



2

Patterns of Students' Learning Time



INTRODUCTION

How much time do students spend learning science, mathematics and the language of instruction through deliberate learning activities? In PISA 2006, students were asked to report how much time they typically spent per week studying these three subjects in deliberate learning activities, such as regular school lessons, out-of-school-time lessons, or individual study. Students could report one of the following five options: "No time", "Less than 2 hours per week", "2 or more but less than 4 hours per week", "4 or more but less than 6 hours per week" or "6 or more hours per week".

LEARNING TIME IN REGULAR SCHOOL LESSONS

Virtually all students from countries and economies that participated in PISA 2006 report being involved in regular school lessons in mathematics and the language of instruction. However, not all students are involved in regular school lessons in science. For example, around 97% of students across OECD countries report participating in regular school lessons in mathematics and on the language of instruction, while 90% report participating in regular school lessons in science (Tables 2.1a, 2.1b and 2.1c). This confirms the idea that most countries place a great emphasis on the study of mathematics and the language of instruction at school.

Not only is the share of students studying mathematics and the language of instruction in lessons at school greater, students also report spending more time in regular school lessons learning mathematics and the language of instruction than they do learning science. Two-thirds of students report spending two hours or more per week learning science in regular school lessons and only one third spends as much as four hours or more per week. However, at least 85% of students report spending two hours or more per week learning mathematics and their language of instruction in regular school lessons; almost half of them spend four hours or more per week in regular school lessons on mathematics and the language of instruction.

Students' participation rates in regular school lessons vary substantially not only across subjects but also across countries. The variation across countries is greatest in science. For example in Norway, Sweden, Poland, the United Kingdom, Korea, Finland, Denmark, Iceland and Japan, and the partner countries Estonia and Lithuania, over 95% of students take part in regular school lessons in science. In Turkey and the Netherlands, and the partner countries and economies Hong Kong-China, Croatia, Kyrgyzstan and Israel, only around three-quarters of students take part in regular school lessons in science.

Few students are exposed to science lessons during their regular school hours; when they are, many of them may only have a limited number of learning hours. In two-thirds of all OECD countries and in 25 out of 27 partner countries and economies, over one-quarter of students spend less than two hours per week studying science in regular school lessons. In one-third of OECD countries and in four partner countries and economies, less than 5% of students have six or more hours per week of science lessons at school. Conversely, the large majority of students in all OECD countries and in all partner countries and economies spend between two and six hours per week studying mathematics and the language of instruction, and sizeable proportions spend six hours or more.

In sum, countries vary widely in how they provide regular school lessons in science, both in terms of how many students attend such lessons and the amount of time students spend engaged in lessons. In some countries, science learning time at school is minimal. This could mean that some students do not receive the necessary training for them to be sufficiently equipped for an increasingly science-oriented world. An alternative explanation could be that in some countries, science learning has already taken place in previous grades and by the age of 15, students have already progressed to a level at which science is no longer compulsory.



LEARNING TIME IN OUT-OF-SCHOOL-TIME LESSONS

In many countries, sizeable proportions of students attend out-of-school-time lessons, especially in mathematics and the language of instruction (Tables 2.1a, 2.1b and 2.1c). Across OECD countries, 35% of students attend these kinds of lessons for science, while the proportion reaches 48% for mathematics and 41% for the language of instruction. The higher proportion of students attending out-of-school-time classes in mathematics as compared to science is only partly due to the lower proportion of students taking regular science classes. Some 38% of students who take regular classes in science attend out-of-school-time lessons for science and 48% of students who take regular classes in mathematics attend out-of-school-time lessons in mathematics. Students not only attend more mathematics and language of instruction classes in regular hours when compared to science, they are also more likely to attend classes in mathematics and the language of instruction after school.

On average, students in OECD countries are less likely to attend out-of-school-time lessons than students in the partner countries and economies, but cross-country variations in attendance rates are wide. For example, at least 70% of students are involved in out-of-school-time lessons in science in Greece and the partner country Tunisia, while at least 70% of students in Austria, Japan, Iceland, Belgium, Ireland, Australia, Finland, Switzerland, New Zealand, Germany, Luxembourg, Spain and the partner countries Croatia and Argentina are not involved in these types of lessons at all. In mathematics, 70% of students or more are involved in out-of-school-time lessons in Turkey, Korea, Greece and the partner countries Qatar, Israel and Tunisia, while at least 70% of students in Finland and Austria are not involved in these kinds of lessons. In the language of instruction, at least 70% of students are involved in out-of-school-time lessons in Turkey, Denmark and the partner countries Kyrgyzstan and Tunisia, while at least 70% of students in Austria, Finland, Belgium, Japan, Spain, Iceland, Switzerland and the partner countries Croatia, Liechtenstein and Argentina do not attend these kinds of lessons.

The difference across subjects is manifested not only in the proportion of the student population that engages in out-of-school-time lessons, but also in the amount of time students devote to such activities. Generally, students spend more time in out-of-school-time lessons in mathematics and the language of instruction than in science, and students in partner countries and economies spend more time in out-of-school-time lessons than students in OECD countries.

