PISA 2022 National Report

Mongolia

GOVERNMENT OF MONGOLIA

MINISTRY OF EDUCATION AND SCIENCE

OECD

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Acronyms

EEC	Education Evaluation Center
ECE	Early Childhood Education
ESMTDP	The Education Sector Mid-Term Development Plan
ESCS	Economic, Social, and Cultural Status
GDP	Gross Domestic Product
ICT	Information and Communication Technology
ISCO	International Standard Classification of Occupations
OECD	Organisation for Economic Co-operation and Development
PISA	Program for International Student Assessment
PPS	Probability Proportional to Size
SDG	Sustainable Development Goal

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Acknowledgements

We would like to express our sincerest gratitude to all the pupils, teachers and principals who took part in PISA 2022. We are very grateful for their efforts and cooperation in administration of the assessment to gather the valuable PISA data. Thanks, are also due to a very wide array of OECD-PISA team, namely Miyako Ikeda, Lucia Tramonte, Gracelyn Lee for their valued contributions of subject expertise, statistical analyses, and communications. Moreover, we thank all the support and guidance by World Bank team namely Salman Asim, Syedah Aroob Iqbal, Jaime Fernandez and others who supported for reviewing and shaping this report up. We are grateful to all staffs of the Education Evaluation Center, Mongolia whose hard work and dedication contributed towards successful implementation of PISA 2022.

Foreword

One of the measures for the education quality of a country is the skill level of its people. In Mongolia, the quality of education has been a priority for education for last years; however, it is widely criticized that education should not be emphasizing to prepare children for the competition or subject Olympiads, rather to nurture them be prepared for the life. Thus, it is publicly agreed that learners' creativity and skills to apply what they have learned in school in life context for uncertain future must be priority objectives and outcomes expected in the education quality.

Under the education reform of Mongolia, a package law is amended and passed the Parliament in July 2023. As present is the beginning of the amended law implementation, it is a great opportunity for us to understand actual skill level of 15-year-old learners, who completed compulsory education, comparing to their peers across 81 countries participated in PISA 2022 and to reveal factors associated with their performance.

When Mongolia submitted the first time ever request to participate in PISA, we intended to identify 15-year-old students not just for what they know, but for what they can do with what they know, PISA goes beyond assessing whether students can reproduce what they have learned in school, and compare the results with students across OECD countries. By the results in this report, we achieved the intention; furthermore, in cooperation with international experts and analysts, identified a compass and orientation for curriculum, textbook, teacher and school reform based on evidence extracted from the assessment data. However, I would like to note that results reflected in the report is analyzed based on the common indicators used in international report; therefore, I highly recommend education experts, researchers, and teachers to dive deep in the analysis using publicly available PISA 2022 database.

If all we do is teach our children what we know, they might remember enough to follow in our footsteps; but if we teach them how to learn, they can go and live anywhere they want using skills. Therefore, we emphasize not only knowledge but also skills to apply the knowledge and create new knowledge.

I wish you all the best and success!

ENKH-AMGALAN LUVSANTSEREN

Minister of Education and Science, Mongolia

Executive Summary

The government of Mongolia aims to develop the economy and join the ranks of upper-middle-income countries and has laid Mongolia's Vision 2050 and New Recovery Plan 2021–2050 to guide the economic reforms in the country. The success of these economic reforms will depend on the quality of human capital in the country. Mongolia boasts high access to education, with expected years of schooling similar to high-income countries. The expected years of schooling is 13.2 years, which exceeds the average for lower-middle-income countries (10.4 years) and even marginally exceeds that for high-income countries (13.1 years). However, before today, there was limited information on the quality of education in the country compared to global benchmarks.

To understand the quality of education in the country better, Mongolia participated in the Program for International Student Assessment (PISA) for the first time in 2022. Launched in 2000 and conducted every three years by the Organisation for Economic Co-operation and Development (OECD), PISA measures the ability of 15-year-olds to use their reading, mathematics, and science knowledge and skills to meet real-life challenges. A total of 81 countries and economies participated in PISA 2022. Between April 5 and May 15, 2022, a two-hour computer-based test in reading, mathematics, science, and creative thinking was conducted for 15-year-old students in grades 7–12. A total of 7,276 students across Mongolia participated in the test and responded to accompanying survey questionnaires.. These students represented different regions, locations (city/aimag/soums), and school types (public/private, general/vocational) in the country. This first-time participation in PISA evaluates the quality of education in Mongolia compared to OECD and other participating countries, identifies key factors associated with student outcomes, and aims to drive education reforms based on evidence. This participation was made possible through financial support from the World Bank as well as technical support from the OECD.

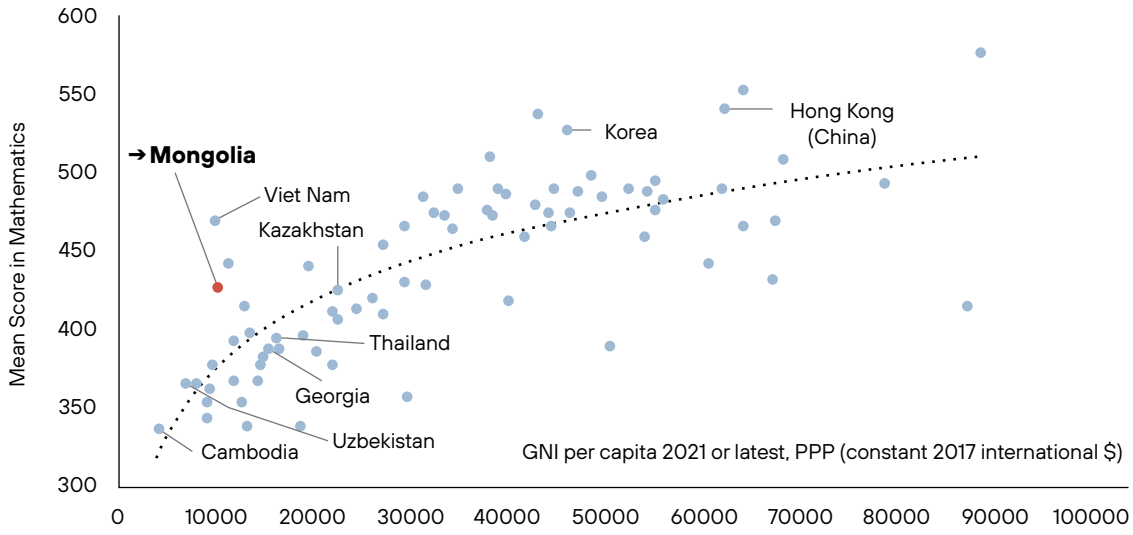
PISA 2022 assesses reading, science, and, as its main subject, mathematics. Being proficient in mathematics today goes beyond the mere reproduction of routine mathematical procedures. Rather, PISA considers a mathematically proficient person as someone who can reason mathematically to solve complex real-life problems and find solutions by formulating, employing, and interpreting mathematics.

How do students in Mongolia perform compared to other countries?

In mathematics

- Figure ES1 shows that 15-year-old students in Mongolia performed substantially better than was expected, given the income level of the country. Among the 81 participating countries, Mongolia stood at 47 with a score of 425, with rank 1 representing the top performer in PISA 2022. Students in Mongolia scored significantly higher than some comparator countries, such as Thailand, Georgia, Uzbekistan, and Cambodia, and performed comparable to the benchmark country of Kazakhstan. However, there is still substantial room for improvement as 15-year-old students in Mongolia perform significantly behind the average of their peers in OECD countries (472) and Asiacountries (451) participating in PISA.

Figure ES.1: 15-year-old students in Mongolia perform substantially higher in PISA compared to expectations, given the country's income level



Source: PISA 2022 Database.
GNI = Gross National Income.

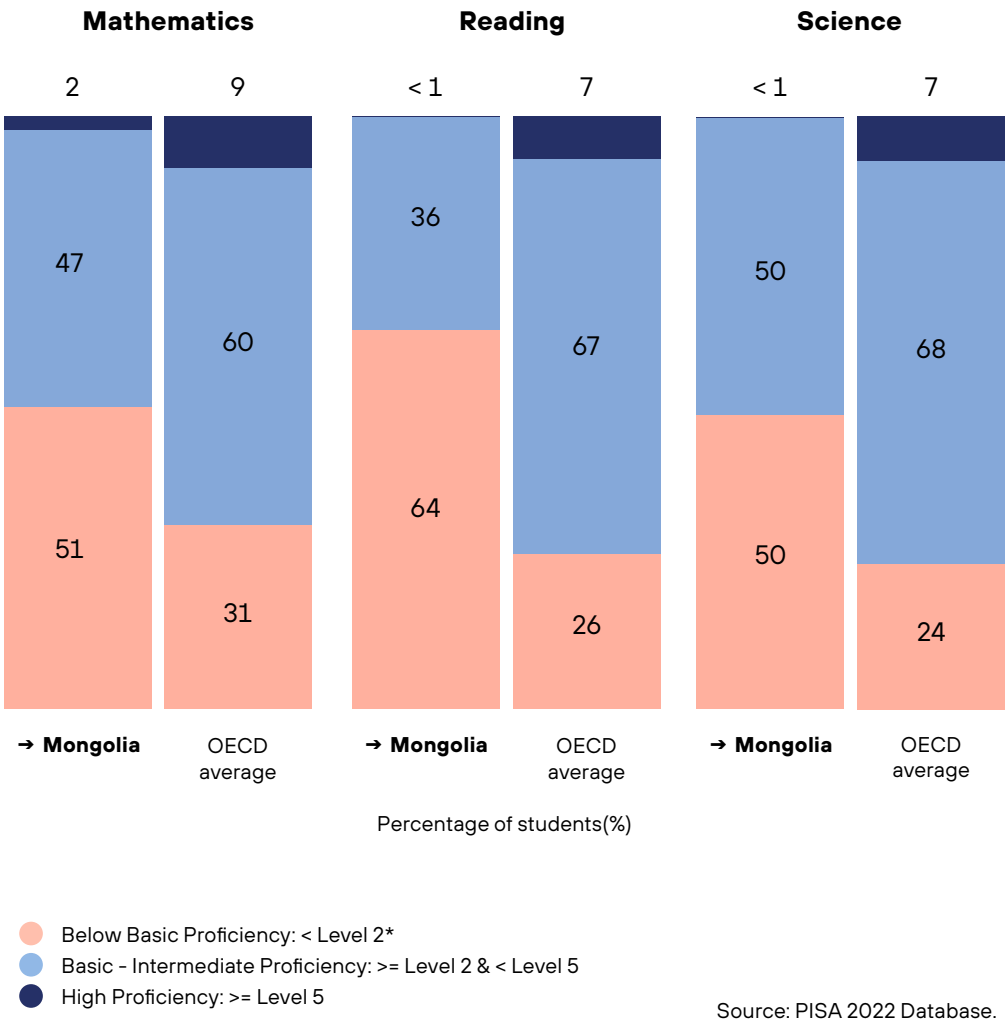
- An average of 49 percent of students are at least basically proficient in mathematics in Mongolia. This share, though higher than comparator countries, is much lowe than the average of OECD countries (69 percent) and Asian countries (55 percent). This means only around half of 15-year-old students in Mongolia are beginning to demonstrate the ability and initiative to use mathematics in simple real-life situations.

- Only 2 percent of students in Mongolia attained Levels 5 or 6 proficiency, compared to the OECD average of 9 percent and Asian average of 11 percent.

In reading and science

- With a score of 378 in reading and 412 in science, Mongolia performed similarly to Thailand, significantly better than Cambodia, Uzbekistan, and Georgia but significantly worse than Kazakhstan and Viet Nam. These scores are, however, significantly lower as compared to the OECD (476 in reading and 485 in science) and Asian (427 in reading and 449 in science) averages.
- In Mongolia, students achieving basic proficiency is one out of three in reading and one out of two in science. These results are much lower than the average of OECD countries, where three out of four students have achieved basic proficiency in both reading and science.
- In Mongolia, almost no students attained high performance in reading and science, unlike OECD countries, where an average of 7 percent of students attained the highest proficiency levels of 5 or 6 in reading and science, respectively. In 13 countries/economies, more than 10 percent of students are top performers in reading. In 14 countries/economies, more than 10 percent of students are top performers in science.

Figure ES.2: PISA 2022 Students' proficiency in Mongolia and OECD



Source: PISA 2022 Database.

Student well-being

- 15-year-olds in Mongolia are overall satisfied with their lives and report significantly greater life satisfaction than their peers in OECD and Asian countries.

- However, a slightly higher share of students in Mongolia report being frequently bullied compared to their peers in OECD countries. Furthermore, there are some concerns with students' sense of safety. In Mongolia, 22 percent of students reported not feeling safe on their way to school (OECD average: 8 percent); 12 percent of students reported not feeling safe in their classrooms at school (OECD average: 7 percent); 24 percent of students reported not feeling safe at other places at school (e.g., hallway, cafeteria, restroom) (OECD average: 10 percent).

Equity in education

- Socioeconomically advantaged students scored 94 points more in mathematics than disadvantaged students, on average, in Mongolia. This socioeconomic achievement gap is comparable to those observed across OECD countries (93 score points), but lower than Korea and higher than the remaining benchmark countries.

- Some 9 percent of disadvantaged students in Mongolia were able to score in the top quarter of mathematics performance. These students can be considered academically resilient because, despite their socioeconomic disadvantage, they have attained educational excellence compared with students in their own country. On average, across OECD countries, 10 percent of disadvantaged students scored in the top quarter of mathematics performance in their own countries.

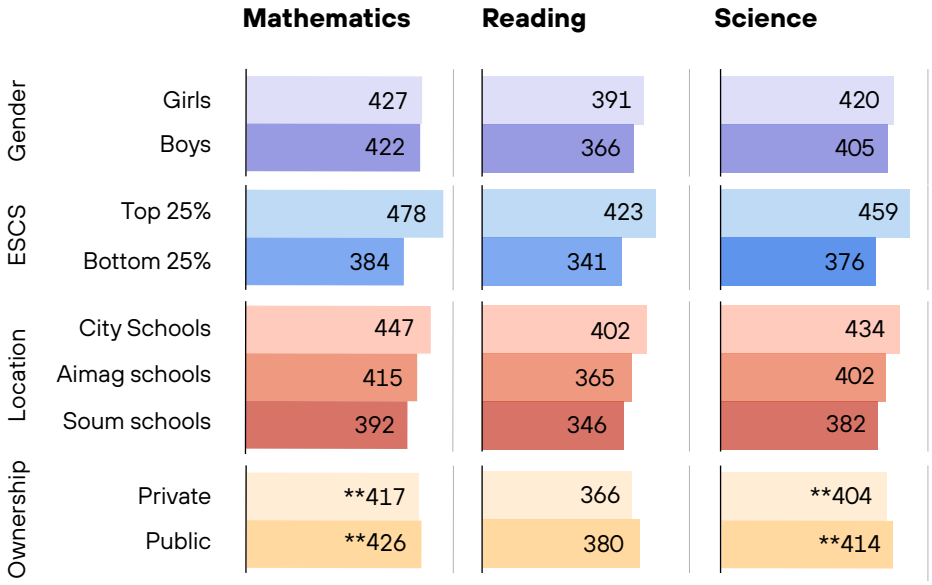
- Boys in Mongolia underperformed compared to girls in all three subjects and in reading, lagged by more than one year of schooling (25 score points). Though the gender gap in reading is comparable to the OECD average, the boys outperformed girls in OECD countries by 9 score points and performed similarly to girls in science.

- Students in city schools outperformed students in aimags and students in aimags outperformed students in soums in all three subjects with students in soums lagging cities by over two years of learning. However, the differences are driven primarily by the differential socioeconomic status of students across cities, aimags, and soums.

- While students in private schools performed better than students in public schools by more than 10 score points in each of the three domains of mathematics, reading, and science, these private-public gaps in mathematics and science are not statistically significant after accounting for socioeconomic status, and students in public schools show significantly higher performance than their peers in private schools in reading.

- Pre-primary education can help in closing socioeconomic achievement gaps, and similar to results across OECD, students in Mongolia who had attended pre-primary for at least a year performed better than their peers who did not. However, a higher share of 15-year-old students (19 percent) in Mongolia have either not attended pre-primary or attended for less than a year, compared to OECD and Asian averages (6 percent and 14 percent, respectively.)

Figure ES.3: Equity Profile in Mongolia schools



20 points in PISA scale ~ 1 year of schooling.

* Scores for students in private and public schools scores are presented after accounted for ESCS.
** Statistically not significant differences.
ESCS: Economic, Social and Cultural Status.

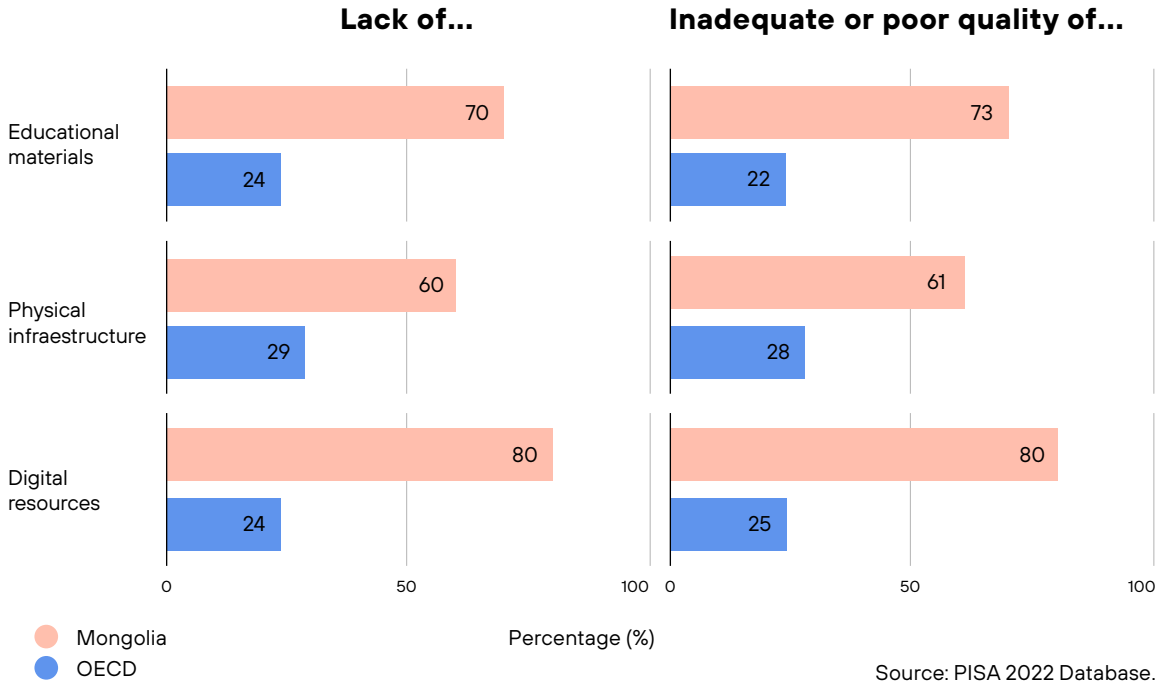
Source: PISA 2022 Database.

Human and material resources

- A higher share of 15-year-old students (38 percent) in Mongolia study in schools where instruction is hindered by a lack of qualified teaching staff, compared to OECD and Asian averages (25 percent). Furthermore, while principals in Mongolia are generally more satisfied with teachers compared to OECD and Asian averages, concerns are reported on teachers' preparation for classes—with 32 percent of students in Mongolia studying in schools where principals report that teachers are not prepared for classes compared to OECD and Asian averages (11 percent and 20 percent, respectively).

- A large majority of students (>60 percent) in Mongolia study in schools where instruction is hindered by a lack or poor quality of educational materials and physical infrastructure. This percentage is significantly higher than that of the OECD (<30 percent) and the Asian average (<40 percent). Similarly, most students (80 percent) in Mongolia study in schools where principals report a lack or poor quality of digital resources. This is substantially higher than the OECD (≤25 percent) and Asian average (≤45 percent). Furthermore, schools educating the majority of disadvantaged students and schools in aimags and soums are more likely to suffer from these shortages or poor quality of the critical educational and physical materials required for the learning process.

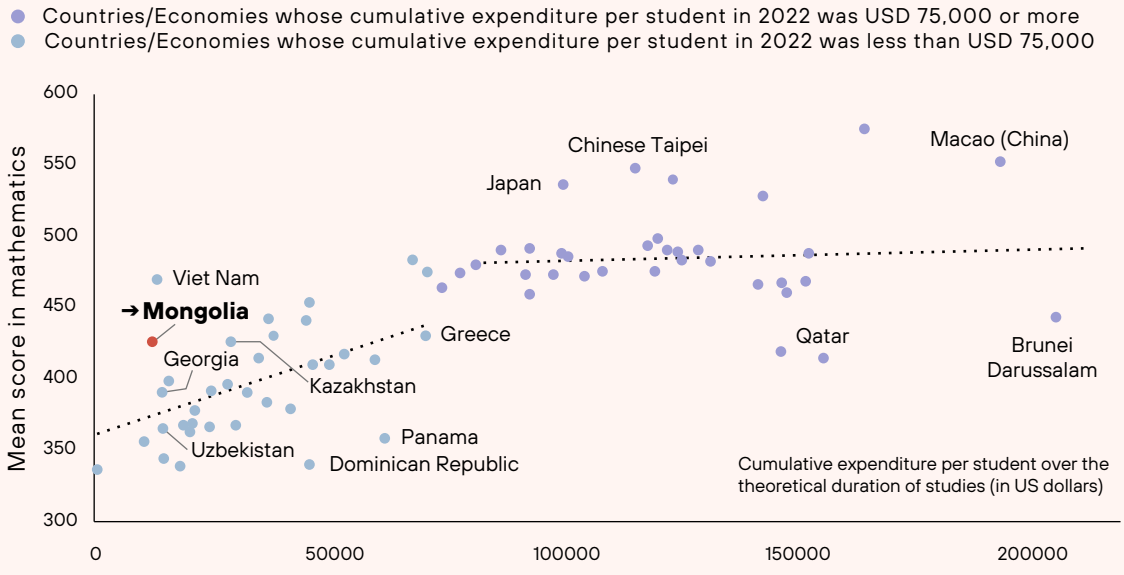
Figure ES.4: Percentage of students in schools whose principal reported that the school's capacity to provide instruction is hindered to some extend or a lot by the following factors...



Source: PISA 2022 Database.

- In Mongolia, the cumulative expenditure per student, between ages 6 and 15, was about US$12,600—the third lowest among all PISA-participating countries with available data. Expenditure on education is related to student performance, though only to a certain extent. Among the countries/economies whose cumulative expenditure per student, for all primary and secondary school years between ages 6 and 15, was under US$75,000 in 2019, higher expenditure on education was associated with higher scores in the PISA mathematics test.
- These lower expenditures may lead to shortage and inadequate quality of educational, infrastructural, and digital resources laid out above. However, despite the lower expenditures per student, students in Mongolia perform better than expected, given the expenditure per student.

Figure ES.5: Expenditure profile



Source: PISA 2022 Database.

Based on the results of PISA 2022, the Government of Mongolia aims to develop targeted policies and programs to improve the quality of education and reduce achievement gaps between student groups in the country.

Mongolia and PISA

01

This chapter describes PISA and explains how this study allows identification of areas requiring improvement in students' achievement, attainment, well-being, and engagement with learning. PISA can also be used to compare the education system in Mongolia to other countries. The last section of this chapter introduces the structure of the national report, outlining the topics that will be covered in the subsequent chapters.

What is PISA?

1. Launched by the OECD in 1997, PISA assesses 15-year-old students' proficiency in reading, mathematics, and science and measures students' skills in applying what they have learned in school to real-life situations. PISA was conducted in 2000, 2003, 2006, 2009, 2012, 2015, and 2022; the next cycle -PISA 2025 is under way. PISA is an ongoing program that offers insights for education policy and practice and that helps monitor trends in students' acquisition of skills and knowledge across countries and in different demographic subgroups within each country. Through PISA results, policy makers can gauge the skills and knowledge of students in their own countries compared to those in other countries, set policy targets against measurable goals achieved in other education systems, and learn from policies and practices of countries that 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 adopted by the United Nations in 2015, which is about ensuring that every child and young person achieves at least basic levels of proficiency in reading and mathematics.

2. In addition to an innovative domain developed specifically for each new round of PISA, the survey measures students' proficiency in three foundational domains of competence—reading, mathematics, and science—one of which, referred to as the major domain, is the particular focus of that assessment. The major domain is rotated with each round of PISA. The PISA assessment not only ascertains whether students can reproduce knowledge but also examines how well students can extrapolate their learnings and 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.

3. Through questionnaires distributed to students, and school principals, PISA gathers a wealth of contextual information about students' home background, their approaches to learning, and their learning environments. This information can be used to highlight differences in performance and identify the characteristics of students, schools, and education systems that perform well under particular circumstances. These questionnaires are described in more detail in later chapters.

4. Combined with the information gathered through the various questionaires, the PISA assessment provides three main types of outcomes:

    - Basic indicators that provide a baseline profile of the skills and knowledge 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 from a country's second participation in PISA, indicators on trends that show changes in mean outcomes; variation of outcomes among students; and relationships between background variables and outcomes at student, school, and system levels.

5. PISA mean scores can be used to rank participating countries and economies 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 domain and this can be used to determine rankings by the mean score of each subject area.

6. It should be noted that, for every round, PISA creates rich databases on students, schools, teachers, and parents; after the release of the official results and reports, interested parties or individuals are able to conduct deeper analysis and produce scientific references and reports using the open access data.

PISA 2022 key features and frameworks

7. PISA 2022 assessed the student's ability to put his/her academic achievements into perspective to use them during various situations and enables countries to compare the results with counterparts. Different contextual questionnaires invited students, teachers, parents, and school principals to respond to questions on learning environments and on their resources, processes, and ways of learning.

8. For this round of PISA, some 690,000 students completed the assessment in 2022, representing about 29 million 15-year-olds in the schools of the 81 participating countries/economies.

9. The PISA 2022 survey focused on mathematics, with reading and science as minor domains of assessment.

10. Mathematical literacy (Chapter 2) is defined as students' ability to reason mathematically and to formulate, employ, and interpret mathematics to solve problems in a variety of real-world contexts. It is based on three interrelated concepts (OECD, 2023).

    - *Cognitive Processes:* Mathematical reasoning and the problem-solving model include the mathematical processes that describe what individuals do to connect the problem's context with mathematics, enabling them to solve the problem. Mathematical reasoning (both deductive and inductive) involves evaluating situations, selecting strategies, drawing logical conclusions, developing and describing solutions, and recognizing how those solutions can be applied. It is enabled by some key understandings that undergird school mathematics, which form the core of mathematical literacy. These include understanding quantity, number systems, and their algebraic properties; appreciating the power of abstraction and symbolic representation; recognizing mathematical structures and their regularities; identifying functional relationships between quantities; using mathematical modeling as a lens onto the real world (e.g., in the field of physical, biological, social, economic, and behavioral sciences); and understanding variation as the heart of statistics. Regarding problem solving, PISA defines three categories of processes: formulating situations mathematically; employing mathematical concepts, facts, procedures, and reasoning; and interpreting, applying, and evaluating mathematical outcomes.

    - *Content Knowledge:* There are four categories (change and relationships, quantity, space and shape, and uncertainty and data) that are closely aligned with the content that is typically found in national school mathematics curricula content strands, such as numbers, algebra, functions, geometry, and data handling.

    - *Contexts:* These refer to aspects of an individual's world where the problems are situated. The framework identifies four contexts: personal, occupational, societal, and scientific.

11. Reading literacy is defined as students' ability to understand, use, evaluate, reflect on, and engage with text to achieve their purposes. PISA assesses students' performance in reading through questions that involve a variety of:

    - *Processes (aspects):* Students are not assessed on the most basic reading skills, as it is assumed that most 15-year-old students will have acquired these. Rather, students are expected to demonstrate their proficiency in locating information, including accessing and retrieving information from pieces of text, and searching and selecting the relevant text; understanding the text, including comprehending the literal meaning of the text and constructing an integrated representation of the text; and evaluating and reflecting on the text, including assessing its quality and credibility and reflecting on its content and form.

- *Text formats:* PISA uses single-source and multiple-source texts; static and dynamic texts; continuous texts (organized in sentences and paragraphs); noncontinuous texts (e.g., lists, forms, graphs, or diagrams); and mixed texts.

- *Situations:* These are defined by the use for which the text was constructed. For example, a novel, personal letter, or biography is written for people's personal use; official documents or announcements are for public use; a manual or report is for occupational use; and a textbook or worksheet is for educational use. Since some students may perform better in one type of reading situation than another, a range of reading situations is included in the test.

12. 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. PISA assesses students' performance in science through questions related to:

    - *Context:* This includes personal, local/national, and global issues, both current and historical, that demand some understanding of science and technology.

    - *Knowledge:* This encompasses understanding of the major facts, concepts, and explanatory theories that form the basis of scientific knowledge. It includes knowledge of both the natural world and technological artefacts (content knowledge), knowledge of how such ideas are produced (procedural knowledge), and an understanding of the underlying rationale for these procedures and the justification for their use (epistemic knowledge).

    - *Competencies:* These are the ability to explain phenomena scientifically, evaluate and design scientific enquiry, and interpret data and evidence scientifically.

13. PISA 2022 also assesses students' proficiency in an innovative domain—creative thinking.

    - *Creative thinking* is defined as the competence to engage productively in the generation, evaluation, and improvement of ideas that can result in original and effective solutions, advances in knowledge, and impactful expressions of imagination.[1]

14. Computer-based tests were used, with assessments lasting a total of two hours for each student. Test items were a mixture of multiple-choice questions and questions requiring students to construct their own responses. The items were organized into groups based on a passage presenting a real-life situation. Over 15 hours of test items were used, with different students taking different combinations of test items.

15. In addition to the tests, contextual questionnaires were administered to students and schools. The background questionnaires served two interrelated purposes. First, they provided a context for interpreting scores obtained from the cognitive assessment (both within and across education systems). Second, they provided reliable and valid noncognitive outcomes, which can inform policy and research in their own right.[2] Students' background questionnaire took 35 minutes to complete. The questionnaire sought information about the students, their homes, and their school and learning experiences. School principals completed a questionnaire that covered the school system and the learning environment. In addition, a new Global Crisis Module was included to collect information on COVID-19-related disruptions to students' learning and well-being in participating education systems.

16. To obtain additional information, some countries/economies decided to distribute a questionnaire to teachers to learn about their training and professional development, their teaching practices, and their job satisfaction. In some countries/economies, optional questionnaires were distributed to parents to obtain information on their perceptions of and involvement in their child's school, their support for learning in the home, and their own engagement with mathematics.

1 PISA 2022 Creative Thinking Framework.
2 PISA 2018 Assessment and Analytical Framework.

17. Countries/economies can also choose an optional questionnaire for students to learn about their familiarity with and use of information and communication technologies (ICTs). A financial literacy questionnaire was also distributed to the students in the countries/economies that conducted the optional financial literacy assessment (OECD, 2023).

18. PISA 2022 databases are publicly available, along with the PISA Data Analysis Manual (OECD, 2009) and PISA 2022 Technical Report.

19. PISA produces a series of reports focusing on student performance in cognitive tests and equity in the performances in terms of gender, socioeconomic status, language spoken at home, and differences in school locations. For PISA 2022, international thematic reports will also be produced and disseminated globally.

Mongolia participation in PISA 2022

20. Mongolia participated in PISA for the first time in 2022. The participation was led by the Ministry of Education and Science, funded by the World Bank and organized by the Education Evaluation Center (EEC), which is appointed as the National Center of PISA. PISA international contractors assisted Mongolia's participation in PISA 2022 and supported all processes of the assessment and survey administration.

21. Mongolia participated in the following tests:

    - A mathematics test, the major domain in PISA 2022
    - A reading and a science test, the two minor domains
    - A creative thinking test, the innovative domain for this cycle.

22. Mongolia opted to evaluate students' creative thinking rather than financial literacy. Also, the contextual assessment only involved students and schools. For the first participation in PISA, Mongolia did not opt for the additional contextual assessment in the questionnaire on ICT familiarity, the teacher questionnaire, or the parent questionnaire.

23. As for the cognitive test, PISA 2022 mathematics test items were analyzed to determine how close the test item content is with Mongolian national curriculum. According to the analysis,[3] 95.1 percent of the items were within the national mathematics curriculum and 3.4 percent were partially within the curriculum. Four items that assessed students' skills on interpreting 'the population pyramids' were not in the national curriculum.

24. The tests were originally developed in English language and were translated into Mongolian and Kazakh languages by following the PISA Translation Protocol. Translation of the English items into Mongolian was done by independent translators and followed by reconciliation for any newly translated tests and questionnaires as required. All translations were verified by international and national verifiers.

25. Rigorous sampling procedures according to PISA's technical standards were implemented in selecting the samples to ensure the results were comparable, reliable, and valid. The sample was based on a complete list of 803 schools with 43,616 15-year-old students, sourced from Education Statistics Information System and submitted by EEC. A complete listing of 15-year-old students in these schools was submitted by the school administrators.

26. As indicated in the PISA 2022 Technical Standards, to have a representative sample, minimum numbers of participating schools and students were specified. Schools were sampled systematically from a national list of mainstream (178) as well as technical and vocational (22) schools using the probability proportional to size (PPS) sampling. Before selecting them, the sample schools

3 Conducted by the Education Evaluation Center.

were assigned to mutually exclusive groups based on school characteristics with explicit[4] and implicit[5] strata. The sampled schools were explicitly stratified by location (city/urban - Ulaanbaatar, suburban - aimag centers, and rural - soums). In PISA 2022, 44 percent of the schools were sampled from Ulaanbaatar city, 29 percent from aimag centers, and 27 percent from soums. This reflects actual distribution of schools in three locations. Implicit stratum levels included school ownership (public - 87percent and private - 13percent), ISCED orientation (general - 89 percent and vocational - 11 percent), and ISCED levels (ISCED 2 - lower secondary, ISCED 3 - upper secondary, and ISCED 2 and 3 - mixed).

27. In Mongolia, 6–42 students were sampled from each sample school. The sample included establishments of all types of schools, except special needs and international schools, where 15-year-old students attended in all locations of the country. Mongolia's original sample consisted of 7,276 students belonging to 200 secondary and vocational schools throughout the country. Out of these students, 628 were identified to have Kazakh as their mother language. More description of the sample students will be presented in Chapter 2.

28. Under direct supervision of the National Center (EEC), 200 schools were sampled and assigned to prepare the devices with Chrome OS and the Ministry of Education and Science supported some schools with the required devices. The National Center checked the preparation of each school and provided the required devices to the students if their schools were unable to do so.

29. PISA tests and questionnaires were administered between April 5 and May 15, 2022. In total, 7,276 15-year-old students in grades 7–12 across the country took a two-hour test in reading, mathematics, science, and creative thinking and responded to the survey questionnaires. Of these, 6999 student observations from 195 schools were considered valid in the process of data cleaning and are used for the analysis in this report.

