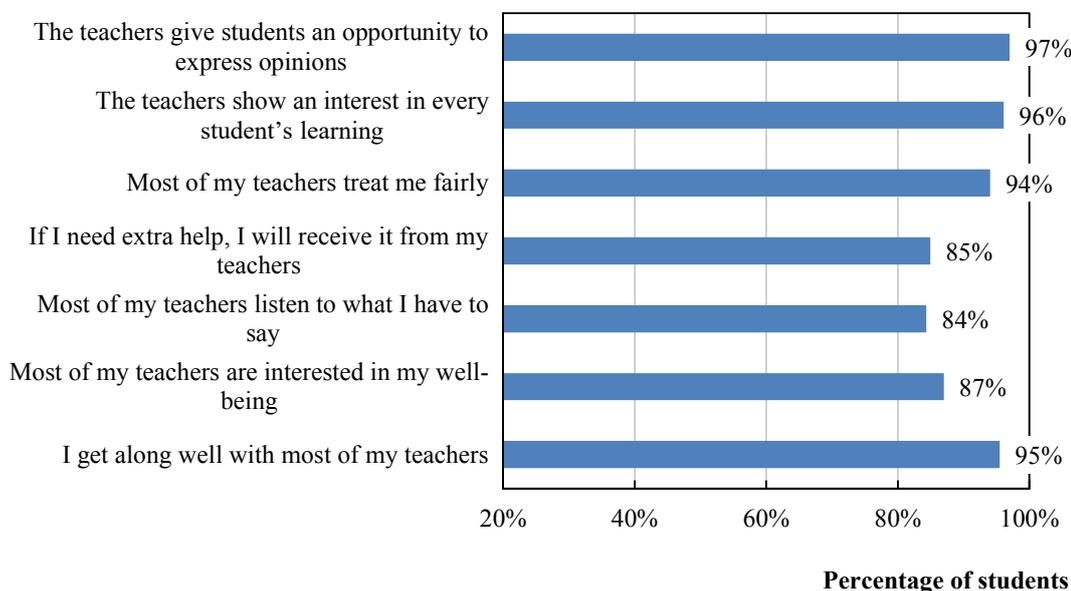
An index of disciplinary climate, which summarises student reports about the classroom climate during lessons, was created to summarise student responses and is used in this chapter in order to analyse how student reports of classroom discipline vary among schools in Cambodia (see below).

5.3.3. Teacher support and expectations of success reported by students

Students need support from school staff, particularly from their teachers, if they are to make the most of the learning opportunities available to them (Klem & Connell, 2004). Most of the 15-year-old students in Cambodia reported positive views about their teachers. Some 95% reported that they get along well with most of their teachers, 87% felt that their teachers are interested in their well-being, and 85% reported that if they needed extra help, they could receive it (percentages refer to the share of students who agreed or strongly agreed with each statement). Student reports on these and other similar statements (see Figure 5.20) were summarised in an index, such that students with more positive views about their teachers have higher values. A comparison of mean index scores between student groups within Cambodia shows that, in general boys and girls cast similar views about teacher support. The same is true about the views of socio-economically advantaged and disadvantaged students.

Figure 5. 20. Teacher support

Percentage of students who agree or strongly agree with the following statements:

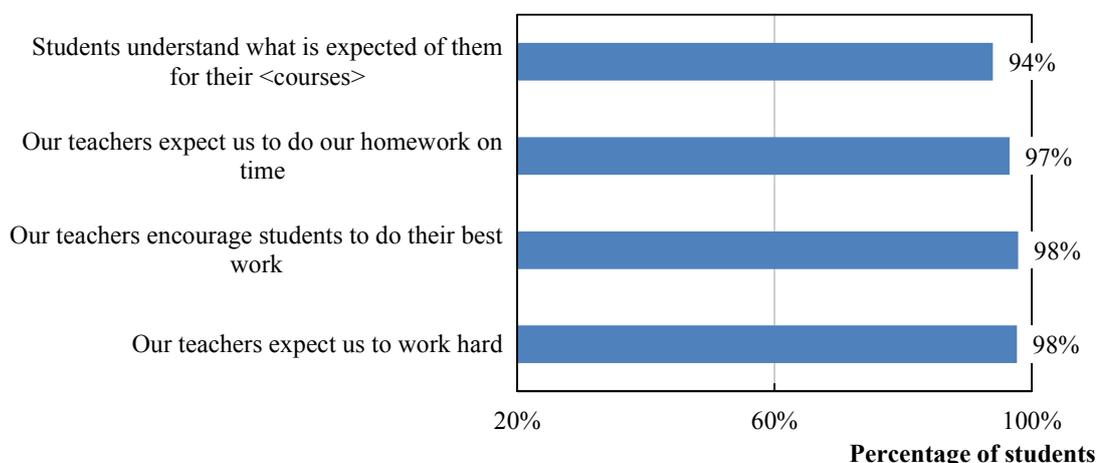


Source: PISA for Development Databases.

Many 15-year-olds in Cambodia also reported that teachers held high expectations for the success of every student in the school: 97% of students reported that teachers encourage students to do their best work, and 97% of students reported that teachers expect them to do homework on time. Student reports on these and other similar statements (see Figure 5.21) were summarised in the index of teacher expectations of success, such that students who perceive their teachers as holding fair expectations for the success of every students have a higher value on this index. A comparison of mean index scores between student groups within Cambodia shows that girls and boys perceived similar high expectations from teachers. Such parity was, however, not found among students with economically advantaged and disadvantaged backgrounds, with the latter holding the feeling that teachers did not have as high expectations towards them as other economically advantaged students.

Figure 5. 21. Teacher expectations of success

Percentage of students who agree or strongly agree with the following statements:



Source: PISA for Development Databases.

5.3.4. How the quality of instruction and teacher support vary among schools within Cambodia

According to students' reports, structured lessons in mathematics tended to be better in rural than in urban schools and in public than in private schools, independent of school socio-economic profile. Teacher support in rural and public schools was also better than in urban and private schools, while teacher expectation of success and disciplinary climate seemed fairly similar in public and private schools. Disciplinary climate was, however, better in rural schools than in urban schools.

The better structured lessons and teacher support in rural and public schools is in contrast to the fact that rural and public schools are more likely staffed with novice teachers whose quality of instruction can be in question. Yet, the high demand for quality teaching from students in urban and private schools might affect their rating. Considering that students in public and rural schools have lower performances than those in private and urban schools, what is taught is as important as how it is taught.

5.3.5. How the classroom disciplinary climate compares internationally

While differences in student reports of the disciplinary climate, across different contexts and countries, are subject to considerable uncertainty (for example, what counts as "noise" in one context may be perceived as normal in another context), PISA as well as other international surveys suggest that the amount of lesson time lost to learning due to poor student behaviour and poor teacher classroom management varies significantly across countries, and is, for example, particularly large in many Latin American countries (Moriconi & Bélanger, 2015).

In PISA, the highest values on the index of disciplinary climate – indicating the absence or near-absence of disruptions to classroom teaching – are observed in Japan and Korea. The index of disciplinary climate in Cambodia was significantly above the OECD and PISA-D averages and above the level observed in Malaysia, Vietnam, Thailand and Indonesia. Classroom disciplinary climate is, thus, a bonus to creating a strong learning culture for students in Cambodia.

5.3.6. Research of the effects of quality instruction

The effectiveness of teachers in ensuring that students are engaged and learn during lessons depends critically on their ability to manage student behaviour and keep their teaching focused on the learning of every student. PISA 2015 data show for example that in the vast majority of countries and economies, students who reported a better disciplinary climate in their science lessons perform better in science, after accounting for the socio-economic status of students and schools (OECD, 2016b, p. 89).

When the classroom discipline is poor, and teachers have insufficient classroom management skills, students miss out on the learning opportunities they so critically need. Out of every hour of lesson, for example, only a fraction of the time is really dedicated to learning. Over a few school years, these differences can create a substantial gap between students. A classroom environment that is not conducive for learning harms, in particular, disadvantaged students who lack the family and community resources to compensate for a poor learning environment at school. To break the circle of disadvantage and underperformance, schools must ensure that the conditions that would enable better learning are met, particularly in schools that concentrate high levels of student disadvantage.

A good disciplinary climate and supportive student-teacher relationships are important not only for learning, but is also strongly associated with other positive outcomes, such as student and teacher wellbeing. For example, teachers' job satisfaction is higher in schools where students, on average, report a better disciplinary climate, even after accounting for student performance and socio-economic status (Mostafa & Pál, 2018); students' sense of belonging at school is also positively related both to students' perception of supportive teacher-student relationships, and to the average disciplinary climate in the classroom reported by students in the school (OECD, 2017, pp. 122-129). These relationships are consistent with research studies showing that the quality of teacher-student relations can influence students' engagement with school and their socio-emotional development (Anderman, 2003; Battistich, Solomon, Watson, & Schaps, 1997; Chiu, Chow, McBride, & Mol, 2016; Ma, 2003), and that teachers who are effective at keeping a good school discipline contribute not only to students' academic achievement, but also to students' sense of belonging at school (Arum & Velez, 2012; Chiu, Chow, McBride, & Mol, 2016; OECD, 2003). Teachers and school staff can promote students' healthy social and emotional development by creating a caring and respectful learning environment (Battistich, Solomon, Watson, & Schaps, 1997).