The majority of students who attend out-of-school-time lessons, particularly among OECD countries, do so on a limited basis in terms of learning hours. For example, in more than one-third of OECD countries, at least 70% of students who are involved in out-of-school-time lessons in science spend less than two hours per week in such activities. Similarly, many students attend out-of-school-time lessons in mathematics and the language of instruction, but most of them attend such lessons for less than two hours per week (notable exceptions in the OECD include Greece, Korea, Spain and Turkey). Students in the partner countries and economies make a slightly greater use of out-of-school-time lessons: while the majority of students engage in these kinds of lessons in the three subjects for less than two hours per week, large fractions of the student population in some partner countries and economies attend similar kinds of lessons for more than two hours.

LEARNING TIME IN INDIVIDUAL STUDY

Across OECD and partner countries and economies, around 75% of students report spending time engaged in individual study learning science; around 85% do so for mathematics and the language of instruction (Tables 2.1a, 2.1b and 2.1c). This difference in participation rates across subjects could be partly explained by the different participation rates in regular school lessons in these subjects.



There is no major difference between OECD countries and partner countries and economies in participation rates in individual study. Most students who engage in individual study in PISA participating countries and economies spend less than two hours per week studying each of the three subjects. However, significant proportions of students both in OECD and partner countries and economies spend two hours or more per week per subject, especially on mathematics.

The amount of time, if any, that students spend on individual study varies across countries, especially in science, although variations are not as great as they are in relation to participation in out-of-school-time lessons. In general, engagement in individual study in mathematics and the language of instruction varies little across countries while variations are more pronounced in relation to science. In 18 out of 30 OECD countries and in 17 out of 27 partner countries and economies, over 85% of students spend at least some time learning mathematics through individual study. Individual study of the language of instruction is marginally less common since, in only about half of the OECD and partner countries and economies, over 85% of students spend some time engaged in individual study. In contrast, the proportion of students engaged in learning science through individual study varies significantly across countries. For example, in Japan, 54% of students engage in some kind of individual study each week, while 90% of Polish students study science individually. Among the partner countries and economies, around 60% of students in Israel and Hong Kong-China engage in individual study in science, while over 90% of students in Indonesia, Jordan, Thailand and Tunisia do so.

In most countries, the majority of students spend two hours or less per week in individual study in science, mathematics and the language of instruction. Across OECD countries, 51% of students spend some time, but less than two hours per week, doing homework or studying by themselves in science and mathematics; 54% spend similar amounts of time studying the language of instruction. These percentages vary widely among countries. For example, in science, over 50% of students in the partner countries the Russian Federation, Jordan, Tunisia and Azerbaijan spend two hours or more per week doing homework or studying by themselves, while only 15% or less of students in Japan, Finland, Denmark, Sweden and partner country Lichtenstein do so.

ALLOCATION OF LEARNING TIME AND DIFFERENT FORMS OF DELIBERATE LEARNING ACTIVITIES

To obtain the results for this section, the original categorical variable, which described time spent in learning science, mathematics and the language of instruction, was recoded into the number of hours individual students reported spending on different deliberate learning activities. Students who reported spending “no time” in any given activity were assumed to have spent 0 hours in that activity. Similarly, students were assumed to have spent 1 hour per week on an activity if they reported having spent “less than 2 hours per week”, 3 hours if they reported having spent “2 or more but less than 4 hours per week”, 5 hours if they had reported “4 or more but less than 6 hours per week”, and 7 hours if they had reported “6 or more hours per week”. Although it creates a risk of introducing measurement errors in the estimates, the recoding of categorical variables into continuous variables enables more direct comparisons across countries in the average number of organised learning hours in which students participate, and in the relative share of time students spend in lessons at school, out-of-school-time lessons and individual study out of total learning time. The comparisons should thus be interpreted with caution.

Students spend more time in deliberate learning activities studying mathematics and the language of instruction than studying science (Tables 2.2a, 2.2b and 2.2c). Across OECD countries, total learning time in school lessons, out-of-school-time lessons and individual study, includes at least 6 hours and 30 minutes per week for the study of mathematics, around 6 hours and 20 minutes for the study of the language of instruction, and 5 hours for the study of science. Students in partner countries and economies also spend more time in learning activities focused on mathematics: in all but seven partner countries and economies,



students allocate significantly more time to mathematics than to the language of instruction and science. In general, students spend more time in activities related to mathematics than the language of instruction or science. However, in five OECD countries – Sweden, Norway, Poland, Italy and Denmark – and four partner countries – Azerbaijan, Kyrgyzstan, Lithuania and Romania – learning activities related to the language of instruction take up more time than activities related to science and mathematics. Science takes up the most time among students in the Russian Federation.