30. One of the critical issues in the questionnaire is the respondent rate of students and schools. According to the data analysis, in general, students and schools responded well (68–100 percent) to each question in the questionnaires.

31. Data were analyzed according to the PISA Data Analysis Manual (OECD, 2009). Based on the design, two types of statistical analysis were conducted: descriptive and inferential. Detailed information regarding the data analysis can be obtained from the Manual.

Why Mongolia participated in PISA 2022

32. One of the reasons Mongolia participated in PISA 2022 was to evaluate the performance of students in the country compared to international benchmarks and countries facing similar challenges elsewhere and to identify the aspects that are associated with performance to effectively enhance or eliminate it. The PISA 2022 results in this report provide the policy makers with data and evidence that can help realize how far Mongolia is from the objectives set in Vision 2050 and where its education system and 15-year-olds stand compared to peer countries and determine what can be done to equip young children to be competent at the global level. Ultimately, the aim is to ensure that Mongolian students obtain the skills needed to succeed in tomorrow's world as set out in the Education SDG Framework.

33. Mongolia committed to achieving the key Education SDG target of ensuring all children and young people attain at least minimum levels of proficiency in reading and mathematics by 2030. This means ensuring all youths have the knowledge, skills, and capabilities necessary to achieve their full potential, contribute to an increasingly interconnected world, and live a fulfilling life.

34. One of the priority policies in the Mongolian education system is to strengthen education evaluation and assessment system by incorporating some internationally recognized evaluations and assessment such as PISA. Participating in PISA enables Mongolia to align national process and procedures for evaluation and assessment with internationally recognized standards. In addition, recently amended Law for Education stipulates that every three years, Mongolia shall be participating in international assessment.

4 Explicit stratification consists of grouping schools into strata that will be treated independently, as though they were separate school sampling frames.

5 Implicit stratification consists essentially of sorting the schools within each explicit stratum using a set of designated implicit stratification variables.

35. Occasionally, Mongolia measures pre-primary and general education quality to identify attained knowledge and skills of students at grades 6, 10, and 12. This evaluation has some features similar to PISA. First, the evaluation samples students from grade 10 which accommodates children ages 14–15 using two-stage sampling method. Second, it applies cognitive tests on skills embedded in mathematics and Mongolian language subjects and background questionnaires are administered to students, school leaders, and teachers.

Reporting of results

36. The PISA 2022 results are published for the first time in this national report. While the national report is published under the responsibility of the Ministry of Education in Mongolia, it was developed by Mongolia with the OECD's technical support. As part of the process leading to the development of this report, the OECD and its contractors—PISA International Consortium—have provided inputs to Mongolia to strengthen its capacities for data analysis, interpretation of PISA results, report writing, and creation of tailored communication products to support the dissemination of PISA results and policy messages.

37. This national report and other communication products present Mongolia's results in the context of the country and benchmark countries that participated in PISA 2022. Performance results of Mongolian 15-year-olds are compared with OECD and the Asian averages.[6] The Asian average includes results from *Hong Kong (China)**, Indonesia, Japan, Kazakhstan, Cambodia, Macao (China), Malaysia, the Philippines, Baku (Azerbaijan), Singapore, Chinese Taipei, Thailand, Uzbekistan, and Viet Nam. Results of Mongolia are also compared with individual benchmark countries and economies: Korea, Kazakhstan, Uzbekistan, Cambodia, Thailand, *Hong Kong (China)**, Viet Nam, and Georgia. These benchmark countries are selected to systematically compare country's results and determine the situations and positions of Mongolian students in relation to the peer countries with similar background. The selection criteria for the benchmark countries are as follows:

    - Countries with similar size of population and geographical areas
    - Countries that are participating in PISA for the first time
    - Neighbor country
    - Countries with similar education background
    - Higher-performing countries in Asia region

38. To interpret the results, the report includes relevant analyses and information based on the policy priorities of Mongolia. The report constitutes a summary of key results and analysis designed to stimulate a constructive debate on improvement of educational outcomes, building upon and enriching already existing data and evidence from national, regional, or international sources. The national report is aimed at key stakeholders in Mongolia and is designed to support the discussion of the results and implications for education policies and practices. Stakeholders include students, parents, teachers, teacher unions, school principals, academia, civil society, media, and central and local government.

39. This report is published in conjunction with the OECD's release of the first international PISA 2022 results and data products. These include the first two volumes of its international report on PISA 2022 (Volume I on student performance in mathematics, reading, and science and equity in education; Volume II on resilient systems, schools, and students); the publication of its initial PISA 2022 data set; and an interactive web-based tool to explore the data set. 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 toward a policy dialogue for educational improvement.

6 Average of Asian countries that participated in PISA 2022.

Structure of Mongolia's national report

40. In this report, the educational outcomes, resources, and opportunities in Mongolia are systematically compared with other countries and within Mongolia itself across five demographic factors. These demographic factors are gender (boys and girls); student and school socioeconomic profile; language background, as indicated by the language spoken at home; school ownership (private and public); and school location (urban and rural). In some analysis, program orientation (general secondary and vocational) was also the factor.

41. This report is structured as follows:

    - Chapter 2 discusses the attainment, learning outcomes, and proficiency levels in three domains.
    - Chapter 3 discusses outcomes related to student well-being (life satisfaction), expectations for the future, and attitudes toward school at age 15 in Mongolia.

42. In Chapters 2 and 3, the average level, but also the variation, of each outcome will be discussed including the prevalence of vulnerable youth, the inequality among groups of students, and the extent to which family and home resources determine the outcomes.

    - Chapter 4 reports whether the foundations for success are present in Mongolia and in all schools, i.e., the extent to which resources invested in education—human, material, time resources—create good conditions for learning and the extent to which the broader classroom, school, and social contexts (school climate) support educational outcomes for all.
    - Chapter 5 (the last chapter) summarizes the findings from PISA 2022, relates them to the broader set of evidence about the effectiveness and efficiency of policy interventions, and presents results in a comparative perspective to stimulate an evidence-based discussion on policy reform in education.

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02 Attainment and achievement outcomes at age 15 in Mongolia

This chapter discusses the PISA 2022 results in Mongolia and their implications for the country's attainment and achievement outcomes. The chapter examines the enrolment of 15-year-olds in Mongolia and their attainment and grade repetition. This provides important background for understanding student achievement in mathematics, reading, and science and for comparing Mongolia's performance with other countries and economies. The chapter then presents the results—in particular, the levels of performance in mathematics, reading, and science—and discusses the main indicators of equity, focusing on performance differences by students' gender, socioeconomic status, and their language spoken at home as well as variation in performance across schools, including those in urban and rural areas and private and public schools.

43. A central preoccupation of policy makers in Mongolia and around the world is to equip 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. The measures of student proficiency included in PISA were developed to monitor how close Mongolia is to achieving these goals.

44. Skill requirements and the contexts in which skills are applied evolve fast. Therefore, PISA revises the definitions and frameworks behind each of its literacy measures every nine years, to ensure they remain relevant and future oriented. By recognizing the evolving nature of our societies, PISA encourages educators and policy makers to consider quality of education as a concept and a goal that continues to evolve. As with previous cycles of PISA, the PISA 2022 cognitive frameworks and the framework for questionnaires have been reviewed and updated by a network of international experts who have experience with PISA.

Box 2.1: What does PISA measure?

Each round of PISA measures students' proficiency in mathematics, reading, and science. In each cycle, one of the domains is given a particular focus. In PISA 2022, mathematics is the main focus.

The frameworks for all three domains emphasize students' capacity to apply knowledge and skills in real-life contexts: students need to demonstrate their capacity to analyze, 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 2022 are as follows:

Mathematical literacy is defined as an individual's capacity to reason mathematically and to formulate, employ, and interpret mathematics to solve problems in a variety of real-world contexts. It includes concepts, procedures, facts, and tools to describe, explain, and predict phenomena. It assists individuals to know the role that mathematics plays in the world and to make the well-founded judgments and decisions needed by constructive, engaged, and reflective 21st century citizens.

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

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.

Source: PISA 2022 Assessment Framework

45. Furthermore, PISA indicators can also be used to assess equity in education—inclusion and fairness—using the rich information available in the PISA database on students' and schools' backgrounds, collected through contextual questionnaires, such as students' gender, socioeconomic status, immigrant and language background, and schools' geographic location (rural or urban). Inclusion refers to the objective of ensuring that all students have access to high-quality education and attain a minimum level of skills. Fairness refers to the goal of fully realizing every student's potential by removing obstacles over which individual students have no control, such as unequal access to educational resources and school environments. Differences in inclusion and fairness can be compared among countries. PISA has put great effort in constructing a comparable indicator of socioeconomic status, known as the PISA index of economic, social, and cultural status (ESCS, see Box 2.2) and this has been used in the analysis of Mongolia's PISA data.

46. The discussion of PISA results for Mongolia in the remaining sections of this chapter starts by comparing the enrolment of 15-year-olds in Mongolia and their attainment, with particular attention to whether students are 'on track' according to their age. This provides important background for the main section in this chapter, which compares student achievement in mathematics, reading, and science in Mongolia with other countries and economies (see Chapter 1). The final section presents the main indicators of equity, focusing on student gender, socioeconomic status, and language spoken at home. This section also covers variation within and between schools in students' performance.

Enrolment and attainment at age 15: A PISA perspective

47. PISA goes beyond assessing the quality of education. It selects the participants for the test through scientific sampling procedures, first choosing the schools to participate and then selecting students within those schools. Students listed in PISA sampling forms must be 15-year-olds enrolled in school in grade 7 and above. The information PISA collects for its sampling operations also provides comparative indicators about the attainment of 15-year-olds in participating countries.

What proportion of Mongolia's 15-year-olds does the PISA sample represents?

48. As for age basis, students between 15 years and 3 (completed) months and 16 years and 2 (completed) months at the beginning of the testing period are sampled. Based on the sampling information, 15-year-olds born between January 1 and December 31, 2006, were selected.

49. The PISA Coverage Index is obtained by dividing the number of students represented in the PISA sample (participating students, weighted by their sampling weights) by the total number of 15-year-olds estimated from demographic projections. In Mongolia, the coverage index is estimated at 0.87 which indicates that 87 percent of 15-year-old students enrolled in schools were covered by PISA 2022.

50. Figure 2.1 shows the PISA coverage of the 15-year-old population in Mongolia compared with the OECD average and benchmark countries. About 87 percent of 15-year-olds in Mongolia are covered by PISA, in grade 7 or higher. Comparing to other benchmark countries and economies,[7] Mongolia has higher coverage than Cambodia, Viet Nam, Thailand, *Hong Kong (China)**, and Georgia and lower coverage than Uzbekistan, Kazakhstan, and Korea. These differences are statistically significant. Moreover, Figure 2.1 also shows that 12.9 percent of 15-year-old students were excluded from PISA schools and they are (a) in special schools, (b) international schools whose medium of instruction is English, and (c) functionally and intellectually disabled students in mainstream schools.

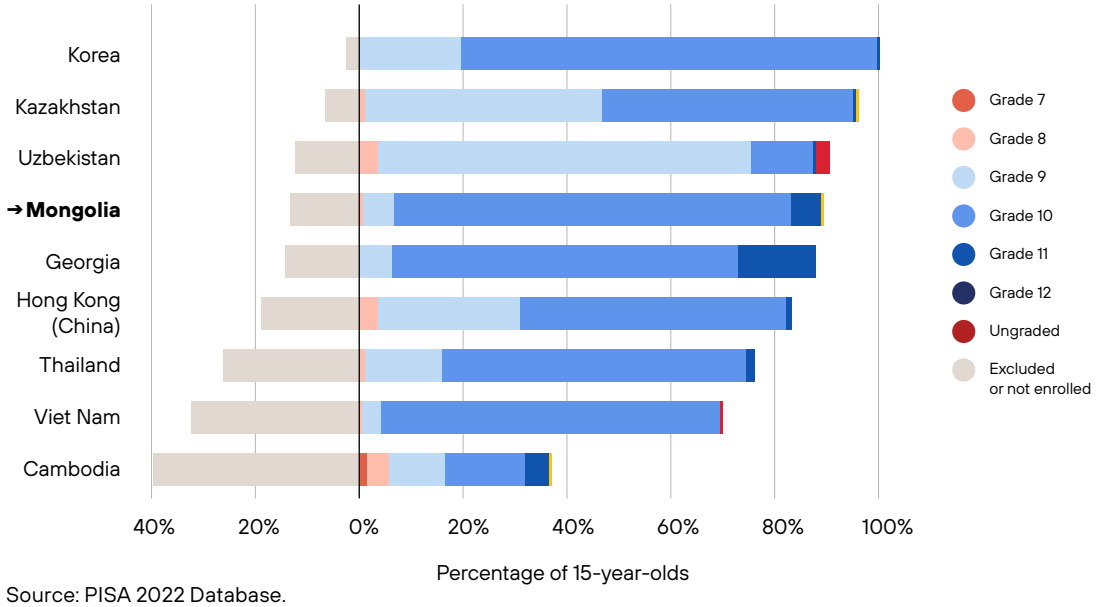
Distribution of PISA students across grades

51. According to Figure 2.1, in Mongolia, 74.7 percent of the sampled students are in grade 10, 6.8 percent of students study at lower grades—from 7 to 9, and 5.6 percent of them study in grades 11 and 12. It indicates that majority of 15-year-olds are in grade 10 which is an international modal grade; this percentage is higher than comparator countries except Korea. However, in Uzbekistan, children officially start schooling at age 7 and thus the majority of 15-year-olds are in grade 9.

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

7 Hong Kong (China) is flagged in PISA 2022 for anomalies in exclusion rate and coverage rate. Every table and figure with Hong Kong (China) should have a star right beside the country name and the same technical note/caution note.

Figure 2.1: Educational attainment at age 15 in Mongolia and comparison countries



Source: PISA 2022 Database.

53. The level of attainment and participation in education at age 15, reflected in coverage rates and the distribution of PISA students across grades, provides important contextual information for interpreting the mean performance and variation among the students assessed in Mongolia. Household surveys often show that children from poor households, ethnic minorities, and children with disabilities or from rural areas face a greater risk of not attending or completing lower secondary education.

54. Despite significant progress in Mongolia over recent years, a small proportion of students reportedly drop out. According to the Ministry of Education's statistics for 2021–2022 academic year, dropout rates for grades 9–10 students are reported as 13.3 percent; main reasons for students to drop out are disability and poverty (Ministry of Education an Science, Mongolia, 2022). Economically disadvantaged children face some challenges. Globally, research has shown that young adults who left school without attaining a formal qualification are at high risk of poor employment, suffer worse health conditions, and are overrepresented among those committing crimes (Belfield & Levin, 2007; Lochner, 2011; Machin, Marie, & Vujić, 2011). Thus, it is critical to ensure that all 15-year-olds do not leave school without alternative learning pathways that respond to their needs and life context.

Grade repetition in Mongolia

55. In Mongolia, 3.7 percent of PISA-sampled 15-year-old students reported that they repeated a grade at least once in primary, lower secondary, or upper secondary school. Mongolia grade repetition result is less than the OECD average (10.6 percent). This percentage is lower than most comparator countries and economies, except Kazakhstan, Georgia, and Korea (Figure 2.2). These differences are statistically significant.

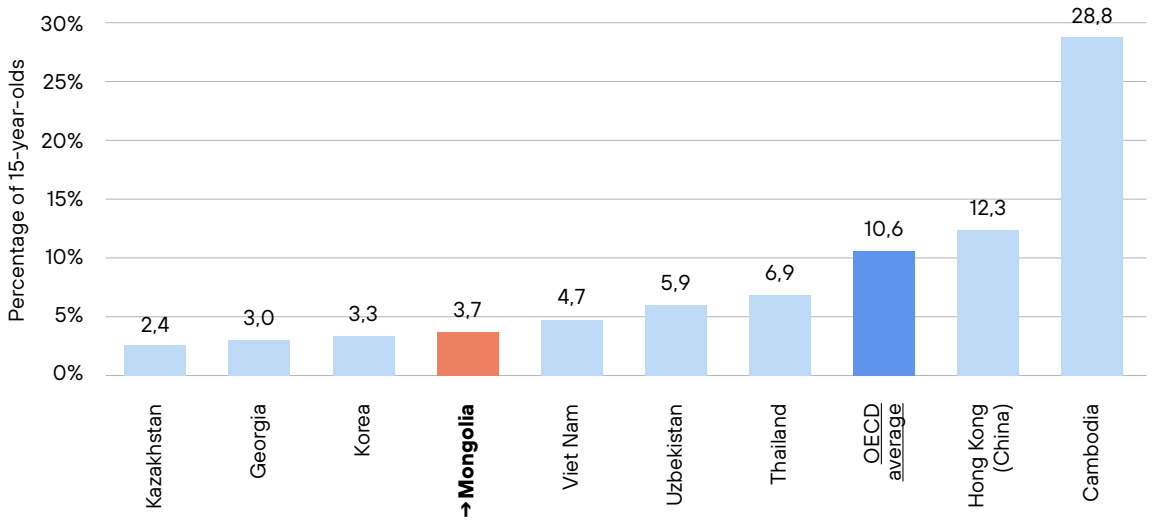
56. According to studies, students might also be delayed in their schooling career without formally repeating a grade, e.g., because of sickness or the requirement to help out in the family business or to look after a family member. Generally, in all countries covered by PISA variation in grade levels is strongly associated with the experience of grade repetition (OECD, 2016, Figure II.5.2): students who are behind track are most likely to report having repeated a grade.

57. In Mongolia, boys repeat a grade more frequently than girls. Also, more 15-year-olds in soums reported grade repetition than in the city. In terms of program orientation, there are no statistically significant differences in occurrence of grade repetition of 15-year-olds in vocational schools and in mainstream general secondary schools.

58. The same applied when comparing students from different socioeconomic statuses: there is no difference in percentage of occurrence of grade repetition across quartiles of socioeconomic status.

Figure 2.2: Grade repetition in Mongolia and comparison countries

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



Source: OECD, PISA 2022 Database.

Student achievement in Mongolia

59. The most straightforward 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. PISA scores do not have a substantive meaning as they are not physical units, such as meters or grams. Instead, they are set in relation to the variation in results observed across all test participants. There is theoretically no minimum or maximum score in PISA; rather, the results are scaled to fit approximately normal distributions, with means for OECD countries around 500 score points and standard deviations around 100 score points.

60. To help users interpret students' scores in substantive terms, PISA scales are divided into proficiency levels. For each proficiency level, descriptions illustrate the kinds of knowledge and skills needed to complete those tasks successfully (see Table 2.1, Table 2.2., and Table 2.3). Level 2 is the baseline level of performance for each of the three domains. 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 domains, 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.

Table 2.1: PISA mathematics proficiency levels

Level	Lower score limit	Descriptor
6	669	At Level 6, students can work through abstract problems and demonstrate creativity and flexible thinking to develop solutions. For example, they can recognize when a procedure that is not specified in a task can be applied in a nonstandard context or when demonstrating a deeper understanding of a mathematical concept is necessary as part of a justification. They can link different information sources and representations, including effectively using simulations or spreadsheets as part of their solution. Students at this level are capable of critical thinking and have a mastery of symbolic and formal mathematical operations and relationships that they use to clearly communicate their reasoning. They can reflect on the appropriateness of their actions with respect to their solution and the original situation.
5	607	At Level 5, students can develop and work with models for complex situations, identifying or imposing constraints and specifying assumptions. They can apply systematic, well-planned problem-solving strategies for dealing with more challenging tasks, such as deciding how to develop an experiment, designing an optimal procedure, or working with more complex visualizations that are not given in the task. Students demonstrate an increased ability to solve problems whose solutions often require incorporating mathematical knowledge that is not explicitly stated in the task. Students at this level reflect on their work and consider mathematical results with respect to the real-world context.
4	545	At Level 4, students can work effectively with explicit models for complex concrete situations, sometimes involving two variables, as well as demonstrate an ability to work with undefined models that they derive using a more sophisticated computational thinking approach. Students at this level begin to engage with aspects of critical thinking, such as evaluating the reasonableness of a result by making qualitative judgments when computations are not possible from the given information. They can select and integrate different representations of information, including symbolic or graphical, linking them directly to aspects of real-world situations. At this level, students can also construct and communicate explanations and arguments based on their interpretations, reasoning, and methodology.
3	482	At Level 3, students can devise solution strategies, including strategies that require sequential decision-making or flexibility in understanding of familiar concepts. At this level, students begin using computational thinking skills to develop their solution strategy. They are able to solve tasks that require performing several different but routine calculations that are not clearly defined in the problem statement. They can use spatial visualization as part of a solution strategy or to determine how to use of a simulation to gather data appropriate for the task. Students at this level can interpret and use representations based on different information sources and reason directly from them, including conditional decision-making using a two-way table. They typically show some ability to handle percentages, fractions, and decimal numbers and to work with proportional relationships.

Level	Lower score limit	Descriptor
2	420	At Level 2, students can recognize situations where they need to design simple strategies to solve problems, including running straightforward simulations involving one variable as part of their solution strategy. They can extract relevant information from one or more sources that use slightly more complex modes of representation, such as two-way tables, charts, or two-dimensional representations of three-dimensional objects. Students at this level demonstrate a basic understanding of functional relationships and can solve problems involving simple ratios. They are capable of making literal interpretations of results.
1a	358	At Level 1a, students can answer questions involving simple contexts where all information needed is present, and the questions are clearly defined. Information may be presented in a variety of simple formats and students may need to work with two sources simultaneously to extract relevant information. They are able to carry out simple, routine procedures according to direct instructions in explicit situations, which may sometimes require multiple iterations of a routine procedure to solve a problem. They can perform actions that are obvious or that require very minimal synthesis of information, but in all instances the actions follow clearly from the given stimuli. Students at this level can employ basic algorithms, formulae, procedures, or conventions to solve problems that most often involve whole numbers.
1b	295	At Level 1b, students can respond to questions involving easy-to-understand contexts where all information needed is clearly given in a simple representation (i.e., tabular or graphic) and, as necessary, recognize when some information is extraneous and can be ignored with respect to the specific question being asked. They are able to perform simple calculations with whole numbers, which follow from clearly prescribed instructions, defined in short, syntactically simple text.
1c	233	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 (e.g., a small table or picture) and defined in a short, syntactically simple text. They are able to follow a clear instruction describing a single step or operation.

Table 2.2: PISA reading proficiency levels

Level	Lower score limit	Characteristics of tasks
6	698	Readers at Level 6 can comprehend lengthy and abstract texts in which the information of interest is deeply embedded and only indirectly related to the task. They can compare, contrast, and integrate information representing multiple and potentially conflicting perspectives, using multiple criteria and generating inferences across distant pieces of information to determine how the information may be used. Readers at Level 6 can reflect deeply on the text's source in relation to its content, using criteria external to the text. They can compare and contrast information across texts, identifying and resolving intertextual discrepancies and conflicts through inferences about the sources of information, their explicit or vested interests, and other cues as to the validity of the information. Tasks at Level 6 typically require the reader to set up elaborate plans, combining multiple criteria and generating inferences to relate the task and the text(s). Materials at this level include one or several complex and abstract text(s), involving multiple and possibly discrepant perspectives. Target information may take the form of details that are deeply embedded within or across texts and potentially obscured by competing information.
5	626	Readers at Level 5 can comprehend lengthy texts, inferring which information in the text is relevant even though the information of interest may be easily overlooked. They can perform causal or other forms of reasoning based on a deep understanding of extended pieces of text. They can also answer indirect questions by inferring the relationship between the question and one or several pieces of information distributed within or across multiple texts and sources. Reflective tasks require the production or critical evaluation of hypotheses, drawing on specific information. Readers can establish distinctions between content and purpose and between fact and opinion as applied to complex or abstract statements. They can assess neutrality and bias based on explicit or implicit cues pertaining to both the content and/or source of the information. They can also draw conclusions regarding the reliability of the claims or conclusions offered in a piece of text. For all aspects of reading, tasks at Level 5 typically involve dealing with concepts that are abstract or counterintuitive and going through several steps until the goal is reached. In addition, tasks at this level may require the reader to handle several long texts, switching back and forth across texts in order to compare and contrast information.

Level	Lower score limit	Characteristics of tasks
4	553	At Level 4, readers can comprehend extended passages in single- or multiple-text settings. They interpret the meaning of nuances of language in a section of text by considering the text as a whole. In other interpretative tasks, students demonstrate understanding and application of ad hoc categories. They can compare perspectives and draw inferences based on multiple sources. Readers can search, locate, and integrate several pieces of embedded information in the presence of plausible distractors. They can generate inferences based on the task statement to assess the relevance of target information. They can handle tasks that require them to memorize prior task context. In addition, students at this level can evaluate the relationship between specific statements and a person's overall stance or conclusion about a topic. They can reflect on the strategies that authors use to convey their points, based on salient features of texts (e.g., titles and illustrations). They can compare and contrast claims explicitly made in several texts and assess the reliability of a source based on salient criteria. Texts at Level 4 are often long or complex and their content or form may not be standard. Many of the tasks are situated in multiple-text settings. The texts and the tasks contain indirect or implicit cues.
3	480	Readers at Level 3 can represent the literal meaning of single or multiple texts in the absence of explicit content or organizational clues. Readers can integrate content and generate both basic and more advanced inferences. They can also integrate several parts of a piece of text in order to identify the main idea, understand a relationship, or construe the meaning of a word or phrase when the required information is featured on a single page. They can search for information based on indirect prompts and locate target information that is not in a prominent position and/or is in the presence of distractors. In some cases, readers at this level recognize the relationship between several pieces of information based on multiple criteria. Level 3 readers can reflect on a piece of text or a small set of texts and compare and contrast several authors' viewpoints based on explicit information. Reflective tasks at this level may require the reader to perform comparisons, generate explanations, or evaluate a feature of the text. Some reflective tasks require readers to demonstrate a detailed understanding of a piece of text dealing with a familiar topic, whereas others require a basic understanding of less-familiar content. Tasks at Level 3 require the reader to take consider many features into account when comparing, contrasting, or categorizing information. The required information is often not prominent or there may be a considerable amount of competing information. Texts typical of this level may include other obstacles, such as ideas that are contrary to expectation or negatively worded.

Level	Lower score limit	Characteristics of tasks
2	407	Readers at Level 2 can identify the main idea in a piece of text of moderate length. They can understand relationships or construe meaning within a limited part of the text when the information is not prominent by producing basic inferences and/or when the text(s) include some distracting information. They can select and access a page in a set based on explicit though sometimes complex prompts and locate one or more pieces of information based on multiple, partly implicit criteria. Readers at Level 2 can, when explicitly cued, reflect on the overall purpose, or on the purpose of specific details, in texts of moderate length. They can reflect on simple visual or typographical features. They can compare claims and evaluate the reasons supporting them based on short, explicit statements. Tasks at Level 2 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	Readers at Level 1a can understand the literal meaning of sentences or short passages. Readers at this level can also recognize the main theme or the author's purpose in a piece of text about a familiar topic and make a simple connection between several adjacent pieces of information or between the given information and their own prior knowledge. They can select a relevant page from a small set based on simple prompts and locate one or more independent pieces of information within short texts. Level 1a readers can reflect on the overall purpose and on the relative importance of information (e.g., the main idea versus nonessential detail) in simple texts containing explicit cues. Most tasks at this level contain explicit cues regarding what needs to be done, how to do it, and where in the text(s) readers should focus their attention.
1b	262	Readers at Level 1b can evaluate the literal meaning of simple sentences. They can also interpret the literal meaning of texts by making simple connections between adjacent pieces of information in the question and/or the text. Readers at this level can scan for and locate a single piece of prominently placed, explicitly stated information in a single sentence, a short text or a simple list. They can access a relevant page from a small set based on simple prompts when explicit cues are present. Tasks at Level 1b explicitly direct readers to consider relevant factors in the task and in the text. Texts at this level are short and typically provide support to the reader, such as through repetition of information, pictures, or familiar symbols. There is minimal competing information.
1c	189	Readers at Level 1c can understand and affirm the meaning of short, syntactically simple sentences on a literal level and read for a clear and simple purpose within a limited amount of time. Tasks at this level involve simple vocabulary and syntactic structures.

Table 2.3: PISA science proficiency levels

Level	Lower score limit	Descriptor
6	708	At Level 6, students can draw on a range of interrelated 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 nonscientific issues and identify the evidence supporting a scientific claim.
2	410	At Level 2, students are able to draw on everyday content knowledge and basic 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 can be investigated scientifically.

Level	Lower score limit	Descriptor
1a	335	At Level 1a, students are able to use basic or everyday content and procedural knowledge to recognize or identify explanations of simple scientific phenomenon. 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.
1b	261	At Level 1b, students can use basic or everyday scientific knowledge to recognize aspects of familiar or simple phenomenon. They are able to identify simple patterns in data, recognize basic scientific terms, and follow explicit instructions to carry out a scientific procedure.

61. By analyzing the proportion of students below and above the baseline levels of proficiency and the proportion who reached the highest levels of proficiency, it possible to gauge the capacity of the Mongolia education system to nurture excellence.

Performance in mathematics, reading, and science

62. In 2022, the mean mathematics score among OECD countries and economies was 472 points; the mean scores in reading and science were 476 points and 485 points, respectively.

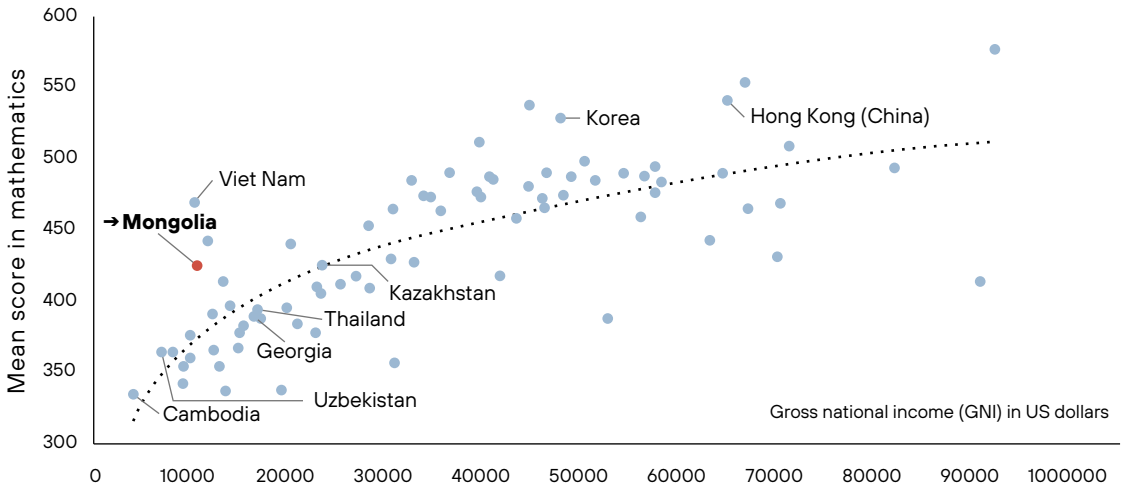
63. Figure 2.3 shows the average performance of Mongolia's 15-year-old students across the three domains compared to OECD and Asian averages as well as their relative standing among comparator countries and the economy.

64. In mathematics, the mean score of Mongolian 15-year-olds is 425 points, which is statistically significantly lower than OECD and Asian averages, 47.8 score points below the OECD average and 25.9 score points below the Asian average.

65. Mongolian students perform higher than 15-year-olds in Thailand, Georgia, Uzbekistan, and Cambodia, about 31 score points above the countries' means. Mongolians students perform similarly to students from Kazakhstan; no statistically significant mean score difference is observed between the two country means.

66. Mongolian 15-year-olds performed significantly lower than *Hong Kong (China)** and Korea, who are top performers in PISA 2022. Mongolian 15-year-olds scored 102.7 and 115.8 points lower than Korea and *Hong Kong (China)**, respectively. According to estimates, 20 score points is considered as one-year learning of 15-year-old students (Avvisati & Givord, 2021). These large score gaps could be interpreted as Mongolian students lagging their peers in Korea and *Hong Kong (China)** by over five years. The score point difference in mathematics performance between means for Mongolian and Vietnamese 15-year-olds is 44.7 points, which implies over two-year learning gap.

67. **Mathematics performance and gross national income**



Source: OECD, PISA 2022 Database.

68. In reading, the mean score of Mongolian 15-year-olds is 378, which is much lower than OECD and Asian averages. The mean score difference between Mongolian 15-year-olds and OECD average is 97.2 points. Moreover, a statistically significant score point difference of 48.4 in reading performance is observed between Mongolia and the Asian average.

69. In comparison to the performance of 15-year-olds in Uzbekistan and Cambodia, a statistically significant score point difference of over 42.9 is observed in reading. Mongolian 15-year-olds performed better than these countries. However, no statistically significant difference is estimated with Georgian students' performance.

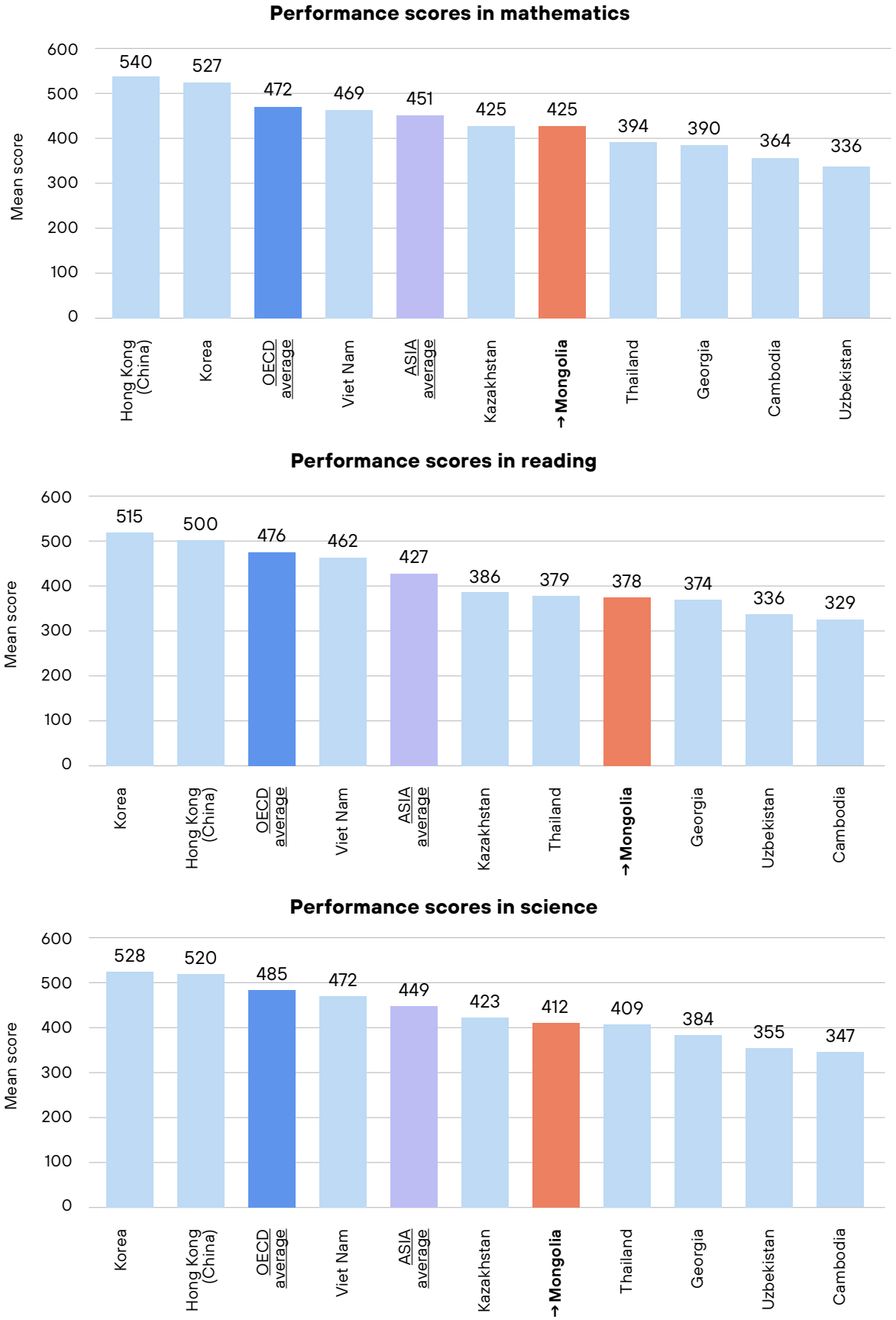
70. In reading, 15-year-old students in Hong Kong (China)* and Korea are top performers for PISA 2022. Mongolian 15-year-olds scored 121.3 points lower than Hong Kong (China)* and 137 score points lower than Korean peers. It implies over six-year learning difference between Mongolian students and top performers. Score point difference in reading performance between 15-year-olds in Mongolia and Viet Nam is 83.5 points.