Research also shows that students, including those with at-risk profiles, show more positive attitudes and higher academic motivation if their teachers care about them, provide them with help when they need it, and let them express opinions and decide for themselves (Pitzer & Skinner, 2017; Ricard & Pelletier, 2016).

5.4. The wider learning environment: families and communities

For children, few relationships in life are as significant and enduring as the relationship with their parents or the adults who raised them. The nature and extent of family and community support differs among countries; but families – whether small, nuclear families, or extended families – invariably are the first social unit in which children learn and develop. And while good parenting can take different forms and be shaped by various social and cultural forces, it always involves providing children with the support, care, love, guidance and protection that set the conditions for healthy physical, mental and social development.

The PISA-D questionnaires ask students about the frequency with which their parents or other family members engage in exchanges and activities with them, typically in their

homes, that indicate a caring relationship and support for their engagement at school and with learning. PISA-D questionnaires also ask teachers about the typical school-based involvement activities of the parents of students they teach, and ask principals whether members of the local community, or parents, contribute to the maintenance of the school building and enrich the school's offer of education services. Box 5.4 details the measures of family and community support used in this report.

Box 5.4. The measures of family and community support used in this report

The PISA-D measures of family and community support used in this report focus on parental behaviours, at home and at school, which indicate involvement with education. They are based on student and teacher responses to the following questions.

Student questionnaire

Students were asked to think about their parents (or those persons who are like a mother and father for them), and to report how often their parents did the following things with them (“never or hardly ever”, “a few times a month”, “about once a month”, “several times a month”, “several times a week”):

- Discuss how well you are doing at school.
- Eat <the main meal> with you.
- Spend time just talking with you.
- Talk to you about the importance of completing <secondary school>.
- Talk to you about any problems you might have at school.
- Ask you about how well you are getting along with kids at school.
- Encourage you to get good <grades>.
- Take an interest in what you are learning at school.
- Talk to you about your future education.
- Ask you what you did in school that day.

Teacher questionnaire

Teachers in schools attended by 15-year-olds were asked how often (“never or almost never”, “sometimes”, “often”, “always or almost always”) family members of students in their class did the following things:

- Attend parent-teacher meetings.
- Ask for personal meetings to discuss the progress of their child.
- Ask for personal meetings to discuss other school matters.
- Participate in school fundraising events or campaigns.
- Help in [their] class.
- Volunteer after school with helping students do their homework.

School questionnaire

School principals were asked whether the community did the following things in and with school:

- Build school facilities such as classrooms or teacher houses.
- Maintain school facilities such as classrooms or teachers' houses.
- Maintain school grounds and fences or hedges around them.
- Construct, maintain or repair furniture or equipment.
- Teach when teachers are absent.
- Assist teachers in addressing the needs of students with disabilities.
- Organize sport activities or school trips.
- Assist with preparation and distribution of school meals.

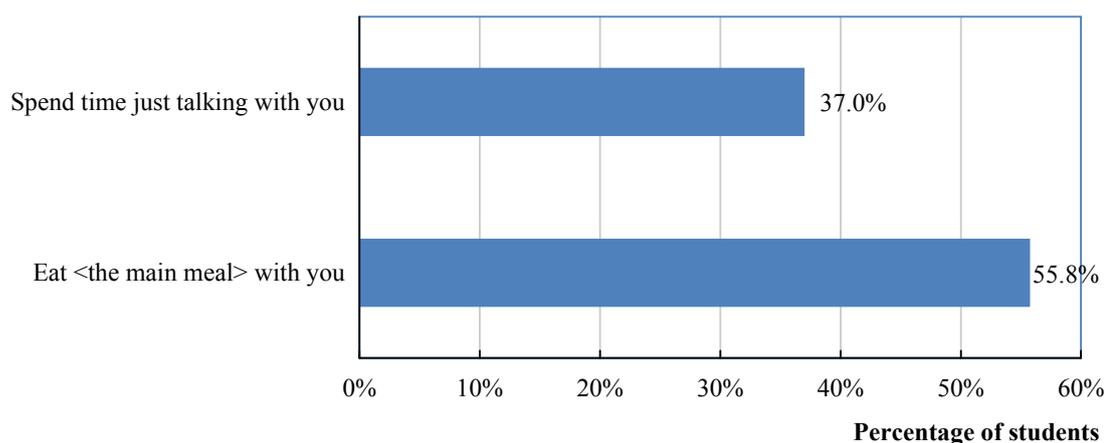
5.4.1. Parental involvement at home

PISA-D asked students how often their parents, or other family members, engaged in activities such as “eating the main meal with them” or “spending time just talking with them” that often characterise a quality relationship with their primary care-takers. If children are deprived of frequent opportunities to talk and exchange with parents (or with other relatives who act as their primary care-takers), their development may suffer. Parents however may struggle to find quality time for their 15-year-old children because of busy work schedules, or because their poor health or lack of economic security limit their ability to provide care, guidance and protection for their children.

On average in Cambodia, 56% of 15-year-olds reported that their parents (or someone in their family) eat the main meal with them several times a week, and 37% reported that their parents spend time just talking with them several times a week. However, there were large differences between students by gender, socio-economic status and across urban and rural regions. Female, socio-economically advantaged and urban students reported a higher quality relationship with their parents or someone in the family.

Figure 5. 22. General parental support in Cambodia

Percentage of students reporting that their parents, or someone in their family, do the following things several times a month or more often:



Source: PISA for Development Databases.

PISA-D also asked students about the frequency and nature of parent-child communications more directly related to their school and learning activities. Parents, and other adult care-takers, can influence students' engagement with school and learning either by devoting time and interest to their own learning activities, thereby modelling their children's behaviour; or by reinforcing students' own engagement with school and learning through questions and exchanges that signal praise, encouragement, interest and attention for their child's learning and school activities (Hoover-Dempsey, et al., 2005; Hoover-Dempsey & Sandler, 1997; Avvisati, F.; Besbas, B.; Guyon, N., 2010). Several questions included in PISA-D questionnaire allow for a description of the extent to which students benefit from this kind of exchanges and parental support.

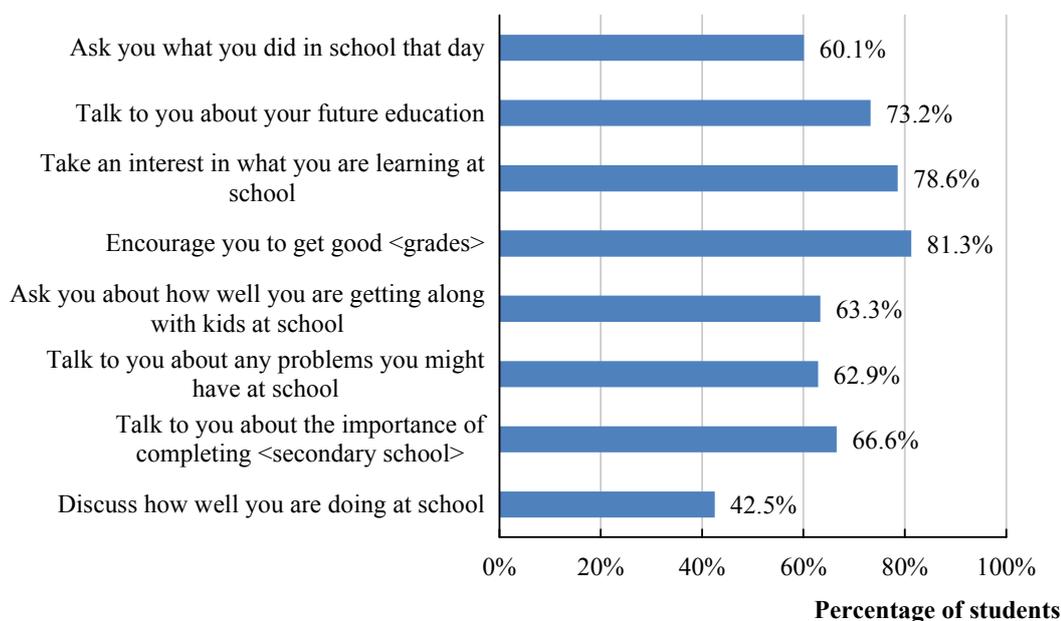
On average in Cambodia, 43% of 15-year-olds reported that their parents (or someone in their family) regularly discuss how well they are doing at school; 81% reported that their parents regularly encourage them to get good grades; 73% reported that their parents talk

to them about their future education. There were no large differences by gender and socio-economic status in terms of attention from parents to students' activities at school and about their future education. However, girls and urban students reported more encouragement from their parents about achieving good grade performance, reflecting a higher expectation of success from parents towards those students.