Figures 2.1a, 2.1b and 2.1c highlight the total number of hours students spend in various learning activities (*i.e.* school lessons, out-of-school-time lessons and individual study in science, mathematics and the language of instruction). In science, the total number of learning hours ranges from less than 4 hours per week in Japan, Switzerland, the Netherlands, Austria and the partner country Croatia, to over 7 hours per week in Greece and the partner countries the Russian Federation, Jordan and Tunisia. In mathematics, the total amount of time ranges from 5 hours or less per week in Sweden, the Netherlands and Finland, to over 9 hours per week in Korea. In the language of instruction, the total number of learning hours ranges from 5 hours or less per week in Finland, Austria, the Netherlands, Sweden and the partner countries the Russian Federation, Argentina and Uruguay, to over nine hours per week in Denmark.

Across OECD countries, the total amount of time students spend in deliberate learning activities is 6 hours and 30 minutes in mathematics, 6 hours and 20 minutes in the language of instruction and 5 hours in science (Tables 2.2a, 2.2b and 2.2c). In some countries, these differences were more pronounced, especially between mathematics and science. For example, the difference between mathematics and science learning time is half an hour or less in Finland, Portugal and Sweden, but over two-and-a-half hours in Iceland, Japan and Korea, among OECD countries, and Macao-China, Hong Kong-China, Chinese Taipei, Latvia and Israel, among partner countries and economies (Tables 2.2a and 2.2b). Although the difference in learning time devoted to mathematics and to the language of instruction is small in most countries, it is over an hour in three OECD countries – Austria, Japan and Korea – and in eight partner countries and economies.

Figures 2.1a, 2.1b and 2.1c present the total number of learning hours broken down into various activities – school lessons, out-of-school-time lessons and individual study – by subjects. While students in two countries may spend the same total amount of time in an activity studying a particular subject, the share of the overall time they dedicate to learning may differ greatly. For example, while students in both Finland and Greece spend three-and-a-half hours per week learning mathematics in regular school lessons, mathematics school lessons represent approximately 70% of total mathematics learning time in Finland and 50% in Greece.

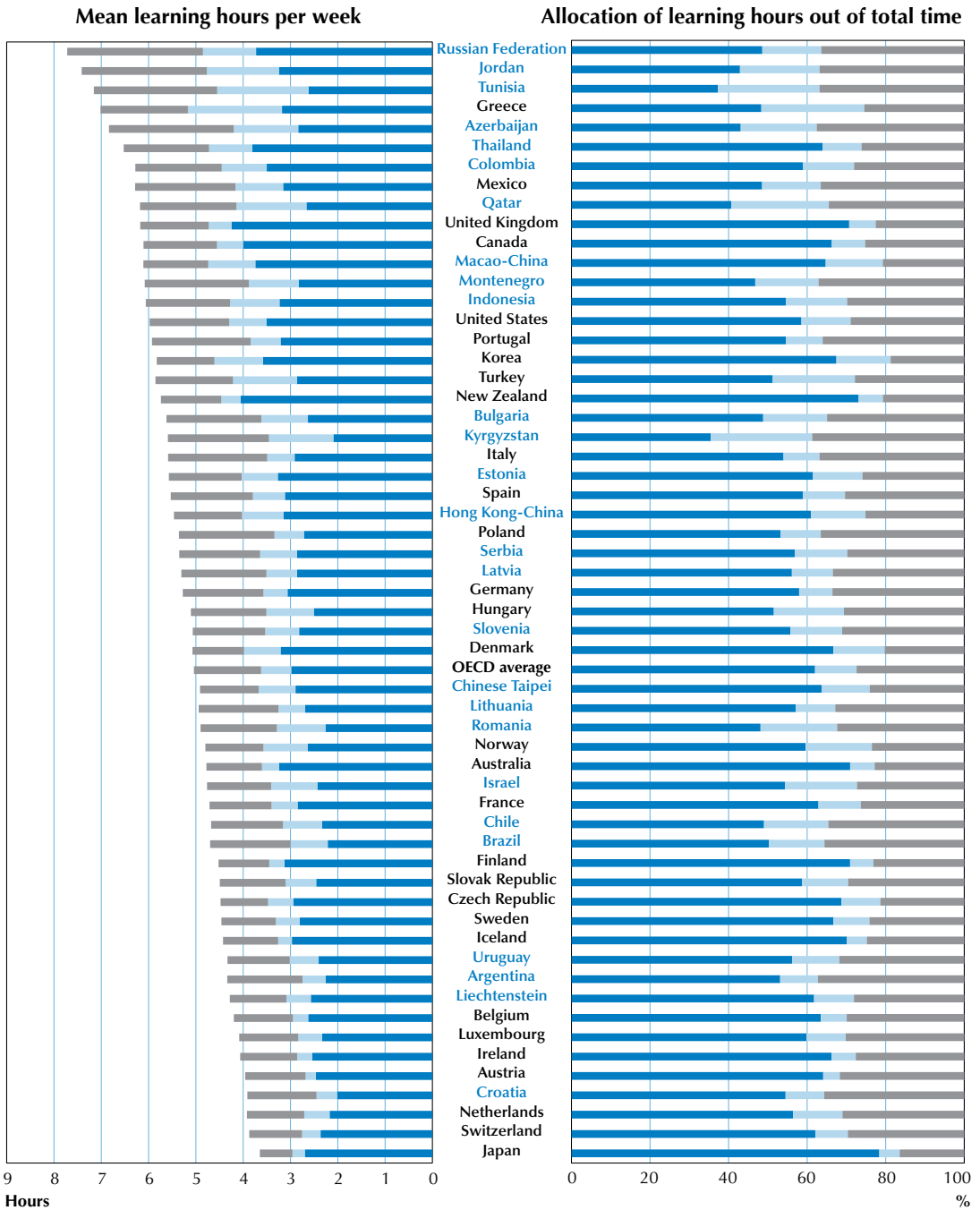
Across OECD countries, the distribution of deliberate learning time in regular school lessons, out-of-school-time lessons and individual study is similar across the three different subjects (Tables 2.2a, 2.2b and 2.2c). This section primarily describes cross-country variations in the allocation of overall deliberate learning time, combining science, mathematics and the language of instruction, across different activities. Students in OECD countries are engaged in regular school lessons for 62% of their overall learning time, individual study for 26% of their time and out-of-school-time lessons for the remaining 12% of their time (Table 2.2d). How students allocate their overall time of engagement in deliberate learning activities varies greatly across countries. For example, Finnish and Japanese students spent about 70% or more of their overall learning time in school lessons, while the corresponding percentage is 50% or less in Greece and in seven partner countries and economies: Azerbaijan, Bulgaria, Jordan, Kyrgyzstan, Qatar, Romania and Tunisia. Participation in out-of-school-time lessons accounts for over 20% of students' overall learning time in Greece, Turkey and in six partner countries and economies: Romania, Israel, Jordan, Kyrgyzstan, Qatar and Tunisia. In 12 OECD countries and in partner countries Croatia and Liechtenstein, out-of-school-time lessons account for 10% or less of overall time that students spend on learning science, mathematics and the language of instruction.