71. In science, Figure 2.3 shows that mean score of Mongolian 15-year-olds is estimated as 412, which presents lower performance than OECD and Asian averages. The mean score difference between Mongolian 15-year-olds and OECD average is 72.3 points. There is a statistically significant score point difference of 36.9 in science performance between Mongolia and the Asian average.

72. Mongolian 15-year-olds performed better in science than Georgia, Uzbekistan, and Cambodia. Mongolian students' mean score is 26.7 points higher than Georgian students and over 57.5 and 65.3 points higher than Uzbekistan and Cambodia, respectively. These differences are all statistically significant. It means that in science, Mongolian 15-year-olds learn about three years ahead of their peers in Uzbekistan and Cambodia. There is no statistically significant difference between Mongolia and Thailand.

73. In science, Mongolian 15-year-old students scored over 108 points lower than students in Hong Kong (China)* and Korea (the top performers). Compared to these countries, Mongolian students' mean score differences are statistically significant. By score point differences, Mongolian 15-year-olds lag their peers in these economies and countries by over five years .

Figure 2.3: Snapshot of performance scores in mathematics, reading, and science



Source: OECD, PISA 2022 Database.

74. In Mongolia, the mean score difference between 15-year-olds in the lowest and highest 10th percentile is estimated as 117 points in mathematics; it implies a statistically significant difference. This indicates that students in the lowest 10th percentile lag their peers in the highest 10th percentile by over five years. The same analysis is conducted with reading and science mean score;

it concludes that in reading, the mean score difference between students in the lowest and highest 10th percentile is 198 points, which indicates that lowest 10th percentile students lag their peers in the highest 10th percentile by almost 10 years. In science, students in the lowest 10th percentile performed statistically significantly lower—103 score points less than their peers in the highest 10th percentile. This is indeed over five years of learning difference. These results indicate large variabilities in the performance of three domains within the country.

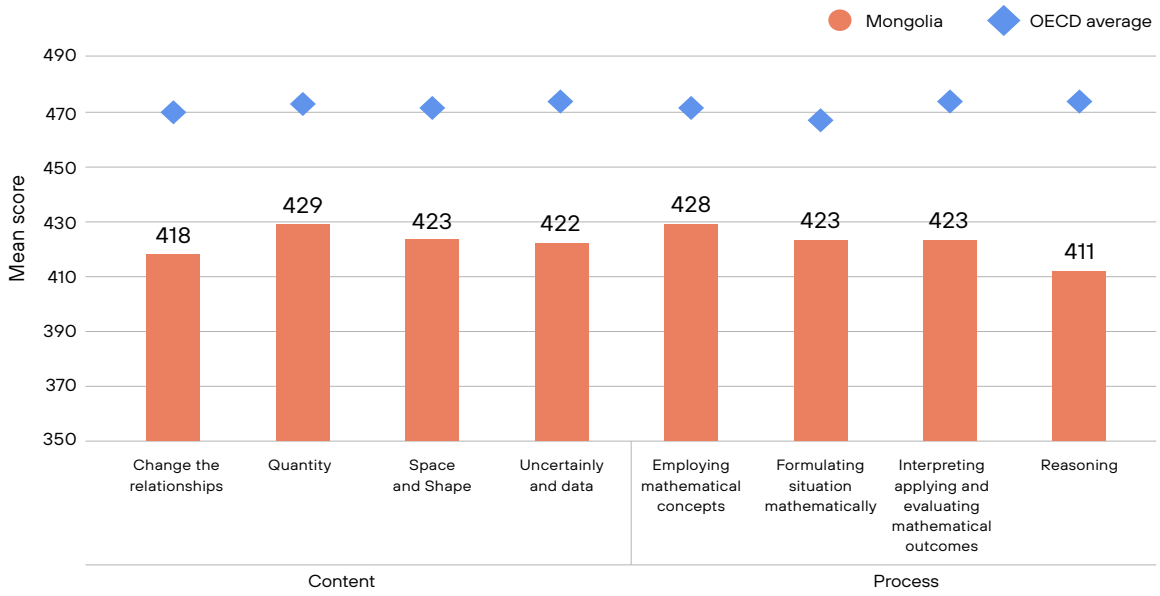
75. In general, three main observations emerge from the results in Figure 2.3 and the comparisons of mean performance of Mongolian 15-year-olds with other countries in the three domains:

- First, Mongolia scores statistically below OECD and Asian averages in all three domains.
- Second, Mongolian students' mathematics score is statistically closer to the OECD average than Mongolia's reading and science scores. Based on the justification that 20 score points equal one year learning of 15-year-olds,[8] it can be interpreted that Mongolian 15-year-olds are lagging OECD peers by over two years of learning in mathematics, over three years in science, and over five years in reading.
- Third, in three domains, statistically significant score point differences between Mongolian 15-year-olds and their peers across Asian countries and economies who participated in PISA 2022 are over 25.9; it implies over one-year learning gap.
- Fourth, Mongolian 15-year-olds performed better than Uzbekistan and Cambodia and much lower than PISA 2022 top performers namely Hong Kong (China)* and Korea.

76. As shown in Figure 2.4, the highest mean score in mathematics content is in the quantity area, involving the understanding of measurements, counts, magnitudes, units, indicators, relative size, and numerical trends and patterns.[9] The lowest mean score is estimated in the change the relationships area that involves understanding fundamental types of changes and recognizing when they occur to use suitable mathematical models to describe and predict change.

77. As mathematics is a major domain for PISA 2022, 15-year-old students' performance in cognitive process and content areas, as conceptualized in PISA 2022 Mathematics Framework, can be analyzed in detail. Figure 2.4 shows subscales related to processes. Mongolian 15-year-old students performed better in the employing process, i.e., the ability of students to apply mathematical concepts, facts, procedures, and reasoning to solve mathematically formulated problems to obtain mathematical conclusions. The lowest mean score in performance is observed in the reasoning process, i.e., the ability to evaluate situations, select strategies, draw logical conclusions, develop and describe solutions, and recognize how those solutions can be applied in different context.

Figure 2.4: Mean scores in student performance on the mathematics content and processes



Source: OECD, PISA 2022 Database.

8 PISA in Focus 2021/115. How much do 15-year-olds learn over one year of schooling?
9 PISA 2022 Mathematics Framework.

78. One indicator for monitoring countries' progress toward achieving Target 4.1 of SDG 4 is the proportion of 15-year-olds who have achieved at least minimum proficiency levels in reading and mathematics. The baseline level of proficiency, Level 2, can be used to monitor countries' achievement of this target.

79. Mongolia has a high percentage of 15-year-old students performing below the baseline level of proficiency in mathematics, reading, and science and a low percentage of high-performing students reaching the highest levels of proficiency in the three domains.

80. In mathematics, 49 percent of students performed at least above Level 2; however, this is significantly less than, on average, across OECD countries (OECD average: 69 percent). At a minimum, these students can interpret and recognize, without direct instructions, how a simple situation can be represented mathematically (e.g., comparing the total distance across two alternative routes or converting prices into a different currency). Some 2 percent of students in Mongolia were high performers in mathematics, meaning that they attained Levels 5 or 6 in the PISA mathematics test (OECD average: 9 percent). At these levels, students can model complex situations mathematically and can select, compare, and evaluate appropriate problem-solving strategies for dealing with them. Only in 16 out of 81 countries and economies participating in PISA 2022 more than 10 percent of students attained Levels 5 or 6 proficiency.

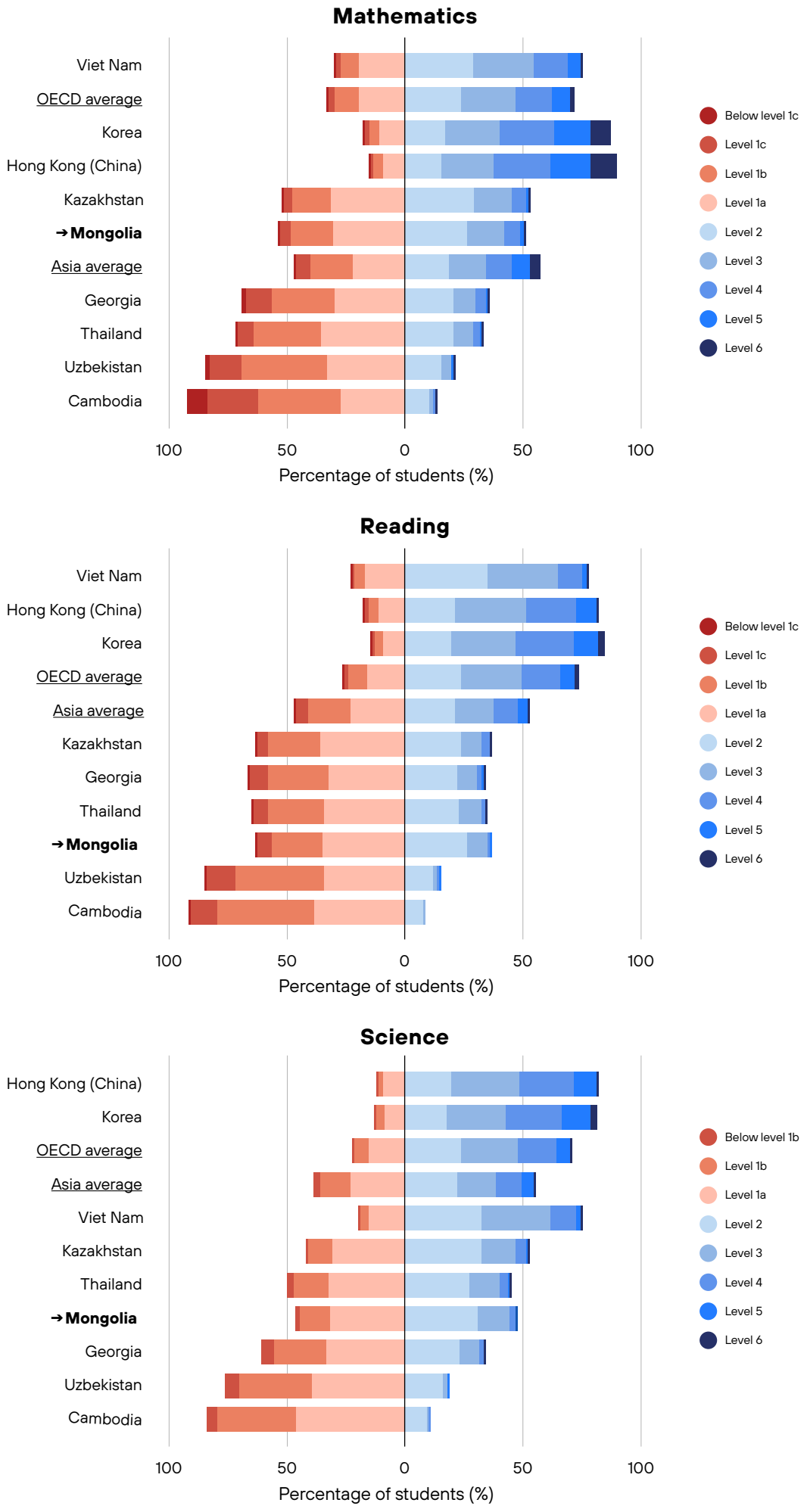
81. In reading, some 36 percent of students attained Level 2 or higher (OECD average: 74 percent). At a minimum, these students can identify the main idea in a text of moderate length, find information based on explicit, though sometimes complex criteria, and can reflect on the purpose and form of texts when explicitly directed to do so. Almost no (merely 0.02 percent) students scored at Level 5 or higher in reading (OECD average: 7 percent). These students can comprehend lengthy texts, deal with concepts that are abstract or counterintuitive, and establish distinctions between fact and opinion, based on implicit cues pertaining to the content or source of the information.

82. In science, some 50 percent of students attained Level 2 or higher in science (OECD average: 76 percent). At a minimum, these students can recognize the correct explanation for familiar scientific phenomena and can use such knowledge to identify, in simple cases, whether a conclusion is valid based on the data provided. Almost no (merely 0.2 percent) students were top performers in science, meaning that they were proficient at Levels 5 or 6 (OECD average: 7 percent). These students can creatively and autonomously apply their knowledge of and about science to a wide variety of situations, including unfamiliar ones.

83. Comparison of the percentage of Mongolian 15-year-old students who performed at least above Level 2 in the three domains with the percentage of their peers in comparator countries shows statistically significant differences. In mathematics, the percentage of Mongolian students above Level 2 is at least 15 percentage points higher than in Uzbekistan, Cambodia, Georgia, and Thailand. In science, this percentage is at least 10 percentage points higher than Cambodia, Uzbekistan, and Georgia. In reading, this percentage is statistically significantly lower by over 3 percentage points than in Uzbekistan and Cambodia

84. Compared to top performing countries such as Hong Kong (China)* and Korea, the percentage of Mongolian 15-year-old students who performed at least above Level 2 is over 35 percentage points lower. The percentage point differences are statistically significant.

Figure 2.5: Students' proficiency in mathematics, reading, and science



Source: OECD, PISA 2022 Database.

Note: Please carefully see Hong Kong (China)*.

Equity in performance in mathematics, reading, and science

85. PISA defines and measures equity in education through two related principles: inclusion and fairness. Inclusion means ensuring that all students acquire essential foundational skills. Fairness relates to students' access to quality education and, more specifically, to the degree to which background circumstances influence students' education outcomes. Inclusion and fairness in education require that all children have access to educational opportunities that lead to effective learning outcomes, irrespective of their gender, their socioeconomic status, or the language spoken at home.

Gender differences in mathematics, reading, and science performance

86. Overall, in Mongolia, girls outperform boys in all three tested areas. Figure 2.6 presents a summary of the differences between the performance of boys and girls in PISA. In mathematics, Mongolian 15-year-old girls outperformed boys by 6 score points while in reading, girls outperformed boys by 25 score points (indicating one year of learning difference). In science, girls again outperformed boys by 15 score points. All these differences are statistically significant.

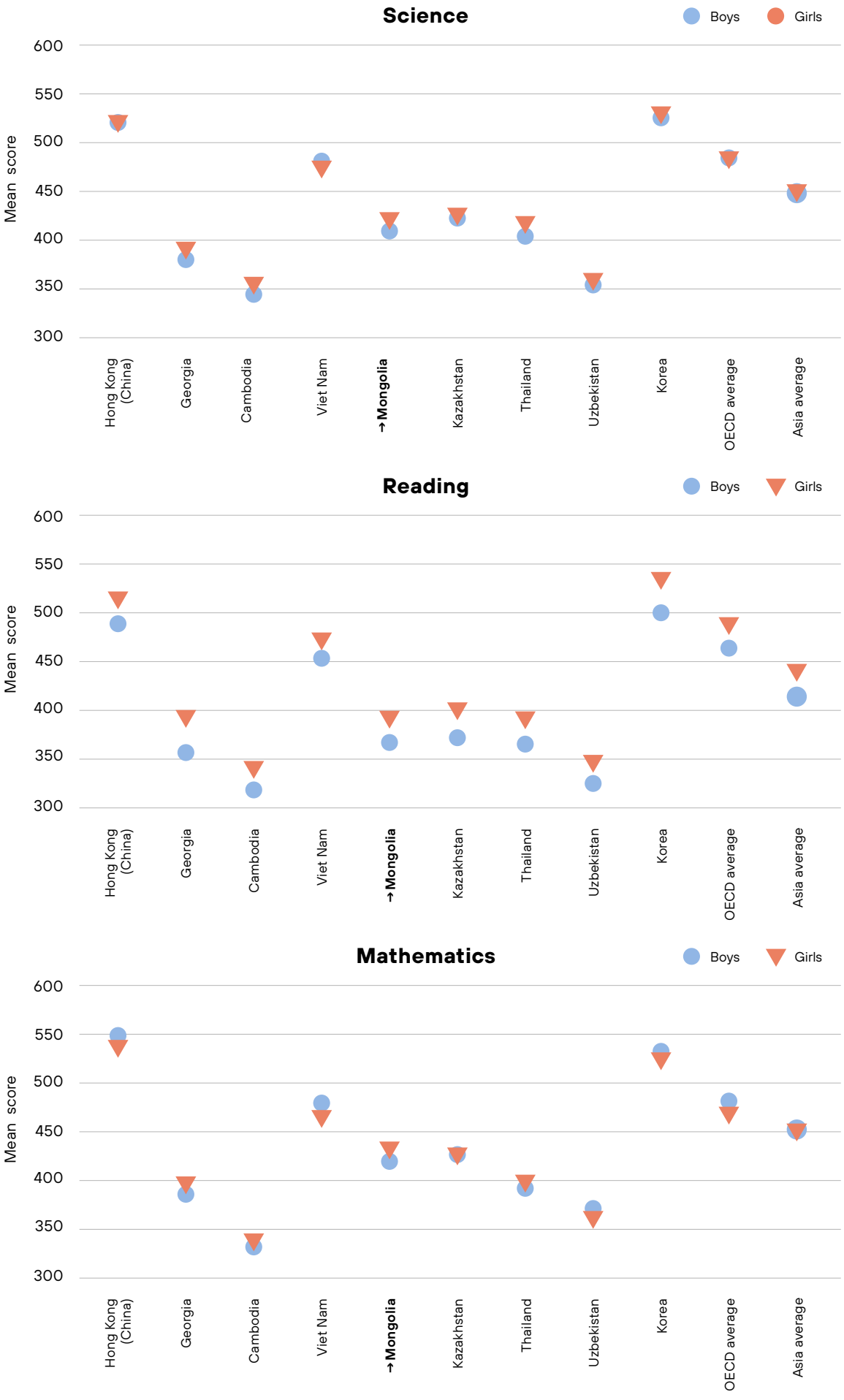
87. The share of low performers is larger among boys (53 percent) than girls (49 percent) in mathematics as well as in reading (58 percent of girls and 70 percent of boys scored below Level 2 in reading). When it comes to top performers, the share is similar among boys (2 percent) and girls (2 percent) in mathematics.

88. The gender gap in mathematics performance of Mongolian students is opposite to that observed across OECD countries and economies, where boys outperform girls. It is the same in reading. In mathematics, boys outperformed girls in 40 countries and economies, girls outperformed boys in another 17 countries or economies, and no significant difference was found in the remaining 24.

89. Compared to Asian average, similar gender gap is observed in reading and science performance. 15-year-old girls across Asian countries and economies outperformed boys in these two domains, and results are statistically significant. In mathematics, no statistically significant difference is observed between boys and girls across Asian countries and economies.

90. Figure 2.6 also shows how Mongolia gender gap in performance is compared with the benchmark countries. In mathematics, statistically significant differences between the performance of boys and girls are observed in Hong Kong (China)*, Viet Nam, and Uzbekistan. In these countries, boys outperformed girls. However, in reading, all comparator countries showed statistically significant differences between the performance of boys and girls, and girls outperformed boys by over 18 score points. This is similar to the gender gap observed in Mongolia. Meanwhile, countries except Hong Kong (China)*, Uzbekistan, and Korea presented statistically significant differences between the performance of boys and girls; except in Viet Nam, girls outperformed boys in science by 6 score points. Mongolia's gender gap in science performance is similar to countries such as Georgia, Cambodia, Kazakhstan, and Thailand.

Figure 2.6: Gender differences in mathematics, reading, and science performance in Mongolia and benchmark countries



Source: OECD, PISA 2022 Database. Note: Please carefully see Hong Kong (China)*.

Socioeconomic differences in performance

91. The equity of education systems with respect to students from different socioeconomic backgrounds can be examined using different features of the statistical relationship between students' performance in PISA and their socioeconomic status. Because this relationship is similar for all domains assessed in PISA, this section only examines the relationship between mathematics performance, main focus of PISA 2022, and the PISA index of students' ESCS (see Box 2.2).

92. In Mongolia, the average score of the students who were in the lowest quartile of the national socioeconomic scale (meaning that they were among the most disadvantaged students who took the PISA test in 2022) was 384 and those in the top quartile scored 478. There was a statistically significant difference of 94 score points. This is similar to the average difference between the two groups (93 score points) across OECD countries. Socioeconomic gap in Mongolia is similar to countries across OECD.

93. Socioeconomic status was a predictor of performance in mathematics in all PISA-participating countries and economies. It accounted for 18 percent of the variation in mathematics performance in PISA 2022 in Mongolia (compared to 15 percent on average across OECD countries).

94. Some 9 percent of disadvantaged students in Mongolia were able to score in the top quartlie of mathematics performance. These students can be considered academically resilient because, despite their socioeconomic disadvantage, they have attained educational excellence compared to students in their own country. On average, across OECD countries, 10 percent of disadvantaged students scored in the top quarter of mathematics performance in their own countries.

95. The PISA index of ESCS is computed in such a way that all students taking the PISA test, regardless of the country they live in, can be placed on the same socioeconomic scale. This means that it is possible to use this index to compare the performance of students of similar socioeconomic background in different countries.

96. Three features of the statistical linear relationship between student socioeconomic 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 other countries facing similar socioeconomic conditions. The slope indicates to what extent students with more advantageous socioeconomic backgrounds perform, on average, better than disadvantaged students, within each country. The strength indicates how well student socioeconomic status predicts their performances score—in other words, 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' of this relationship—i.e., to result in higher levels, but milder slopes and weaker relationships.

97. Figure 2.7 shows the mean performance of students (between bottom 5th and top 95th percentiles) at different levels of the PISA index of ESCS. This figure shows statistically significant results and represents several important findings related to relationship between student socioeconomic status and mathematics performance. First, the socioeconomic status of all Mongolian 15-year-olds extends well below the average index for 15-year-old students across OECD countries and economies: the line is longer to the left and shorter to the right, indicating overall a greater presence of more disadvantaged students compared to OECD countries. The greater length of the line for Mongolia also indicates a greater socioeconomic variability. Second, students with an average socioeconomic status similar to OECD countries are relatively advantaged in Mongolia; yet, their score in mathematics is almost 30 points below that of their peers in OECD countries and about 13 points lower than their peers in Asian PISA countries. The most advantaged students in Mongolia systematically perform well below similarly advantaged students across OECD countries and economies. In fact, the performance of Mongolia's students lies below the performance achieved by similar students in OECD countries at all levels of socioeconomic status. Third, a positive value (33.3 points) for the slope of the blue line indicates that in Mongolia, advantaged students generally performed better than disadvantaged students. In mathematics, students with a one-unit higher index of ESCS on average scored 33.3 points higher in mathematics. This gradient, or socioeconomic gap, is slightly smaller than the one observed in OECD countries (39.7 points), but it is greater than that observed in PISA Asian countries (27.6 points). Fourth, the strength of the blue line indicates that 20 percent of the total variation in student performance in mathematics was associated with socioeconomic status. This is similar to that in OECD countries; the strength of the relationship in PISA Asian countries and economies is less than 0.1, indicating that less than 10 percent of the variability in mathematics performance can be accounted for by students' socioeconomic status.

Box 2.2: Definition of socioeconomic status in PISA

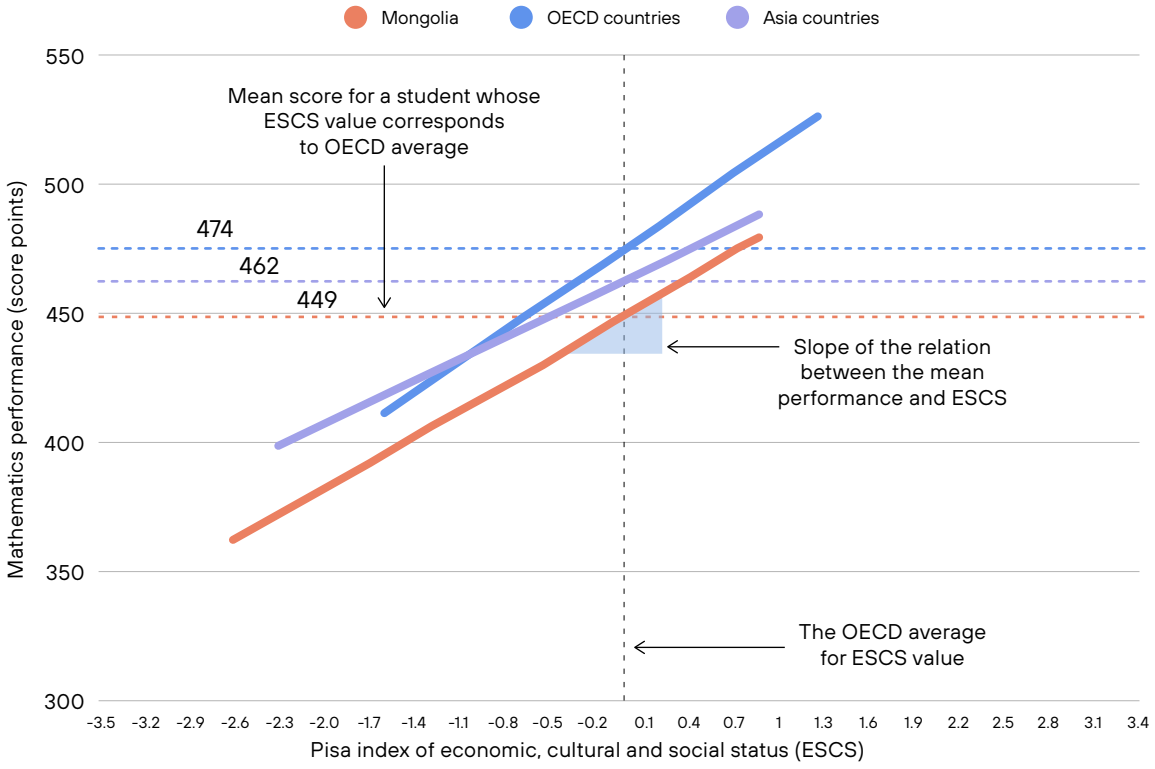
Socioeconomic status is a broad concept. PISA estimates a student's socioeconomic status by using the PISA index of ESCS, which is derived from several variables related to students' family background: parents' education, parents' occupations, number of home possessions that indicate the household's material wealth, and number of books and other educational resources available in the home. The PISA index of ESCS 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 socioeconomically advantaged if they are among the 25 percent of students with the highest values on the ESCS index in their country or economy; students are classified as socioeconomically disadvantaged if their values on the ESCS index are among the bottom 25 percent of their country or economy. Following the same logic, schools are classified as socioeconomically 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, 16.6 percent of the students assessed by PISA in Mongolia are in the lowest 20 percent of students internationally.

Source: PISA 2022 Assessment Framework .

Figure 2.7: Students' socioeconomic status and mathematics performance in Mongolia, OECD, and Asia



98. Figure 2.8 compares the mean performance for the 25 percent of boys (and girls) with the lowest socioeconomic status to the 25 percent of boys (and girls) in the highest socioeconomic status in Mongolia. Figure 2.8 shows the following results.

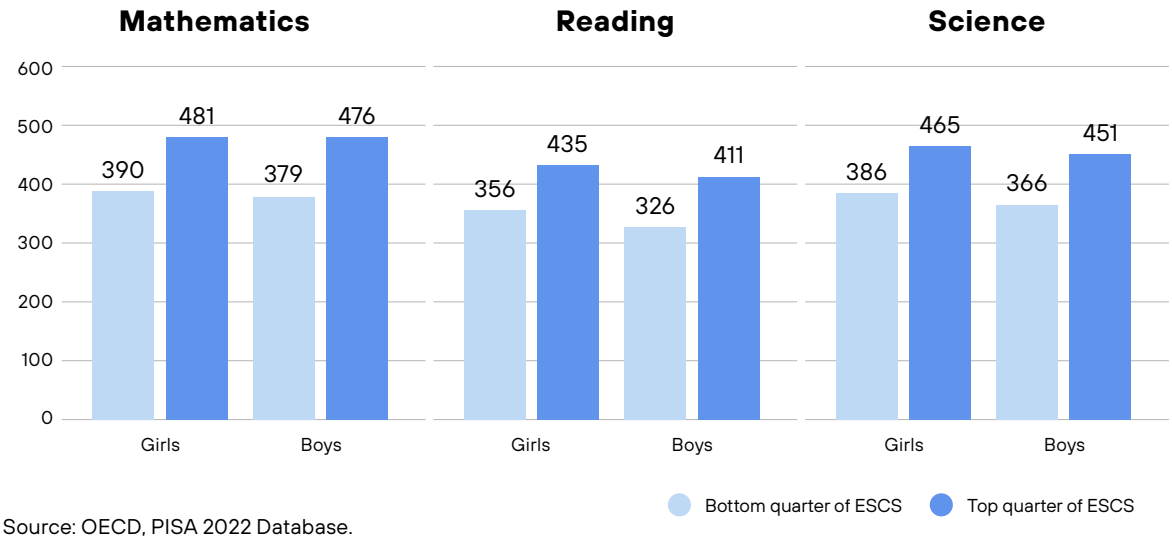
99. Socioeconomically advantaged girls outperform disadvantaged girls, and a statistically significant score point difference of 91 is observed in mathematics. There is similar mean difference between socioeconomically advantaged and disadvantaged boys' performance in mathematics; nevertheless, it is statistically significant.

100. In addition, a 12 score point difference in mathematics performance between 25 percent of boys and girls with the lowest socioeconomic status is also statistically significant; however, mean score difference was not statistically significant for 25 percent of boys and girls with the highest socioeconomic status.

101. Socioeconomically advantaged girls (boys) statistically significantly outperform disadvantaged girls (boys) in reading and science. In reading, the mean score difference between advantaged and disadvantaged girls (boys) is estimated as 80 score points (81 score points). In science, this difference is 79 score points (113 score points). Science and reading performance differences are statistically significant.

102. In reading, statistically significant differences in mean scores between socioeconomically disadvantaged boys and girls amount to 30 score points. The performance mean difference between advantaged boys and girls is 24 score points. Both differences are statistically significant.

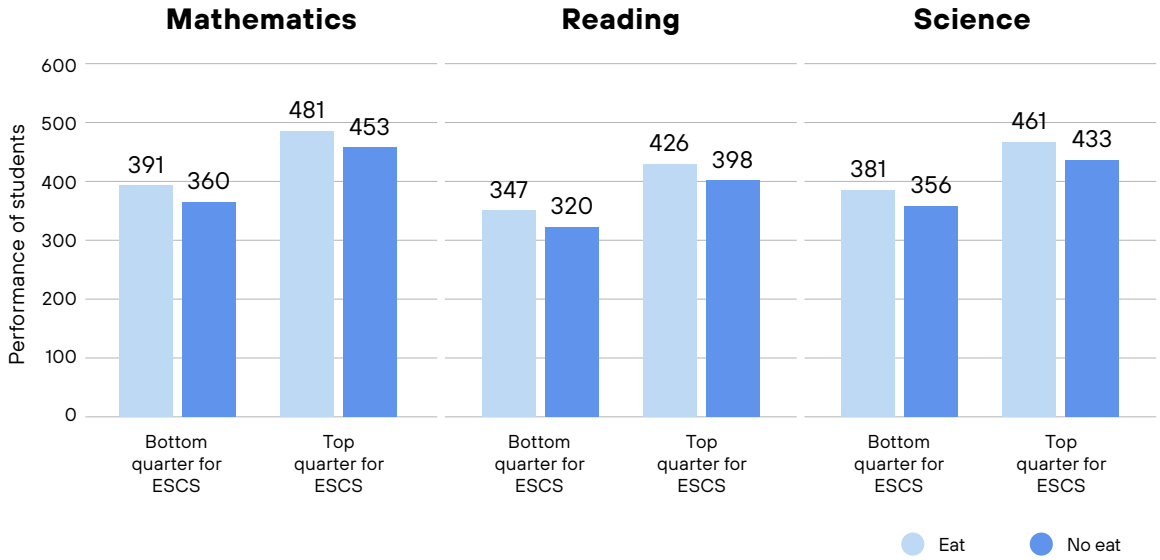
Figure 2.8: Performance among socio-economic disadvantaged Mongolian students relative to advantaged students



Source: OECD, PISA 2022 Database.

103. There is a new question in PISA 2022 student questionnaire: "In the past 30 days, how often did you not eat because there was not enough money to buy food." The response options are "Never or almost never," "About once a week," "2 to 3 times a week," "4 to 5 times a week," and "Every day or almost every day." Around 13 percent of 15-year-old students in Mongolia reported they did not eat at least once a week because there was not enough money to buy food. For analysis, these students are classified as 'do not eat'. Further disaggregation of the share by the students' socioeconomic condition shows a negative and monotonic relationship between both measures: the share reduces when the ESCS index increases, and among the students in the more disadvantaged quartile the share is twice the size compared to the students in the top quartile (17% vs 8% respectively). Mean differences in mathematics, reading, and science between socioeconomically advantaged (highest 25 percent) and disadvantaged (lowest 25 percent) students who responded 'do eat' or 'do not eat' are estimated; statistically significant results indicate that performances in three domains of advantaged students who 'eat' are higher than those who do not eat. The same result is also observed for disadvantaged students.