The small percentage of students reporting parental involvement in how well they are doing at school indicates a lesser effort with regard to home-based learning reinforcement, thereby suggesting the disconnect between learning at school and at home. Parents seem more interested in their children's grade performance than what they are actually doing in school and the learning activities they are following. This implies that parents pay less attention to the learning process than learning outcomes.

Figure 5. 23. Home-based parental involvement with school and learning in Cambodia

Percentage of students reporting that their parents, or someone in their family, do the following things several times a month or more often:



Source: PISA for Development Databases.

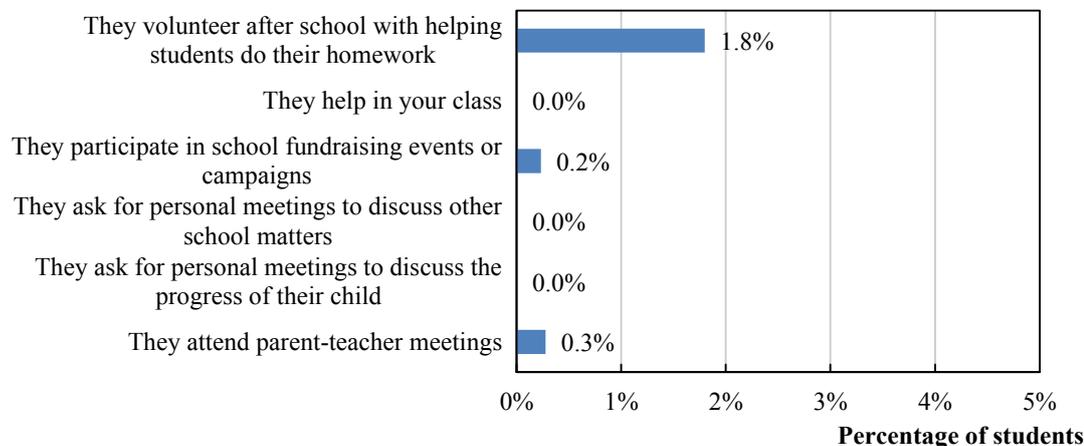
5.4.2. Parental involvement at school

Parental involvement activities that take place at school were measured, in PISA-D, through the teacher questionnaire. In particular, PISA-D asked teachers about the typical activities of the parents of students they teach. School-based parental involvement can take the form of personal or group meetings with their children's teachers, or providing volunteer work to help teachers in their class or help students do their homework.

On average in Cambodia, a small proportion of 15-year-old students were in schools where a majority of teachers who responded to the teacher questionnaire (more than 2 out of 3) reported that parents "often" or "always or almost always" attend parent-teacher meetings or other school-based activities. This reflects a significant lack of parental involvement at school, especially related to their children's learning.

Figure 5. 24. School-based parental involvement with school and learning in Cambodia

Percentage of students in schools where more than 2 out of 3 teachers report that family members of students in their class do the following things "often" or "always or almost always":



Source: PISA for Development Databases.

5.4.3. Community involvement in the provision of schooling

PISA-D also asked school principals about the community involvement in the provision of schooling. Their involvement in these school-based activities can influence school management and environments to some degree. In Cambodia, it is more common to see the community or parents support schools in maintaining the school facilities and school grounds. On average, 71% of the school principals reported the contribution from the community or parents/parental organization in maintaining school grounds and fences or hedges around them; about half of the school principals reported the community participation in maintaining school facilities such as classrooms and building schools or constructing, maintaining or repairing furniture or equipment; helping schools organize sport activities or school trips appeared less common. The lack of community involvement in supporting school activities reflects a school-community relation gap and seems to question the accountability of schools in the country.

5.4.4. Research on the effects of family and community support

The literature consistently documents positive associations between a range of home- and school-based parental activities related to the child’s education and children’s educational achievement. This positive relationship holds in various disciplines, across ethnic groups, gender and over time (Bogensneider, 1997; Catsambis, 2001; Fan & Williams, 2010; Kaplan Toren & Seginer, 2015; Keith, et al., 1998; Shumow & Lomax, 2002). The most effective forms of parental involvement are a function of the child’s age; in late childhood and adolescence, they often do not involve direct help or instruction, but rather rely on modelling positive behaviours (such as perseverance in the face of difficulties) and showing, in particular through oral communication, interest in the child’s learning.

PISA 2015 data also show that parental activities that characterise, more generally, a caring family environment – and in particular, “spending time just talking” and “eating the main meal” with their child- are positively related not only to academic achievement,

but also to other areas of their life, such as how satisfied students are with their own life (OECD, 2017, p. 162).

Parents' involvement not only provides additional support to their child's learning; it can also bring greater accountability to education systems. In practice, however, the extent to which this leads to positive outcomes is disputed (Banerjee, Banerji, Duflo, Glennerster, & Khemani, 2010). In some cases, accountability initiatives that increase parental involvement in school seem to moderate the impact of school resources: having parents serve on school boards, for example, can ensure that school resources are used in the interest of children, rather than of school staff (Duflo, Dupas, & Kremer, 2015). But in many cases, community monitoring initiatives that increased the information on the quality of services provided by schools (e.g. on teacher absenteeism, or on student achievement levels) did not lead to significant improvements (Glewwe & Muralidharan, 2016).

Schools have not always been interested in encouraging parents to participate in their activities. In many countries, parents, especially those from disadvantaged groups, were regarded by many teachers, school leaders and policy makers as obstacles to the creation of a society based on dominant values and ideology (Warzee, et al., 2006; Seginer, 2006; Bowles & Gintis, 1976).

More recently, a growing understanding that parents and teachers can be effective partners in helping children succeed in school has led policy makers and school leaders in many countries to take deliberate actions to increase parents' participation in school life. Policies and school-level practices to increase parental participation have been shown to facilitate students' positive behaviours and attitudes at school (Avvisati, Gurgand, Guyon, & Maurin, 2014; Berlinski, Busso, Dinkelman, & Martinez, 2016; Dizon-Ross, 2018).

One meaningful way for school leaders to help parents engage more often and more effectively with their child's school is to help remove the barriers that hinder their regular participation in school activities or that limit their knowledge of the school system and of the behaviours that are conducive to success in school. While some of these obstacles lie outside of the education policy realm – and must be addressed as part of more comprehensive strategies for improving children's outcomes – recent evidence shows that schools can do much to improve communications with family, by adopting those channels of communication with which families are most familiar (e.g. short message systems) and by making the language of their communication open and inclusive, thereby reducing language barriers (Avvisati, Gurgand, Guyon, & Maurin, 2014; Berlinski, Busso, Dinkelman, & Martinez, 2016; Cerdan-Infantes & Filmer, 2015).

In Cambodia, engaging parents and community in school and learning activities is challenging, especially in rural areas where the majority of the population are still unskilled or domestic workers. But evidence shows that it can be done by improving communication from school to the commune and to the core network of the community, i.e., the pagoda. The three entities can work together to change parents' and community's perception of school and learning through creating school-based and community-based activities (No & Heng, 2015; Shaeffer & Heng, 2016; To, 2016). While school principals have a leading role in this especially in engaging parents in their child's learning at school and at home through regular meetings to discuss learning and what promotes learning, the commune and pagoda leaders can add their role in sensitizing the public awareness about schooling and learning activities. To this end, school principal, however, requires basic leadership techniques and community organizational skills (e.g., the use of school budgets, financing and community organization) (Shoraku, 2008). Successful experience was evident in Save the Children's project "I'M LEARNING" in Cambodia in transforming disadvantaged schools into a model school of the community, the model

subsequently guiding a school-based management approach in the current education reform (KAPE, 2017).

Keeping the public aware of their roles and the functions of school is key to increasing family and community involvement. Care Cambodia⁴ successfully did this in its School Governance Project by strengthening the capacity of the School Support Committee (SSC) who is a liaison entity developed by school and of school principals to better understand what school can offer to students and to the community and vice versa. The participation of SSC helped connect school to the community and resulted in major improvement in student enrolment, attendance, retention, school development plan, and school building and maintenance.

Across countries in Asia and Africa, low levels of family and community participation in school and learning activities have been attributed to the lack of participation of teachers in the school management process and in the school-community structure, family and community's little knowledge about the education process and their roles, and school principal's poor management and leadership (Pellini, 2007; Shoraku, 2008). The lack of trust and decision-making power from parents and community has also been found as the barrier to their full participation in the schooling and learning process of their children. Increasing family and community participation thus appears to rely on the participation of various stakeholders, including not only the school principals, parents and community but also teachers and commune/local leaders.