Figure 2.1a

Mean learning hours and allocation of learning hours out of total time in science

■ Regular lessons at school ■ Out-of-school-time lessons ■ Individual study



Countries are ranked in descending order of the total learning hours in science.
 Source: OECD PISA Database 2006, Table 2.2a.



Figure 2.1b

Mean learning hours and allocation of learning hours out of total time in mathematics

■ Regular lessons at school ■ Out-of-school-time lessons ■ Individual study

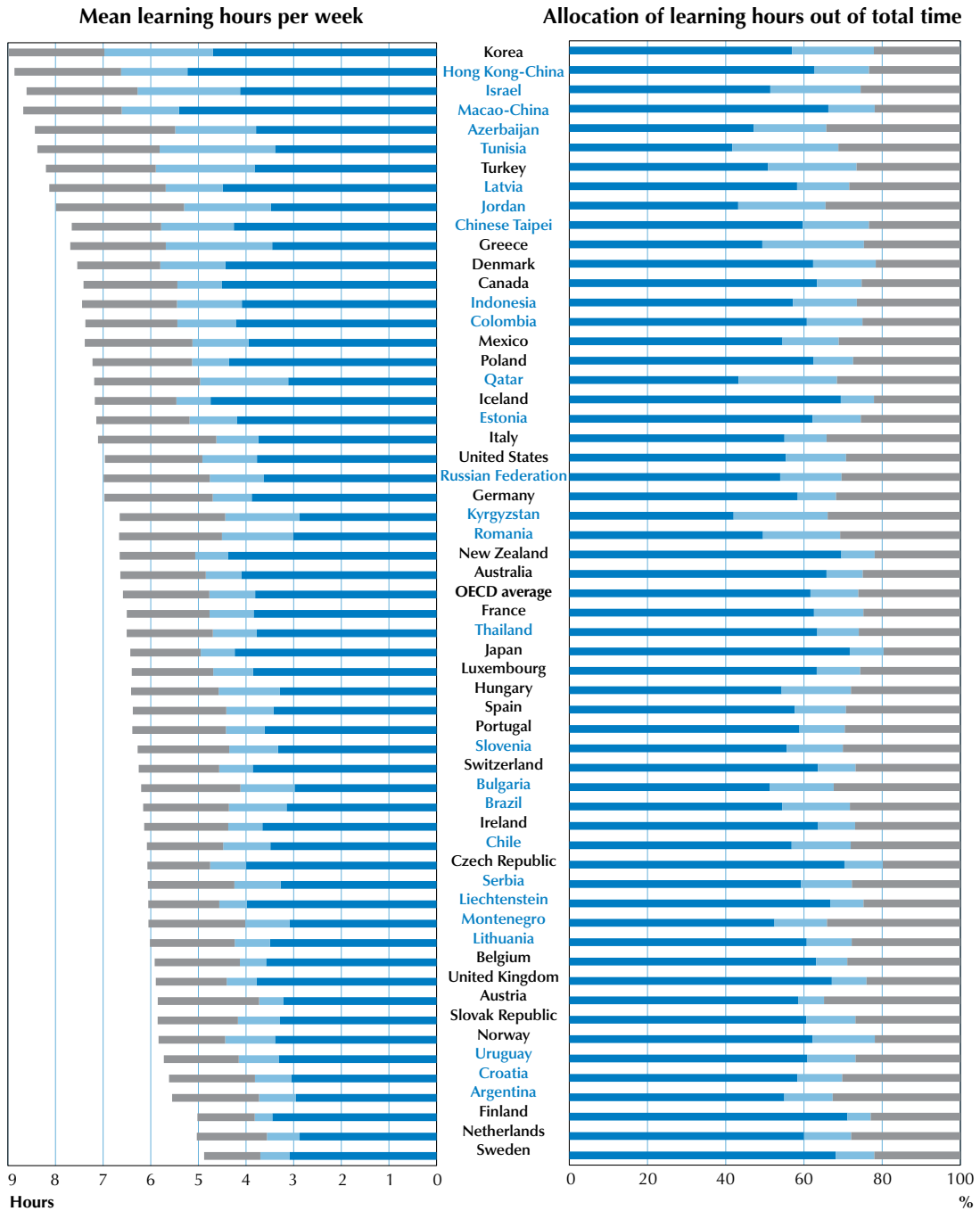
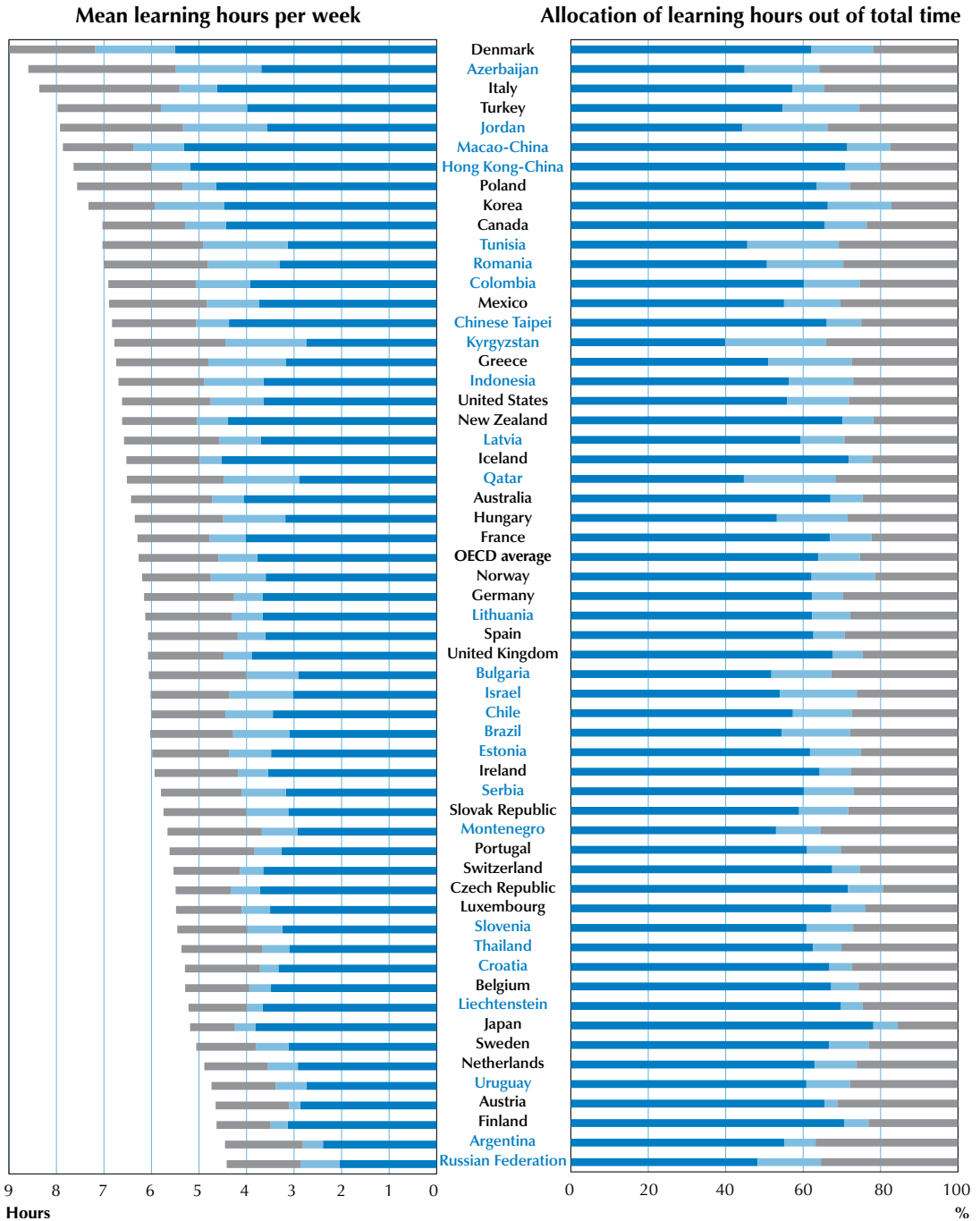




Figure 2.1c

Mean learning hours and allocation of learning hours out of total time on the language of instruction

■ Regular lessons at school ■ Out-of-school-time lessons ■ Individual study



Countries are ranked in descending order of the total learning hours on the language of instruction.
 Source: OECD PISA Database 2006, Table 2.2c.