Figure 2.9: Mean difference in mathematics, reading, and science performance of advantaged and disadvantaged students who responded as 'do eat' and 'do not eat'



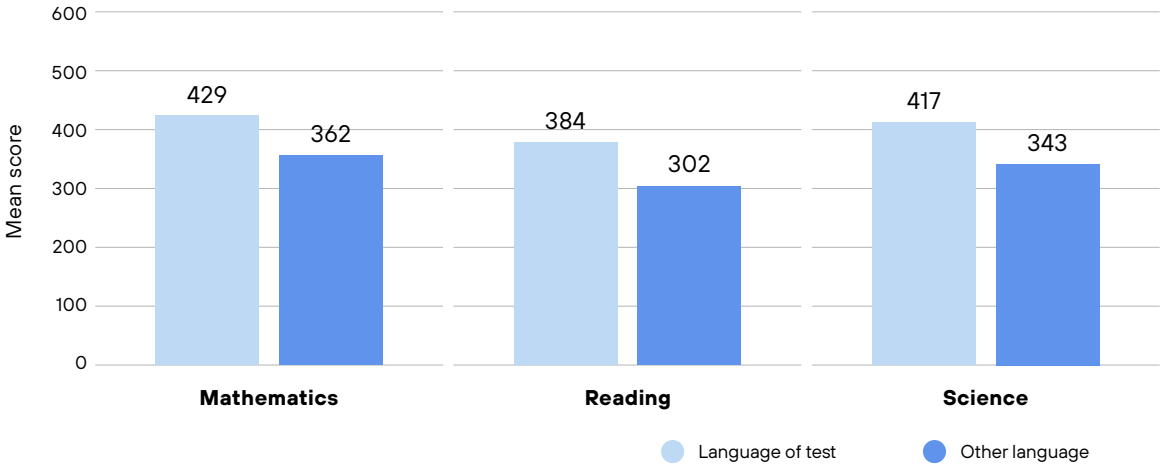
Source: OECD, PISA 2022 Database.
Note: Please carefully see *Hong Kong (China)**.

Differences in performance by language spoken at home

104. Speaking a different language at home than the language of instruction in school is one of the barriers to learning that students must try to overcome.

105. Figure 2.10 shows that in mathematics, reading, and science, students who speak the test language at home largely outperform students who speak a different language at home. In mathematics, the students who spoke the same language as the test language scored 67 points higher than students who speak any other language at home. The differences are 82 score points in reading and 74 score points in science.

Figure 2.10: Score point differences in mathematics, reading, and science, by whether students speak the test language

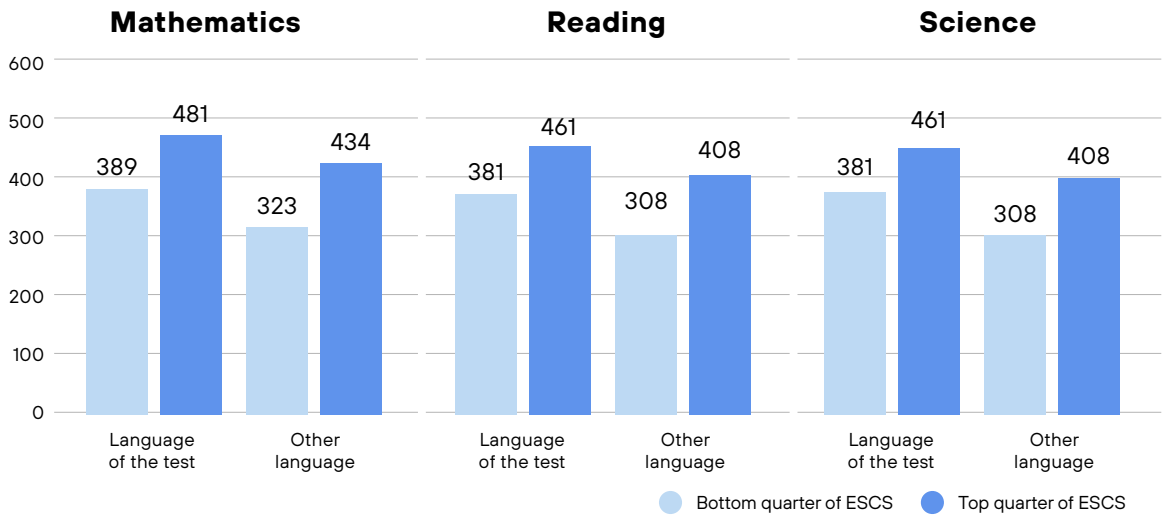


Source: OECD, PISA 2022 Database.

106. Figure 2.11 shows Mongolian 15-year-old students' mean score differences in three domains between those who speak language of test (Mongolian and Kazakh), in both the bottom and top national quartiles of ESCS. For students who speak language of test, socioeconomically advantaged students outperformed disadvantaged students by 92 score points in mathematics and 80 score points in reading and science. For students who do not speak language of test, socioeconomically advantaged students outperformed disadvantaged students by 111 score points in mathematics and 100 score points in reading and science.

107. The achievement gap between students who speak language of test and other languages is smaller for students in the top quarter of socioeconomic status compared to those in the bottom quarter. However, students who speak other languages in the top socioeconomic quartile also perform significantly behind students who speak language of test in top socioeconomic quartile (47 points in mathematics, 50 points in reading, and 53 points in science).

Figure 2.11. Performance in mathematics, reading, and science, by language of the test



Source: OECD, PISA 2022 Database.

108. Performance difference between students with the test language and those without the test language is also observed in other national assessment in Mongolia. The Education Law of Mongolia enables Kazakh children to learn primary education in their mother language; from junior secondary, they are required to learn in Mongolian language.

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

109. Ensuring consistently high standards across schools is a formidable challenge for any school system. Some performance differences between schools may be related to the socioeconomic 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, different types of schools 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 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 offering greater school choice (Hsieh & Urquiola, 2006; Söderström & Uusitalo, 2010; Willms, 2010).

110. Score point differences in mathematics, reading, and science were analyzed between city, aimag, and soum students. The analysis showed statistically significant results on the differences in performance between city and aimag, city and soum, and aimag and soum students. According to Figure 2.12, in three domains, Mongolian 15-year-old students in city outperformed aimag and soum students. Score point difference in student performance is estimated as over 31.4, which indicates that aimag and soum students lag over 1.5 year behind their peers in city. There is a 1-year learning gap between aimag and soum students and a comparatively bigger gap of more than 2.5 years of learning (>51 points) between city and soum students. The differences shown in Figure 2.12 are estimated before accounting for the socioeconomic status, and it is statistically significant. There are no statistically significant differences after accounting for the socioeconomic status.

Box 2.3: How PISA and Mongolia national report define urban and rural schools

PISA definition

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

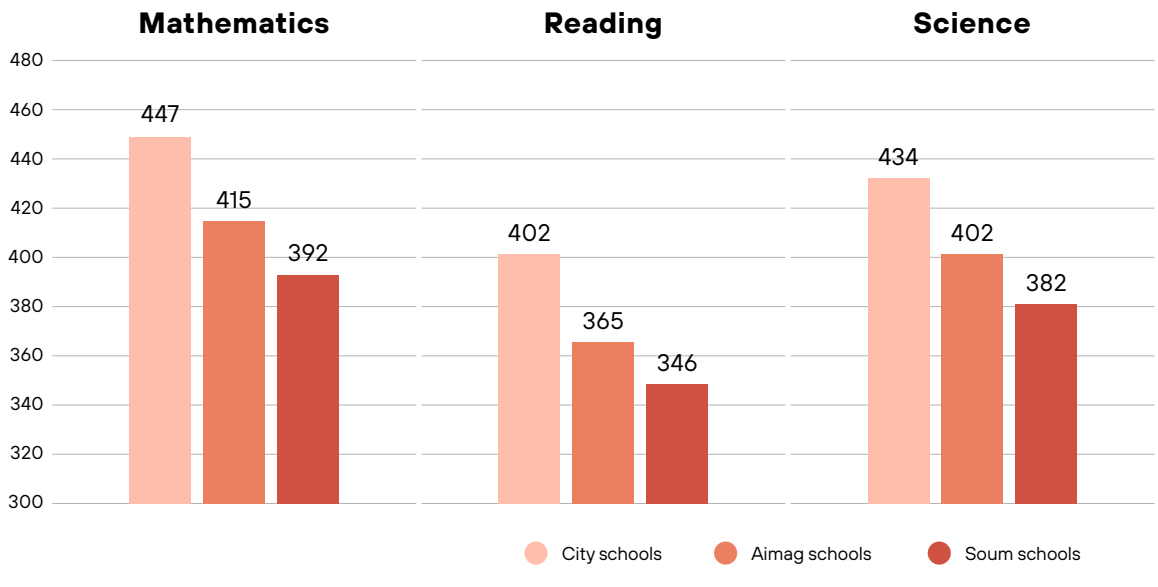
- A village, hamlet ,or rural area (fewer than 3,000 people)
- A small town (3,000 to about 15,000 people)
- A town (15,000 to about 100,000 people)
- A city (100 000 to about 1 000 000 people)
- A large city (1,000,000 to about 10,000,000 people)
- A megacity (with over 10 000 000 people)

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', 'a large city', or 'a megacity'.

National report definition

In the national report, urbanicity used how schools are registered in Education Statistics and Information System under the Ministry of Education and Science, Mongolia This categorization is different from how the PISA International Report used. Thus, there are differences in analysis interpreted in the national and international reports.

Figure 2.12. Score point difference in mathematics, reading and science between city, aimag and soum students

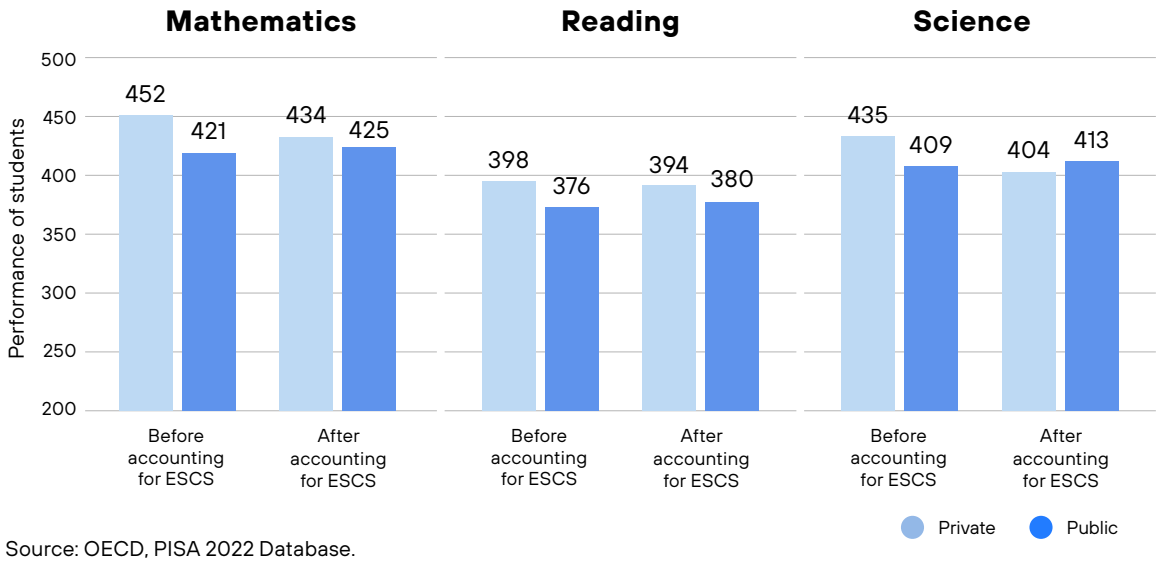


Source: OECD, PISA 2022 Database.

111. In Mongolia, commonly perceived performance gap exists between public and private school students, and even the national assessment highlights it. Thus, further analysis on differences in students' performance is done considering student socioeconomic status as private schools tend to have more advantaged students.

112. As Figure 2.13 shows, in mathematics and science, mean scores of performances of students in private schools are statistically significantly higher than students in public school before accounting for socioeconomic status of students and schools. However, after accounting for the socioeconomic status, no statistically significant differences are observed in mathematics and science. In reading, statistically significant mean score differences in student performance are observed both before and after accounting for the socioeconomic status.

Figure 2.13: Mean differences in performances of students in public and private schools after and before accounting for student ESCS



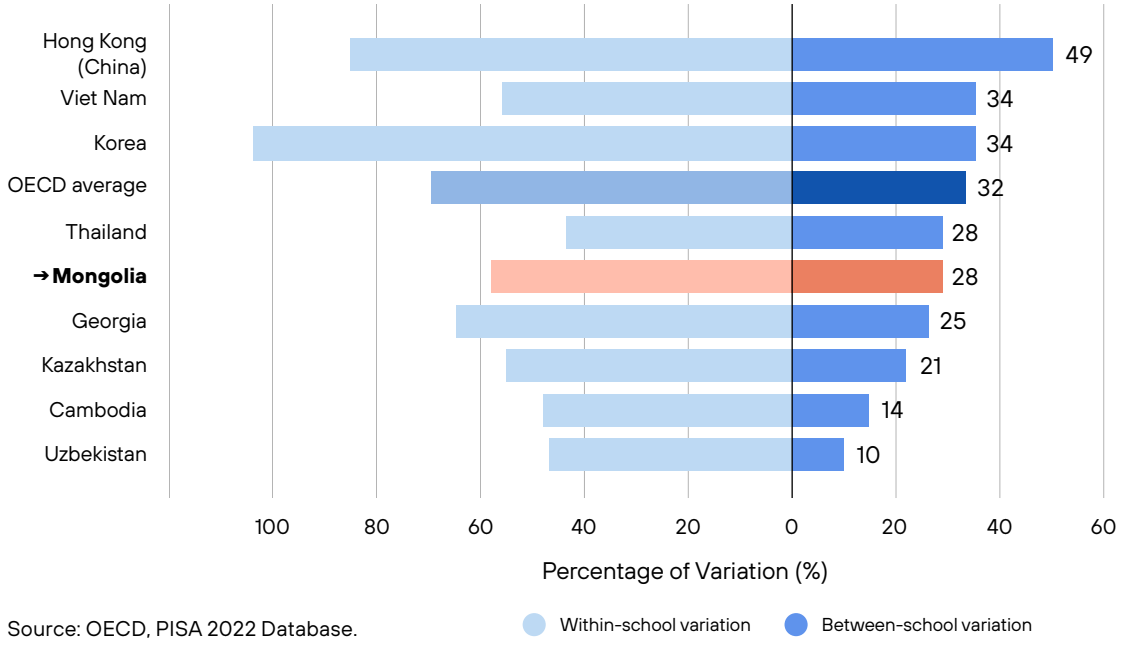
Source: OECD, PISA 2022 Database.

113. PISA results consistently show that in many education systems, average performance measured at the school level varies within and between schools. How the variation in performance is distributed between and within schools is often related to the degree of socioeconomic diversity across schools.

114. Figure 2.14 represents the variation in student performance in mathematics between and within schools in Mongolia compared to the OECD average and the comparator countries. The overall length of the bar represents the total variation in Mongolia as a proportion of the OECD average level of variation in performance. The blue part of the bar represents the proportion of differences that is observed between schools, and the gray part of the bar represents the proportion observed within schools. It is important to note PISA's specific nature of aggregating student data at the school level. There is performance variation in 15-year-old students, between and within schools.

115. Figure 2.14 shows that in Mongolia, 28.2 percent of the variation in mathematics performance of 15-year-old students was observed between schools (right side) and 56.2 percent of the variation was observed within schools (left side of the figure). As indicated above, the presence of public and private schools as well as school location can explain variation between schools in student performance. In Uzbekistan and Cambodia, between-school differences accounted for less than 15 percent of the total variation in mathematics performance. By contrast, in the remaining countries, these differences are observed for more than 21 percent of the total variation in the performance.

Figure2.14: Variations in mathematics performance between and within schools



Source: OECD, PISA 2022 Database.

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The well-being of 15-year-old students in Mongolia

03

This chapter examines the psychological and social well-being of students in Mongolia. These subjective dimensions of well-being are explored through an indicator of overall life satisfaction and through students' perceptions of the school environment as safe and supportive, including their experience of bullying. The chapter also examines the associations between students' well-being and the achievement and attainment outcomes that are discussed in Chapter 2 as well as between students' well-being and their expectations for the future.

117. This chapter focuses on the subjective well-being of 15-year-olds in Mongolia, specifically their current psychological and social well-being at school, the relationship of these dimensions of well-being with their academic achievement, and the expectations they hold for their future.

118. A student-centered perspective on education recognizes the importance of monitoring not only the academic attainment and achievement of children but also the psychological and social dimensions of their well-being. In the past, the lack of representative and reliable data often limited the capacity of educators and policy makers to target their efforts in this area and to monitor the effectiveness of their action. More recently, during the COVID-19 pandemic, school closures and other restrictions may have affected not just the learning trajectories of young people but also their well-being and opportunities to socialize and imagine their future.

119. It is important to invest in the future of children and adolescents, and therefore in their learning. It is 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 (capabilities) to pursue what they value in life (Sen, 1999).

120. PISA 2022 questionnaires asked 15-year-old students to provide overall (subjective) evaluations of life satisfaction and describe their expectations for their future as young adults. Because of its educational focus and policy orientation, PISA highlights aspects of psychological and social well-being which are more closely related to adolescents' school experience and perception of their school environment as safe and supportive. The PISA 2022 measures of well-being are described in detail in Box 3.2, Box 3.3, and Box 3.4.

121. By age 15, adolescents have spent a considerable amount of time in the classroom: engaging in lessons, socializing with classmates, and interacting with teachers and other staff members. The experiences they have in school are interconnected with their mental health, happiness and satisfaction in different aspects of life, including aspirations for the future. At the same time, their well-being at age 15 and aspirations for the future are the cumulative result of many other influences over their life course—genetic disposition and early physical and cognitive development, past exposure to environments that promote their healthy development, and access to the required resources in their families and communities and school. While this chapter highlights some of the associations between well-being outcomes and contemporary school and education-related factors, it also acknowledges the importance of other factors in shaping the well-being of 15-year-olds and their aspirations.

Box 3.1: Can subjective well-being be compared across countries?

Some caution is needed in interpreting the PISA 2022 results on well-being. 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 countries across countries within the OECD and subpopulations cannot be guaranteed; however, it can be compared with the benchmark countries.

The PISA questionnaires use student self-reports to derive measures of well-being. 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 way 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 known only to the respondent 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 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.

Comparisons within and across countries are also affected by response rates, which may differ across groups of respondents. PISA 2022 represents the distribution of academic achievement in the population by using non-response adjustments and by assigning imputed values (i.e., values estimated from a model, based on known information about the respondent) for reading, mathematics, and science proficiency estimates. However, sSelf-reported outcomes based on questionnaire measures remain affected by nonresponse, e.g., if low-achieving students find it hard to complete the questionnaire. For indicators reported in this chapter—the index of being bullied, the index of feeling safe, the index of sense of belonging at school, the index of the quality of student-teacher relationships—the overall level of missing data in Mongolia ranges from 0.8 percent to 3 percent.

In PISA 2022, students are not asked to respond to all questions in their questionnaire. Within-construct matrix sampling was used, where different respondents receive different sets of items to reduce student burden while maintaining content coverage across relevant areas. This method is viable due to the limited time available for the questionnaire and the large sample size in large-scale assessments. With this approach, every student received questions on all constructs but only answered a subset of all questions for each construct, thus resulting in a complete database in terms of construct-level indexes.

Levels of life satisfaction among 15-year-old students

Box 3.2: PISA 2022 measures of well-being: Students' satisfaction with life

The main measure of psychological well-being is based on a general life satisfaction scale. The PISA 2022 questionnaire asked students to rate their lives 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 also used in PISA 2018 and 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), 5 or 6 as 'moderately satisfied', 7 or 8 as 'satisfied', and 9 or 10 as 'very satisfied'.

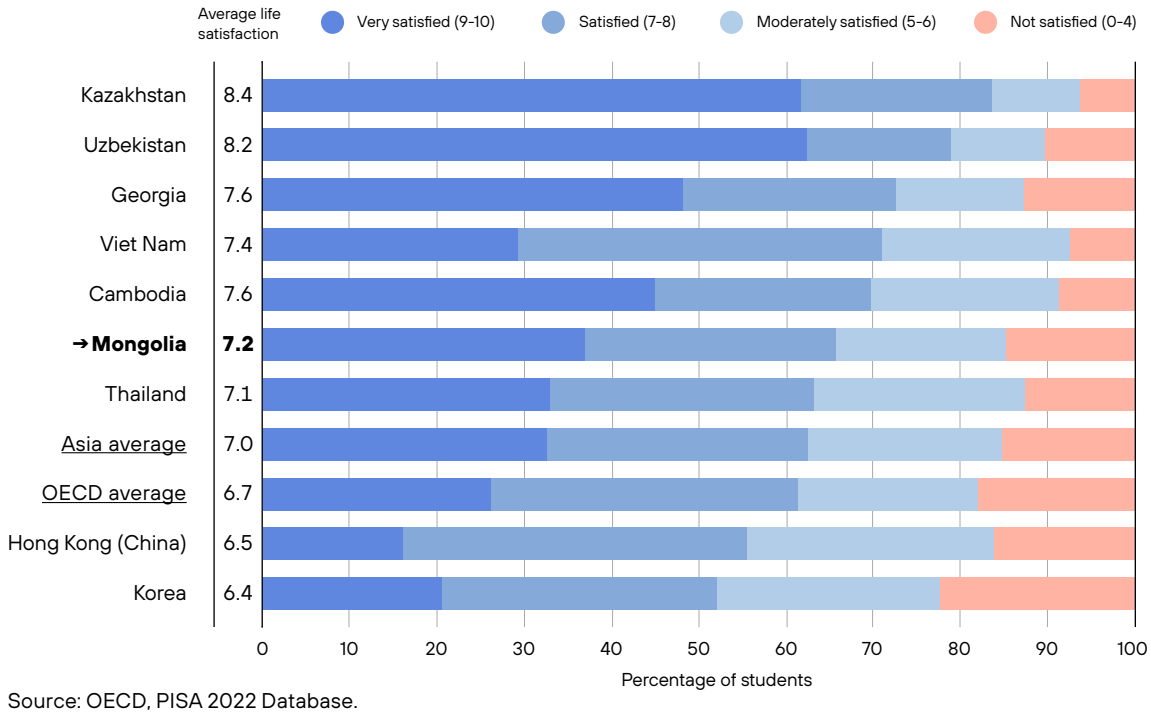
Life satisfaction among students in Mongolia

122. Children may strive to do their best when they are joyful and have a strong sense of purpose in their lives. But no matter how supportive and encouraging schools and families are, students suffer when they are unhappy and cannot find meaning in their lives. This is especially true for 15-year-olds, who are in the middle of adolescence—a period of rapid change when social, emotional, cultural, and economic influences on health and well-being may be established for life (OECD, 2019).

123. In Mongolia, on average, 15-year-old students are satisfied with their lives: they report 7.2 on a scale of life satisfaction that ranges from 0 to 10 (Figure 3.1). The percentage of 15-year-old students satisfied with life in Mongolia is 65.8 percent ('very satisfied' and 'satisfied'), while 14.6 percent of students report low levels of life satisfaction and can be described as 'not satisfied with life'. This level of life satisfaction is statistically significantly higher than the mean level of life satisfaction among average students across OECD and Asian countries that participated in PISA 2022.

124. Comparing to the countries in Figure 3.1, Mongolian 15-year-olds reported levels of life satisfaction similar to Thailand students. Mongolian students showed lower levels of life satisfaction than peers of Cambodia, Georgia, Uzbekistan, and Viet Nam but higher levels of satisfaction than peers of Hong Kong (China)* and Korea.

Figure 3.1: Life satisfaction among 15-year-old students



Source: OECD, PISA 2022 Database.
Note: Students rated their satisfaction with life on a 0 to 10 scale.

Gender and socioeconomic differences in life satisfaction

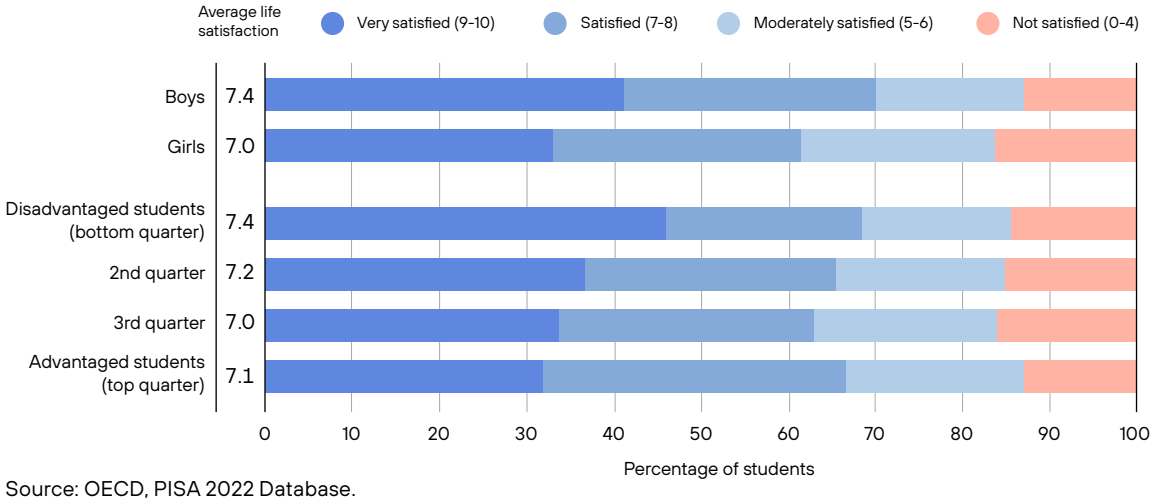
125. Research indicates that a wide range of individual characteristics, including gender, socioeconomic status, and immigrant background, has a modest role in students' self-reported life satisfaction (Chen et al., 2019; Crede et al., 2015; Huebner, Drane, & Valois, 2000). For example, several studies find that adolescent boys are more satisfied with their lives than girls (Levin, Dallago, & Currie, 2012; Soares, Pais-Ribeiro, & Silva, 2019]). Other studies, however, have found no or little difference in life satisfaction between boys and girls (Huebner, Drane, & Valois, 2000; Neto, 1993)

126. Figure 3.2 shows differences in self-reported life satisfaction by gender and socioeconomic status in Mongolia. In Mongolia, 15-year-old boys reported a higher level of life satisfaction than girls; the difference is statistically significant (7.4 points on the life satisfaction for boys and 7.0 for girls). More boys are 'very satisfied' and 'satisfied' than girls: the difference is 9 percentage points.

127. Self-reported life satisfaction of 15-year-old students varies by socioeconomic status. Figure 3.2 shows that socioeconomically disadvantaged students, those at the bottom and 2nd quartiles of

the index's distribution, reported slightly more life satisfaction than the remaining students in the 3rd and top quartiles. Average difference in life satisfaction between students in the top quarter and those in the bottom quarter of this index is 0.3 points and is statistically significantly. The results show that greater wealth does not necessarily buy greater life satisfaction (Kahneman & Deaton 2010). However, this finding should be interpreted with some caution, as the reasons driving greater life satisfaction among disadvantaged students compared to advantaged students are not clear.

Figure 3.2: Differences in self-reported life satisfaction by gender and socioeconomic status in Mongolia



Source: OECD, PISA 2022 Database.

Do students perceive their school environments as safe and supportive?

128. School is central to the daily life of many youths in Mongolia. Academically successful students often perceive their peers and teachers as supportive; they view schooling as essential to their future well-being; and this attitude is reflected in their participation in academic pursuits. Negative school environment is associated with negative emotions, such as feeling physically or psychologically unsafe, feeling threatened by other students, intimidated by their teachers, or feeling lonely and out of place.

Box 3.3: PISA 2022 measures of well-being: Safe and supportive school environments

Four indicators in PISA 2022 measure the extent to which school environments are perceived as safe and supportive for students' well-being.

The index of feeling safe is a general measure of students' feelings of safety at and around school. It is constructed from the responses, reported on a four-point agreement scale ("strongly disagree," "disagree," "agree," "strongly agree"), about the extent to which students feel safe on their way to school, on their way home from school, in classrooms at school, and at other places in school, such as in hallways and at the cafeteria. While the overall index values can help identify vulnerable groups, the proportion of students who disagree with individual questions from which the overall index is built can help understand the situations in which vulnerable students are most likely to feel unsafe.

Two other sets of questions address the quality of relationships with peers at school.

First, PISA asked students about their experiences with bullying-related behaviors at school. It distinguished four types of bullying in particular: physical, relational, verbal, and extortion. In detail, PISA 2022 asked students how often ("never or almost never," "a few times a year," "a few times a month," "once a week or more") during the 12 months prior to the PISA test they had the following experiences in school (the question indicated that "Some experiences can also happen in social media"): "Other students left me out of things on purpose" (relational bullying); "Other students made fun of me" (verbal bullying); "I was threatened by other students" (verbal bullying); "Other students took away or destroyed things that belong to me" (extortion bullying); "I got hit or pushed around by other students" (physical bullying); "Other students spread nasty rumours about me" (relational bullying); "I was in a physical fight on school property" (physical bullying); "I stayed home from school because I felt unsafe" (any type); "I gave money to someone at school because they threatened me" (extortion bullying). These statements were combined into a single index, the index of exposure to bullying, such that the average value of the index is 0 and the standard deviation is 1 across OECD countries. Positive values in this index indicate that the student is more exposed to bullying at school than the average student in OECD countries; negative values in this index indicate that the student is less exposed to bullying at school than the average student in OECD countries. Students were classified as being "frequently bullied" if they were among the 10 percent of students with the highest values in the index of exposure to bullying across all countries and economies with available data (a value greater than 1.51 in the index of exposure to bullying). This cut-off was selected because most of the students at or above this level were frequently exposed (at least a few times a month) to the three forms of bullying measured by the index.

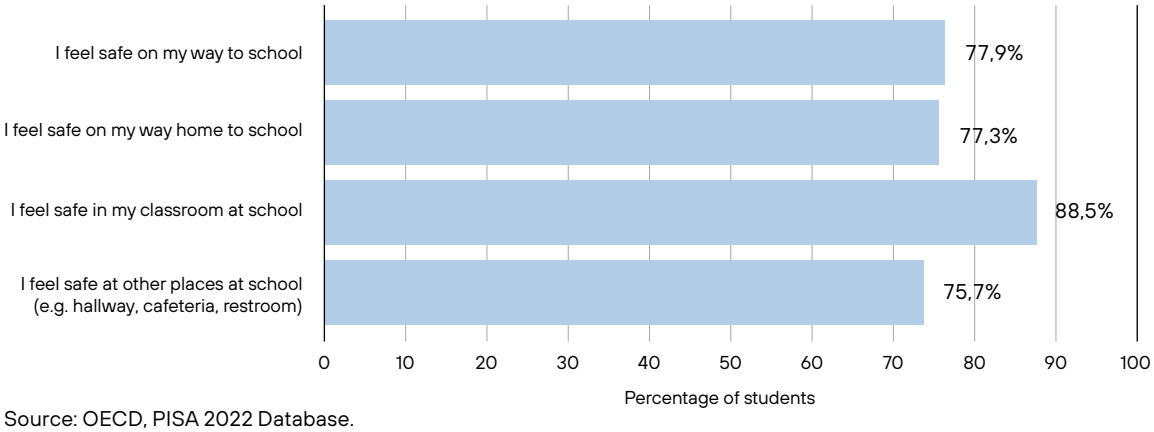
Second, PISA measured students' sense of belonging at school by asking students whether they agree ("strongly disagree," "disagree," "agree," "strongly agree") with the following statements about their school: "I feel like an outsider (or left out of things) at school;" "I make friends easily at school;" "I feel like I belong at school;" "I feel awkward and out of place in my school;" "Other students seem to like me;" and "I feel lonely at school." These statements were combined to create the index of sense of belonging whose average is 0 and standard deviation is 1 across OECD countries. Positive values on this scale mean that the student has a stronger sense of belonging at school than the average student in OECD countries. 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 most of the positive indicators of sense of belonging and disagree (or strongly disagree) with most of the negative indicators of sense of belonging. Values below –2 indicate the lowest levels of sense of belonging, experienced by students who disagree (or strongly disagree) with all positive indicators of sense of belonging and agree (or strongly agree) with all negative indicators of sense of belonging.

Finally, PISA investigated the quality of student-teacher relationships by asking students whether they agree ("strongly disagree," "disagree," "agree," "strongly agree") with the following statements about their teachers: "The teachers at my school are respectful towards me;" "If I walked into my classes upset, my teachers would be concerned about me;" "If I came back to visit my school three years from now, my teachers would be excited to see me;" "I feel intimidated by the teachers at my school;" "When my teachers ask how I am doing, they are really interested in my answer;" "The teachers at my school are friendly towards me;" "The teachers at my school are interested in students' well-being;" "The teachers at my school are mean towards me." These statements were combined to create the index of quality of student-teacher relationships whose average is 0 and standard deviation is 1 across OECD countries. Positive values on this scale mean that the student perceives his or her teachers as more supportive than the average student in OECD countries.

Feelings of safety

129. Most students in Mongolia reported feeling safe at and around school. Figure 3.3 shows that 78 percent of students agreed or strongly agreed that they feel safe on their way to school and 77 percent on their way home from school. Moreover, 88 percent of students reported feeling safe in classrooms at school and 76 percent at other places at school such as hallway, restroom, and cafeteria. These percentages indicate that schools and classroom are safer than other places at school or on the way between home and school.

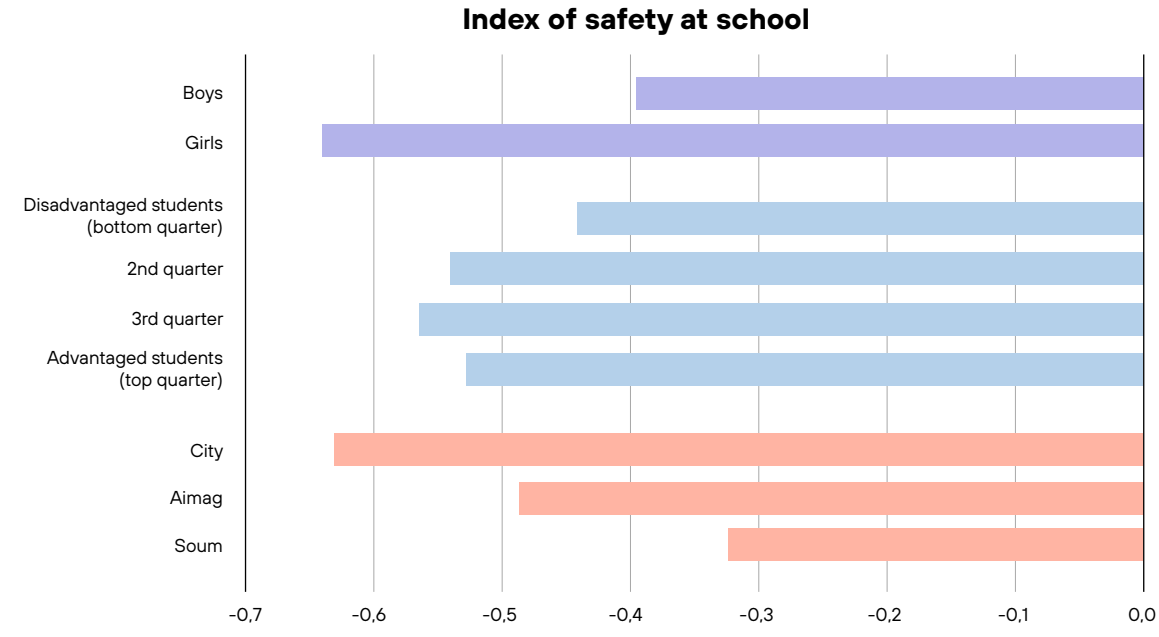
Figure 3.3. Feeling safe at or around school



Source: OECD, PISA 2022 Database.