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⁴ The details of the project can be seen at <http://schoolgovernance.care-cambodia.org/>.

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Looking forward: Policy options for Cambodia

Chapter 6

Looking Forward: Policy Options for Cambodia

This chapter discusses key findings of PISA-D for Cambodia, emphasizing both the prosperity outcomes and foundation for success of education in the country. It then presents policy options that can have both short- and long-term impacts on education development in Cambodia. It particularly discusses how students' competence is developed within the emerging global competency-based education discourse and the resource-scarce education context.

6.1. Summary of findings for PISA-D

6.1.1. Four core outcomes of education at age 15

6.1.1.1. Attainment & Achievement

As presented in Chapter 1, Cambodian education has been characterized as the education utterly in need of reforms to revive from the high rate of grade repetition, school dropout and low student achievement. Despite the success in increasing student enrollment in the fact that almost every child can attend school in the primary education, Cambodia is facing a learning crisis, which requires immediate yet visionary and systemic solutions.

PISA-D results corroborate such evidence, revealing that Cambodia has a sizable number of 15-years-old population who are not able to attain at least grade 7 at age 15. The percentage of the Cambodian population that has attained at least Grade 7 by age 15 in 2017 was only 28%, meaning that the remaining 72% of 15-year-olds in 2017 were either in grades below 7 or out of school. In addition, Cambodia has almost half of 15-year-old students in school who are one or more years behind track, particularly among boys. Grade repetition seems to be main cause of this schooling problem. This is clearly evident in the fact that about one in three students reported having repeated a grade at least once in primary, lower secondary or upper secondary school. Grade repetition in Cambodia appeared to be a grave concern compared to those in PISA-D and ASEAN countries, particularly to its neighbors Thailand and Vietnam. The high grade repetition is not only costly but also harmful to student learning when remedial education is lacking.

In Cambodia, student performance in reading and science was significantly below the PISA-D average; while student performance in mathematics was similar to the PISA-D average. In all domains, students in Cambodia outperformed those in Zambia and Senegal but particularly underperformed other PISA-D countries in reading and science. Students at the age of 15 in Cambodia performed significantly lower than the internationally agreed standards of basic literacy (level 2) and in comparison with other countries, in particular with its ASEAN peers. About 90% of students were at level 1a or below in all the three domains, the proportion based on PISA experience and the child development trajectory highlighting the learning crisis not just within the range of grade 7 or above but also within earlier schooling and learning.

The low performance is anticipated in low-income countries and economies. However, as the PISA-D assessment and analytical framework highlights, while Level 2 is a particularly important threshold, as this marks the baseline level of proficiency at which students begin to demonstrate the competencies that will enable them to participate effectively and productively in life as continuing students, workers and citizens, within the low-income country context, it is important to highlight the extent to which students know and can do at level 1a to foresee what the education system in a country can do to quickly prepare students to reach at least the threshold of level 2.

In Cambodia, about 42% of students performed at Level 1a in science, followed by reading (35%) and mathematics (23%), reflecting that in reading and mathematics there are more students performing below level 1a. From these results, there is a clear pattern that students aged 15 in Cambodia have not only low reading literacies but also low mathematic literacies. But these results also show the optimism that students aged 15 in Cambodia can do more to improve from Level 1a to at least Level 2 once the right education is in place. Aiming learning tasks at level 1a or level 2 in teaching and learning on a regular basis, especially in reading and mathematics, can improve a chance of reaching high levels of performance in the next student assessments.

Even more than in other countries, results varied greatly within schools, and every school seemed to have a large share of low-performing students. The overall association of school factors with the outcomes of children was weak in Cambodia. It is as if schools

do not contribute to the development of children into skilled and healthy young adults to the full extent they could.

On all educational outcomes, there were significant differences in favor of female, urban and socio-economically advantaged students/schools. Girls achieved at better levels in reading and science (and at a similar level in mathematics). The rural regions within the country often achieved worse outcomes than the urban regions, except for well-being. Private schools were better performing but their performance was still below the baseline level on average, reflecting the lack of competency-based practices in classroom teaching and learning. All of these results reflect an inequality in student performances at age 15 in Cambodia; and this inequality seems to be the function of differences in socio-economic profiles of students and schools.

The findings from PISA-D are consistent with those of curriculum-based national student assessments in Cambodia in that students across grades 3, 6 and 8 appear to have low basic reading and mathematical skills (MoEYS, 2016; 2017; 2018). Despite some improvement over the years, in Cambodia student performances across these grades remain below the average level anticipated in the national curriculum standards. This reflects the learning crisis since the low grades. Low performance in PISA or PISA-D presents new evidence that schooling does not translate into actual learning since PISA or PISA-D measures the cumulative development of cognitive skills of children at the age of 15, equivalent to the learning achievement at grade 10 in Cambodia. The performance below the baseline level among 15-year-old students means that the quality of education in a country, especially in the low grades, remains in question and that schooling has yet to translate into learning to its fullest extent. The findings echo the global learning crisis emphasized in the World Bank Development Report 2018 in the fact that, in most developing education systems, schools seem to do little to impact student learning (World Bank, 2018). The report suggests a strong school management and leadership and effective classroom practices that matter most to student learning; but this is rarely evident in schools in developing education systems.

6.1.1.2. Health, well-being and attitudes towards school and learning

The findings from PISA-D seem to suggest that schooling is a luxury in Cambodia; being at school is what students and the community endeavor. Students despite studying in less resourced schools seemed to show the feeling of gratefulness of being at school. This is clearly evident in their positive attitude and behaviors towards school and learning.

Students aged 15 in Cambodia reported a higher life satisfaction level than those in PISA-D and OECD countries. The higher life satisfaction appears to indicate two ironic pictures of schooling in Cambodia: (1) again it is a luxury to be at school; (2) but schooling does not ensure learning; there is less pressure at school, meaning that schools are less likely to fully attend to student learning, resulting in low levels of academic challenges and, as a consequence, preventing students from fully cultivating their academic potential.

Self-rated health in Cambodia was, however, often poor or fair, much lower than across PISA-D countries; there was a relatively high prevalence of gastrointestinal problems (e.g., stomach pain, constipation, diarrhea), a cold or flu, and poor mental health, particularly among girls. Girls also tended to report greater anxiety and depression than boys. These findings suggest that physical and emotional well-beings of 15-year-old students in Cambodia seem to be an issue.

6.1.2. Foundations for success

6.1.2.1. Inclusive environments

More than in other countries, students in Cambodia in general showed a high level of sense of belonging and school safety although some episodes of physical violence and stealing had been reported at times. Sexual harassment also seemed not common at schools in Cambodia. The results, however, showed that there was a relatively high concern among girls about their safety in commuting to and from school. Attending such a school and having experienced school violence personally were both associated with lower levels of sense of belonging, and with poorer achievement and well-being outcomes.

The threat to inclusive environments was also observed among school principals and teachers in regard to their views towards repeated students or those who lag behind academically. It is no doubt that schooling does not always translate into learning when academically poor students are arbitrarily placed in a heterogeneous classroom, but teachers lack inclusive attention and mechanisms in teaching such as not providing them with supportive tasks or not using differentiated pedagogies. PISA-D results reported that a significant number of school principals and teachers still held a view that grade repetition is necessary for low-ability students; and students who lag behind should be placed in special classes, which is in contrast with the goal of promoting inclusiveness in education. This view appears not useful for but harmful to the educational outcomes of at-risk students, especially to those coming from socio-economically disadvantaged backgrounds. The PISA-D results appeared to suggest that schools in Cambodia have not made all efforts yet to support the academically disadvantaged students.

6.1.2.2. Learning time

The foundation for success of schools in Cambodia can be described by two metaphors: *schooling is a luxury but schools are not always places of learning*. The notion that schooling is a luxury among 15-year-old students in Cambodia as reflected in their positive attitude towards school and learning and high sense of belonging is a foundation for success at school and a dividend for promoting student learning. However, the fact that *schools are not always places of learning* merits special scrutiny in policies and actions. Schooling without learning is a wasted opportunity (World Bank, 2018). PISA-D data showed that education in Cambodia, like that of comparable countries in PISA and PISA-D, is locked within this situation, with students seemingly viewing schooling is a luxury while not necessarily learning to the full extent.

In many respects, the PISA-D results revealed that time loss and the lack of attention or measures to diversity in learning have greatly reduced opportunities for learning in Cambodia. While student absenteeism is not a particular problem, and every student seems to have a school nearby he can attend (distance to school is very small), some of the instruction time gets lost due to teachers arriving late, classes being cancelled, teachers answering personal calls or teachers attending meetings during class hours. Students' frequent lateness especially among girls also exacerbates the quality of teaching and learning time greatly. Either explicitly or implicitly, the learning time for students in Cambodia appeared shortened in one way or another, which is consistent to what was found in other studies in Cambodia (Ang, Colin, & Chhum, 2015).