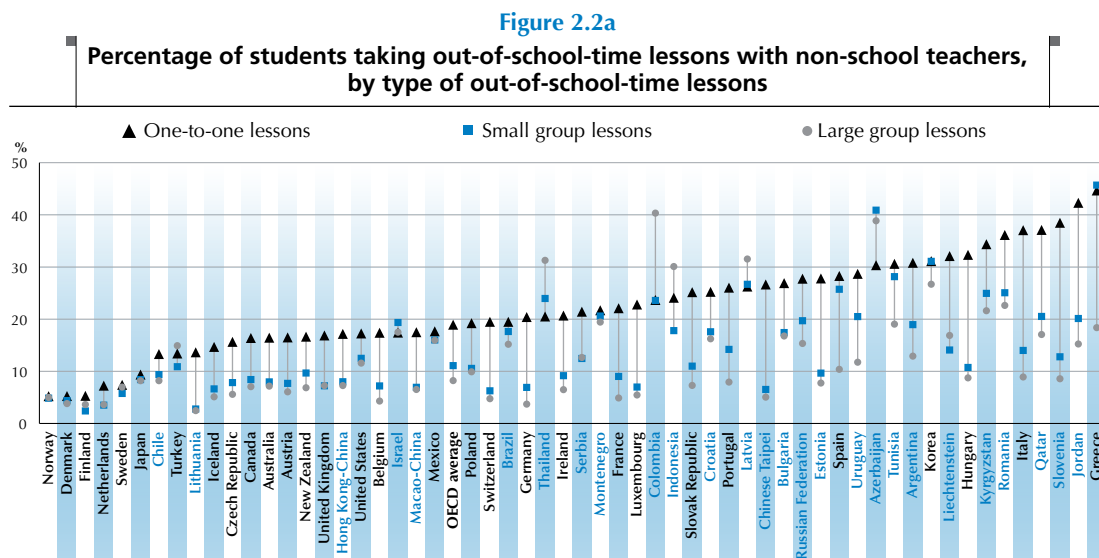


TO WHAT EXTENT ARE STUDENTS INVOLVED IN OUT-OF-SCHOOL-TIME LESSONS?

In PISA 2006, students were asked to report their engagement in each of the following six types of out-of-school-time lessons: one-to-one lessons with a school teacher; one-to-one lessons with a teacher not from the school; lessons in small groups with a school teacher; lessons in small groups with a teacher not from the school; lessons in large groups with a school teacher; or lessons in large groups with a teacher not from the school.

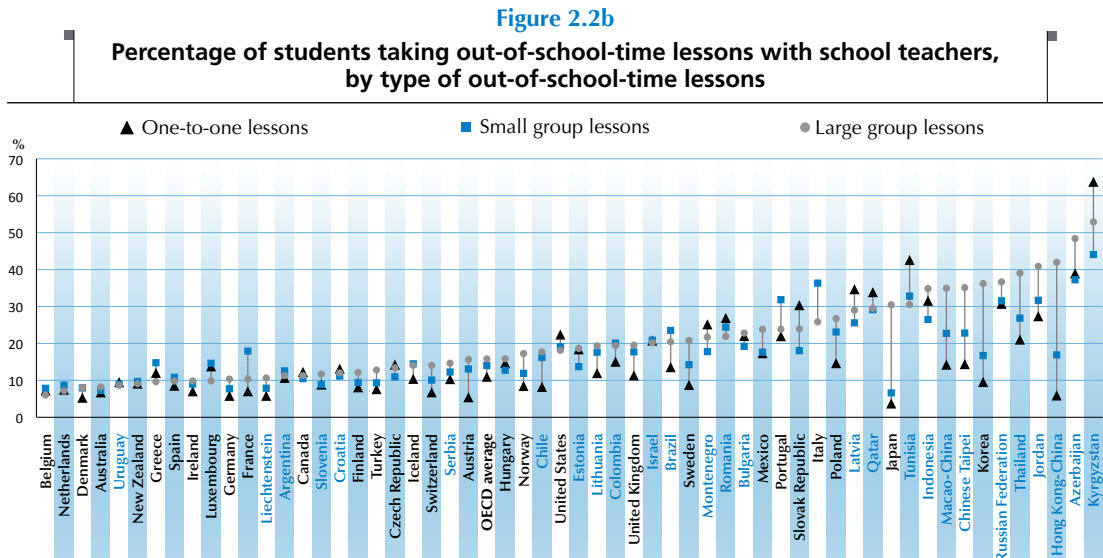
Across OECD countries, 43% of students are engaged in out-of-school-time lessons on school subjects (Table 2.3). About one-quarter of students are involved in at least one type of out-of-school-time lessons with teachers from their own school and another quarter are involved in out-of-school-time lessons with instructors who are not the teachers in the schools the students attend. Figures 2.2a and 2.2b illustrate the differences across OECD countries in the proportions of students taking different types of out-of-school-time lessons from teachers who teach in the schools they attend or from those who don't. The differences in proportions between these two groups are generally small, except for Greece, Spain and the partner countries Kyrgyzstan and the Russian Federation. In general, students who engage in out-of-school-time lessons with teachers who are not teachers in their schools (referred to as "non-school teachers" for the rest of this report) also tend to show extensive engagement in out-of-school-time lessons with school teachers.