130. The index of safety at school is a general measure of students' feelings of safety at and around school. It is constructed from the responses reported on a four-point agreement scale ("strongly disagree," "disagree," "agree," "strongly agree"), about the extent to which students feel safe on their way to school, on their way home from school, in classrooms at school, and at other places at school, such as in hallways and cafeteria (see Box 3.3). OECD average of the index is estimated as 0; negative value of the index represents less safety compared to the OECD average.

Figure 3.4. Differences in how safe different groups of students feel at or around schools in Mongolia



Source: OECD, PISA 2022 Database.

131. Across student groups, girls feel less safe at school compared to boys; students in the top socio-economic quartile feel less safe than those in the bottom quartile; students in the city feel less safe than those in aimags and students in aimags feel less safe compared to those in soums (Figure 3.4). These differences are statistically significant. The above analysis raises questions like why 15-year-old girls feel less safe at schools and why socioeconomically advantaged students feel less safe at school. To understand the results, it is crucial to examine the extent to which students' feeling of safety is associated with bullying, as described in following section.

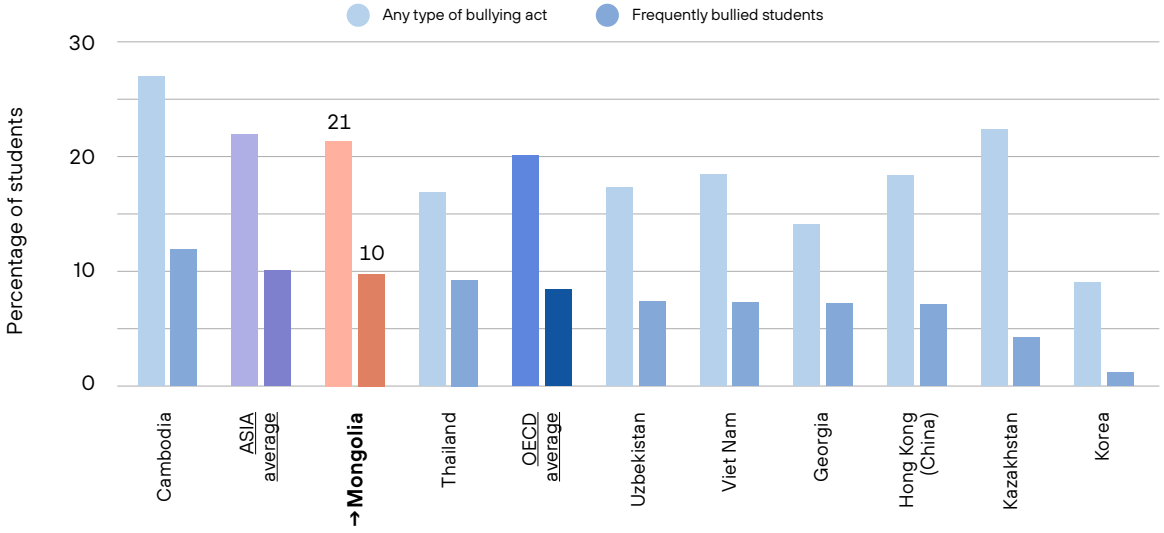
Bullying

132. Bullying at school can affect any student in any country (Nansel et al., 2004). Being a victim (or experiencing) of this violent behavior can have severe physical and emotional long-term consequences for students. Teachers, parents, policy makers, and the media are increasingly drawing attention to bullying and trying to find ways to prevent it (Phillips, 2007). Bullying is a specific type of aggressive behavior that involves unwanted, negative actions in which someone intentionally and repeatedly harms and discomforts another person who has difficulty defending himself or herself (Olweus, 1993). It is characterized by a systematic abuse of power and an unequal power relationship between the bully and the victim (Woods & Wolke, 2004). Bullying can be physical (hitting, punching, or kicking) and can involve extortion (forcing the victim to give away his/her possessions); it can also be purely verbal (name-calling and mocking) and relational (spreading gossip and engaging in other forms of public humiliation, shaming, and inducing social exclusion) (Woods & Wolke, 2004). With widespread use of ICT, cyberbullying has become another type of harassment that takes place through digital devices and tools (Hinduja & Patchin, 2010; Smith et al., 2008).

133. In 2022, PISA asked students about their experiences as victims of bullying at school. PISA measures four distinct types of bullying: physical, relational, verbal, and extortion (see Box 3.3). Figure 3.5 shows 15-year-old students' exposure to bullying in Mongolia and comparator countries. PISA 2022 asked students how often during the 12 months prior to the PISA test they experienced bullying in school. In Mongolia, 9.7 percent of 15-year-old students are classified as frequently bullied; and 21.3 percent of students reported experiencing any type of bullying including "other students made fun of me," "other students left me out of things on purpose," and "other students spread nasty rumours about me."

134. Compared to the OECD average, the percentage of Mongolian 15-year-old students who reported frequent bullying is higher; statistically significant difference of 1.2 percentage points is observed compared to OECD countries and economies. Comparing to the countries and economies in Figure 3.5, the percentage of Mongolian 15-year-olds who experienced frequent bullying is statistically significantly higher than most of them, except for Kazakhstan and Cambodia. The percentage of Mongolian students exposed to any type of bullying is statistically significantly higher than most comparator countries, except for Kazakhstan and the OECD, where no statistically significant differences are observed. Compared to Mongolia, 15-year-old students in Hong Kong (China)* and Korea experience less bullying.

Figure 3.5: 15-year-old students who reported the exposure to bullying in Mongolia and comparator countries

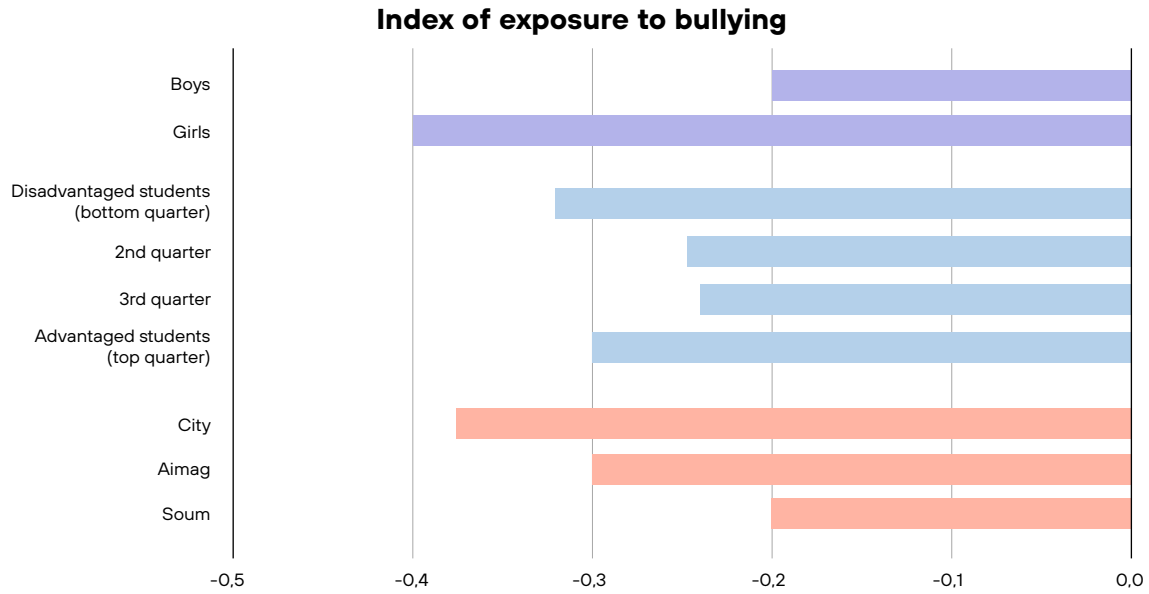


Source: OECD, PISA 2022 Database.

135. Individual characteristics can shape how students approach bullying. The international literature suggests that boys tend to be more often involved in bullying than girls (Camodeca et al., 2002; Haynie et al., 2001; Veenstra et al., 2005) and more physically violent (Rivers and Smith, 1994), while girls tend to engage in more relational aggression (Crick and Grotpeter, 1995). Moreover, it is also associated with students' socioeconomic status. In addition, bullying can be a group activity that takes place in the larger peer and school community (Hong and Espelage, 2012; Salmivalli et al., 1996). It is therefore particularly interesting to explore differences in the prevalence of bullying not just across students but also across schools.

136. Figure 3.6 shows the index of exposure to bullying (see Box 3.3) in 15-year-old students in Mongolia. According to PISA data, 15-year-old girls experience more frequent bullying than boys. Students from the top and bottom quartiles of the ESCS index distribution experience similar levels of bullying, while 3rd and 4th quartile students experience less bullying. These differences are statistically significant. Soum students are statistically significantly less exposed to frequent bullying compared to city and aimag students, and no statistically significant differences are observed in the exposure to bullying between city and aimag students.

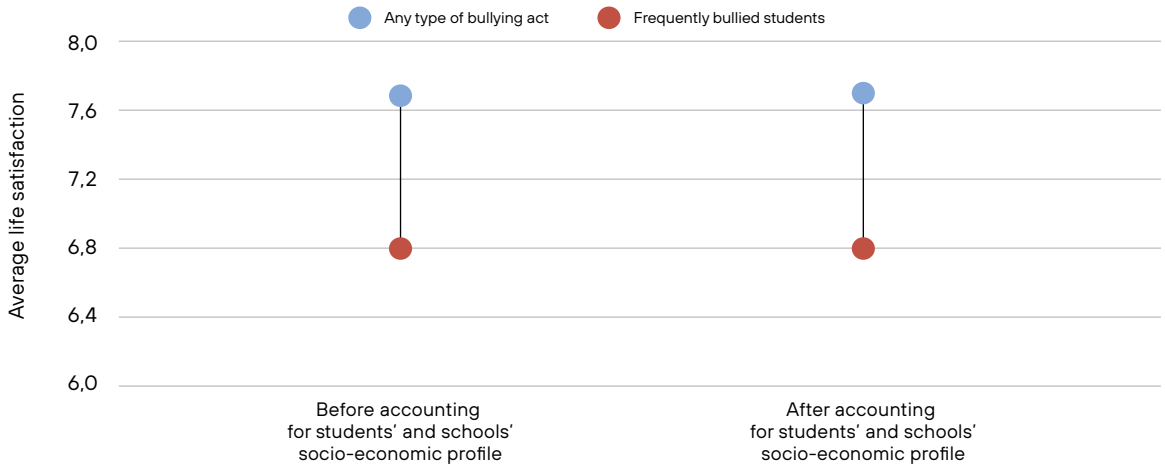
Figure 3.6: Differences in exposure to bullying among students and schools in Mongolia



Source: OECD, PISA 2022 Database.

137. As shown in Figure 3.7, students who did not experience bullying reported higher value of life satisfaction. They scored 0.8 scale points more in the life satisfaction index than those who reported bullying, before and after accounting for student and school socioeconomic status; this difference is statistically significant.

Figure 3.7: Mongolian 15-year-old students' life satisfaction and experience of bullying



Source: OECD, PISA 2022 Database.

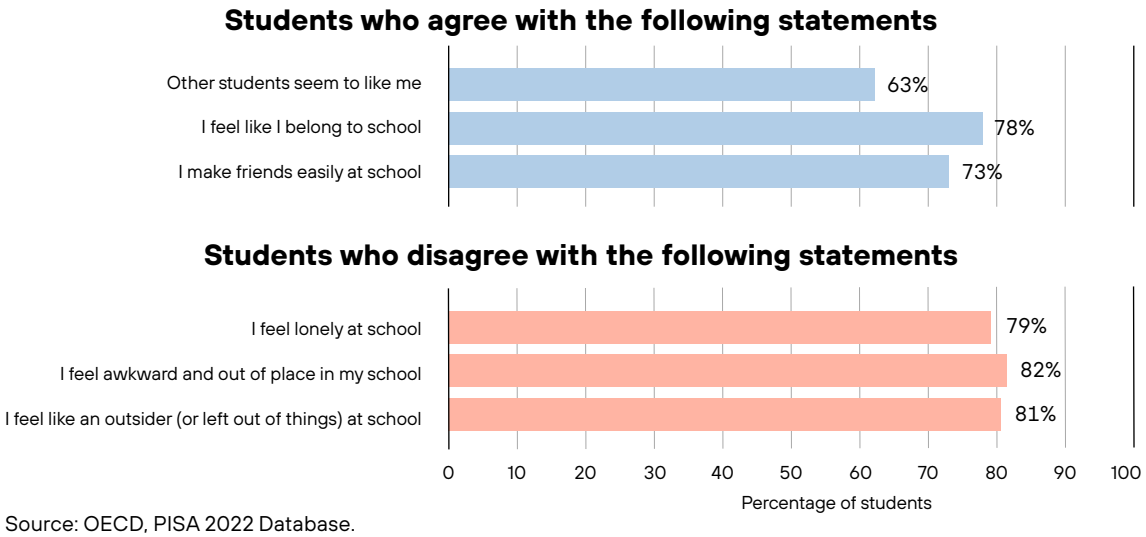
Sense of belonging at school

138. 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 and care and support from others. In school, a sense of belonging gives students feelings of security, identity, and community, which, in turn, support academic, psychological, and social development.

139. In Mongolia, as shown in Figure 3.8, 73 percent of students in Mongolia reported that they make friends easily at school (OECD average: 76 percent) and 78 percent felt that they belong to school (OECD average: 75 percent); 63 percent of students agreed that other students liked them. Therefore, most students sense that they belong to school. About 80 percent of students disagreed with negative statements such as feeling awkward and out of place in school, feeling like an outsider, or feeling lonely at school.

140. Meanwhile, 21 percent reported feeling lonely at school and 19 percent like an outsider or left out of things at school (OECD average: 17 percent and 16 percent).

Figure 3.8: Sense of belonging at school among students in Mongolia



Source: OECD, PISA 2022 Database.

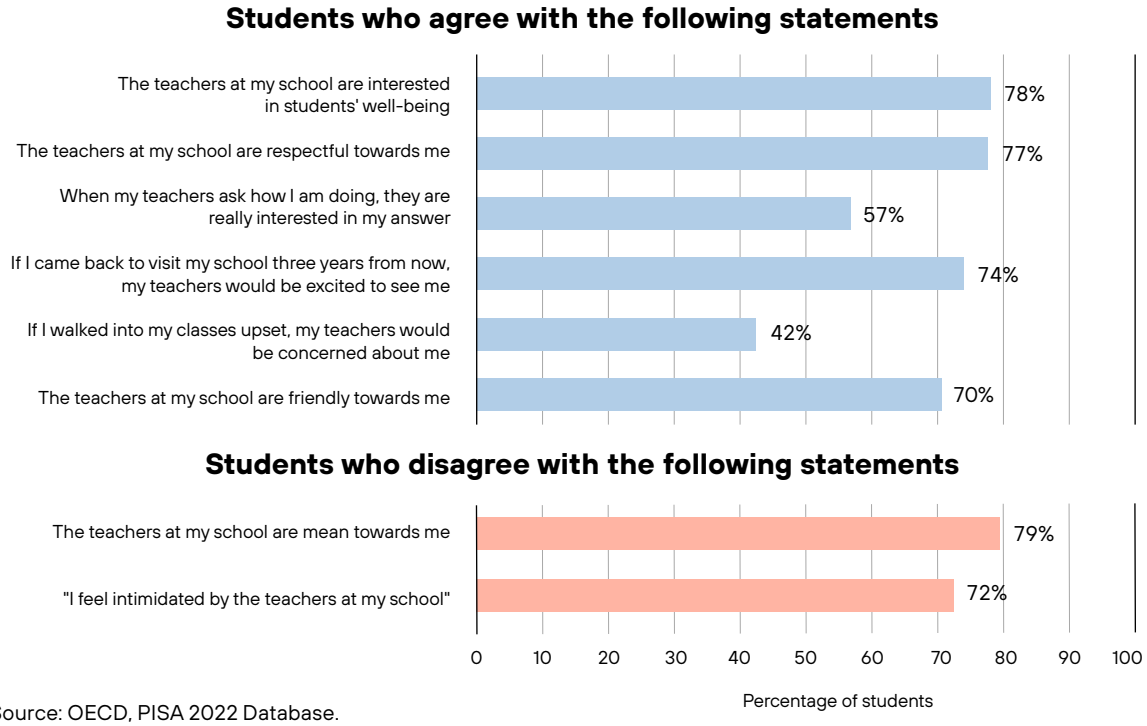
Quality of student-teacher relationships

141. Interactions between students and their teachers play a crucial role in students' learning and their feelings toward school. Students need to feel that their teachers care about them and their achievement to fully engage in learning activities and perform at their best (Federici & Skaalvik, 2014). Teachers can support students by encouraging and helping them, but also by setting goals and rules, treating them fairly, and giving them the opportunity to make their own choices (Klem & Connell, 2004; Wang & Holcombe, 2010).

142. Several studies find that teachers' emotional support is associated with better behavioral outcomes in students, such as greater engagement in learning, more academic enjoyment, and greater self-efficacy, all of which lead to greater effort and perseverance (Federici & Skaalvik, 2014; Lee, 2012; Ruzek et al., 2016; Sakiz, Pape, & Hoy, 2012). Support from teachers is also related to higher levels of intrinsic motivation and lower levels of anxiety (Pitzer & Skinner, 2017; Ricard & Pelletier, 2016; Sakiz, Pape, & Hoy, 2012; Yu & Singh, 2018).

143. Figure 3.9 shows that in Mongolia, over 70 percent of 15-year-old students agreed or strongly agreed that teachers interact positively with students, are interested in student well-being, are friendly toward them, and show respect for students. Seventy-four percent of students also expected their teachers to be excited to see them if they came back to visit school three years after the test day. Similarly, over 72 percent of students disagreed with statements indicating negative teacher-student interaction, such as that teachers are mean toward students and that students feel intimidated by the teachers at their school.

Figure 3.9: Quality of student-teacher relationships in Mongolia



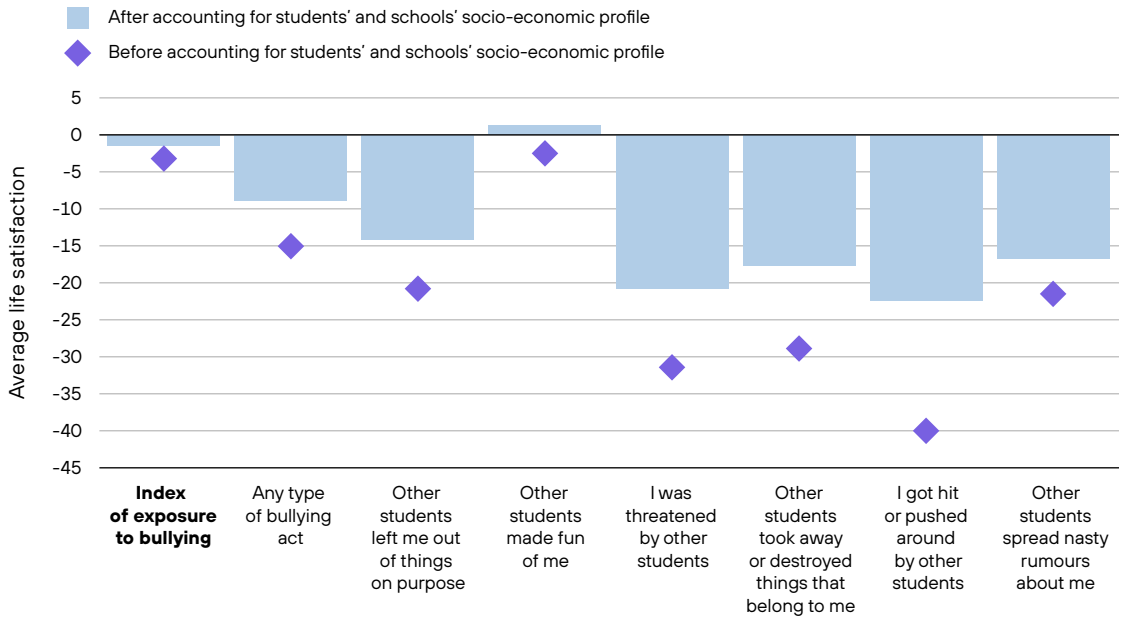
Source: OECD, PISA 2022 Database.

Student well-being and academic achievement

144. PISA 2022 data reveal that greater exposure to bullying was associated with lower performance in mathematics (Figure 3.10). Every one-unit increase in the index of exposure to bullying (equivalent to one standard deviation across OECD countries and economies) was associated with a drop of 2.9 score points in mathematics; this difference is statistically significant before accounting for their socioeconomic status, but not after accounting for it.

145. In Mongolia, the association of bullying with mathematics performance, however, varied depending on the type of bullying considered. For example, before accounting for the socioeconomic status, 15-year-old students who reported that other students threatened them at least a few times a month scored statistically significantly lower (22 points on the mathematics scale) than students who did not report this. This statistically significant score point difference is 21 after accounting for their socioeconomic status. Moreover, before accounting for their socioeconomic status, students who responded that s/he got hit or pushed around by other students scored statistically significantly lower in mathematics (40 points) than students who did not report. However, after accounting for the socioeconomic status, this statistically significant difference is estimated to be 22 score points in mathematics. By contrast, students whose peers made fun of them at least a few times a month do not show statistically significant score difference before and after accounting for students' socioeconomic status. It indicates that the experience of certain types of bullying is more prevalent among academically weaker students.

Figure 3.10: Mongolian 15-year-old students' exposure to bullying and mathematics performance



Source: OECD, PISA 2022 Database.

146. Figure 3.10 shows association between Mongolian 15-year-old students' mathematics performance and quarters of index of sense of belonging and index of the quality of student-teacher interaction. As shown earlier, students who reported least sense of belonging to school performed the lowest compared to students who reported more levels (2nd, 3rd, and top quarter) of sense of belonging. There is statistically significant score point difference in mathematics performance between students who reported the lowest level of sense of belonging and students who reported the highest level of sense of belonging. The similar statistically significant score point differences are observed between students at bottom and 2nd quartiles and students at bottom and 3rd quartiles of index of sense of belonging.

Students' expectations for the future in Mongolia

147. Adolescence is a time when youth begin to think seriously about their future; when their aspirations become more closely aligned with their interests, their abilities, and the opportunities available to them; and when their vision of themselves can be influenced by peers and adults around them (Beal & Crockett, 2010). Students' expectations for their future influence what they choose to study and the activities they pursue, which, in turn, determine subsequent accomplishments (Khattab, 2015; Nurmi, 2004).

148. Students' expectations can be self-fulfilling prophecies, as the effort students invest to meet their expectations often pay off (OECD, 2012). For example, when comparing students of similar socioeconomic backgrounds and academic achievement, students who expect to graduate from university are more likely to complete their degree than their peers who do not have such high expectations (Beal & Crockett, 2010). Conversely, students who expect to drop out of school without qualifications are more likely to do so (Morgan, 2005; Perna, 2000).

Box 3.4: PISA 2022 measures of students' expectations for the future

PISA 2022 asked students about their expectations for social mobility, the educational qualifications they expect to earn, and their occupational expectations. In addition, a set of questions focused on students' outlook on their future career and their perception of school's usefulness in preparing them for it.

Expectations for social mobility are derived from two questions—one about the current situation of the family on a 'social ladder' and other about where students expect themselves to be when they reach age 30. The instructions indicate that the response scale, which ranges from 1 to 10, represents "how society in Mongolia is set up: At the top of the scale (value 10) are the people who are the best off. They earn the most money, receive the best education, and have the most respected jobs. At the bottom of the scale (value 1) are the people who are the worst off. They earn the least money, receive no education, and have no jobs or the least respected jobs." Students are classified as having expectations for upward social mobility if they report a higher value on the second question (about their future self) than on the first (about their current family situation) and as having expectations for downward social mobility if they report a lower value on the second question than on the first.

Expectations about educational qualifications are based on the question "Which of the following qualifications do you expect to complete?": the highest ISCED level for which student answer "yes" (rather than "no," or "I don't know") is used for analyses in this chapter.

Finally, occupational expectations are based on the question "What kind of job do you expect to have when you are about 30 years old?." The open response by students was coded into an occupational category based on the International Standard Classification of Occupations (ISCO). Occupational expectations are not analyzed in detail in this report.

Mongolia education expectations

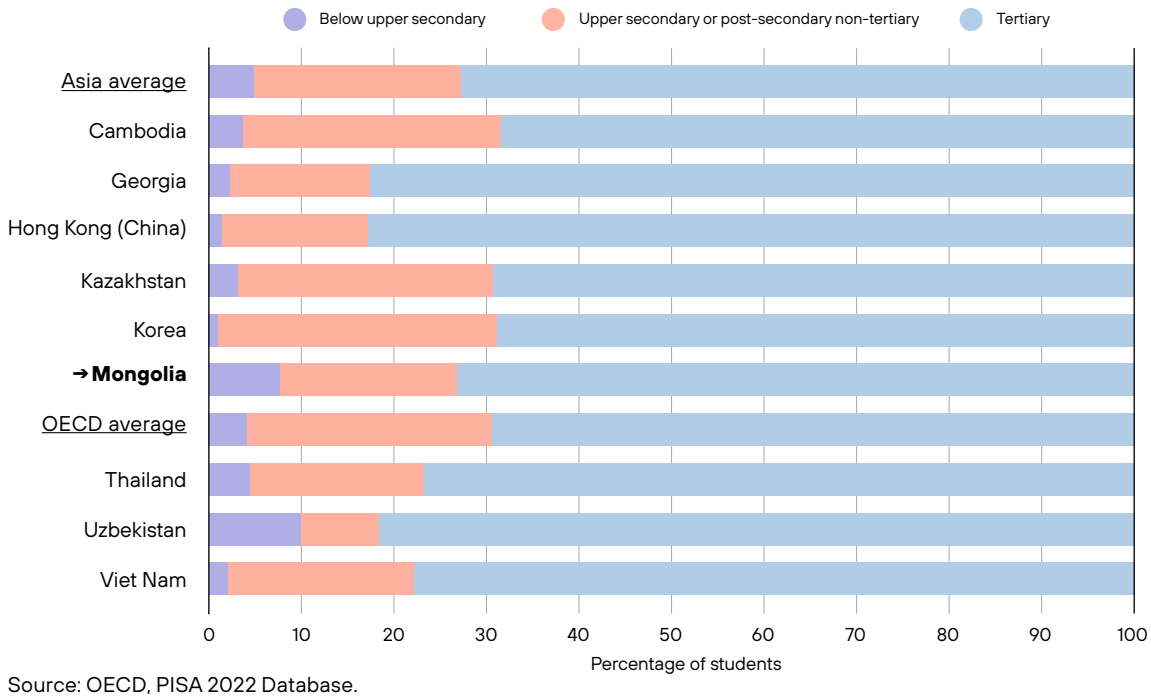
149. A 15-year-old's expectation to participate in higher education is not a guarantee that the student will, in fact, pursue further education. Expectations of further education are based on students' evaluation of the costs and benefits of investments in further education (Morgan, 1998) and on students' self-assessment of their capacities to realize their aspirations. Adolescents frequently question their own opinions about their future and often change their aspirations and expectations. Students' expectations are shaped by the influence of people such as peers, family members, local communities, and teachers. Students adjust their expectations based on past academic achievement; they readjust them according to the degree of selectivity of universities and the direct financial and opportunity costs of participating in higher education. Students and their families constantly evaluate the returns associated with different choices, considering the rigidity of the education system, which may restrict access to some education opportunities to only those students who have followed a particular path through the system.

150. For these reasons, the expectations of 15-year-old students vary considerably both within and across countries (Buchmann & Park, 2009; Matějů, Smith, & Basl, 2007; OECD, 2012; Sewell, Hauser, Springer, & Hauser, 2003).

151. PISA 2022 asked students to report their expected levels of education completion. In Mongolia, 73.2 percent of students expected to complete tertiary education, whereas the remaining (27.8 percent) planned to complete upper secondary or post-secondary non-tertiary education (Figure 3.11).

152. Compared to average 15-year-old students across OECD countries and economies, the percentage of Mongolian students who expect to complete tertiary education is higher; this difference is statistically significant. Compared to top performing countries such as *Hong Kong (China)** and Korea, the percentage of Mongolian students who reported to complete tertiary education is lower than *Hong Kong (China)** and higher than Korea. These differences are statistically significant. Higher percentage of Mongolian students reported to complete tertiary education than their peers in Cambodia and Kazakhstan.

Figure 3.11: Students' expectations for completing further education



Source: OECD, PISA 2022 Database.

153. The trend depicted in Figure 3.11 has been observed in Mongolian students for the past few decades (MECS & UNESCO, 2020). It is difficult to accurately predict the number of universities graduates a country needs to sustain innovation, growth, and sociocultural development. Tertiary graduation rates illustrate a country's capacity to provide the workforce with advanced and specialized knowledge and skills. Earning a university degree is often a pathway to higher salaries and better employment prospects. On average, across OECD countries, the employment rate in 2020 was 58 percent for adults without upper secondary education and 84 percent for those with tertiary education (OECD, 2021). But attaining university education also requires economic investments, postponing of social transitions, and entry into the labor market. For some students, the opportunity costs of pursuing a university degree and the difficulties they must overcome may outweigh the benefits they will derive from enrolling in university.

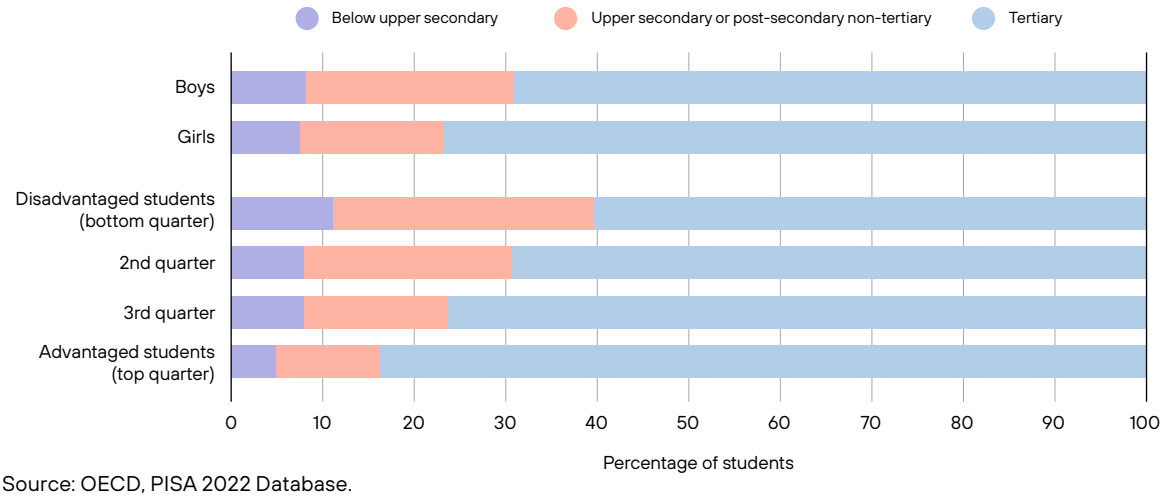
How are students' expectations shaped by socioeconomic status and gender?

154. Equality of opportunity means the ability for all students to achieve their potential, regardless of their initial endowment and characteristics. Academic performance is important for future success in the labor market. However, some students may encounter various obstacles in their educational path. For instance, tertiary education requires a considerable financial commitment that could be difficult for low-income families to fulfil. Even in the absence of financial constraints, students whose parents do not have a tertiary education may perceive a lack of other critical resources for successful participation in that level of education (Guyon & Huillery, 2020; Musset & Mytna Kurekova, 2018).

155. In 2022, as shown in Figure 3.12, in Mongolia, more girls (7.8 percentage points) completed tertiary education than boys, whereas more boys (7.2 percentage points) completed upper secondary or post-secondary non-tertiary than girls. These differences are statistically significant.

156. A lack of financial resources and a paucity of role models can undermine the aspirations of disadvantaged students in Mongolia, with negative consequences on the effort they invest at school. In Mongolia, there is statistically significantly difference of 23.7 percentage points between socio-economically advantaged and disadvantaged students in their expectations to complete tertiary education. Disadvantaged students are more likely to report the expectation to complete upper secondary or post-secondary non-tertiary education.

Figure 3.12: Student education expectations, by socioeconomic status and gender

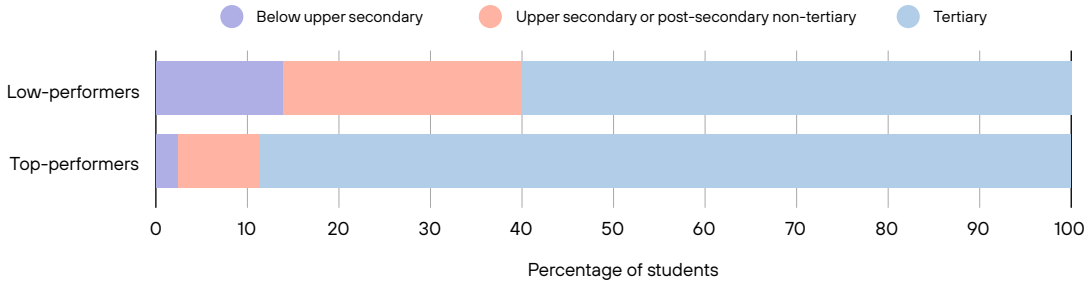


Source: OECD, PISA 2022 Database.

Expectations of higher education and student performance

157. Figure 3.13 shows that in Mongolia, there are statistically significant differences in expectation to complete tertiary education between low performers (students who score below proficiency Level 2 in the PISA reading, mathematics, and science tests) and top performers. Low performers are more likely to report the expectation to complete education below tertiary education.

Figure 3.13: Mongolian 15-year-old students' expectations for completing further education by performance



Source: OECD, PISA 2022 Database.

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04 Foundations for success in Mongolia: Physical and social learning environment

This chapter examines various types of resources invested in education including financial, material, and human resources and key aspects of the learning environment in which 15-year-olds grow and learn in Mongolia and compares these factors with other PISA-participating countries and economies. The chapter describes, in particular, how the presence of these foundations for educational success varies across schools in Mongolia. The chapter concludes with the examination of the relationships between education resources, the learning environment, and student performance.