The loss of instruction hours in Cambodia combined with the relatively fewer hours of instruction, especially in primary school, presents a piece of evidence that learning opportunities for students in Cambodia are not even comparable to those observed in the PISA-D countries. The system-level PISA-D data analysis revealed that the instructional hours of primary and secondary education in Cambodia are not equitably balanced, with significantly more hours allocated to the upper grades; whereas evidence from successful

countries such as Singapore, Finland, South Korea or Vietnam suggests that the emphasis on the low grades is critical to building the foundation for students to acquire basic skills to learn (for example, learning to read and reading to learn). In most high-performing countries in PISA, learning time between primary and secondary education appears well-balanced; otherwise, skewed to the low grades; while this is not the case for Cambodia. On balance, this reflects less learning time in the low grades, let alone its quality.

The issue of shortened learning time, like that in other countries in PISA-D, raises a grave concern about the quality of teaching and learning in the classroom in Cambodia, especially in the midst of an unobserved impact of the quality of instruction on student performance in all the three domains in this study. Across PISA-D countries, the quality of instruction in the classroom had a weak correlation with student performance although in Cambodia students rated their teachers' teaching more positively, especially towards the disciplinary climate in the classroom. On the one hand, this indicates that self-rating might not be an effective method of measuring teaching effectiveness especially when students are culturally expected to respect their teachers. The rating might not realistically reflect the quality of teaching. On the other hand, the results seemed to suggest that a good performance in PISA-D requires not only good teaching but also the breadth and depth of cognitive tasks students are supposed to practice in the classroom given that PISA-D is a competency-based assessment, measuring what students at age 15 know and can do in the real-life settings. Sustained practices of different levels of cognitive tasks linked to real-life situations are what matter to students' competency in PISA or PISA-D.

6.1.2.3. Family and community support

Like in many countries in PISA-D, parents in Cambodia spent limited time talking with their children about their learning at schools. There was a higher tendency among parents to discuss their children's learning outcomes (such as getting good grades) than to discuss what their children are learning or doing at school, reflecting that home schooling appeared not common in Cambodia. Also, teachers reported having limited time to discuss teaching and learning with parents of students they teach. The support from community to school is also weak. The PISA-D results suggested that the community involvement in school is not strongly related to student learning and school activities but more to the development of school infrastructure or facilities. This reflects an unfulfilled role of school in reaching out to parents and community to promote the shared responsibility of the education of children. But the involvement of parents and community in school development seemed to suggest that school-community relationship can be re-activated when strong school management and leadership is in place.

6.1.2.4. Resources

PISA-D results indicated that resources invested in education are low but vary to a degree across countries in PISA-D. There was, however, an unclear pattern of its effect on educational outcomes. This implied that the poor performance among PISA-D countries was not just tied to low investment in education but also to the resource allocation and use.

In Cambodia, investment in education was the lowest in the PISA-D league, as reflected in the low number of teachers per students, in the difficulty of attracting qualified teachers, in the poor state of school buildings and particularly in the low cumulative expenditure per student between the ages of 6 and 15.

The low expenditure in education was associated with fewer resources allocated to schools. This was most clearly evident given that school infrastructure was in poor condition, with many schools, for example, not having access to running and drinkable

water, having doors and windows in poor condition or in need of minor repairs, not having access ramp and having electricity but not used to the full extent.

The same was true in that instructional resources were generally in poor condition/not adequate or in need of repair such as writing board, a wall chart, map or diagram, school library, workbook, teacher guide and reference books for teachers. There were even fewer advanced instructional resources, with many schools, for example, not having science lab, teacher staff room, education resource center and ICT-related materials.

Teacher training in Cambodia was relatively short in duration and had a very low entry requirement (except for upper-secondary school teacher training), and across schools in Cambodia, class size as well as student-teacher ratios were very large, in comparison with all other comparable countries in both PISA and PISA-D.

The resource allocation within Cambodia appeared strongly related to the socio-economic profile of schools, with urban and more advantaged schools, systematically having more resources as well as more teachers and more experienced ones. Particularly rural schools appeared significantly under-staffed.

Evidence in PISA-D and PISA 2015, however, stressed that while more investment in education (i.e., preferably in low-income countries from an average of 3% to 5% and in middle-income countries from 4% to at least 6% between now and 2030) merits attention to ensure the education system in a country works to its full extent, effective resource allocation and use has to come into play.

Examples of PISA-D countries showed that educational outcomes were not strongly related to expenditure in education. Although spending per student differed greatly among these countries, a vast majority of students (more than 70%) similarly performed below the threshold of the competency level. In contrast, a similar spending per students (e.g., Chile, Hungary, Costa Rica and Chinese Taipei) was not a guarantee of the same success, with Chinese Taipei surprisingly outperforming those countries. The ceiling effect of resources invested in education was reflected in the striking difference in spending per student between Finland and Chinese Taipei, the two countries, nonetheless, witnessing a similar performance in science in PISA 2015.

The PISA 2015 results of Thailand, Vietnam and Indonesia further highlighted wasteful investments and tradeoffs in education, with Vietnam turning out as a potential contender to the long-standing top performers South Korea, Japan and Finland. How much resources are spent in education is, therefore, as important as how effectively and efficiently they are spent, particularly for low-income countries and economies where the value of money is extraordinarily greater than that in the high-income ones.

6.2. Establishing foundations for success and improving educational outcomes in Cambodia

Results from PISA-D present crucial evidence for Cambodia to revisit some priority policies and actions in education invested over the last few decades. Despite showing low educational outcomes, PISA-D results reveal that some progress in Cambodian education can be considered as lessons learnt for future interventions.

Gender differences are, for example, not strong and in particular in favor of girls in attendance, attainment and achievement, reflecting strong priority on gender equality policies in the past decades; the availability of schools in proximity is guaranteed, making school distance not totally a formidable barrier to schooling and reflecting the lower secondary school expansion policy in the rural Cambodia (one commune, one school) has started to materialize.

Noticeable progress is also observed in increasing values towards school and learning as can be seen in students' self-rated strong sense of belonging and good disciplinary classroom climate, suggesting that schooling is a luxury. Learning is, thus, not impossible when things are rightly planned and implemented.

The outcomes of concerted efforts in the past decades seem not like those in today. Besides from a budget constraint in education and in the country, the low levels of teacher education and first-generation experience among young populations following the end of Khmer Rouge made education development a difficult journey. Today, considering the dividend made from the past, the prospect of education development is relatively higher.

Cambodia has the potential to bring a better change in its socio-economic discourse. With a large share of young population in its demographic pyramid (about one third of the population aged 15-30) (NIS, 2017), investing in the school system today is investing in everyone's future. This is augmented by the stable economic growth in the last decade and the committed economy to become the upper-middle income country in 2030 and high-income country in 2050. The increase in foreign direct investment and the projected industrial development in line with the long-term vision towards 2030 and 2050 creates a more conducive environment for growth and development.

Education today is not the same as what was in a decade ago. In addition to the success in increasing student enrollment to almost 100% in primary education, many innovations have been in place: school inspection and student assessment have been implemented; examination discipline has been being strengthened; upgrading teacher education is underway; more comprehensive and forward-looking curriculum has been developed, awaiting the actual implementation; school principals' capacity development in school-based management is being focused. The success of those innovations is expected to have substantial impact on the quality of education in Cambodia.

Current education reforms are in particular poised to increase student learning. But to do so, priority policies and actions are utterly in need to ensure learning is taking place in full swing. The right education is needed to ensure sustained development of education. The sections that follow describe the evidence-based scenarios for improved policies and practices in Cambodian education, highlighting both short-term improvement (at the same time reflecting the low hanging fruit) and long-term change linked to existing policies, programs or actions.

6.2.1. Low hanging fruit: policies that do not cost much but can have impact

Education development is a complex journey, requiring not only the financial investment but also the commitment to the right education (Schleicher, 2018). Evidence from PISA 2015 suggests that the right education likely compensate for the low investment in education. Vietnam provides this prime example, with lower spending per student but outperforming many OECD countries in science; South Korea spends well below the OECD average per student but becomes the highest-performing OECD country in mathematics. It also reveals that social disadvantage is not completely a barrier to learning. In Shanghai, 10% most disadvantaged 15-year-olds perform better in math than the 10% most privileged students in the United States and several European countries. This evidence provides an inspiration for low-and middle-income countries to consider policies that do not cost much but still can have impact while finding ways to increase the budget in education to the optimal level that fosters sustained growth and development.