Previous sections in this chapter suggest that student attendance in out-of-school-time lessons varies greatly from country to country. Figures 2.2a and 2.2b show that the type of out-of-school-time lessons students attend also varies across countries. Less than 15% of students in Finland, Norway, Denmark, the Netherlands and Sweden attend at least one type of out-of-school-time lessons with non-school teachers, while over 50% of students do so in Greece, Korea and partner countries Azerbaijan, Chinese Taipei, Israel and Hong Kong-China. Similarly, around 15% or less of students in Australia, Denmark, Belgium and the Netherlands attend at least one type of out-of-school-time lesson with school teachers, but that proportion exceeds 50% in Korea and the partner countries Kyrgyzstan, Azerbaijan, the Russian Federation, Jordan, Tunisia, Indonesia and Latvia.



Countries are ranked in ascending order of the percentage of students taking out-of-school-time one-to-one lessons.

Source: OECD PISA Database 2006, Table 2.3.



Countries are ranked in ascending order of the percentage of students taking out-of-school-time large group lessons.

Source: OECD PISA Database 2006, Table 2.3.

Differences in the size of lessons for out-of-school-time activities appear to be primarily determined by whether students in a particular country attend out-of-school-time lessons with school or non-school teachers. One-to-one lessons seem to be the most prevalent type of out-of-school-time lessons with non-school teachers, while large group lessons are the most prevalent type of these kinds of lessons when they are led by school teachers.

PATTERNS OF STUDENTS' ABSOLUTE AND RELATIVE LEARNING TIME

In order to summarise the differences and similarities in the patterns of students' learning time, countries are grouped according to two factors. The first is absolute learning time in regular school lessons, which is equivalent to the length of learning time spent in regular school lessons in science, mathematics and the language of instruction altogether. The second is relative learning time in regular school lessons, which is equivalent to the proportion of total learning time (*i.e.* the time spent in regular school lessons, out-of-school-time lessons and individual study combined) allocated to regular school lessons out of total learning time in all three subjects. This grouping of countries shows both the amount of time students spend in regular school lessons and the way they allocate learning time across countries¹. The relationship between absolute learning time or relative learning time in regular school lessons and performance is examined in detail in Chapter 4.

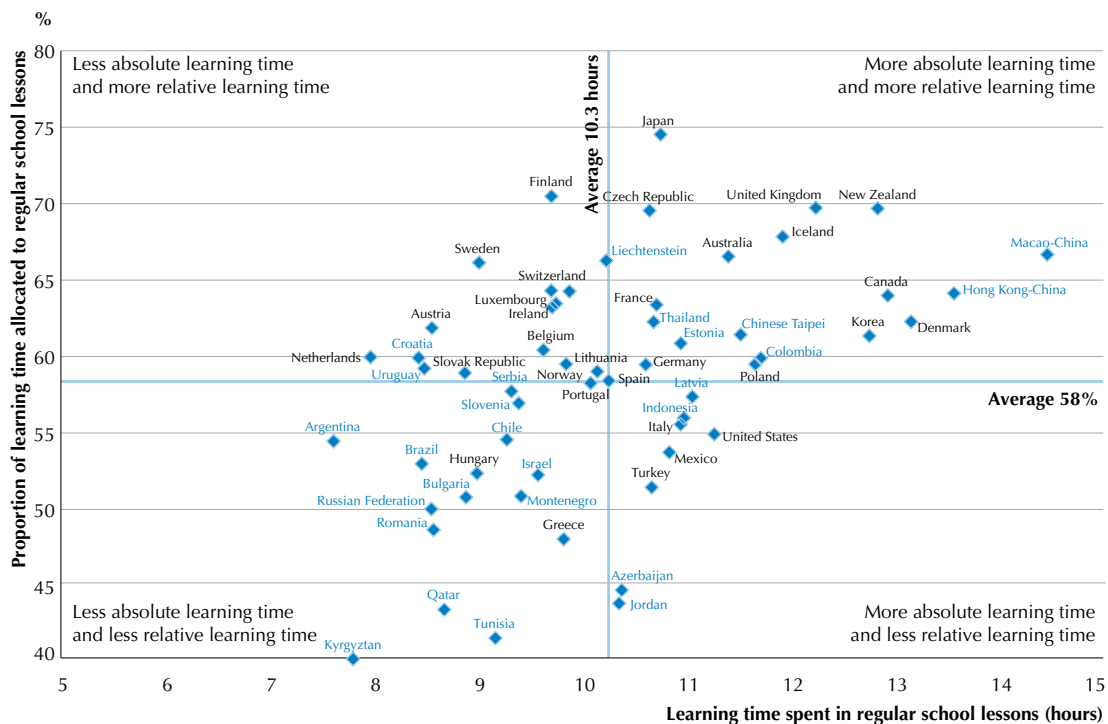
As shown in Figure 2.3, four groups were identified: "high absolute learning time in regular school lessons, and high relative learning time in regular school lessons", "low absolute learning time in regular school lessons, but high relative learning time in regular school lessons", "high absolute learning time in regular school lessons, but low relative learning time in regular school lessons" and "low absolute learning time in regular school lessons, and low relative learning time in regular school lessons".