Resources invested in education

158. This section analyzes the resources invested in education in Mongolia. How much time and human, material, and instructional resources are invested in education in Mongolia compared with other countries and economies? How are the resources allocated across schools? How do resources relate to student outcomes? Given the correlational nature of the analyses, it is impossible to draw causal inferences. However, the results of this section suggest avenues that policy makers in Mongolia may explore to allocate resources more fairly and efficiently.

Human resources

Fully certified teachers

159. 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 that teachers' knowledge of the subject they teach and the quality of their instruction have a measurable impact on student performance. This relationship is stronger than the association between student performance and teachers' level of education, experience, qualifications, work status, or salaries (Allison-Jones & Hirt, 2004; Hanushek & Rivkin, 2006; Hanushek, Piopiunik, & Wiederhold, 2014; Hattie, 2008; Lockheed et al., 1988; Metzler & Woessmann, 2012; Palardy & Rumberger, 2008). The type and quality of training teachers receive and the requirements to enter and progress through the teaching profession shape the quality of the teaching force. Public policy prioritizes attracting, developing, and retaining effective teachers (Barber & Mourshed, 2007).

160. PISA has been surveying school principals to determine the number teachers in their school who were fully certified by an appropriate authority. The PISA 2018 results show that teacher certification is related to reading performance at the system level. In other words, education systems where more teachers were fully certified tend to score higher in reading on average, even after accounting for per capita gross domestic product (GDP), across OECD countries and all countries (OECD, 2019).

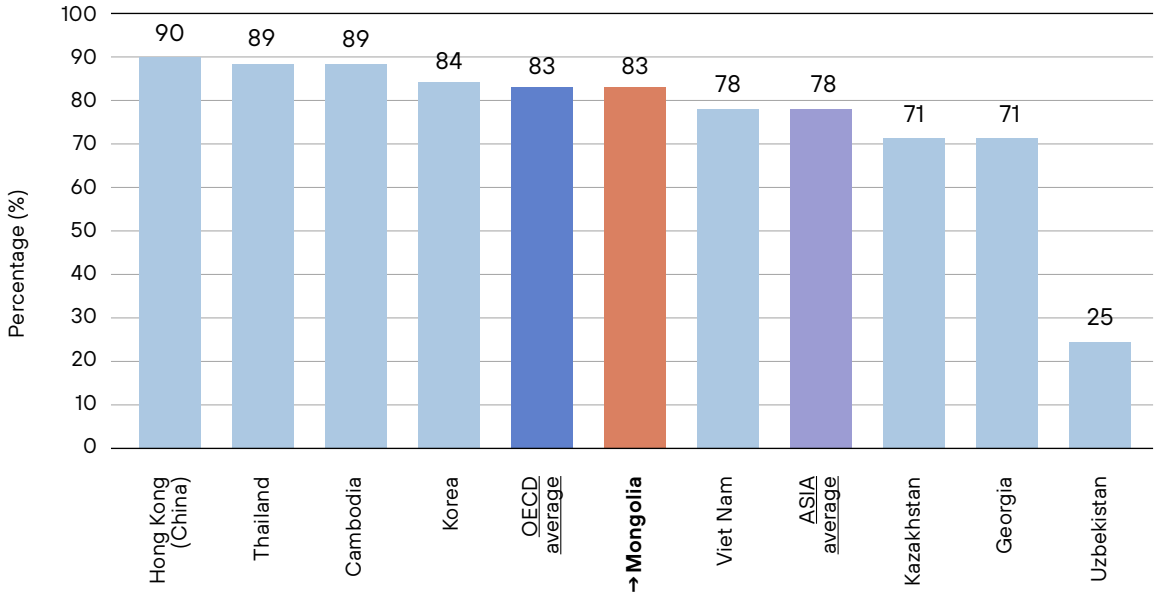
161. PISA 2022 results show that, on average, across OECD countries and economies, students study in schools where school principals reported that 83.3 percent of the teachers working in the schools were fully certified by the appropriate national or local authority. In Mongolia (Figure 4.1), students study in schools where the principals reported similar percentage of fully certified teachers. Compared to average 15-year-old students across the group of PISA 2022 Asian countries and economies, Mongolian students attended schools where principals reported a statistically significantly higher percentage of certified teachers. Comparing benchmark countries to Mongolia, as shown in Figure 4.1, it can be determined that the percentage of certified teachers in schools where 15-year-old students enrolled is statistically significantly higher than Kazakhstan, Georgia, and Uzbekistan and lower than Hong Kong (China)* and Thailand. For the remaining benchmark countries (Cambodia, Korea, and Viet Nam), the percentages are not statistically different from Mongolia.

162. The Teacher Development Law[10] stipulates that all teachers who graduated from four-year (ISCED 6) teacher university are automatically considered as certified teachers. According to 2021–2022 academic year statistics, 99.5 percent of schoolteachers have graduated from four-year teacher university, which means that they have ISCED 6 level teaching qualification and teaching certification (Ministry of Education and Science, Mongolia, 2022). PISA results show 83.2 percent of certified teachers, as shown in Figure 4.1, which seems to be below the national statistics. One of the reasons is that this question might not be interpreted by the principals. The questionnaire asked the principals to report the percentage of his/her schoolteachers who are certified by Teacher Professional Development Institute.[11] After Teacher Development Law, the institute stopped its certification procedure, which means that teachers who graduated after 2019 are automatically considered as certified teachers.

10 Teacher Development Law became effective in 2018; the law regulates that all graduates from four-year Teacher University will be granted the certification.

11 Teacher Professional Development Institute used to certify teachers before Teacher Development Law.

Figure 4.1: Fully certified teachers in Mongolia and comparison countries



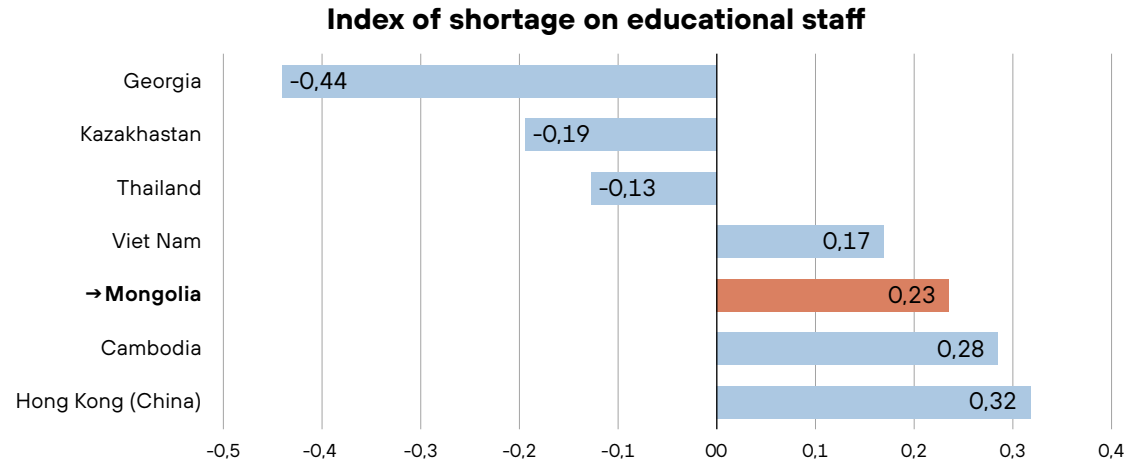
Source: OECD, PISA 2022 Database.
Note: Based on principals' report.

Teacher shortage

163. PISA 2022 asked school principals whether providing instruction at their school is hindered by a lack of teaching or support staff or by an inadequacy or poor qualifications of teaching or support staff. This information refers to the availability and quantity of staff as well as the quality of available staff. All the information was combi ned into a single standardized measure: the PISA index of shortage of education staff. Higher values in the index indicate more shortages of quality education staff in school. For interpretation purposes, it is important to keep in mind that the index reflects the perception of school principals rather than providing an objective measure of staff shortage. School principals in different countries may have different perceptions of what constitutes a shortage in teaching or support staff in their school.

164. In Mongolia, the index of shortage of education staff was estimated as 0.2, a value that indicates more shortage of education staff, as perceived by school principals, than OECD countries. Compared to other countries in Figure 4.2, Mongolia's score on the index of teacher shortage is higher than Thailand, Kazakhstan, and Georgia but statistically similar to that in Viet Nam, Cambodia, and Hong Kong (China)*.

Figure 4.2: Index of shortage of educational staff in Mongolia and comparator countries and economies



Source: OECD, PISA 2022 Database.

165. When the components of the index of shortage of education staff were examined separately, it became evident that in Mongolia, a lack of inadequacy or poor qualification of staff was more prevalent than comparator countries (OECD, 2019).

166. Figure 4.3 shows in detail the components of the index of educational shortage. In particular, it presents the percentages of 15-year-old students who attended schools where the capacity to provide instruction was hindered by a lack of qualified teaching and assisting staff. In Mongolia, 38 percent students attended schools where principals reported that instruction is hindered by a lack of teaching staff. Similarly, 38 percent students attended schools where principals reported that instruction is hindered to some extent or a lot due to inadequate or poorly qualified teaching staff.

167. In addition, as Figure 4.3 shows, 26 percent of them studied in schools where principals reported that the capacity to provide instruction is hindered a lot by a lack of assisting staff. Similarly, 21 percent of students attended schools where principals reported that inadequate or poorly qualified assisting staff hindered the provision of instruction.

168. Compared to OECD and Asian averages and comparator countries, instruction in Mongolia is hindered more by inadequate or poorly qualified teaching staff rather than the lack of educational staff. A smaller share of students in Mongolia study in schools where principals report that instruction is hindered to some extent or a lot by a lack of teaching staff or assisting staff, with only two countries (Uzbekistan and Georgia) reporting lower shares for lack of teaching staff and two countries (Kazakhstan and Uzbekistan) reporting lower shares for lack of assisting staff. However, Mongolia reports higher shares of students studying in schools where principals report that instruction is hindered by inadequate or poorly qualified teaching staff compared to OECD and Asian averages and all other benchmark countries, and these differences are statistically significant for all except Hong Kong (China)* and Viet Nam.

Figure 4.3: Teacher shortage in Mongolia and comparison countries

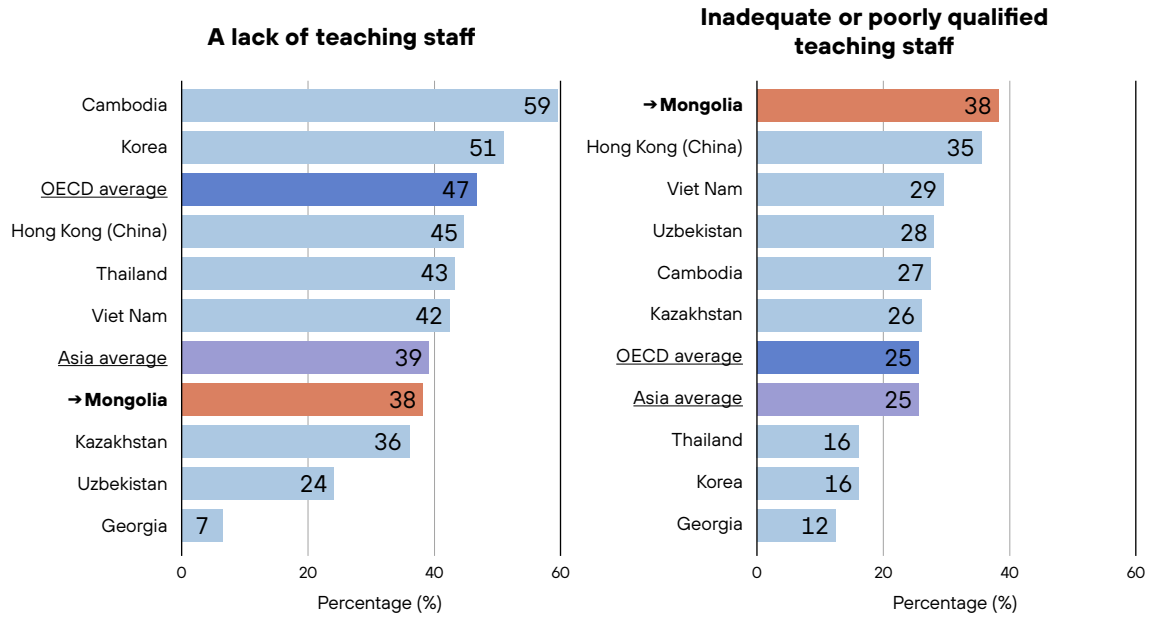
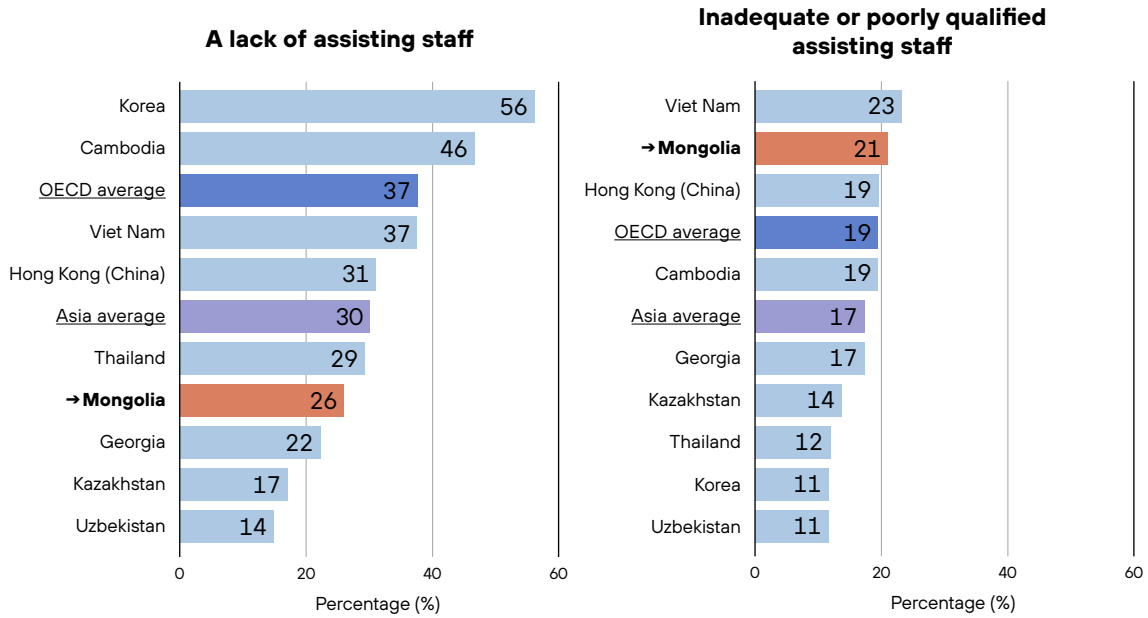


Figure 4.3: Teacher shortage in Mongolia and comparison countries



Source: OECD, PISA 2022 Database.

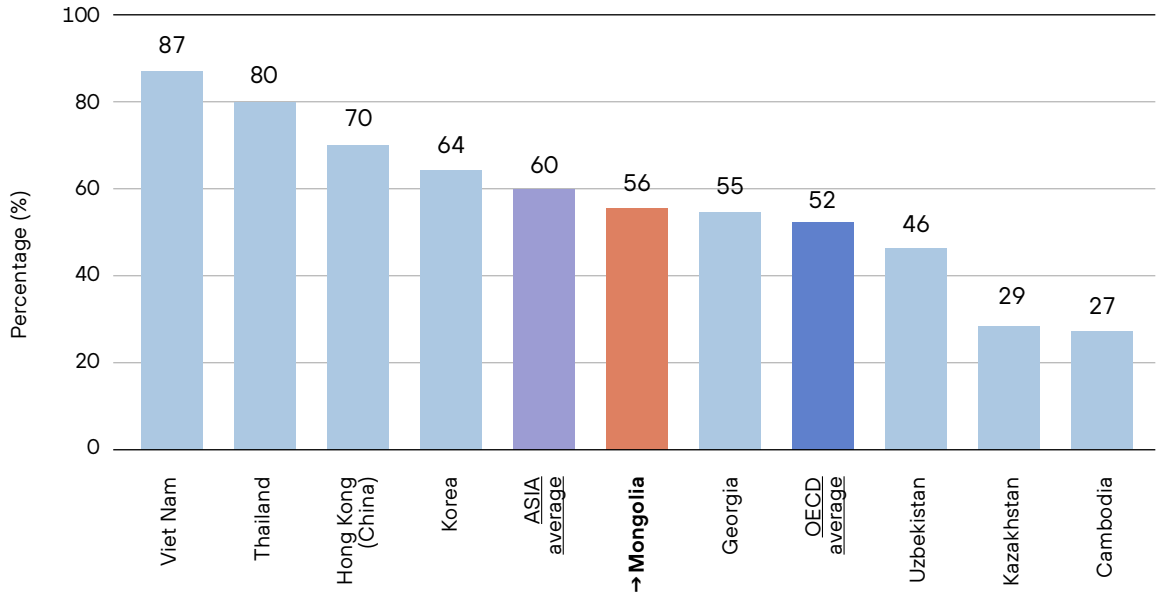
Teacher professional development

169. Together with autonomy and participation in peer networks, teacher professional development is one of the pillars of teacher professionalism (OECD, 2016). Professional development programs aim to develop the skills, knowledge, and dispositions of individual teachers, but in addition they can enhance schools' capacity for organizational change and improvement (Borko, Elliot, & Uchiyama, 2000; Borko, Jacobs, & Koellner, 2010; OECD, 2009; OECD, 2016). Research suggests that professional development is more effective when it focuses on student learning; actively engages teachers in designing instructional strategies; supports collaboration among peers; uses models of effective practice; and provides coaching, feedback, and enough time for teachers to implement and sustain changes (Darling-Hammond, Hyler, & Gardner, 2017; Lumpe et al., 2012).

170. According to PISA 2022 data, across OECD countries and economies, 52.3 percent of typical 15-year-old students attended schools where principals reported that teachers had participated in a program of professional development in the three months prior to the PISA test (Figure 4.4). This figure was only slightly higher in Mongolia, i.e., 55.8 percent.

171. Comparing to countries and economies, except Georgia, all differences in percentages of students whose school principals reported that teachers participated in a program of professional development are statistically significant. There are no statistically significant differences with Georgia and across OECD countries and economies. According to the school principals' report, a lower percentage of Mongolian students attended schools where teachers participated in professional development program compared to Viet Nam, Thailand, Hong Kong (China)*, and Korea; a higher percentage of students attended schools where teachers participated in professional development program compared to Kazakhstan, Uzbekistan, and Cambodia. It implies that according to the school principals' report, in higher-performing economies and countries (Hong Kong [China]* and Korea), more students study in schools where teachers participate in professional development program than in Mongolia.

Figure 4.4: Teacher professional development in Mongolia and comparison countries



Source: OECD, PISA 2022 Database. Note: Based on principals' report.

172. It is worthwhile to note that teacher professional development in Mongolia is aimed to be one of the priority policies in the country; teachers are obliged to attend compulsory training every five years. In addition, they attend elective trainings and school-level professional community activities based on teacher needs. In September 2021, dedicated budget for teacher professional development training and activities had been included in the school budget; therefore, teachers are provided ample opportunities to participate in the professional development activities including trainings.

Variation in human resources by school characteristics

173. The distribution (or availability) of human resources varies from school to school, depending on the socioeconomic profile of the schools, school location, and school type (see Box 4.1 for more details).

Box 4.1: How school characteristics are defined

Socioeconomic profile of schools

Advantaged and disadvantaged schools are defined in terms of the socioeconomic profile of schools. All schools in each PISA-participating education system are ranked according to the average of the PISA index of ESCS of students in the schools and then divided into four groups with approximately equal number of students (quarters). Schools in the bottom quarter are referred to as 'socioeconomically disadvantaged schools' and schools in the top quarter are referred to as 'socioeconomically advantaged schools'.

School location

In this report, schools are differently categorized than PISA 2022 International Report. Schools are grouped into city, aimag, and soum schools according to Education Statistics and Information System.

School type

Schools are classified as either public or private, according to school principal's response to whether a private entity or a public agency has the ultimate power to make decisions concerning its affairs. Public schools are managed directly or indirectly by a public education authority, government agency, or governing board appointed by the government or elected by a public franchise. Private schools are managed directly or indirectly by a nongovernmental organization, such as a church, trade union, business, or other private institution.

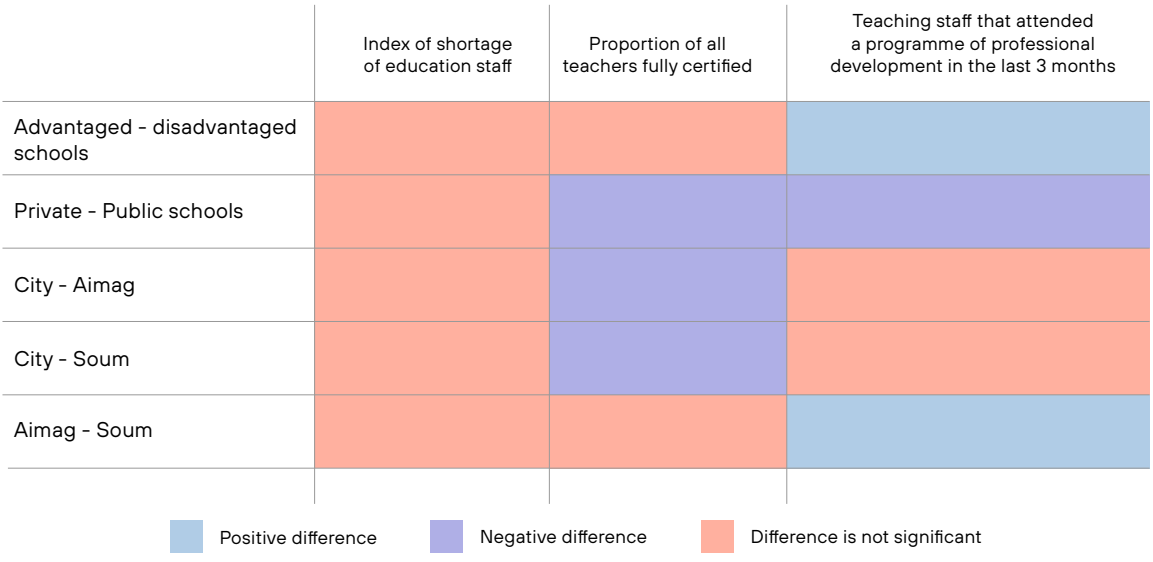
Program orientation

In PISA 2022, vocational school students are also selected in the sampling. As the nature of teaching and learning in vocational education is different, in the Mongolian context, it is better to analyze some of the results by considering the program orientation as general secondary and vocational.

174. Figure 4.5 presents that in Mongolia, although variations exist in the shortages of education staff in different schools, they are not statistically significant.

175. In addition, 11.5 percentage points more teachers participated in professional development program in the last three months prior to the PISA 2022 test in socioeconomically advantaged schools than in disadvantaged schools. In public school, more teachers attended professional development programs in public schools than in private schools. Interestingly, more teachers (difference of 11.4 percentage points) participated in professional development program in aimags compared to soum schools.

Figure 4.5: Variation in human resources in Mongolia, by school characteristics Human resources and student mathematics performance

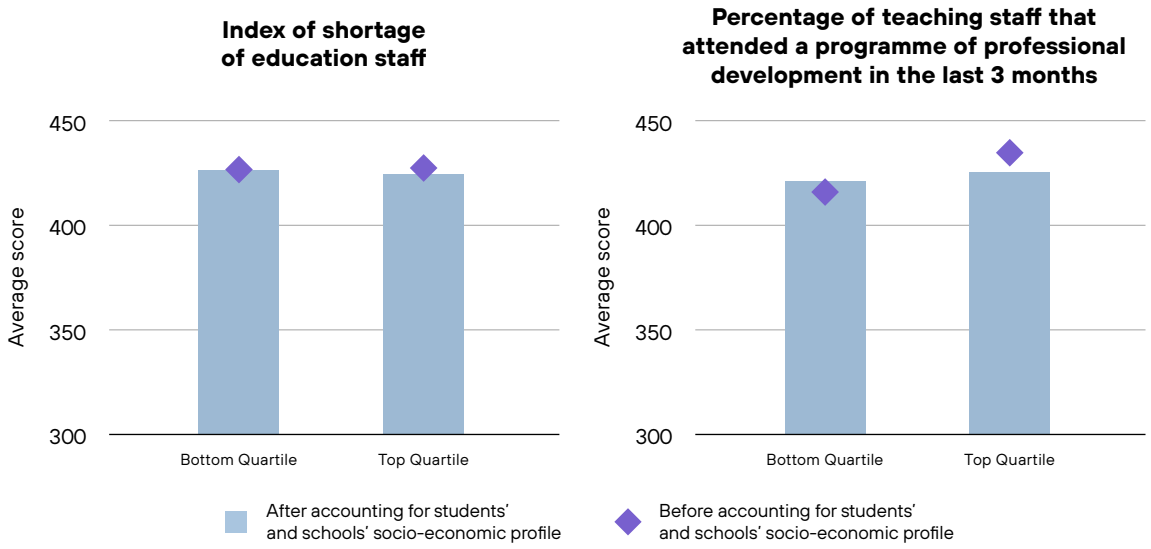


Source: OECD, PISA 2022 Database. Note: Based on principals' report.

176. School human resource is one of the factors that hinder student learning. Figure 4.6 presents differences in mathematics performances of Mongolian 15-year-old students in schools with the least and most shortage of education staff before and after accounting for student and school socioeconomic profile (see Box 4.1). In Mongolia, there is no statistically significant difference in performance between students in schools with the highest value of education staff shortage and those with the lowest value before and after accounting for socioeconomic profile.

177. A statistically significant difference is observed in mathematics performance between schools where least and most percentages of teachers attended professional development three months prior to the test before accounting for the socioeconomic profile. Before accounting for the socio-economic status of students and schools, students in schools with the highest percentage of teachers attending professional development scored 18 points higher in mathematics than schools where fewer teachers attended professional development. However, after accounting for socio-economic profile, the score point difference was 4 points; yet, it is not statistically significant.

Figure 4.6: Human resources and student mathematics performance in Mongolia



Source: OECD, PISA 2022 Database. Note: Based on principals' report.

Material resources

178. High-quality education requires the presence and condition of adequate physical infrastructure of a school and the availability and usage of didactic materials by teachers and students. These are collectively referred here as 'material resources'. Teachers need to access and use these resources, including textbooks, computers, library materials, or laboratories, to plan and offer their lessons. Material resources support instruction that is up to date and challenging and responsive to students' needs (Oakes & Saunders, 2004; Murillo & Román, 2011). This section begins by examining the availability and distribution of physical infrastructure and educational materials. It then presents a separate section on digital resources.

Physical infrastructure and educational material

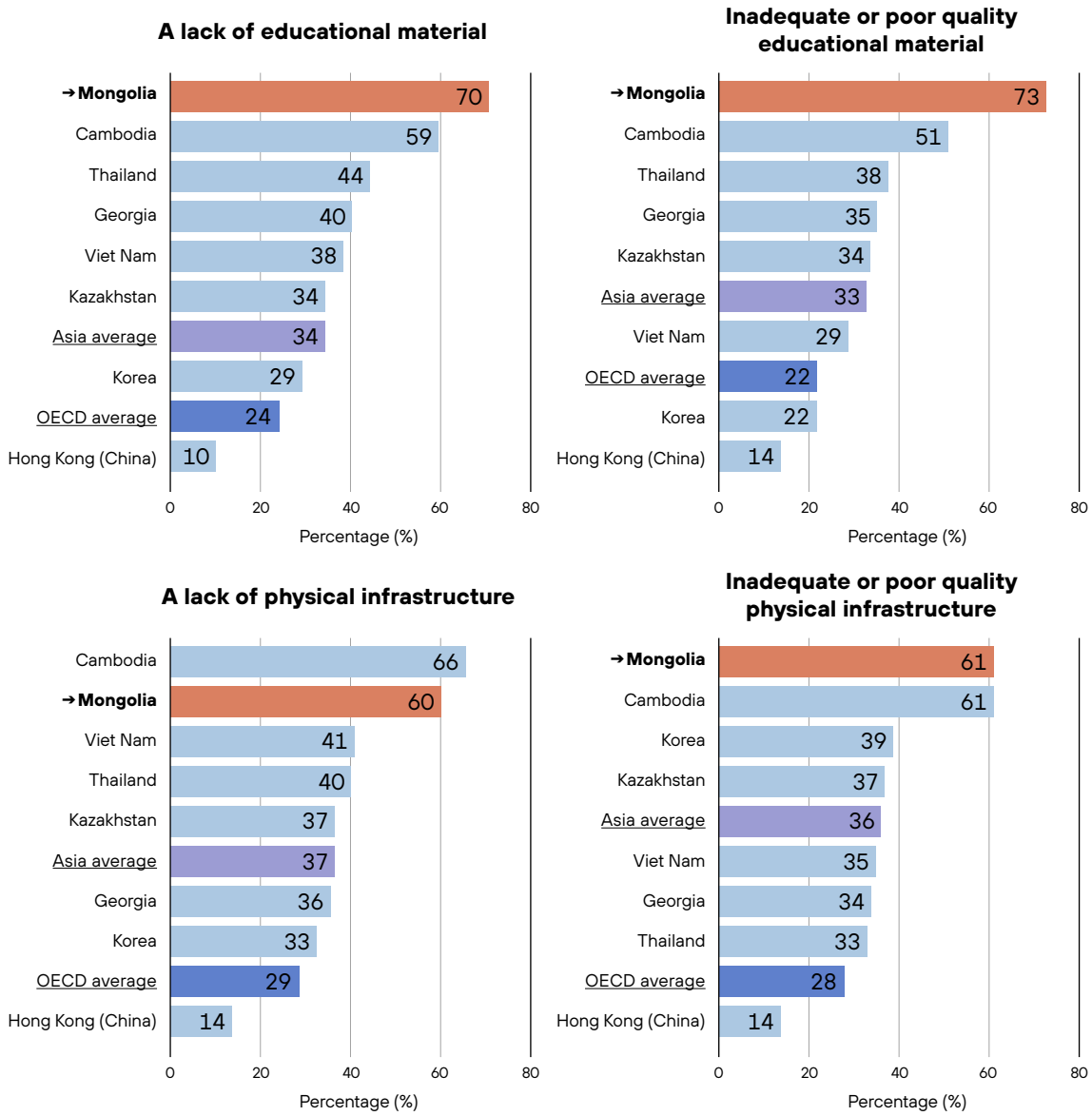
179. Material resources need to be up to date and functioning to meet students' needs. For example, if textbooks are not updated to include recent advances in scientific knowledge or curricular reforms in learning standards; if computers have slow or unstable internet connection, students and teachers cannot accomplish basic tasks or activities. To measure school principals' perceptions of potential factors hindering instruction at school, in PISA 2022 school principals were asked about their perceptions on lack of educational material, inadequate or poor-quality educational material, on lack of physical infrastructure, and inadequate or poor-quality physical infrastructure. Principals had to choose between four response categories: "not at all," "very little," "to some extent," or "a lot." The index of educational material shortage was derived from answers to these four questions. Positive values in the index mean that, compared to the OECD average, in the country school principals viewed the amount or quality of educational materials in their schools as an obstacle to providing instruction.

180. Figure 4.7 shows the percentages of students in schools where principals reported that the capacity to provide instruction is not at all or little hindered by lack of availability and quality of education materials (e.g., textbooks, IT equipment, library, or laboratory material) and physical infrastructure (e.g., building, grounds, heating/cooling, lighting, and acoustic systems). In Mongolia, 70 percent of students attended schools where instruction is to some extent or a lot hindered by lack of education material, whereas 73 percent students are in schools where instruction capacity is affected by poor quality of education materials. It also reveals that 60 percent of students studied in schools where the capacity to provide instruction is to some extent or a lot affected by lack

of physical infrastructure. Moreover, over 61 percent of students enrolled in schools with a lot of issues related to poor quality of educational materials and physical infrastructure. It means that in Mongolia, more than half of the students attended schools that lacked availability and quality of education materials and physical infrastructure.

181. According to Figure 4.7, the availability and quality of educational materials and physical infrastructure of Mongolian schools where 15-year-old students study is statistically significantly poorer than OECD and Asian averages and other comparator countries.

Figure 4.7: Physical infrastructure and educational materials in Mongolia and comparison countries



Source: OECD, PISA 2022 Database.

Digital resources

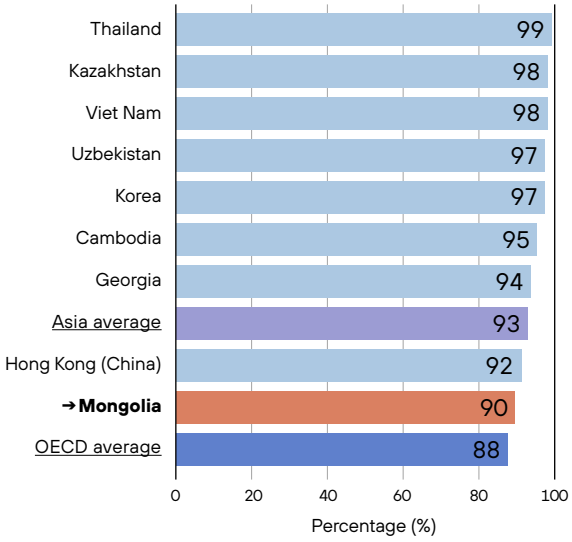
182. School principals were also asked about their perceptions on the degree to which the following factors hinder their schools' capacity to provide instruction: lack of and inadequate or poor-quality digital resources such as computers, internet access, learning management systems, or school learning platforms.

183. Figure 4.8 shows that in Mongolia, 80 percent of 15-year-old students attended schools where principals reported that the school's capacity to provide instruction is to some extent or a lot hindered by a lack of and poor-quality digital resources.

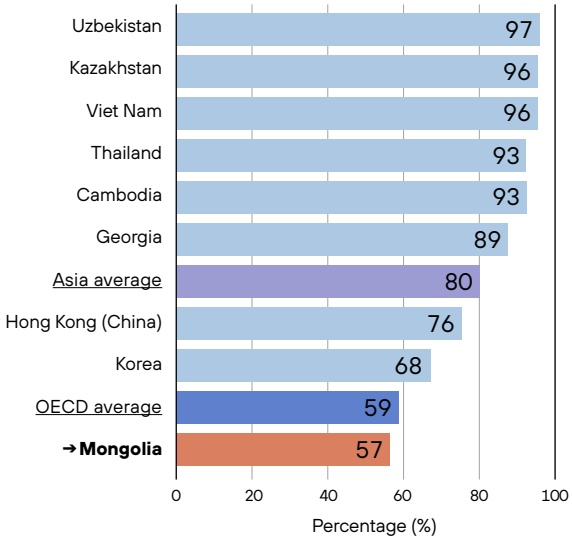
184. The percentage of Mongolian 15-year-old students whose school principals reported lack of and poor quality of digital resources is also statistically significantly the highest among the comparator countries and economies except Cambodia.