Lessons from Cambodia's experience in PISA-D suggest that some existing education policies in Cambodia merely require further reinforcements to increase student learning. With some foundations for success already in place, extra actions from schools can bring about substantial changes in student learning at the least expense of finance. The most obvious action considered as a low-hanging fruit is to ***reduce grade repetition*** particularly

among boys and socio-economically disadvantaged students. Most of student achievement studies have shown that grade repetition is not helpful but even harmful to student learning (OECD, 2013; 2016b). Grade repetition reflects the fact that students are not well on track or less academically prepared for the next grade. Various evidence from PISA 2015 shows that grade repeaters are more likely to hold negative attitudes and behaviors towards school and to drop out of school and that any positive short-term effects of grade repetition appear to decline over time. High-performing countries in science in PISA 2015 are often those with the education system that has the minimal grade repetition rate (e.g., Japan, Chinese Taipei, Vietnam, Finland, Estonia, Singapore and Canada).

Grade repetition is a costly policy as it generally requires greater expenditure on an additional year of education for students and delays students' entry into the labor market. Also, it only reinforces inequity in education. Across education systems, especially in low-income countries, grade repetition generally leads to an increase in class size and thus has an undesired effect on the quality of teaching and learning. From an economic point of view, grade repetition negatively affects the internal efficiency of the use of educational resources. If resources spent on repeating a grade were instead spent on enrolling new students into school without reducing the quality of education, annual GDP globally would increase by 0.37% (UNESCO, 2010). The growth rate was in particular larger in low-income countries (UNESCO, 2012).

In Cambodia, both national assessments of student achievement in grades 3, 6 and 8 (MoEYS, 2016; 2017; 2018) and PISA-D results show that grade repetition is associated with lower levels of academic performances. With about one in three students reporting to have repeated a grade at least once in primary or secondary education, addressing the grade repetition crisis is one of the key strategies to improve student learning and to reduce the gaps in the quality of education.

Avoiding policies that are costly and have little change in student learning is critical in the educational contexts where financial resources are still limited. In the current context of Cambodia, reducing grade repetition can benefit the system both academically and financially. The current promotion assessment in Cambodia in which students can sit the second semester exam is a right response to that challenge; yet without remedial classes or tutoring during or before the semester break, it does not add any academic value to those who lag behind, the consequence of which is that the system will continue to promote the academically underprepared students to face daunting challenges in the higher grade. Grade repeaters are often, if not always, at high risk of underperforming or dropping out of school. Grade repetition is more harmful than helpful to students when academic and perhaps psychological support is not firmly in place. To improve student learning, Cambodia, therefore, needs, among other things, to revisit its existing measures or to rethink better approaches to reduce grade repetition.

To do so, providing extra teaching time for those who fall behind and adapting teaching to their needs so that they can catch up with their peers (providing extra practices if not extra teaching time) can be a timely and right response given the fact that in Cambodia the investment in education is still very low even compared to that in the PISA-D countries. Creating extra classes, peer learning activities or study clubs led by teachers or outstanding students to provide early support to academically poor students is more cost-effective than giving them a second chance to repeat a grade (UNESCO, 2012). The alternative approach is to provide extra support to repeated students in the form of increasing extra practices. This, however, requires a strong push from the school principals and from those directly working with schools such as teachers and parents. School principals and teachers particularly need to monitor slow and low-ability learners (who are often, if not always, the late entry students) every month to ensure they can well match other students in the class. Ensuring students do not start school late or are on track is also a highly preferable and cost-effective policy to reduce grade repetition. France experience in PISA shows that grade repetition does no justice to students. The reduction of grade repetition with strong support

from school helps students' confidence and improves their performance in PISA accordingly (OECD, 2016b).

6.2.2. *Quick wins: impact in the short run*

Some other interventions can be also drawn from the current results. In fact, Cambodia has a long journey to bring education on the international par. To do so, long-term investment in finance, human and school material resources is needed; yet at the same time some immediate solutions can make a difference in student learning. What can be foreseen as the quick wins is to **ensure quality learning time** by preventing tardiness through strengthening school discipline and by increasing learning opportunities at school and home through supplementing students with extra competency-based practices—homework or routine tasks in the classroom.

- **Strengthen school discipline.** As the results reflect, absenteeism and tardiness from teachers and students have harmful effects on the amount of instructional time, let alone its quality. This issue can be addressed when *a strong school discipline is in place*. Without strict measures at school, schooling does not translate into learning. Achieving the desired learning outcomes per the curriculum standards or top performance in PISA is rather a myth. The positive effect of school discipline on student performance is clearly evident in many PISA countries such as Vietnam, Korea, Japan and B-S-J-G (China) (OECD, 2013; OECD, 2016a). *Cambodia needs to build a strong school management system which enables the school principal and teachers to monitor student attendance more closely*. Making student learning assessment, be it through monthly testing or short formative tasks such as review questions or quizzes, a serious classroom activity can also encourage students to be in school and to be committed to learning and this is possible given that students have already reported a strong classroom disciplinary climate.
- **Make learning visible in the classroom.** Schools need to find a game changer to change the learning culture of students. *Abolishing cheating in any testing or assessment process in the classroom is what truly matters*. Evidence from the grade 12 examination led by the current minister of education proves this is possible by cultivating the belief that there is no substitute for learning without realizing learning from one's self. The results from PISA-D about a higher sense of belonging and positive values towards school and learning cast by students indicate that this is the dividend to ensure that schooling is not only a luxury but also can translates into learning.

Previous PISA results consistently show that when learning becomes a serious goal in schooling, it can compensate for the so-called passive teaching or even social disadvantage. East Asian countries such as Beijing-Shanghai-Jiangsu-Guangdong-Macao-Hong Kong (China), Chinese Taipei, South Korea and Japan are among top-performers in science in PISA 2015. The deep-rooted learning culture, perhaps derived from Confucius school of thoughts, plays a key role in their success. Many argue that resources are key to their success. But evidence shows that it is not about how much resources are spent but about how those resources are used (OECD, 2013; 2016a; 2016b). U.S., UK, Australia and the other OECD countries, for example, spend significantly more but lag behind South Korea, Finland and even New Zealand in reading performance. Building a strong learning culture, in fact, makes a difference.

- **Emphasize classroom assessment not only for monitoring progress but also for shaping what is being taught.** The PISA-D results show that about 90% of 15-year-old students in Cambodia have a low proficiency level, suggesting what happens in the classroom needs serious reinforcements. *One approach is to monitor and shape what*

and how students learn. The current five-year Secondary Education Improvement Project 2017-2022 (SEIP) led by the Ministry of Education, Youth and Sport (MoEYS) is a timely response to this issue, having teachers develop the monthly and semesterly assessment templates and align their teaching practices based on contents and skills measured in them. In addition to this, promoting performance- and competency-based classroom assessments is what truly matters in the long run. Sustained practices of the right classroom assessment not only shape effective teaching but also the desired learning process, i.e., what and how students learn.

As the new K-12 curriculum for Cambodia has just been rolled out, aligning the classroom assessment templates to the intended learning outcomes or competencies in the new curriculum will bolster the right competency-based practices in the classroom. The templates need to encompass a wide range of knowledge and skills and expose students to different tasks, for example, capturing concepts and skills through close-ended questions (e.g., defining key terms, matching or true/false statements) and constructed response questions (e.g., comprehension questions, compare/contrast, interpretation and reasoning, problem-solving and real-life applications). Should the cheating-free environment be in place, the approach will have immediate impact on teaching and learning.

- ***Expose students to learning beyond limits.*** As reflected in Chapter 4, Cambodia has the lowest spending per student and instructional time. Clearly, learning opportunity is limited. More than that, there is also a relatively large amount of instructional time loss. Having a longer school day is a response to this challenge, but requires more investment, which is a challenge for a country investing less than 3% of its GDP in education. Creating extra learning opportunities through increasing learning tasks per lesson/chapter and align them with the competency skills is an alternative solution. This can be done in the form of developing workbooks, extra creative tasks for students to practice in the class and at home, and the resource banks for teachers and students from the early grades. All need to be aligned with the competency-based curriculum or PISA test items. The successful experience of Asian countries such as South Korea, Hong Kong, China Macao Vietnam and Taiwan through supplementary education indicates that this can be done, particularly with a strong engagement of parents and the community in the learning process of the students both at school and home (OECD, 2013; 2014).