Box 2.1 shows the lists of countries in the four groups identified in Figure 2.3. The "high absolute and high relative learning time in regular school lessons" group includes 12 OECD countries and 6 partner countries and economies. Interestingly, it includes five Asian countries and economies (Japan, Korea, Chinese Taipei, Hong Kong-China and Macao-China). In this group of countries and economies, more time is spent in regular school lessons and the proportion of time spent in regular school lessons is higher than the average across all participating countries and economies.



Figure 2.3

Absolute learning time and relative time in regular school lessons in science, in mathematics and on the language of instruction



Source: OECD PISA Database 2006, Table 2.2d.

The “less absolute but more relative learning time in regular school lessons” group includes 11 OECD countries and 4 partner countries, including 3 Nordic countries (Norway, Sweden and Finland). This group is characterised by a shorter amount of learning time in regular school lessons, but a higher proportion of hours spent in regular school lessons than the average across all participating countries and economies. As students spend a small amount of time in regular school lessons and outside regular school lessons, the total learning time is the shortest among these four groups of countries.

The “more absolute but less relative learning time in regular school lessons” group includes four OECD countries and four partner countries. In this group, the amount of time spent in regular school lessons is higher, but the proportion of time spent in regular school lessons is lower than the average across all participating countries and economies. In this group, the total learning time tends to be long since students spend larger amounts of time in regular school lessons and in out-of-school-time lessons and individual study.

The “less absolute and less relative learning time in regular school lessons” group includes 3 OECD countries and 13 partner countries. This group is characterised by smaller amounts of learning time in regular school lessons and a lower proportion of learning hours in regular school lessons than the average across all participating countries. One could infer that students’ learning in regular school lessons is limited because the students tend to spend a small amount of time in those lessons, but a large amount of learning time outside of those lessons.



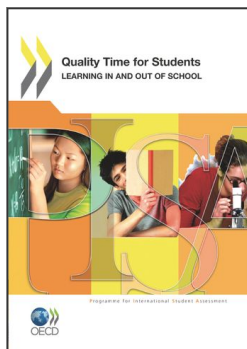
Box 2.1. Patterns of learning time in regular school lessons, by country

More absolute learning time and more relative learning time		Less absolute learning time and more relative learning time		More absolute learning time and less relative learning time		Less absolute learning time and less relative learning time	
OECD	Partner	OECD	Partner	OECD	Partner	OECD	Partner
Germany	Thailand	Norway	Croatia	Turkey	Jordan	Hungary	Argentina
Czech Republic	Estonia	Austria	Uruguay	Mexico	Azerbaijan	Greece	Kyrgyzstan
France	Chinese Taipei	Slovak Republic	Lithuania	United States	Indonesia	Portugal	Brazil
Japan	Colombia	Sweden	Liechtenstein	Italy	Latvia		Bulgaria
Australia	Hong Kong-China	Netherlands					Romania
Poland	Macao-China	Belgium					Qatar
United Kingdom		Finland					Montenegro
Iceland		Luxembourg					Tunisia
Korea		Ireland					Chile
New Zealand		Switzerland					Serbia
Canada		Spain					Slovenia
Denmark							Russian Federation
							Israel

Source: OECD PISA Database 2006, Table 2.2d.

Note

1. As no difference is observed across subjects, the three subjects – science, mathematics and the language of instruction – are combined and reported together.



From:
Quality Time for Students: Learning In and Out of School

Access the complete publication at:
<https://doi.org/10.1787/9789264087057-en>

Please cite this chapter as:

OECD (2011), "Patterns of Students' Learning Time", in *Quality Time for Students: Learning In and Out of School*, OECD Publishing, Paris.

DOI: <https://doi.org/10.1787/9789264087057-4-en>

This document, as well as any data and map included herein, are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area. Extracts from publications may be subject to additional disclaimers, which are set out in the complete version of the publication, available at the link provided.

The use of this work, whether digital or print, is governed by the Terms and Conditions to be found at <http://www.oecd.org/termsandconditions>.