Figure 4.8: Digital resources in Mongolia and comparison countries

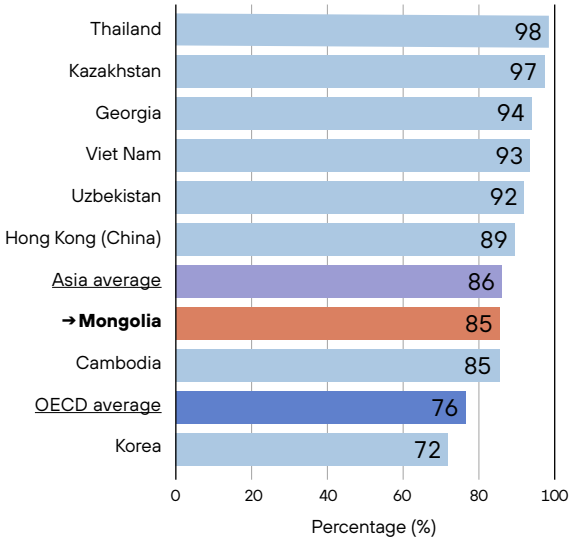
Teachers have the necessary technical and pedagogical skills to integrate digital devices in instruction



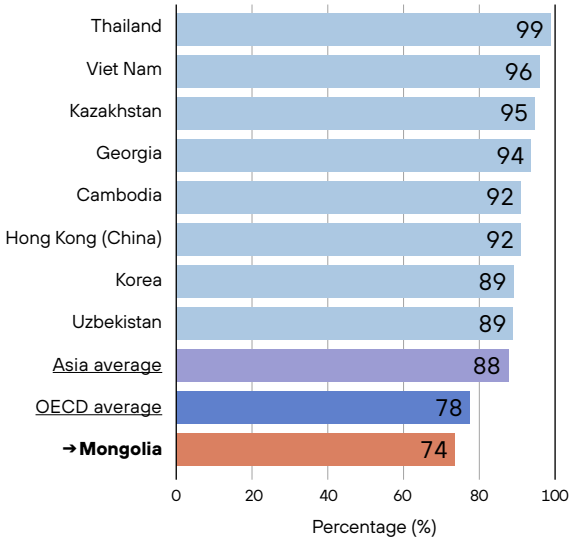
Teachers have sufficient time to prepare lessons integrating digital devices



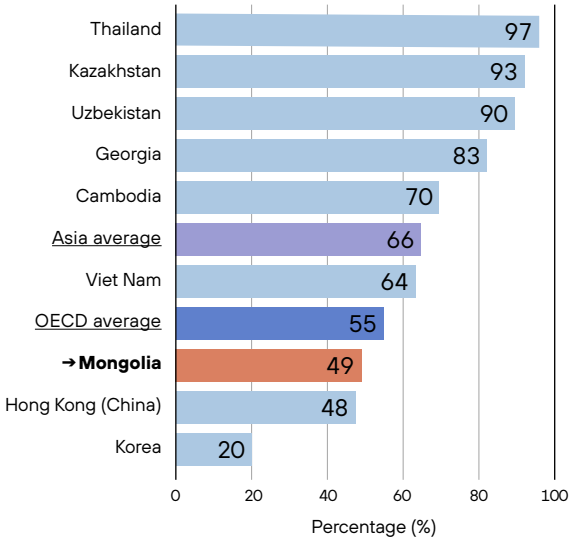
Effective professional resources for teachers to learn how to use digital devices are available



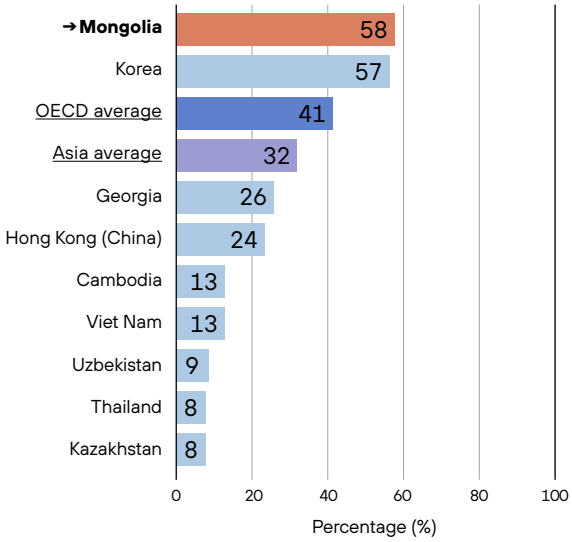
An effective online learning support platform is available



Teachers are provided with incentives to integrate digital devices in their teaching



The school has sufficient qualified technical assitant staff



Source: OECD, PISA 2022 Database.

185. However, the availability and quality of instructional materials do not guarantee better learning. Schools and teachers must be able to incorporate these resources into teaching practice and daily lessons to improve teaching and learning results. This idea applies specifically to resources related to ICT in education. The rapid adoption of ICT technology by schools needs to be accompanied by development of teachers' capacity to integrate digital devices in their practice.

186. In PISA 2022, school principals were asked to assess the following six statements about their schools' capacity to enhance learning and teaching using digital devices. Principals chose among the given options—"strongly disagree," "disagree," "agree," or "strongly agree"—for each of the following statements:

- Teachers have the necessary technical and pedagogical skills to integrate digital devices in instruction.
- Teachers have sufficient time to prepare lessons integrating digital devices.
- Effective professional resources for teachers to learn how to use digital devices are available.
- An effective online learning support platform is available.
- Teachers are provided with incentives to integrate digital devices in their teaching.
- The school has sufficient qualified technical assistant staff.

187. The index of preparedness for digital learning was derived from the answers to these six statements. Positive values of the index mean that principals viewed their preparedness for digital teaching as being greater than the OECD average.

188. Figure 4.8 shows percentages of students in schools where principals agreed or strongly agreed with statements about their school's capacity to enhance learning and teaching using digital devices. Several statistically significant results are observed in Figure 4.8. In Mongolia, 90 percent of 15-year-old students enrolled in schools where principals agreed or strongly agreed that teachers had the necessary technical and pedagogical skills to integrate digital devices in instruction. Also, 85 percent of students studied in schools where principals agreed that effective professional resources to learn how to use digital resource in instruction were available for teachers. These results imply that a large majority of the 15-year-old students study in schools where teachers have required skills and resource materials to integrate the lessons with digital devices. According to principals' report, 57 percent of students are in schools where teachers were considered to have sufficient time to prepare lessons integrating digital devices.

189. In Mongolia, 74 percent of students study in schools where principals reported that schools had effective online learning support platform for teachers and students. Without proper technical support and incentives, teachers lose motivation to use digital devices and platforms in the lesson. In Mongolia, as principals reported, 58 percent of students are in schools that do have sufficient qualified technical assistant staff who support teachers. Moreover, about half (51 percent) of the students studied in schools where teachers are provided incentives for integrating digital devices in their teaching.

190. Comparison with the benchmark countries reveals that Mongolia has a smaller percentage of 15-year-old students attending schools where teachers have the necessary technical and pedagogical skills to integrate digital devices in instruction. Mongolian results are similar to those of *Hong Kong (China)** and Georgia. Mongolia has the smallest percentage of students whose teachers have the time to prepare lessons integrating digital devices and have effective professional resources to learn how to use digital devices. The same result is also revealed for availability of learning support platforms for students and teachers. Compared to most benchmark countries, except for Cambodia, Mongolia has more students enrolled in schools where incentives are provided to teachers for using digital devices in lessons. However, more students in Mongolia than in other countries study in schools where supporting staff are available to assist teachers in using the devices for instruction.

Variation in material resources by school characteristics

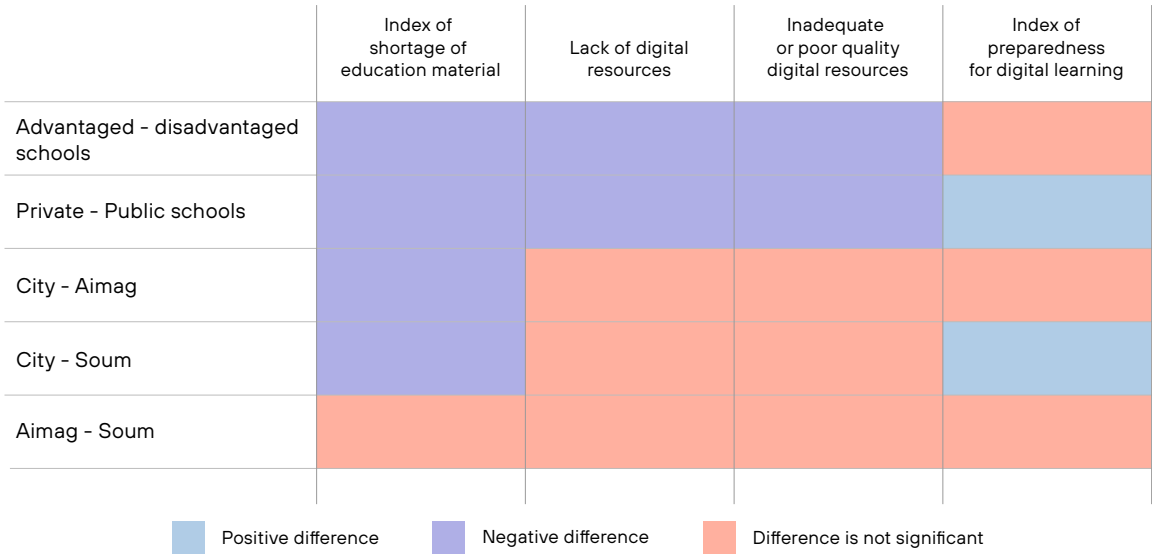
191. Material resources need to be available in sufficient quantity where they are most needed. This section examines the availability of material resources by school types: by socioeconomically disadvantaged and advantaged schools, rural and urban schools, and public and private schools.

192. Figure 4.10 shows how provision of school education material and digital resources varied by school and student socioeconomic profile, school location, and school type (see Box 4.2). The mean score of the index of shortage of educational materials is higher in socioeconomically disadvantaged schools compared to socioeconomically advantaged schools. Similarly, the mean of this index is higher in public compared to private schools and in aimag and soum compared to city schools.

193. Similarly, the indexes measuring shortage of digital resources and inadequacy of such resources have higher means in disadvantaged schools and public schools, while there seem to be no differences by school locality.

194. Mongolian private schools display, on average, higher levels on the index of preparedness for digital learning. There are no differences by school socioeconomic status, but the gap between city and soum schools on this index favors cities.

Figure 4.10: Variation in material resources in Mongolia, by school characteristics



Source: OECD, PISA 2022 Database. Note: Based on principals' report.

Pre-primary education attendance

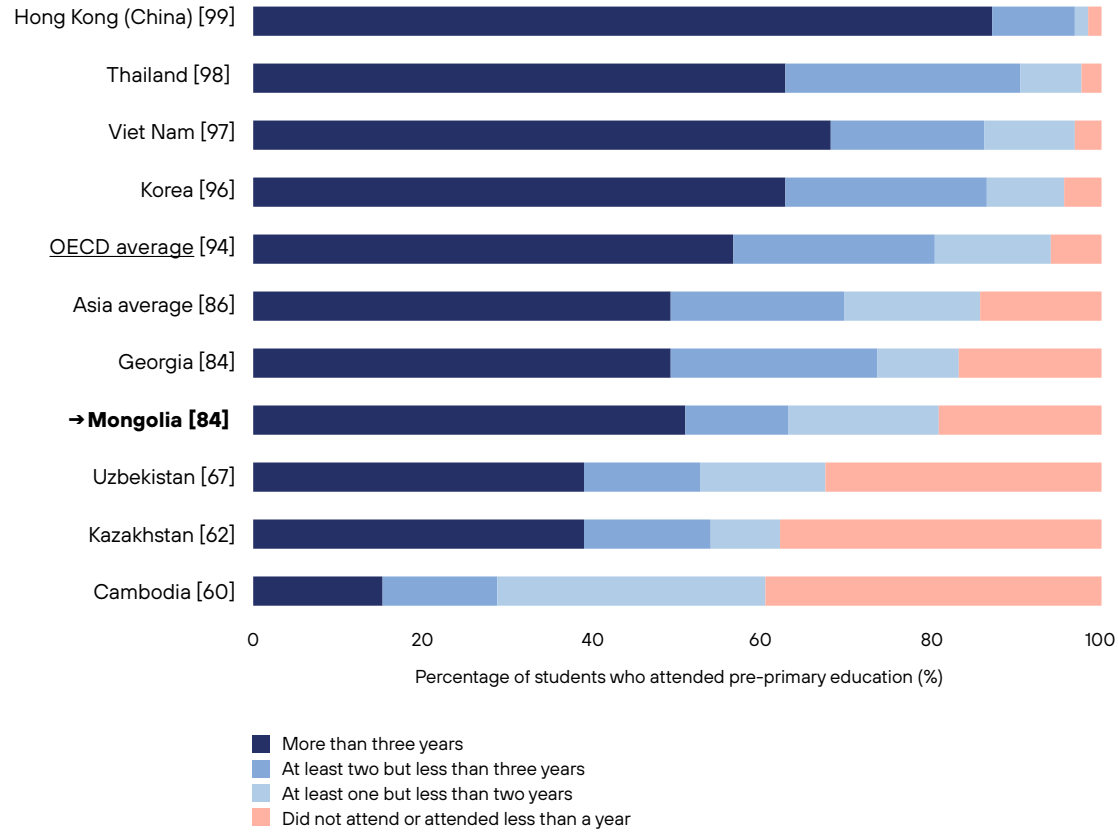
195. There is growing evidence about the importance of high-quality pre-primary education (Heckman, 2006; OECD, 2018b). In parallel, over the past few decades, enrolment in pre-primary education has become more prevalent across countries around the world (OECD, 2018a; UNESCO Institute for Statistics, 2012). Research suggests that a variety of outcomes can be boosted by high-quality pre-primary education, including children's cognitive development and well-being, later academic achievement, and even adult earnings (Duncan et al., 2007; Nordic Council of Ministers, 2012). Attendance at pre-primary school has been shown to improve students' behavior, attention, effort, and class participation in primary school (Berlinski, Galiani, & Gertler, 2009). In addition, early education programs are cost-effective interventions with substantial economic returns to investment (Heckman et al., 2010).

196. The benefits of attendance at pre-primary education tend to be greater for socioeconomically disadvantaged children (Suziedelyte & Zhu, 2015). However, the benefits also depend on the quality of the early childhood education and care, as defined by positive staff-child interactions and more exposure to developmental activities, among other factors (Melhuish et al., 2015).

197. In Mongolia, children ages 2–5 attend pre-primary education. Figure 4.11 illustrates that in Mongolia, 51 percent of 15-year-old students attended pre-primary education for more than three years, whereas 30 percent of them attended for one to two years. The remaining students did not attend pre-primary education.

198. Compared to the average 15-year-old students across OECD countries and economies as well as Thailand, the percentage (51 percent) of Mongolian students who attended pre-primary education for more than three years is statistically significantly lower. On the contrary, this percentage is statistically significantly higher than the remaining countries except Georgia. Moreover, the percentage (19.2 percent) of students who did not attend or attended less than a year in pre-primary education is lower than percentage of students in Cambodia, Kazakhstan, and Uzbekistan and higher than the remaining countries and economies in Figure 4.11. These results are statistically significant.

Figure 4.11: Pre-primary attendance in Mongolia and comparison countries



Source: OECD, PISA 2022 Database.

Note: Based on students' report.

Numbers in brackets adjacent to the country name indicate the total share of students who reported having attended pre-primary education for at least one year.

Absenteeism

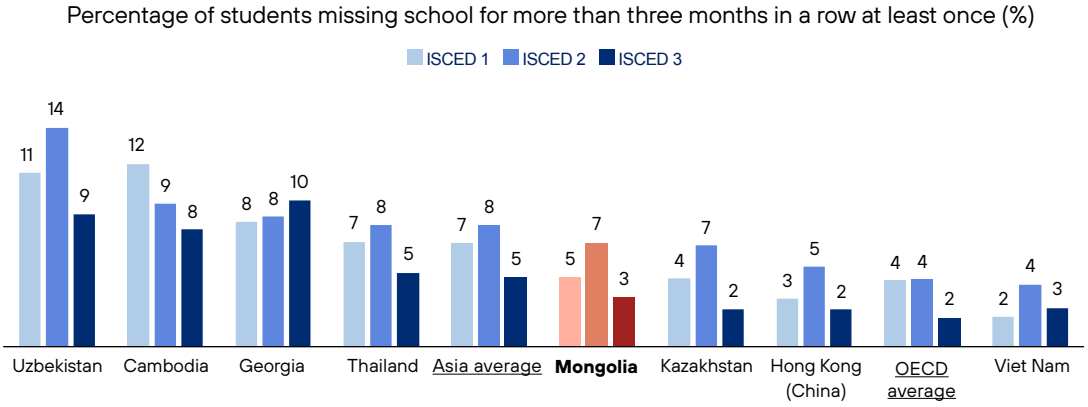
199. Every school day, students may miss learning opportunities by skipping school or by arriving late for class. Doing so repeatedly has adverse effects on the individual students and on their learning environment in school. Students play truant for many reasons: because they are academically disengaged or do not feel they belong at school or failed to wake up or simply needed at home (Appleton et al., 2008; Gottfried, 2017; Lehr, Sinclair, & Christenson, 2009). Moreover, some victims of bullying avoid school because they are too afraid or embarrassed (Hutzell & Payne, 2012; Townsend et al., 2008). Good academic performance and positive relationships with peers and teachers seem critical for developing students' attachment to school and for feeding a desire to attend school every day (Gehlbach, Brinkworth, & Harris, 2012; Juvonen, Espinoza, & Knifsend, 2012; Reid, 2005).

200. PISA 2022 asked students to report if they had missed school for more than three months in a row at primary (ISCED 1), lower secondary (ISCED 2), and upper secondary (ISCED 3) grades; students had four response options: "No, never," "Yes, once," and "Yes, twice or more."

201. Student absenteeism for more than three months in a row is not a common practice at any level of education in Mongolia. Figure 4.12 presents that in Mongolia, 5 percent of 15-year-old students reported that they missed school for more than three months in a row at least once in primary level, 7 percent in lower secondary, and 3.2 percent in upper secondary level.

202. The percentages of students who reported absenteeism at all levels are statistically significantly higher than average students across OECD countries and economies. The percentages are also statistically significantly higher than in PISA 2022 Asian countries and economies as well as in PISA 2022 top performing country and economy—Korea and *Hong Kong (China)**. The percentages of Mongolian students who reported absenteeism in primary and secondary schools are statistically significantly lower than in Uzbekistan and Cambodia.

Figure 4.12: Absenteeism in Mongolia and comparison countries



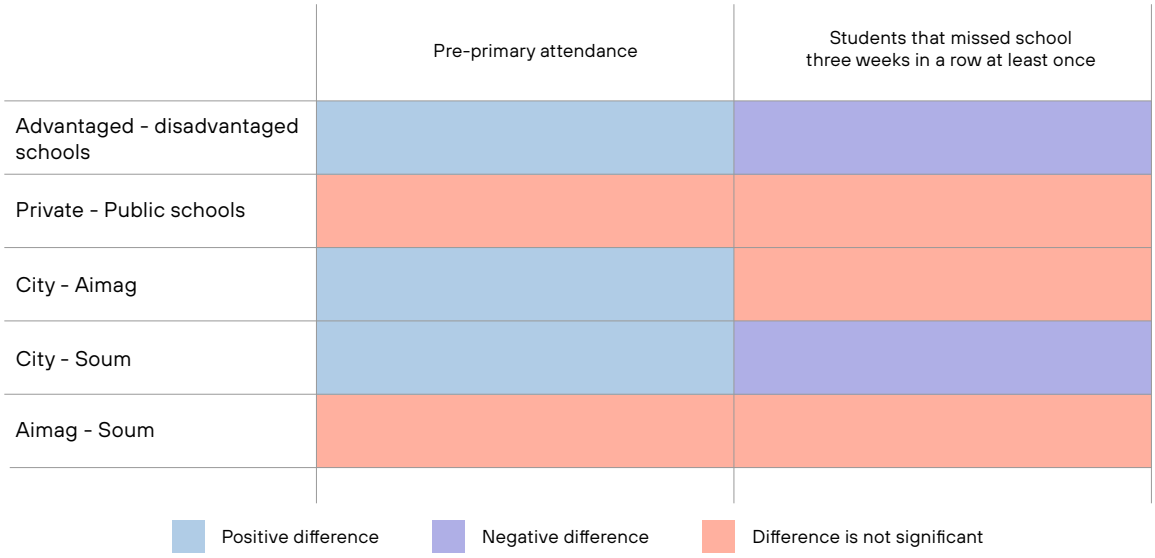
Source : OECD, PISA 2022 Database.
Note: Based on students' responses.

Variation in time resources by school characteristics

203. The allocation of time is not necessarily consistent across schools. This section examines how time availability and management vary by school types such as socioeconomically disadvantaged and advantaged schools, rural and urban schools, public and private schools.

204. As illustrated in Figure 4.13, in Mongolia, statistically significant differences in students' pre-primary attendance years are observed between socioeconomically advantaged and disadvantaged schools as well as city and aimag/soum schools. A higher percentage of students in socioeconomically advantaged and city school attended pre-primary education for more than three years. On the contrary, a higher percentage of students in socioeconomically disadvantaged and soum schools reported that they missed school three weeks in a row at least once.

Figure 4.13: Variation in time resources in Mongolia, by school characteristic

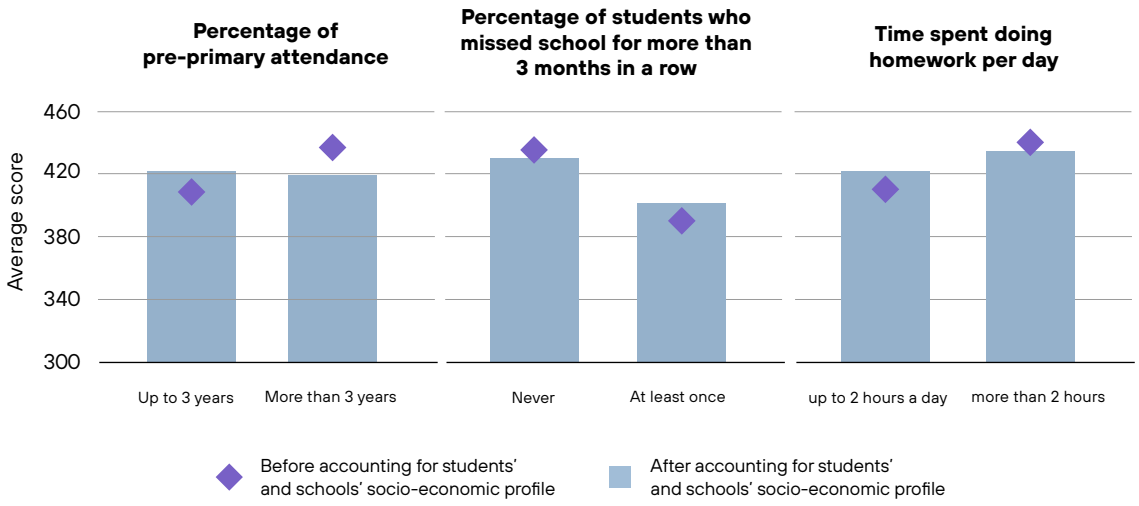


Source: OECD, PISA 2022 Database.

Time resources and student mathematics performance

205. Figure 4.14 shows the association between time resources and students' performance in mathematics before and after accounting for socioeconomic profile. In Mongolia, before accounting for socioeconomic profile, students who reported more than three-year attendance in pre-primary education scored 30 points higher in mathematics than those who attended up to three years. After accounting for socioeconomic profile, one year increase in pre-primary attendance year is statistically significantly associated with 15 score point increase in the performance. In addition, before accounting for school and student socioeconomic profile, students who never missed school scored 30 points higher in mathematics than students who missed at least once. After accounting for socioeconomic profile, similar statistically significant difference is observed in student performance.

Figure 4.14: Time resources and student mathematics performance in Mongolia



Source : OECD, PISA 2022 Database.

School climate

206. A positive school climate is one of those things that is difficult to define and measure, but everyone recognizes it when they see it. Visitors to a school, including parents and education inspectors, can identify a positive school atmosphere "within minutes" (DeWitt, 2016). School climate has been described as the "quality and character of school life" (Cohen et al., 2009), the "the heart and soul of the school" (Freiberg & Stein, 1999), and "the quality of relationships among students, teachers and school staff" (Hoy & Sweetland, 2001). School climate can be safe or unsafe, cohesive or divisive, collaborative or competitive. Above all, it is typically perceived as either positive or negative. In a positive school climate, students feel physically and emotionally safe; teachers are supportive, enthusiastic, and responsive; parents participate in school activities voluntarily; the school community is built around healthy, respectful, and cooperative relationships; and everyone looks after the school premises and works together to develop a constructive school spirit.

207. A positive school climate, for instance, can promote students' academic achievement, well-being, and self-esteem (Hoge, Smit, & Hanson, 1990; MacNeil, Prater, & Busch, 2009; Way, Reddy, & Rhodes, 2007), and some of these effects persist for years (Hoy, Hannum, & Tschannen-Moran, 1998). A positive climate can even mitigate the pervasive and strong link between socioeconomic profile and academic achievement (Berkowitz et al., 2017). Schools with safe, respectful, and caring learning environments also protect students from engaging in maladaptive behaviors, such as truancy, smoking, drinking, using drugs, and other deviant and risky behaviors (Catalano et al., 2004; Gase et al., 2017; LaRusso, Romer, & Selman, 2008) Teachers too can benefit from a positive school climate. For instance, teachers in disciplined and supportive schools report higher job satisfaction and less burnout (Aldridge & Fraser, 2016; Berg & Cornell, 2016; Mostafa & Pál, 2018). In other words, children are more likely to reach their social, emotional, and academic potential in a safe, supportive, and collaborative school environment.

208. PISA 2022 questionnaires cover several dimensions of school climate. This section focuses on the following three indicators: student-related factors affecting school climate, teacher-related factors affecting school climate, and negative school climate.

Student-related factors affecting school climate

209. School principals were asked to describe the extent to which the following hinder student learning in their schools: student truancy, students skipping classes, students using alcohol or illegal drugs, students intimidating or bullying other students, and students not being attentive.

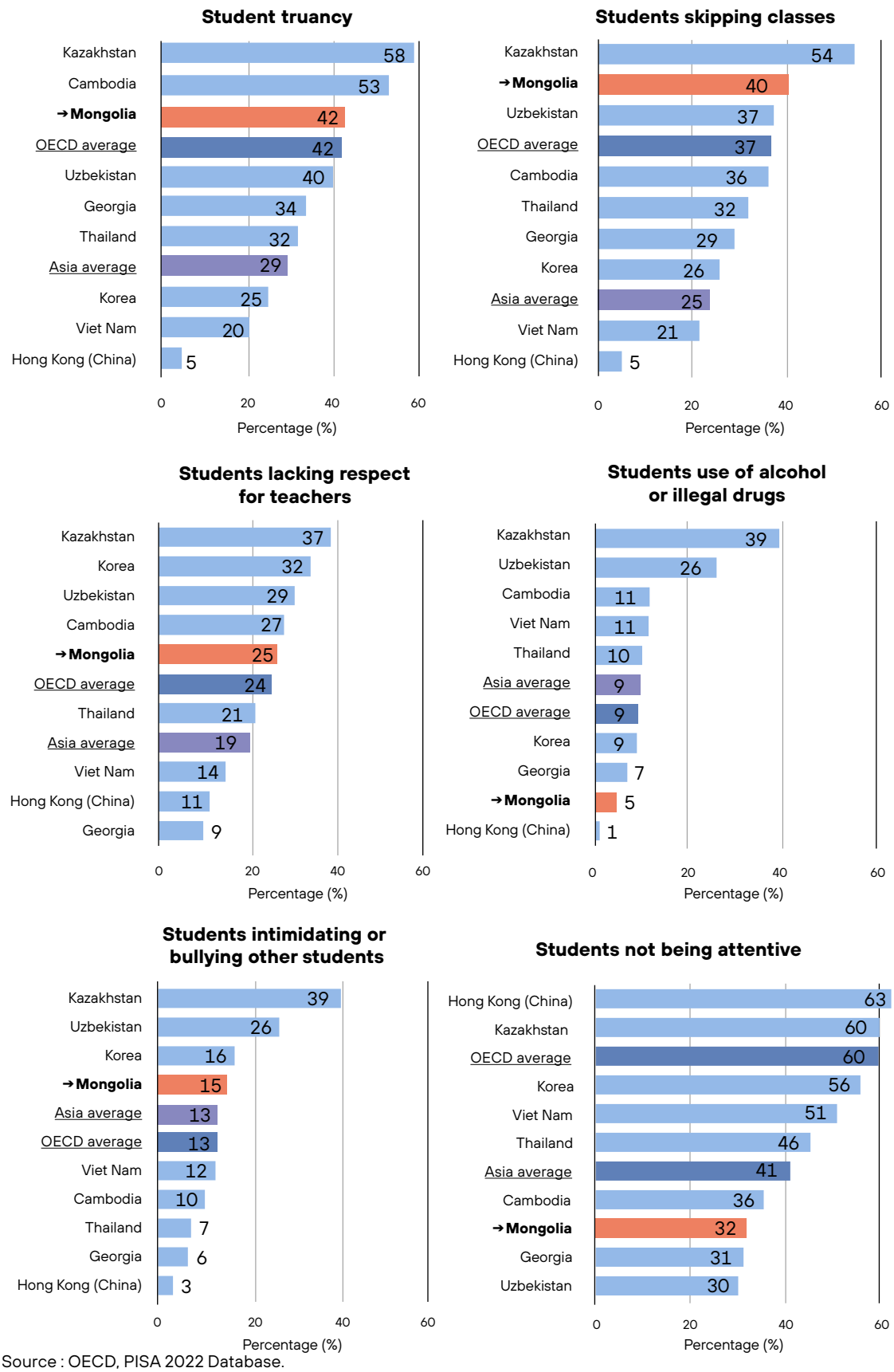
210. Figure 4.15 shows the percentages of students in schools where principals reported that the school's capacity to provide instruction is hindered by student-related factors. The first three diagrams in this figure show that in Mongolia, more than half (58 percent) of 15-year-old students attended schools where principals reported that students' truancy did not affect at all or slightly affected the capacity to deliver instructional learning, whereas 60 percent of students attended schools where principals reported that students' skipping of class did not hinder the instructional capacity. About 75 percent of students are in schools where principals reported that students' lack of respect toward teachers did not affect the learning and school climate.

211. Diagrams in second row of Figure 4.15 also represent similar results that over 70 percent of students attended schools where principals reported no hindering issues related to alcohol or illegal drugs, no bullying or intimidating, and non-attentiveness to the class. Among the student-related factors, the percentages of Mongolian students in schools where the capacity to provide instruction is not hindered by students issues related to alcohol or illegal drugs and non-attentiveness are statistically significantly lower than the percentages of average 15-year-old students across OECD countries and economies.

212. Compared to the PISA 2022 top performing country and economy (Korea and Hong Kong [China]*) as well as Thailand, the percentages of students who attended schools where principals reported that student-related factors such as student truancy and skipping class to some extent or a lot hindered the instructional capacity is observed as statistically significantly higher. On the contrary, this percentage is statistically lower than that observed in Kazakhstan. No statistically significant differences are observed with Uzbekistan and Cambodia.

213. Regarding students' respect toward teachers, use of alcohol or illegal drugs, intimidating or bullying other students, and not paying attention to lessons, the percentage of Mongolian 15-year-old students that attended schools where principals reported that these factors to some extent or a lot hindered the instructional capacity is statistically higher than *Hong Kong (China)**. There are no statistically significant differences with other countries.

Figure 4.15: Student-related factors affecting school climate in Mongolia and comparison countries



Source : OECD, PISA 2022 Database.

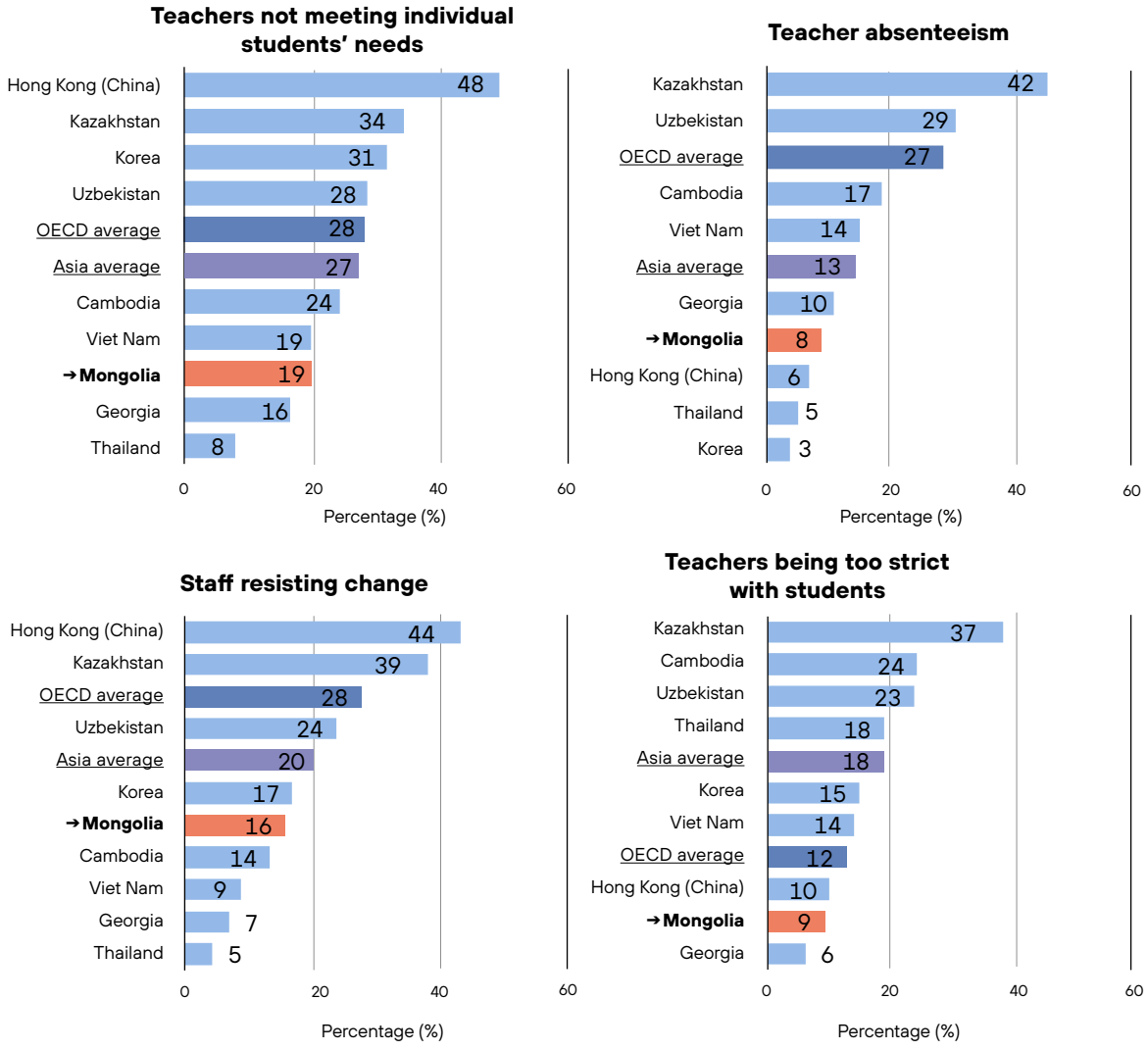
Teacher-related factors affecting school climate

214. School principals were asked to describe the extent to which the following hinder student learning in their schools: teachers not meeting individual students' needs, teacher absenteeism, staff resisting change, teachers being too strict with students, and teachers not being well prepared for classes. Principals' responses from "not at all," "very little," "to some extent," to "a lot" were used to construct the index of teacher-related factors affecting school climate. Higher values in the index indicate principals' perception of these factors affecting school climate.