6.2.3. Must haves: impact in the long run

Considering the low performance of 15-years-old students, education development has to be supported with a clear vision and planned actions to realize a long-term impact. Drawn from PISA-D results for Cambodia, some policies and priority actions merit further attention and investment. Below are the must-haves:

- ***Strengthen “school standards”*** and use this as a benchmark for decisions on the allocation of budgets and human resources, especially to identify and support disadvantaged schools. The implications of this intervention can be seen as follows:
 - ***Make school a place for learning.*** PISA-D results reveal that schools in Cambodia are not well-resourced, reflecting a lack of a foundation for success. In fact, the current Child-Friendly School (CFS) policy has an important implication on “*make school a place for learning*” through the development of school standards, with some schools relatively successful learning from it. The

CFS policy⁵ is a key initiative to promote school standards under its framework (inclusiveness, effective teaching and learning, health, safety and child protection, gender responsiveness and support system). Meanwhile, Cambodia has also implemented the New Generation School (NGS)⁶ policy as a new model to promote school environment, STEM education and independent learning. Despite differing in approaches, the premise of these two models is meant to develop “*a school standard*” for the future education. In principle, this move is on the right track in promoting teaching and learning in the 21st century. However, this is a “*must-have*” for all, not for some. While having schools under the NGS model is a bonus for both urban and rural regions, it seems unlikely for the latter considering that it requires a significant investment from the government. Therefore, creating an average school standard for the rural schools and networking them with district- or province-based NGS can be a win-win solution. At the same time, it is important that the scale-up plan to transform the average schools into the NGS-like schools be considered to prevent the widening gap in inequality.

- ***Ensure schools are self-driving.*** School is very important in maintaining the delivery of the education intended in the curriculum. However, it appears that school has yet to fulfil its function. With clear evidence of absenteeism and tardiness among students and teachers, low attention to professional development for teachers and no dedicated solution to grade repetition, schools are not always places of learning. A strong accountability system is necessary within that problematic context. The current Leadership Upgrading Program (LUP) under SEIP to *promote school-based management is a timely response to assist school principals in developing the management and self-assessment system.* Schools need to be self-driving in the midst of resource scarcity. But this requires a strong monitoring and mentoring system at the subnational levels.
- ***Ensure schools benefit from school networking.*** Schools can learn from schools, and this model still is relevant (Shaeffer & Heng, 2016). Evidence suggests that the gaps in school academic profile can be reduced when good practices are mutually and constantly shared. Cambodian experience from a child-friendly school policy evaluation tells that school administration and management capacity has improved to some extent from the monthly meeting organized by the school cluster, which is a network of schools within their district proximity. Meanwhile, this model benefits teachers when teaching demonstration and experience is constantly shared. However, more reinforcements are needed. The District Training and Monitoring Team (DTMT) is a close body to school, playing an important monitoring and training role. Reinforcing this team to work with the school cluster to mentor schools and teachers on developing creative tasks and delivering good practices in teaching can be a response to the low quality of teaching.

The current project-based structure under SEIP has significant added values to school in developing the school-based management capacity and in ensuring its on-track implementation through the mentoring support from 30 national core trainers and the technical advisors. However, scaling-up nationwide is an issue, requiring a different and less costly structure. The challenge also lies on how to capitalize on the existing school monitoring and training system led by districts, the provincial office of education and the national center to build accountable schools.

⁵ See “Child-Friendly School Policy” in Cambodia

⁶ See “New Generation School Policy” in Cambodia

UNESCO's Global Monitoring Report 2018 stresses that monitoring is key to school development and education quality improvement (UNESCO, 2017); yet monitoring is not a substitute for training or mentoring in countries with poor education systems. Schools are self-driving when they are mentored to do so. And it can be done through *school networking or school-based mentoring*.

- ***Improve universal basic skills among students by investing more in basic education (K-9)***

The low performance across all the PISA-D countries seems to cast the same concern about what is right in education. In fact, it is not the grades 7-10 curriculum that matters. PISA-D results suggest evidence that poor basic skills (functional literacy such as ability to read and reflect in reading a text or ability to explain a mathematical theory and solve mathematical exercises associated with everyday life.) in the lower grades is what truly matters to the overall student performance in secondary education since PISA-D measures the cognitive skills students develop across ages.

The dedicated time to literacy and numeracy development for students is, therefore, needed to prepare them to reach their full potential in achieving the universal basic skills; increasing instructional hours or expanding school days to promote practices of cognitive skills (often through a competency-based curriculum) for the low grades is a long-term solution. The current Early Grade Reading Assessment (EGRA) and Early Grade Mathematic Assessment (EGMA) in Cambodia can be a foundation for increasing universal basic skills for students, yet they have to be concentrated in teaching and learning and be made system-wide with clear and committed goals/benchmarks.

To achieve this goal, the ministry needs to focus on incorporating a concept- or a competency-based teaching and learning modality into the textbook, and aligning them with classroom assessment. This practice will support the implementation of the new curriculum and develop competencies for Cambodian students to prepare better for international student assessments such as PISA.

The investment in early childhood and basic education (K-9) plays a key role in achieving universal basic skills and in maintaining economic growth. The projection study by OECD 2015 shows that increasing average achievement in current students by 25 PISA score-points has a uniform effect on all countries' GDP by 30% over the next 80 years if there is a 100% enrollment (Hanushek & Woessmann, 2015). Although this estimate can vary across economies due to differences in student enrollment rates, previous evidence consistently shows that increasing the quality of school has a large impact on economic gains.

To do so, Cambodia needs, among other things, better resourced schools and effective teacher training and allocations. But given the current small share of GDP (less than 3%) committed to education compared to that of Thailand and Vietnam (about 6% and 7%, respectively), improving universal basic skills is a real challenge. In the context of Education Sustainable Development Goal (SDG), developing countries need to raise their total investment in education to at least 6% of GDP between now and 2030 in order to achieve the Education SDG.

- ***Improve the quality of instruction*** by strengthening the competency-based curriculum in teacher education

Policy makers, teachers and parents often think that school is very important to student learning. Having a well-resourced school is a precondition to schooling.

There is no denial. But evidence from PISA 2012 and 2015 suggests that better teachers can compensate for the school disadvantage. In top-performing PISA countries, investing in the quality of teachers makes a different impact on student performance.

The road to success in Cambodian education in the long run relies on improved teacher preparation and development, especially for teachers teaching in rural/disadvantaged regions. Given the vast majority of teachers have lower education and training than even those in PISA-D countries, it is important that their education and training merits further attention. In fact, teacher education in Cambodia currently is on the right move in that all teachers are to have at least a bachelor's degree to teach at the K-12 education level. The Teacher Policy Action Plan developed in 2015 sets consecutive goals to upgrade teacher education and lays out a new platform through which teachers are trained (MoEYS, 2015). Nonetheless, a more committed plan is needed to accommodate the demand for qualified teachers. Currently, only two Teacher Education Colleges (TEC) and an institute (National Institute of Education) offer that degree level, resulting in the gap between the supply and demand. In addition, teacher education and training should align with what entails in teaching universal basic skills rather than with the subject contents and pedagogies. Teacher education and training need to focus more on concept- or competency-based teaching to emphasize the development of knowledge, skills and attitudes among students.

Many lessons from successful countries experiencing the tradeoff between having more teachers as a response to reducing class size and good teachers by investing in competitive salaries, ongoing professional development and a balance in working time show that investment in the latter is what matters the most (Schleicher, 2018). Within that, the incentive system is needed if teachers perform above par (based on students' learning outcomes). South Korea, Finland and lately Vietnam benefits a lot from developing cadres of good and dynamic teachers and from deploying them to the more disadvantaged schools.

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Annex: Sample test items

Reading items

Moreland library

The Moreland Library System gives new library members a bookmark showing its Hours of Opening. Refer to the bookmark to answer the questions which follow.

	HOURS OF OPENING				
	Brunswick Library	Campbell Turnbull Library	Coburg Library	Fawkner Library	Glenroy Library
Sunday	1pm-5pm	Closed	2pm-5pm	Closed	2pm-5pm
Monday	11am-8pm	11am-5.30pm	1pm-8pm	11am-5.30pm	10am-5.30pm
Tuesday	11am-8pm	11am-8pm	11am-8pm	11am-8pm	10am-8pm
Wednesday	11am-8pm	11am-5pm	10am-8pm	11am-5pm	10am-8pm
Thursday	11am-8pm	11am-5.30pm	10am-8pm	11am-5.30pm	10am-8pm
Friday	11am-5pm	11am-5pm	10am-8pm	11am-5pm	10am-5.30pm
Saturday	10am-1pm	10am-1pm	9am-1pm	10am-1pm	9am-1pm

Question 1: MORELAND LIBRARY

What time does the Fawkner Library close on Wednesday?

.....
 Situation: Public
 Text format: Non-continuous
 Text type: Instruction
 Aspect: Access and retrieve: Retrieve information
 Question format: Closed constructed response
 Difficulty: Level 1b

This item assesses basic access and retrieve tasks in a simple non-continuous text. Question 1 requires accessing the information directly from a row in the table which is likely to be Level 1b.

QUESTION 2: MORELAND LIBRARY

Which library is still open at 6 p.m. on Friday evening?