215. Figure 4.16 shows the percentages of students in schools where principals reported that student learning is hindered by teacher-related factors. According to Figure 4.16, in Mongolia, over 81 percent of 15-year-old students attended schools where principals reported that the learning is not at all or little hindered by teacher-related issues such as teachers not meeting individual students' needs, teacher absenteeism, staff resisting change, and teachers being too strict with students. This result is significantly lower than OECD average. However, almost one-third of principals reported that student learning is a lot hindered by teachers who are not being well prepared for classes, and this is significantly higher than OECD average.

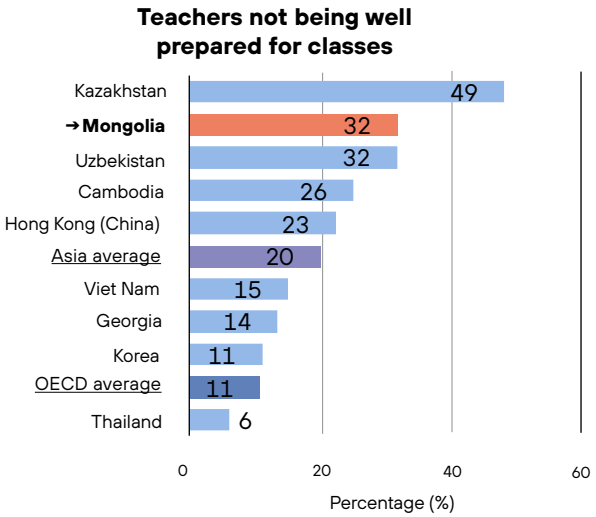
216. In comparison with countries and economies except Cambodia, Georgia, and Viet Nam, the percentage of Mongolian students in schools where the learning is a lot hindered by teachers not meeting student needs is significantly lower. Teachers not being prepared for the class is observed to be significantly higher than comparator countries and economies except *Hong Kong (China)**, Cambodia, and Uzbekistan.

Figure 4.16: Teacher-related factors affecting school climate in Mongolia and comparison countries



Source : OECD, PISA 2022 Database.

Figure 4.16: Teacher-related factors affecting school climate in Mongolia and comparison countries

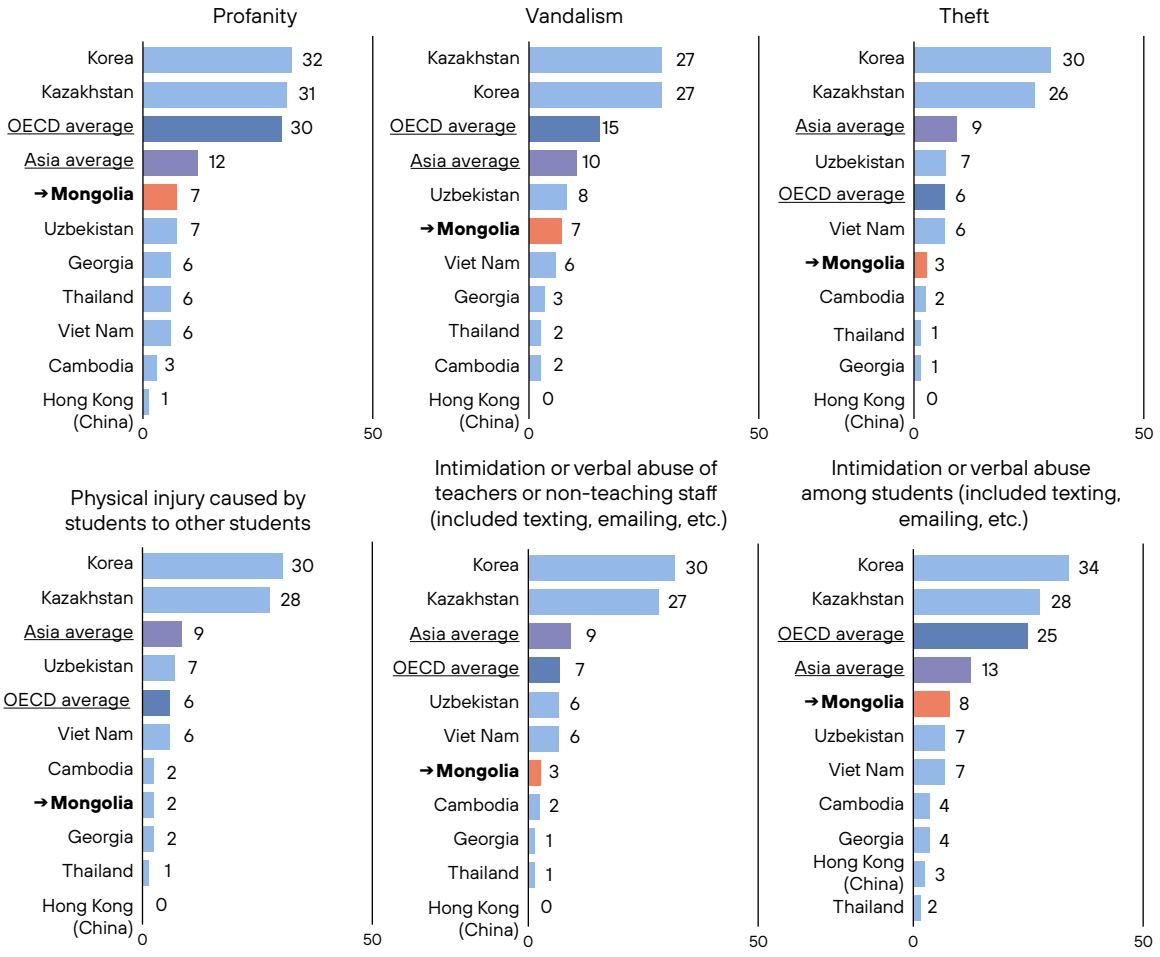


Negative school climate

217. School principals were asked to describe the extent to which the following behaviors are a problem in their schools: "Profanity," "Vandalism," "Theft," "Intimidation or verbal abuse among students," "Physical injury caused by students to other students," and "Intimidation or verbal abuse of teachers or nonteaching staff." Principals' responses ranging from "not at all," "small extent," "moderate extent," to "large extent" were used to construct the index of negative school climate. Higher values in the index indicate principals' perception of these behaviors being problems in their schools to a larger extent.

218. Figure 4.17 illustrates that over 90 percent of students attended schools where principals reported that the abovementioned behaviours are not problems in their schools. Comparing to the benchmark countries, this percentage is significantly lower than *Hong Kong (China)**, Cambodia, Kazakhstan, and Korea.

Figure 4.17: Negative school climate in Mongolia and comparison countries



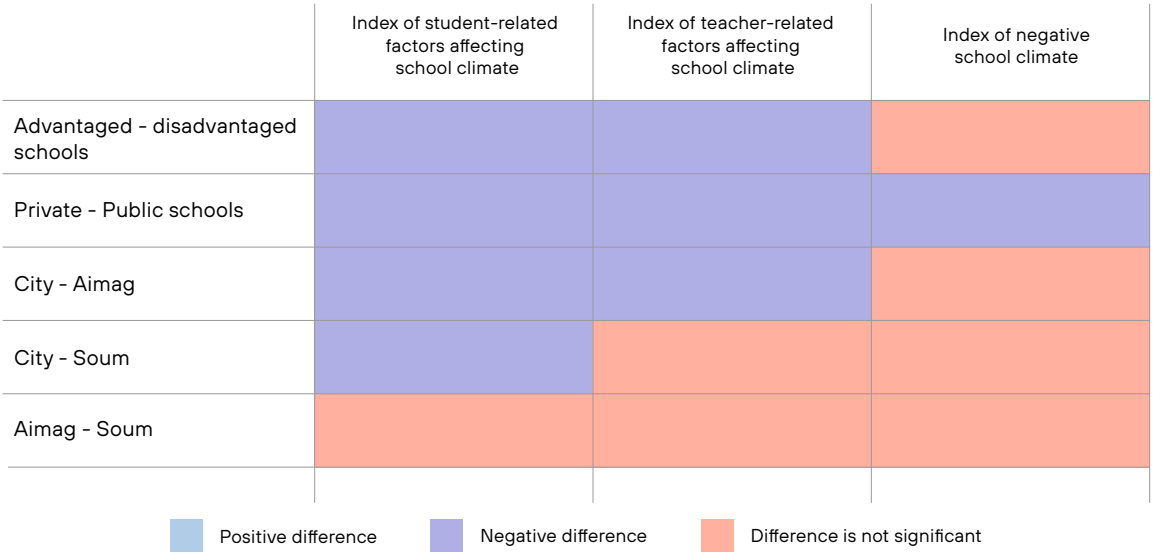
Variation in school climate by school characteristics

219. This section examines how school climate varies by school socioeconomic status and type, specifically between socioeconomically disadvantaged and advantaged schools, rural and urban schools, and public and private schools.

220. Figure 4.18 shows that in Mongolia, the percentage of students in disadvantaged schools where the learning is hindered by student- and teacher-related factors is significantly higher than the percentage of students in advantaged schools. This result is the same as students in public or aimag schools. In other words, public as well as aimag school students' learning is more affected by teacher- and student-related factors than students in private or city schools. According to principals' report, the percentage of students in soum schools where the learning is hindered by student-related factors is also more than the percentage of students in city schools.

221. Students in public schools are more affected by schools' negative climate than their peers in private schools. Behaviors such as profanity, vandalism, theft, verbal abuse among students, physical injury, and verbal abuse of teachers and nonteaching staff are more problematic in public schools.

Figure 4.18. Variation in school climate in Mongolia, by school characteristics



Source: OECD, PISA 2022 Database.

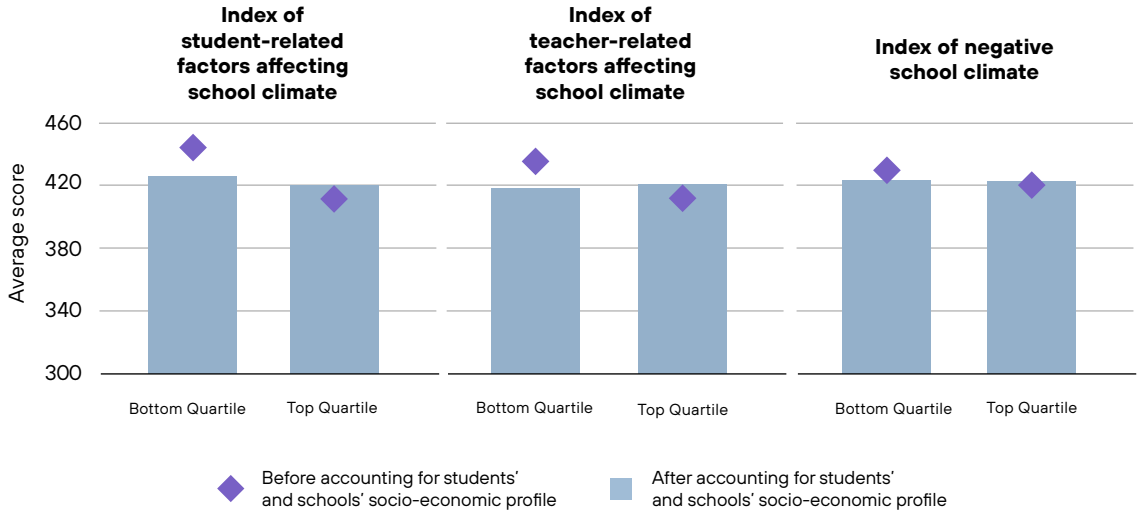
School climate and student mathematics performance

222. Figure 5.22 shows mathematics score differences of students at bottom and top quartiles of index of student and teacher-related factors affecting school climate and index of negative school climate accounting student and school socioeconomic profile. In Mongolia, before accounting socioeconomic profile, in mathematics, students in schools where the school climate is less affected by student-related factors scored 31 points higher than those in schools that a lot affected by the factors. This is statistically significant result. However, after accounting socioeconomic profile, no statistically significant difference is observed in mathematics performance.

223. In Mongolia, statistically significant similar finding is observed for teacher related factors affecting school climate; and performance difference in students between schools whose climate is less affected, and a lot affected by teacher-related factors is 20 score points which equals with one year of learning. No statistically significant difference is observed after accounting for schools' socioeconomic profile.

224. By third diagram of Figure 5.22, before accounting socioeconomic profile, students in schools with positive climate scored 10 points higher than their peers in schools with negative climate. But there is no statistically significant performance difference after accounting the profile.

Figure 4.19: School climate and student mathematics performance in Mongolia



Note: Based on principals' report

Box 4.2: Expenditure per student and performance in PISA

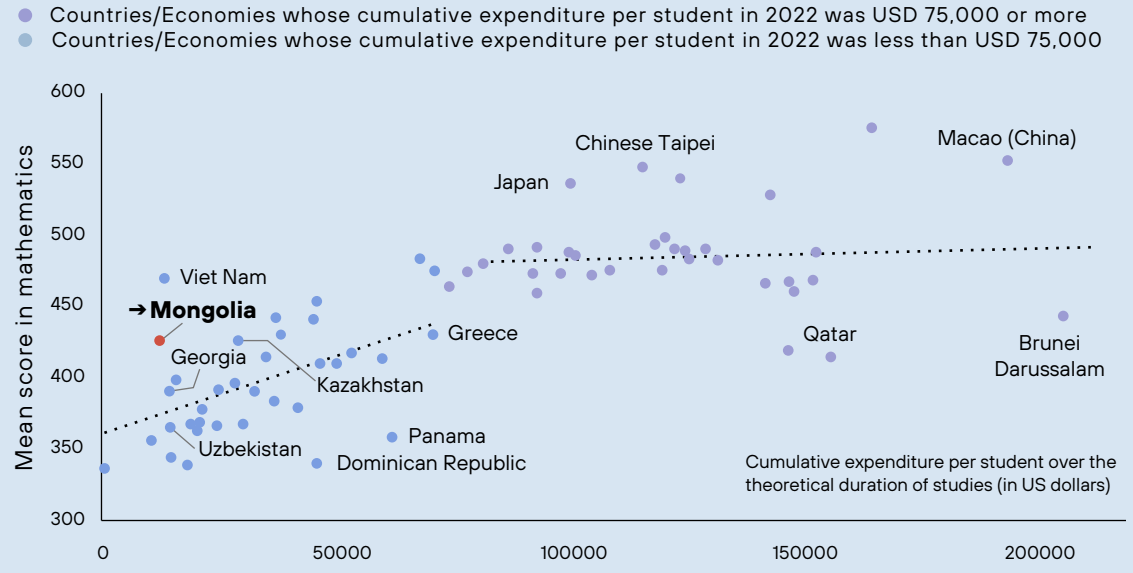
As would be expected, spending on education and per capita GDP are correlated. School systems with greater total expenditure on education tend to be those with higher per capita GDP. However, the relationship is far more complex than a linear relationship between two.

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 US$20,000) have more resources to spend on education. These countries and economies cumulatively spend US$91,132 on each student from age 6 to 15, on average, while countries that are not considered to be in that group spend US$13,805 on average. Students in high-income countries and economies score 73.4 points higher in mathematics, on average, than students in countries where per capita GDP is below the US$20,000 benchmark.

Mongolia is ranked third from bottom in terms of estimated cumulative expenditure on educational institutions per student from ages 6 to 15. Mathematics performance of Mongolian 15-year-old students is 25.8 score points lower than students in high-income countries and economies.

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). Among the countries and economies whose cumulative expenditure per student is under US$50 000, 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 US$50,000, which include most OECD countries (OECD, 2019). For this latter group of countries and economies, the relationship between spending per student and performance is no longer observed and substantially different levels of spending per student are observed yet similar mathematics scores. 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.

Figure 4.20: Expenditure per student and student mathematics performance



Source: OECD, PISA 2022 Database. Note: See PISA International Report Annex B3 Table B3.2.2.

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05 Looking forward: Policy options for Mongolia

This chapter discusses key findings of PISA 2022 for Mongolia and the policy implications arising from these. It then presents policy options that can have both short- and long-term impacts on education in Mongolia. It also discusses what the disparities in student performance, attitudes toward school and learning, and resources invested in schools imply for education policy and practice. The chapter expands on the findings on school closure and learning during the global pandemic and introduces ideas and strategies for future scenarios.

Summary of findings for PISA 2022

225. While Mongolia performs better than benchmark countries such as Thailand, Georgia, Uzbekistan, and Cambodia and is comparable to the benchmark country of Kazakhstan, there is still substantial room for improvement. In Mongolia, 15-year-old students perform significantly behind the average of their peers in OECD and Asian countries participating in PISA. This difference is the highest in the domain of reading, with students in Mongolia lagging their peers in the OECD by around five years. Substantial differences also exist for mathematics (more than two years) and science (more than three years) between students in Mongolia and their peers across OECD countries.

226. As a result of the lower quality of education in the country compared to the OECD, a large share of students is unable to achieve the basic proficiencies in mathematics, reading, and science. In Mongolia, students achieving basic proficiency is only one out of three in reading and one out of two in science and mathematics. These results are much lower than the average of OECD countries, where three out of four students have achieved basic proficiency in both reading and science and two in three students in mathematics.

227. Substantial gender gaps exist in Mongolia, with girls outperforming boys in all three subjects with a greater gap in the domain of reading (in which boys lag girls by around a year of learning).

228. Similarly, substantial socioeconomic achievement gaps exist with socioeconomically disadvantaged students lagging their socioeconomically advantaged peers by 94 score points (or more than four years of schooling). These socioeconomic achievement gaps also appear in the form of achievement gaps across city/aimag and soums as a larger share of students in soums and aimags belong to socioeconomically disadvantaged households.

229. The analysis in Chapters 2, 3, and 4 also provide some possible reasons for the low quality of education in the country and what policies and programs can potentially support improvement in education quality.

230. First, we see that students who attended pre-primary education perform significantly better than their peers who did not or attended only for a year. These differences persist even after controlling for students' socioeconomic status. Global literature also shows that investing in early childhood education (ECE) is one of the best investments that a country can make. ECE is efficient in shaping skills and often leads to better outcomes than similar interventions later in life. Investing in ECE is a superior strategy over one that seeks to remedy deficiencies in cognitive and social development found later in life. Any disadvantages borne by children in their early years are associated with poorer performance in school in later years. Inversely, the good impact of ECE has a cascading effect on the acquisition of technical and social skills later in life (Bodewig et al. 2014). Therefore, investing in ECE yields higher economic returns than investing in subsequent levels of education.

231. Second, the analysis shows that instruction in Mongolian schools is significantly hindered by the inadequate quality of teaching staff. About 38 percent of students study in schools where principals reported that instruction was hindered to some extent or a lot due to inadequate or poor quality of teaching staff. While the share of teachers who participated in professional development opportunities in the last three months in Mongolia is similar to the OECD countries, this share was lower than the Asian average and countries such as *Hong Kong (China)**, Korea, and Viet Nam. Further detailed analysis is required to more clearly understand the gaps in the knowledge and skills of teaching staff and structure effective professional development opportunities to upgrade teachers' skills.

232. Third, the analysis shows that a vast majority (>60 percent) of students in Mongolia study in schools where instruction is hindered by a lack or inadequate quality of educational materials or physical infrastructure. This percentage is significantly higher than that of the OECD (<30 percent) and Asian average (<40 percent). Similarly, most students (80 percent) in Mongolia study in schools where principals report a lack or poor quality of digital resources. This is also substantially higher than the OECD (≤25 percent) and Asian average (≤45 percent). This limitation in critical educational, infrastructure, and digital resources may be the reason restricting the educational excellence of Mongolian students. Furthermore, schools educating the majority of disadvantaged students in aimags and soums are more likely to suffer from shortages or poor quality of critical educational and physical materials required for the learning process.

Establishing foundations for success and improving education outcomes in Mongolia

233. A strong education system is one that provides quality education to all. The education system in Mongolia s hows some strong features and the government aims to build on the system's successes to nurture excellence in all children in the country.

Ensuring universal access to pre-primary education

234. The net enrolment rate of 5-year-old children in Mongolia is 93.4 percent (2022–2023) (Ministry of Education and Science 2023). The government aims to ensure universal enrolment in pre-primary education; in this regard, by education law amendment passed the Parliament in July 2023, enrolment of 5-year-old children access to pre-primary education is regulated as compulsory; and prep-primary education starting age is set as 2.

235. To increase the enrollment rate, since 2022-2023 academic year, the Ministry of Education and Science has been implementing an intervention (1) to rent or purchase more learning spaces and classrooms negotiating with private entities, (2) to introduce a new funding scheme for private kindergarten and (3) to digitalize children registration system. The first 2 are based on public-private partnership and provided "doubled" variable cost for private kindergarten where children from the catchment area are enrolled. It also provides financial support to the kindergartens for establishing standardized learning environment with necessary materials and equipment. Moreover, prior to 2022-2023 academic year, 2-5 school children used to be registered in public kindergarten via lottery-like scheme. In 2022, all children registered online, and provided equal opportunity to enroll in public and private kindergartens.

236. One more key challenge in terms of equitable access for ECE in Mongolia is to ensure education services for children from herder households, vulnerable households, and children with disabilities, who comprise the majority of children not covered by pre-primary education services. There is still a gap of 45.2 percent in the pre-primary education access of herders' children, which is mostly related to the nomadic lifestyle, increased internal migration from rural to urban areas, and the decrease in the quality and financing of alternative preschool services. Similarly, only 34 percent of preschool children from the poorest families attended focus group discussions with teachers and parents which revealed that school supplies and other materials required from each child in the beginning of school year, voluntary contributions from parents to improve the learning environment of classrooms, costs related to kindergarten art and sport activities, and seasonal clothes for children are the major barriers to attend kindergarten for children from the poorest households. Similarly, the enrolment rate of children with disabilities in pre-primary education services is low and has not changed in the last decade. Pre-primary and general secondary education law specifically stipulates inclusive education; and regulates mechanisms to enable all children from 2 to 18 to equally access education services regardless of barriers and difficulties they have.

Ensuring universal access to pre-primary education will therefore require targeted approach that understands the specific reasons and enables flexible approaches to overcome these specific barriers.

Table 5.1: Programs included in ESMTDP to increase access to pre-primary education

Develop parental education program	1. Conduct a baseline survey to assess parental skills. 2. Develop training package for parents on how to support child development. 3. Deliver the above trainings based on local education departments and lifelong education centers.
Improve kindergarten infrastructure and environment	1. Optimally identify kindergarten capacity, structure, building age, and location. 2. In relation to growth of kindergarten children, improve the capacity (construct or extend kindergarten buildings). 3. Construct standard, modern toilets annually in kindergartens that have outside toilets. 4. Provide toys and learning materials in line with learning objectives.
Establish condition for Children with Disabilities (CWD) to access pre-primary education services	1. Establish a condition for CWD to access pre-primary education within the residential area. 2. Expand the special kindergartens, renovate soft items including furniture and equipment. 3. Develop teacher training modules focusing on specific disability features of children. 4. Retrain pre-primary teachers focusing on specific skills related to children disability type in distance, online, and face-to-face training.
Open online pre-primary education program	1. Develop open, online, and distance learning content and resources for children and their parents in cooperation with related professional organizations, universities, civil society organizations, and companies. 2. Develop open, online, and distance teacher training content and resources in cooperation with related professional organizations, universities, civil society organizations, and companies. 3. Support Quality Assurance organization to verify the quality of the above open, online, and distance content and resources.

Ensuring continuous professional development of teachers

237. Mongolia long- and medium-term development strategies and policies recognize teacher quality as one of the constraints limiting education quality across all education subsectors and lays out a number of activities to improve teachers' pre- and in-service training. By sector analysis, the gap in the learning achievements among rural and urban students is mainly associated with the professional capacity of teachers. In Mongolia, teachers are trained at universities that implement different, unaccredited programs and pedagogical curricula; as a consenquence, the quality of graduates-prospective teachers is varied. Moreover, there is no link between pre- and in-service trainings; and the content of the training does not provide the necessary knowledge and required skills for teachers, which has a negative impact on teacher's professional development.

238. In response to the above challenges, Ministry of Education and Science has been implementing "Competent Teacher" Program promoting teachers' learning and cooperation through professional communities. Moreover, by recently amended education laws, all programs in teacher pre-service universities are regulated to be accredited. One of the major policy is teacher performance appraisal system launched in 2022. It aims to extrinsically motivate teachers to work with individual students to acquire knowledge and skills intended in the learning objectives in the subject curricula..

239. In addition, by legal reform, teacher professional development system is revised. Based on results of the appraisal (as well as practical needs), they plan their professional development activities in more flexible way. Teachers are provided more opportunities to attend in face-to-face trainings, school based on-the-job training and professional community activities, and online learning.

240. By ESMTDP, Ministry of Education and Science aims to implement a special teacher development program or continuous professional development plan, including on-the-job and online training and lays down the planned activities in ESMTDP.

Table 5.2: Programs Included in ESMTDP to ensure continuous professional development of teachers

Implement competent teacher program	1. Develop professional standards for primary and secondary education teacher. 2. Amend teacher pre-service training program in line with professional standards. 3. Update the current Minister Order #287 to make the primary and secondary schoolteachers' professional development system more flexible. 4. Establish environment and conditions for continuous professional development. 5. Retrain special education teachers and supply schools with psychologists. 6. Implement school-based mentor-teacher activities for newly recruited teachers at each school.

241. MES is also currently planning to introduce Teacher 3-Pillar Policy for improving the quality and supply of teachers focusing on teacher (1) pre-service training, (2) professional development and (3) social security and salary. The key moving forward would be to ensure that teachers are empowered as professionals to discuss their development needs with their mentors and supervisors; develop their skills through different programs available at pedagogical universities, national and regional and school-level teacher professional development centers, within schools, or through online platforms to meet the identified development needs; and engage in professional learning communities with their peers. Such a system of teachers as empowered professionals would also require motivating and meritocratic recruitment and career progression structures for teachers.

Improving learning environment

242. PISA 2022 results highlight the vast shortages of educational and physical resources in Mongolian schools. The government currently aims to reduce these shortages through a performance-based funding mechanism that provides funds to schools along with the autonomy to spend toward the critical resources needed to improve education quality.

243. Since 2022, schools are provided funding that enables teachers to purchase necessary teaching and learning materials and tools, and school leaders to Improve the school infrastructure and materials based on actual needs of students, teachers and others. At the beginning of every financial year, school leaders and teachers identify what materials and equipment including mobile data are needed to facilitate student offline and online learning more effectively, and plan the purchase within the allocated budget which is provided based on the numbers of students in the school. For example, for last years, in-school toilet and sanitation has been installed; and by 2025, all schools will have standard toilets and sanitation.

244. Together with this, the government aims to support physical infrastructure of schools to ensure that schools have the physical capacity to educate the increasing number of children in urban areas without negatively affecting the quality of children.

Table 5.3: Programs Included in ESMTDP to improve learning environment

Classroom construction and infrastructure improvisation	1. Optimally identify school capacity, infrastructure, building age, and location. 2. Increase school capacity based on school-age population growth. 3. Improve schools' toilet and water and sanitation conditions with standard facilities. 4. Ensure the implementation of school dormitory standards. 5. Align school, dormitory food production, and service expenses with the standards and provide nutritious and healthy food to students. 6. Establish new school.

Closing achievement gaps

245. PISA 2022 highlights the large socioeconomic and urban-rural gaps in the achievement of 15-year-old students in Mongolia. Similar gaps also appear in national assessments and MES is implementing a series of activities to reduce these achievement gaps and ensure quality education for all.

246. Mongolia's distinctive geographical and demographic features pose specific challenges to effective service d elivery for all. Mongolia is among the least densely populated countries, with an overall population density of only 2 persons per km2. Nearly half of all students in Mongolia's general education system are in the densely populated capital city of Ulaanbaatar. This results in severe congestion, with a large share of schools operating double shifts, a situation that is likely to be exacerbated by an expected demographic surge. Conversely, vast areas of the country experience extremely low population density, with a high share of nomadic households. Overall, one-quarter of households in Mongolia are nomadic. These contrasting challenges necessitate flexible, hybrid, and digital modes to ensure learning for all.

To close achievement gaps, MES aims to roll out a digital transformation in education; and enables students to access free online resources using good quality learning platforms. The well-accessed one is MEDLE platform (Medle.mn). The platform provides teaching content and ready-to-use videos to both teachers and students to ensure access to quality lessons education in the remotest areas of Mongolia's vast expanse. Currently, a version of the platform has been in operation since 2021, prompted by the COVID-19-induced school closures. The platform has 1,780 lessons and is accessed every month by 5,017 teachers and more than 1 million users. Moreover, in 2022, Ministry of Education and Science established a "Medle" e-school where all students and teachers learn and teach in online using well-developed learning and teaching platforms and tools. This school provides equal opportunities to children who had limited ability to study subjects according to their future careers due to class size and lack of subject teachers. Equal opportunities will also be created for children who could not participate in educational services due to developmental differences. In 2023-2024 academic year, over 15,000 students from all corners of the country are learning in this schools and being taught by the most qualified teachers in Mongolia. Under the digital transformation reform, school connection has been improved applying innovative funding scheme such as leasing, all schools are provided at least one smart class by international and national EdTech partners; and teacher digital skills and capacity to use digital tools and platforms in teaching have strengthened. MES introduced the well-known learning platform in some school subjects such as English language and primary mathematics . The availability of smart devices and universal access to the internet is critical to the e-learning transition. MES aims to provide teachers and students with smart devices and computers. First, 'Medle' e-school teachers were provided with computers and accessories. Local authorities have also implemented measures to provide computers to their teachers with their own resources. For example, Gobi-Altai and Orkhon provinces provided computers to all their teachers. However, out of the 630 schools, 57 schools are not connected to the internet. The teachers of these schools are provided with mobile data.

Table 5.4: Programs Included in ESMTDP to close achievement gaps

Improving quality of rural education program	1. Conduct teacher development needs assessment by local Education Departments and report assessment results, annually. 2. Disseminate advisory activities to rural schools. 3. Implement teacher exchange program between aimag and soum school leaders and teachers. 4. Deliver capacity-building trainings to rural schoolteachers focusing on IT skills. 5. Implement dormitory-based after-school learning activities engaging teachers whose teaching hour do not meet the specified norm.

246. Another gap in student achievement is observed between urban (city and aimag) and rural (soum) schools. One of the major interventions to reduce the gap is to provide learning opportunities to rural children using the technology. In addition, as rural schools are likely to suffer from lack of school physical resources, a targeted policy to reduce inequalities in education by providing additional resources, support or assistance to disadvantaged students and schools, targeting disadvantaged schools is critical. The intervention needs to include the provision of school lunch program for disadvantaged schools. Reflecting upon the PISA 2022 results, MES is planning a national target program for improving rural education quality emphasizing foundational factors for success.

Improving children reading skills

247. PISA 2022 shows that 15-year-old students in Mongolia perform the lowest in reading skills and only 36 percent of students were able to attain the minimum proficiency standards. The low results in reading highlight the need for a targeted program to improve the reading skills of students. Reading is a gateway for learning as the child progresses through school—and conversely, inability to read constrains opportunities for further learning. Reading proficiency is also critical for foundational learning in other subjects.

248. MES is currently working to reform the curriculum and to implement a targeted program to develop Mongolian language skills. One of the major changes in the curriculum is to introduce emergent literacy and numeracy in pre-primary education curriculum and emphasize foundational skills in all subject curricula and evaluation in secondary education. By January 2024, Mongolian national Institute for Education Research is going to start a pilot program for revising primary school ABC instructional methodology and textbook. A dedicated learning platform and digital content will be developed for children to joyfully learn ABCs.

Ensuring children's well-being

249. PISA 2022 shows that while 15-year-olds in Mongolia are generally more satisfied on average than their peers in the OECD, they report slightly higher exposure to bullying. More exposure to the bullying is also associated with lower overall well-being (in terms of life satisfaction) and with lower academic achievement. Therefore, MES is pursuing a number of measures to ensure a safe and supportive environment for children in schools. Starting from the 2021–2022 academic year, MES and the Mongolian Association of Psychologists have organized four training sessions for the qualification of educational psychologists with the technical support and funding of the United Nations Children's Fund, the Swiss Development Agency, and Badamlan NGO and trained 207 psychologists in general education schools. As a result, in the 2022–2023 school year, one out of every three state-owned schools has a psychologist.

250. MES also aims to conduct a situational analysis to determine the perceptions of teachers, students, parents, and guardians about the social and psychological problems in the general education school environment and then plan activities to address the specific problems experienced by the schools.

251. Furthermore, MES successfully implemented a free 'Chatbox' service to provide advice and help from professional psychologists to students in grade 12 of secondary education to overcome their fear and stress before the exam. According to the results of the satisfaction survey about the service, the chatbox psychological counselling service is effective and provides great emotional support to the students. Looking at the figures, 74.5 percent were very satisfied and 79.8 percent concluded that the service was useful. Moreover, 89.7 percent answered yes to the question whether they were able to get the help they needed.

Complementing programs with student assessments to ensure effectiveness

252. As the MES rolls out these programs, it would be important to complement these with effective student assessment systems to ensure that the activities improve student achievement. Based on the country's experience with implementing and analyzing PISA, MES aims to reform the current national assessment system to incorporate the problem-solving skills tested in PISA. Measures to create a national quality assessment system based on PISA's assessment methodology and regularly monitor and improve the quality of education were implemented starting from the 2022–2023 school year. The first such national assessment was implemented in November 2022.

253. Regular implementation and analysis of assessments will be important to understand the effectiveness of the different government programs in enhancing student learning outcomes and well-being and improve the programs accordingly.

Table 5.5: Programs Included in ESMTDP to reform student assessments

Revision of primary and secondary student learning assessment	1. Administer quality evaluation annually and improve the quality based on results and feedback. 2. Participate in PISA assessment in 2022. 3. Based on PISA 2022 results, reform assessment policy. 4. Build capacity of teachers and assessment experts who administer assessments. 5. Update EEC Item bank reflecting the above skills in mathematics and science subject items. 6. Align national school leaving and graduation exams with the learning objectives stated in the curricula. 7. Initiate improvisation of relevance and integration of school leaving and grade promoting assessment.

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