- A. Brunswick Library
- B. Campbell Turnbull Library
- C. Coburg Library
- D. Fawkner Library
- E. Glenroy Library

Situation: Public
 Text format: Non-continuous
 Text type: Instruction
 Aspect: Access and retrieve: Retrieve information
 Question format: Multiple choice
 Difficulty: Level 1a or Level 2

Question 2 requires combining multiple criteria in order to access the correct information which is more likely Level 1a or Level 2.

Student opinions

There are so many people out there dying from hunger and disease, yet we are more concerned about future advancements. We are leaving these people behind as we attempt to forget and move on. Billions of dollars are poured into space research by large companies each year. If the money spent on space exploration was used to benefit the needy and not the greedy, the suffering of millions of people could be alleviated.

Ana

The challenge of exploring space is a source of inspiration for many people. For thousands of years we have been dreaming of the heavens, longing to reach out and touch the stars, longing to communicate with something we only imagine could exist, longing to know... Are we alone?

Space exploration is a metaphor for learning, and learning is what drives our world. While realists continue to remind us of our current problems, dreamers stretch our minds. It is the dreamers' visions, hopes and desires that will lead us into the future.

Beatrice

We ruin rain forests because there is oil under them, put mines in sacred ground for the sake of uranium. Would we also ruin another planet for the sake of an answer to problems of our own making? Of course!

Space exploration strengthens the dangerous belief that human problems can be solved by our ever-increasing domination of the environment. Human beings will continue to feel at liberty to abuse natural resources like rivers and rain forests if we know there is always another planet around the corner waiting to be exploited.

We have done enough damage on Earth. We should leave outer space alone.

Dieter

The earth's resources are quickly dying out. The earth's population is increasing at a dramatic rate. Life cannot be sustained if we continue to live in such a way. Pollution has caused a hole in the ozone layer. Fertile lands are running out and soon our food resources will diminish. Already there are cases of famine and disease caused by over-population.

Space is a vast empty region which we can use to our benefit. By supporting exploration into space, one day we may find a planet that we can live on. At the moment this seems unimaginable, but the notion of space travel was once thought of as impossible. Discontinuing space exploration in favour of solving immediate problems is a very narrow-minded and short-term view. We must learn to think not only for this generation but for the generations to come.

Felix

To ignore what the exploration of space has to offer would be a great loss to all mankind. The possibilities of gaining a greater understanding of the universe and its beginnings are too valuable to waste. The study of other celestial bodies has already increased our understanding of our environmental problems and the possible direction Earth could be heading in if we don't learn to manage our activities.

There are also indirect benefits of research into space travel. The creation of laser technology and other medical treatments can be attributed to space research. Substances such as teflon have come out of mankind's quest to travel into space. Thus new technologies created for space research can have immediate benefits for everyone.

Kate

The passages on the previous two pages were written by students in their final year of school. Refer to them to answer the questions which follow.

Question 1: STUDENT OPINIONS

Which of the following questions do the students seem to be responding to?

- A What is the major problem facing the world today?
- A Are you in favour of space exploration?
- B Do you believe in life beyond our planet?
- C What recent advances have there been in space research?

Situation: Educational
 Text format: Multiple
 Text type: Argumentation
 Aspect: Integrate and interpret – Form a broad understanding
 Question format: Multiple choice
 Difficulty: Level 3

Question 3: STUDENT OPINIONS

Which one of the writers **most directly** contradicts Felix's argument?

- A Dieter.
- B Ana.
- C Kate.
- D Beatrice.

Situation: Educational
 Text format: Multiple
 Text type: Argumentation
 Aspect: Integrate and interpret – Develop an interpretation
 Question format: Multiple choice
 Difficulty: Level 4

Question 6: STUDENT OPINIONS

Thinking about the main ideas presented by the five students, which student do you agree with most strongly?

Student's name:

Using your own words, explain your choice by referring to your own opinion **and** the main ideas presented by the student.

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Situation: Educational

Text format: Multiple

Text type: Argumentation

Aspect: Reflect and evaluate: Reflect on and evaluate the content of a text

Question format: Open constructed response

Difficulty: Level 3

Question 7: STUDENT OPINIONS

Some statements are matters of opinion, based on the ideas and values of the writer. Some statements are matters of fact, which may be tested objectively and are either correct or incorrect.

Draw a circle around “matter of opinion” or “matter of fact” next to each of the quotations from the students’ writing listed below.

The first one has been done for you.

Quotation from students’ writing	Matter of opinion or matter of fact?
“Pollution has caused a hole in the ozone layer.” (Felix)	Matter of opinion / Matter of fact
“Billions of dollars are poured into space research by large companies each year.” (Ana)	Matter of opinion / Matter of fact
“Space exploration strengthens the dangerous belief that human problems can be solved by our ever-increasing domination of the environment.” (Dieter)	Matter of opinion / Matter of fact
“Discontinuing space exploration in favour of solving immediate problems is a very narrow-minded and short-term view.” (Felix)	Matter of opinion / Matter of fact

Situation: Educational
Text format: Multiple
Text type: Argumentation
Aspect: Reflect and evaluate: Reflect on and evaluate the content of a text
Question format: Complex multiple choice
Difficulty: Level 2

Mathematic items

Exchange rate

Mei-Ling from Singapore was preparing to go to South Africa for 3 months as an exchange student. She needed to change some Singapore dollars (SGD) into South African rand (ZAR).

QUESTION 1: EXCHANGE RATE

Mei-Ling found out that the exchange rate between Singapore dollars and South African rand was:

1 SGD = 4.2 ZAR

Mei-Ling changed 3000 Singapore dollars into South African rand at this exchange rate.

How much money in South African rand did Mei-Ling get?

Answer:

For this item, the student must make a decision of which operation to use and then make a calculation. This aligns with proficiency Level 1a.

QUESTION 2: EXCHANGE RATE

On returning to Singapore after 3 months, Mei-Ling had 3 900 ZAR left. She changed this back to Singapore dollars, noting that the exchange rate had changed to:

1 SGD = 4.0 ZAR

How much money in Singapore dollars did Mei-Ling get?

Answer:

Answering this question correctly corresponds to a difficulty of 439 score points (Level 2) on the PISA mathematics scale. To answer the question correctly students have to draw on skills from the reproduction competency cluster.

QUESTION 3: EXCHANGE RATE

During these 3 months the exchange rate had changed from 4.2 to 4.0 ZAR per SGD. Was it in Mei-Ling's favour that the exchange rate now was 4.0 ZAR instead of 4.2 ZAR, when she changed her South African rand back to Singapore dollars? Give an explanation to support your answer.

Answering this question correctly corresponds to a difficulty of 586 score points (Level 4) on the PISA mathematics scale. To answer the question correctly students have to draw on skills from the reflection competency cluster.

Science items

Physical exercise

Regular but moderate exercise is good for our health.



Question 1: PHYSICAL EXERCISE

What are the advantages of regular physical exercise? Circle “Yes” or “No” for each statement.

Is this an advantage of regular physical exercise?	Yes or No?
Physical exercise helps prevent heart and circulation illnesses.	Yes / No
Physical exercise leads to a healthy diet.	Yes / No
Physical exercise helps to avoid becoming overweight.	Yes / No

Answering this question correctly corresponds to a difficulty of 545 score points (Level 3) on the PISA science scale. The question assesses students’ competencies in explaining phenomena scientifically.

Question 2: PHYSICAL EXERCISE

What happens when muscles are exercised? Circle “Yes” or “No” for each statement.

Does this happen when muscles are exercised?	Yes or No?
Muscles get an increased flow of blood.	Yes / No
Fats are formed in the muscles.	Yes / No

Answering this question correctly corresponds to a difficulty of 386 score points (Level 1a) on the PISA science scale. This question assesses students’ competencies in explaining phenomena scientifically.

Question 3: PHYSICAL EXERCISE

Why do you have to breathe more heavily when you’re doing physical exercise than when your body is resting?

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Answering this question correctly corresponds to a difficulty of 583 score points (Level 4) on the PISA science scale. This question assesses students' competencies in explaining phenomena scientifically.

Education in Cambodia

Findings from Cambodia's experience in PISA for Development

Cambodia's participation in the Programme for International Student Assessment for Development (PISA-D) is one of remarkable growth and achievement in its education system. Over the past ten years, efforts to develop a comprehensive student assessment system have enabled the country to gauge student learning and to formulate policies for education improvement in terms of both quality and equity. Nonetheless, student assessment in an international perspective plays a key role in monitoring student learning progress and achievement in the midst of globalization and the pressing need of 21st century skills.

This report is a result of collaborative work between Cambodia's Ministry of Education, Youth and Sport and the OECD, aiming to identify and address education issues at policy and school levels in Cambodia. It examines multifaceted factors that affect students' educational attainment, academic performance, health and well-being, and attitudes towards school and learning and suggests specific policy options that directly foster student learning. The report also provides an in-depth analysis of the experience of other high-performing countries, ASEAN countries and the PISA-D countries.

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